



SPEAKER 2: DR NIGEL TAYLOR

THE CHALLENGES OF WORLD HERITAGE INSCRIPTION

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Aerial View of Palm Valley, Singapore Botanic Gardens (DL8_7936)

**WORKSHOP ON
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ABSTRACT

There are now 3 botanic gardens inscribed as such on the UNESCO World Heritage List: the Orto Botanico, Padua, Italy (inscribed 1997), the Royal Botanic Gardens, Kew (2003) and the Singapore Botanic Gardens (SBG) inscribed in July last year. World Heritage sites are those that are deemed to have Outstanding Universal Value (OUV) and the road to inscription begins by determining which of the ten qualifying criteria can be applied to the site. This is a key part of the dossier to be submitted to the World Heritage Centre in Paris, which must also include a draft Site Management Plan. Evidence must be presented of the means by which the site's OUV can be preserved and this is subsequently tested by a visit from an expert appointed by ICOMOS, the body that gives advice to UNESCO for cultural sites. A Comparative Analysis of the site versus other similar properties is a particular challenge in that no one wishes to denigrate sites belonging to other nations! The process that took SBG and Singapore on the journey to the World Heritage List, 2010 to 2015, will be described and the historic assets of SBG, both tangible and intangible, will be demonstrated in this illustrated talk. The UNESCO World Heritage Convention is not well understood by the "man in the street" and some of the misconceptions that came to light on the road towards inscription will be discussed and some myths exploded. Tips for how to succeed with inscription will be offered based on the author's experience of having taken two botanic gardens on to the World Heritage List.

BIODATA

Dr Nigel Taylor has spent 39 years in botanic gardens. He came to direct the Singapore Botanic Gardens in 2011 following 34 years at London's Kew Gardens, a UNESCO World Heritage Site that he helped inscribe in 2003. A botanist by training, Dr Taylor has latterly become a garden historian while retaining a fascination with plants. He is the author of 10 books and more than 250 other publications.

CONFERENCE PAPER

The Challenges of World Heritage Inscription

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Abstract. There are now 3 botanic gardens inscribed as such on the UNESCO World Heritage List: the Orto Botanico, Padua, Italy (inscribed 1997), the Royal Botanic Gardens, Kew (2003) and the Singapore Botanic Gardens (SBG) inscribed in July last year. World Heritage sites are those that are deemed to have Outstanding Universal Value (OUV) and the road to inscription begins by determining which of the ten qualifying criteria can be applied to the site. This is a key part of the dossier to be submitted to the World Heritage Centre in Paris, which must also include a draft Site Management Plan. Evidence must be presented of the means by which the site's OUV can be preserved and this is subsequently tested by a visit from an expert appointed by ICOMOS, the body that gives advice to UNESCO for cultural sites. A Comparative Analysis of the site versus other similar properties is a particular challenge in that no one wishes to denigrate sites belonging to other nations! The process that took SBG and Singapore on the journey to the World Heritage List, 2010 to 2015, will be described and the historic assets of SBG, both tangible and intangible, will be demonstrated in this illustrated talk. The UNESCO World Heritage Convention is not well understood by the "man in the street" and some of the misconceptions that came to light on the road towards inscription will be discussed and some myths exploded. Tips for how to succeed with inscription will be offered based on the author's experience of having taken two botanic gardens on to the World Heritage List.

Introduction

Gardens, including botanic gardens, that are to be considered as candidates for inscription on the UNESCO World Heritage List, are classed as Cultural Landscapes, i.e. those representing the "combined works of nature and of man", as defined in the World Heritage Convention's *Operational Guidelines (OG)*. Thus, they are usually Cultural, as opposed to Natural or Mixed Sites, and likewise must demonstrate what the Convention calls "Outstanding Universal Value" (OUV). This is judged on the basis of 10 criteria, 6 of these relating to cultural, the remainder to natural sites. A key part of the inscription process is defining a site's OUV and the relevant criteria that support it, which need to be justified in the Nomination Document. As part and parcel of the overall Nomination Dossier a draft Site Management Plan must also be prepared, the purpose of this being to demonstrate how the identified OUV can be protected. Protection of OUV, including by statutory legislation and local management practices, is the only part of the inscription process that is assessed on site by a representative of the International Council on Monuments and Sites (ICOMOS), the expert body appointed by UNESCO to give recommendations on cultural sites to the 21-member-state World Heritage Committee. The Nomination Dossier is otherwise assessed by ICOMOS experts through a desk top evaluation, so the case has to be made very well in writing according to the prescribed format of such documents as specified in the *OG*. Besides OUV and protective measures, a further key element in the Nomination Document is a section called Comparative Analysis, a comparison of the proposed site with any similar sites around the World, whether already inscribed or not.

Thus far the inscription process may appear to be largely a matter of historic research compiled into a dossier, but in fact this represents only a part of the time that needs to be invested for a successful inscription bid. For whilst dealing with UNESCO is the province of state party governments, the Convention should be seen as something for the “man in the street”, i.e. heritage that we can all appreciate and be a part of, even if he may not have a very clear understanding of what constitutes a World Heritage Site (for example, there is the need to dispel the mistaken belief that SBG must be compared to the Egyptian pyramids or Angkor Wat). Therefore, a key thrust of any inscription bid must be public engagement and awareness-raising, both for the proposed site’s existing supporters, including the general public, and for any visiting dignitaries who may be able to influence the eventual decision through having seen the OUV with their own eyes. Such activity should not be restricted to face-to-face briefings, beneficial as these invariably are, but can also include the sharing of relevant documents on-line, educational signage within the site, touring exhibitions and creation of heritage museums etc.

Beyond successful inscription there will be an on-going need for public engagement, especially to meet the objectives of UNESCO, bearing in mind that the E in the acronym stands for Educational. Equally important is that UNESCO and its adviser, ICOMOS, will want to be reassured that the management of the site and its surroundings, including any new developments not accounted for in the documentation submitted with the Dossier, is in keeping with the protection of OUV. A best practice method of achieving this is to establish a stakeholder committee comprised of relevant governmental and non-governmental representatives with a genuine interest in the site, amongst which will be heritage experts who can hopefully endorse any proposed developments.

The Singapore Botanic Gardens UNESCO journey

Elsewhere I have previously described the Singapore Botanic Gardens’ UNESCO journey to a popular audience¹, but here we will focus on the more technical aspects of the process. This began in 2010 when Singapore’s government commissioned a consultant to examine sites for consideration as potential World Heritage (WH) bids. However, amongst those assessed only the Gardens (SBG) was at that time regarded as a strong case. Then, in 2012, the Republic signed up as a state party to the World Heritage Convention and at the close of that year submitted to the WH Centre (Paris) its Tentative List of sites it intended to propose for inscription at a future date. In fact, this List included only SBG. Earlier in the year another consultant firm with a proven track record in WH bids was appointed to prepare the Nomination Dossier. The firm in question, Chris Blandford Associates (CBA), based in the UK, had previously worked with the present author to get the Royal Botanic Gardens, Kew on to the WH List in 2003. Meanwhile, the team at SBG, assisted by local heritage experts from the National Heritage Board (NHB) and Singapore Heritage Society (SHS), researched the historic data that were needed to populate the Nomination Document. CBA prepared this document as well as a draft Management Plan, the latter including nearly 100 targets for activities that would ensure the protection and enhancement of OUV, including educational programming. This whole process was overseen by a government Steering Committee jointly chaired by the CEOs of NHB and the National Parks Board (NParks). The earliest possible submission date for the Dossier to go to UNESCO was towards the close of the year ending 1 February 2014, since 12 months must elapse between the state party’s submissions of the Tentative List and its first Nomination Dossier. Prior to the latter submission, which occurred in January 2014, we decided to invite a range of interested parties to form a Site Management Plan Stakeholder Committee and at its inaugural meeting in December 2013 unanimous

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endorsement was obtained for the draft Management Plan. This Committee has subsequently met every 6 months and will continue to oversee the progress against the Plan's targets into the foreseeable future. Such a committee is not a UNESCO requirement, but can be regarded as "best practice" and especially as a means of demonstrating to UNESCO the inclusiveness of the site's management practices by involving its varied stakeholders and experts in this consultative body.

While all of the above was on-going a comprehensive programme of public awareness-raising and community engagement kicked off in 2013, as well as consultations with a range of non-governmental interest groups and experts, such as SHS, Nature Society Singapore, Singapore Gardening Society, SBG's Volunteers, Tanglin Residents' Committee and various others. This programme included public briefings and garden tours by the Director and staff of SBG, feedback sessions both face-to-face and on-line, public access to the draft Nomination Dossier on-line and as "hard" copies deposited at SBG's principal entry gates, and much interaction with Singapore's media, via print and televisual outlets. The NHB mounted a touring exhibition about SBGs' bid during 2014, which visited schools and shopping malls after its launch at the Stamford Gallery in the National Museum in March. Thus, by the close of 2014 few Singapore residents with an interest in current affairs could have failed to be aware of the nation's first UNESCO WH bid! The feedback received was almost without exception very supportive of the bid. Besides these interactions, two other educational initiatives were launched at SBG in support of the bid: some 70 heritage interpretation signs were installed around the Gardens and in the historic Holttum Hall our Heritage Museum was opened by Prime Minister Lee in November 2013.

In parallel with this public engagement programme an equally important international awareness-raising agenda was carried out, led by the Ministries of Foreign Affairs (MFA) and Culture, Community & Youth (MCCY, including NHB). This involved activities in Singapore as well as abroad, and especially in Paris, where the World's state parties to UNESCO base their ambassadors and cultural experts. Singapore's ambassador to UNESCO, H.E. Andrew Toh and his team were key and devoted players throughout this part of the process. From late 2013 until April 2015 a seemingly un-ending stream of ambassadors and heritage experts from all of the 21-member-states of the UNESCO WH Committee were invited to Singapore for briefings and tours of SBG. However, all those on the Singaporean side were careful to avoid any activity that could be construed as "lobbying" for the bid, which is strictly frowned upon by UNESCO. Another part of this international agenda was attendance at the annual meeting of the WH Committee. This was held in Phnom Penh (Cambodia) in June 2013 and in Doha (Qatar) in June 2014. Teams from NHB and NParks attended both meetings and staged exhibitions to raise awareness of Singapore's bid amongst the thousands of delegates from the 190+ sovereign states that are parties to the Convention. A special highlight occurred at the Doha meeting in 2014, when to the Singapore delegation's delight we were allowed to name a new orchid hybrid after UNESCO in the plenary session of the meeting in front of some 1700 delegates. *Dendrobium* UNESCO caused a huge stir and whilst our Minister for Culture, Lawrence Wong, carefully avoided mention of SBG and its WH bid in his speech prior to presenting the orchid, in publicly thanking Singapore the Director General of UNESCO and Chairman of the WH Committee both noted that the orchid had come from SBG and commented favourably on their previous visits to the Gardens! Such advocacy was extremely welcome and caused considerable envy amongst other nations present at the meeting.

Another strand of the UNESCO process concerned ICOMOS, the expert advisory body to the WH Committee on Cultural Sites. Together with the International Union for the Conservation of Nature and natural resources (IUCN) and the WH Centre in Paris, these were the 3 organisations to receive copies of SBG's Nomination Dossier, sent in January 2014. Following confirmation, a month later, that the SBG Dossier was complete, ICOMOS experts reviewed the bid and subsequently appointed an expert to visit SBG in September 2014. Stuart Read, an Australian authority on historic parks and gardens, spent 3 days meeting officials from NHB, the Urban Redevelopment Authority (URA) and NParks/SBG to evaluate Singapore's ability to resource, manage and protect the proposed site and its potential OUV. A key part of his visit was meeting URA's Chief Planner in order to understand the diverse measures ensuring that SBGs' setting would not be compromised by inappropriate urban development both within and beyond the proposed Site's Buffer Zone. On the afternoon of the third day of his visit, Mr Read sat down with the SBG management team and fired off many salvos of questions regarding the site and its management, most of which we could answer on the spot, though some responses were committed to a follow-up letter as the answers were not straightforward. Meanwhile IUCN, although normally focused on Natural sites, saw reason to solicit opinion from independent botanical experts, since SBG is a remarkable refuge for plants and wildlife within the urban environment and also carries out world-leading bio-conservation work in reintroducing examples of locally extinct flora. A very supportive letter was received by IUCN and later formed part of the recommendation that went to the WH Committee. Next there came the first of two letters of enquiry from ICOMOS HQ in Paris with deadlines for our responses. Our initial response to queries relating to why the proposed boundary to the site had been chosen, since only 49 out of the 74 hectares of SBG's land was to be inscribed (the remainder as Buffer Zone), provoked a second enquiry and offer of a 4-way Skype interview with two of the ICOMOS experts in South Africa and Argentina, coordinated by their HQ in Paris. This exchange of information happened late at night in Singapore to accommodate the different time zones in which the participants were situated. It was extremely useful and one of the first times this medium had been used in conducting WH business. It gave the Singapore team clarity about what to include in the answer to the second ICOMOS letter, which focused heavily on the significance of the site in relation to the foundation of the rubber plantation industry in SE Asia. Besides this, it enabled a much more detailed Comparative Analysis (CA), in which no punches were pulled, to be made between SBG and similar historic gardens, but within the privacy of confidential correspondence. This was requested by ICOMOS, because the CA section of the Nomination Dossier had been necessarily bland to avoid causing any offence to the member states whose cherished gardens might have received unfavourable comparison in a publicly accessible document. The second letter of reply to ICOMOS ran to 11 pages and was submitted in late February 2015, beyond which the team could no longer influence future developments, as ICOMOS prepared its recommendation to the WH Committee.

That recommendation was sent in April 2015 and made public a month later, when the Singapore team could now relax a little, since ICOMOS fully supported the inscription of SBG and it was known that the WH Committee rarely if ever disagrees with a positive recommendation such as this. Then, on 4 July, the Singapore team was at the 39th meeting of the WH Committee in Bonn (Germany) to see the chairman's hammer come down in declaring SBGs' inscription on to the WH List and hear each of the 21 Committee members eulogise about the Gardens' merits.

So, what are the merits that got SBG inscribed? These can be divided into 5 aspects: OUV, Integrity, Authenticity, a favourable CA, and a proven ability to resource and protect the site. All 5

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must be demonstrated satisfactorily and failure to achieve this with any of the 5 would likely have resulted in the inscription bid being “Referred, Deferred” or “Rejected” by ICOMOS and the WH Committee. During the preparation of the Dossier it was agreed that two of the 6 OUV criteria relating to Cultural sites were applicable to SBG. These are as follows:

- **Criterion (ii)** – “*exhibit an important interchange of human values, over a span of time or within a **cultural area of the world**, on developments in architecture or **technology**, monumental arts, **town planning** or landscape design”.*
- **Criterion (iv)** – “*be an outstanding example of a type of **building**, architectural or technological ensemble or **landscape** which illustrates (a) significant stage(s) in human history”.*

The emboldened text above identifies the specific qualities that SBG had to demonstrate OUV. These are:

- The Trialling and technological development of key crops during colonial times², such as rubber³, oil palm and orchids⁴, which changed the economic fortunes of the region and beyond.
- SBGs’ scientists have recorded the mega-diverse flora of the SE Asian region over the past 140 years and helped train its developing nations in botany.
- The “greening” of Singapore in the 1880s and again from the 1960s was spearheaded by SBG⁵ and has since been copied by others around the world (town planning).
- SBG has been the place where Singapore’s nationhood was built and continues to be a key place for social interaction and leisure as a culturally rich civic space^{4,6}.
- SBG is a well-preserved example of the English Landscape Movement’s informal design and unique in having been developed in the tropics as opposed to the temperate regions^{4,7}; it includes buildings, such as Burkill Hall, which are the last surviving examples of their style⁴.

In terms of Integrity and Authenticity, which are interrelated, the original landscape design of paths, lawns and water bodies survives intact as does most of the suite of historic buildings, exhibiting an evolutionary process of building design from the 1860s until the 1950s. The foregoing statement relates to the 49 hectares now inscribed, but not to the remaining 25 hectares (as of 2014), which for various reasons have either lost their integrity/authenticity or were not historically a part of the site, namely the northern end of the Bukit Timah Core and the Tyersall land gifted to SBG in 2006. The inscribed site is enriched by the greatest concentration of officially recognised Heritage Trees in Singapore, some of these being 100s of years’ old^{8,9} and many reflecting the time when Economic Botany was a significant part of the Gardens’ role. An even more remarkable example of living heritage is the 156-year-old Tiger Orchid planted in 1861 by the Gardens’ original designer, Lawrence Niven, and now claimed as the World’s oldest and largest species orchid¹⁰. Importantly, SBGs’ original dual roles as public attraction and research institution have been maintained and considerably expanded up to the present day. The visitor-ship now stands at 4.7 million visits/year and the output of scientific publications, including those in high impact journals (e.g. *Nature* and *Nature Plants*), is exceptional when the modest number of scientists employed at SBG is considered. The Comparative Analysis conducted for SBG has demonstrated that no other “tropical colonial botanic garden” – the category we identified as describing SBGs’ global significance – has in combination the same degree of Authenticity, Integrity, scientific output and resources at its disposal, nor has any contributed historically to the development of crops that changed the economic fortunes of a region to the extent

that SBG achieved in relation to rubber and hybrid orchids. The gardens, with all of which SBG can be favourably compared, are listed with commentary in Appendix 1, below.

Last, but not least amongst the 5 critical aspects for inscription, is the ability of Singapore to ensure the protection of SBGs' OUV, which though it evidently satisfied both ICOMOS and the WH Committee, nevertheless caused the former to issue some recommendations and requests for consideration. Leaving aside for the moment the undoubted power of the UNESCO inscription itself, Singapore's planners (URA) already had a range of measures to safeguard SBG and its surroundings from undesirable developments. Nearly all of the extensive Buffer Zone proposed in the Dossier and now in effect gazetted by UNESCO inscription is designated as either residential land for High Class Bungalows, of no more than 2 storeys, or as parkland. In addition, within a one kilometre radius of the Bandstand there can be no new built developments that are visible from that historic location. SBG is gazetted as a National Park under The Parks and Trees Act (2005) and a significant part of it is recognised by URA as a Nature Area, including parts of the Buffer Zone. Amongst the built structures at the site, 12 are gazetted as Conservation Buildings by URA. It is also a commitment on the part of SBGs' management to continue the regular planting of tall trees around the boundaries of the site and strategically elsewhere to ensure that the rising city-scape of Singapore is obscured in views from within the site.

The ICOMOS considerations that came with their recommendation to inscribe have been heeded by SBGs' management and the solutions have been shared with the Site Management Plan Stakeholder Committee. Three of these have already been implemented, *viz* (1) more regular professional inspections of heritage buildings; (2) formulation of a Living Collections Plant Acquisition and Replacement Policy; and (3) the communication of any new development plans to the WH Centre (Paris), which we will effect by means of sharing the minutes of our Stakeholder Committee meetings where we hope the Committee will endorse our proposals as they arise. The fourth consideration does not need any action as it stems from a misunderstanding on the part of ICOMOS as to the effectiveness of the measures for protecting the site. However, the final consideration is the most difficult to both comprehend and implement, though we will do our best, namely *"Developing monitoring indicators for the development and tourism in light of growing impact from these potential threats"*. We recognise that visitation has been growing steadily over the past 4 years, with visits/year increasing from 4.1 to 4.7 million. During 2016 we will monitor the site for any impacts this increase may have on its fabric, i.e. lawns, paths, buildings and collections, but the most likely impact is actually to the level of visitor enjoyment. This latter aspect we can assess by regular visitor surveys, but as a free-to-enter attraction it is inevitable that increased publicity and profile, and easier access through improved public transport, such as the recently opened Downtown Line station in the Bukit Timah Core, will further drive visitor-ship upwards. One mitigation measure is to concentrate any new developments and attractions within the Buffer Zone areas, rather than inside the inscribed site itself. This, in fact, is already happening, with 4 new features to open in the next 3 years in the Buffer Zone, such as the Tyersall Learning Forest, Ethnobotany Garden, Jacob Ballas Children's Garden extension (partly within the inscribed site) and Gallop Road extension exhibition houses.

Besides these considerations it is important to focus on public education about our heritage and role, this even extending to promoting knowledge about the World Heritage Convention itself. The Convention is now a part of Singapore's National Curriculum and between March and November 2016 we will run an exhibition entitled *"Exploring our World's Heritage"* in the CDL Green Gallery

extension to our Holttum Hall Heritage Museum, and run tours for school groups on the same theme. Further educational signage is also being installed across the site and we already have a new guide book published just one month after our UNESCO inscription was confirmed⁴ and distributed to all state schools in the Republic. Inscription does not mean that research into our history comes to an end. On the contrary, we are discovering new avenues of heritage interest regularly and have, for example, commissioned an archaeological survey of the early Chinese family graveyard and Japanese WW2 bunker, which are hidden away in a corner of the Bukit Timah Core, but were specifically included within the UNESCO site boundary to ensure their survival. The graves include the earliest *in situ* burial of a Chinese in Singapore, dating from 1842, and we still wonder whether there is an historic connection between the family in question and the botanic gardens. The bunker is the second WW2 artefact located in SBG, the first being the Prisoner-of-War brick steps that lead down to the Plant House, constructed by Australian PoWs under Japanese command during 1942–45.

Conclusion

Getting a heritage site inscribed on to the WH List is not so difficult a task if the site has demonstrable OUV, is well resourced, properly managed and adequately protected. From the outset public support needs to be demonstrated and considerable investment of time and effort is necessary for this essential engagement and awareness-raising activity. Inviting the very people who will eventually take the decision, hopefully in your favour, to the proposed site to showcase its assets is a most valuable option, if it can be afforded. The inscription process is a well-defined one and nowadays bodies such as ICOMOS are expected and indeed prepared to offer advice to state parties on which kinds of heritage are worthy of consideration. Compilation of the Nomination Dossier is not a mysterious art, but one that must be rigorously pursued, and if a consultant experienced in the WH process can be contracted, a lot of the uncertainties that face a first time inscription team can be avoided. Don't expect the visiting public to understand the heritage of your site unless you put it "right in their face" by means of every form of educational signage, interpretation and face-to-face opportunities, such as guided tours of the site and the development of museum facilities. The print and broadcast media can be great allies and should be cultivated to ensure that those who have perhaps never visited or even heard of the site get the desire to know more. Record any feedback you receive, good or bad, and document all efforts made to engage the public – all of this can be appended to the Nomination Dossier, as can media coverage. Before and beyond inscription it is good to retain the voluntary help of a team of stakeholder advisers, because as WH Site it is not only the official managers that should have a say in its management and UNESCO and ICOMOS will want to be assured that any new developments that can potentially impact the recognised OUV have been carefully considered by the wider community and heritage experts alike.

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Appendix 1: Botanic gardens on the WH List and other historic colonial botanic gardens in the tropics that can be compared with SBG

Three other botanic gardens are inscribed on the World Heritage List, whether in their own right or as part of larger sites:

Orto Botanico, Padua (Italy), founded in 1545, is the World's oldest botanic garden and preserves most elements typical of a garden of this era. Its focus was on the introduction of rare examples of temperate flora to Europe. It is a university garden and is still used for research purposes, but it cannot be compared with SBG on account of its landscape genre and temperate as opposed to tropical collections.

Royal Botanic Gardens, Kew (United Kingdom), established 1759, became the imperial hub at the centre of more than 100 British colonial gardens during the 18th to 20th centuries, among which SBG is the best preserved example in the tropics. Kew and SBG are therefore complementary gardens, representative of distinct elements of what was the world's largest gardens' network during colonial times. Both have extensive research programmes and a strong focus on the conservation of biological diversity. They were also the two most important institutions in the establishment of the plantation rubber industry with distinct but mutually dependent roles, Kew being the supplier of the first seedlings, while SBG developed and mass-disseminated the crop and the techniques for its cultivation, harvesting and latex curing.

Jardim Botânico, Rio de Janeiro, Brazil, was established by the Portuguese in 1808. It is formal in its landscape design, much of which is preserved, but it has played only a small role in the development of economic crops, being focused more on research towards a better understanding of Brazil's huge native flora, thus giving it a national rather than regional focus. It holds the largest and most important

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herbarium in Latin America. It was inscribed on the World Heritage List in 2012 as part of the much wider area designated as “Carioca Landscapes between the Mountains and the Sea”. It is different from SBG, a British tropical botanic garden, from the perspectives of historical significance, national focus of its research and in its landscape style.

Other colonial gardens in the tropics:

Peradeniya botanic garden (Kandy, Sri Lanka) was established as a British colonial garden in 1821. Overall, Peradeniya is perhaps the most similar to SBG amongst tropical colonial gardens, but is laid out in a formal style with some trees of economic interest surviving, especially timber-producing species. Its fabric has been largely preserved, though it currently suffers from some environmental issues (e.g. an over-abundance of giant fruit bats, whose daytime roosts are damaging its historic trees). Scientific research by its staff continues, being particularly focused on local flora and the introduction and breeding of garden plants and training of local communities in their small scale commercial and domestic cultivation. However, research is on a smaller scale to SBG in terms of publications. SBGs’ scientists produce on average 40–60 refereed publications each year, whereas Peradeniya’s scientists publish less than half this amount.

Penang botanic garden (Penang, Malaysia) was established in 1884 as a sister garden to SBG in the Straits Settlements and until the late 1940s was directly managed by SBG with similar aims and functions (e.g. economic botany, including experimental tapping of rubber trees). Its former herbarium was incorporated into SBGs’ collections prior to 1950. Today it retains the lower part of its historic landscape, but the famous waterfall above the current boundary is no longer an integral part of the site and its staff do not engage in scientific research, nor in economic botany. Nevertheless, it remains a very popular destination for Penang’s residents and tourists, show-casing a number of fine heritage trees, including some originally planted for their economic potential.

Calcutta botanic garden (Kolkata, India), established 1787, was the most important British colonial garden in the 18th & 19th centuries. It was at the forefront of botanical inventory/floristic research in Asia (Indian Subcontinent) in the 19th century under the leadership of Sir George King, a close collaborator of Director Henry Ridley at SBG. As such, its collections were a major contributor to the monumental *Flora of British India*, largely written by RBG Kew’s former Director, Sir Joseph Hooker, in his retirement. Its significance decreased during the latter part of the 20th century as its purpose has changed. Historically it focused on cinchona and tea cultivation, achieving success with the latter, bringing Chinese varieties together with Indian varieties. It was the first site where rubber was introduced in 1873, but unsuccessfully, as the climate did not suit this crop.

Hong Kong botanic garden (China) was established as a British colonial garden in 1871. Its subtropical climate is not suitable for rubber. It regularly exchanged plants of botanical and economic interest with Kew. Some of its historic fabric survives today, but its function has changed as it has become a zoological, rather than primarily, a botanical garden. It was renamed in 1975 as the “Botanical and Zoological Gardens” to reflect the increased commitments to zoological exhibits.

Yangon botanic garden (Myanmar) was established c. 1886 by an Agri-Horticultural Society. It may have been a secondary site for the cultivation of rubber, but was not the first to receive the tree in Myanmar. It is not presently known to conduct significant botanical research.

Sir Seewoosagur Ramgoolam botanical garden (Pamplemousses), Mauritius, was established by the French as a plant nursery in 1768 and subsequently taken over by the British. Today it is a popular tourist attraction, but no longer functions in its original form as a station for acclimatising plants in transit and for the trialling of potential crops. As far as is known, the rubber saplings supplied to the garden in the 1870s from Kew did not survive; rather it was a trial ground for sugarcane.

Bogor botanic garden (Kebun Raya), was established briefly by the British in 1817, then managed and further developed by the Dutch, in West Java (now Indonesia). Like Peradeniya, it is comparable with SBG, but formal in its landscape design. However, the former colonial governor-general's palace, which was originally an integral part of the site, is no longer an accessible part of the garden. Its famous herbarium of Indonesian flora has been relocated to a distant facility, in effect taking a key part of its botanical research assets out of the garden. It was historically involved in the first introductions of both rubber and oil palm in Indonesia, though not to an extent comparable with SBG in the remainder of Southeast Asia, and there is only limited interpretation of the significance of its heritage to the visiting public. It has many large heritage trees, some planted for their economic potential as timber species.