

Gardenwise



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Special Volume dedicated to Dr Leong Chee Chiew





- 1 Message from the Director
Tan Puay Yok

Articles

- 2 Message of gratitude from Minister Desmond Lee to Dr Leong Chee Chiew
- 3 A tribute to Dr Leong Chee Chiew from the National Parks Board (NParks)
- 6 Singapore Botanic Gardens colleagues remember Dr Leong Chee Chiew
- 12 A Botanical Odyssey: An exhibition at the Botanical Art Gallery
Michele Rodda, Martina Yeo
- 16 A Garden of Birds: A curator's perspective
Ratika Shah Singh
- 20 Coming home to the Gardens
Jeremy Purseglove

Regular Features

- 24 **Edibles**
Growing edible flowers in the Tropics (Part 2): Climbers
Wilson Wong
- 28 **From the Earth**
Ethel Maud Morrison Burkill: Fungi in art and science
Serena Lee
- 32 **Beyond the Gardens**
Orchid and Bryophytes Conservation Workshop at the Dr Cecilia Koo Botanic Conservation Center, Taiwan
Koh Teng Seah, Ho Boon Chuan
- 37 **Key Visitors to the Gardens**
January–June 2024

Back Cover

From the Archives
A Garden of Birds over the years
Ratika Shah Singh



Cover

Dr Leong Chee Chiew looking out at the planted lawns on the balcony of Inverturret at 7 Gallop Road, the Gallop Extension of Singapore Botanic Gardens' Learning Forest. (Source: Singapore Botanic Gardens)

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Message from the Director

We dedicate this issue to the memory of Dr Leong Chee Chiew, who passed on after a battle with cancer on 13 June 2024. He had dedicated 40 years of his working life to the National Parks Board (NParks), Singapore. He will be remembered for always keeping at heart, the state of conservation of Singapore and its green spaces, the welfare of his colleagues, and the continued success of the Singapore Botanic Gardens. The Gardens is where he started his career, and over his whole working life here, other than a short stint in the Ministry of National Development (MND), there was not a period when he was not working in or overseeing the Gardens. We owe him a debt of gratitude for all he has done for the Gardens.

In this issue, colleagues recount their memories of a colleague, a friend and to many, a fatherly figure. We are also very grateful to Minister Desmond Lee for allowing us to reproduce his message to Dr Leong.

I share my interactions with Dr Leong that exemplify his personal qualities. My first direct close interaction with Dr Leong as a supervisor was in 1998 when I was the Show Manager for the Skyrise Gardens Exhibition, for which he was the Chairperson of the Steering Committee. He showed tremendous patience in guiding an inexperienced young man taking on his biggest project, being supportive and patiently advising but not dominating. I recall too that when there were some last-minute safety regulations to clear for construction of the exhibition to commence, he personally accompanied me and another colleague to a government agency to make sure we were able to clear the hurdle, something which he need not have done as the Deputy CEO of the organisation.

The second incident which I remember vividly was the surprise and some level of shock I had created when I informed him that I have decided to leave NParks in 2012. I had been away on a trip, and he had wanted to see me to tell me when I came back to work that the organisation had decided that I would take up a higher appointment in NParks. He appreciated that I had already made up my mind, and we discussed briefly the missed



(Source: Ministry of National Development)

opportunity given to me, but I sensed that he was fundamentally supportive and understood the reasons for my decision. Despite the surprise, he was in his usual calm demeanour and wished me the best. I believe that over the years, he would show the same understanding and support for other colleagues leaving NParks, always wishing them the best whether they are in or out of the organisation.

Seven years later, I had just given a lecture at an NParks event, and during the break, he quietly pulled me aside and asked if I would consider coming back to NParks to head the Gardens. This was a magnanimous offering. He was also remarkably patient as I pondered over this and discussed with him over several meetings to work out an arrangement that would allow me to keep my tenure at the University and contribute to the Gardens at the same time. In the end, I decided to step out of my comfort zone. I was won over not just by the opportunity to contribute to a place which I care for but also by Dr Leong's sincerity and the support of the previous CEO, Mr Kenneth Er and former Chairman, Mr Benny Lim. My feeling upon returning was as if I had gone on a long sabbatical and been welcomed home, knowing that I would continue to have the counsel of a supportive and wise supervisor.

The third incident occurred soon after I had returned, when the Gardens was thick into preparing for the opening of Phase 1 of Gallop Extension. The project had been delayed for different reasons, and work was still ongoing on the day before opening. I was very shocked when I learnt that Dr Leong was at the site at 3 am before the opening event at 9 am to troubleshoot a problem with the Visitor Centre. He could have asked the whole team to go to the site, but instead chose to be there with just the project manager to solve the problem. Such is the level of personal commitment to make sure that things are always achieved with the best possible outcome.

I will remember always Dr Leong for his kindness and guidance as a supervisor, and his supreme dedication to his work, which must have however, come at a huge sacrifice of his personal time. I hope that since returning to the Gardens, I was able to take a load off his shoulders. While we will miss him, we are also glad that he can now have a good rest.

Tan Puay Yok
Group Director
Singapore Botanic Gardens

Message of gratitude from Minister Desmond Lee to Dr Leong Chee Chiew

When I first joined the Ministry of National Development (MND) in 2013 as a Minister of State, I was tasked to oversee the National Parks Board (NParks) portfolio. Although I had always enjoyed the outdoors, I was less familiar with the natural habitats and biodiversity in Singapore. Throughout my time in MND, you have been a constant guide and mentor, sharing with me the wonders of the flora and fauna in our midst, and introducing me to the nature community.

From the time you joined the Singapore Botanic Gardens in 1983, you helped chart Singapore's green journey, from a Garden City to a City in a Garden, and now a City in Nature.

Singapore is greener because of your efforts. Beyond curating the plants to grow in our gardens, parks and roadsides, you have helped to set in place the foundations that made the Singapore Botanic Gardens a premier botanical institution. You were also instrumental in our successful bid for the Botanic Gardens to be inscribed as Singapore's first UNESCO World Heritage Site in 2015, making it the first botanic gardens to be inscribed from the Tropics. With City in Nature as our vision, you led the shift from monoculture tree-planting to a programme of tiered planting that replicates the structure of a tropical rainforest. Our streetscapes transformed from roadside greenery to nature ways as connectors for native birds and butterflies, and brought about much respite for pedestrians walking along our roads.

You have also been crucial in our efforts to conserve nature areas and allow our biodiversity to flourish, for example the momentous milestone of gazetting of Sungei Buloh and Labrador Nature Reserves in 2002 to add to the existing Central Nature Reserves of Bukit Timah and Central Catchment. Under your watch, Sungei Buloh Wetland Reserve and Bukit Timah Nature Reserve were successfully recognised as ASEAN Heritage Parks. When the management and conservation of Singapore's coastal and marine environment was included

under NParks' ambit in 2008, you paved the way for Singapore's Nature Conservation Masterplan (NCMP), which we launched in 2015. We are seeing the fruits of your lifetime of passion and labour – in the last few years, NParks has been able to introduce Nature Park Networks to buffer core biodiversity areas, develop Singapore's first marine park at Sisters' Islands, and expand Sungei Buloh Wetland Reserve to conserve more sites crucial for migratory shorebirds.

You led the effort to strengthen ecological connectivity across Singapore, ensuring that even as urban development progresses, our native fauna can still move safely between nature areas, thereby ensuring their long-term survival. As chairperson of the Ecological Profiling Exercise (EPE) Advisory Panel, you worked with academics and the nature community to carry out a comprehensive island-wide study to map and understand the ecological profiles of green and blue spaces across Singapore. This has provided a holistic view of Singapore's ecological landscape, and helped to guide our urban planners to balance between nature conservation and urban development through the Long-Term Plan Review.

The willingness to engage and listen to the voices of different stakeholders and arrive at a solution will be one of your greatest legacies. Whether it is to assure the public and our stakeholders that we take care of their safety when we maintain trees, or that we conserve our precious green spaces and natural heritage, your sincerity, humility and keen knowledge of our challenges have helped build consensus amongst diverse stakeholders on the solutions or approaches that we have developed. Your leadership and commitment to engaging the community shone through when we had to make difficult decisions, such as the decision for the Cross Island Line to run deep under the Central Catchment Nature Reserve.

You also helped build up a community of nature stewards for Singapore. From the first volunteer programme

at Sungei Buloh to the Community in Bloom programme, to the Youth Stewards for Nature and Nature Kakis Network, volunteerism bloomed under your watch. Now the community can contribute in many ways, whether through planting trees as part of the OneMillionTrees movement, donating to the Garden City Fund to fund nature projects, or participating in citizen science surveys. Through these efforts, you have developed a stronger community, which bodes well for the future of our natural heritage.

In all that you have done, in greening Singapore, enhancing our biodiversity and strengthening the nature community, you have navigated the waters with much pragmatism, and a can-do spirit. Your contributions are valued and appreciated, not just by me and NParks, but also the community.

Our behalf of all of us at the MND family, I thank you for your firm but quiet stewardship, dedication and valuable contributions to building a City in Nature for Singaporeans to cherish and enjoy.

Mr Desmond Lee
Minister for National Development



(Source: Ministry of National Development)

A tribute to Dr Leong Chee Chiew from the National Parks Board (NParks)

With great sadness, we mourn the passing of our former Commissioner of Parks and Recreation, Dr Leong Chee Chiew. The last post he held was as Executive Director for National Parks, Gardens and Nature Reserves. In his time with NParks, he helped map our journey from a Garden City to that of a City in a Garden, and now as a City in Nature.

Dr Leong, armed with a PhD in plant physiology, joined the Singapore Botanic Gardens as a researcher in 1983 when it was still part of the Parks and Recreation Department, the predecessor of NParks. Over the years, he helped masterplan the revival of the Botanic Gardens as a premier botanical institution and was instrumental in the successful bid for the Botanic Gardens to be inscribed as Singapore's first UNESCO World Heritage Site.

Dr Leong was passionate about conservation and played key roles in several milestones: the gazetting of Sungei Buloh and Labrador as nature reserves in 2002; NParks taking over the management and conservation of Singapore's coastal and marine environment and the creation of the Nature Conservation Masterplan; the establishment of Nature Park Networks to buffer core biodiversity areas that also provide people with additional nature recreation options. He led the effort to strengthen ecological connectivity across Singapore, ensuring that our native fauna can move safely between nature areas even as urban development progresses.

Beyond nature conservation, Dr Leong played a crucial role in transforming our cityscape through the expansion of our streetscape greenery into the backbone of our country's greenery. He guided the move from monoculture tree-planting to a multi-tiered one that replicates the tropical rainforest structure. These Nature Ways not only expand the range of native birds and butterflies but has



also helped to make our streets more pleasant for pedestrians. At the same time, he was aware that skilled people were needed to sustain our greening efforts, so he worked to develop schemes to upskill staff and people in the landscape industry.

He also recognised that for Singapore to become a City in Nature, the people had to be involved as community stewards. From the first NParks volunteer programme at Sungei Buloh to the Community in Bloom programme, to Youth@SGNature and Nature Kakis Network, and from the OneMillionTrees movement to supporting nature-related projects through the Garden City Fund, Dr Leong was the torchbearer for community involvement.

But what may probably be his greatest legacy was his willingness to engage and listen to what different stakeholders had to share, and his drive to encourage consensus and develop solutions. His commitment to engaging the community helped steer NParks through many challenges and overcome obstacles through the years.

Dr Leong's inspiring leadership and wry sense of humour will be dearly missed by the staff of NParks, but we will carry on the work that he started and continue the greening of Singapore.

All photos courtesy of the National Parks Board.





Singapore Botanic Gardens colleagues remember Dr Leong Chee Chiew



An avid football fan, Dr Leong gamely participated in a staff football challenge during Sports Day last year. (Photo credit: Charlie Pang Joo Kang)

Dr Thereis Choo

Coordinating Director for Living Collections and Facilities Management and Centre Director for the Forest Discovery Centre

“I had my first conversation with Dr Leong when I was still a teenager. I say “conversation”, but that is an incredible overstatement on my part. The topic was Pulau Ubin, and Dr Leong graciously sat through a few ums and ahs and my pathetic story about how I visited that one time, before gently schooling me on Chek Jawa and the wonderful conservation work that was going on there. I remember sitting on a wooden chair in Burkill Hall, listening, fully captivated by this interesting little man.

Since that day more than 20 years ago, I’ve had many more interactions with Dr Leong. Unsurprisingly, most have been work-related. Emails, submissions, big meetings, phone calls, messages, small discussions in his office,

quick check-ins at the sidelines of events... All these have been amazing opportunities to observe Dr Leong in action, and I will try my best to remember all the masterclasses he gave in nuance, brevity, positioning, conflict resolution and stakeholder engagement.

On the other hand, when it comes to personal memories that I will forever cherish, the main interactions that stand out are the handful of conversations I had with him over the years.

Initially, getting called into Dr Leong’s office was downright intimidating. Most occasions were related to performance reviews, so there were the usual expectations of talking about work achievements and goals. Fortunately, the stiffness didn’t last long. Soon, our meetings became less formal and more conversational. Once all the obligatory work topics were dispatched, we would drift into subjects that lit Dr Leong up – happenings

in the Gardens, matters to do with staff development and training, and stories about how specific staff were doing. It’s been said many times that Dr Leong genuinely cared about his staff, and that was certainly my experience too. I remember early on in my career being slightly taken aback by his wholehearted support for the work we were doing to improve the (then) Landscape Technician scheme, and later, by the degree of his personal involvement when staff found themselves in difficult situations. Another time, after I’d shared that a key member of my team was resigning to take up mission work, Dr Leong gave a little sigh before saying with pride, “What to do? NParks is full of good people.”

In recent years, conversations with Dr Leong would veer off from work and staff well-being, and he would share a little more about his own journey and struggles. He spoke about his cancer treatments and the toll they

were taking on him. When he learnt that I was pregnant, he spoke about his own fatherhood experience and the importance of family. As work and his medical condition sapped him of time and energy, he seemed to relish stories about all that was happening in the Gardens even more.

The Dr Leong that I visited in the hospital in his final weeks was a frailer, more emotionally raw Dr Leong than I was used to. Seeing the white SBG shirts worn by my Living Collections colleagues immediately brought tears to his eyes, and later, he reminisced about watching SBG staff tending to the climbers at the NParks Headquarters (HQ) through his office window. When he touched on the future and the need to continue the good work in the Gardens, he spoke with a conviction that overwhelmed him. Given his weakened state, our visit must have taken a lot out of him. Yet he graciously spent almost an hour conversing with us like family – which I suppose in a way, we were.

When asked what his favourite spot in the Gardens was, he took his time

to consider. “The Bandstand,” he eventually replied. He spoke about Dr Tan Wee Kiat’s eye for aesthetics and how that ring of yellow raintrees was a masterful landscaping choice, before urging us to follow in the footsteps of “the NParks greats”, and to develop our own eyes. Dr Leong then shared a more personal memory from when he first started working in the Gardens in his very first job here. Back then, the Bandstand lawn was full of weeds, including love grass, which his boss couldn’t abide. As part of their turf management work, Dr Leong went out and bought a miniature ride-on mower for the lawn. Problem was, the Gardens’ staff were terrified of operating it! At this point, Dr Leong paused in his storytelling and chuckled at the picture in his mind’s eye. “So I told the fellow, don’t worry! I’ll walk beside you!” And that is apparently how they mowed the Bandstand lawn, with Dr Leong walking alongside his staff on the mower the whole way.

Had that been my final conversation with Dr Leong, I think he would have been satisfied. He’d touched on all the Gardens-related topics that were dear

to his heart, and even managed to give us directions for the future. However, in the days that followed, as I reflected on what Dr Leong meant to me personally, I became deeply unsatisfied by my part in that conversation. For the first time, just sharing stories and updates seemed woefully insufficient. Dr Leong was there from my Day 1 in NParks. He was, in many ways, my anchor to this organisation and my reference point when it came to our work, our culture and our people. He was also my mentor and teacher, and I would consider him up there as an “NParks great”, to borrow his phrase. While I was just one of the *many many* staff he’d impacted over the years, it broke my heart to think that I might never get a chance to tell this humble, wonderful man just what he meant to me.

Thankfully, I did get that chance to have one last conversation with Dr Leong. And it’s probably the one I will remember forever.

Thank you, Dr Leong. May you rest in peace xxx”



Dr Leong (Left) and Mr Teo (Right) watering a tree they planted together in 2017.

Mr Teo Chan Seng *Senior Manager, Operations*

“I am very honoured to have been invited by Dr Leong to plant this tree with him during NParks’ trees planting event for staff on 27th November 2017. I worked with Dr Leong for 30 years, and he was always a humble, caring and soft-spoken boss. He never raised his voice or showed anger to his staff, save for one incident that I recall when a staff member committed a very serious misconduct and tried to implicate other colleagues too. Dr Leong raised his voice as I was standing by outside Holttum Hall. He immediately dismissed them and asked me to send him out of the Gardens.

Dr Leong showed great concern for staff who were away for overseas studies and always checked in with them, such as asking about their well-being, whether they were eating proper meals, etc. He never stopped anyone who wanted to resign and enter the private sector, but he always asked me to keep in contact with them in case they ever wanted to return to NParks and, if they did, to inform him of their intention to return.

I visited him at the hospital on the evening of the 5th June 2024 before he was transferred to the hospice the next day. Dr Leong requested that his family hold his wake at a location accessible by public transport. Finally, he chose the song *Yuèliàng dàibiǎo wǒ de xīn* (月亮代表我的心) by the late Taiwanese singer Teresa Teng for his last journey. This goes to show how caring he was as a person.

Finally, it is his time to rest. He will always be remembered in my heart.”

Whang Lay Keng*Curator of the National Orchid Garden*

“Dr Leong was a highly dedicated and committed boss who approached his work with the utmost seriousness. I have seen him replying to emails and making phone calls to staff while inside the vehicle on a working trip. He would also offer assistance and ask if we needed help, even to junior staff in NOG.

One of Dr Leong’s most admirable qualities was his genuine concern for the wellbeing of the older NOG staff. He would take the time to check on their welfare and ensure that they felt valued and cared for. This act of kindness endeared him to everyone who had the privilege of working with him.”

Mark Choo*Assistant Curator of the National Orchid Garden*

“Throughout Dr Leong’s distinguished career in NParks, he served as a role model for many NParks staff, including myself, and it is easy to see why Dr Leong was so highly regarded in NParks.

Firstly, his careful deliberation of difficult situations led to many astute decisions. I have personally seen how he would appreciate the problem before providing staff with a well-thought-out solution. When the National Orchid Garden (NOG) team was working with the Centre for Urban Greenery and Ecology (CUGE) on orchid industry matters, Dr Leong was very supportive of the needs of NOG and the Botanic Gardens, and pushed hard to ensure that they were addressed. Despite all the frustrations and stumbling blocks at work, Dr Leong wouldn’t get angry or take it out on staff. He would focus on the problem and try his best to resolve it.

Secondly, Dr Leong was highly committed to his work, often spending

long hours thinking about the complex issues that he faced. Over several plant sourcing trips, I witnessed Dr Leong spend long hours during car rides thinking deeply about the issues that he was having to deal with. He would lament that sometimes the issues would cause him to have sleepless nights. Such was the level of dedication of Dr Leong.

Over the years, Dr Leong has also had to step in as a listening ear and provide comfort to staff who were feeling dejected and demoralised, and will always be able to motivate staff in a calm yet assuring manner!

Beyond work, Dr Leong enjoyed winding down the workday with a beer. I’ve had the privilege of spending time with him on overseas trips and in the office at the end of the day while he had that beer. It did help him feel better!

Dr Leong was a true professional and role model for NParks staff aspiring to do well. His contributions to NParks have undoubtedly left an indelible mark on the organisation.”



Dr Leong (First row, 7th from left) with Dr Kiat Tan (8th from left), then Executive Director of the National Parks Board, and staff from the Gardens in 1999.

In Pictures: Remembering Dr Leong Chee Chiew

Dr Leong joined the Singapore Botanic Gardens in 1983 and, for over four decades, played a crucial role in transforming the Gardens into a world-class institute for conservation, research and education in tropical botany and horticulture. He was the salt of the earth and the light of the world—a beacon of hope and a source of inspiration to all who knew and worked with him. His gentle demeanour belied a sharp wit and a keen sense of humour. He was tireless in his support for the Gardens' work and mission.

While Dr Leong is no longer with us, his legacy will live on as we continue our work to burnish and conserve this much-loved garden and civic space so that it will forever be a special place for all.

All photos courtesy of the Singapore Botanic Gardens.



Dr Leong (4th from right) with Baroness Margaret Thatcher, then Prime Minister of the United Kingdom, during her visit to the Gardens on 8th April 1985.



Dr Leong (Left) with His Excellency the Right Honourable David Johnston, then Governor General of Canada (2010–2017), in 2011 for the Orchid Naming Ceremony to mark his official visit to Singapore.



Staff and family members celebrating Dr Leong's (6th from left) 62nd birthday at the Singapore Garden Festival 2014.



Dr Leong (2nd from right) with staff celebrating the 50th anniversary of the independence of Singapore (SG50) and the Gardens' inscription as a UNESCO World Heritage Site in 2015.



Dr Leong joins colleagues from the National Parks Board and Singapore Botanic Gardens during the official opening of the Learning Forest in 2016 with Mr Lee Hsien Loong, Senior Minister of Singapore (then Prime Minister) and Mr Lawrence Wong, Prime Minister of Singapore (then Minister for National Development).



Dr Leong (2nd from left) with staff at the Singapore Garden Festival 2016.



Dr Leong (Left) with Mr Kenneth Er (2nd from left), Deputy Secretary (Planning), Ministry of National Development (then CEO of the National Parks Board), Mr Desmond Lee (2nd from right), Minister for National Development and Prof. Leo Tan (Right), Chairman of the Garden City Fund, at the Launch of Trees of the World 2016.



Dr Leong (Right) welcoming Dr Vivian Balakrishnan, Minister for Foreign Affairs of Singapore, at the Singapore Pavilion at the World Horticultural Exhibition (EXPO 2016) Antalya, Turkey.



Dr Leong (Standing, far left), along with participants, judges and staff, at The Wonders of Orchids event organised by Singapore Botanic Gardens in 2019.



Dr Leong (Left) with Prof. Leo Tan (2nd from left), Chairman of the Garden City Fund, Mr Leslie Tan (2nd from right), a supporter of the Gardens and Dr Tan Puay Yok (Right), Group Director, Singapore Botanic Gardens at the unveiling of the *Biji Sayang* sculpture at Gallop Extension.



Dr Leong (Right) with Dr Kiat Tan (Left), Advisor to National Parks Board and Gardens by the Bay, and Ms Eri Imose (Centre), Managing Director, WIN Landscape Planning & Design, at the Asia Pacific Orchid Conference 2023.

A Botanical Odyssey: An exhibition at the Botanical Art Gallery

In 1768, Captain James Cook embarked on the HMS Endeavour from Plymouth, commencing his first world circumnavigation voyage, which lasted nearly three years. The official objective was to observe the Transit of Venus from Pacific islands, a rare event crucial for calculating distances within the solar system. However, the expedition was also tasked with a covert mission to search for a hypothetical southern continent, *Terra Australis Incognita*, although none was found. While the Venus Transit data proved inaccurate, the expedition yielded highly significant natural history discoveries.

Accompanying Cook was Joseph Banks, a wealthy and daring traveller, along with his team, including naturalist artist Sydney Parkinson, landscape artist Alexander Buchan, and Daniel Solander, a botanist trained by Carl Linnaeus. The journey, however, was not without peril. Buchan, who suffered from epilepsy, passed away shortly after reaching Tahiti, while Parkinson and several crew members perished at sea after departing from Java.

The exhibition 'A Botanical Odyssey' chronicles the voyage of the Endeavour and features a curated collection of engraved illustrations of plants

from Madeira, Rio de Janeiro, Tierra del Fuego, the Society Islands, New Zealand, Australia and Java.

The production of the illustrations is also characterised by a complex history. They are based on Parkinson's drawings, but the completion of these botanical illustrations only occurred in 1990 when they were published as a set of 737 prints under the title *Banks' Florilegium*. A complete set was donated to the Singapore Botanic Gardens by Mr Tan Jiew Hoe, and selected images are exhibited for the first time in the Gardens' Botanical Art Gallery. The exhibition also narrates the intricate process of publishing plant



The room which includes plants from New Zealand, Australia, and Java.

illustrations from the voyage and features a variety of artefacts related to botanical exploration.

The Journey

The Endeavour set sail from Plymouth dockyard on 26 August 1768 and arrived at Madeira, a Portuguese island in the Atlantic Ocean, after three weeks at sea. The botanical artist onboard the Endeavour, Sydney Parkinson, described Madeira as “cultivated to the very tops of the mountains; and, being covered with vines, citrons, oranges, and many other fine fruit-trees, it appears like one wide, extended, beautiful garden”. Before continuing the voyage across the Atlantic Ocean to Brazil, the crew replenished their supplies, including three thousand gallons of wine.

Eight weeks after departing from Plymouth, the Endeavour reached Rio de Janeiro. The Portuguese Governor, acting on orders from the King of Portugal, refused to allow the crew to land, fearing that the vessel was part of the Royal Navy.



The room which includes plants from Maderia to Society Islands. The central showcase features images demonstrating the complex production of the *Banks' Florilegium*, from the original sketches by Sydney Parkinson from the 1700s to the modern printing (1980–1990).



Expedition teams rarely included artists, especially botanical artists. The *Endeavour* voyage stands out for its complexity, scientific achievements, and for including naturalist artist Sydney Parkinson and landscape artist Alexander Buchan. The exhibition features books by botanists such as Joseph Dalton Hooker and Odoardo Beccari, who had to do their own sketches of plants during their botanical travels.

Despite this, Banks and his team secretly went ashore multiple times, gathering many plants, including some interesting ones found among the ship's livestock fodder.

While many of the collections from Madeira consisted of plants already classified by Swedish botanist Carl Linnaeus, the specimens from Brazil and beyond included numerous species previously unknown to Western botanists.

Subsequently, the Endeavour only stopped briefly at Tierra del Fuego, the southernmost tip of the American continent. Despite the mid-summer season, the weather quickly turned to heavy snow during an inland expedition, leaving Banks and his group stranded overnight. Two of Banks' servants perished, while Buchan began experiencing epileptic fits. A great quantity of plants previously unknown to the Western scientific world were collected.

After rounding Cape Horn on 21 January 1769, the ship set sail for Tahiti, arriving after nearly three months at sea. There,

Buchan died, likely due to epilepsy, leaving Parkinson as the sole artist aboard the Endeavour.

In contrast to the challenges faced on the ship and in Tierra del Fuego, the four months spent in Tahiti and the Society Islands were both pleasant and productive. However, painting in the tropics posed significant difficulties for Parkinson. Parkinson had to adapt to outdoor painting, often contending with flies that were drawn to the paint as soon as it touched the paper. Parkinson nonetheless achieved remarkable results, creating over 100 paintings during this period.

Documenting the precise distance of Venus from the Sun was a key scientific objective of Captain Cook's voyage, as it would enable the determination of distances between celestial bodies and any two points on Earth. This observation was to be made from Tahiti on 3 June 1769. Still, the separate measurements taken by Charles Green, the official astronomer, Cook, and Solander showed more variation than anticipated and were not as conclusive or accurate as hoped. The next transit was not due until 1874.

Following this, the Endeavour sailed south in pursuit of the secret mission to discover the Southern Continent,

as theorised by geographers. Having found nothing after reaching 40° S, the Endeavour then proceeded towards New Zealand in early September.

The Endeavour anchored at Teoneroa (Poverty Bay) on 8 October 1769, in the northeast of the North Island. Cook discovered that New Zealand comprised two islands, with the strait between them named Cook Strait by Banks. The local inhabitants were formidable fighters, and efforts to establish peace failed, leading to multiple violent encounters and casualties. This, coupled with the fact that many areas had been cleared and cultivated, rendered extensive inland botanical collections unattainable.

Despite these obstacles, 44 out of 174 exploration days were spent ashore, resulting in the collection of about 360 plant species. Parkinson, tasked with botanical drawings, struggled to keep up with the steady influx of collections. Further burdened with creating topographical and figure drawings after Buchan's death, Parkinson adapted by making sketches with general features, reserving colour for critical parts. At times, he only noted down colours for later completion.

After leaving New Zealand, Cook initially planned to sail to Tasmania,

but on 19 April 1770, the Endeavour unexpectedly reached the southeastern tip of mainland Australia. Throughout May and into June, the ship sailed northward, making several landings along the coast, including a significant one at Botany Bay (part of today's Sydney), which Cook later named due to the diversity of plants observed. On the evening of 10 June, while most of the men were sleeping, the ship struck the corals of the Great Barrier Reef, causing significant damage. The river where the ship ran aground was later named the Endeavour River. A temporary repair at the Endeavour River allowed the ship to remain afloat, preventing a disaster. The botanical collections from Australia were so extensive that Parkinson could only manage partially coloured, pencil sketches.

Upon anchoring in Batavia (today's Jakarta, Indonesia) on 7 October 1770, the Endeavour underwent extensive repairs, having been badly damaged in Australia. Up to this point, Cook's rigorous emphasis on maintaining a clean ship, promoting exercise, and ensuring a healthy diet for his crew successfully prevented any sickness-related casualties. However, Batavia proved to be one of the most disease-ridden foreign cities, with malaria, dysentery, and other illnesses affecting



On 5th June 2024, the new exhibition 'A Botanical Odyssey' was officially launched at the Botanic Art Gallery in Singapore Botanic Gardens. The launch was attended by Mr Tan Jiew Hoe, exhibition donor; Mr Dimitri Desmet, exhibition lender; Ms Hwang Yu-Ning, CEO of NParks; NParks senior management, and Ms Chang Hwee Nee, CEO of National Heritage Board (NHB), as well as special guests of the Singapore Botanic Gardens. (Photo credit: Muhammad Taufiq Jumal)



Examples of some of the exhibited illustrations.

almost everyone on board, resulting in numerous fatalities.

Parkinson continued to sketch plants near Batavia, creating 72 drawings, but tragically, he never had the chance to complete any of them. Regrettably, he was among the 27 individuals who perished at sea on the Endeavour's journey back to the United Kingdom via Cape Town. After Java, the Endeavour returned to England on 10 July 1771 after successfully completing its voyage.

The Banks' Florilegium

Following his return from the voyage until his death in 1820, Joseph Banks remained a prominent figure in the British scientific community. Initially, the plan was to publish the botanical findings in a series of 14 volumes, each featuring prints produced from Parkinson's more than 900 drawings and sketches, intended to be finalised by Parkinson upon his return. However, Parkinson's untimely passing led Banks and Solander to enlist a team of artists, including John Frederick Miller and his brother James, John Cleveley, and Frederick Polydore Nodder, to complete the drawings in London.

In preparation for publication, a complete set of copper printing

plates were engraved based on the watercolours. By the late 1780s, however, Banks had abandoned the idea of publication, possibly due to the exorbitant production costs, the grief following botanist Daniel Solander's death in 1782, and the realisation that many discoveries had already been published, achieving the primary goal of scientific dissemination.

Despite this, several sets of printing proofs were taken. From 1900 to 1905, a three-volume publication featuring a selection of Australian plants was lithographically printed based on the proofs. The Australian plants were considered the most significant part of the Endeavour's botanical collections.

The original copperplates remained in storage at the Natural History Museum (London) until 1963, when William Stearn had impressions taken at the Royal College of Arts to test their condition. In 1973, a limited edition set of 30 plates printed in black ink was published. Thereafter, Alecto Historical Editions attempted printing in black ink with hand colouring, which proved unsuccessful. They then employed the "à la poupée" technique, allowing colour printing by applying each individual colour using a twist of cloth (the *poupée*) to the copper plate. This successful method led to the publication of all 743 plates in colour

as Banks' *Florilegium*, published by Alecto Historical Editions.

Depending on the level of detail and number of colours needed, a print could take as little as 30 minutes to a few hours. The entire printing process took 10 years and was completed by November 1989.

Michele Rodda
Martina Yeo
Herbarium & Botanical Art Gallery

All photos by Michele Rodda, unless otherwise indicated.

For more information about the exhibition and upcoming programmes at the Botanical Art Gallery, visit <https://go.gov.sg/sbg-abotanicalodyssey>.

Exhibition details
 Venue: Level 1, Botanical Art Gallery, Gallop Extension, Singapore Botanic Gardens
 Time: Open daily*, 9 am–6 pm
 *Closed on the last Thursday of every month

A Garden of Birds: A curator's perspective



The exhibition title features iconic birds and plants of the Singapore Botanic Gardens stylised in it.

The Singapore Botanic Gardens is not only the caretaker of the botanical heritage of Singapore - it is also a haven for numerous resident and migrant birds in the island state. About 44% of all 413 bird species recorded in Singapore can be spotted in the Gardens, contributing to its status as a designated Nature Area of Singapore and a favoured spot for birding in Singapore. The birds, in turn, contribute to enriching the habitats by playing their part in the complex food webs that underpin our urban and forest ecosystems.

The current photography exhibition at the CDL Green Gallery, A Garden of Birds, is the first-ever exhibition that spotlights the diversity of avian fauna in the Singapore Botanic Gardens. In doing so, it also spotlights the meticulous work in habitat conservation, enhancement, restoration, and species recovery that is undertaken by the Gardens, and not to forget the community of bird watchers who provide vital sighting information as well as records of the activities of some of the birds and duration that they have spent at the Gardens. These efforts go hand in hand in making the Singapore Botanic Gardens, A Garden of Birds.



The Singapore Botanic Gardens is one of the favoured birding hotspots in Singapore.

In fact, the exhibition is a community exhibition. Earlier this year, an open call was made to the residents of Singapore, inviting them to send in photographs of birds that are sighted in the Singapore Botanic Gardens. As a result of that, we received 832 photographic entries. The exhibition displays more than 160 of those photographs, clicked by 49 photographers. These were shortlisted by our esteemed panel of judges – Mr Wong Tuah Wah, Dr Chua Ee Kiam and Mr Lee Tiah Kee, renowned birders and photographers in the birding community. The exhibition also features never heard before interviews from the Gardens' staff – their dedication to their work and passion is palpable through the audio boxes located at convenient spots in the gallery.

Another community aspect of the exhibition is Garden Bird Watch, a citizen science initiative led by the National Parks Board to get residents of Singapore involved in collecting valuable



A visitor listening to the interview of the Garden's staff via the audio box.



This section of the exhibition features photographs of birds that are tracked as part of the Garden Bird Watch.

information about birds in our parks, gardens, and nature reserves. Each year, Garden Bird Watch runs for nine days in April and November, with training sessions scheduled beforehand in March and October. Volunteers are trained to look out for 34 common bird species found in Singapore (and four additional migratory species during the migratory season in November). Visitors to the exhibition will be treated to photographs of some species tracked in Garden Bird Watch and interesting anecdotes from our long-term volunteer. In addition, they can even sign up as volunteers for themselves by just scanning a QR code.

This section of the exhibition features photographs of birds that are tracked

as part of the Garden Bird Watch.

To make the exhibition experience immersive, bird calls recorded by Dr Yong Ding Li (Birdlife International Asia) play as background score. Ms Wei Wei Hove's botanical illustrations of plants growing within the Gardens that are useful to birds for food and shelter and a calming pastel colour palette are used on the exhibition panels. The carpet at the entrance is brown, and now muddy with visitors' footprints, giving the exhibition a true-garden feel!

When you enter the gallery, you will notice that some bird photographs have been mounted at low heights on the walls—this is done on purpose

for the viewing pleasure of our tiny visitors who come as school groups or as families. Interactive tablets pre-loaded with educational materials and pop quizzes invite visitors to try their bird-IQ while a video reminds them of bird-etiquette.

This exhibition wouldn't have been possible without generous support from City Developments Limited (CDL), our Garden City Fund (GCF) donor and sponsor of Singapore's first net zero gallery. An important resource in putting together the material for the exhibition has been the Singapore Botanic Gardens' Library of Botany and Horticulture, with nearly 300 books on the birds of



Digital interactives at the exhibition are a great attraction for the young and old alike.



The exhibition on display at People's Gallery Exhibition Spaces at all Garden gates.

Singapore and wider Southeast Asia in the collection. More importantly, it houses archival material that traces the history of avian conservation in the Gardens right back to its first Director, Henry Nicholas Ridley. For more of that story, you will need to go to the back cover of this issue!

For now, I hope you will be persuaded to step into A Garden of Birds – Community Photography Exhibition of the Birds of the Singapore Botanic Gardens, exhibiting at CDL Green Gallery

and People's Gallery Exhibition Spaces from 7 May–31 October 2024.

Ratika Shah Singh
Events & Exhibition

Source of all photos from the Singapore Botanic Gardens.



Ms Hwang Yu-Ning, CEO of the National Parks Board, delivering the opening remarks at the launch event of the exhibition on 6 May 2024.



A photographer getting himself clicked beside his exhibited photograph at the launch of the exhibition on 6 May 2024.

Coming home to the Gardens



Director's House, 1955; *Tembusu* tree in left foreground.



On the verandah of Director's House with parents, 1957.

On 27th March 2024, I had the good fortune to return to the Singapore Botanic Gardens, where I had spent the most magical days of my childhood. My father, John William Purseglove, was the Director of the Singapore Botanic Gardens between 1954 and 1957.

Everyone at the Gardens made me hugely welcome and the highlight for me was a visit to the Director's house, now Burkill Hall, where I used to live.

I can never forget my family's arrival there 70 years ago. When we first came to the great house it rained for a week. My parents and I perched in its unfamiliar shadows, which smelt of bats and tropical damp. Only one room was free from leaks. Fungus and the fingers of fern sprouted on steps and windowsills, as if seeping out of the very seams of the neglected building. Outside the storm fell upon the garden and the surrounding city. The sky flashed green and heart-stopping thunderclaps sent flocks of parrots screaming from the wind-lashed bamboos. Veils of warm rain, humming as they came, swarmed across



Chelsea Flower Show in May 1957; Dr Eric Holttum (Right) and Mrs Phyl Purseglove (2nd from right) with RHS Committee members.

the garden, consuming and dissolving everything they overtook. So, unlike the timid patter of English rain, the downpour epitomised everything about this awesome place. It was absolute and immense.

After the rain finally stopped, we began to notice that we were sharing our home with a large company of fellow tenants and visitors. The most obvious were the monkeys, which certainly seemed to regard us as rival occupants. They entered the house, stole the food, jumped on the dog and were only driven off by the catapults of our cook's six children. Our other companions belonged to the hours of darkness. At dusk, the flying foxes, most satanic-looking of the bat-tribe, would gather in chattering hordes to roost in the great *Tembusu* tree. As the lights came on it was the turn of the stag beetles and geckos, which fought life and death battles in the suspended translucent bowls of the light shades, casting vast puppet-like shadows across

the ceiling. Later still there was the occasional appearance of an eight-foot python, which, after regular raids on the chicken run, was finally smoked out of its hollow tree and stuffed for the benefit of the Singapore Natural History Museum. At dead of night there was the inevitable ghost, whose footsteps echoed on the dark stairs, where pierced ceramic air vents, which seemed to me like swirling oriental dragons, opened their eyes and mouths to the tropical night. The ghost's identity was canvassed among a number of claimants, including a servant, who had hanged himself on the back verandah, and James Murton, an early director, who, on rather slender evidence, was said to have been unhinged and to having taken pot shots at the servants. However the favourite candidate was and remains a Victorian lady, whose continued presence was firmly attested to me by the night watchman when I previously visited in 2001.

But by far the most entrenched and all-intrusive possessors of the house were the exotic orchids. On the stairs, in the bathroom, lined up in serried ranks around the building, these unnatural looking pot plants, their rigid fanlike growth tied to a cane and mulched with charcoal, were the true spirits of the place. Their sinister glamour was not enhanced by the whiff of dilute urine, with which they were watered as a primitive substitute for liquid fertiliser. My mother firmly announced that they had to go, or she would. This was the origin of the first Orchid Enclosure since my father obediently exiled them to the bottom of the hill as a visitor attraction.

So what has survived unchanged from those distant days? The great house of course, right down to the miraculously intact ceiling lamps and that atmospheric eternal hiss of cicadas through the hot tropical day. The immediate setting of the house seems to me much improved. Expansive

lawns and a failed attempt at an English herbaceous border have given way to a much more luxuriant and appropriate throng of palms and other trees, crowding up to the high verandahs. The effect of the old colonial building is now of a great white birdcage at the bottom of a glowing green sea.

Most obviously the orchids have triumphantly come back into their own since Burkill Hall is now the centerpiece of what is arguably the finest orchid garden in the world. Another improvement is the departure of those pesky monkeys, but the monkey-eating eagle, which used to nest on the highest trees of the central nature reserve, is sadly no longer heard of. I suppose he is now denied his regular diet. A welcome addition are the jungle fowl, which I am sure were not there in my childhood since I remember seeing them for the first time on holiday in Malaysia.



Jeremy Purseglove on the verandah of Burkill Hall, March 2024.
(Photo credit: Tim Utteridge)



John William Purseglove and Malay plant collector Sidek bin Kiah, Sarawak, 1957.

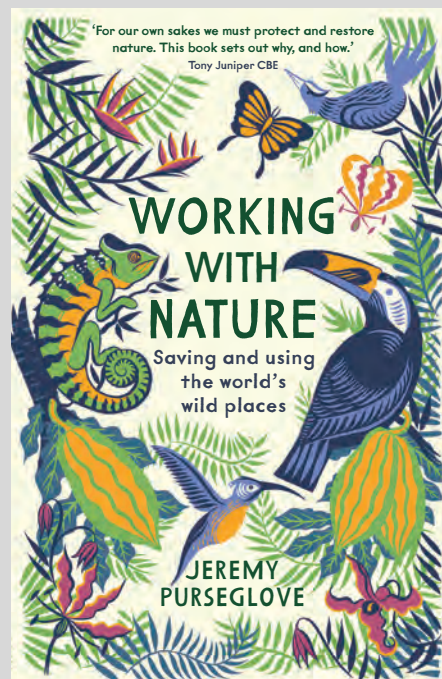
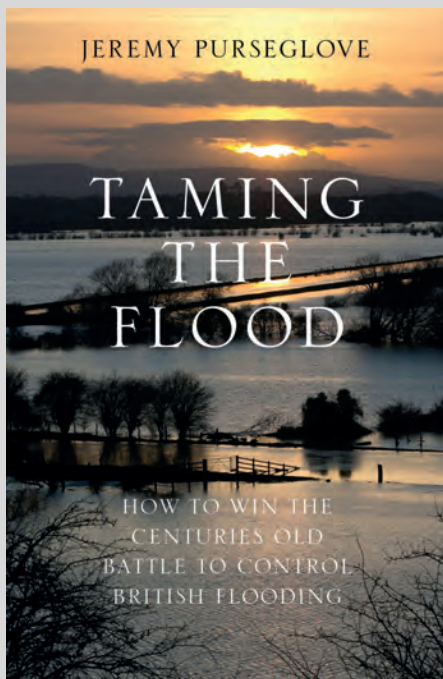
And the best thing? For me, undoubtedly the recently rebuilt and re-equipped Herbarium with its teams of botanists and other experts. My father used to say that the core of a Botanic Gardens was its scientific endeavour. Without that, it would simply relapse into a pleasure park. Through my lifetime and earlier, such a fate has surely always been a possibility. Less than ten years before my family arrived in Singapore, Eric Holttum stood on the steps of the old herbarium to defend its precious botanical archive from being thrown on a bonfire by liberating Australian troops intent on tidying the whole place up. Since then, the budgets and the political will have held and Singapore Botanic Gardens, now also a World Heritage Site, must be the best Centre of Excellence of its kind in the tropics.

Jeremy Purseglove

All photos courtesy of the author, unless otherwise indicated.



Jeremy Purseglove (Centre) accompanied by Dr Michele Rodda (Left), Senior Researcher of the Singapore Herbarium and Curator of the Botanical Art Gallery; Ms Whang Lay Keng (2nd from left), Curator of the National Orchid Garden; Dr Jana Leong-Skornickova (2nd from right), Keeper and Principal Researcher of the Singapore Herbarium; and Dr Tim Utteridge (Right), Director of Research & Conservation of the Singapore Botanic Gardens, on his visit to the Gardens. (Photo credit: Michele Rodda)



Jeremy Purseglove (*1949) is a landscape architect and a passionate environmentalist of British origin who specialises in the water industry and pioneering nature-based solutions. He is published author of two books. *Taming the Flood*, first published in 1988 and most recently updated in 2017, advocates an integrated approach to river, wetland and flood management. It was also presented as a part of a TV series in the UK. His most recent book published in 2020, *Working with Nature*, makes the case for conserving and using natural landscapes and includes a chapter on Singapore and Southeast Asia. Born in Africa and growing up in Singapore, Trinidad and the UK, Jeremy spent four unforgettable years in Singapore during his early childhood when his father, John William Purseglove, served as the Director of Singapore Botanic Gardens between 1954 and 1957. In March 2024, the Singapore Botanic Gardens had the pleasure of welcoming Jeremy to visit his childhood home in Burkill Hall and show him around the gardens.

Growing edible flowers in the Tropics (Part 2): Climbers

Climbing plants produce long, trailing stems that require a vertical structure to grow on where their aerial parts reach towards sunlight to carry out photosynthesis. As a result, there is a tendency for the growth of these plants to 'bunch up' at the top of the structure. With time, leaves found near the base of the plant, either due to shade or simply their limited lifespan, will be shed, revealing their bare stems.

In the garden, ornamental climbing plants are often used to adorn archways to provide a colourful entrance to the space. They can be grown on trellises, which can double up as shaded seating areas. Others are grown on various structures to provide differences in form and height in flowerbeds. Climbers can also cover up bare walls, fences and rooftops. Often, there is a need to train, tidy and prune the 'vines', referring to the long stems of these plants, to keep their growth tidy and prevent them from encroaching on nearby areas.

Climbers can be categorised based on their growing habits. Some plants twine their stems around vertical supports, while others produce specialised organs, such as hooks or thorns, tendrils, stem roots or sticky pads to anchor and support vining stems. Twining and tendril-producing climbers are the two main groups of climbing plants commonly encountered in the garden. In cultivation, gardeners would use materials such as bamboo sticks, strings, cables, netting and meshes to construct a frame or structure to support their climbing plants.

A small selection of species produces aerial roots that grow onto moist, porous surfaces. Hence, they can be used to grow on walls, wooden poles and stakes, and even on the trunks of trees and palms!

There are also plants that produce hooks or thorns on their long stems, which help them latch onto surrounding supports as they grow.

It is important to take note of where such plants are grown to ensure that they are not grown near areas with high human traffic. Thorns and hooks can be sharp and pose a hazard.

In Singapore, various climbing plants that produce edible flowers can be grown. All of them will add colour to the landscape. Some plants produce flowers that emit a fragrance. Depending on the species, some also produce nectar that will attract pollinators to the garden. They can also play an educational role, where visitors can learn about the unique climbing habits of each plant and the appropriate structure that the gardener constructs to suit its growth. Note that the plants introduced in this article are best grown in a location with direct sunlight and moisture-retentive, well-draining growing media.

Blue Pea

The Blue Pea (*Clitoria ternatea*) needs little introduction as it is widely grown in local gardens. It belongs to a group of plants known as legumes and is usually grown from seed and matures into a twining vine. Although several floral colour cultivars are available, the blue-flowered version is more widely grown, mainly for its vividly coloured dye. Besides colour cultivars, single- and double-petalled cultivars exist. Fresh or dried petals are steeped in water to extract the blue dye and used for food and beverage colouring. The dye is sensitive to changes in pH and changes from blue to pink in an acidic environment. Check out what happens when you add lime juice to a Blue Pea beverage!



Coral Vine

The Coral Vine (*Antigonon leptopus*) is a common ornamental vine in Singapore that produces bright pink flowers. A white-flowered version is sometimes seen. The flowers of this plant are rich in nectar, and it is an excellent bee-attracting plant species. This vine grows as a perennial and is rather drought-tolerant when established. It climbs via tendrils arising from the tip of the inflorescence. Various parts of the plant are reported to be edible, such as its underground tubers, young shoots, flowers and fruits. Flowers are readily prepared by dipping them in batter and deep-frying them or adding raw into salads to punctuate that bowl of greens with some pink colour.



(Photo credit: Joan Hung)

Dragon Fruit

In Singapore, three types of Dragon Fruit can be encountered for sale in local markets based on differences in skin and flesh colour. Belonging to the genus *Selenicereus*, the plants that bear these delicious fruits are epiphytic and have a scandent growth habit. Their fleshy stems produce aerial roots that grow into walls and wooden surfaces. As the plant can grow quite large and heavy with time, it is vital to ensure the support used to grow this plant is durable and sturdy. Flowers of the Dragon Fruit are large, showy and scented. They bloom at night and are pollinated by moths and bats. Opened flowers and flower buds are edible, and in their fresh form, they are highly perishable. The floral parts have a mucilaginous texture and can be prepared by stir-frying with meat or mixed in with other leafy vegetables. The floral material can also be dried for long-term storage. In addition, Dragon Fruit flowers can be steeped in hot water to yield a unique floral tea.

Hyacinth Bean

The Hyacinth Bean (*Lablab purpureus*) is a twining plant of the legume or bean family. Young pods and flowers are known to be harvested for consumption. While mature seeds are also edible, they must be cooked thoroughly before consumption as mature seeds contain trypsin inhibitors and cyanogenic glucosides. Cultivars known to be daylength-sensitive (photoperiod) exist, so make sure you select daylength neutral varieties to grow in Singapore to ensure they will produce flowers and fruits here. Watch out for the highly ornamental variety that produces red flowers and fruits for your garden. The flowers are edible and can be added to brighten up your salad bowl, and the inflorescences with flowers and fruits can be used as cut flowers for floriculture display.



Japanese Honeysuckle

Another perennial twining vine, the Japanese Honeysuckle (*Lonicera japonica*), is known as the “Gold and Silver flower” in Chinese. It produces highly scented white flowers when they open but gradually turn to yellow before fading. Dried flowers are available for sale in local Chinese medicine shops, and a simple herbal tea can be made by steeping the dried flowers in hot water for several minutes. Japanese Honeysuckle tea is valued for its anti-bacterial and anti-inflammatory properties and helps to rid the body of heat and toxins. This vine is ideal for growing in the medicinal or beverage corner of a garden.



Moon Flower

The Moon Flower (*Ipomoea alba*) is an annual, twining vine that is grown from seeds. A relative of the common morning glory with a twist, this plant produces large, white-coloured, trumpet-shaped blossoms that bloom in the evening. The flowers are scented and attract night pollinators such as moths. The flower buds are harvested and eaten as a vegetable. Interestingly, the immature, developing fruits of this plant are also eaten. They are typified with swollen pedicels that are reddish purple and are also referred to as ‘Purple Clove Beans’. Fruits can be stir-fried for consumption.

Pumpkin

Pumpkin (*Curcubita moschata*) is a fruited vegetable vine commonly grown in edible gardens. It grows as an annual and climbs via tendrils produced along the stem. The bright yellow flowers attract bees to the garden. Female pumpkin flowers have ovaries that resemble a miniature pumpkin fruit behind the whorl of petals and, when pollinated, turn into the large fruits seen in markets. As pumpkins are well-known to produce numerous “useless” male flowers, they can be put to good use by harvesting them for consumption. You can use them to make either sauteed or deep-fried stuffed pumpkin flowers. Do watch out for and select cultivars that are suited for Singapore’s tropical climate. These are often called ‘tropical pumpkins’ and will be more disease-resistant and less problematic to grow here.





Rose

Roses are generally plants from the genus *Rosa* and are well-known ornamental plants admired for their attractive blossoms that come in a wide range of sizes and colours. While many cultivars are scented, some can be scentless. Roses can generally be classified horticulturally based on their growth habits. Sadly, roses can be challenging to grow and maintain in tropical climates such as Singapore. The most reliable cultivar for growing in the tropics is 'Maggie', often called the 'Kampong Rose'. It is heat-tolerant and has a rather floriferous flowering habit. It is believed to be a type of Bourbon rose that is pest and disease resistant. Although 'Maggie' is not exactly a climbing rose, it tends to develop long trailing stems when left untended, so it can be trained to become a pillar rose to grow on a column. Note that rose plants can be infested by thrips and spider mites during hot weather and bothered by fungal and bacterial diseases during the wet season. Organic pest management methods will be necessary, especially if the flowers are harvested for culinary purposes.



Tonkin Climber

Another twining perennial vine that is much loved by older adults or pioneer generation here is the Tonkin Climber (*Telosma cordata*), which is affectionately called the *Yèlái xiāng* (夜来香). It translates directly to 'Night Scented Flower' from Chinese, referring to its floral scent that is more evident at night. This plant belongs to the Frangipani family (Apocynaceae) and produces hanging clusters of scented flowers. The flowers are often hidden in the dense canopy of leaves. Flower buds and opened flowers are edible, and a common way to prepare them is to mix them with egg

and fry them to make an omelette. Fragrant Tonkin Climber oil is used medicinally in traditional medicine to treat conjunctivitis.

Wilson Wong

Jurong Lake Gardens

Horticulture & Community

All photos by Wilson Wong, unless otherwise indicated.

Ethel Maud Morrison Burkill: Fungi in art and science

In today's world, molecular-based studies utilising DNA sequencing have become crucial for preliminary fungal identification. In the past, descriptions in protologues (where new organisms are described) needed to be more varied to distinguish between similar-looking species. This was especially true during a time when macrofungi and its diversity were less understood in many parts of the world.

Ethel's watercolour illustrations have proven extremely important as specimen vouchers from the past contained minimal information on their labels. Nowadays, every fungal collection must be fully photo-documented; otherwise, they will not be admitted as vouchers at the Singapore Herbarium (SING). Colours in mycology play a far more significant role in fungal identification than in plants. In certain groups of fungi, there are very few morphological characters (both micro and macro) to distinguish distinct species, making every bit of colour detail crucial until the species is fully known scientifically.

Specimens collected in the past are not suitable for DNA sequencing. High humidity over decades in the tropics, especially before the advent of air conditioning, caused fungal specimens to rehydrate after drying, leading to secondary moulding. Ethel's paintings, therefore, capture in time a moment of life when these species were first recorded in Singapore, serving as proof of their presence.

Most of Ethel's paintings were sent to the Royal Botanic Gardens Kew for identification. In 1912, George Edward Masee stated in *Fungi Exotici XIV*, "The following new species of Indian fungi have been sent to Kew by Mr Burkill from Calcutta. The specimens were very well-preserved and accompanied by coloured drawings by Mrs Burkill and notes, so it has been possible to draw up descriptions under particularly favourable conditions." In *Fungi Exotici XVII* published in 1914, Masee noted, "All the specimens

described were collected by Mrs Burkill at the Botanic Gardens, Singapore, and were accompanied by coloured drawings and notes prepared by the collector. The genus *Boletus* appears to be especially well-represented, new species have already been described from the Singapore Gardens, and there is evidence of more, which will be dealt with when better material is available." Among the newly described species by Masee, *Annularia burkilliae* Masee and *Entoloma burkilliae* Masee were named in her honour. Later, in Thomas Ford Chipp's *A List of the Fungi of the Malay Peninsula* published in 1921, about 54 of Ethel's vouchers, including illustrations, are cited.

Ethel Maud Morrison was born in 1874 in Wakefield, Yorkshire, England, and attended the Cheltenham Ladies' College, which still exists today.



Ethel M.M. Burkill taken around the age of 30. (Courtesy of Humphrey M. Burkill)

Little is known about her life before she married her first cousin Isaac H. Burkill in 1910. Four years later, at the age of 40, their son Humphrey M. Burkill was born. Ethel resided in Singapore from 1912–1925, during the period when Isaac Burkill was Director of the Singapore Botanic Gardens, Straits Settlements (see *Gardenwise* 23, pages 16–19).

When Humphrey was four, he was sent to Yorkshire, UK, away from his parents, as was the tradition of the colonial past to keep children away from the tropics. During her time in Singapore, her chief interest was collecting and painting fungi until Humphrey came along. After Humphrey went to the UK in 1918, her focus likely shifted to assisting her husband with his *magnum opus*, *A Dictionary of the Economic*

Products of the Malay Peninsula, as no further collections of fungi were made after that. Of the 262 fungal specimens in SING made by Ethel, one accession each from 1912, 1915, and 1919, 225 accessions from 1913, and 34 accessions from 1914. Other collections in her name included 73 plants, four mosses, and two ferns, most of which were collected between 1920 and 1924.

In Issac Burkill's acknowledgements published in *A Dictionary of the Economic Products of the Malay Peninsula*, he acknowledges, "My wife has given me constant and most generous help in numerous ways from the beginning to the end of my work." This might explain the punctuated

stop of Ethel's fungal contributions as she was occupied with preparing the typescript for her husband's manuscript and deciphering his poor handwriting (as recounted by Humphrey Burkill). Issac's book also includes many fungal names, edibility, and uses, possibly influenced by Ethel or perhaps sparking her initial interest, as he made 207 fungal collections to his name at SING.

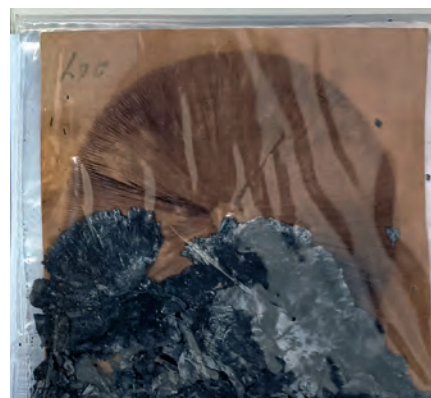
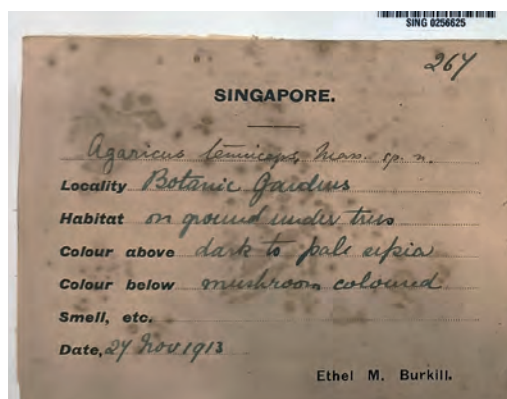
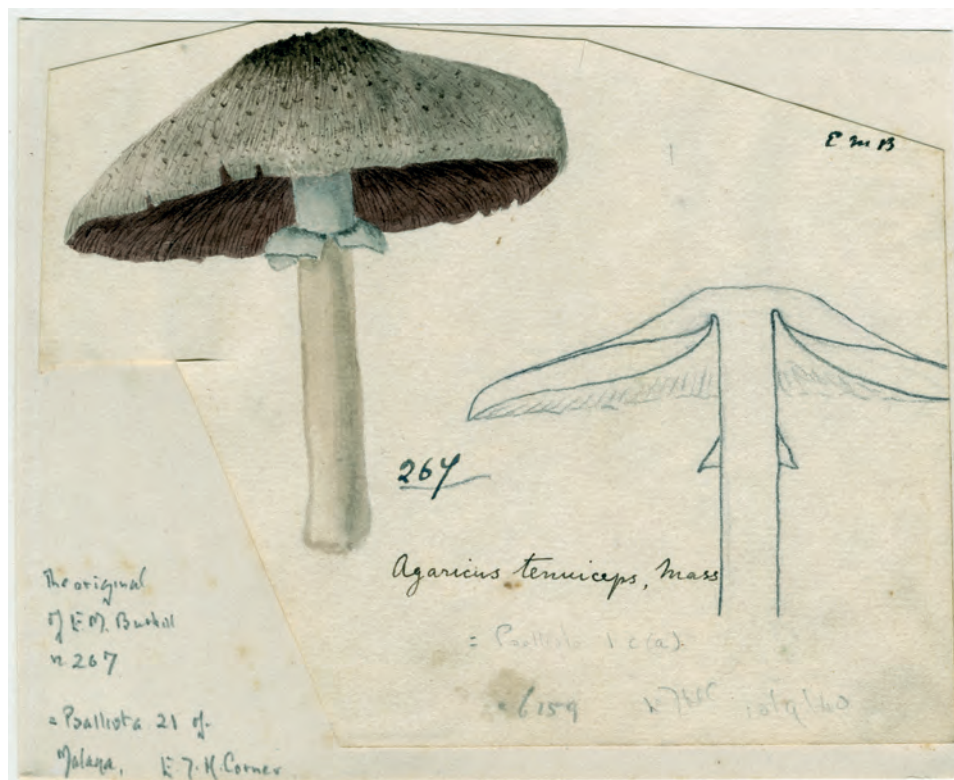
While researching for this article, it was discovered that many of Ethel's specimens, although identified, described or cited, remain in the unidentified *Agricaceae* boxes and are, in fact, Types collections! If you are reading this and wish to help with the curation of Ethel's fungal

collections, please do get in touch with me. We need these specimens located, cross-referenced with journals, her illustrations printed out and attached to the specimens, and then filed under the current accepted names.

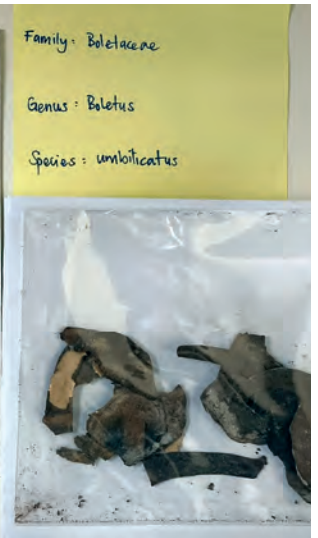
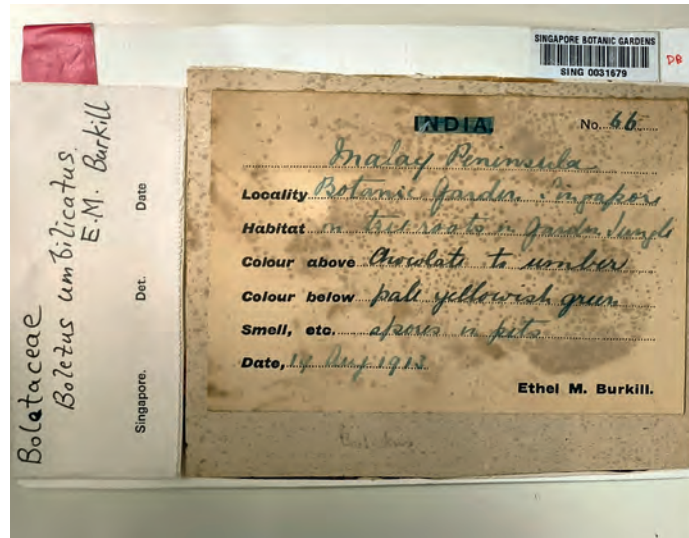
Not all of Ethel's drawings are in Singapore (see *Gardenwise* 22, page 28). This is crucial as pictures or illustrations truly convey more than a thousand words!

Serena Lee
Herbarium

All photos by Serena Lee, unless otherwise indicated.



An example of an Ethel M. Burkill (EMB) collection with both illustration (Left) and voucher (Right). The voucher is EMB267, a type specimen of *Agaricus tenuiceps* Masee and currently accepted as *Megacollybia platyphylla*. You can tell from the illustration that E.J.H. Corner had examined it and determined it as a *Psalliota* sp. (Photo credit: (Right) Bazilah Ibrahim)



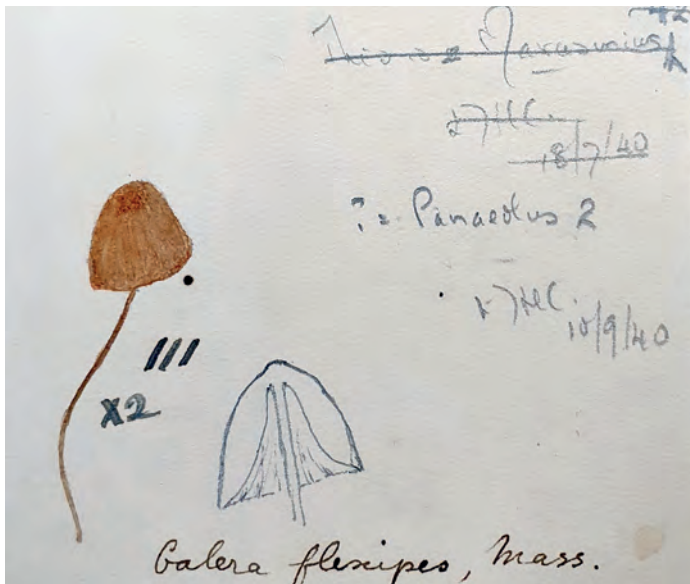
Another example of a collection with both illustration (Top left) and voucher (Top right). This taxon has a confusing history, in that Massee named it *Boletus umbilicatus* Massee in 1909 (citing a Ridley specimen) and again as *Boletus indecorus* Massee citing EMB66 in 1914. Later, E.J.H. Corner re-illustrated *Boletus umbilicatus* in his 1972 account *Boletus in Malaysia* (Bottom left) and cited EMB147 instead as the type specimen of *B. indecorus*, which the Singapore Herbarium also have a specimen but not the illustration. The accepted name of this taxon now is *Hemileccinum indecorum* (Massee) G.Wu & Zhu L. Yang. A recent collection of *Hemileccinum indecorum* (SL2138) from Singapore (Bottom right). (Photo credits: (Top right) Bazilah Ibrahim; (Bottom right) Lim Yi He)



Painting of *Annularia burkillae* Massee from India (EMB6, without voucher).



Painting of *Entoloma umbonatum* Massee (a type collection represented by an illustration for a taxon) from Singapore (EMB61, without voucher).



Painting of *Galera flexipes* Massee (a type collection represented by an illustration for a taxon) from Singapore (EMB111, with voucher present in the Singapore Herbarium (SING)).



Painting of *Marasmius aratus* Massee from Singapore (EMB113, without voucher).



Painting of *Collybia altissima* Massee (a type collection represented by an illustration for a taxon) from Singapore (EMB112, without voucher). The accepted name of this taxon now is *Hymenopellis altissima* (Massee) R.H. Petersen.

Orchid and Bryophytes Conservation Workshop at the Dr Cecilia Koo Botanic Conservation Center, Taiwan

In February 2024, we participated in a nine-day workshop held at the Dr Cecilia Koo Botanic Conservation Center (KBCC) in Taiwan on the conservation of orchids and bryophytes. This special programme was developed in partnership with Botanic Gardens Conservation International (BGCI) – Southeast Asia Botanic Gardens (SEABG) Network and the 2024 World Orchid Conference (WOC) and attended by some 20 participants from

various botanical institutions across Southeast Asia. It was most appropriate for KBCC to host this training programme as it currently houses the largest *ex-situ* living collection of bryophytes and orchids, with 666 and 9579 species in cultivation, respectively. More importantly, the institute has dedicated much effort and resources towards conserving these two plant groups, particularly those native to Taiwan.



Four species of native orchids on Lanyu (Orchid Island) chosen for conservation: *Dendrobium goldschmidtianum* (Top left), *Bletilla formosana* f. *kotoensis* (Top right), *Tuberolabium kotoense* (Bottom left), and *Vanda lamellata* (Bottom right). (Courtesy of the Dr Cecilia Koo Botanic Conservation Centre)



Examples of bryophytes in cultivation at the Dr Cecilia Koo Botanic Conservation Centre. (Photo credit: Ho Boon Chuan)



Mr Chen Chun Ming, Senior Collection Manager of Dr Cecilia Koo Botanic Conservation Centre sharing his knowledge on *ex-situ* orchid conservation (Left); Mr Chen briefing participants on the management of the Dr Cecilia Koo Botanic Conservation Centre living collections and the greenhouse facilities (Right). (Courtesy of the Dr Cecilia Koo Botanic Conservation Centre)

During the workshop, we were kept abreast of the latest research relevant to the biology and conservation of these two plant groups, such as advancements in cryopreservation and micropropagation methods, as well as the interactions between symbiotic fungi with orchids or with bryophytes. After that, we also had the opportunity to apply what we had learnt in theory from earlier lectures to practice via various hands-on sessions that covered topics such as the planting and cryopreservation of bryophytes to the maintenance of living collections and greenhouse facilities.



Lecture on cryopreservation of plants conducted by Dr Greetha Arumugam, Botanic Gardens Conservation International (BGCI) Southeast Asia Botanic Gardens (SEABG) Network Coordinator. (Photo credit: Dr Supaporn Rodpradit, Queen Sirikit Botanic Garden)



Ms Cheng Ken-yu from the Dr Cecilia Koo Botanic Conservation Centre showing participants how to prepare plant materials for cryopreservation (Top left); Ms Cheng demonstrating how to transfer plant materials into cryogenic tubes (Bottom left); Ms Cheng showing how to store plant materials in a liquid nitrogen tank (Right).
(Courtesy of the Dr Cecilia Koo Botanic Conservation Centre)

Ms Cheng Ken-yu guiding participants on how to create moss-balls for the planting of orchids and bryophytes.
(Photo credit: Koh Teng Seah)



The staff of Chi Yueh Enterprise Ltd. performing subculturing of *Phalaenopsis* orchid cultures in the transfer room. (Photo credit: Koh Teng Seah)

To further augment the learning experience, we were also given a guided tour to a commercial *Phalaenopsis* orchid production facility, where we learnt about the latest methods adopted by the

industry that are also relevant to the micropropagation of orchid species for conservation purposes. In 2018, KBCC started collaborating with the orchid industry to carry out the micropropagation of orchid species,

with 56 species being propagated successfully thus far. These plants are channelled to *ex-situ* conservation programmes and are also used to educate the public on the importance of such efforts.

We were also taken on a guided walk via the Jing Shui Ying Historic Trail, a subtropical forested site, to observe how plants, especially bryophytes, grow in their natural habitat. This exercise is extremely useful, as it helps us better understand how to create conditions necessary for optimal plant growth in

artificial settings such as greenhouses. This field trip was undoubtedly one of the most enjoyable aspects of the workshop, as we learned about the growing conditions of bryophytes while surrounded by nature. The training program culminated with a visit to the 23rd World Orchid

Conference 2024 (WOC) and the 20th Taiwan International Orchid Show (TIOS), which allowed us to experience the incredible diversity of orchid species, hybrids and cultivars and to immerse ourselves in the stunning and breath-taking displays.



Notoscythus lutescens, a bryophyte, spotted along the Jing Shui Ying Historic Trail. (Photo credit: Ho Boon Chuan)



Participants from the workshop ready for the guided walk along Jing Shui Ying Historic Trail (Top); A fallen branch cloaked with a luxuriant bryophyte layer (Bottom left); A developing inflorescence of *Monotropa uniflora*, an obligate parasite from the Rhododendron family (Ericaceae) that leeches nutrients from mycorrhizal fungi of tree species nearby (Bottom right). (Courtesy of the Dr Cecilia Koo Botanic Conservation Centre)



This fiery, red-hot orchid display was one of the most eye-catching exhibits in the Taiwan International Orchid Show (TIOS) 2024 - aptly named the 'City of the Phoenix', the exhibit features a phoenix with wings widespread, guarding the historic city of Tainan while bringing peace and prosperity to her. (Photo credit: Ho Boon Chuan)

Through the workshop, we gained extensive technical and scientific knowledge on bryophytes and orchids. More importantly, we also took the opportunity to forge new ties while strengthening prior connections. Through this network, we hope to generate more research collaborations and facilitate plant exchanges with scientific and botanical institutions across the region in the near future.

Koh Teng Seah

Molecular Biology & Micropropagation

Ho Boon Chuan

Herbarium



Some of the orchid landscaping displays in the World Orchid Conference 2024 exhibition hall. (Photo credit: Ho Boon Chuan)

January–June 2024



His Excellency Dr Abiy Ahmed Ali (Centre), Prime Minister of The Federal Democratic Republic of Ethiopia, and spouse Mdm Zinash Tayachew (Second from right), with the orchid *Aranda Abiy Ahmed Zinash Tayachew* named in their honour on 5 June 2024 on the occasion of their visit to the National Orchid Garden. Dr Abiy Ahmed Ali and Mdm Zinash Tayachew were accompanied by Mr Chee Hong Tat (Second from left), Minister for Transport and Second Minister for Finance, Mrs Chee (Left), and Ms Hwang Yu-Ning (Right), CEO of the National Parks Board, Singapore. (Photo credits: National Parks Board)

His Excellency **Dr Abiy Ahmed Ali** and spouse
Prime Minister of Ethiopia

Her Excellency **Anneke Adema**
Ambassador of the Kingdom of the Netherlands to Singapore

Ms **Fai K. Aldossary**
Managing Director of ARAMCO Asia Singapore, Singapore

Dr **Henk Beentje**
Royal Botanic Gardens Kew, UK

Ms **Maitreyi Bery**
Spouse of Dr Suman Bery, NITI Aayog Vice Charman, India

Dr **Gilles Bloch**
President of the National Museum of Natural History, France

Ms **Sandra Botterell**
Director of Marketing & Commercial Enterprise, Royal Botanic Gardens Kew, UK

Mr **Richard Boyne**
Northern Territory Herbarium, Australia

Dr **Charles H. Cannon**
Morton Arboretum, USA

Ms **Claire Chandler**
Shadow Assistant Minister for Foreign Affairs, Special Advisor to Tasmanian Minister for Skills, Training and Workforce Growth, Australia

Prof. **Panom Chantaranonthai**
Khon Kaen University, Thailand

Mr **Ethan Cheah**
Forest Research Institute of Malaysia, Malaysia

Mr **Eric Chua**
Senior Parliamentary Secretary, Ministry of Culture, Community and Youth & Ministry of Social and Family Development, Singapore

Mr **Richard Deverell**,
Director of Royal Botanic Gardens Kew, UK

Mr **Dennis Flynn** OBE
CEO of Wild Planet Trust, UK

Her Excellency **Laurie Foon**
Deputy Mayor, Wellington City Council, New Zealand

His Excellency **Darius Gaidys**
Ambassador of Lithuania to Singapore

Ms **Isabelle Glais**
Director of Botanical Gardens at the National Museum of Natural History, France

His Excellency **Frank Grütter**
Ambassador of Switzerland to Singapore and Brunei

His Excellency **Samdech Moha Borvor Thipadei Hun Manet**
Prime Minister of Cambodia

Mr **Shinichiro Ito**
Miyazaki Parks Association and Authority, Japan

Asst. Prof. **Chortip Kantachote**
Ubon Rachathani University, Thailand

Dr **Amy Khor**
Senior Minister of State, Ministry of Sustainability and the Environment & Ministry of Transport, Singapore

Mr **Desmond Lee**
Minister for National Development & Minister-in-charge of Social Services Integration, Singapore

Mr **Kiat Lim**
The Peter Lim Scholarship, Singapore

Rt. Hon. **Christopher Luxon**
Prime Minister of New Zealand

Dr **Ashiho Mao**
Director of Botanical Survey of India, Kolkata, India

Ms **Hildegard Naughton**
Government Chief Whip and Minister of State with responsibility for Special Education and Inclusion, Ireland

Ms **Shiella Olimpos**
University of North Carolina Wilmington, USA

Her Excellency **Iwona Piórko**
Ambassador of the European Union to Singapore

Mr **Jeremy Purseglove**
Son of J.W. Purseglove, former Director of the Singapore Botanic Gardens (1954–1957)

Ms **Indranee Rajah**
Minister in the Prime Minister's Office, Second Minister for Finance, and Second Minister for National Development, Singapore

Mr **David Richardson**
Board of Trustees, Royal Botanic Gardens Kew, UK

Asst. Prof. **Kanokorn Ruengsawang**
Ramkhamhaeng University, Thailand

Her Excellency **Ingrida Šimonytė**
Prime Minister of Lithuania

Mr **Paulo Baleeiro Souza**
University of Queensland, Australia

Mr **Anthony Tan** and family
Group CEO of Grab

Dr **Kiat Tan**
Advisor to National Parks Board and Gardens by the Bay, Singapore

Mr **Tan Kiat How**
Senior Minister of State for Ministry of Digital Development and Information & Ministry of National Development, Singapore

Dr **Nigel Taylor**
Independent Researcher, UK

AR Riyadh Holdings & Group AMANA, Saudi Arabia

China Academy of Urban Planning & Design (CAUPD), China

Head Judges of the Singapore Garden Festival 2024

Incheon Metropolitan City, Republic of Korea

Khazanah National Berhad, Malaysia

Nusantara Botanical Garden, Indonesia

Seoul Metropolitan Government, Republic of Korea

South Korean National Heritage Centre, Republic of Korea

A Garden of Birds over the years

The earliest evidence of the Singapore Botanic Gardens being a hotspot for avian diversity comes from the writings of its first director, Henry Nicholas Ridley. In 1898, Ridley published “Birds in the Botanic Gardens, Singapore” in the *Journal of the Straits Branch of the Royal Asiatic Society*. Ridley begins his paper with a lament from the residents of Singapore, “... they never see any birds here except the one popularly called the black and white robin...”. He goes on to compare this to his own circumstances, “...Living in the Botanic Gardens with its patches of shrubbery, woods and lakes, I get an opportunity of seeing them when all is quiet, and as many rare and beautiful ones have from time to time visited the gardens...”. He went on to describe sightings, habits, and several interesting anecdotes of birds in the Gardens from his personal observations.

Fast-forward 99 years to the publication of the first issue of *Gardenwise* in November 1989. We have an article titled “Birds of the Singapore Botanic Gardens” written by Chris Hails, Asia Programme Officer, WWF (who had his office in the Gardens), with photographs by Morten Strange. Later, an article with the same title

by Morten Strange and Ng Bee Choo was published in *Gardenwise* 13 (July 1999).

It is interesting to compare the bird species mentioned in Ridley’s paper against the two articles published in *Gardenwise* as the findings in all three articles are based on the author’s visual observations of birds in the Gardens (thus comprehensive, but not limited to). Juxtaposing these with one’s observation of birds in the Gardens today can reveal another element of the story of the habitat usage and conservation work of the Gardens in the last 25 years or so.

So what are you waiting for? Head to the Singapore Botanic Gardens’ library and get a copy of Ridley’s paper and the two *Gardenwise* articles now! Then, take notes of the bird species listed and head to the Gardens for birding. Remember to bring your binoculars! The Singapore Botanic Gardens has always been and will continue to be a Garden of Birds.

Ratika Shah Singh
Events & Exhibition

