

Tracing the Past, Conserving the Future

The British and Irish Botanical Expedition to
Tasmania 2018



Piers Lunt
Merlin 716

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Cover photo: Waratah (*Telopea truncata*), floral emblem of Tasmania. Near Pine Lake, Central Plateau Conservation Area, Tasmania, January 2018.

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ACKNOWLEDGMENTS

So many people made this trip possible for me, gifting their time, finances, energy or simply their enthusiasm. I should like to thank all of them presently. However pride of place, I think, has to go to Harold Comber. He is of course unable to accept my thanks, having died in 1969, but I can say with complete confidence that this trip would either not have happened, or would have been a very different prospect, were it not for his 1929-30 expedition. Despite our divergent aims in collecting from the Tasmanian flora, I travelled in his footsteps, visiting many of the same places, collecting from the same species – indeed, I even wondered on many occasions whether I was looking upon some of the same individuals he would have done, now more than 80 years older, which is not such a very long time in the plant kingdom. Perhaps they even remembered him stopping to make a collection, take a photograph, or simply trudging past looking for the next wonderful species to bring back home. It is a humbling experience, walking in a plant hunter's shoes. It connects us to the past, framing our current activity in a historical context, and this brings history very much to life. Even in the modern age with aeroplanes, cars and roads, and hot coffee just around the corner, we can nonetheless share some of the thrill of first discovery. After all we are primarily plant lovers, and whatever our reasons for collecting we have at least one thing in common: appreciation of their beauty, which is the primary impulse that arises when we are confronted with, say, the Waratah or the Pencil Pine. Although access around the island is greatly improved since Comber's day, much of Tasmania remains in a state of wilderness, or near wilderness. With the right kind of eyes, and a little imagination, it still looks as it would have done in 1930.

Secondly then it is only right to thank the expedition leader, Stephen Herrington, current head gardener of Nymans and champion of Harold Comber. His interest in restoring Comber's Tasmanian collection at Nymans, tragically ruined during the great storm of 1987, provided the impetus behind the expedition. Charlie Bancroft, also of Nymans, must get a special mention here too. Together they organised the expedition in minute detail, from compiling the itinerary to arranging permits and accommodation, booking hire cars, and generally dealing with the whole load of boring organisational necessities, ensuring everything ran smoothly. More than that, however, they proved the most amiable of companions, making the trip a very special and memorable one. As were 'the Irish Contingent', Seamus O'Brien, Neal Porteous and Robert Wilson-Wright, who were always on hand with wit, wisdom and humour. What an august group to travel with on my first expedition!

I must turn my appreciation now to the staff and friends of the Royal Tasmanian Botanical Gardens. Deputy Director Mark Fountain in particular was an excellent host when we gave our talks on the 19th January. But it was the generosity of James Wood and Natalie Tapson that, in many ways, made the whole trip. They gave freely and tirelessly of their knowledge and time, answering endless questions and providing us with an invaluable crash course in Tassie botany, without which we would have been far more in the dark when collecting on our own. What these two don't know between them about Tasmanian flora is probably not worth knowing. In addition they took us to floral hotspots that are easily overlooked by the uninitiated, and gave us tips for collecting and seed cleaning that will continue, I am sure, to serve well in to the future. Their friendship and contribution to the expedition cannot be overstated.

I am very grateful to many people at the National Botanic Garden of Wales (NBGW), not least the curator (my boss) Will Ritchie. His recommending me for the trip, and belief in my abilities, made the whole thing possible. If I'd been told a year ago that I'd be on a plant collecting expedition within 12 months, I'd have laughed heartily; it seemed such a remote possibility it didn't even figure on my radar. My participation in the trip must stand as a testament to Will's dedication to both the botanic garden mission, and the professional development of his staff. His assistance with fund applications, training for DNA sampling, knowledge of the mechanics of expeditions, and general tips and advice on etiquette, was invaluable. Equally invaluable was the energy and enthusiasm of staff and volunteers, evinced by their fund raising efforts, and the very kind words of encouragement I received. Especial mention must be made of my colleagues in the horticulture department, who put aside their understandable irritation at my ducking out of winter duties for a month, in light of the greater good the expedition afforded; I can assure you all, it was definitely worth it! I would also like to thank any garden members, and members of the public, who donated funds through the website's Just Giving page. Participation would have been far more difficult for me without such generosity.

On the subject of funds, I must thank the RHS and the Merlin Trust. Both of these institutions provided very significant bursaries, enabling us to pay for everything from accommodation, car hire, camping equipment and national park fees, to food, petrol and coffee. It is heartening that, at a time of economic austerity when money seems scarcer than ever, even though there is more of it in circulation than at any time in history, organisations such as these are still prepared to invest in people. This giving attitude comes, I feel, from the belief that investment ensures the vibrancy and relevance of the horticultural industry in perpetuity. Without passionate and well trained individuals, the industry would die a death, and that has implications not just for horticulture, but for the natural world per se. These trips provide us with opportunities for conservation, education, and the fostering of community and networking across institutions globally. Whatever brings people together, with these noble endeavours as the common cause, is surely a boon to the world.

Lastly and most importantly I thank, with all my love, my family for consenting to me spending three and a half weeks in the antipodes. This cannot have been an easy decision for my wife Augusta, particularly given that we parent two small children, and I'll be eternally grateful that she saw the benefit to my going. Their love and understanding sustained me throughout the expedition, especially during those times of utter exhaustion when I just wanted to come home.

INTRODUCTION

It was in the characteristically wet September of 2017 that my curator at the National Botanic Garden of Wales (NBGW), Will Ritchie, approached me with a simple proposition: would I be prepared to travel to Tasmania on a field trip? The expedition was to be led by Stephen Herrington, head gardener at one of the most prestigious gardens in the National Trust (NT) portfolio, Nymans in West Sussex; it would take three weeks, three and a half including travel, so I'd be away from my family for nearly a month; it was being organised for January, the hardest month in the UK by anybody's standards. January? As I understood it botanical expeditions were often two years in the planning, yet this was going ahead within four months. Not much time to even get funding applications together, let alone wrap my head around the whole project with all the necessary research and preparation. Undeterred by these minor obstacles, I offered a cautious yes. I knew that going would place a rather large burden on my family, and so I had to discuss the implications with them first. Would it really be fair to abandon them to winter wet and cold, and something of a childcare headache? When I went home that evening, my wife Augusta looked me in the eye and said simply 'you'd be crazy not to go'. Thus the deal was sealed.

For Stephen the expedition was to be an opportunity for historical restoration, and would be the first led by the NT. Nymans once played host to a Tasmanian collection from the 1930s, the result of a collecting trip by Harold Comber, who had an intimate relationship with the property. This collection was devastated by the great storm of 1987, that monstrous extreme weather event which caused, in barely 3 hours, the downing of 15 million trees across southern Britain. The tragedy of this loss was more than merely historical, it was also botanical. Many of the plants in the collection were Tasmanian endemics, which for some reason are virtually unknown in British cultivation. As a result they constituted a fantastic educational and research resource, and would have been amongst the most mature specimens of Tasmanian flora growing anywhere in the UK. Perhaps more importantly, they occupied an accidental *ex situ* site for conservation, as do any wild collected plants in cultivation in the age of climate change and habitat destruction. But quite aside from these weighty issues, it is always a loss when things of beauty, and living beauty especially, are destroyed. And yet in destruction are sown the seeds of opportunity. Windblown trees create space, and space is the precursor to planting; a reduced collection provides the impetus to collect again, and with modern technologies both travel and collecting are made easy. So it took Stephen with his sympathetic understanding of what they call at the Trust 'spirit of place', and his own spirit of adventure, to take the leap and suggest a restorative expedition. Fortunately for me he began casting around for participants in the direction of Wales.

I say fortunately for me, as it undoubtedly was on personal and professional levels, but it was also fortunate for NBGW. The expedition would afford us the opportunity to develop more seriously our wild origin collections, especially within the arboretum and the Boulder Garden, both of which have a strong temperate Australasian focus. Wild origin material is really the backbone to botanic gardens' collections, for a number of reasons. Firstly, collecting from known wild provenance, as widely as possible from extant populations, helps preserve genetic material into the future. This becomes starkly vital when those populations are threatened or even decimated, for example by climate change or habitat destruction. A germane example of this is the Miene Cider Gum, discussed in detail later in this report. French conservation work from the 1980s has preserved genetic material, from populations of this incredibly rare tree that exist now only as bleached stags, victims to an altered climate and the increased herbivory that results from it. We may not be able to restore those populations in our lifetime, or even our children's lifetime, but perhaps one day our

descendants will. And in that worst case scenario which sees the complete inability to reintroduce the plant to the wild, we still preserve a species that could prove unimaginably important in other ways, bringing me to my next salient point. Cultivation and preservation of wild plants allows us to continue studying them on every level, from the horticultural to the genetic. Why is this so important? Systematics, that is the study of taxonomy, allows us to classify biological life. With the advance of genetic technologies we are now able to classify to such an extent, that we can clearly observe the movements of evolution down the ages. I can see that to some people this endless quest to classify everything may look suspiciously like a fetish, but understanding the genetic connections between plants has a real-world impact. If we know who is related to who we can, for just one example, breed new crops that may prove resistant to certain diseases or produce higher yields, thereby feeding more people; no small matter, in view of the exponential increase in global population. Whatever we may think about modern genetic engineering, humans have selectively bred plants since they first began modifying the environment with fire, albeit unknowingly. Later these efforts became focused, initially when peripatetic peoples planted seed in the forest from high yielding individuals, so they could be certain of abundance when next visiting a phytogeographic area on migration. Subsequently of course, the rise of agriculture accelerated this behaviour, so we are now both beneficiaries and descendents of this early experimentation. All of this is to say nothing of medical science, which is continually scouring the natural world for compounds that can heal. Digitalin, paclitaxel and morphine, just a few examples among many, all derive from plants and have saved or improved countless lives. It is the understanding of how plants work, and how they are related, that ensures our ability to continue experimenting. If researchers can work on plants in collections closer to home that may be buffered against the vagaries of climate change, so much the better.

The expedition would also prove a fantastic opportunity to increase the standing of NBGW within the international botanic gardens community, after a decade-long period in our history that could be described as near hermetic. 2008 was the last time someone from the garden had joined anything like this expedition, strangely enough to Tasmania; so things were now coming full circle. If these expeditions do nothing else, they create the conditions for scientific and botanic organisations to forge networks of deep connection and communication, facilitating exchange and benefit sharing. And it really is on connections that institutions such as ours rise and fall. Botanical gardens are the repositories of much of the world's threatened flora, and it is the scientific and horticultural trade in material and skill that keeps the quest for conservation and knowledge alive. Trade and exchange cannot exist in a vacuum, so working closely with other organisations, under the guiding principles of Nagoya, CBD and CITES, is absolutely essential. In the end all organisations are simply collections of people, and not in fact the faceless and amorphous entities we might want to conveniently believe them to be. Ultimately it is on the ability of those individuals to cohere that the success of our work rests.

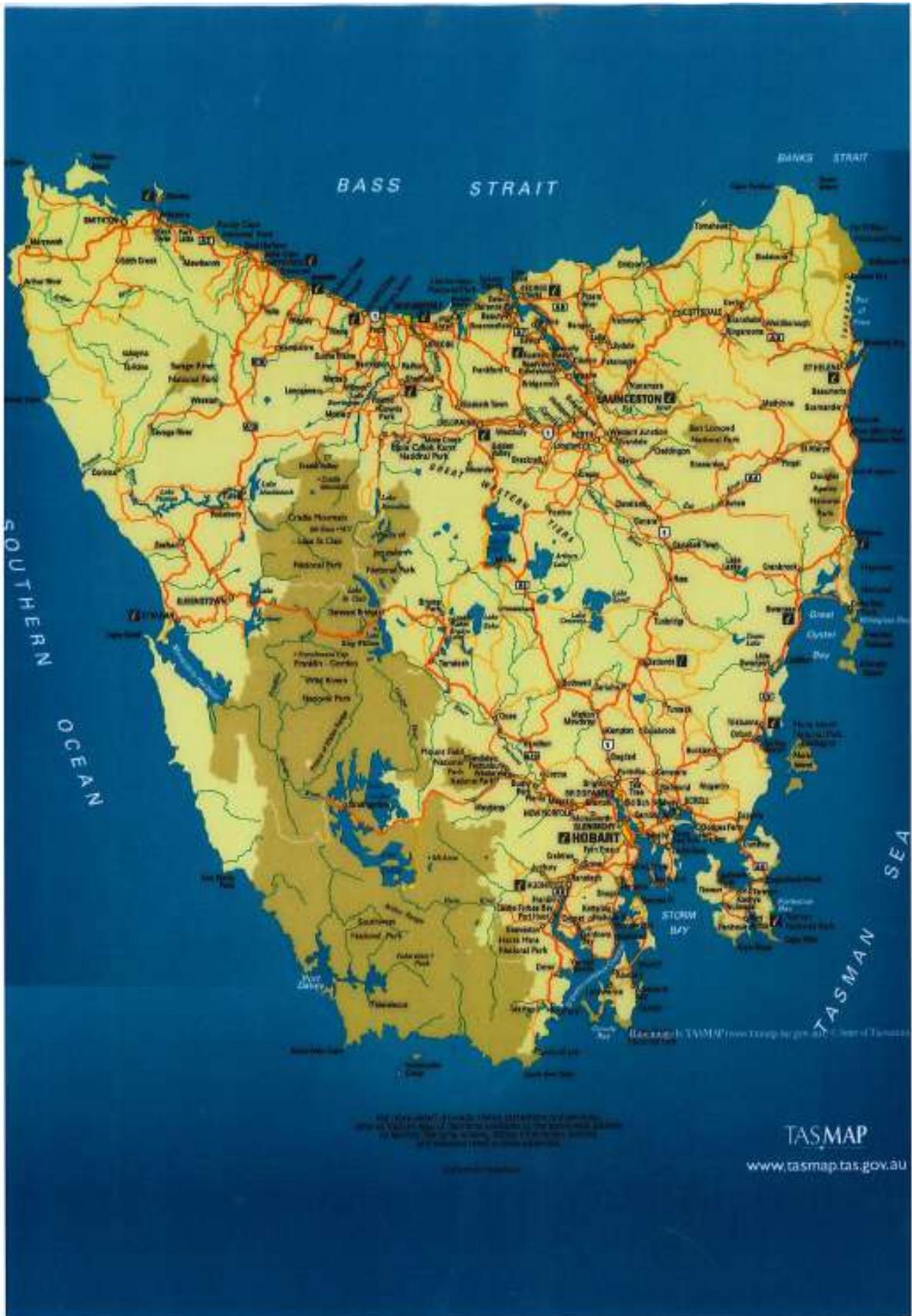
Not only would I be working with Stephen and Charlie Bancroft from Nymans, but also Neal Porteous, head gardener at Mount Stewart, an NT property in County Down, Northern Ireland; Seamus O'Brien, head garden at Kilmacurragh Botanic Gardens, a satellite of the National Botanic Gardens of Ireland Glasnevin; and Robert Wilson-Wright of Coolcarrigan, County Kildare. I later found out that the Royal Tasmanian Botanical Gardens (RTBG) would use our visit as an opportunity to conduct some of their own field research, and so we would be spending around a week in total with Natalie Tapon, and James Wood of the garden's seedbank. The trip was shaping up to be a

perfect example of institutional collaboration, and I grew more excited by the day at the thought of what we'd be able to accomplish between us. Now the British and Irish Botanical expedition to Tasmania , BIBET, was born.

So with sights set on the southern hemisphere I applied for funding with the Merlin Trust, a bid which was ultimately successful even though it was submitted after the deadline; and I conducted what research I could, in the little time I had between my usual tasks in the garden. I read up on the island in general, trying to grasp an understanding of its natural and social histories. I learned about its flora, the endemics, the 'poster children', and those that we wouldn't be able to collect due to their inclusion on Tasmania's Red List of Threatened Species. These last were of particular interest to me, promising the greatest opportunity for conservation and education, and I hoped that I'd be able to convince James to relinquish material from the seedbank for us to grow at the garden. As it turned out he didn't need much convincing! Colleagues and volunteers at NBGW raised funds for me, with a successful Just Giving campaign and cake sale, and before I knew it all the money needed had materialised, return flights were booked, and regular news was filtering through from Stephen, detailing the progress of his and Charlie's planning. Will gave me a crash course in DNA sampling, and I riffled the store in our laboratory for silica granules (with Natasha de Vere's blessing!). At the eleventh hour collection permits were issued, the last piece in the jigsaw. After all that manic activity, Christmas and New Year promised calm before the storm...

PART ONE

BACKGROUND



[source: www.tasmap.tas.gov.au]

THE ISLAND

The state of Tasmania, located approximately 150 miles across the Bass Strait from Victoria, southeast Australia, is made up of not one but 335 islands. Mainland Tasmania, the largest of them, is the 26th largest island in the world, with a land area of 26,410 square miles, somewhat slightly smaller than Ireland and roughly three times the size of Wales. One oceanic boundary definition sees the island entirely surrounded by the Southern Ocean; other definitions prefer the Indian Ocean or Great Australian Bight to the west, and the Pacific Ocean or Tasman Sea to the east. Tasmania's latitude position between 40-44°S places it directly in the path of the Roaring Forties, strong westerly winds influenced by both the Hadley Cell and the Polar Vortex combining with earth's rotation. With no landmass to act as a windbreak the west of the island in particular is heavily wind battered and takes significant rainfall, with some places receiving as much as 3 metres per year. In contrast the east is far drier, and is often at the mercy and caprice of the El Niño/La Niña Southern Oscillation.

Tasmania is classified as having a cool temperate climate, being placed as it is within the South Temperate Zone (approx. 23.5°S-66.5°S latitude). As a consequence Tasmania experiences greater temperature variation across four distinct seasons than regions outside of these latitudes, much like the UK. In fact this similarity allows for the very successful cultivation of a wide range of Tasmanian flora, excluding some from lowland, eastern and coastal areas that would only thrive in the mildest parts of Britain. Temperatures on the east of the island reached a record 42.2°C on 30th January 2009, but more commonly range from 4.9°C in July to 22.2°C in January. In contrast Liawenee in the Central Plateau regularly sees sub-zero winter temperatures, being one of the few places in Australia with a subpolar climate.

In deep geological time Tasmania was a volcanic region, and remains today the most mountainous of Australian states. Its largest mountain is Mount Ossa at 1,617m, nearly 300m higher than Ben Nevis, and is located in the heart of Cradle Mountain-Lake St. Clair National Park. The differences in elevation and climate across the island have led to the development of some very diverse ecosystems: dry and wet sclerophyll forests; temperate rainforest; alpine and coastal heaths; montane. This in turn has led to a high degree of endemism in both the flora and fauna of the island, making it a rich place to study and collect in.

Like many countries around the world Tasmania has a number of national parks, all of which work to protect the island's natural heritage. In fact, somewhere in the region of 42% of the landmass is protected in some way, either as reserve or national park. This number is increasing incrementally, thanks to the work of the Tasmanian Land Conservancy. This organisation buys agricultural holdings, and then sells them on with covenants to protect their natural values, thereby preventing the implementation of disastrous agrarian practices and policies.

It would be remiss of me to leave out mention of human society on Tasmania, as it stretches back 40,000-70,000 years, and has left an indelible mark. Aborigines would have migrated to the island when it was still connected to mainland Australia, eventually being cut off after the last glaciation some 10,000 years ago. At the time of European discovery these peoples comprised nine distinct 'nations', engaging in fire-stick agriculture, the hunting of game and seals, and fishing for

subsistence. They had an intimate knowledge of the land and its inhabitants, both plants and animals, and consequently trod very lightly in their use of natural resources. Their patch burning techniques were evidently very sophisticated, as there is little evidence of large scale destruction from out of control fires, unlike many of those we see in the modern era. Patch burning allowed them to flush out and hunt game, but also had the effect of rejuvenating forest, improving conditions for certain ground flora species (much as coppicing in Europe), and encouraging regeneration of those plants that rely on fire for propagation.

In 1642 the seafarer Abel Tasman reported sight of the island, the first recorded European to do so. His expeditions around the area were funded by Governor to the Dutch East Indies, Anthony van Dieman, and Tasman named the land after his benefactor. It wasn't then until the 1770s that the French attempted to found a colony on the south at Blackmans Bay. They failed to do so, but French explorers continued to investigate the area around southern Australia and the Bass Strait into the 1790s. Eventually the British founded a colony on the island in 1803, finally forestalling any French claim to the region. Quickly the British established Van Dieman's Land as a penal colony, eventually sending four out every ten of those transported to Australia there.

Non-convict settlers turned, inevitably, to farming as a principal occupation, pushing further and further into the interior. Of course this led them into direct conflict with Aborigines, creating an animosity that would virtually spell the end of the indigenous culture. This conflict reached its apogee in the Black War from the mid-1820s to the final surrender and removal of the surviving Aborigines in 1832. Terrible atrocities were committed on both sides in the war, with the Aborigines coming off very much the worst of it. It is only now, nearly 200 years after the event, that Australian society is beginning to come to terms with this dark episode in its past.

Eventually, with the end of transportation, Van Dieman's Land began to look to the future, and to modernisation, changing its name to Tasmania on January 1st 1856. It subsequently became an international centre for ship building, supplying British imperial ambitions, and developed its agriculture and forestry industries, two of its economic mainstays to this day. Finally, in 1901, it merged the five other Australian colonies to form the Commonwealth of Australia.

HAROLD COMBER

Harold Comber was born in 1897 at Nymans in west Sussex, to James and Ethel Comber. His father was the first head gardener of the estate, working under the direction of Ludwig Messel.



Left: Harold Comber [source: <https://nymansgardenblognt.wordpress.com/2016/01/15/the-harold-comber-collection/>]
Right: Nymans [source: <http://www.reallygardenproud.com/blog/?tag=national-trust-nymans>]

After leaving college in his mid-teens Harold apprenticed to his father in the gardens at Nymans, and evidently began to quickly show an aptitude for the work. Within two years he had been recommended by Sir Edmund Loder to the eminent plantsman Henry Elwes, who employed Harold at his Gloucestershire home, Colesbourne Park. Comber's skills were such that on the outbreak of World War I, a knee injury invaliding him for service, he took charge of the botanical collections and glasshouses on the estate, despite his young age. During this time he also published an article in the *Gardeners' Chronicle* and took up war work on munitions at Earlswood.

After the war Harold was sponsored by Elwes and Loder to study at the Royal Botanic Garden Edinburgh for a Diploma in Horticulture. Excelling in his work he achieved high marks and wrote a thesis on rhododendrons. His knowledge of nomenclature and plant classification brought him to the attention of aristocratic plant enthusiasts, including Lord Aberconwy, who funded two expeditions to the Andes in 1925-6, and 1926-7. Comber collected more than 1200 herbarium and seed samples on these trips, introducing many species to British horticulture, if not to science, including species of *Berberis*, *Desfontainea spinosa* and *Weinmannia trichosperma*. Some of these, either original plantings or their descendents, can still be found thriving at Nymans today.

On his return to Scotland Comber completed his studies and then took the post of head gardener at Galloway House, seat of the McEacharn family, developing the garden there until his departure in 1930 when the house was sold. While in this position he undertook another plant hunting expedition in 1929-30, this time to Tasmania. He collected some 147 plants on this trip, from a variety of locations around the island, producing a small leather-bound book on his return, highlighting a selection of those species he considered especially worthy of cultivation in the UK.

After this, Comber worked at a number of different gardens in the UK, including Exbury Gardens in Hampshire for Edmund de Rothschild. At this point in his career he developed a passion for lily breeding and was invited, after giving a talk on lilies for the RHS in 1952, to take up a position with the Oregon Bulb Farm. He accepted, moving to the US where he worked for Jan de Graaff as a lily hybridizer, creating new hybrids and improving bulb production methods. He died in Oregon in 1969.

Despite the esteem he enjoyed in life and his notable output, Harold Comber has become something of a lost plant hunter since his death. Talk to people in horticulture today and virtually no-one has even heard his name. But his contribution to horticulture in the UK is far from modest. As well as introducing some very rare plants from the Andes, he opened up the Tasmanian flora to study at a time when large tracts of the island were completely inaccessible to all but the most intrepid. This should be considered a boon to UK horticulture as so many plants from that temperate island are well suited to our climate. It is, therefore, mystifying that his contribution has largely gone ignored, except of course at Nymans, which has played host to many of his most notable introductions since the 1930s. Yet even there, nature tried its best to destroy the collection with the great storm of 1987. It is to be hoped that this BIBET expedition, following as it is in his footsteps, and with ambitions to restore the 200m long Tasmania Walk, can also restore a great man's reputation.

WOODS OF THE WORLD

The development of an arboretum has been a core goal of the National Botanic Garden of Wales (NBGW) from its inception in the late 1990s. Many botanic gardens include this essential element to their design, even those with a dearth of space. Fortunately we do not lack space at NBGW, comprising as we do an estate of 568 acres. The site eventually chosen for the project covers 18.14 hectares to the south of the estate. Large enough to accommodate an ambitious project, the area was parcelled off into eight distinct phytogeographical zones. These zones would represent the woodland flora of temperate regions of the world with a similar climate to Wales, identified as biodiversity hotspots in the WWF Ecoregion assessments.

The eight original regions identified to meet this criterion were: Chile, Bhutan and India, China, Tasmania, New Zealand (South Island), Eastern Himalaya, Appalachia, and south-eastern USA. For one reason or another these were eventually simplified, with Appalachia and SE USA amalgamated to eastern USA, Bhutan and India scrapped in favour of Western Himalaya, and the inclusion of the western USA. Planting began in 2005, with additions ongoing till 2015 when the last of the original wild collected material was planted. Unfortunately certain challenges with the site, such as waterlogging in some places and exposure to wind, have led to a percentage of the collection perishing over the years. In 2012/13 a Woodland Trust Jubilee Wood (Coed Nantglir) was planted between the Woods of the World, which will in time create a series of shelterbelts around the area, offering greater protection for the collection. The last 5 years has seen tremendous growth in many of these native species, which were carefully selected to suit the site.

Recently I undertook a review of the project with curator Will Ritchie, to take stock of the health and condition of the collection, and decide upon an appropriate vision for its future. It was decided that the project's geographical focus was too limiting, so several changes are currently being put into effect. China is staying as a distinct region, while the Himalayan regions are being amalgamated. East and west USA are to be joined and broadened to represent North America – this will also include Canada and other temperate areas of the region. Chile will now be included in South America, which will also represent flora from Argentina and other areas of the region. New Zealand and Tasmania are to be absorbed into a new Australasia zone. A new zone is to be created to represent flora of Indochina, as Will believes this to be an emerging frontier of conservation botany. Where possible, planting combinations will highlight natural associations between trees, shrub and herbaceous perennials to emulate habitats. The key to success in this will be the careful phasing of planting, to ensure adequate protection for the more vulnerable ground flora. This will be achieved by focusing on establishing the canopy layer first, then the shrub layer, and finally the ground flora.

The key to any botanical collection is the percentage of wild origin plants included in it, and to that end we are working with other global institutions to provide material for the arboretum. Index seminum is an invaluable way of increasing the collection through donated plant material, as is the direct collecting of wild seed material from conservation expeditions.

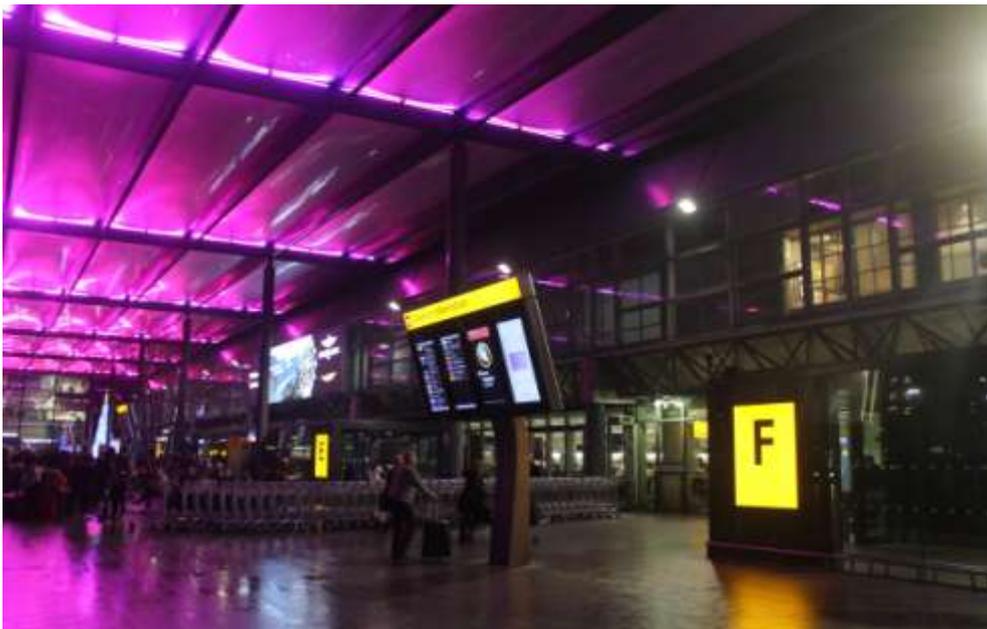
PART TWO
THE EXPDITION

DEPARTURE

Day 1: 02.01.2018

Leaving London in cold and winter's dark, making way by taxi from West Hampstead to Paddington, to catch the Heathrow express. Don't need to be at the airport until 7 or 8pm for check-in, but as Augusta and the boys are heading back to Wales I'll be there much earlier; no point in hanging around Paddington, might as well spend time relaxing in the departure lounge. Contemplate *en route* our plants in their winter dormancy, in contrast to the high summer I'll soon be entering, everything leafing and utilising the light. No light here, January draws shades across the day. Already feeling the strangeness of season hopping, the ability to enter new worlds within a matter of hours. Crowds like pilgrims in the cathedral echo of Paddington, St. Christopher is buried here, and in all great stations of travel the world over. A final coffee with my loved ones, littlest sleeping in his pushchair, oblivious to imminent departures, Oscar in his imagination up and down the escalator. These last moments will stay imprinted on my mind, and I'll return to them as anchor throughout the trip. 'Platform 3 for the 16:30 Great Western train service to Swansea, calling at...' Time beginning its inexorable onward march, the stop-clock started. Three and a half weeks to be kept apart. We embrace, Rowan thankfully wakes allowing me opportunity to say farewell. Too young to know where and for how long his father goes, he's calm and steady. Oscar understands, bears parting well. Augusta is a rock, I can feel tears that don't quite show themselves; I'd rather be steadfast. After all, this is not an unusual scenario, people travel and work away from family all the time. Still, it is different when it happens to you. I watch them leave, walking along the platform to the disabled access carriage, easiest for pushchairs and plenty of space for tumbling children. We wave from a distance and send a kiss, final view before it ends, and they're gone.

Onward to Heathrow on the cleanest and quietest train I've seen. 15 minutes to the Portal, Terminal 3. Check in my heavy bag and begin the waiting that is a hallmark of travel everywhere.



Heathrow Terminal 3

I'm not used to travel, having only been on a handful of plane journeys in my life, and this is something epic. 7 hours to Dubai, 13½ hours to Melbourne, 1¼ to Hobart. With stopover time, something like 26 hours. Relax into it, I tell myself, read and write, watch films, listen to music. Time will flow, and we'll arrive before we know it.

Meet Stephen and Charlie in the departure lounge, have dinner and take some photos/film/audio records for documentation. The National Trust (NT) will put a short film of the trip together, so this will become something of a feature of the expedition. Make our way to the departure gate.



Airbus A380-800, taxi to Dubai, from the departure gate

In the air or moving dazed through liminal spaces into other worlds. Time and its usual confines suspended. When all the hours of night and day are stacked like this, one upon the other in two dimensions, we cannot undertake ritual observance. And so we must make time serve us, create new observance whenever and however suits. For me now, currently held aloft in a preternatural state, sleep is the first casualty. Ride it out, accept this narcotic feeling, hot behind the eyes and near delirium.

HOBART

Day2: 04.01.2018

Can this really be day 2? What happened to Wednesday 3rd? We must have lost it somewhere in the Indian Ocean between Dubai and Melbourne. What a strange feeling, the elasticity of time! Now it's the 4th, and we've finally arrived in Hobart at 9:50am after 26 hours ceaseless travel. Wonderful to have feet firmly planted on the ground, to feel solidity instead of only air. Deeply weary from sleep's lack, but energised being somewhere foreign and warm, buzzing for the trip. Coffee and planning with maps and lists at the airport cafe.



Stephen & Charlie of Nymans NT, with maps and caffeine

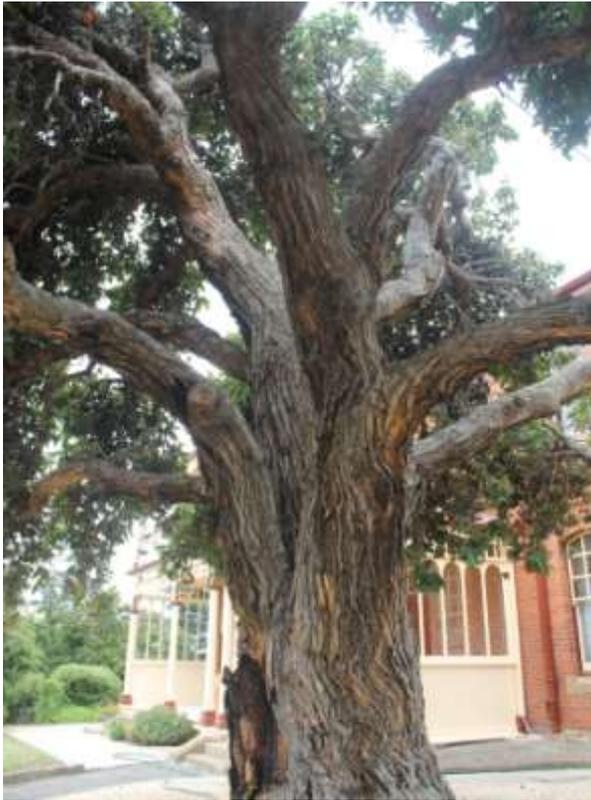
Waiting for the Irish contingent, who arrive at 11:30am. Now we are all here, grounded, ready to travel this island and meet its flora, to collect and to conserve. Three busy weeks stretch before us and I for one, being less travelled, have no conception of how fast this will fly. But at this point it feels long and exciting, full of learning and hiking, brimful of opportunity and growth.

We meet a young man from Sheffield who

hires us two white Mitsubishi Outlanders, which will be virtually home for the duration. Why white, I think, surely these will look battered by the end? A glance at other vehicles shows that white is the favoured shade on Tasmania. Fortunately I'm not on the insurance as a driver. This was already arranged before we arrived. It would cost now an extra \$18 a day to include me in that responsibility – no need when Stephen, Seamus, Neal and Charlie are designated chauffeurs. This allows me the rare opportunity to play passenger, and take in views and thoughts along the way.

On to Hobart, former penal colony and now state capital. A clean city, affluent by appearance, wide streets a mixture of beautiful colonial and brutish modernist architecture. Evidently a climatically mild place with *Agapanthus* sp. grown widely in domestic gardens, along with the sickly sweet *Agave americana* 'Marginata'. Some of these are so tall they're nearly bumping their heads on power lines. *Corymbia ficifolia* (Western Red Flowering Gum) is a popular tree here. Beautiful in full bloom humming with honeybees, from brilliant vermilion through pink to orange, with huge seed pods dangling, retention of former years' distilled sunlight. This almost Rococo Western Australian species would never work outside with us being so tender, but perhaps should be grown in the Great Glasshouse with our mediterranean climate collection? Would certainly turn some heads, and even though the tree is a large 10 meters our 15 meter apex would amply accommodate.

Check in to the Midcity Hotel for two nights to settle and shower. We all agree to meet after 30 minutes freshening up, no sleep. It's far better that we attempt to regain routine as soon as possible; sleep now would ultimately jeopardise recovery from jetlag.



Corymbia ficifolia, formerly *Eucalyptus ficifolia* (Myrtaceae), growing in a domestic front garden, Hobart

We wander into the city for dinner, and to find our feet. It's planted on a grid system, as many New World cities are. This makes it easy to navigate, but lacks the charm of ancient places that writhe organically, having more a feeling of being imposed on the landscape than of being moulded by it. I marvel at seeing mature English elm (*Ulmus minor* 'Atinia') growing in parks, a rarity back home, along with *Tilia cordata* and *Platanus x hispanica*, most of which must stand at 150 years old. Evidently many early colonists were feeling sick for the homeland. To me this speaks volumes about the relationship we have with trees. Planting familiar species, like importing familiar architectural styles, obviously gave these settlers a connection to their history, a grounding, a feeling of home which conferred a sense of security. It also accidentally provided the English elm with a haven from Dutch elm disease.

Back to the hotel for 7pm to catch up on sleep and attempt some recuperation. We are to meet in the morning at 9am.

Day 3: 05.01.2018

A good night's sleep, the first in several days, although I wouldn't say I'm running at 100% efficiency. Up at 6:30am, catch up on diary, and wait to catch up with the others. When we congregate in the

foyer I learn that James Wood and Natalie Tapson of the Royal Tasmanian Botanical Gardens (RTBG) are already in Miena, at our shared accommodation. We plan to get camping supplies in Hobart and spend some time at the botanic garden, before driving to the Central Plateau to meet them for the first leg of the expedition.

First we head into town to Mountain Creek outdoor supplies, to buy tents, tarps, camping plates and cutlery, water bottles, and kit for disinfecting footwear between field locations. This last is a vital precaution against the transfer of plant pathogens, from sites of known infection to areas designated disease free. Of greatest concern in Tasmania are various *Phytophthora* spp., but especially the Phytophthora Root Rot (*P. cinnamomi*) which is known to affect 181 host species on the island. Interestingly this disease is not of major concern to Tasmanian eucalypts, as it is in WA, but does affect plants in the *Dilleniaceae*, *Proteaceae*, *Fabaceae*, *Rutaceae* and *Epacridaceae* in particular. Most grasses and rushes seem resistant, with a few exceptions, with the effect that in areas of high mortality grass and rush take advantage of decreased competition and proliferate. Endemics, such as the White Waratah, *Agastachys odorata*, are at risk of local extinction, with the potential for very serious ramifications across the flora and the wider ecosystem.

The Royal Tasmanian Botanical Gardens occupy 14 hectares of land just outside Hobart, on the Domain Highway. Originally a first settler farm, it quickly turned over to a Colonial Gardens in the very early days of settlement. It finally became a botanical garden in 1818 under the stewardship of Lieutenant-Governor William Sorrell. His successor, Governor George Arthur, developed the site with systematics in mind, creating one of the first scientific institutions in Australia.



Entrance gate to RTBG, with Seamus, Stephen & Rob about to enter

The original focus of the garden was largely the acclimatisation of plants from foreign regions, principally for the purposes of researching suitable economic crops. These included food plants, but also those used in the manufacture of cloth, dye and medicine.

Development of the arboretum began around 1828 when William Davidson took up his position as the first Superintendent. He planted something like 800 trees, and 200 years later the garden is reaping the reward of such excellent forward planning. The gardens now boast a fine pinetum in which I could happily have spent a whole day, as well as many other specimens from around the world. Having a very mild climate allows for the cultivation of such tender species as *Musa*; palms from the Mediterranean, South America and the Canaries; *Jacaranda mimosifolia* from Argentina; and *Agonis flexuosa* from WA.



Seamus in the tree-lined approach to RTBG



Jacaranda mimosifolia



Two views across the garden with the Derwent estuary beyond

Today the garden is home to a diverse collection, maintained to a very high standard of horticulture. Comprising the arboretum are collections of eucalypts, oaks (including a cork oak, *Quercus suber*, planted more than 150 years ago), and many conifers from around the world, as well as trees from Britain, Europe and Asia. In addition to this is the native plant collection, conserving some of the most threatened plants on the island, as well as species from mainland Australia. A particular favourite of mine is the Sub Antarctic Plant House, a quirky little structure displaying plants from that region, with particular emphasis on the flora of Macquarie Island.



Rob Wilson-Wright inspecting tree ferns, *Dicksonia antarctica*



Stephen with Huon Pine, *Lagarostrobos franklinii*



Stephen & Charlie with *Melaleuca styphelioides*



The Sub Antarctic Plant House. Very cold in there!

Behind the scenes is the Tasmanian Seed Conservation Centre, established in 2005 in collaboration with Seed Conservation Department at Kew, amongst others. It was conceived as part of the Millennium Seed Bank Project with the aim of conserving all of Tasmania's plant species. Literally millions of seeds are stored in this facility, carefully climate controlled and presided over by the

watchful eyes of James Wood. We wouldn't be visiting the facility until the 19th, but the collections and displays within the garden owe their continued development to it.

We leave Hobart and head north to find the A5 that is our route to Miena, passing through Bagdad and Bothwell, one of Tasmania's most historic towns. This lowland area is predominantly sheep farming, and I have never seen such huge flocks in relatively modest fields. Huge sprinklers on pivot, looking like the little siblings of pylons, irrigate grassland, making it lush for grazing.

Along the Highland Lakes Rd this agricultural land gives way to eucalypt forest, where we stop to make our first collections (seed, herbaria & DNA) at an elevation of 623m. This forest is composed predominantly of *E. rodawayi*, a rough barked, small-leaved species, and *E. pauciflora*, also small-leaved with classic smooth khaki bark. Fire has obviously ripped through here at some point in the recent past, as evidenced by blackening of many of the trunks, and by the age of many individuals, which are clearly the result of regeneration. The height of these trees makes it impossible to collect seed, so we content ourselves with collections of *Hakea lissosperma*, and *Leptecophylla juniperina* subsp. *parvifolia* which would become a common feature of the expedition.



Eucalypt forest *en route* to Miena, site of our first BIBET collections



Fire damaged eucalypt trunk



L. juniperina subsp. *parvifolia* fruiting



Neal & Stephen collecting from *H. lissosperma*



The Australian Bluebell, *Wahlenbergia stricta*

The understory here includes *Wahlenbergia stricta*, the Australian Bluebell, a native in the *Campanulaceae* that is found growing in all Australian states except the Northern Territories. I think we must be catching the last of them here as we find only a few flowers, but apparently they look stunning when seen flowering in carpets, much like our bluebells back home. Someone also spots *Pelargonium australe*, another of Australia's widespread flowers. Something that throws me a little is seeing the common centaury, *Centaureum erythraea*, flowering profusely along the road verge. It has adapted well in Tasmania, and I'll see a lot of it along roadsides throughout the island. It's always something of an event for me this flower, as I find it quite rarely in my part of Wales.

These collections gave me a first opportunity to collect DNA samples, which is really a very simple business. You tear off roughly 5mm square of green material. There are two important points here. The first is that the material HAS to be green, for that is where the mitochondrial DNA resides that lab people need to extract for sequencing. Secondly the material MUST be torn, not cut: tearing passes between cells keeping them intact, whereas cutting would damage cells and compromise the sample. It then has to be dried as quickly as possible, hence the gallons of silica granules I will be carrying around with me everywhere. This preserves the integrity of the sample, preventing rot which would ruin it completely. The reason we used empty teabags is because of their porosity, but it is also a neat way to separate samples. When I return with them, lovingly dried, they will eventually go to Kew where one day the DNA will be sequenced and the info will be made available to researchers for study. As a little side point, people have been able to extract DNA from historic herbarium samples, so they obviously retain integrity indefinitely if they were initially handled properly. In the end my collection of samples will look like this:



One of two Tupperware boxes containing BIBET DNA samples

MIENA

Day4: 06.01.2018

Location Lake Augusta, Central Highlands

Our first field trip with James and Natalie, they want to show us around the Lake Augusta area for its rich habitat that is home to some very interesting flora. We eat an early breakfast and leave our accommodation by about 8am, to spend a long day collecting. Elevation, of around 1095m, is fairly consistent throughout the day, as we are on a plateau. Our first collection of the day is a beautiful trailing form of *Leptospermum rupestre*, the Mountain Teatree, from the shore of Lake Augusta. This highly scented shrub is in full flower, but is also holding previous years' seed that we harvest. None of us have seen this form in cultivation, so it generates huge excitement; later in the day we would also collect from an upright form. We meet some other wonderful plants in this area too, including *Richea acerosa*, one of several *richea* spp. that are endemic to Tasmania, and *Hakea microcarpa*. This last is unusual for hakea species in that it drops seed at the end of each season, rather than holding on to it in anticipation of favourable conditions for germination to arise.

Another fascinating species is *Bellendenia Montana*, the Mountain Rocket. This monotypic endemic is a basal species in the *Proteaceae*, and is typically found growing in dolerite basalt sand.



H. microcarpa with a beard of lichen



Trailing form of *L. rupestre*. These lovely flowers smell of honey



Two views of Lake Augusta from different shores

Collecting seed and herbarium specimens



B. Montana in its favoured habitat

We drive to a further shore of Lake Augusta, to investigate an area of alpine heathland. This area is characterised by shrubs including *Epacris gunnii* and *E. lanuginosa*, *Richea gunnii*, and the gloriously bizarre Tasmanian cushionplant, *Abrotanella forsteroides*. We also find *Coprosma repens*, a creeping

species of a genus we'll come to know very well; *Pentachondra pumila*, a stunning little mat-forming alpine with tiny, frilly white flowers and red berries; and one of Tasmania's restio species, *Baloskion australe*. Amongst the herbaceous plants of the area we find *Celmisia asteliifolia*, *Podolepis decepiens*, *Viola betonicafolia* and *Xerochrysum subundulatum*, the Mountain Everlasting.



V. betonicafolia



X. subundulatum



Podolepis decepiens



A. forsteroides

As we wind our way through the heath, feet by turns crunching on dry twigs and soil, and squelching in unseen mini-bogs, we find ourselves coming upon an alpine sand dune, a very rare environment indeed. Here we find the only native grevillea, *Grevillea australis*; *Pultenaea fascicularis*; and the extremely localised endemic *Planocarpa nitida* amongst the shrubs. Herbaceous species included *Senecio pectinatus*, *Gentianella eicheri* and fairies' aprons, *Utricularia dichotoma*. This last plant is a semi-aquatic found growing across Australia. Flower stems are up to 20cm tall, the flowers having an erect upper petal and a broad, fan-shaped lower petal. The plant grows small bladders attached to root-like structures below the surface of the soil, in which it traps and digests small aquatic insects.



Alpine sand dune, Lake Augusta



Planocarpa nitida



Pultenaea fascicularis



G. eicheri



U. dichotoma

Along this shore of the lake we also encounter our first Pencil Pines (*Athrotaxis cupressoides*), but in nothing like the numbers we would see them in the Walls of Jerusalem National Park. They were presumably once far more numerous here, but have dwindled over time as a result of changes in climate and increased grazing, which greatly affects seed recruitment.

We spend the evening cleaning and processing seed, and organising herbarium specimens.



Left: *Leptecophylla juniperina* subsp. *parvifolia* seed drying after being processed from the fruit
Right: seed packets, representing the expedition's initial collections

Additional plants collected today:

Leptospermum rupestre, both trailing and upright forms; *Bellenden montana*; *Pentachondra pumila*; *Leptorhynchos squamatus* var. *alpinus*; *Astelia alpina*; *Baloskion australe*; *Grevillea australis*; *Baekea gunniana*; *Heirochloe redolens*; *Ozothamnus hookeri*.

I should here state that throughout the trip we were unable to collect seed samples from every plant that we wanted, as many of them were not bearing. In those cases, but where the plant was deemed sufficiently interesting for study, we nevertheless took herbarium and DNA samples. A full list can be found in the Appendices.

Day 5: 07.01.2018

A day of multiple field locations.

Location 1 Liawenee Quarry, Central Highlands

This disused basalt quarry is located to the northwest of Miena, on private land that we've been given permission to collect from. Elevation: 1160m. On the edge of *Eucalyptus pauciflora* wood pasture. James and Natalie are seeking out the rare *Cardamine tyssa*, known only from a few sites. The floral focus here is on low growing herbaceous plants, including the beautiful *Muehlenbeckia axillaris*, which is both flowering and fruiting; the fern *Botrychium lunaria*, or moonwort, which is, bizarrely, also native to the UK; and the native Solomon's seal, *Drymophila cyanocarpa*.



View of Liawenee Quarry from below



View from the top



Left: *M. axillaris*
Right: *D. cyanocarpa*

Although these smaller plants are incredibly beautiful, it is the weeping gum, *E. pauciflora* that really takes my breath away, its gnarled and twisted trunks displaying the most unbelievable patterning. Some of the individuals here are evidently of an advanced age, but as with most other eucalypts on the island, probably not more than 200-300 years, being fast growing and susceptible to fires.



E. pauciflora. Bottom right shows resinous exudate known locally as 'Kino'

Location 2 Liawenee Canal

Elevation: 1100m. Up to the place at which the river Ouse is stolen for a hydro scheme. Hiking along a concrete canal, with a grill-metal walkway in the baking sun from a clear sky. Strange to see a river dammed in this way, the old riverbed drying and dying, a few pools of stagnant green water the only indication it ever had liquid in it. We need power though I suppose, and this is a sustainable method of production, so say. Still, I wonder at the cost to this ecosystem.



Views from the canal down the old riverbed. Note the steel walkway to the left of the picture on the right

A rich shrub vegetation up the valley side as we clattle along the steel work: *Boronia citriodora* subsp. *citriodora*, a lovely shrub with a profusion of four-petalled flowers, and small upright leaves that smell strongly of citrus when crushed; the endemic *Olearia tasmanica*, the Tasmanian daisybush; *Tasmannia lanceolata*, otherwise known as the mountain pepper – the berries do indeed burn on the tongue, but the Black Currawong doesn't mind; and *Coprosma nitida*, the mountain currant, a shrub to 3m tall that we see many times across various locations. Returning to the car we collect from the snow peppermint, *Eucalyptus coccifera*, an endemic treeline species typical of this area.



B. citriodora subsp. *citriodora*

Location 3 Miena

We travelled back to the ranch for lunch, and to indulge some local botanising. Just down from the cabin we found *Gunnera cordifolia*, *Rhodanthe anthemoides*, the pirri-pirri burr *Acaena novae-zealandiae*, invasive in other global locations such as California, and the pea family plants *Hovea montana* which unfortunately wasn't flowering, and *Bossiaea riparia* which obligingly held on to a few blooms for us to admire.



Left: *R. anthemoides*, the Chamomile Sunray of montane grasslands in Tasmania's North
Right: *A. novae-zealandiae*. The pirri-pirri burr spreads easily, its hooked seeds grabbing on to clothing or animal fur. No wonder it has become a noxious weed in some parts of the world

South out of Miena toward Tods Corner we stop, stunned, to see a whole forest of dead Miena Cider Gum (*Eucalyptus gunnii* subsp. *divaricata*).



This species is endemic to the southern end of the great lake around Miena, and is suffering measurably the ravages of climate change. As spring in the region becomes drier year on year there is less fresh greenery around, so herbivores hunt wider and more desperately for any available food source, in this case the cider gum. Nothing is more voracious than a starving herbivore it seems, and they strip these trees of foliage totally. This weakens the trees over a short time, eventually killing them stone dead. It is a very sad thing to see, almost like the end of a terrible battle before the dead have been gathered and given dignified burial. James has been involved in attempting to increase the population in the area but regrettably these efforts have come to nothing – after all, it would take all the power of a deity to reset the climate, because these adverse conditions are expected to intensify, especially if Australia keeps mining coal for Asian countries to burn in their power stations. Unfortunately we're unable to collect seed, even from the living individuals, but fortunately James will provide some from the seedbank for our *ex situ* conservation efforts back in the UK and Ireland.

Location 4 Poatina Road

Around the eastern side of the Great Lake at an elevation of 1061 metres, we stop at a forest clearing to make some further collections. Of primary interest here is the gum-topped stringybark, *Eucalyptus delegatensis* subsp. *tasmaniensis*, which I climbed like a child in his freedom in the woods to collect the nut-hard seed. A Tasmanian endemic, this species is distinguished by rough bark covering the entire trunk, orange-red leaves dotted throughout the canopy, and by the fact of its being the only Tassie eucalypt with alternate juvenile leaves – all others are opposite. In addition to this we made collections of *Ozothamnus thyrsoides*, *Olearia viscosa*, and another collection of *Hakea lissosperma*.



Day 6: 08.01.2018

Location 1 Projection Bluff

The habitats on this dolerite cliff are unchanged in 11,000 years since the last glaciation, which would designate them ancient by any definition. Forest composition here is *Nothofagus cunninghamii*, *Phyllocladus aspleniifolius* and the wonderful sassafras, *Atherosperma moschatum*. These characters are undergrown with *Telopea truncata*, *Tasmannia lanceolata* and *Persoonia muelleri* subsp. *angustifolia*, all of which reads like a compendium of endemics.



Left and bottom right: *Phyllocladus aspleniifolius* (celery top pine)
Top right: start of the walk looking up the bluff

Coming off the road to the start of the walk we enter a beautiful small clearing alive with insects and *Stylidium graminifolium*. We collect a herbarium specimen of the wonderful everlasting bush *Ozothamnus rodwayi*.

The escarpment rises some 130m from the car park to an elevation of 1335m, a straight rise through dense forest. Some wonderful ground flora here, including the greenhood orchid (*Pterostylis dubia*) and bird mouth orchid (*Chiloglottis* sp.). Also *Senecio glomeratus* and the exceedingly lovely *Olearia pinifolia*, the thin needle-like leaves with recurved margins giving this shrub a distinctive similarity to pine.



Left: *S. glomeratus*
 Right: *O. pinifolia*

Reaching the summit we come to an alpine heathland of dolerite loam, a breathtakingly rich tapestry of greens and browns and rufous red. This carpet is composed mainly of the shrubs *Richea scoparia*, *Baeckea gunniana*, *Cyathodes straminea*, *Epacris serpyllifolia*, and *Exocarpos humifusus*. This last is strange parasite, feeding from the roots of other species.



View from the top of the bluff down the valley, road visible



Richea scoparia, just coming to end of flowering



Alpine heathland



Olearia phlogopappa

Amongst the flora up here we find the wonderful *Olearia phlogopappa*, which particularly excites Stephen. Comber discovered a blue form, which is something of a holy grail for the trip.

Unfortunately we won't find that, but still enjoy the vibrant sprays of the white form. Among the ground flora we come across *Euphrasia striata*, a beautiful little eyebright, and the glorious fern *Gleichenia alpina*. This will become a familiar throughout, baking away in sun and obviously unconcerned by harsh winter weather.



E. striata

We sit to lunch in this strange technicolour moonscape, in the wind to baffle March flies, like our horse flies back home but slower to settle and bite. I contemplate Cummings Head in the distance, the skeletal lower jaw of some long extinct hominid, strong and defiant in erosion.

After lunch we begin the descent, heading for a dry river valley that will take us to Pine Lake. We have to scramble through dense flora, stumbling and boulder hopping, they call it bush bashing but I think that phrase too belligerent, bellicose even: I decide on bush scrambling as a finer alternative. Reaching the dry river, which rages in winter, we find some indeterminate species of *Wahlenbergia*, more *Olearia pinifolia*, and *Eucalyptus coccifera*.

Location 2 Pine Lake

At 1200m this alpine lake takes some real extremes of temperature and exposure. No wonder then that the Pencil Pine's here are amongst some of the sparsest canopied, gnarly and twisted individuals found anywhere on the island. This is my first proper meeting with a forest of *Athrotaxis cupressoides*, a very exciting moment. These trees need two hot summers in succession to mast, an event often taking place once in around 7 years; interestingly this tends to occur with other members of the *Cupressaceae* within the wider southern hemisphere. This erratic behaviour leaves the pencil pine vulnerable to extinction, especially when groups of them, which tend to be clonal, are threatened by environmental breakdowns or fires. Unfortunately, despite much searching, we won't find any seed on this trip.



Left: view of Pine Lake
Right: clonal stand of *A. cupresoides*

The area around Pine Lake is beautifully set up, with a well-maintained board-walk and informative interpretation. A little detail of how seriously the island's governance takes tourism.

Day7: 09.01.2018

Location 1 Marlborough Road

Heading up toward Lake St. Clair National Park along the Marlborough Road. There is plenty of floral interest along the way, despite the gorse-like ubiquity of *Ozothamnus hookeri* and the bareness of grazing land. We make a huge seed collection of *Hakea epiglottis*, a dioecious, spring flowering species of wet areas.



Left: Seamus collecting *H. epiglottis* seed; Rob and Stephen taking GPS coordinates
Right: *H. epiglottis*, showing reduced foliage

Further on, along the Serpentine River's sandstone geology, we come across an amazing *Acacia dealbata*, its silver-blue foliage and purple seed pods giving to it the appearance of a sorcerer.



A. dealbata

As the tree was so prolific in seed we collected a very large amount. We also come across the native olive (*Notelaea ligustrina*) with unripe fruit, and *Lomatia tinctoria*, the wonderfully named guitar plant. The guitar plant spreads predominantly via suckering, having poor seed set, seeds very often being killed by fungal infection in the pod. Regrettably we are only able to collect herbarium specimens of these plants.



L. tinctoria

Another interesting plant we discover along the way is the native bracken *Pteridium esculentum*. Apparently the Aborigines ate the rhizome of this plant (esculentum means edible). It is a pioneer species after fire, being amongst the first to colonise ashy ground. Not one we want to introduce back home, knowing how successful our native bracken (*Pteridium aquilinum*) is.

Location 2 Lake St. Clair



Lake St. Clair is the deepest lake in Tasmania at 167m. We don't have time to do a circuit around the lake, but there is a wonderful floral diversity on the stretch of path that we do take. One of our prize collections of the day is *Banksia marginata*. Fortunately there is a 'heap' of seed pods, many of them full of seed.

Some of the notable plants we see here include: *Gahnia grandis*, the cutting grass – this is a plant we'll encounter throughout the trip, I'll say more of it later; *Dianella tasmanica*, the forest flax-lily; *Leptospermum lanigerum*, a tall shrub making a dense, almost impenetrable understory; and two ferns *Blechnum nudum* and *B. watsii*.



Left: *B. nudum*
Right: *L. lanigerum*



B. marginata: sub-canopy (left); flower spikes (top right); seed pod (bottom right)

The general impression is that banksia seed pods need heat to open, but that is not necessarily true: drought can serve the same purpose. What is true is that one should always extract the seed before freeze-storage – if the pods are frozen they will not open on thawing, despite best efforts. James and Natalie will heat the pods for us in the microwave, before sending the seed out.

The dominant eucalypt here is the black peppermint *E. amygdalina*. This species can reach up to 20m, and has rough bark turning smooth higher up the trunk. It makes for an impressive canopy. I climb one to collect seed.



Location 3 Novarre Plain

James and Natalie take us to an incredible eucalypt forest in the Novarre Plain, off the beaten track. The plain itself is predominantly button grass (*Gymnoschoenus sphaerocephalus*). This is a fascinating plant. It prefers, and can dominate, sites with poor nutrition and impeded drainage, storing high levels of carbohydrate in its edible rhizomes, and silica, lignin and oils in the leaves to aid survival. Consequently the leaves, and accumulation of leaf litter, render the plant vulnerable to fire. In areas of high peat cover the plant will successfully resist fire damage, fairing far worse where this is not the case. Reproduction is mainly via seed, with seed requiring high light and moisture levels to successfully germinate. Button grass is a vector of *Phytophthora cinnamomi*, but is unaffected by the disease. Although this species is found on mainland Australia, 95% of the population exists in Tasmania, concentrated principally on the western side of the state.



Top left: *G. sphaerocephalus* moor; Right: flower
Bottom left: demarcation of *Eucalyptus pauciflora* forest and moorland

The *E. pauciflora* forest yields us some very beautiful specimens, mostly herbarium, including *Gaultheria hispida*; *Libertia pulchella*; *Telopea truncata*; and *Nothofagus cunninghamii*. We also encounter our first *Euchryphia lucida*, the leatherwood. This will turn out to be one the absolute stars of the trip, and has an intimate association with Harold Comber.

Fortunately, after a long search, Seamus, Rob and I manage to discover a cache of *E. pauciflora* seed. The bark of these trees is amongst the most impressive I have seen anywhere, especially in the day's light drizzle. It is almost a surreal experience being in such a highly decorative forest.



Left: highly patterned *E. pauciflora* bole
Top right: *E. pauciflora* forest; Bottom right: *Eucryphia lucida* flowers

On the way back to Miena, around King William Pass, we spot and collect from a columnar form of *Leptospermum lanigerum*, and admire the silky milligania *Milligania densiflora*.



Left: *M. densiflora*; Right: collecting seed from *L. lanigerum*

Our last night in Miena, we process seed and ensure the herbarium collection is up to speed for James and Natalie to take back with them to RTBG. In the morning we will take our leave of them, to travel northwest to our new base at Gowrie Park, from where we'll travel to Walls of Jerusalem National Park for a two day hike.

WALLS OF JERUSALEM NATIONAL PARK

Day 8: 10.01.2018

Travelling early up the Highland Lakes Road, passing places that are now familiar, Liawenee, Pine Lake and Projection Bluff, *en route* to Deloraine. It is a very strange experience rounding mountain bends in the road to see large patches of naturalised foxglove, *Digitalis purpurea*, amongst the myrtle beech, sassafras, and tree ferns.



Seamus in classic plant hunter pose, looking up at a conical sassafras tree

Deloraine is a fairly sizable town with the amenities that we need, ATMs and a Woolworths at which we stop for supplies for the hike through the national park. The surrounding countryside is mainly grazing, with lots of lovely old apple trees around farms. It's also interesting to note several large fields growing opium poppy (*Papaver somniferum*) baking in the mid-summer sun; apparently Tasmania is a significant producer of medical opium for the pharmaceutical industry.

After passing through the village of Sheffield, we eventually make it to our digs, three cabins in the woods, at Gowrie Park. The reception still has Christmas decorations outside, a bizarre reminder of the season back home. As we've been making very good time so far on the trip we decide to set off that afternoon for the hike.

The car park (at 1250m) is busy, evidently a lot of people use the hiking trails up here – we’d find out that most of them just walk so far and then turn back, not many wanting to do the full round trip over 2 or 3 days.



My companions at the beginning of the walk

This first part of the hike, a steep rise for a few hundred metres, takes us through *Eucalyptus amygdalina* forest. It is the domain of giants and their allies, many shrubs and a wonderful ground flora. I won't dwell on these here as we think it prudent to collect on the way back down, to keep our carrying load light.

Coming out along the top we have a hard trek to our first camp, Wild Dog Creek, passing through Dublin Plain, passed Lake Rowallan, a trapper's hut, through Solomon's Jewels. Arrive at Wild Dog Creek just before dusk and pitch our tents. It is very busy here, I was hoping for something more wild and quiet, but it's good to have my heavy pack off my back and be settling for a few hours.



Right: Lake Rowallan with stand of pencil pine
Left: camping at Wild Gog Creek

Day 9: 11.01.2018

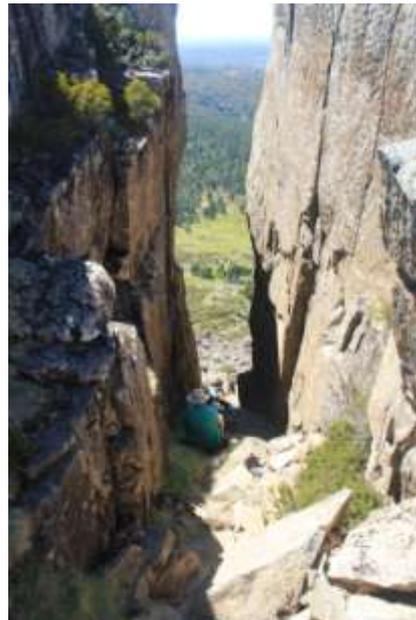
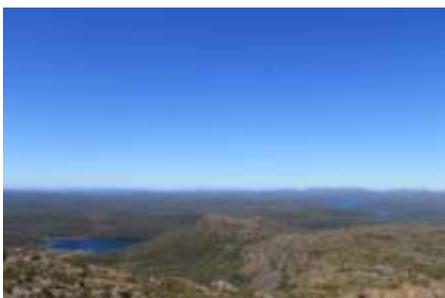
After a fitful night (always the case for me when camping), we rise early, breakfast, de-camp and head off through Herod's Gate, collecting seed, DNA samples and herbarium pressings from *Eucalyptus coccifera* on the way.



Herod's Gate, with sun-glare

Just through the gate we find make seed collections of *Gunnera cordata* and *Astelia alpina*, which we know will be hardy from this elevation. We also find *Plantago tasmanica* growing in cushions of *Abrotanella forsterioides*. *P. tasmanica* is also found in Victoria, and very often grows in association with the cushion plant.

Passing Lake Solomon and through the Vale of Bethesda, Solomon's Throne comes into view. We decide to take a detour to climb, as the views from the summit promise to be absolutely stunning.



Left: Solomon's Peak and view from summit; Right: the way is narrow and steep!

The climb is easy, but very fun.

On descending we collect seed from the creeping pine, *Microcachrys tetragona*. The overlapping leaf scales on this species give it appearance of having square stems. Everyone is slightly tentative plunging hands to the plant for fear of snakes.



Collecting *M. tetragona*

Continuing along the track we suddenly find ourselves walking through extensive pencil pine forest, and I have to say this experience is deeply humbling. I could have taken endless photographs of these ancient trees, but somehow the solemnity of them in pure stand like this checks my impulse. Stately is too human a concept to accurately describe these trees here in this prehistoric landscape. We are come to collect specimens, and of these endangered monoliths too, if we can, but that seems to have no bearing anymore. No human words or ideals, or endeavours even, actually matter when walking through the pines. Specimens – these are not specimens. We swan about collecting seed samples, herbarium specimens, we collect DNA samples, but these trees are individuals. Really, they are people just like us, and yet fundamentally not like us at all. They converse in a loud whisper, and the sound is a million years old. In form they begin as perfect pyramids, and end beautifully, gracefully, dilapidated. They live their pagan religion by actively becoming the temple.

We pass on through Damascus Gate and stop to lunch at Dixon's Kingdom trapper's hut. This is the second camp on the trail, half wild, still with compost loos but no running water. But the day is still good, and we're just passing through, across Jaffa Vale, to Lake Ball, at which we stop for a good swim in the fine water, drenching relief from the sun's heat. After swimming and taking a moment's rest we carry on through pencil pine forest, this time mixed with the first *Nothofagus gunnii* of the trip. This shrub is Tasmania's only deciduous plant, with stunning autumn colour that inspires thousands of people to travel to the island to witness the spectacle each year, much like *sakura* in Japan. If the pines are solemn in pure stand, with a grandeur befitting their status as elders and ancestors, mixed with deciduous beech the feeling is altogether far more lively, a fiesta. The tiny leaves, those at the tips of twigs flushed pink-red, lend a carnival atmosphere as the shrubs' crowns weave their dancing way around the solid trunks of pine.



Top left: Dixon's Kingdom trapper's hut; Bottom left: Lake Ball
Top right: *N. gunnii*, the deciduous beech; Bottom left: Camp Adelaide

After something like 9 miles of trekking we reach Camp Adelaide at the northern shore of Lake Adelaide, surrounded by many familiar plants – *Gleichenia alpina*, *Leptospermum lanigerum*, amongst others - and *Eucalyptus coccifera* forest. Even the stags (dead trees) look beautiful and stately in their decline. The scene is picturesque, the water good to drink. This camp is truly wild, no loos or running water, and we are virtually alone here.



E. coccifera flowers

Day 10: 12.01.2018

The return to the starting point of the trek. we've heard from other trekkers that the weather is supposedly coming in wet in the afternoon, so the goal is getting back to the cars fairly quickly, while still hopefully making some good collections along the way. This last leg of the journey, along the Junction Lake Track, takes us passed pines running along watercourses, but is mostly alpine moorland where leaches lurk, taking every opportunity to latch on to us. At one point, just before losing our way down a dead end track, we collect from *Melaleuca squamea*, the swamp honeymyrtle. The one plant we spot is absolutely laden with seed, giving us a good load to take back with us.



Top left: *M. squamea* in flower – you can just make out seed in the background; Bottom left: alpine moor, with clouds gathering
Right: applying sunscreen and/or insect repellent!

Eventually, after 2-3 hours from Camp Adelaide, we make it back to the first trapper's hut, where we are able to collect from some of species we noted on the way up. Amongst these is a vibrant pink form of *Leptocophylla juniperina* subsp. *parvifolia*, and two species of *Bedfordia* (blanket bush), *B. linearis* and *B. salicina*. The first has more slender leaves than the latter; they both have yellow flowers, and produce large quantities of seed that are wind dispersed.



B. linearis in flower

Returning to Gowrie we pass some of the most amazing strands of tree ferns spread through the forest. So amazing in fact, Neal, Rob and I have to stop the car for photos.



Dicksonia antarctica

I must confess, I never really understood tree ferns before seeing them in their native habitat. They seemed brash and overly showy, a talking point and little more. But here they rule in the understory with all the confidence of Pacific island gods. They still strange, unearthly, beamed down from the spirit realm; but they belong. You feel as though you could almost reach out and take one for a talisman, kept in a leather pouch for an epic trek through the bush.

CRADLE MOUNTAIN NATIONAL PARK

Day 11: 13.01.2018

Our area of interest for this part of the trip is the circular walk around Dove Lake, in the heart of the national park. It is the busiest area we have been to so far, with throngs of people taking advantage of the well constructed track, despite the mizzle and wind. The lake is extremely beautiful and picturesque, with Cradle Mountain appearing and disappearing behind veils of cloud throughout the day.



Dove Lake, looking toward the Ballroom Forest, with Cradle Mountain behind

We discover some wonderful species here, including the weird, Dr. Seuss plant *Richea pandanifolia*.



R. pandanifolia

We make some seed collections of *Gymnoschoenus sphaerocephalus*, and *Leptospermum grandiflorum*. This teatree will be great in cultivation, having a robust upright form and very large flowers in comparison to others.



Left: inflorescence of *R. pandanifolia*
Right: *L. grandiflorum*

Among the richeas we also find *R. x curtisiae*, a natural hybrid between *R. scoparia* and *R. pandanifolia*. It is somewhat similar to the pandani, but with finer leaves and a branched, straggly habit. Speaking of hybrids, we also come across *Athrotaxis x laxifolia*, the natural hybrid between the pencil pine and the King Billy pine, *Athrotaxis selaginoides*.



Left: *A. x laxifolia*; Right: Seamus standing under a massive King Billy in the Ballroom Forest

A. x laxifolia has wider spacing of the leaves compared to the other species. The King Billy is quite distinguishable by its ability to grow to an enormous size, many here being 30m or more.

One of the loveliest plants we find is the bulb *Blandfordia punicea*, a member of the lily family. Known as Christmas bells for its beautiful bell shaped flowers that appear on terminal spikes during that season. It is a sporadically flowering plant in the wild, being somewhat more reliable in cultivation. Often flushes after fire. We would only see it twice on this trip, and regrettably without seed.



B. punicea inflorescence

After a fruitful day collecting we pitch tents at a place called Discovery Park, located at the entrance to the national park, and spend the evening processing seed and herbarium specimens.

I have time to reflect on the walk whilst writing up my day's diary. Dove Lake and the Ballroom Forest, a diversity of moor and rainforest gracefully descending to the shore with a comfortable blending of species. The most perfect pyramidal pencil pine I've yet seen, and thousand year old King Billys, rearing up through the canopy like masts on giants' ships. A timeless landscape. As Neal said, you can just imagine dinosaurs crashing around, it is so long unchanged. One of the greatest walks I've had, and heartening to see what the uplands can look like. Trees, forests, allowed to their natural elevation, clothing the bare rock, softening the land. Healthy water, drinkable, properly filtered through stone and root.

MONTEZUMA FALLS

Day 12: 14.01.2018

Having made such good time, and having seen Dove Lake/Cradle Mountain over one day instead of two, Stephen decides to take in Montezuma Falls, and book different accommodation in Strahan on the west coast. Passing through Roseberry, we breakfast in a cafe. If Hobart is the islands wealth Roseberry is the poverty, the whole town feels dilapidated and depressed. But isn't that always the case with heavy industry? Extraction is exploitation, of land and culture, people and spirit; and exploitation brings impoverishment. Copper and zinc are mined here, apparently extracted by the Chinese, though originally it was by others closer to home. Thousands of tons of raw railed out each year, and with it the riches and the human soul of the place, riches that should be gifted to those who bear the worst of extraction by their proximity to it.

The track to Montezuma Falls follows the North East Dundas tramway. Built in th 1890s this tramway was used to freight raw materials mined from the area to smelters in Zeehan, becoming disused from 1914 and the outbreak of world war, when smelting in Zeehan ended. Ironically, those smelters were responsible for the arming of Germany in the arms race leading up to conflict, as the smelted materials were exported there. Now nature has reclaimed the area, sprouting a rainforest to take the place of mining, sassafras, leatherwood, blackwood (*Acacia melanoxylon*), *Anopterus glandulosa* (Tasmanian laurel) and a host of ferns instead of zinc, copper, tin and silver. Unlike the Walls of Jerusalem the water here is not to drink, poisoned by the residual wastes of industry. But the plants don't mind.



Left and top right: two view on the walk
Bottom right: Stephen with *Anopterus glandulosa*

The Tasmanian laurel is a lovely evergreen that would do very well in the Welsh weather. (In fact all of these plants would, given that the area around Montezuma Falls receives around 3m of rainfall per year, almost twice as much as Carmarthenshire!) It appears to coppice well, making attractively vibrant stands. However, the real stars of the day are the many ferns we encounter, and also tree ferns again, the abundance of which takes us all very pleasantly by surprise.



Top left: ferns and moss on a dripping wet rock; bottom left: unidentified fern
Right: *Hymenophyllum* sp.

The leatherwoods are incredible here, blooming like apple trees in the mid canopy, one perfectly conical, smothered in flower from crown to buttress, a white Christmas tree within the evergreen. Too hard to photograph for the forest, it will only allow us to take it away as a memory. Shafts of light irradiate fronds of tree fern and sprays of laurel which luminesce, beguiling the traveller, drawing him on to the next view around the many bends.

We reach the falls, natural stopping place before heading back. 449m tall, the gorge 48m across, we tread a suspension bridge at a height of more than 100m. Time was the train crossed this ravine on a wooden bridge.



Right: the bridge across
Left: the falls

HELL'S GATE, QUEENSTOWN AND HORSETAIL FALLS

Day 13: 15.01.2018

Strahan, our resting place overnight sharing a holiday house. Strahan with its dark convict history, now a quiet harbour town of fish and fish folk, and Tassies ubiquitous tourism. Today we split up, the Irish contingent to Emu Valley rhododendron garden near Burnie in the north: Neal is giving a talk there. Stephen, Charlie and I decide to head to Queenstown and the surrounding area, to meet up with the others in Burnie where we'll spend the night.

Location 1 Hell's Gate; Swan Basin State Forest; Ocean Beach

We head down the peninsula to the south, for some botanising around Hell's Gate. We make some wonderful collections along this route, but the low elevation and proximity to the ocean will increase the tenderness of these species. Firstly we collect from the coastal heath: *Billardiera longiflora*, an endemic woody climber with a wide distribution; *Eucalyptus amygdalina*; and the common heath, *Epacris impressa*, with its shocking pink flowers that can be seen throughout the year in Tasmania.



Left: *B. longiflora* flowers (top) and berries (bottom)
Top right: *E. amygdalina*; bottom right: *Epacris impressa*

Between Hell's Gate and the beach we stop at Swan Basin State Forest, where we find some of the most colossal *Banksia marginata*, and a new species of mountain currant, *Coprosma quadrifida*. This species has smaller leaves and far more vibrantly red berries. It is a larger shrub than its cousin too, but this could be down to the environmental differences.



Left: Stephen with a huge *B. marginata*
Right: *C. quadrifida*

Down by Ocean Beach we collect seed from the fabulous *Dianella tasmanica*, and the weird and wonderful native pigace, *Carpobrotus rossii*. This last belongs to a genus of the southern hemisphere, species of which are found in southern Australia, South Africa and Chile. Some of these have naturalised elsewhere in the world, including the Hottentot fig (*C. edulis*) around the southern coast of Britain. Indeed, as a spreading invasive it is seen by some as a threat to native flora, particularly in Cornwall where it is very successful. Perhaps we should attempt to eradicate it by eating its edible fruits?



Left and top right: *C. rossii*
Bottom right: *D. tasmanica* berries

Location 2 Queenstown

The history of this small town is tied up with mining, the surrounding hills having yielded alluvial gold, among other valuables. Around the turn of the last century it was economically thriving through this industry, to the impoverishment of the locality's mountain ecology, which still very much bears the scars to this day. These hills, as so many others, were once wooded and free, and are now barren and bald, having suffered poisoning and the ravaging effects of soil erosion. Perhaps one day, now mining activity has been vastly reduced, it may throng with life again. Stephen was particularly keen to explore here as it is a Harold Comber location. He especially wanted to recreate a photograph of Comber overlooking Mount Owen. Eventually we are able to satisfy this, before heading to Horsetail Falls.



Recreating Comber: Stephen overlooking Mount Owen

Location 3 Horsetail Falls

A little diversion to see another waterfall, this time in a denuded landscape. However, vegetation is returning, and as we know, nature has a way of tailoring new clothes for land.



Horsetail falls

We make only one collection here, *Baloskion tetraphyllum*. I will find out from James when I'm back home that unfortunately the seeds are immature.



B. tetraphyllum

Having finished our sojourn in this area we travel through the mountains on the long drive to Burnie on the north coast.

THE TARKINE

Day 14: 16.01.2018

Spent the night in a hotel on the seafront in Burnie, which is not a very interesting place from a botanical point of view. However, I was pleased to see it because the co-founder of permaculture, Bill Mollison, spent his final years there before his death in 2016. I must confess I'm a little confused by his decision to settle in such a place, given his philosophy on life. It is a busy port town, evidently receiving much of Tasmania's sea imports, and is heavily reliant on tourism, making use of its clement weather and coastline. Perhaps he felt the need to be reminded of the unsustainability that inspired permaculture in the first place? Or maybe there were other reasons, family or secret havens. The countryside around the town leaves much to be desired, being as it is large tracts of grazing and forestry.

We head south from Burnie on the Murchison Highway, with the intention of heading down the Pieman River, and up into the Tarkine at Corinna. In hindsight we should have come off at Waratah, approaching Corinna from the north, but we didn't plan this well. This will cost us a fairly significant amount of time and many extra miles. Instead we come off Murchison onto the C252 through the Meredith Range Regional Reserve. This region reminds me strongly of many parts of Wales, the monotony of over-grazed uplands being broken only by veins of deep wooded valleys too steep for farming. Finally we come to forest again, turning north onto the C249 toward Corinna. This is a controversial road apparently, many of the locals objecting to the increase in tourism that it promises to bring – I wonder if these are the same locals lobbying the government to reopen mining in the area?

At the entrance to the Tarkine we stop to collect herbarium from a beautiful little flower, the tall yelloweye (*Xyris tasmanica*). This is one of four *Xyris* spp. in Tasmania. Some say they all prefer moist or even waterlogged soils, but this seems to be growing in very dry, free draining soil; perhaps it is seasonally waterlogged.



X. tasmanica (source: <https://en.wikipedia.org/wiki/Xyris>)

On the way to Corinna the forest cover is so dense you can barely see more than a few feet into it from the road. Occasionally we spot a clearing full of bee hives, source of the world famous leatherwood honey, which is incidentally, one of the loveliest honeys I've ever tasted, having a strongly floral flavour.

Corinna is located on the northern shore of the Pieman River, so coming as we are from the south we cross with the cars by cable barge. The town is pretty well deserted of residents, having fallen into desertion with the collapse of mining and pining in the Tarkine. It is still a haven for the Huon pine (*Lagarostrobos franklinii*), with the water's edge growing some very impressive, very old specimens too twisted to fall victim to the pinner's axe. There is a degree of seed recruitment here, so hopefully the tree's future is assured.



Left and top: *L. franklinii*; bottom: cruise boat on the Pieman

Stephen, Seamus and I head into the forest proper for an hour or so, at some point becoming separated. I soak in the atmosphere of the place, and thank my stars that we got a chance to see it. On researching the island before travelling I read about the Tarkine, about how it is one of the last great temperate wildernesses left on earth, and felt disappointed that we'd miss it. This unscheduled stop, brief as it is, satisfies my extreme need to experience the region. I stop beneath a massive myrtle beech, probably 200 years old or more, and contemplate the global fate of regions like this, many lost to the heavy hand of industry or 'progress' as it's come to be called. I think too of the thylacine, or Tasmanian Tiger, that beautiful marsupial destroyed in the terrible ignorance and hubris of men. It inspires a poem:

Thylacine

I heard you underneath soft riffing
and crickets in the Tarkine,
saw your tiger stripes in solid spars
of light carried by the cutting grass
and felt your fur as leafmould,
or like the direct crumbling of a bole.

You went to ground in the Tarkine
but they found you there
and bore false witness
branding you savage, a curse
to pastoral ambition -
captured by sight of their gun
to spend your final age
in its deadly sepia image.

But what they couldn't know for lack
of seeing: body back
to land the land became you, took you on for its daemon;
fur the dense canopy, paw and limb the wood-floor's concretion,
Pieman River your muscular tongue
lapping up the entire ocean.
Now, near century down when loss in kind
is merely commonplace I mind
the warning of shade you cast for me there at Corinna,
hold tightly in lung the coolness you breathe for the Tarkine.

We now need to make our way to the Mount Field National Park, a 196 mile, 5 hour journey southeast. It is pretty much uneventful, apart from seeing a huge forest of standing dead eucalypts in the Franklin Gordon Wild Rivers National Park, victims to the raging fires that can devastate patches of the island in summer.

MOUNT FIELD NATIONAL PARK

Day 15: 17.01.2018

Location Tarn Shelf

Today we are heading into the national park for a circular, 5-6 hour walk around Tarn Shelf via Lake Newdegate, Twilight Tarn and Lake Webster, starting at Lake Dobson. This is another Comber location, there being a photograph of him at a ski hut at Twilight Tarn. I think the elevation hovers around the 1000m most of the way, with some rising and falling as we go.

The first collection we make is a seed collection of the alpine yellow gum, *Eucalyptus subcrenulata*. This species has completely smooth bark, and buds and fruit capsules in threes. It is reported as reaching a size of 55m in lower altitudes but typically achieves heights of 6-17m in higher altitudes. It is another eucalypt endemic to the island.



Top left: Lake Dobson with pencil pine; bottom left: family portrait of pandani
Right: *E. subcrenulata*

The pandanis here are markedly different from those we met at Dove Lake. These seem to hold on to their leaves all the way down the trunk, wearing them like a variation on the Hawaiian skirt.

Walking on round the lake we collect *Trochocarpa thymifolia*, the thymeleaf purpleberry. As the name suggests its foliage is reminiscent of that herb. This is an endemic shrub to 1m tall with deep pink, bell-shaped flowers.



T. thymifolia

Off the footpath and out of the woods we suddenly find ourselves on a vehicle track with many bends rounding upward. It reminds of walking in Wales somehow, this change in track, which breaks the spell for me. I prefer the hypnotism of following footpaths, eyes focused on the broad ecologies of micro landscapes, long views restricted by the rising rush of endless trunks and sub-canopy species and ground flora.

We come out to the top of this world, stark moorland, saturated bog, the alpine yellow gum reduced to a miniature of its former self. Everything here is kept low and cropped by the remorseless wind and the weight of winter snows. The views are breathtaking.



We encounter an interesting little sundew (*Drosera murfetii*) in this clipped landscape, along with *Nothofagus gunnii*. Apparently this whole area used to be covered in deciduous beech, but a 'controlled' fire on the other side of a bluff got away, and toasted most of them. It also did for a large swathe of pencil pine, which remains as a collection of ghostly stags, bleached by the elements.



Left: *D. murfetii*

Right: deciduous beech

The ski hut, or shelter, at Twilight Tarn is a place of almost pilgrimage for Stephen, as Harold Comber photographed it on his expedition. The hut has been preserved a museum piece, replete with tins and photos, and boxes of food from the 1920s. Apparently it had fallen into serious disrepair by the 1980s, so a group of enthusiasts took it upon themselves to re-roof it. I can't imagine how difficult it must have been to get all of the materials there, a Herculean task by anyone's standards.



On the return half of the circuit we collect seed from the very upright pencil form of *Leptospermum glaucescens* and another of *Banksia marginata*. The highlight for me, however, is coming into a clearing of *Baeckea gunniana*. I could smell them before seeing them, their honeyed fragrance welcome at this point of extreme tiredness.

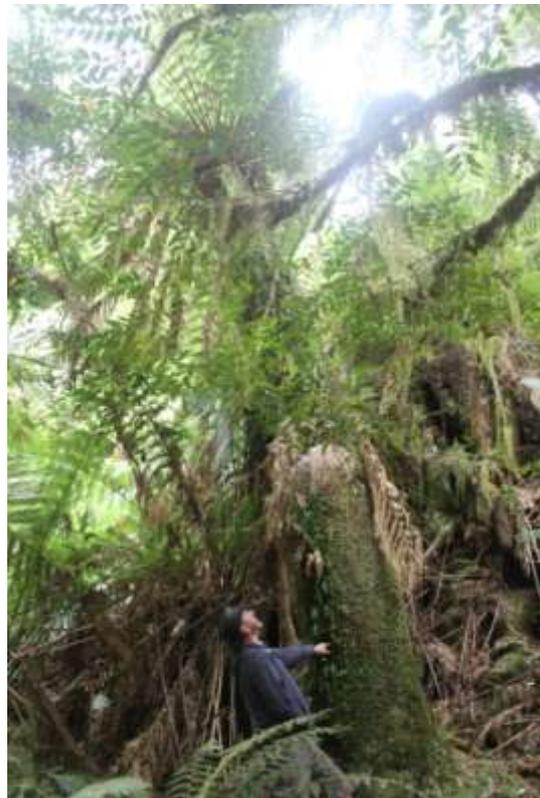
Day 16: 18.01.2018

Location 1 Russell Falls

Our final stop at this national park is a quick early look around Russell Falls before any other visitors, before heading into Hobart for couple of days. This is another Comber location, again with photographic evidence of his time here. The tree ferns here are obviously very old, perhaps many hundreds of years, and are enormous, with bendy boles stretching right up for the sky. Larger still however are the impossible giant ashes, *Eucalyptus regnans*, which must be easily 70m or more. This species is the tallest flowering plant in the world, with an individual on the mainland reported at 115m. The smooth grey bark is shed in strips that can reach 10m long, and often dangle or catch in the branches of other trees in the sub-canopy. It is too difficult to photograph these giants, although I do try.



E. regnans, the picture on the left is pretty meaningless really, with nothing to indicate the scale of the tree. The photo on the right shows something of the way in which the bark peels



Top left: Russell Falls with its cast of floral characters, including sassafras growing straight from the bed rock

Right: Neal with his new friend, a giant tree fern

Location 2 Kunanyi/Mount Wellington

We are travelling back to Hobart for two nights, with the intention of giving a number of talks at the botanic garden. It will also give us a little time to rest and recoup after a very hectic 2 weeks. On the way we decide to scale Mount Wellington, known as Kunanyi in the Aborigine dialect. This isn't as heroic as it sounds, as you can actually drive to the summit. As much as I hate to admit it, this is something of a blessing at this point in the trip, as we are all reaching the end of our energy reserves. We don't collect here as we our permits do not cover us.



Hobart seen from the summit of Kunanyi

On descending we check into the hotel and agree to have some down time before meeting for dinner in the evening. Some time alone to rest and reflect: heaven.

HOBART PART II

Day 17: 19.01 2018

Today we are due to give a series of talks at RTBG, and I am terribly nervous, having never given one before.

We have some time when we arrive at the garden for a quick tour around the nursery and the seedbank, hosted by James and Natalie. The Tasmanian Seed Conservation Centre (TSCC) is a remarkable facility, with state of the art refrigeration and climate control for literally millions of seeds. This is where James and Natalie are based, the epicentre of all their years' research into the Tasmanian flora. This facility was established in 2005 as part of the Joint Tasmanian-Millennium Seedbank Project (MSBP). The MSBP, based at Kew's Wakehurst Place facility, aimed to collect and store the seeds of 24,200 species globally, with the Tasmanian partner (SeedSafe) aiming to conserve 800 native species, and 60% of native threatened flora by 2010. By the first quarter of 2010 SeedSafe had made 1100 collections and was actively conserving 56% of threatened flora. A new target of 75% by 2020 has subsequently been set. At the close of the MSBP in 2009 Kew had surpassed the target, and they continue to take collections to this day. Within the labs at TSCC seeds are carefully cleaned, dried and stored at a temperature of -20°C, keeping them fresh and viable for considerable lengths of time. They can then be removed from storage whenever needed, and germinated and grown on in RTBGs on-site, dedicated nursery facilities. This allows James and his team to discover information about species' germination requirements, seed viability, life-cycles, and the ecology of germination, including the impact on seeds of environmental conditions.



The Tasmanian Seed Conservation Centre – note the profusion of solar panels on the roof



Inside the lab, aka James' and Natalie's domain

On leaving the Seed Conservancy building we go to have a look around the nursery. On this quick tour we learn about a very interesting endemic King's Lomatia, *Lomatia tasmanica*, found in the South West National Park. This plant of the *Proteaceae* is critically endangered, with only one clone left in the wild. The principal threats are *Phytophthora cinnamomi*, which is now recorded as being present only 20m away from the plant, and increased fire as a result of climate change. Compounding the woes of the species is the fact of its triploidy: having 3 sets of chromosomes it doesn't set seed, relying solely on vegetative spread via suckering. Triploid organisms' sterility is a result of homologous chromosomes being unable to pair during meiosis. This quirk is useful in cultivation of certain plants, the Cavendish banana being one of the most famous examples. Breeders are able to utilise the plant's ability to propagate vegetatively, ensuring it will contain no seed, and will be genetically identical to the parent plant. However, a consequence of triploidy is to make a species particularly vulnerable to extinction. RTBG is working on a conservation project with the aim of raising at least 50 plants. Some will be grown in the ground at the garden, with the excess being sent to other botanical institutions around the world. However, this project is currently somewhat hampered by the plant refusing to strike well. There is an initial 80% strike rate, with a 50% loss on potting on. RTBG currently has only four plants large enough to take cuttings material from, but as these four are doing well there is reason to be optimistic. In addition to this researchers are working on ways to propagate using tissue culture. There is still some way to go with this, with plants having an eight month life expectancy before succumbing to rapid phenolic blackening, a particular problem with species in the *Proteaceae*. Interestingly this species is more closely related to the Chilean *Lomatia ferruginea* than to the other Tasmanian species.



Left: view of the nursery glasshouses and compound
Right: *L. tasmanica* in cultivation – the famous (and precious) four



L. tasmanica in flower (source: <https://www.brandtasmania.com/live-stories/?item=623>)

Following on from the tour we give our talks to an assembled audience of RTBG staff and members. I have decided to deliver my talk, entitled *The National Botanic Garden of Wales: Past, Present and Future*, first. My rationale for this is that I am inexperienced at public speaking, and so the worst should be over and done with at the beginning of the programme, to give people enough time and distraction to forget how awful it was. As expected it went tolerably badly, my delivery being significantly affected by nerves. The remedy for this, I realise, is simply to do more of it, so I sign up for more talks, on my trip to Tasmania, on returning to NBGW.



Delivering my nerve-racked and floundering talk [Porteous 2018]

TASMAN PENINSULA

Day 18: 20.01.2018

We travel southeast from Hobart to the Tasman Peninsula, where we will base ourselves at the Tasman Ecovillage in Nubeena for two nights. The peninsula is world famous as the location of Port Arthur, one of the New World's largest and harshest penal colonies. From 1833-1853 Port Arthur was the destination for those convicts deemed to be the very dregs of the criminal barrel. Many were repeat offenders, violent offenders, offensive offenders, but many it seems were just kids, some as young as 9 – it's hard to know what wrong a 9 year old could commit to warrant sending them to such an abject place. Apparently the prison at the colony was modelled on Jeremy Bentham's panopticon theory. In this 'Model Prison' method, prisoners are housed in cells that are observable by a single guard in a watch room, but are unable to know whether they are being observed. The idea of this is to lead them to self-regulate their behaviour, out of fear of being watched. The complex was finally abandoned as a penal colony in 1877, after which it began its transformation into a tourist attraction.

On a lighter, happier note, the Tasman Peninsula is a very beautiful place. It is reached from the mainland via the Arthur Highway, which passes across the 30m wide Eaglehawk Neck isthmus.



Eaglehawk Neck, connected the Tasman Peninsula with the Forestier Peninsula [source: <https://maps.google.co.uk>]

The Arthur Highway heads west at first, and we have been advised by James and Natalie to look out for Pirate's Road, which promises some fine botanising. Indeed, off the highway and up this road, which is really a very potholed forestry track, we find some lovely shrubs and trees rubbing shoulders with cutting grass. One of my favourite finds here is *Exocarpos cupressiformis*, the common native-cherry. This weird and wonderful plant resembles a cypress (hence *cupressiformis*), but is actually in the sandalwood family, *Santalaceae*. The berries look very similar to the aril and seed of *Taxus* spp., but are made of the swollen pedicel. These sweet edible berries were a food source for both Aborigines, and for early settlers to Australia. As species of *Exocarpos* are semi-parasitic on the roots of other plants they don't transplant well. It is also nigh-on impossible to raise them from seed, so they are pretty well unknown to cultivation.



E. cupressiformis leaves and fruit (top), and form (left)

The seed's of this species are bird dispersed, the testa being sufficiently weakened within the stomach to aid germination. Thinking of birds leads me to thinking of eucalypts, and something James had mentioned about pollination. Honeyeaters are the principal group of birds that pollinate eucalypts, and they tend to feed from flowers starting at the top of the tree, working down the crown and trunk, before moving on to the next one.

This means of course that seed produced higher up the tree has the better genetic diversity, being as it is the result of cross-pollination with the individual next door. When seed collecting, one wants to procure seed with the greatest genetic diversity – not a problem on smaller eucalypts, but extremely difficult with some of the titans such as *E. regnans*. Fortunately for James and Natalie, they are in talks with the Tasmanian Forestry Service, who have offered to give over the seed they have collected with the use of trained arborists climbing to the dizzy heights, for storage in the seedbank. This mutually beneficial relationship will ensure the ongoing conservation and research into Tassie flora, as well ensure suitable stock is available to the forestry service in perpetuity.

We also find here a beautiful epacrid endemic to this extreme south eastern tip of the island, *Cyathodes platystoma*. This would be a fantastic plant in cultivation, but would perhaps need to be grown in milder areas of the UK, or at least with appropriate protection. It has excellent conservation value too, being listed as rare and threatened.



C. platystoma showing lanceolate leaf and berries

We make it to our digs and have the rest of the day off. Tomorrow we go for a long hike around Cape Raoul to the south.

Day 19: 21.01.2018

Location 1 Cape Raoul

This walk takes us through, firstly, dry sclerophyll forest dominated by *Eucalyptus tenuiramis*. This Tasmanian endemic is found across the east of the island from 0-600m asl. The glaucous juvenile leaves are fused at the based, the adult leaves being lanceolate with a hooked tip. Typically this species reaches 20m, and creates a lovely, open canopy, allowing for a diversity of ground and shrub flora.



Left: *E. tenuiramis* forest (top), and showing fine patterning of, presumably, a bark beetle
Right: a disinfectant station for boots at the start of the walk, common in phytosphthora-free zones across Tasmania

Notables under the canopy include a profusion of *Gahnia grandis*, the mountain riceflower (*Pimelea sericea*), *Cyathodes platystoma*, and the absolutely magnificent *Pentachondra involucrata*. This last is called the mountain frilly-heath, which along with the epithet *involucrata* refers to the whorl of frilly bracts below the flower.



Left: *Pimelea sericea* with atypical sparseness of flower; right: *Gahnia grandis* – sharp, long leaves and tall seed-heads



The impossibly beautiful *Pentachondra involucrata* – nice compact form covered in stunning frilly flowers

Eventually we pass out of this area of forest to a coastal path, where the vegetation is dominated by two she oaks, *Allocasuarina monilifera* and *A. verticillata*, both of which are Tasmanian endemics.



Left: *Allocasuarina* sp., possibly *A. verticillata* – evidently female as it's seed-bearing
Right: lunch with a view!

She oak woodland has a quality very similar to pure stand conifer forest: the ground is virtually devoid of any other floral life. I assume this is because the leaf litter is highly resistant to decay, and its build-up leads to acidification of the soil, thereby limiting the growth potential of other species. In addition their cover is so dense little light makes it to the ground.

Coming out of the she oak wood we find ourselves on a rock plateau, too exposed to allow anything to grow above 2-3feet, overlooking the most magnificent dolerite sea columns. These columns rise some 300feet from the sea, and are the bizarre result of volcanic activity in the Jurassic. It is breathtaking, especially when coupled with the thought that there is no land between us and the

Antarctic at this point. Notable flora here include a very reduced form of *Banksia marginata*, native pig-face, and its cousin the roundleaf pig-face, *Disphyma crassifolium* subsp. *clavellatum*.



Left: dolerite formation creating a long drop to the sea
Right: *D. crassifolium* subsp. *clavellatum*

Location 2 Remarkable Cave

A few miles east (several more in a car), up the coast from Cape Raoul, we make a short stop at Remarkable Cave, because with a name like that who wouldn't? We even manage to sneak a small bit of botanising in, collecting herbarium and DNA samples from the southern storksbill, *Pelargonium australe*.



Left: *P. australe*
Right: Remarkable Cave, beautiful and deadly – waves can flood the cave within seconds

HARTZ MOUNTAINS NATIONAL PARK

Day 20: 22.01.2018

We rise early to head back to Hobart, to meet James and Natalie at RTBG for the last leg of the trip. Fortunately I have enough time to run around the garden one last time before we all set out. I head for the Japanese garden specifically to take photos of it for my friend Daryll at NBGW, who looks after our own Japanese garden.



Two views of the Japanese Garden at RTBG, neither of which do the place full justice

Once the troupe is ready we head southwest to travel the 50 or so miles to the national park, and the lodge at Tahune Adventure Area which is our digs for next three nights. However, we can't pass up the opportunity for some serious botanising along the way...

Location 1 State Forest, Bennet's Road

This location is an area of wet sclerophyll 656m asl, and is subject to periods of snow in the winter, and exposure to Antarctic winds. We drive passed colossal *Eucalyptus regnans* (giant ash) which then give over ground to *E. delegatensis* subsp. *tasmaniensis* (gum-topped stringy bark), which is really no less gigantic, reaching heights up to 90m. These two species are easy to tell apart: the giant ash has smooth bark with long peeling strips and has more lanceolate adult leaves, while the gum-topped stringy has rough bark to approximately halfway up the trunk, turning smooth into the crown. This sub-species is also a Tassie endemic.

Within the understory we come across an impressive weeping form of *Acacia riceana*, with limbs gracefully hanging to the ground. Twining through this and others is *Clematis aristata*, a widespread native that is also found on the mainland. Flowering is over for the season, but the seed-heads are no less beautiful.



Left: *C. aristata* seeding
 Right: *A. riceana* weeping

Another wonderful climbing character is *Prionotes cerinthoides*, or the climbing heath. This endemic has small dark green leaves, and tubular, deep red flowers around 2cm long.



P. cerinthoides growing up gum-topped stringy bark

Probably the finest catch of the day is the three Tasmanian species of leatherwood, *Euchryphia lucida*, *E. milliganii*, and their intermediate offspring, *E. x hybrida*. This last is interesting in that it was identified by Harold Comber back in 1930, but has been curiously ignored by Tassie botanists ever since. Laying all three in a row puts to bed any discrepancies, as they are clearly three separate species, having a marked gradation in flower size.



The Three Musketeers, from left to right: *E. milliganii*, *E. x hybrida* and *E. lucida*

Location 2 Picton River

Our interest in this large tributary of the Huon is primarily for some epacrids that James and Natalie have been searching for. It is to prove an auspicious location for these, and for *Tasmannia lanceolata*, from which we are finally able to collect some elusive seed. James leaves very happy too, having found *Epacris mucronata*, an endemic found only around this river, after much intrepid searching.



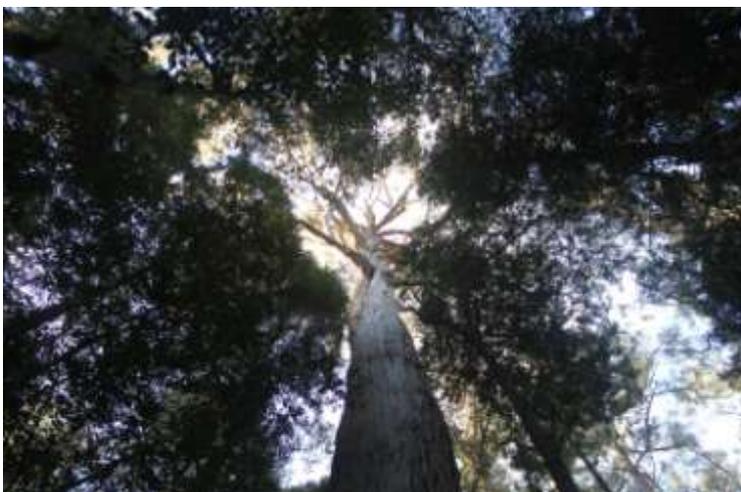
Two views of Picton River – spot the camouflaged botanist!



Tasmania lanceolata, with empty seed pod (bottom)

Location 3 The Tahune

The Tahune Adventure Area has one of the most incredible airwalks I have ever seen, and as we are staying right next to it we have it to ourselves in the evening, all the tourists having gone. Built and owned by Forestry Tasmania, and opened in 2001, this airwalk has a total length of 620m, and is 50m above the forest floor, overlooking the confluence of the Huon and Picton rivers. The forest canopy is dominated by *Eucalyptus obliqua*, a massive tree in this wet sclerophyll, easily reaching 80m or more. Again, as with the other giant eucalypts, it is almost impossible to photograph them.



Eucalyptus obliqua, looking up through the crown

This eucalypt, grouped in the ashes and known as the stringybark, is common throughout Tasmania up to around 600m asl. Its bark is fibrous and rough, and the adult leaves are strongly lanceolate and asymmetrical at the petiole. As you can see from the photo (right), the trees can reach a sizeable girth. The interesting thing about eucalypts is that their great size is deceptive, in that the trees rarely make it beyond approximately 200 or so years, often being killed by an environmental disturbance, normally fire. This means of course that they have an astonishing rate of growth.

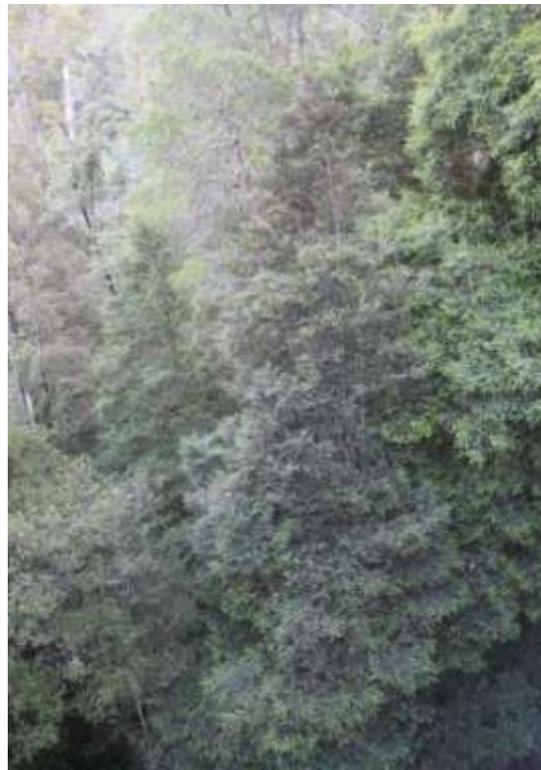


Neal, Stephen and Seamus modelling with *E. obliqua* (right)

The wet sclerophyll here provides us with something like a roll call of now familiar characters, and in great display. Blackwood and celerytop pine, rubbing shoulders with the largest leatherwoods we have seen, form the sub-canopy, with cutting grass and tree ferns putting on impressive display below.



Left: celerytop pine, *Phyllocladus aspleniifolius*



Right: blackwood, *Acacia melanoxylon*



Left: blackwood amongst the stringybark
Right: *Dicksonia antarctica* and leatherwood



View of the walkway (left), and the Huon river (right) – note the giant logs that wash down with the currents



The Tahune and Huon, as seen from the airwalk cantilever

Day 21: 23.01.2018

Location Adamson's Peak

Today we are climbing the greater part of this mountain, but will not make all the way to the 1,225m summit, it being a fuller day's work than any of us have the energy for at this late stage of the trip.

Coming off the road where we park the cars, we enter an area of wet sclerophyll that used to be logged, and there is still evidence of that previous activity. The picture on the right shows an old eucalypt stump, all that is left visible of a titan tree felled probably more than 100 years ago, a time before powered machinery. The notches cut into the trunk were for boards to slot into. The loggers would then be able to stand firm on them when using a two-man crosscut saw.



The track is fairly flat at first, with some steps made from tree fern logs laid lengthwise. In a couple of places the path is composed of fallen *Eucalyptus obliqua* boles, moss covered and still solid decades after falling. There is a large population of cutting grass here, it is evidently highly ubiquitous across the island – testament to its evolutionary advantage.

After some time we are confronted with the path rising almost vertically, it seems to us. This promises to be a fine workout for the legs, and we tackle it with firm resolve and dedication.

A few dozen metres up the path levels out again, and we begin to meet some plants that we wish to collect, including the endemic *Trochocarpa cunninghamii*. This scrambling plant is very similar to *T. gunnii*, but is smaller and more common at higher altitudes. It is a very attractive shrub with very small leaves and beautiful, deep violet berries.



T. cunninghamii

Other plants here include *Melaleuca squarrosa*; *Blandfordia punicea* with unfortunately empty seed pods; *Pseudopanax gunnii*, with leaves that quite closely resemble that of an illicit smokeable herb; and further up toward the alpine heath *Nothofagus cunninghamii*, dropping the fruiting bodies of the parasitic *Cytaria* fungus all over the place.

At the top of the walk we come out onto an area of alpine heath, and find some very interesting flora, although we are unable to collect much. One of my absolute favourites, *Tetracarpaea tasmannica*, an endemic in the escallonia family, is in full bloom, a very lovely sight, with its spikes of white flowers perfectly complimented by the upright evergreen foliage tinged red at the tips.



Another of interest is the small herbaceous perennial *Campynema lineare*. This is a small genus of two species, one native to Tasmania and the other to New Caledonia.



Finally, at this height of 840m, we find a seed collection of *Richea scoparia*, which has eluded us over the entire trip. This makes everyone happy to have scaled this trek, as it's a plant we all want to grow in our respective gardens.

Before descending we stop to lunch with this view of the south coast:



Day 22: 24.01.2018

Location Lake Esperance and Hartz Mountain

This is our final day in the field and final night on the island. The intention today is to botanise around Lake Esperance before scaling Hartz Mountain. For some stupid reason, lulled falsely by the good weather of yesterday, I head out completely unprepared, leaving my coat and waterproof trousers at the lodge. On the drive, climbing elevation, the clouds gather until we end up firmly inside them at the car park to the walk. A freezing wind is whipping through, with high moisture in the air, and I feel that if I stay here for long I will contract an illness, especially given the fact that I'm already run down with tiredness. James is in the same boat, although much better equipped, and so we resolve to turn back after the lake and head to Geeveston for dinner supplies. I decide that I'll cook a mighty pasta for everyone as our final supper, which makes me feel slightly better about missing the very last trek of the trip – I know that will always be a sore spot for me.



View across the lake - looks chilly and it is!

Tonight we take a final stroll around the Tahune airwalk, a perfect way to depart Tasmania, surrounded by an extraordinary floral cast. I feel as though we know them well now, and they take a bow for us in the still and balmy air. We quietly applaud, tucked away in our own thoughts. We linger on the cantilever contemplating the confluence of Picton and Huon, listening to the song of the currangwongs and watching them glide across the scene. For a final impression we really could do no better than this. After hours this walk is all to us, unhurried and still, conducive to thought and the last moments of our appreciation. Although I am ready to leave, to embrace my family again and feel all the pleasures of home, I will miss it here. The place itself has changed me in subtle ways, the soil and rock, the air, water, flora and fauna, the spirit of it has opened my eyes to a larger world, with all the simple complexity of its charm.



AFTERWORD

I feel that here I must apologise to you, the reader of this report, whoever you are. What you have just ploughed through is very much a first draft: my lifestyle - that of full time employment with the even fuller-time occupation of child rearing – has conspired to prevent me reworking this text to anything approaching the extent to which I would have liked. This would no doubt have pleased Jack Kerouac, that great traveller and writer, who said ‘no emendations in time’s reconsidering backstep’, but personally I like revision. I believe that it gives a honed quality of craft to a piece, sharpening sense and meaning, rendering it clearer in its communication. If I have failed in any this I can only blame myself. I would also have liked to include more of the floral characters of the story, as well as more detail of the places we visited, but time and the need for brevity have prevented the entertaining of that particular indulgence. Had I been able to do all of these things I should have ended up writing not so much a report as a book, and I couldn’t have expected you to maintain stamina for such a thing as that. Of course, I am not in any sense complaining. The work has suited me well enough, and I’m content to move forward to the next challenge, whatever that may be. I only hope you have not lost interest or patience throughout the preceding 100 or so pages, and that you are able to derive some value from this exposition of my experience. I hope also that I have managed to convey at least a little of what this journey has meant to me. It would be no exaggeration to say that it has changed my life, and wherever I go subsequently from here it will remain a watershed moment. I give the final word to T. S. Eliot, whose eloquence sums up my feeling much more succinctly than I can:

We shall not cease from exploration. And the end of all our exploring shall be to arrive where we started and know the place for the first time.



The BIBET team

Left-right: Seamus O’Brien; Piers Lunt; James Wood; Stephen Herrington; Charlie Bancroft; Rob Wilson-Wright; Natalie Tapson; Neal Porteous

[Seamus O’Brien 2018]

APPENDICES

APPENDIX I

BRIEF

The British-Irish Botanical Expedition to Tasmania (BIBET) January 2018

From January 4th to January 26th senior horticultural staff from Britain and Ireland's leading National Trust and botanic gardens plan to visit Tasmania with a view to collecting seeds and herbarium specimens of a wide range of temperate plants. We will work for a time with James Wood from the Seed Conservation Unit at the Royal Tasmanian Botanical Gardens in Hobart.

Aims

The primary aim of the visit to Tasmania is to collect seeds and herbarium specimens from a wide range of plants for conservation use and it is for this reason we attach a copy of the listings for genera and species from the Vascular Flora of Tasmania. Obviously, we will not collect everything on the list but we would like our collections to be as broad-ranging as possible.

Herbarium specimens will be lodged in the herbaria at The Royal Botanic Gardens, Kew; the Royal Botanic Garden Edinburgh the National Irish Herbarium at the National Botanic Gardens, Glasnevin in Dublin and the National Botanic Garden of Wales.

Seeds collected will be raised in the gardens listed above, and Nymans and Mount Stewart National Trust, where they will enhance the *ex situ* conservation collections there.

Vegetation and conservation research will be carried out with the Royal Tasmanian Botanical Gardens in the field. This will also strengthen important links between the institutions to enable skill and information sharing.

To promote skills and knowledge transfer, junior horticulturists will be trained in the field on collecting techniques, processing herbarium specimens and taking field notes and it is hoped that as a consequence of the expedition an exchange programme between UK/Ireland and Tasmanian gardens will be set up.

Historic Connections

The expedition is an opportunity to research and retrace the footsteps of one of the significant plant hunters of the 20th century - Harold Comber's expedition made in 1930 - and to re-collect species collected by him that have since become lost in British horticulture. Nymans has a very strong link with Harold as he was born there and this expedition will enable a historic feature - the Tasmanian walk - to be reinstated.

The Royal Botanic Garden Edinburgh has visited Tasmania on previous occasions and grows a wide range of Tasmanian taxa across its four sites in Scotland.

The National Botanic Gardens, Kilmacurragh and Glasnevin, have a long history of growing Tasmanian plants since the 1850s, through to connections with Lord Talbot de Malahide and Winnifred Curtis in the mid-20th century. Seamus O'Brien, from Kilmacurragh, carried out field studies in Tasmania in 2010 with staff from the Royal Tasmanian Botanical Gardens.

[Herrington 2017]

APPENDIX II

ITINERARY

Destination	Transport	Dates	Key Species	Information	Accommodation
Depart UK	Flying	2/01/18	N/A	N/A	N/A
Arrive Hobart	Flying	4/01/18	N/A	Pick up 4x4 trucks from Hobart Airport http://rentaltrucks.com.au/	Hotel in Hobart Midcity Hotel
RTBG/Hobart	N/A	5/01/18	N/A	Planning expeditions/RTBG Organise tent hire, Bio-security kits and other expedition equipment (Maps, Water containers)	Hotel in Hobart Midcity Hotel
Central Plateau Conservation Area	Car	6/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Miens
Central Plateau Conservation Area	Car	7/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Miens
Lake St Claire	Car	8/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Miens
Lake King William	Car	9/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Miens
Walls of Jerusalem National Park	Car/Walking	10/01/18	Alpine and sub alpine vegetation	Focusing on Alpines and low growing Shrubs	Gowrie Park Wilderness Village Three cabins have been booked http://www.gowriepark.com.au/

Walls of Jerusalem National Park	Walking	11/01/18	Alpine and sub alpine vegetation	Focusing on Alpines and low growing Shrubs	Camping/Wild Dog Creek
Walls of Jerusalem National Park	Walking/car	12/01/18	Alpine and sub alpine vegetation	Focusing on Alpines and low growing Shrubs	Gowrie Park Wilderness Village Camping http://www.gowriepark.com.au/
Cradle Mountain National Park	Walking	13/01/18	Athrotaxis species grow in this location, collections made for ICCP. This also a known location for <i>Richea</i> species	Trekking and Botanising in the field	discoveryholidaysparks Camping at the entrance to the national park and near Mt Cradle
Cradle Mountain National Park	Walking/car	14/01/18	Athrotaxis species grow in this location, collections made for ICCP. This also a known location for <i>Richea</i> species	Trekking and Botanising in the field	discoveryholidaysparks Camping at the entrance to the national park and near Mt Cradle
Visiting Emu Valley Garden	Car	15/01/18	https://www.emuvalleygarden.com.au/ Possibly giving talks to garden staff	The garden is situated in Burnie which is about 2hr drive from Cradle Mountain National Park	Hotel in Burnie http://www.beachfronttraveller.com.au/
Area around Queens town Pieman river	Car	16/01/18	See attached Comber plant List	Comber Location	National Park Hotel http://www.nationalparkhotel.com.au/
Mount Field National Park	Walking/car	17/01/18	See attached Comber plant List	Comber Location/Russel Falls	National Park Hotel http://www.nationalparkhotel.com.au/

Mount Field National Park	Walking/car	18/01/18	See attached Comber plant List	Comber Location	Hotel in Hobart IBIS Hotel
Hobart	N/A	19/01/18	N/A	Giving Lectures to Staff/Students from RTBG/Mount Wellington National Park	Hotel in Hobart IBIS Hotel
Tasman Peninsula	Car/Walking	20/01/18	See attached Comber plant List. Trek from Fortescue Bay to Cape Pillar	Comber Location/ Trekking and Botanizing in the field	Camping Waghalee falls
Tasman Peninsula	Walking/Car	21/01/18	See attached Comber plant List. Trek from Fortescue Bay to Cape Pillar	Comber Location/ Trekking and Botanizing in the field	Tasman Ecovillage http://tasmanecovillage.org.au/
Hartz Mountain National Park	Car/Walking	22/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Tahune
Hartz Mountain National Park	Walking	23/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Tahune
Hartz Mountain National Park	walking/Car	24/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG
Fly Back to the UK	Flying	25/01/18	N/A	N/A	N/A
Arrive back in the UK	Flying	26/01/18	N/A	N/A	N/A

[Herrington 2017]

APPENDIX III

AMENDED ITINERARY

Destination	Transport	Dates	Key Species	Information	Accommodation
Depart UK	Flying	1/01/18	N/A	N/A	N/A
Arrive Hobart	Flying	4/01/18	N/A	Pick up 4x4 trucks from Hobart Airport https://rentforless.com.au/	Hotel in Hobart Midcity Hotel
RTBG/Hobart	N/A	5/01/18	N/A <i>Spent time at RTBG. See diary.</i>	Planning expeditions/RTBG Organise tent hire, Bio-security kits and other expedition equipment (Maps, Water containers)	Hotel in Hobart Midcity Hotel Mason. Met w/ James of Minto Hill.
Central Plateau Conservation Area	Car	6/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Miens
Central Plateau Conservation Area	Car	7/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Miens
Lake St Claire <i>Projections Buff</i>	Car	8/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Miens
Lake King William	Car	9/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Miens
Walls of Jerusalem National Park	Car/Walking	10/01/18	Alpine and sub alpine vegetation	Focusing on Alpines and low growing Shrubs	Gowrie Park Wilderness Village Three cabins have been booked http://www.gowriepark.com.au/

Sampled from the mountains in the forest

Met w/ James of Minto Hill.

W/10 Dug Creek camping

Walls of Jerusalem National Park	Walking	11/01/18	Alpine and sub alpine vegetation	Focusing on Alpines and low growing Shrubs	Camping/Over Day Black Camp Abraham
Walls of Jerusalem National Park	Walking/car	12/01/18	Alpine and sub alpine vegetation	Focusing on Alpines and low growing Shrubs	Gowrie Park Wilderness Village Camping http://www.gowriepark.com.au/
Cradle Mountain National Park	Walking	13/01/18	Athrotaxis species grow in this location, collections made for ICCP. This also a known location for Richea species	Trekking and Botanising in the field <i>Dove Lake</i>	discoveryholidaysparks Camping at the entrance to the national park and near Mt Cradle
Cradle Mountain National Park <i>Montezuma Falls</i>	Walking/car	14/01/18	Athrotaxis species grow in this location, collections made for ICCP. This also a known location for Richea species	Trekking and Botanising in the field	discoveryholidaysparks Camping at the entrance to the national park and near Mt Cradle
Walls of Jerusalem National Park <i>Arched Kellie Gate, Sth of Sornham; around Q.T. Rosehill Falls</i>	Car	15/01/18	https://www.rising.com.au/extended-0-kef-also Possibly drive talks to garden start	The garden is situated in Sornham which is about 2hr drive from Cradle Mountain National Park Comber Location	Beachfront Voyager Motel Linn.
Walls of Jerusalem National Park <i>Weymouth, Clapton, Pleman river</i>	Car	16/01/18	See attached Comber plant List	Comber Location <i>Corner of Franklin</i>	National Park Hotel http://www.nationalparkhotel.com.au/
Mount Field National Park	Walking/car	17/01/18	See attached Comber plant List	Comber Location <i>Turner Falls Terra Suel; Twilight Tara.</i>	National Park Hotel http://www.nationalparkhotel.com.au/

Abraham

Discovery Parks

The Cradle Accommodation Strabrom.

Mount Field National Park	Walking/car	18/01/18	See attached Comber plant List	Comber Location <i>See attached Fortescue Falls</i>	Hotel in Hobart IBIS Hotel
Hobart	N/A	19/01/18	N/A	Giving Lectures to Staff/Students from RTBG/Mount Wellington National Park	Hotel in Hobart IBIS Hotel
Tasman Peninsula	Car/Walking	10/01/18	See attached Comber plant List. Trek from Fortescue Bay to Cape Pillar	Comber Location/ Trekking and Botanising in the field	Camping Wagtail <i>See attached</i>
Tasman Peninsula	Walking/Car	11/01/18	See attached Comber plant List. Trek from Fortescue Bay to Cape Pillar <i>See attached</i>	Comber Location/ Trekking and Botanising in the field	Tasman Ecovillage http://tasmanecovillage.org.au/
Hartz Mountain National Park	Car/Walking	12/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Tahire
Hartz Mountain National Park	Walking	13/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG Staying in Tahire
Hartz Mountain National Park	walking/Car	14/01/18	Looking at the native flora in this area and collecting seed and herbarium samples	Field work with RTBG/Comber Location	Take Lead from RTBG
Fly Back to the UK	Flying	25/01/18	N/A	N/A	N/A
Arrive back in the UK	Flying	26/01/18	N/A	N/A	N/A

5/6 nights camping total.

[Herrington 2017; Lunt 2018]

APPENDIX IV

PERMIT APPLICATION

Department of Primary Industries, Parks, Water & Environment
Natural and Cultural Heritage Division



PERMIT APPLICATION FORM To Apply for the Taking of Native Flora¹

(Issued under Section 29 of the Nature Conservation Act 2002
Regulation 4 of the Threatened Species Protection Regulations 1996
Regulation 28 of the National Parks and Reserved Land Regulations 2009
Section 46(1) of the Crown Lands Act 1976
Regulation 22 of the Crown Lands Regulations 2001)

Please tick appropriate box: Threatened flora species Non-threatened flora species Both

Surname Given Names Title

Organisation/Institution:

Street address (street address of institution or business is acceptable):

Postal address (if different from above):

Contact Details:

Phone

Email

Names and addresses of others involved with the project who will also require a permit. For projects undertaken by large organisations, please provide name and title of the head of the organisation and the name of the organisation.

Short title of project

Proposed start date

End date

Brief description of the proposed activity and expert advice that has been provided (~150 words). Where a document already exists which provides a description send a copy of it along with the application form instead.

List the plant species to be taken¹ (include scientific name), estimated number of plants to be impacted and the type and quantity of materials requested (eg botanical specimens, seed etc.). Attach a list if insufficient space.

For applications where destruction of threatened species is requested you must also provide an estimate of the species population size, area occupied and distribution (eg clumped, scattered) and what proportion of the population will be affected for the area where the destruction is proposed.

We hope to collect herbarium specimens and seed from a wide range of genera and species and so the vascular flora of Tasmania listings are attached

Attach a legible map (scale, map sheet no., easting/northing, datum grids) and/or describe in detail the location/s (e.g. place name or reserve name). For each location provide the land tenure (national park, conservation area, etc.), grid references (easting and northing) and the species targeted. Where destruction of Threatened Species is proposed, provide an additional map showing the exact location of each threatened species and/or plant community within the take area in relation to the works location/s and the approximate area occupied by the species. For general collecting/research permits you need only provide the name and tenure of the reserves you are intending to take from.

Locations visiting (Map and itinerary attached of areas being visited):
Central Plateau Conservation Area, Lake St Clair, Lake King William, Walls of Jerusalem National Park, Cradle Mountain National Park, Mount Field National Park, Hartz Mountain National Park, Wellington Park Reserve, Freycinet National Park, Arthur-Pieman Conservation Area and area around Lake Burbury.

Provide a description of what the plant material taken will be used for.

For ex situ conservation purposes and research/education to include research into conifers and herbarium samples that will be stored at the Royal Botanic Gardens, Kew, the Royal Botanic Garden Edinburgh and the National Botanic Gardens, Kilmacurragh and Glasnevin. Plant material will be grown/displayed at National Trust properties and botanic gardens across Britain and Ireland.

Location/s where the plant material taken will be used or lodged (eg glasshouse, herbarium).

The material will be grown and stored as herbarium specimens in the following institutions: National Botanic Gardens, Kilmacurragh and Glasnevin; National Botanic Garden of Wales; Royal Botanic Garden Edinburgh; Birr Castle (Ireland); Coolcarigan Gardens (Ireland); and National Trust gardens Nymans and Mount Stewart. Royal Botanic Gardens, Kew will hold some herbarium samples.

List any significant biosecurity risks to research target or other local biota that are posed by the proposed activities.

The infection of native flora from the spread of pest and diseases especially *Phytophthora cinnamomi* from site to site.

List biosecurity controls that will be applied to limit potential risks.

Standard precautions to include boots, vehicles and collecting equipment being disinfected between each collecting site. Advice on specific procedures will also be sought from the Royal Tasmanian Botanical Garden who we are working very closely with.

List proposed mitigation measures to minimise physical impact to plants (e.g. sampling to affect < 5% of population at location, specimens will compose no more than 5% of the foliage of the individual plants).

Seed collections will take no more than 25% of the total harvest per plant.

¹ For the purposes of this permit take includes destroy or damage a plant and take destroy or damage any fruit, seed, product or other plant parts.

Have you previously been issued with a permit to Take Native Flora requiring, as one of the conditions, that a report be submitted? (this may be in the form of data being uploaded to the NVA).

Report submitted? Yes No The report must be completed and submitted to the relevant officer before further permits will be issued.

If applicable please provide number of last permit issued:

Signature of Applicant Date

Please Read Carefully: The Department retains the authority to reject any permit application and also to apply conditions to any permit issued. Allow 4 weeks for processing of applications. Permission must be sought from the relevant land manager(s) to access land. Fees for permits may apply.

Permit Applications can be emailed or posted to:

- **Non-Threatened Plants from Reserved Lands** – Ecologist, Biodiversity Monitoring Section, Natural Values Conservation Branch:
FloraPermitEnquiries@dpiwwe.tas.gov.au
Phone: 03 6165 4348
Natural and Cultural Heritage Division, Department of Primary Industries, Parks, Water & Environment, GPO Box 44 Hobart, TAS 7001
- **Threatened Native Plants, including permits for planned burns which impact threatened species** – Threatened Species Section
ThreatenedSpecies.Enquiries@dpiwwe.tas.gov.au
Phone: 03 6165 4340
Natural and Cultural Heritage Division, Department of Primary Industries, Parks, Water & Environment, GPO Box 44 Hobart, TAS 7001

1. Personal information will be collected from you for the purpose of managing Tasmania's flora and will be used by DPIWWE for assessing, considering, advising upon, managing and/or determining the relevant application and may be used for other purposes permitted by the *Crown Lands Act 1976*, *National Parks and Reserves Management Act 2002*, *Nature Conservation Act 2002* and *Threatened Species Protection Act 1995* and regulations made under these Acts.
2. You are required to provide this information by the *Crown Lands Act 1976*, *National Parks and Reserves Management Act 2002*, *Nature Conservation Act 2002* and *Threatened Species Protection Act 1995* and regulations made under these Acts. Failure to provide this information may result in your application not being able to be processed or the service not being able to be provided.
3. Your personal information will be used for the primary purpose for which it is collected, and may be disclosed to contractors and agents of the Resource Management and Conservation Division, law enforcement agencies, courts and other organisations authorised to collect it.
4. Your basic personal information may be disclosed to other public sector bodies where necessary, for the efficient storage and use of the information.
5. Personal information will be managed in accordance with the *Personal Information Protection Act 2004* and may be accessed by the individual to whom it relates on request to DPIWWE. You may be charged a fee for this service.

¹ Please refer to 'Guidelines for Applications of Scientific Permits, Authority to Take of Native Flora in Tasmania' to assist you in filling out this form.

APPENDIX V

AUTHORITY TO TAKE PLANTS FOR EDUCATIONAL PURPOSES



DEPARTMENT of PRIMARY INDUSTRIES, PARKS, WATER and ENVIRONMENT

AUTHORITY TO TAKE PLANTS FOR EDUCATIONAL PURPOSES

Authority No. FL 17339

Issued in accordance with Regulation 28 of the National Parks and Reserved Land Regulations 2009

**Mr Stephen Charles Herrington
National Trust Nymans Garden
Staplefield Road, Handcross,
West Sussex, RH17 6EB.
United Kingdom**

Inquiries : Tim Rudman
Phone : 61654196
Fax :
Our Ref. : NH-NH-PE-ST_215896_12
Email : tim.rudman@dpiwwe.tas.gov.au

is authorised to take
plant specimens and seed samples

from

Central Plateau CA, Cradle Mountain - Lake St Clare NP, Franklin - Gordon Wild Rivers NP, Walls Of Jerusalem NP, Mount Field NP, Hartz Mountain NP, Freycinet NP, Arthur-Pieman CA, Tasman NP, Four Mile Beach RR

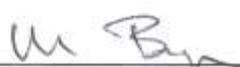
subject to the conditions in Schedule 1 (overleaf)

This authority is valid only from 01/01/2018 to 01/02/2018

Issued by  Date 29-11-17

Tim Rudman

Delegate Of The Director National Parks And Wildlife

Parks and Wildlife Service Consent to take Wildlife on Reserved Land	
Issued with the consent of the Managing Authority (Parks and Wildlife Service) for land reserved under the Nature Conservation Act 2002.	
Signature <u></u>	Date <u>19/12/2017</u>
Name <u>Mark Byers</u>	Title <u>Director Operations</u>



DEPARTMENT of PRIMARY INDUSTRIES, PARKS, WATER and ENVIRONMENT

AUTHORITY TO TAKE PLANTS FOR EDUCATIONAL PURPOSES

Authority No. FL 17339

Issued in accordance with Regulation 28 of the National Parks and Reserved Land Regulations 2009

SCHEDULE 1 Conditions of Authority

1. This permit does not constitute permission to enter land. Prior permission must be obtained from land owners or land managers to enter their land to take the specified wildlife. The relevant Parks and Wildlife Service field centre must be notified prior to taking or collecting on reserved land.
2. No species listed on the Schedules of the *Threatened Species Protection Act 1995* (i.e. no rare, vulnerable or endangered species) may be knowingly collected or disturbed. If you accidentally take a threatened species you must contact the Threatened Species Section, Department of Primary Industries, Parks, Water and Environment immediately.
3. Metadata, including a minimum of species, sample type, date and an accurate grid reference for **each individual sample** must be entered into the Natural Values Atlas (www.naturalvaluesatlas.tas.gov.au) and confirmation that this has occurred sent to the issuing officer of this authority within three months of the expiry of the authority. A copy of any publication resulting from collections made under this authority must also be forwarded once published.
4. This authority must be carried while collecting, and produced on demand by an authorised officer. Collection and disturbance should be kept to a minimum and restricted to places away from publicly accessible sites and not in immediate view of the public.
5. Only the authorised collector and those persons listed on Schedule 2 are authorised to take and possess the specified plant material.
6. Appropriate hygiene measures **must** be taken to prevent the introduction and spread of flora pathogens such as *Phytophthora cinnamomi* and fauna pathogens such as chytrid fungus. Relevant Biosecurity information can be found in the selection of videos available on the NRM South YouTube Channel under the Biosecurity playlist. The Tasmanian Field Hygiene Manual is available through the DPIPWE website.
7. Subject to all other conditions this authority permits the collection of botanical specimens and seed samples.
 - seed samples collected under this authority must not exceed 100 grams or 1000 seeds, whichever is less per collection.
 - The maximum total number of collections (a collection being a set of botanical specimens and/or a seed collection from the same taxa) permitted to be taken under this authority is 300.
8. The amount of material taken from a population of a taxa for botanical specimens must not exceed that which will create 3 sets of specimens (a set being made up of several specimens to show different parts or developmental stages of the species).
9. Vegetative samples (specimens, cuttings, genetic samples etc.) - For perennial and larger annual species the amount of material taken for collections must be limited to <20% of the total above ground mass of any individual plant. For small annual species whole plants may be taken but these must be limited to <10% of the total local population of the species.
10. Seed Samples - For perennial and larger annual species the amount of seed taken from any one plant must be limited to <20% of the seed present on that plant ; for small annual species where seed harvesting necessitates the collection of the entire plant, collection must be limited to <10% of the local population.



DEPARTMENT of PRIMARY INDUSTRIES, PARKS, WATER and ENVIRONMENT

AUTHORITY TO TAKE PLANTS FOR EDUCATIONAL PURPOSES

Authority No. FL 17339

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2009

11. For populations where there is less than 500 individuals only 20% of plants can be sampled from.

SCHEDULE 2 Joint Permit Holders

Martin Gardner - Royal Botanic Garden Edinburgh, Scotland, EH3 5LR, UK.

Seamus O'Brien, National Botanic Gardens of Ireland, Glasnevin, Dublin, Ireland.

Neil Porteous, National Trust Mount Stewart Gardens, Portaferry Road, County Don, BT22 2AD, North Ireland.

Piers Lunt, National Botanic Gardens of Wales, Middleton Hall, Llanarthne, SA32 SHN, Wales, UK.

Lord Rosse, Birr Castle, County Offaly, R42 VO27, Ireland.

Robert Wilson-Wright, Coolcarrigan Gardens, Nass, County Kildare, W91 H9X6, Ireland.

[DPIPWE 2017]

APPENDIX VI

BIBET COLLECTIONS SPREADSHEET

Coll. No.	sp. No.	Family	Genus	Species	isp rank	isp epithet	Comments	Seed	Herb	MS	DNA
001		Proteaceae	Hakea	lissocarpa				1	3		Y
002		Ericaceae	Leptecophylla	parvifolia				1	1		Y
003		Myrtaceae	Leptospermum	rupestre			Prostrate Form	1	2		Y
004		Proteaceae	Bellendena	montana				N	2		Y
005		Ericaceae	Pentachondra	pumila				1	1		Y
006		Asteraceae	Celmisia	astelifolia				N	1		Y
007		Asteliceae	Astelia	alpina				1	1		Y
008		Restoniaceae	Beloskion	australe				N	1		Y
009		Proteaceae	Grevillea	australis				N	2		Y
010		Myrtaceae	Baeckea	gunniana				N	1		Y
011		Poaceae	Hierochloa	redolens				1	3		Y
012		Asteraceae	Ozothamnus	hookeri				N	1		Y
013		Asteliceae	Astelia	alpina				1	1		N
014		Myrtaceae	Leptospermum	rupestre			Upright Form	1	1		Y
015		Myrtaceae	Leptospermum	lanigerum				1	1		N
016		Polygonaceae	Muehlenbeckia	axillaris				1	1		Y
017		Liliaceae	Dryophila	cynocarpa				N	1		Y
018		Ericaceae	Leptecophylla	parvifolia				1	1		N
019		Myrtaceae	Eucalyptus	pauciflora				1	2		Y
020		Myrtaceae	Leptospermum	rupestre			Upright Form	?	N	Y	N
021		Dryopteridaceae	Polystichum	proliferum				1	4		Y
022		Asteraceae	Olearia	tasmanica				N	1		Y
023		Rubiaceae	Coprosma	nitida			Female plant	N	1		Y
023	A	Rubiaceae	Coprosma	nitida			Male Plant	N	1		Y
024		Myrtaceae	Eucalyptus	coccifera				1	3		Y
025		Myrtaceae	Eucalyptus	delagatensis	ssp.	tasmaniensis		1	3		Y
026		Asteraceae	Ozothamnus	thrysoideus				N	1		Y
027		Myrtaceae	Eucalyptus	delagatensis	ssp.	tasmaniensis		1	2		N
028		Proteaceae	Hakea	lissosperma				1	1		Y
029		Faboceae	Oxylobium	ellipticum				N	1		Y
030		Stylidiaceae	Stylidium	graminiifolium				Y	2		Y
031		Asteraceae	Olearia	viscosa				N	2		Y
032		Stylidiaceae	Stylidium	graminiifolium				1	N?	Y	N
033		Myrtaceae	Leptospermum	lanigerum				1	2		N
034		Rubiaceae	Coprosma	nitida				1	1		Y
035		Asteraceae	Ozothamnus	rodwayi				N	1		Y
036		Proteaceae	Telopea	truncata				N	2		Y
037		Asteraceae	Olearia	phlogopappa				N	1		Y
038		Ericaceae	Cyathodes	straminea				1	1		Y
039		Gleicheniaceae	Gleichenia	alpina			No spore?	1	2		Y
040		Santalaceae	Exocarpos	humifusus				1	2		Y
041		Ericaceae	Acrothamnus	hookeri				1	1		Y
042		Asteraceae	Olearia	piniifolia				N	1		Y
043		Myrtaceae	Eucalyptus	coccifera				1	Y	Y	Y
044		Winteraceae	Tasmania	lanceolata				N	1		Y
045		Proteaceae	Telopea	truncata				N	1		Y
046		Isotaceae	Isotetes	gunnii				N	1		Y
047		Cupressaceae	Athrotaxis	cupressoides				N	2		Y
048		Ericaceae	Epacris	lanuginosa				N	1		Y
049		Asteraceae	Olearia	obcordata				N	1		Y
050		Ericaceae	Cyathodes	straminea				1	2		Y
051		Asteraceae	Abrotanella	forsterioides				1	1		Y
052		Myrtaceae	Eucalyptus	coccifera				1	Y	Y	N
053		Proteaceae	Hakea	epiglottis				1	2		Y
054		Myrtaceae	Eucalyptus	rodwayi				1	2		Y
055		Myrtaceae	Melaleuca	virens			syn. Callistemon viridiflorus	1	2		Y
056		Faboceae	Acacia	dealbata				1	2		Y
057		Oleaceae	Notelaea	ligustrina				N	2		Y

Coll. No.	sp. det.	Family	Genus	Species	isp rank	isp epithet	Comments	Seed	Herb	Herb	DNA
058		Proteaceae	Lomatia	tinctoria				N	2		Y
059		Blechnaceae	Blechnum	nudum				1	2		Y
060		Ericaceae	Leptocophylla	parvifolia				1	1		Y
061		Casuarinaceae	Allocasuarina	zephyracea				1	2		Y
062		Proteaceae	Banksia	marginata				1	6		Y
063	A	Myrtaceae	Eucalyptus	amagdalena			1 PACKET FOR 163 & 163A	1	2		N
063		Myrtaceae	Eucalyptus	amagdalena				1	3		Y
064		Dilleniaceae	Hibbertia	procumbens				N	1		Y
065		Cunoniaceae	Eucryphia	lucida				N	3		Y
066		Iridaceae	Libertia	pulchella				N	1		Y
067		Ericaceae	Gaultheria	hispida				N	1		Y
068		Lamiaceae	Prostanthera	lesianthos				1	3		Y
069		Nothofagaceae	Nothofagus	cunninghamii				N	2		Y
070		Proteaceae	Telopea	truncata				1	1		Y
071		Asteraceae	Ozothamnus	ledifolius				N	1		Y
072		Myrtaceae	Eucalyptus	pauciflora				1	4		Y
073		Myrtaceae	Eucalyptus	gunnii	ssp.	gunnii	Should be a herb specimen?	1	Y	Y	Y
074		Myrtaceae	Leptospermum	lanigerum			Pillar form	1	2		Y
075		Myrtaceae	Melaleuca	virens			syn. Callistemon viridiflorus	1	1		Y
076		Iridaceae	Diplarrhena	latifolia				N	2		Y
077		Asteraceae	Podolepis	decipiens				N	1		N
078		Pittosporaceae	Bursaria	spinosa				N	2		N
079		Proteaceae	Banksia	marginata				N	3		N
080		Myrtaceae	Eucalyptus	coccifera				1	2		N
081		Gunneraceae	Gunners	cordata				1	1		Y
082		Asteliaceae	Astelia	alpina				1	N		Y
083		Cupressaceae	Microcachrys	tetragona				1	1		Y
084		Cupressaceae	Athrotaxis	cupressoides				N	2		Y
085		Cupressaceae	Diselma	archeri				N	3		Y
086		Nothofagaceae	Nothofagus	gunnii				N	2		Y
087		Asteraceae	Ewartia?	planchoni?				1	1		Y
088		Dilleniaceae	Hibbertia	procumbens				1	1		Y
089		Myrtaceae	Melaleuca	squamea				1	1		Y
090		Asteraceae	Brachyscome	decipiens				1	Y	Y	Y
091		Ericaceae	Leptocophylla	parvifolia			Pink fruited form	1	1		Y
092		Asteraceae	Bedfordia	linearis				1	2		Y
093		Ericaceae	Leptocophylla	parvifolia			Burgundy fruited form	1	1		Y
094		Blechnaceae	Blechnum	nudum				1	2		Y
095		Asteraceae	Bedfordia	salicina				1	1		Y
096		Myrtaceae	Eucalyptus	delegatensis	ssp.	tasmaniensis		1	3		Y
097		Proteaceae	Lomatia	tinctoria				N	1		Y
098		Asphodelaceae	Dianella	tasmanica				N	2		Y
099		Rhamnaceae	Pomaderris	apetala				N	2		Y
100		Liliaceae	Drymophila	cyanocarpa				N	1		Y
101		Asteraceae	Olearia	viscosa				1	2		Y
102		Asteraceae	Olearia	phlogopappa				1	1		Y
103		Ericaceae	Gaultheria	hispida				1	1		Y
104		Asteraceae	Olearia	argyrophylla				1	2		Y
105		Dicksoniaceae	Dicksonia	antarctica				1	2		Y
106		Cyperaceae	Gymnoschoenus	sphaerocephalus				1	2		Y
107		Myrtaceae	Leptospermum	grandiflorum				N	1		Y
108		Rubiaceae	Boronia	citriodora				N	1		Y
109		Myrtaceae	Leptospermum	lanigerum?			2 seed packets.	2	1		Y
110		Casuarinaceae	Allocasuarina	zephyrea				1	2		Y
111		Proteaceae	Cenarrhens	nitida				N	1		Y
112		Proteaceae	Persoonia	gunnii				1	1		Y
113		Myrtaceae	Eucalyptus	coccifera				1	2		Y
114		Cupressaceae	Athrotaxis	cupressoides				N	2		Y

Coll. No.	sp. type	Family	Genus	Species	isp rank	isp epithet	Comments	Seed	Herb	MBL	DNA
115		Cupressaceae	Diselma	archeri				N	2		Y
116		Podocarpaceae	Phyllocladus	aspleniifolius				N	2		Y
117		Cupressaceae	Athrotaxis	selaginoides				N	2		Y
118		Ericaceae	Richea	x curtisiae			No seed	N	2		Y
119		Myrtaceae	Melaleuca	squamea			White Form	1	1		Y
120		Myrtaceae	Leptospermum	glaucescens				1	1		Y
121		Liliaceae	Blandfordia	punicea				1	1		Y
122		Cyperaceae	Gahnia	grandis				1	2		Y
123		Cupressaceae	Athrotaxis	x laxifolia				N	1		Y
124		Pittosporaceae	Pittosporum	bicolor				1	1		Y
125		Myrtaceae	Eucalyptus	delegatensis	ssp.	tasmaniensis		1	4		Y
126		Ericaceae	Richea	scoparia			Immature fruits.	1	1		Y
127		Proteaceae	Cenarrhens	nitida			Dried fruits.	1	1		Y
128		Dicksoniaceae	Dicksonia	antarctica				1	2		Y
129		Ericaceae	Gaultheria	hispida				1	1		Y
130		Blechnaceae	Blechnum	wattsii				1	2		Y
131		Elaeocarpaceae	Aristotelia	peduncularis				1	1		Y
132		Ranunculaceae	Clematis	aristata				1	1		Y
133		Asteraceae	Olearia	sp.				1	1		Y
134		Stylidiaceae	Stylidium	graminifolium				1	2		Y
135		Iridaceae	Libertia	pulchella				1	2		Y
136		Gleicheniaceae	Gleichenia	sp.				1	4		Y
137		Pittosporaceae	Billardiera	longifolia				N	2		Y
138		Oxalidaceae	Oxalis	magellanica				N	1		Y
139		Grammitidaceae	Grammitis	billardieri			Very little spore.	1	1		Y
140		Hymenophyllaceae	Polyphlebium	venosum				N	1		Y
141		Hymenophyllaceae	Hymenophyllum					N	1		Y
142		Geocalycaceae?	Heteroscyphus?				Leafy liverwort. No spore.	N	1		Y
143		Asplenaceae	Asplenium	sp.				1	1		Y
144		Blechnaceae	Blechnum	fluviatile & nudum			2 different species.	1	2		Y
145		Dennstaedtiaceae	Pteridium	esculentum			Spore <u>not</u> to be sent to UK!	1	2		Y
146		Dryopteridaceae	Rumohra	adiantiformis			Very little spore. Collected late?	1	2		Y
147		Polypodiaceae	Microsorium	pustulatum				1	2		Y
147	A	Polypodiaceae	Microsorium	pustulatum				1	N		N
148		Fabaceae	Acacia	melanoxydon			Semi-mature fruits.	1	2		Y
149		Lamiaceae	Prostanthera	lasianthos				1	3		Y
150		Hymenophyllaceae	Hymenophyllum	sp.				N	1		Y
151		Monimiaceae	Atherosperma	moschatum				N	2		Y
152		Cyathaceae	Cyathea	australis			Incorrectly labelled as 157	1	2		Y
153		Escalloniaceae	Anopterus	glandulosa				1	2		Y
154		Cunoniaceae	Eucryphia	lucida				N	2		Y
155		Pittosporaceae	Billardiera	longifolia				1	N?	Y	Y
156		Myrtaceae	Eucalyptus	amgdalyne aff.				1	2		Y
157		Ericaceae	Epacris	impressa				N	1		Y
158		Rubiaceae	Coprosma	quadrifida				1	2		Y
159		Aizoaceae	Carpobrotus	rossii				1	1		Y
160		Asphodelaceae	Dianella	tasmanica			Dried fruits.	1	N		Y
161		Chenopodiaceae	Rhagodia	candolleana				1	1		Y
162		Polygonaceae	Muehlenbeckia	gunnii				1	1		Y
163		Restoniaceae	Baloskion	tetraphyllum			Immature fruits.	1	1		Y
164		Liliaceae	Dryophila	cyanocarpa			Immature fruits.	1	1		Y
165		Ericaceae	Sprengelia	propinqua				N	1		N
166		Myrtaceae	Leptospermum	scoparium				1	1		N
167		Asteraceae	Cassinia & Olearia	2 Cass. & 1 Olearia				1	3		N
168		Cupressaceae	Lagarostrobos	franklinii				N	1		Y
169		Cupressaceae	Athrotaxis	selaginoides				1	2		Y
170		Asteraceae	Oothismus	sp.			(Cassinia 167)	N	2		Y
171		Asphodelaceae	Dianella	tasmanica			Seed & dried fruits.	1	1		N

Coll. No.	sp. type	Family	Genus	Species	isp rank	isp epithet	Comments	Seed	Herb	MH-4	DNA
172		Myrtaceae	Melaleuca	squarrosa				1	1		Y
173		Xiridaceae	Xyris	tasmanica				N	3		Y
174		Rutaceae	Acradenia	frankliniae				N	2		Y
175		Cupressaceae	Lagarostrobos	franklinii				N	2		Y
176		Polypodiaceae	Microsorium	pustulatum				1	3		Y
177		Cupressaceae	Lagarostrobos	franklinii				N	1		N
178		Myrtaceae	Eucalyptus	subcrenulata				1	2		Y
179		Ericaceae	Trochocarpa	thymifolia			Dried fruits.	1	1		Y
180		Ericaceae	Richea	pandanifolia				N	1		Y
181		Myrtaceae	Eucalyptus	coccifera				1	2		Y
182		Ericaceae	Dracophyllum	miliganii				N	3		Y
183		Droseraceae	Drosera	murfetii				N	2		Y
184		Proteaceae	Lomatia	polymorpha				N	1		Y
185		Proteaceae	Banksia	marginata				1	2		Y
186		Myrtaceae	Leptospermum	glaucescens			Very upright pencil shape, slender form	1	1		Y
187		Liliaceae	Blandfordia	punicea			No seed	N	1		Y
188		Rhamnaceae	Pomaderris	spetala				N	2		N
189		Asteraceae	Olearia	argyrophylla				1	2		N
190		Faboceae	Acacia	melanoxyton				1	2		N
191		Dicksoniaceae	Dicksonia	antarctica				1	N		Y
192		Rhamnaceae	Pomaderris	spetala				1	1		Y
193		Myrtaceae	Eucalyptus	sp.				1	N		N
194		Myrtaceae	Eucalyptus	globulus				N	Y	Y	Y
195		Myrtaceae	Eucalyptus	coccifera				1	2		Y
196		Pittosporaceae	Billardiera	longifolia				N	2		Y
197		Faboceae	Acacia	verticillata				1	1		Y
198		Myrtaceae	Eucalyptus	sp.				1	2		Y
199		Ericaceae	Cyathodes	platystoma				1	3		Y
200		Thymelaeaceae	Fimelea	nivea				N	2		N
201		Santalaceae	Leptomeria	drupacea			Native broom Family.	N	1		N
202		Thymelaeaceae	Fimelea	drupacea				1	1		Y
203		Thymelaeaceae	Fimelea	sericea				1	N?	Y	Y
204		Asteraceae	Bedfordia	salicina				1	2		Y
205		Asteraceae	Olearia	stellulata				1	1		Y
206		Oleaceae	Notelaea	ligustrina				1	2		Y
207		Asteraceae	Bedfordia	linearis				Y	N		Y
208		Myrtaceae	Melaleuca	sp.				1	1		Y
209		Proteaceae	Banksia	marginata			3 specimens, no coll. num. - 209 or 218?	N	Y	?	N
210		Myrtaceae	Leptospermum	scoparium				1	1		Y
211		Lycopodiaceae	Lycopodium	deuterodensum				N	2		N
212		Myrtaceae	Eucalyptus	tenuiramis				1	3		Y
213		Ericaceae	Pentachondra	involuta				N	1		Y
214		Ericaceae	Cyathodes	platystoma				1	2		Y
215		Faboceae	Acacia	riceana				1	2		Y
216		Asteraceae	Bedfordia	linearis				1	1		Y
217		Aizoaceae	Disphyma	crassifolium	ssp.	clevatum		1	1		Y
218		Proteaceae	Banksia	marginata			Coastal form. 3 specimens, no coll. num. - 209 or 218?	1	Y	?	N
219		Casuarinaceae	Allocasuarina	verticillata				1	Y	Y	Y
220		Myrtaceae	Melaleuca	pallida			(Callistemon)	1	2		Y
221		Proteaceae	Hakea	megadenia?				1	1		Y
222		Proteaceae	Hakea	lissosperma				1	2		N
223		Geraniaceae	Pelargonium	australe				N	1		N
224		Unknown					A collection of Tasmanian seaweeds and red algae from Cape Raul.	N	2		N

Coll. No.	W L SP	Family	Genus	Species	isp rank	isp epithet	Comments	S P B	H E R B	M S B	DNA
225		Proteaceae	Lomatia	polymorpha				1	2		Y
226		Proteaceae	Olearia	tasmanica				1	2		Y
227		Cunoniaceae	Eucryphia	x hybrida				N	1		Y
228		Faboceae	Acacia	riceana				1	1		Y
229		Cunoniaceae	Eucryphia	milliganii				N	2		Y
230		Cunoniaceae	Eucryphia	x hybrida				N	1		N
231		Myrtaceae	Leptospermum	lanigerum				N	1		N
232		Cunoniaceae	Eucryphia	lucida				N	3		N
233		Myrtaceae	Eucalyptus	regnans				N	2		Y
234		Myrtaceae	Leptospermum	riparium				1	1		Y
235		Winteraceae	Tasmania	lanceolata				1	2		Y
236		Myrtaceae	Eucalyptus	obliqua				N	2		Y
237		Ericaceae	Cyathodes	glauca				1	2		Y
238		Ericaceae	Trochocarpa	cunninghamii				1	1		Y
239		Myrtaceae	Leptospermum	nitidum				1	2		Y
240		Ericaceae	Richea	scoparia				1	1		Y
241		Proteaceae	Agastachys	odorata				N	1		N
242		Droseraceae	Drosera	murfetii				1	1		Y
243		Ericaceae	Prionotes	cerinthoides				1	1		N
244		Rhamnaceae	Pomaderris	elliptica				N	2		Y
245		Cunoniaceae	Bauera	rubrioides				N	3		Y
246		Proteaceae	Persoonia	gunnii				N	1		Y
247		Myrtaceae	Eucalyptus	vernica				1	1		Y
248		Apiaceae	Anisotome	procumbens				1	2		Y
249		Asteraceae	Senecio	pectinatus				Y	1		Y
250		Escalloniaceae	Tetracarpaea	tasmanica				N	1		Y
251		Gentianaceae	Gentianella	diemensis				N	1		Y
252		Asteraceae	Senecio	albogivus				1	1		Y
608		Ericaceae	Leptecophylla	parvifolia			JW collection (JW608).	J	N		
616		Ericaceae	Trochocarpa	thymifolia			JW collection (JW616).	J	N		
000	0	Pittosporaceae	Biltardiera	longifolia			No accession (137 or 196*)	1	N		
000	0	Myrtaceae	Leptospermum	sp.			No accession (20*)	1	N		
000	0	Myrtaceae	Eucalyptus	sp.			No accession (194, 233 or 236 or 2nd part)	1	N		
000	0	Myrtaceae	Corymbia	ficifolia			Unnumbered collection	1	N		
000	0	Myrtaceae	Metrosideros	excelsa			Unnumbered collection	1	N		
000	0	Sapindaceae	Acer	pentaphyllum			Unnumbered collection	1	N		

[Wood & Lunt 2018]

GLOSSARY

agar: jelly-like substance derived from algae

aril: accessory covering around certain seeds, most famously in species of yew

asl: above sea level

basal species: a species that gives rise to derived species through evolution

calyx: arrangement of sepals, enclosing, and providing protection to, the flower in bud

CBD: Convention on Biological Diversity (1992)

chromosome: a structure, made of nucleic acids and proteins, resembling a thread, within the nuclei of most living cells, carrying genetic information in the form of genes

CITES: Convention on International Trade in Endangered Species Fauna and Flora

cleistogamy: fertilisation within a closed flower

clonal: genetically identical, the result (in flora) of vegetative reproduction or cleistogamy

columnar: having a column-like form

corolla: arrangement of petals around the reproductive organs of the flower

deciduous: of woody plants, shedding leaves seasonally; herbaceous

dioecious: having male and female flowers on separate plants

endemic: of a species, found in a closed, distinct geographical region and nowhere else

gene: unit of heredity, passing from parent to offspring, determining a particular characteristic, such as leaf shape, etc

glaucus: a blue-grey/green colour

hardiness: incremental measure of a plant's ability to withstand low temperatures

'heap': Australian vernacular for 'a large number'; *synonym* 'a shit ton'

herbaceous: aerial plant material dying back to a crown (often subterranean) at the end of the growing season for perennation

homologous chromosomes: having different structures, promoting incompatibility

inflorescence: group of flowers on a plant

lanceolate: narrow and pointed, like a lance

mast: *v.* to set seed. Many trees have **mast years**, i.e. years when they produce large numbers of seed. Intervening years may see little or no seeding at all

meiosis: a form of cell division in which four daughter cells each contain half the number of chromosomes in the parent cell

Nagoya: Nagoya Protocol (2010)

NBGW: National Botanic Garden of Wales

NT: National Trust

pedicel: a flower stalk

perennation: of a plant, hibernation to survive adverse environmental conditions, e.g. cold/drought, between germination seasons

petal: a segment of a corolla

petiole: a leaf stalk

pioneer: in ecology, a species quick to colonise ground after a dramatic environmental change or disturbance. Lichens and mosses are typical examples

recurved: bending/curving backward

rhizome: modified stem of a plant, acting as storage organ and point of growth for roots, flowers and foliage. Often but not always subterranean

RTBG: Royal Tasmanian Botanical Gardens

sakura: Japanese, cherry blossom

scale: reduced flat leaf, as found on many conifers

sclerophyll: a plant, usually woody, that has tough, thick evergreen leaves adapted to reduce water loss. **Wet sclerophyll** and **dry sclerophyll** refers to the relative rainfall in forests composed of these types of plants

seed recruitment: natural sexual reproduction of a species *in situ*

sepal: a segment of the calyx

sp.: species (*sing.*)

spp.: species (*pl.*)

strike rate: the number of plants in a batch of cuttings that take root

suckering: the sending up of new shoots from a root crown or stool; a variation of vegetative reproduction

tarn: a small mountain lake

testa: the hard outer coating of a seed

tissue culture: the propagation of plant material from cells derived from living tissue. This is conducted in an artificial medium, often agar jelly

triploidy: the state of having three, rather than the usual two, sets of chromosomes. This condition causes sterility in the organism

vector: an organism that transmits disease to another organism, often without suffering any symptoms itself

vegetative reproduction: asexual propagation, either natural or artificial

WA: Western Australia

whorl: the radial arrangement of petals, sepals, bracts or leaves from a single point on a stem

BIBLIOGRAPHY

Culley, Theresa M. (2013). Why vouchers matter in botanical research. *Applications in Plant Science*; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4103463/>

Hillier Nurseries. *The Hillier Manual of Trees and Shrubs*. Newton Abbott. David & Charles.

Holliday, Ivan (2002). *A Field Guide to Australian Trees*. Third Edition. Sydney. Reed New Holland.

Launceston Field Naturalists Club. (2008). *A Guide to Flowers and Plants of Tasmania*. Sydney. Reed New Holland.

UBD – Gregory's. *Tasmania State and Cities State Map; Scale 1:625 000*. Ultimo. Universal Publishers Pty Ltd.

Wiltshire, Rob & Jordan, Greg (2009). *TreeFlip. Life-size guide to the trees of Tasmania*. School of Plant Science, University of Tasmania & CRC for Forstry.

Wiltshire, Rob & Potts, Brad (2007). *EucaFlip. Life-size guide to the eucalypts of Tasmania*. School of Plant Science, University of Tasmania & CRC for Forstry.

WEBOGRAPHY

www.alpinegardensociety.net

www.anbg.gov.au

www.bom.gov.au

www.botanicgarden.wales

www.brandtasmania.com

www.brc.ac.uk

www.colesbournegardens.org.uk

www.discovertasmania.com.au

www.dpipwe.tas.gov.au

www.encyclopedia.com

www.exploringtheearth.com

www.flora.sa.gov.au

www.gardens.rtbg.tas.gov.au

www.google.co.uk

www.keyserver.lucidcentral.org

www.nationaltrust.org.uk

www.ncbi.nlm.nih.gov

www.nhs.uk

www.nonnativespecies.org

www.northqueenslandplants.com

www.nymansgardenblognt.wordpress.com

www.metoffice.gov.uk

www.parks.tas.gov.au

www.plantlife.org.uk

www.reallygardenproud.com

www.rhs.org.uk

www.saseedbank.com.au

www.tasmap.tas.gov.au

www.theplantlist.org

www.tropicalbritain.co.uk

www.utas.edu.au

www.wikipedia.org

INDEX PLANTAE

All entries in **bold** indicate illustrations within the text.

Plants are listed by family firstly for ease of reference, and secondly to clearly show the relationships between plants in the Tasmanian flora. I have elected to use, where possible, the Australian classification system even when this differs from both the Kew Plant List and the RHS Plant Finder, for the simple reason that I feel they know their own flora better. James Wood informed me that where taxonomic changes are made as a result of new findings by Australian botanists, Kew will often be slow to recognise them. Any discrepancies will have to be taken up and resolved by people far more qualified than myself.

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