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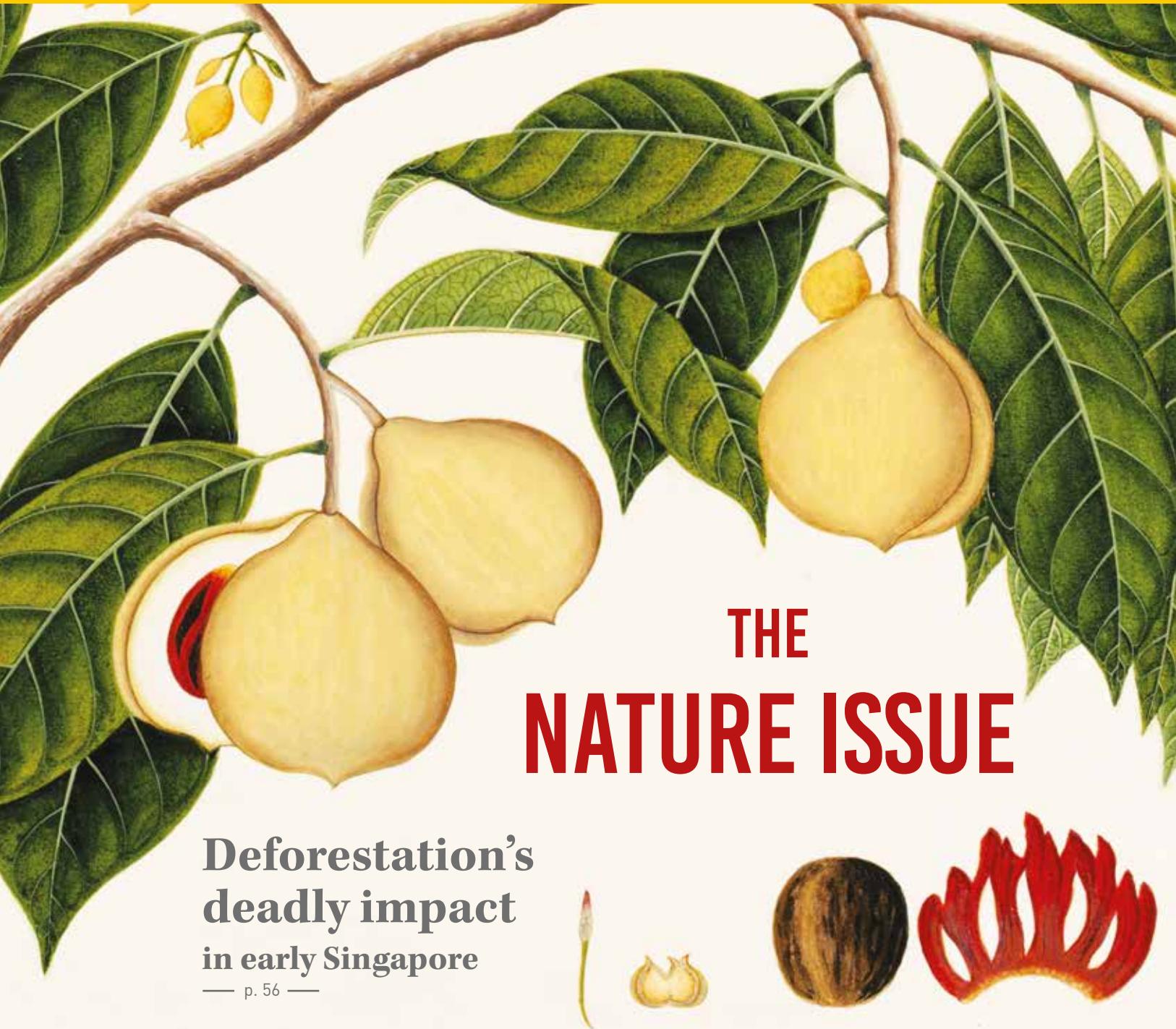
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THE **NATURE ISSUE**

**Deforestation's
deadly impact
in early Singapore**

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Director's Note

Our cultural beliefs influence how we view the natural environment as well as our understanding and attitudes towards animals and plants. These views and perceptions impact our relationship with the natural world.

Some people see nature as wild and chaotic while others view nature as orderly, acting according to natural "laws". There are those who perceive nature as an economic resource to be exploited for profit or for human enjoyment, yet there are also many who strongly believe that nature should be left untouched to flourish in its natural state.

This issue of *BiblioAsia* looks at how human activities over the past 200 years have affected and transformed our physical environment, and how we are still living with the consequences today. This special edition accompanies an exciting new exhibition launched by the National Library – "Human x Nature" – at the Gallery on Level 10 of the National Library Building on Victoria Street. Do visit the exhibition, which will run until September this year.

Georgina Wong, one of the curators of the show, opens this issue by exploring the relationship between European naturalists and the local community as plants and animals new to the West were uncovered. Not unexpectedly, indigenous input was often played down, dismissed, or exoticised. Farish Noor examines this phenomenon by taking a hard look at Walter Skeat's book *Malay Magic*.

Faris Joraimi sees a similar impulse at work as he examines the beautiful paintings of Malayan fruits in the Dumbarton Oaks collection, which relied on anonymous Chinese artists and Malay informants.

One exception to the rule was Ishak Ahmad, whose knowledge helped create an understanding of the economic potential of the seas around Malaya. Anthony Medrano outlines the contributions of the man who, among other things, was the father of Yusof Ishak, Singapore's first president.

Turning our gaze landward, we look at the environmental destruction caused by humans. Timothy Pwee documents the history of plantation agriculture as Chia Jie Lin (the exhibition's co-curator) examines the impact of deforestation caused by these plantations. Ang Seow Leng explores how attitudes towards conservation have evolved over time while Fiona Tan writes about a failed attempt to control the wildlife trade in 1930s Singapore.

For most city dwellers, the closest we have to nature is the greenery in our housing estates and the easily accessible parks and recreational areas. All this is thanks to a deliberate effort to turn Singapore into a Garden City. Lim Tin Seng tells us how that vision has evolved since the 1960s.

Also, don't miss Michelle Heng's essay about Singaporean poets who have tackled nature in their work and Jacqueline Lee's piece highlighting how writers of speculative fiction envisage Singapore's environmental future.

We hope this issue amply demonstrates that the fates of humanity and nature are ultimately intertwined.

Tan Huism
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On the cover
A painting of the nutmeg plant from the William Farquhar Collection of Natural History Drawings, c. 1810. Gift of G.K. Goh. Courtesy of the National Museum of Singapore, National Heritage Board.

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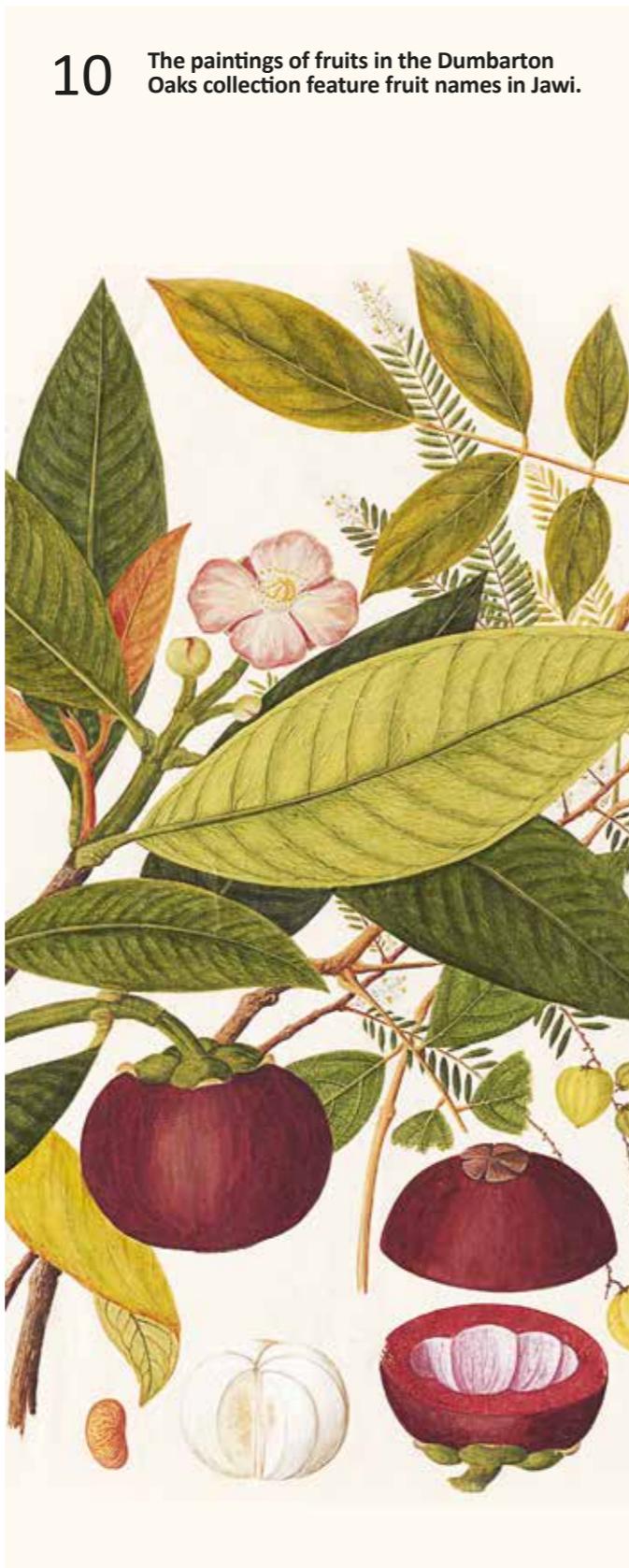
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Lim Tin Seng traces the journey from the first botanical garden in 1822 to the "City in Nature" vision in 2020.

Image credits: (This page) Dumbarton Oaks Research Library and Collection. (Facing page clockwise from the top) Wildlife Reserves Singapore; Tong Seng Mun Collection, National Archives of Singapore; Ministry of Information and the Arts Collection, National Archives of Singapore; *Skizzen aus Singapur und Djohor*, National Library, Singapore; National Archives of Singapore.



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The paintings of fruits in the Dumbarton Oaks collection feature fruit names in Jawi.

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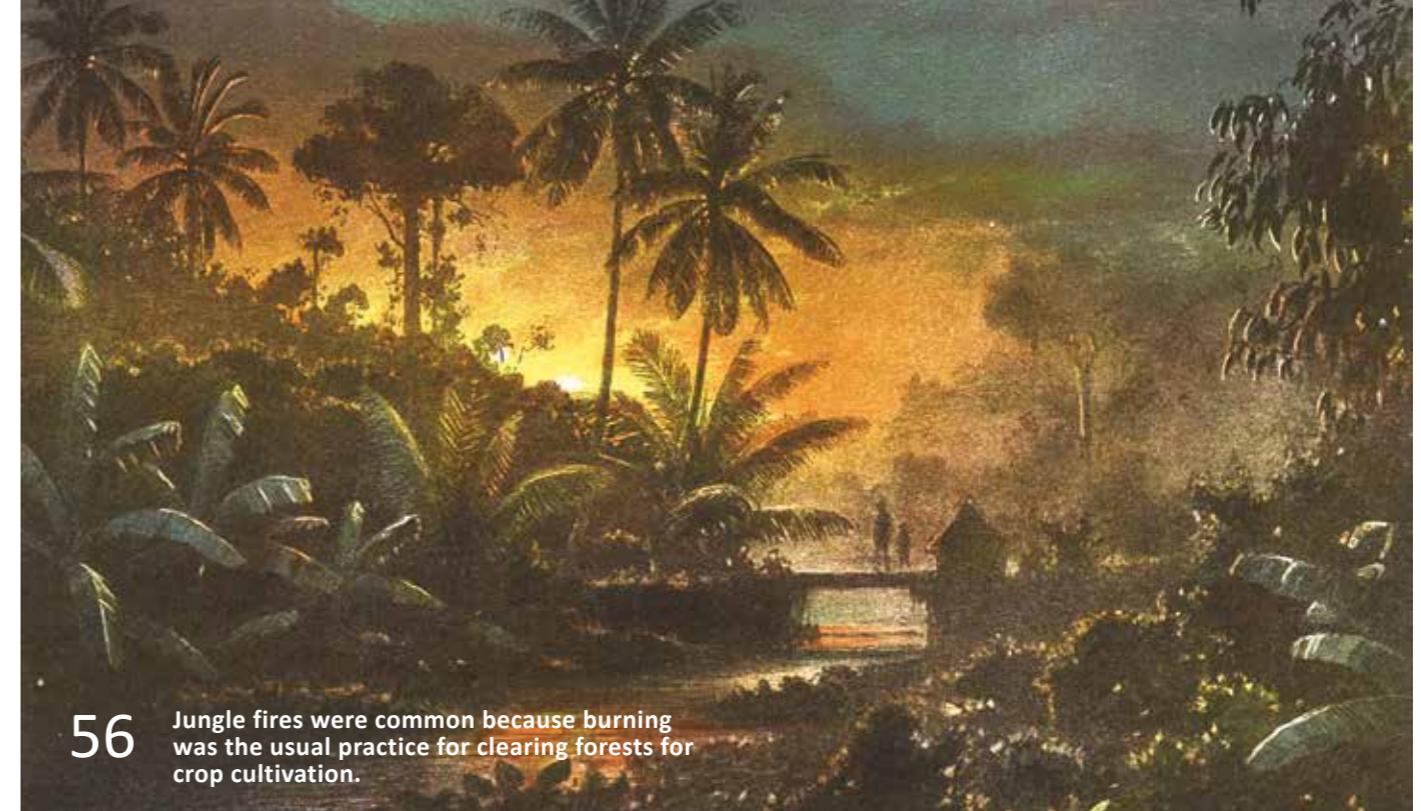
Jungle fires were common because burning was the usual practice for clearing forests for crop cultivation.

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An attempt in the 1930s to regulate the wildlife trade in Singapore failed.

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The Garden City vision has blossomed over the years.



SINGAPORE'S ENVIRONMENTAL HISTORIES

Georgina Wong explores the relationship between the human and natural worlds, and shares highlights from the National Library's latest exhibition.

Georgina Wong is a Curator with Programmes & Exhibitions at the National Library, Singapore. She is co-curator of the "Human x Nature: Environmental Histories of Singapore" exhibition.

"[I]t is apparent that but few years can elapse before the whole island will be denuded of its indigenous vegetation, when its climate will no doubt be materially altered (probably for the worse), and countless tribes of interesting insects become extinct. I am therefore working hard at the insects alone for the present, and will give you some little notion of what I have done and may hope to do."¹

— Alfred Russel Wallace,
Singapore, 9 May 1854

The National Library's latest exhibition, "Human x Nature: Environmental Histories of Singapore", explores the history of human relationships with nature on the island over the last 200 years. These relationships – be they scientific study, sustenance farming or commercial exploitation – vary between communities and have evolved over time. As much of the ways in which humans interact with the environment are based on our understanding and perception of the natural world, the exhibition begins with an examination of the study of natural history in Southeast Asia.

The Study of Nature

While the region has long been the subject of much fascination for travellers and explorers, especially for Europeans since the 16th century, the influx of naturalists and scientists to the region only started in the 17th century and intensified throughout the 18th century when the British and Dutch East India companies began their commercial and colonial efforts in earnest. A thorough understanding of the environment was considered a key component of colonial expansion as it enabled European empires to seize control of merchant economies, which relied heavily on the trade of natural resources such as spices, timber and plantation crops.

To this end, the British East India Company (EIC) – the commercial and colonial arm of the British government – and later the Colonial Office, actively encouraged and funded their employees' efforts to undertake natural history research. By the

mid-20th century, the research fund of the Colonial Office in London had grown to one million pounds sterling annually.² While the EIC's primary agenda for natural history research was to maximise the company's profit, naturalists and scientists were also motivated by the prospect of expanding the frontiers of science.³

European Study and Patronage

The naturalists conducting research in Southeast Asia had strong connections to Europe and often built on the study and collecting work of others in the same line of work. Naturalists would donate or sell their specimens in Europe and elsewhere to be stored and displayed in museums and research collections for further study. This enabled other naturalists to examine the region's flora and fauna remotely without having to leave Europe at all.

The collections of the famed naturalist Alfred Russel Wallace were extensively studied across Europe, where he sold many of his specimens in order to fund his expeditions. While best known for his work on the theory of evolution, jointly published



with Charles Darwin in 1858,⁴ he is better remembered in this region for his research into the natural history of the Malay Archipelago. He spent eight years, from 1854 to 1862, exploring present-day Malaysia, Singapore and Indonesia, collecting and recording – by his own count – more than 125,000 species of wildlife.⁵

While in Singapore, Wallace spent a significant amount of time collecting over 700 species of beetles in the Dairy Farm and Bukit Timah areas. In his letters and his 1869 book, *The Malay Archipelago*, Wallace provides interesting perspec-

(Facing page) Famed naturalist Alfred Russel Wallace spent eight years, from 1854 to 1862, exploring present Malaysia, Singapore and Indonesia, collecting and recording more than 125,000 species of wildlife. Shown here are illustrations of the king bird-of-paradise and the twelve-wired bird-of-paradise. *Image reproduced from Wallace, A.R. (1874). The Malay Archipelago: The Land of the Orang-utan, and the Bird of Paradise; a Narrative of Travel, with Studies of Man and Nature (between pp. 548 and 549). London: Macmillan. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 915.9804 WAL; Accession no.: B18835319E).*

(Top) A photograph of Alfred Russel Wallace taken in Singapore, 1862. *Image reproduced from Marchant, J. (1916). Alfred Russel Wallace: Letters and Reminiscences (vol. I, between pp. 36 and 37). London, New York, Toronto and Melbourne: Cassell and Company. Retrieved from Biodiversity Heritage Library website.*

(Below) Wallace discovered and identified the gliding tree frog, *Rhacophorus nigropalmatus*, also known as Wallace's flying frog. It is found in Malaysia, Borneo and Sumatra. *Image reproduced from Wallace, A.R. (1874). The Malay Archipelago: The Land of the Orang-utan, and the Bird of Paradise; a Narrative of Travel, with Studies of Man and Nature (p. 38). London: Macmillan. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 915.9804 WAL; Accession no.: B18835319E).*



tives on Singapore's natural landscape in the mid-19th century, lamenting that the virgin forest in the suburbs had been entirely cleared for nutmeg and areca palm plantations, resulting in a dearth of insect life. Naturalists at the time were studying native biodiversity in a region that was experiencing rapid deforestation to make way for plantation agriculture. Their research and records have since become invaluable documentation of species that are now locally or globally extinct.

Part of Wallace's collection of beetles was eventually sold to the French entomologist and natural history dealer Henri Deyrolle. His father, Jean-Baptiste Deyrolle, established a business dealing in taxidermy and specimens in Paris in 1831. Today, Maison Deyrolle serves as a museum of natural history and a cabinet of curiosities open to the public.⁶

Henri Deyrolle had procured a collection of buprestidae – jewel beetles highly prized by collectors for their glossy, iridescent colours – obtained by Wallace in Malaya. The former subsequently published an essay providing detailed descriptions of these beetles in the *Annales de la Société Entomologique de Belgique* in 1864.⁷ Being the first published author to describe several of the species, Deyrolle had the privilege of naming them. He named the beetle *Calodema wallacei* in Wallace's honour.⁸

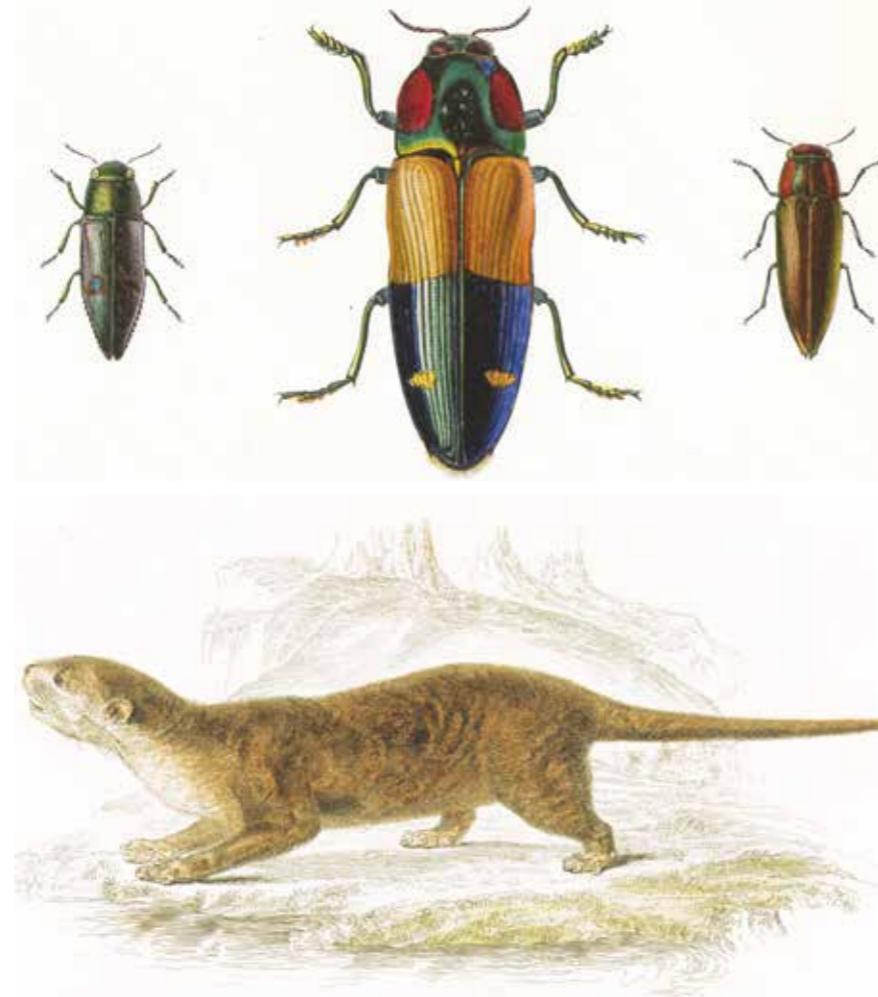
Naturalists of the British East India Company

By the turn of the 19th century, the EIC had amassed an extensive collection of all manner of cultural artefacts, books, valuables and natural history specimens from across the globe. These items were collected not only for their value or for profit, but also for the acquisition of control and power over colonised nations. Francis Rawdon-Hastings, First Marquess of Hastings and the Governor-General of Bengal, was an avid supporter of the company's ambitions to acquire knowledge. In 1799, he wrote that the company had "joined a desire to add the acquisition of knowledge... to the power, the riches, and the glory which its acts have already so largely contributed to the British Empire and Name".⁹

Stamford Raffles was a significant contributor to the knowledge gathering effort. A self-styled naturalist, most of his contributions to the study of natural history were the result of hiring and commissioning naturalists and artists to collect and draw specimens. One would be hard-pressed to

(Below) French entomologist and natural history dealer Henri Deyrolle named the beetle species *Calodema wallacei* (centre) after Alfred Russel Wallace, whose collection he was studying. *Images reproduced from Deyrolle, H. (1864). Description des buprestides de la Malaisie (plate II). Brussels, Paris: [n.p.]. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 595.763095951 DEY-[SEA]; Accession no.: B20395528A).*

(Bottom) American physician and naturalist Thomas Horsfield conducted natural history research in Southeast Asia when he was employed as a surgeon by the Dutch East India Company in Batavia (now Jakarta) in 1801. One of the mammals he described is the small-clawed otter shown here. These mammals are native to Singapore but are now rarely seen as a result of habitat loss, unlike the smooth-coated otters which have become prevalent in recent years. *Image reproduced from Horsfield, T. (1824). Zoological Researches in Java, and the Neighbouring Islands. London: Printed for Kingsbury, Parbury, & Allen. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 591.9922 HOR; Accession no.: B03013680J).*



name a well-known naturalist in Southeast Asia in the early 1800s not connected to Raffles in some way.

American physician and naturalist Thomas Horsfield, who was employed as a surgeon by the Dutch East India Company in Batavia (now Jakarta) in 1801, began conducting his natural history research in the region. When the British wrested control of Java from the Dutch in 1811, Horsfield befriended the newly minted Lieutenant-Governor of Java Stamford Raffles, who commissioned him to research and collect specimens.¹⁰ Horsfield went on to collect and describe hundreds of species of flora and fauna.

Raffles also employed two young French naturalists – Alfred Duvauzel and Pierre Médard Diard – who were on board the *Indiana* when Raffles and William Farquhar made landfall in Singapore in January 1819. Diard and Duvauzel accompanied Raffles around the region and subsequently amassed a large collection of specimens. Together, they captured, dissected and ate a dugong (*Dugong dugon*) while on a natural history expedition in Sumatra in 1819.¹³ Specimens were sent to London, where British surgeon Everard Home illustrated and described the animal's skeleton and organs in a paper read before the Royal Asiatic Society in London in 1820. The stuffed animals, skins and skeletons collected by the two Frenchmen, including the drawings they had commissioned, are currently housed in the Muséum National d'Histoire Naturelle in Paris.¹⁴

Indigenous Knowledge

European naturalists and authors were connected by an exclusive scientific fra-

ternity of universities, scientific organisations and historical societies that depended on a system of publishing and peer review. Authors who were a part of this system enjoyed the patronage of royalty, governments and businesses such as the EIC that were invested in their research.

However, this privileged access, primarily available to white men with a European education, the means to travel and connections that allowed them to publish their work, marginalised indigenous communities and their knowledge systems which had been passed down mainly from one generation to another rather than through published works. As a result, indigenous knowledge and understanding of the environment faced obstacles in being widely disseminated or accepted as mainstream science.¹⁵ Hence, almost all extant printed materials from the 17th to 19th centuries documenting indigenous knowledge of the region originated from European naturalists.

Yet these Europeans consistently relied on indigenous knowledge and expertise to navigate the region, collect specimens, and identify and name species as well as their respective properties and uses. In other words, close collaboration with local communities was crucial for their research and data collection.¹⁶ However, non-European sources were rarely, if ever, credited, as these were usually regarded as objects of study, rather than sources of credible information. European authors often derided indigenous knowledge as unscientific and superstitious.

John Desmond Gimlette's 1915 book, *Malay Poisons and Charm Cures*, is an example of simultaneously relying on indigenous knowledge while devaluing it at the same time.¹⁷ In his foreword to Gimlette's book, W.H. Wilcox, then Medical Adviser to the Home Office in London, disparaged the knowledge and experience of the Malay *bomoh* (shamans and medical practitioners) as primitive and clouded by black magic:

(Below) John Desmond Gimlette's book, *Malay Poisons and Charm Cures*, devotes a chapter to poisons obtained from fish such as the pufferfish. Shown here are illustrations of the pufferfish by the Dutch ichthyologist, Pieter Bleeker. *Images reproduced from Bleeker, P. (1865). Atlas Ichtyologique des Indes Orientales Néerlandaises: Publié sous les auspices du Gouvernement Colonial Néerlandais (vol. V; CCXIII). Imprimerie de De Breuk & Smits. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 597.09598 BLE; Accession no.: B18975254H)*

(Right) Portrait of Mohamed Haniff, Field Assistant and one-time Overseer of the Penang Botanic Gardens. Mohamed Haniff, who died on 25 March 1930, co-wrote *Malay Village Medicine* with Isaac Burkhill, then Director of the Botanic Gardens in Singapore. This was published in *The Gardens' Bulletin Straits Settlements* in April 1930, and is one of the rare works that credits a Malayan botanist as co-author. *Image reproduced from Mohamed Haniff Obituary (1930, June). The Gardens' Bulletin Straits Settlements, 5 (3–6), 161–162, p. 161. Retrieved from Biodiversity Heritage Library website.*



[A]n especial and absorbing interest is attached to a description of medicine as practised in a country into which modern medicine has not yet penetrated, for one is carried back to the times far distant when in one's own country the practitioners of medicine were striving to see light amidst the medley of faith cures, charms, herbal and animal remedies which has formed the *Materia Medica* of their forefathers.¹⁸

However, a chapter of the book that is dedicated to poisons obtained from fish such as the pufferfish (also called globefish, balloonfish and blowfish) clearly demonstrates the value of indigenous knowledge. Gimlette describes various species of pufferfish along with their Malay names, complete with anecdotes on poisonings and known antidotes. He also lists instructions on how to prepare the fish to render

it safe for consumption. Such valuable, hard-won information could only have come from indigenous guides. In the book, Gimlette did, however, credit his primary sources of information – two *bomoh* of the Kelantanese royal court, Hadji Awang and Enche' Harun bin Seman.¹⁹

Mohamed Haniff and Henry Ridley

One of the rare works that credits a Malayan botanist as co-author is *Malay Village Medicine*, published in *The Gardens' Bulletin Straits Settlements* in April 1930. It was written by Mohamed Haniff, Field Assistant and one-time Overseer of the Penang Botanic Gardens, and Isaac Burkhill, then Director of the Botanic Gardens in Singapore. Long-time collaborators Burkhill and Haniff toured the Malay Peninsula, extensively consulting *bomoh* and *bidan* (midwives) about local medicine and collecting plant samples to deposit in the gardens' herbarium.²⁰

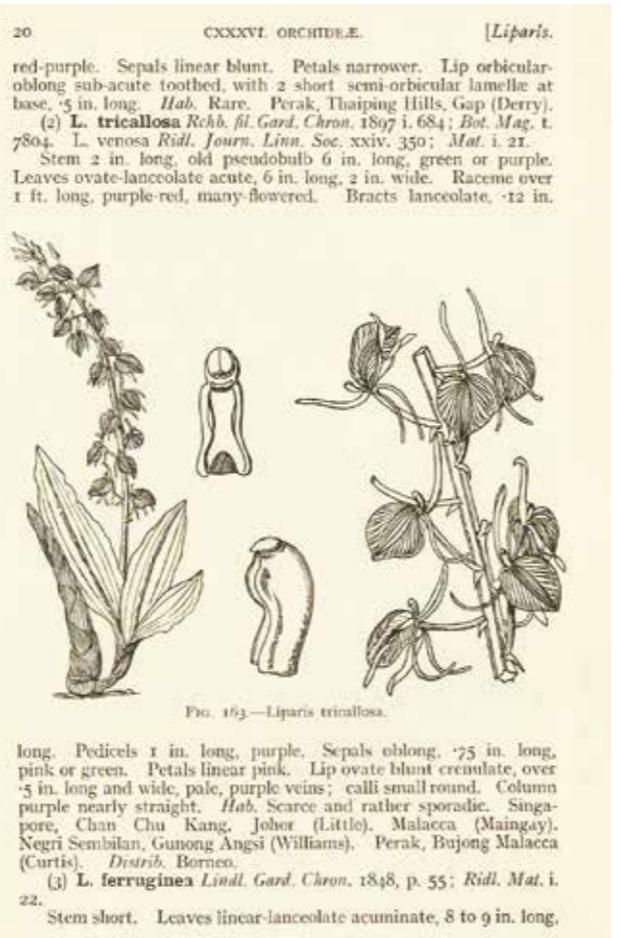
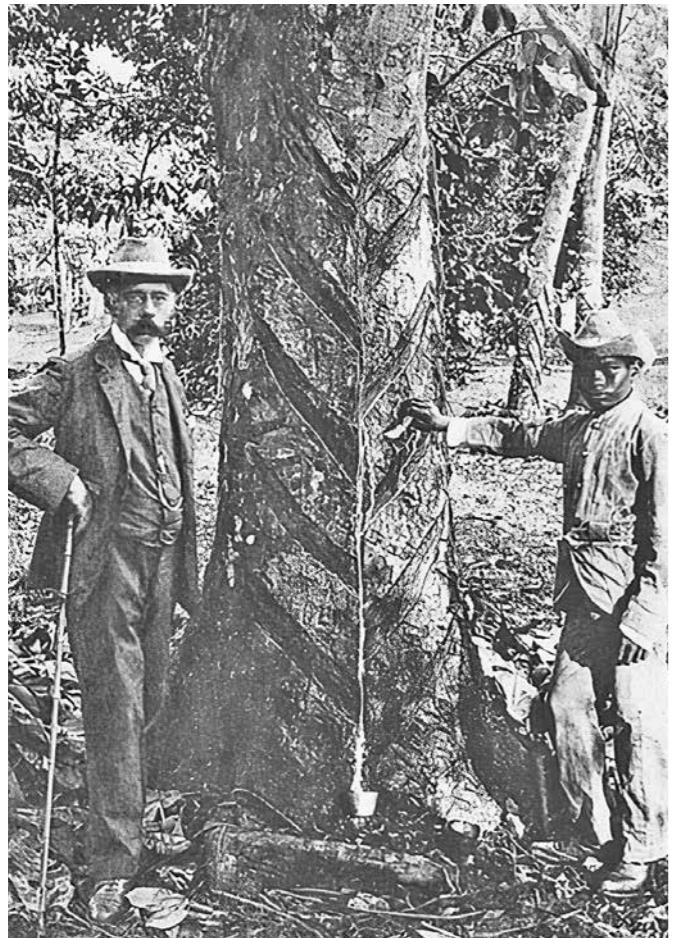
Haniff was one of many Malayan botanists working at the Botanic Gardens

The publication contains a glossary of plant species, complete with their Malay names. The authors note that according to Malay naming convention, many plants were named for their properties and uses instead of their physical characteristics – resulting in plants with wildly different appearances sharing similar names. According to Burkhill, this led European naturalists who only understood plants but not Malay knowledge systems, attributing perceived inaccuracies to their Malay sources.²¹

Haniff was an extremely prolific botanist and collector. Armed with an extensive knowledge of Malayan flora, he was frequently relied upon to source for plants and collect information from indigenous communities. Despite having worked with several prominent European botanists, Haniff was never promoted beyond the rank of Field Assistant.²²

(Below) Henry Nicholas Ridley (left), Director of the Singapore Botanic Gardens (1888–1912), posing with his Malay assistant beside a rubber tree in the Economic Garden. The herringbone incision patterns are clearly visible on the tree trunk. He invented this method which allowed rubber trees to be tapped at regular intervals without causing damage to the trees. Courtesy of National Archives of Singapore.

(Below right) Henry Nicholas Ridley published his landmark five-volume work, *The Flora of the Malay Peninsula*, after his retirement. Published between 1922 and 1925, the work is a record of his research on the region's flora. Shown here are illustrations of the *Liparis tricallosa*, a type of orchid. Image reproduced from Ridley, H.N. (1922). *The Flora of the Malay Peninsula* (vol. I; p. 20). London: L. Reeve & Co., Ltd. Collection of the National Library, Singapore. (Call no.: RRARE 581.9595 RID; Accession no.: B03006199F).



in Singapore, all of whom reported to European directors such as Henry Nicholas Ridley, the first director who served from 1888 to 1912. Ridley's tenure heralded an era of intense botanical exploration and specimen collecting across Singapore and the Malay Peninsula. Much of the work was undertaken by Malayan collectors and herbarium assistants who accompanied European botanists in the field.²³

During this period, a huge volume of research on the region's flora was produced, much of which appears in Ridley's landmark five-volume work, *The Flora of the Malay Peninsula*, published between 1922 and 1925 after his retirement as director.²⁴ Ridley's book helped establish Singapore's position as a centre for botanical research in the region and facilitated the transfer of many botanical specimens from Singapore to the Kew Gardens Herbarium, from which he based his research.²⁵

One of Ridley's objectives in publishing his book was to generate interest in the economic and scientific potential of the flora of Southeast Asia. However, the colonial authorities and the public found his work dense and overly scientific, with little application to their interests, which were primarily economic.²⁶ His successor,

Isaac Burkhill, reorganised the herbarium's collection and later produced a more accessible work, the two-volume *A Dictionary of the Economic Products of the Malay Peninsula* (1935), which framed plant "discoveries" in terms of their usefulness and economic value.²⁷

Another of Ridley's legacies would have a profound impact on the global economy and the landscape of the region. He experimented with developing a more sustainable method of latex extraction from rubber trees called the "herringbone technique" that allowed the trees to be tapped at regular intervals without causing long-term damage to them.

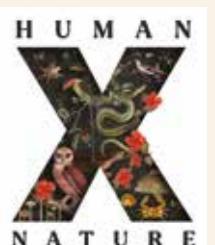
His subsequent relentless promotion of the commercial value of rubber and the large-scale introduction of the tree in

Malaya spurred the growth of the rubber industry in Malaya.²⁸ By the 1930s, Malaya had become the world's largest rubber producer, with rubber plantations sprouting up across Singapore and the peninsula. "Everyone went mad", said Ridley. "Every bit of waste ground, orchards and even gardens were planted [with rubber trees]. No one talked of anything else."²⁹

The study of Southeast Asia's natural history has been driven by many factors, including colonialism, territorial expansion and the European pursuit of knowledge. This perception of nature, shaped primarily by collection, classification and ultimately profit, paved the way for the large-scale exploitation and transformation of the landscape of Singapore and the region. ♦

ABOUT THE HUMAN X NATURE EXHIBITION

Visit the "Human x Nature: Environmental Histories of Singapore" exhibition at the Gallery on Level 10 of the National Library building on Victoria Street. Featuring over 150 artefacts, it explores our relationship with the natural world, from cultural understandings and scientific study to commercial and urban land use. It also examines efforts at conservation and restoration.



- (Call no.: RRARE 595.76309595 DEY-[SEA]; Accession no.: B20395528A); Deyrolle, H. (1864). Description des buprestides de la Malaisie Recueillis par M. Wallace. *Annales de la Société Entomologique de Belgique*, 8, 1–269, p. iii. Retrieved from Biodiversity Heritage Library website.
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- 18 Gimlette, 1923, p. xi.
- 19 Gimlette, 1923, pp. vi, 113–114.
- 20 Burkhill, I.H., & Mohamed Haniff. (1930, April). Malay village medicine. *The Gardens' Bulletin Straits Settlements*, 6 (6–10), 165–321, p. 165. Singapore: Botanic Gardens. (Call no.: RDTYS 615.3209595 BUR)
- 21 Burkhill & Mohamed Haniff, Apr 1930, p. 166.
- 22 Mohamed Haniff obituary. (1930, June). *The Gardens' Bulletin Straits Settlements*, 5 (3–6), 161–162, p. 161. Retrieved from Biodiversity Heritage Library website.
- 23 A large volume of letters along with Henry Nicholas Ridley's own field notes document the everyday work of the Singapore Botanic Gardens. These can be accessed at the Biodiversity Heritage Library website.
- 24 Ridley, H.N. (1922–25). *The flora of the Malay Peninsula* (5 volumes). London: L. Reeve & Co., Ltd. (Call no.: RRARE 581.9595 RID; Accession nos.: B03006199F [vol. I], B03006198E [vol. II], B03006197D [vol. III], B03006204D [vol. IV], B03006203C [vol. V])
- 25 Barnard, T. (2016). *Nature's colony: Empire nation and environment in the Singapore Botanic Gardens* (p. 181). Singapore: NUS Press. (Call no.: RSING 580.735957 BAR)
- 26 Barnard, 2016, pp. 182–183.
- 27 Burkhill, I.H. (1935). *A dictionary of the economic products of the Malay Peninsula*. London: Published on behalf of the Governments of the Straits Settlements and Federated Malay states by the Crown Agents for the Colonies. (Call no.: RCLOS 634.909595 BUR)
- 28 Tinsley, B. (2009). *Gardens of perpetual summer: The Singapore Botanic Gardens* (pp. 41–42). Singapore: National Parks Board, Singapore Botanic Gardens. (Call no.: RSING 580.735957 TIN); Tan, P.W.C., Tan, A.L., & Lau, L. (2015). *Singapore rubber trade: An economic heritage* (pp. 41–42). Singapore: Suntree Media Pte Ltd. (Call no.: RSING 338.47678209597 TAN)
- 29 Ridley found a way to tap rubber and gave Malaya its wealth. (1953, November 21). *The Straits Times*, p. 9. Retrieved from NewspaperSG.

A BANQUET OF MALAYAN FRUITS

BOTANICAL ART IN THE MELAKA STRAITS

Who commissioned the Dumbarton Oaks collection of 70 drawings on local fruits?

Faris Joraimi attempts to unravel the mystery of its origins, which could predate Raffles' arrival.

Faris Joraimi is a student at Yale-NUS College and will graduate in 2021. He studies the history of the Malay world, and has written for *Mynah*, *Budi Kritik*, *S/pores* and *New Naratif*. Faris was also co-editor of *Raffles Renounced: Towards a Merdeka History* (2021), a volume of essays on decolonial history in Singapore.



The expansion of European imperial power in the Malay Archipelago beginning in the early 19th century introduced not just conscripted soldiers, missionaries and colonial officials, but also explorers and naturalists. Their urge to catalogue and classify generated an extensive visual record of flora and fauna found in Southeast Asia.

Painters – although not often associated with the branches of science – were instrumental to the study of natural history. The William Farquhar Collection of Natural History drawings,¹ for instance, enjoys the privilege of being Singapore's best known and most publicly accessible set of botanical art from the early colonial period. The 477 watercolour paintings of plants and animals from Singapore and Melaka by unnamed Chinese artists (most likely Cantonese) were commissioned by Farquhar between 1819 and 1823 when he was First Resident and Commandant of Singapore. The entire collection currently resides in the National Museum of Singapore.

The Dumbarton Oaks Collection

This story, however, is about a far more modest, and relatively obscure, collection: one folio of 70 drawings, but no less intriguing because of its mysterious origins

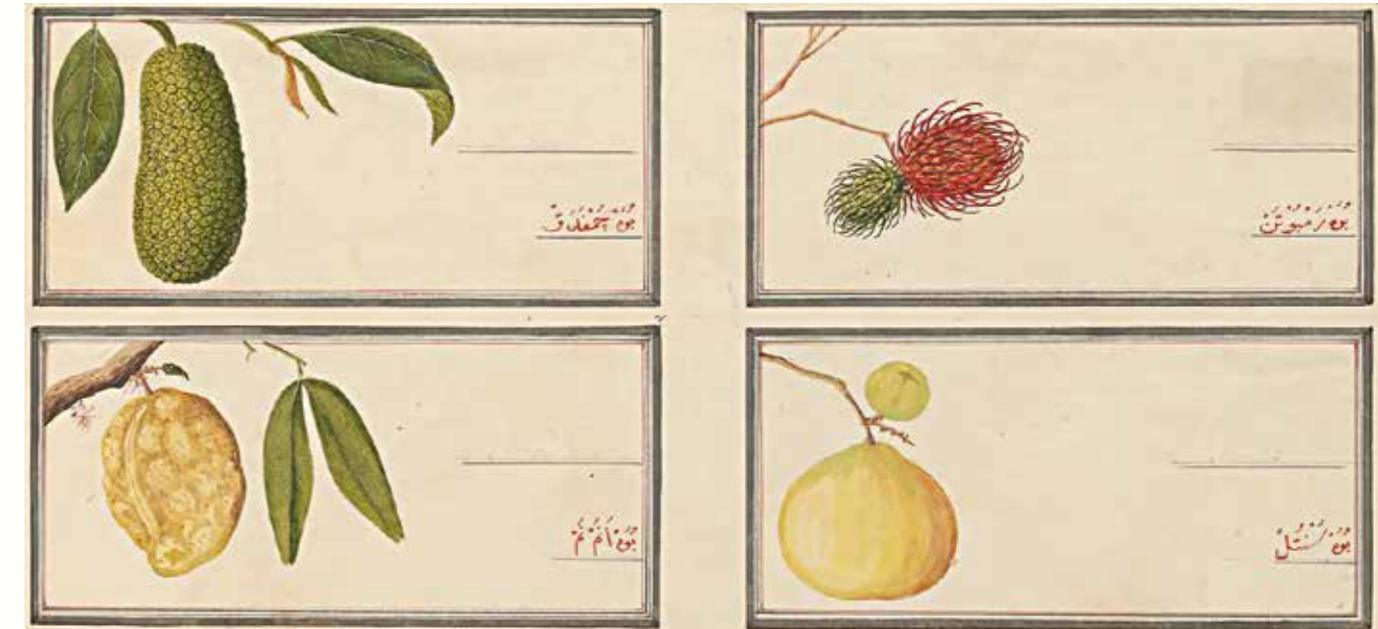
and almost singular uniqueness. In locating this folio, our scene shifts an ocean away, to the United States.

In 2019, I visited the Dumbarton Oaks Research Library and Collection, a historic estate about the size of 20 football fields. Nestled in Georgetown, a manicured district in Washington, D.C., Dumbarton Oaks comprises a mansion surrounded by lush gardens. The estate made history in 1944 when international delegates convened here for a series of critical meetings that led to the creation of the United Nations. It was also the residence of Robert and Mildred Bliss, influential and wealthy cultural patrons who were active in politics and philanthropy. Today, Dumbarton Oaks is a research institute where Mildred Bliss' vast collection of Byzantine and Pre-Columbian art keeps company with valuable manuscripts on gardens and landscaping.

Carefully housed among the shelves in its impressive reading room is this folio containing exquisite depictions of fruits from the Malay world. The bound volume has no label on its cover save a generic title, "Chinese Watercolours: Fruits", hot-stamped in gold on the spine. The drawings feature 57 species of fruits commonly found in Southeast Asia, such as pineapples, watermelons, mangosteens and durians.

(Facing page) In this set of drawings from the Dumbarton Folio featuring mangosteens, there are unopened flower buds, flowers in full bloom, juvenile fruits as well as fully ripe ones, all on the same branch. The other three types of fruit are the ivory yellow rambutan, *jambu air* and *buah melaka*. Image reproduced from *Album of Chinese Watercolours of Asian Fruits*, Dumbarton Oaks Research Library and Collection.

(Below) Each page in the last section of the Dumbarton Folio depicts eight fruits drawn in miniature, two groups of four. Each group – two rows on top and two rows below – corresponds to the four species depicted in each of the 12 composite scenes. Each fruit is labelled according to its Malay name in Jawi as well as poor transliterations in barely visible Roman script. Shown here are the top two rows from one of the pages. Clockwise from the top: *cedpedak*, red rambutan, *sentul* and *nam-nam*. Image reproduced from *Album of Chinese Watercolours of Asian Fruits*, Dumbarton Oaks Research Library and Collection.



Scientific Illustration as an Aesthetic

The Dumbarton Folio is structured in three parts. The first 12 watercolours are composite scenes, each showcasing four species of fruit. Following these are 10 drawings, each focused on a specimen of a single species. In the last section, each page depicts eight fruits drawn in miniature, two groups of four. Each group – two rows on top and two rows below – corresponds to the four species depicted in each of the 12 composite scenes. The groups of four are arranged in the order of the corresponding composite scenes, and each fruit is labelled according to its Malay name in Jawi as well as poor transliterations in barely visible Roman script.

The folio dissolves hard distinctions between conventionally "scientific" documentation and "ornamental" representation. Of course, the key formal features of botanical illustration are strongly evident. For instance, the fruits are typically drawn on plain backgrounds which traditionally serve to isolate the specimen from its original setting, so that it could be properly recorded and observed. This was a near-universal procedure used by European botanists for representing specimens collected in the field.² Another typical element is the portrayal of multiple stages in the plant's life cycle within a single drawn

specimen. In the set of drawings featuring mangosteens for example (see facing page), the viewer is shown unopened flower buds, flowers in full bloom, juvenile fruits as well as fully ripe ones, all on the same branch.

Historian Daniela Bleichmar, who studied 16th-century botanical drawings by colonial Spanish expeditions to the Americas and the Philippines, found these features to be among the “iconographic strategies” that allowed artists to “compress time and space” in order for drawings to contain the necessary botanical information.³ While plants in reality take time to manifest visible changes across different seasons, an artist could capture the full range of that information on one page. In a “single imaginary specimen”, for instance, the plants could be rendered in different stages of growth to depict all possible conditions it could be in.⁴ The botanical illustration was effective at capturing knowledge obtained about the biodiversity of distant colonies for circulation and analysis in the imperial centre. This involved a degree of artistic manipulation, however, distorting essential distinctions we have about “objective” versus “artistic” representation.

Viewing these drawings, one also cannot help but notice how intensely lyrical the compositions are. Highly expressive, the scenes are richly illustrated with leaves and stems entwined around one another. Vividly textured fruits catch one’s eye among the foliage. In most of these pieces, the leaves and branches are cut off at the

edges of the frame. A visual protagonist dominates each scene, usually a fruit like a *cempedak*, mangosteen or durian.

A notable example features a large pineapple, whose seductive shade of pink is characteristic of the species, *Ananas bracteatus* (red pineapple). It is a different variety from *Ananas comosus*, which we find in every local wet market and supermarket. *Ananas bracteatus*, on the other hand, is esteemed for its pretty foliage: note the stripes and red-tinted edges. The artist evidently decided to show off these ornamental qualities by having one of the leaves drape elegantly across the page.

We find instances of lyrical expressions in the second set as well. The stunning watermelon painting depicts swirling tendrils with leaves and flowers shown in distinct stages of development. Like the pineapple, the watermelon is also cut in half to reveal its fleshy red interior, with the seeds laid aside. All the fruits in both the composite scenes and single-species studies are dissected this way. Revealing the anatomy of the fruit, down to every last succulent pulp, pit and seed, was crucial to botany’s thorough investigation of plant life. Dissection was an invaluable technical skill. Many pioneering botanists, such as Nathaniel Wallich,⁵ were surgeon-naturalists after all.

Little is known about the precise circumstances surrounding the volume’s production, or who and what it was intended for. There is no information that survives

regarding how and why it came into the custody of the Blisses. However, it likely predates the William Farquhar collection, and indeed the establishment of a British trading post in Singapore in 1819. The late Mildred Archer, Curator of Prints and Drawings at the India Office Library in London, dated the Dumbarton Folio’s production to be roughly between 1798 and 1810.⁶ To the best of my knowledge, it is the only such volume known to exist, and there are no known duplicates. Only two of its illustrations find parallels in one other collection. Apart from those, every other painting is unique.

The title given on the spine is, at least, accurate. Like the Farquhar drawings, those in the Dumbarton Folio bear the stylistic mark of Chinese artists trained in the Cantonese tradition of ink painting in the ateliers of southern Chinese ports. For instance, the light blue shade applied as a backdrop to white-coloured flowers was a signature technique in Chinese watercolour painting.

Generally, British officials working in Southeast Asia in the 19th century commissioned Chinese artists to produce botanical illustrations. Abdullah Abdul Kadir (more popularly known as Munshi Abdullah), who was employed by Stamford Raffles as his scribe and interpreter, corroborates this fact in his memoir, *Hikayat Abdullah (The Tale of Abdullah)*: Stamford Raffles himself employed painters from Fujian and Macau while playing gentleman-naturalist in the forests of Singapore.⁷

Included in the Dumbarton Folio is the composite drawing featuring the *Ananas bracteatus* (red pineapple), with its distinctive shade of pink skin characteristic of the species, and the *langsat*, *chiku* and *kundang*. Although the exterior of the pineapple is pink, it has a fleshy yellow pulp like other pineapple varieties. Image reproduced from *Album of Chinese Watercolours of Asian Fruits*, Dumbarton Oaks Research Library and Collection.



The watermelon painting in the Dumbarton Folio (left) depicts swirling tendrils with leaves and flowers shown in distinct stages of development. The watermelon is also cut in half to reveal its fleshy red interior and black seeds. Image reproduced from *Album of Chinese Watercolours of Asian Fruits*, Dumbarton Oaks Research Library and Collection. An almost exact replica of the painting (right) can be found in the bound folio titled NHD 42 housed at the Prints and Drawings Room of the British Library. Photo by Faris Joraimi.



What also stands out about the folio was its inclusion, in clear hand, of the Malay names for all the 57 fruits depicted. The Jawi script reads as sharply today as perhaps when it was first inscribed. Who identified these names? Was there a local expert consulted? Maybe – as with the William Farquhar Collection – the British official who commissioned these drawings had instructed artists to visit the local marketplace: all the fruits depicted are edible after all; in which case, all it took was to ask the fruit seller what they were called.

But who wrote the names? Before mass education, most people in the Malay world were illiterate. “Penmanship”, noted Amin Sweeney and Nigel Phillips, “was an exclusive art”.⁸ Literature flourished almost only within palace walls. Still, there lived in the European entrepôts like Melaka and Batavia (present-day Jakarta) a handful of professional Malay scribes who served as secretaries and polyglot interpreters for merchants and diplomats: Munshi Abdullah and his father, for instance. Someone of such standing and occupation could have been the ghostwriter. It is almost certain that a folio like this could have only been produced in one of the few Malay-speaking, European-controlled ports along the Straits: Melaka and Penang on the Malay Peninsula, or Bencoolen (now Bengkulu) in Sumatra.

The William Farquhar Collection also has Jawi labels, but like the anonymous Chinese artists who did the illustrations, the identity of the author of the labels remains elusive.

Following the Watermelon’s Lead

There are only two pieces in the entire Dumbarton Folio that find almost exact matches in another collection of botanical art. A few months after encountering

Dumbarton’s Malay fruits, I chanced upon the watermelon’s twin in Mildred Archer’s catalogue, *British Drawings in the India Office Library*.⁹ It was listed as being part of a folio simply titled NHD 42, housed at the Prints and Drawings Room of the British Library. Leafing through the large sheets of drawings in the Asian and African Prints Room of the British Library, I discovered a pomelo study among the 10 watercolours in NHD 42 that was also an almost exact twin of the one in the Dumbarton Folio.

Unfortunately, the British Library has no idea who NHD 42 was made for and why, but at least they have firmer dates: the watermark on the sheets of paper used for the drawings is from 1807, so the NHD 42 most likely dates back to 1808. This places it comfortably within Archer’s 1798–1810 range for the Dumbarton Folio. The artist is also a Chinese “probably from Sumatra”, and the drawings “appear to have been borrowed by the Marsdens in 1809”.¹⁰

There can only be one pair of “Marsdens” where Sumatra is concerned: William Marsden and his wife Elizabeth. The former’s landmark book, *The History of Sumatra*, published in 1783, was a magisterial survey of the island, with observations on its cultures, languages and physical environment.¹¹ An Orientalist, William’s work became the model for Stamford Raffles’ more intellectually and morally impoverished *The History of Java* (1817).¹²

Elizabeth contributed the illustrations to her husband’s tome. At some point, Charles Wilkins, her father and himself a leading Indologist, was in possession of NHD 42, and lent it to Elizabeth who adapted some of the drawings for her husband’s book.¹³ Beyond this, nothing more about

this folio is known. Despite the Bencoolen connection, we still do not know where NHD 42 was produced; it found its way to the Marsdens only in England. Therefore, it offers no satisfying clue as to where the Dumbarton Folio was made either.

Nevertheless, the duplicates led me to briefly entertain the possibility of model types, circulated to enable the reproduction of copies produced for a wide clientele expecting the same images. If, however, such an established commercial market existed, with demand sufficient to justify some sort of mass production, we will have likely found many more duplicates and not a mere two drawings. It is far likelier that these duplicates were individually copied.

What is the Dumbarton Folio, then? Its scale and scope do not match that of earlier, more encyclopedic catalogues documenting local ecology in the Malay world. A century earlier, there was Johannes Nieuhof’s *Voyages and Travels, into Brasil, and the East Indies*, for instance, with its elaborate accounts of this region’s flora and fauna, published in 1703.¹⁴ Neither does the folio engage in the kind of intense accumulation of data found in Georg Eberhard Rumphius’ six-volume *Het Amboinsche Kruidboek*, or *Herbarium Amboinense*, a catalogue of the plants of the island of Amboin, published posthumously from 1741 to 1750.¹⁵ By the time the Dumbarton Folio was produced, the field of botany had been established in the region. And while it was likely made slightly before the Farquhar drawings, it falls far short of the latter’s range, but its style is certainly more ornate.

The academic Farish Noor believes that the folio was commissioned as a picturesque record of local flora by a European official, most probably someone

from the British East India Company (EIC), who wanted a souvenir to take home.¹⁶ A lovely present, surely, for a wife none too pleased that her husband's little excursion to the "Far East" had lasted several more years than promised. This was exceedingly common in the 18th and 19th centuries, especially in India, where EIC officials hired local painters to depict ancient monuments, people and, of course, "exotic" plants and animals to be taken home as mementos.¹⁷ Many of these artisans were trained in the courtly tradition of Indian miniature painting, but to suit the European aesthetic preferred by their British patrons, they developed a hybrid Indo-European type of painting now referred to as "Company style" or "Company painting".

(Below) For the sake of comparison, shown here is the durian from the William Farquhar Collection of Natural History Drawings. Gift of G.K. Goh. Courtesy of the National Museum of Singapore, National Heritage Board.

(Bottom) A composite drawing from the Dumbarton Folio featuring the durian, *pulasan*, *rambai* and *rukam*. Image reproduced from *Album of Chinese Watercolours of Asian Fruits*, Dumbarton Oaks Research Library and Collection.



When the EIC officials were posted to Southeast Asia, the Indian artists apparently did not accompany their British employers. However, the EIC officials found a ready pool of Chinese artists steeped in their own tradition of ink painting. Historian Kwa Chong Guan referred to the Farquhar drawings as a "charming and distinct record" of Chinese artists grappling with European demands for realism.¹⁸ Commentators looking at similar collections from the period have christened them collectively as the "Straits school" of botanical art.¹⁹ The Dumbarton Folio is without doubt a product of this tradition.

While drawing upon the representational conventions of botanical illustration, the Dumbarton Folio was not intended as a formal catalogue of nature the same way the Farquhar collection was. What the

folio does, however, is demonstrate the deployment of these conventions as an aesthetic in its own right, to be enjoyed as art. Looking at these drawings, my thoughts floated to the Nanyang Style artists²⁰ and their delicate still lifes in the 1950s: the rambutans, durians and mangosteens of Liu Kang, Chen Wen Hsi and Georgette Chen.²¹ By then, painting local fruits was about capturing the "soul" of Malaya in all its living colour. These Nanyang artists certainly had illustrious predecessors.

The Scientific Cosmopolitanism of the Malay World

When the Dumbarton Folio was made, Europeans still had much to learn about the biodiversity of the Malay Archipelago. It would take the exertions of later naturalists, notably Alfred Russel Wallace (who conceived the theory of evolution through natural selection), Henry Nicholas Ridley (first director of Singapore's Botanic Gardens), Pieter Bleeker (Dutch medical doctor, ichthyologist and herpetologist) and Isaac Henry Burkhill (second director of Singapore's Botanic Gardens), to identify and describe the grand multitude of life in the region. Their illustrated catalogues and scientific encyclopedias brought these strange new forms – now taxonomised and given Latin binomial names – existing on the frontiers of the West's understanding into an ordered familiarity.

The art historian Gill Saunders argues that naming and description was a process of "placing these unfamiliar plants in the existing scheme of things".²² Assimilated into an ever-expanding universal regime of classifying life, modern science alienated these plants and animals from the original cultural contexts in which they were embedded, and through which Europeans first encountered them.

Complicating this, however, is the fact that modern scientific inquiry in the Malay world was not an unmediated process where Europeans simply entered and independently extracted information about local biodiversity for their own curiosity and profit. The Dumbarton Folio embodies the work of science as a cross-ethnic interface – one where European patrons employed Chinese labour to produce images, while Malay botanical knowledge supplied local nomenclature. This is not to downplay the fundamentally unbalanced relationship between the Europeans and their local assistants. Men like Wallace were privileged by their connection to the 19th century's global centres of knowledge, with societies dedicated to botany, geology, zoology and



A composite drawing of the cempedak, rambutan, *nam-nam* and *sentul* from the Dumbarton Folio. Image reproduced from *Album of Chinese Watercolours of Asian Fruits*, Dumbarton Oaks Research Library and Collection.

other scientific disciplines blossoming in places like London and Paris. The colonisation of the Malay world enabled European scientists to travel freely and organise field research in a way that locals could not.

In fact, the Dumbarton Folio demonstrates how local knowledge almost always facilitated European access to new species found in the region. All of those gentlemen-naturalists, celebrated as "great men of science", owed their findings to the labour of local guides and local experts who collected, preserved and identified specimens for them. Their vast tomes also relied heavily on drawn images, often executed by local artists.

Popular narratives about science, with their persistent focus on the trope of "discovery" by an individual genius, have conveniently erased the contributions of these faceless and nameless local individuals. In reality, scientific inquiry is cosmopolitan, and involves the participation of diverse

NOTES

- 1 Farquhar, W. (2015). *Natural history drawings: The complete William Farquhar Collection: Malay Peninsula, 1803–1818*. Singapore: Editions Didier Millet and National Museum of Singapore. (Call no.: RCLOS 508.0222 FAR-[JSB])
- 2 Saunders, G. (1995). *Picturing plants: An analytical history of botanical illustration* (p. 15). Berkeley: University of California Berkeley Press. (Call no.: RART 743.7 SAU)
- 3 Bleichmar, D. (2006). Painting as exploration: Visualising nature in eighteenth-century colonial science. *Colonial Latin American Review* 15 (1), 81–94, p. 90. Retrieved from Taylor & Francis Online.
- 4 Bleichmar, 2006, p. 90.
- 5 Together with Stamford Raffles, the Danish surgeon and naturalist Nathaniel Wallich founded the first botanical garden on Government Hill (now Fort Canning Hill) in Singapore in 1822. Wallich was previously Superintendent of the Royal Gardens in Calcutta, India.
- 6 Archer, M. (1962). *Natural history drawings in the India Office Library* (p. 100). London: Her Majesty's Stationery Office. (Call no.: RART 743.6 ARC)
- 7 Abdullah Abdul Kadir, Munshi & Hill, A.H. (1985). *The hikayat Abdullah: The autobiography of Abdullah bin Rumphius, G.E. (1741). *Herbarium amboinense* (6 vols.). Retrieved from Botanicus.org website. (Not available in NLB holdings). For a commentary, see Hamilton, F. (1824). *Commentary on the Herbarium Amboinense*. [Edinburgh]: [Wernerian Natural History Society]. (Call no.: RCLOS 581.95985 HAM)*
- 8 Sweeney, S., & Phillips, N. (1975). *The voyages of Mohamed Ibrahim Munshi* (p. xxii). New York: Oxford University Press. (Call no.: RSING 959.5 MUH)
- 9 Archer, 1962, p. 100.
- 10 British Library Board. (1807–1809). *NHD* 42. Archives and Manuscripts, The British Library. Retrieved from The British Library website.
- 11 Marsden, W. (1783). *The history of Sumatra*. London: Printed for the author. Retrieved from BookSG. (Call no.: RRARE 959.81 MAR-[JSB]; Accession no.: B030135261)
- 12 Raffles, T.S. (1817). *The history of Java* (2 vols.). London: Printed for Black, Parbury, and Allen, booksellers to the Hon. East-India Company, Leadenhall Street, and John Murray, Albemarle Street. (Call no.: RRARE 959.82 RAF-[JSB]; Accession nos.: B29029409B [Vol. I], B29029410E [Vol. II])
- 13 British Library Board, 1807–1809.
- 14 Nieuhof, J. (1703). *Voyages and travels, into Brasil, and the East Indies*. London: A. and J. Churchill. Retrieved from Cornell University Library Southeast Asia Visions website. [Note: NLB has the 1744 edition. See Nieuhof, J. (1744). *Voyages and travels, into Brasil, and the East Indies*. London: A. and J. Churchill. (Call no.: RRARE 910.41 NIE-[JSB]; Accession no.: B29265189I)]
- 15 Pioneered by artists Cheong Soo Pieng, Liu Kang, Chen Wen Hsi and Georgette Chen in the 1950s, the Nanyang Style integrates Chinese painting traditions with Western techniques from the School of Paris, and typically depict local or Southeast Asian subject matter.
- 16 For more information about these Nanyang artists, see Tan, B., & Creamer, R. (2016). *Liu Kang*; Ho, S. (2015, January 28). *Chen Wen Hsi*; Creamer, R. (2018, January 24). *Georgette Chen*. Retrieved from Singapore Infopedia website.
- 17 Sardar, M. (2004, October). Company painting in nineteenth-century India. *Heilbrunn Timeline of Art History*. Retrieved from The Metropolitan Museum of Art website.
- 18 Farquhar, 2015, p. 327.
- 19 Noltie, H.J. (2009). *Raffles' ark redrawn: Natural history drawings from the collection of Sir Thomas Stamford Raffles* (p. 12). Edinburgh: Royal Botanic Gardens. (Call no.: RSING 508.0222 NOL)
- 20 For more information about these Nanyang artists, see Tan, B., & Creamer, R. (2016). *Liu Kang*; Ho, S. (2015, January 28). *Chen Wen Hsi*; Creamer, R. (2018, January 24). *Georgette Chen*. Retrieved from Singapore Infopedia website.
- 21 Saunders, 1995, p. 65.

languages, the Dumbarton drawings are a symbol of the region's dynamic cultures of consumption, enriched by hybrid interactions and international trade. ♦

Faris Joraimi wishes to record his thanks to Dr Trisha Craig of Yale-NUS College and Professor Sir Peter Crane of the Oak Spring Garden Foundation for making this study possible, as well as Dr Yota Batsaki and Dr Anatole Tchikine for their hospitality throughout his stay at Dumbarton Oaks in 2019.

To access the Dumbarton Folio, visit <https://www.doaks.org/resources/rare-books/album-of-chinese-watercolors-of-asian-fruits>

Nature Conservation in Singapore

Balancing biodiversity conservation with urban development is a hot-button issue in land-scarce Singapore. Ang Seow Leng examines how this process has played out over the last 200 years.

OEven in tiny, highly urbanised Singapore, nature still has the capacity to surprise. In May 2019, the National Parks Board (NParks) revealed that more than 40 species of animals, potentially new to Singapore, were discovered during a comprehensive survey carried out at the Bukit Timah Nature Reserve between 2014 and 2018. The reserve is home to 40 percent of spider species, 84 percent of amphibian species and 56 percent of mammal species.¹

More recently, in September 2020, it was announced that 20 new animal species had been found on Pulau Ubin during the first comprehensive survey of biodiversity on the island, including three species of bats, the buff-rumped woodpecker as well as species of butterflies, dragonflies, damselflies, grasshoppers, crickets and katydids.²

Despite extensive development, Singapore still has immensely diverse wildlife, including critically endangered species like the Sunda pangolin, the Raffles' banded

langur and the straw-headed bulbul. The 720-square-kilometre of land boasts more than 2,000 native plant species, some 57 mammal species, 98 reptile species, 25 amphibian species, 355 species of birds and over 282 species of butterflies. There are also hundreds of fish species living in intertidal mangroves and mudflats, and many more other species.³

Preserving the natural environment from human encroachment, however, took deliberate effort. In fact, just 30 years after the establishment of a trading settlement on the island in 1819, half of Singapore's forests had been cleared for the planting of commercially viable cash crops such as gambier and pepper and for development to meet the needs of a rapidly growing population.⁴

The physical landscape was also reshaped to support urbanisation and commerce. Hills were levelled, swamps filled and coastlines extended. The first effort at land reclamation was carried out in 1822 on the swampy grounds around South Boat Quay.⁵ As a result, little remains of the original rainforests, mangrove swamps and other ecosystems that greeted Stamford Raffles when he arrived in 1819.

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variety of needs, including housing, green spaces, infrastructure, community facilities, workplaces, amongst others".⁷

Laws Protecting Singapore's Biodiversity

It was only in the late 19th century that Singapore began efforts to conserve the natural environment. Birds became the first wildlife in Singapore to be protected from unlicensed killing, wounding or taking when the Wild Birds Protection Ordinance was passed in 1884.⁸ This law followed a magistrate's inquiry that year when it was discovered that as many as 20,000 birds of brilliant plumage had been captured by a single individual within a six-month period in 1883, and were later exported. The threat of these birds becoming extinct, as well as the widespread complaints of insects ravaging paddy fields, led to the Straits Settlements Legislative Council proposing a Wild Birds Protection Bill that would "make it an offence punishable by fine and simple imprisonment to kill or take" birds, other than those that may be lawfully shot such as game birds and birds of prey.⁹

Two decades later, the Wild Animals and Birds Protection Ordinance was enacted in 1904, replacing the Wild Birds Protection Ordinance. The new legislation extended protection from birds to other animals. Singapore also passed the Plumage Ordinance in 1916, which banned the import and export of plumage (this law was in force until 1970).¹⁰

In 1882, Nathaniel Cantley, then Superintendent of the Botanic Gardens in Singapore, conducted a survey of forests in the Straits Settlements and made recommendations for their management. He estimated that only 7 percent of the original forest were still intact at the time of the survey.¹¹

At the time, there were no laws or regulations to offer legal protection to the forests. Cantley proposed creating forest reserves to stop illegal deforestation, identifying forest reserves for the supply of wood for general purposes, protecting mountain and river reserves where necessary, and introducing an ordinance for better conservation of the Crown forest. In 1883, the first forest reserves were identified and administered by the newly established Forest Department under the Singapore Botanic Gardens with Cantley as its first director.¹²

In 1908, the Forest Ordinance was finally passed. The legislation prohibited trespassing or cattle grazing in a reserved forest, and made it an offence to cut, collect or remove forest produce such as soil, minerals, plant parts, honey, wax and guano without proper authorisation. In Singapore, 15 areas were gazetted as forest reserves:



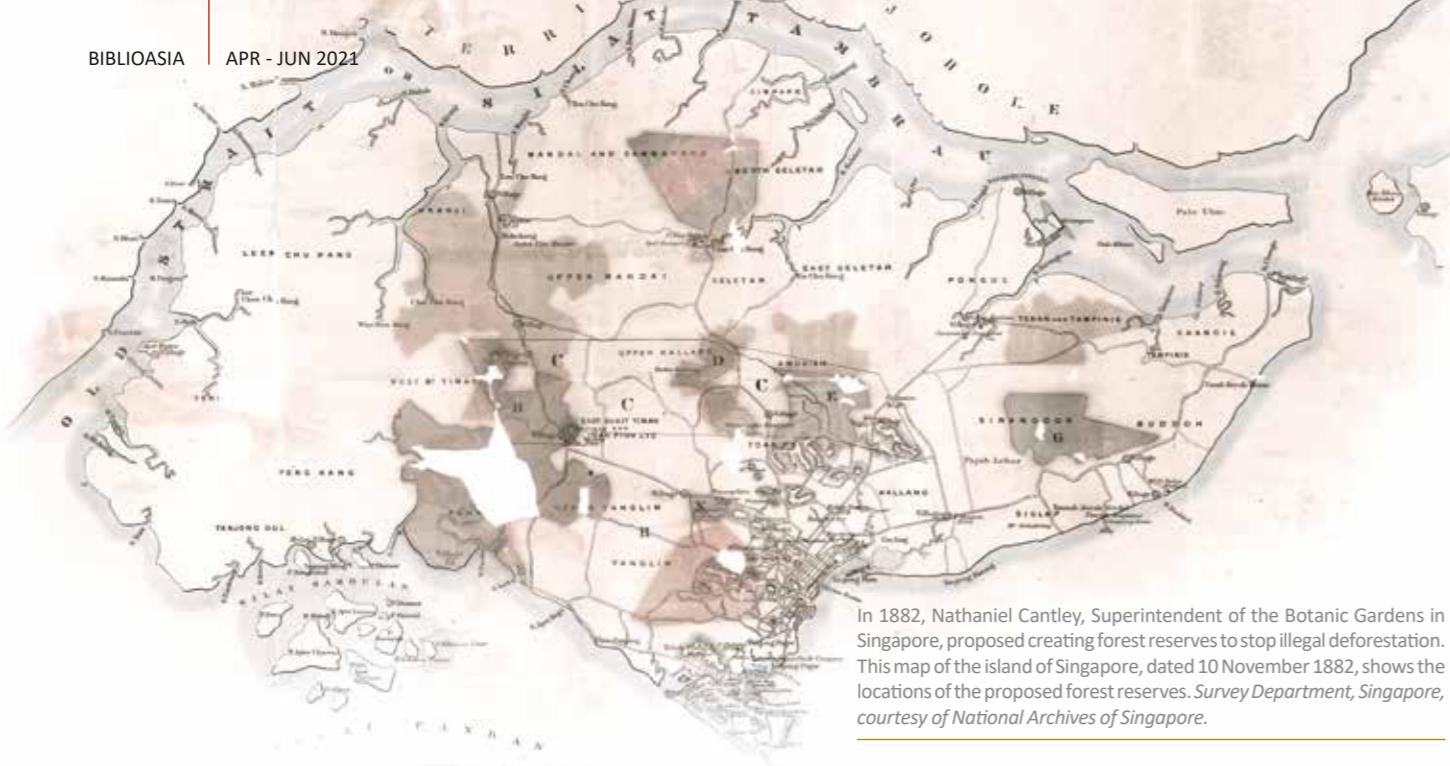
Sungei Buloh, Kranji, Murai, Tuas, Choa Chu Kang, Bukit Panjang, Bukit Mandai, North Seletar, Bukit Timah, Ang Mo Kio, South Seletar, Changi, Jurong, Pandan and Sembawang.¹³

However, in 1925, 17 years after the enactment of the Forest Ordinance, the colonial government began questioning the value of preserving forest reserves in Singapore. The annual report on the forests of the colony for that year stated that "really effective management of the Singapore forests is possible only at a cost which the forests themselves do not

(Top right) The Raffles' banded langur, 2020. Named after Stamford Raffles and native to Singapore and southern peninsular Malaysia, the primate was once common throughout Singapore but its population is now critically endangered. The main threat to its survival is the loss of habitat. Photo by Andie Ang. Retrieved from Wikimedia Commons (CC BY-SA 4.0).

(Below) "Rolling Timber Through Jungle to River, Straits Settlements Court", a wood engraving published in the Illustrated London News, 1886, depicting the economic opportunities of the forests of the Straits Settlements. By the late 19th century, much of the primary forest in Singapore had been cleared for cash crops and a growing migrant population. Courtesy of the National Museum of Singapore, National Heritage Board.



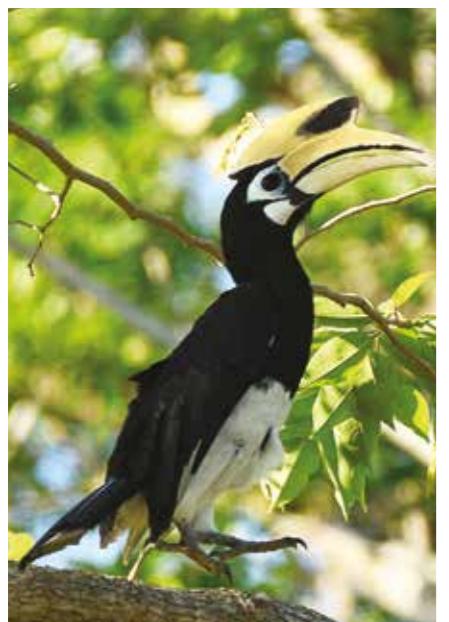


In 1882, Nathaniel Cantley, Superintendent of the Botanic Gardens in Singapore, proposed creating forest reserves to stop illegal deforestation. This map of the island of Singapore, dated 10 November 1882, shows the locations of the proposed forest reserves. Survey Department, Singapore, courtesy of National Archives of Singapore.

seem to justify". This was because none of the reserves were deemed to be of great value, with substantial areas leased out on temporary occupation licences to vegetable growers. The report further mentioned that the reserves could never meet the demand for timber and firewood.¹⁴

In 1931, the government deliberated over a proposal to revoke all forest reserves in Singapore because these were unable to generate revenue from timber production and were expensive to maintain. It was also difficult to prevent

The oriental pied hornbill, a species native to Singapore, once declined in numbers to the point of local extinction. Successful conservation efforts in recent years have seen these majestic creatures taking to the skies once again. Courtesy of Quek Yew Hock, NParks SG BioAtlas/BIOME.



encroachment by illegal squatters and stop illegal cutting.¹⁵

Five years later, all forest reserves were revoked in Singapore, although selected areas like some parts of the Bukit Timah forest were protected. This was after the Commissioner of Lands reported that the forest reserves of Singapore were made up largely of "market gardens, villages and granite quarries".¹⁶

In 1939, Bukit Timah, Pandan and Kranji were re-gazetted as forest reserves and came under the management of the Director of Botanic Gardens as the Conservator of Forests.¹⁷ Bukit Timah was found to offer samples of interesting plants for research by students, while the other two reserves were mangrove forests.¹⁸

After the Japanese Occupation (1942–45), Richard Eric Holtum, then Director of the Botanic Gardens, pushed for legislation to protect the Bukit Timah forest reserve and possibly other areas as "sanctuaries for wild life of all kinds".¹⁹ He also contributed an article in *The Straits Times*, explaining that the "mangrove is a land-building agent of major importance in the wet tropics", besides being a sanctuary for plants and animals.²⁰

In 1951, a select committee on granite quarries and nature reserves called for the inclusion of the municipal water catchment area, the Crown land including the cliff at Labrador, and the two forest reserves of Pandan and Kranji as nature reserves. As the nature reserves would be extended to mangrove swamps, the committee pointed out that the latter might contain species of extinct orchids

that could have a chance of reappearing when the mangroves began regenerating. These areas also provided shelter to animals and birds not found elsewhere on the island.²¹

This led to the Nature Reserves Ordinance, which came into force in 1951. The law aimed to protect and preserve flora and fauna in the nature reserves and provide opportunities for their study and research within the natural environment in which they live. The ordinance evolved into the Nature Reserves Act in 1985, which was repealed and replaced by the National Parks Act in 1990.²²

With growing awareness and calls for the conservation of nature areas, Singapore currently has 24 nature areas comprising the four main nature reserves – Bukit Timah Nature Reserve, Central Catchment Nature Reserve, Sungei Buloh Wetland Reserve and Labrador Nature Reserve – as well as 20 other areas that are subject to administrative safeguards under the Parks and Waterbodies Plan. The four nature reserves are protected under the Parks and Trees Act.²³

Nature Conservation in the Last 40 Years

A more consolidated approach towards nature conservation emerged with the formation of NParks in 1990 to manage the national parks, then comprising the Singapore Botanic Gardens, Fort Canning Park and the nature reserves. In 1996, the Parks and Recreation Department merged with NParks to streamline the management of parks under one single organisation.²⁴

Today, NParks is responsible for propagating, protecting and preserving "the animals, plants and other organisms of Singapore and, within the national parks, nature reserves and public parks, to preserve objects and places of aesthetic, historical or scientific interest".²⁵ NParks also administers the following laws that protect Singapore's flora and fauna: Animals and Birds Act; Control of Plants Act; Endangered Species (Import and Export) Act; Parks and Trees Act; and Wildlife Act.

In 1986, Singapore joined the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). It is currently among the 183 countries bound by an international agreement that regulates international trade in endangered species of wild animals and plants through a system of licences.²⁶ During the signing of the CITES treaty, then Minister for the Environment Ong Pang Boon noted that "the [Southeast Asian] region was at the crossroads of a thriving international trade on flora and fauna, which if left unchecked could lead to the irreversible loss of valuable species".²⁷

Singapore is also a signatory to the International Convention on Biological Diversity arising from the Rio Earth Summit in 1992. That same year, the Singapore Green Plan – the nation's first environmental blueprint – was launched to develop an economic growth model for Singapore without compromising or causing harm to the environment in any way.²⁸ The blueprint charted the strategic directions that Singapore would adopt, looking into all areas of environmental concerns and presenting proposals to preserve, protect and enhance the environment for the future. The plan also proposed that up to 5 percent of Singapore's land area would be set aside for protection as nature conservation areas.²⁹

In 2002, the Singapore Green Plan 2012 was launched to better address conservation issues as new ideas and concerns had emerged in the preceding decade, such as transboundary air pollution and climate change as a result of greenhouse gas emissions. In 2006, a revised edition of the earlier green plan was released which called for establishing more parks and green linkages, and the setting up of a National Biodiversity Reference Centre (now renamed National Biodiversity Centre).³⁰ Under the purview of NParks, the centre was established in 2006 as a "clearing house not only for centralising biodiversity data about

Singapore, but also for co-ordinating and facilitating research in biodiversity and ecology issues".³¹

Recent Initiatives

The National Biodiversity Strategy and Action Plan (NBSAP) announced in 2009 by NParks aimed to address both policy frameworks and specific measures for better planning and coordination in the sustainable use, management and conservation of Singapore's biodiversity, taking into consideration the country's national priorities as well as its international and regional obligations.³²

The action plan was updated in 2019, incorporating input from various public sector agencies and nature groups. Close to 10 percent of Singapore's total land area would be set aside for parks and nature conservation, up from the 5 percent proposed in the 1992 Singapore Green Plan.³³

In 2015, NParks launched the Nature Conservation Masterplan to chart the course of Singapore's future biodiversity conservation efforts. It aimed to "systematically consolidate, coordinate, strengthen and intensify the biodiversity conservation efforts outlined in [the] NBSAP".³⁴

More recently, in 2021, the Singapore Green Plan 2030 – spearheaded by government ministries in charge of education, national development, sustainability and the environment, trade and industry, and transport – was unveiled.³⁵ One of the key pillars in the green plan is the "City in Nature" strategy. This means that by 2030, Singapore would have an additional 1,000 hectares of green spaces and 160 km of park connectors, every household would live within a 10-minute walk from a park, and 1 million more trees would be planted across the island.³⁶

View from Jelutong Tower in the Central Catchment Nature Reserve. This reserve, along with Bukit Timah Nature Reserve, Sungei Buloh Wetland Reserve and Labrador Nature Reserve, make up the four main nature reserves in Singapore. Image reproduced from Chua, E.K. (2015). Rainforest in a City (p. 21). Singapore: Simply Green. Collection of the National Library, Singapore. (Call no.: RSING 577.3409597 CHU).



Nature Society (Singapore)

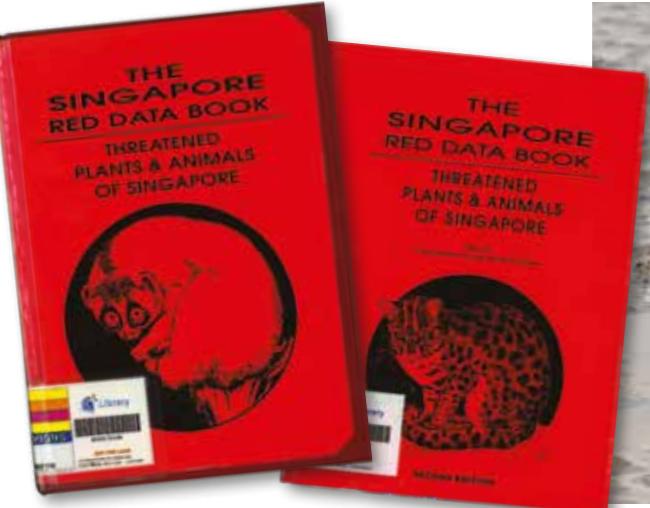
While the state has played an important role in conserving nature by passing legislation and promoting government policies to green Singapore, non-governmental organisations have played an important role too. Perhaps the most prominent of these is the Nature Society (Singapore), or NSS.

The NSS is one of the oldest non-governmental organisations in Singapore, with roots dating back to 1921 when its predecessor, the Singapore Natural History Society, was formed. Although the society later faded away, a new society – the Malayan Nature Society (MNS) – was established in 1940 and based in Malaya. In 1954, the Singapore section of the MNS was founded. It eventually separated from the MNS in 1991 and became an independent entity in 1992.³⁷

Since the 1980s, the NSS has been actively working with passionate individuals and associated groups in researching, documenting, surveying and partnering with the government and other stakeholders in joint projects like the biological survey of the Central Catchment Nature Reserve and the Bukit Timah Nature Reserve.³⁸ Over the years, the society has issued various nature conservation plans, proposals and biodiversity works and reports, and was the first to propose a Master Plan for the Conservation of Nature in Singapore in 1990. The plan, which listed protected nature reserves and relatively unknown areas of secondary forests that were noted for their rich birdlife, was referenced by the government for policymaking and planning.³⁹

(Below) The Nature Society (Singapore) first published *The Singapore Red Data Book: Threatened Plants & Animals of Singapore* in 1994. It became an indispensable source of reference for conservation plans and efforts in Singapore. The publication was updated in 2008. Davison, G.W.H., Ng, P.K.L., & Ho, H.C. (Eds.). (2008). *The Singapore Red Data Book: Threatened Plants & Animals of Singapore*. Singapore: Nature Society. Collection of the National Library, Singapore. (Call no.: RSING 591.68095957 SIN).

(Below right) The Sungei Buloh Wetland Reserve opened as a nature park in 1993, was gazetted as a nature reserve in 2002 and became Singapore's first ASEAN Heritage Park in 2003. One of the migratory birds found at the reserve every year between August and April is the common redshank, which originates from Mongolia, the Russian Far East and China. The bird's distinguishing feature is its long bright orange-red legs. Courtesy of Mendis Tan, NParks.



In 1994, the NSS published *The Singapore Red Data Book*. The publication became an indispensable source of reference for conservation plans and efforts in Singapore, complementing the global list of threatened species maintained by the International Union for the Conservation of Nature.⁴⁰ To reflect the significant changes in Singapore's landscape and new conservation locales, the book was updated in 2008 as a joint project of the NSS, NParks, the Raffles Museum of Biodiversity Research (known as the Lee Kong Chian Natural History Museum since 2015) and the Tropical Marine Science Institute.⁴¹

The NSS' first success at convincing the government to preserve an area for nature conservation is the Sungei Buloh Wetland Reserve.⁴² It was opened as a nature park in 1993, then gazetted as a nature reserve in 2002 before becoming Singapore's first ASEAN Heritage Park the following year.⁴³

Another success story is the preservation of the Keretapi Tanah Melayu (KTM) Railway land as a green corridor for flora and fauna to thrive as well as a recreation area for the public. Prior to the closure of the KTM Railway, NSS submitted a proposal to the government, *The Green Corridor: A Proposal to Keep the Railway Lands as a Continuous Green Corridor*, explaining that the railway track runs through the heart of Singapore and serves as a continuous green corridor connecting many green spaces together. The green corridor is also a potential contender as a future World Heritage Site.⁴⁴

Similarly, in 1994, an appeal to conserve land at Senoko in Sembawang as a nature park was rejected by the Ministry of National Development. A working group convened by the ministry, comprising representatives from both the public and private sectors, had weighed various options before deciding not to conserve the site.⁴⁵

Today, the society continues to promote nature awareness and nature appreciation, and to advocate the conservation of Singapore's natural environment.

After the last train pulled out of Tanjong Pagar Railway Station on 30 June 2011 and the closure of the railway the following day, the Singapore Land Authority took over the stewardship of the land and worked closely with the NSS Green Corridor Watch Group. The latter had been formed as a volunteer service to patrol the entire corridor, reporting issues such as overgrowth, fallen trees and illegal encroachment.⁴⁶

However, not all appeals to the government for areas to be conserved have been successful. In May 1992, the society had asked the government to reconsider filling up the duck ponds at the reclaimed Marina South area as these ponds had become breeding and feeding grounds for several bird species. The Ministry of Environment rejected the request, citing the area as "man-made" and that it might become a public health hazard due to rampant mosquito-breeding in the waterlogged environment.⁴⁷

Singapore has two of the world's four species of horseshoe crabs – the coastal horseshoe crab (shown here) and the mangrove horseshoe crab. Courtesy of Ria Tan, Wild Singapore.



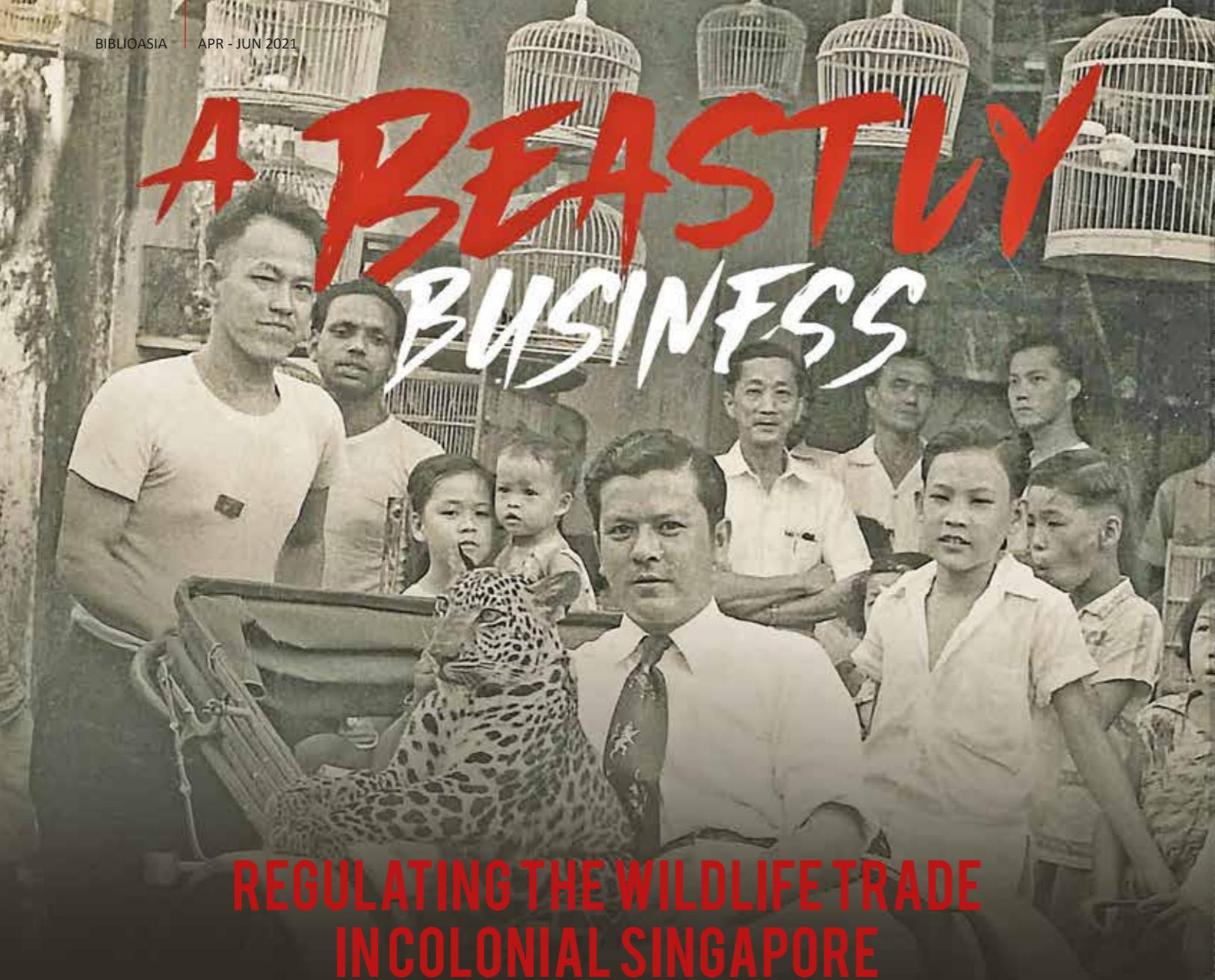
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Human Versus Nature

Just like any complex and multilayered ecosystem, nature conservation requires the combined efforts of stakeholders at all levels in order to undertake and manage conservation efforts in a sustainable way.

As NParks works towards making Singapore a "City in Nature", non-governmental organisations such as the NSS, interested individuals and even the ordinary man in the street also play key roles in educating, creating awareness and seeking cooperation among all Singaporeans in the preservation of our biodiversity and natural heritage. Policymakers and conservationists have to continually work closely together in order to find a middle ground that will enable Singapore to preserve its biodiversity and, at the same time, plan for its future requirements. ♦



The 1933 *Report of the Wild Animals and Wild Birds Committee* represents a failed attempt to regulate the buying and selling of wildlife in pre-war Singapore, says Fiona Tan.

Amid growing public concerns about animal welfare in Singapore in the early decades of the 20th century, Straits Settlements Governor Cecil Clementi convened a committee in 1933 to examine the import and export trade of wild animals. Completed at the end of 1933 and presented to the Legislative Council in April 1934, the resulting 21-page report was one of the earliest and most comprehensive

efforts to investigate the wildlife trade in Singapore. The report, however, failed to lead to improvements, illustrating the challenges faced by the British colonial government of the day in regulating the wildlife trade on the island. The lack of political will, the rise in smuggling and the increasing international demand for exotic animals scuttled efforts and exacerbated the problem.

The "Beastly Business" of the Wildlife Trade

The wildlife trade in island Southeast Asia existed long before the arrival of the Europeans in this part of the world.¹ From elephants used in royal processions, to birds kept as pets or killed for their plumage, to the capture and release of animals for religious purposes – the sale of wildlife had been part and parcel of life in Southeast Asia for centuries. However, the rise of animal acts, travelling circuses, zoological gardens and pet shops in Europe and America in the 19th century further fuelled the in-

Fiona Tan is an Archivist with the Records Management department at the National Archives of Singapore. She started her journey with the archives as an undergraduate studying history, poring over microfilms at the old Archives Reading Room. This research formed the basis of her dissertation, which is abridged in this article.

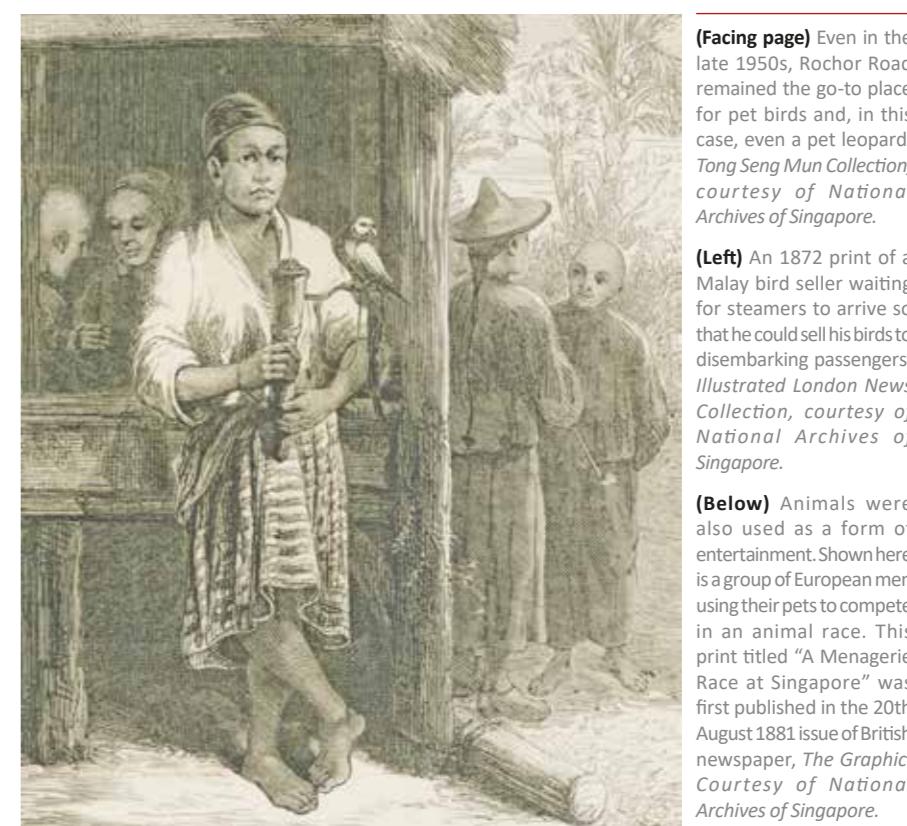
ternational trade in exotic live animals. As a key trading port in the region, colonial Singapore – strategically located along the East-West trade route between the South China Sea and the Indian Ocean – developed into one of the most important centres for the international wildlife trade.

As early as 1839, traveller and Orientalist Thomas John Newbold described how the Malays were “admirable snarers” of birds and wild animals.² And in 1878, during his visit to Southeast Asia, American zoologist William Hornaday remarked, “had I been a showman or collector of live animals, I could have gathered quite a harvest of wild beasts in Singapore”. Tigers, rhinoceroses and orangutans were worth more than \$100 each, while tapirs and slow lemurs could be bought for \$2 per animal.³

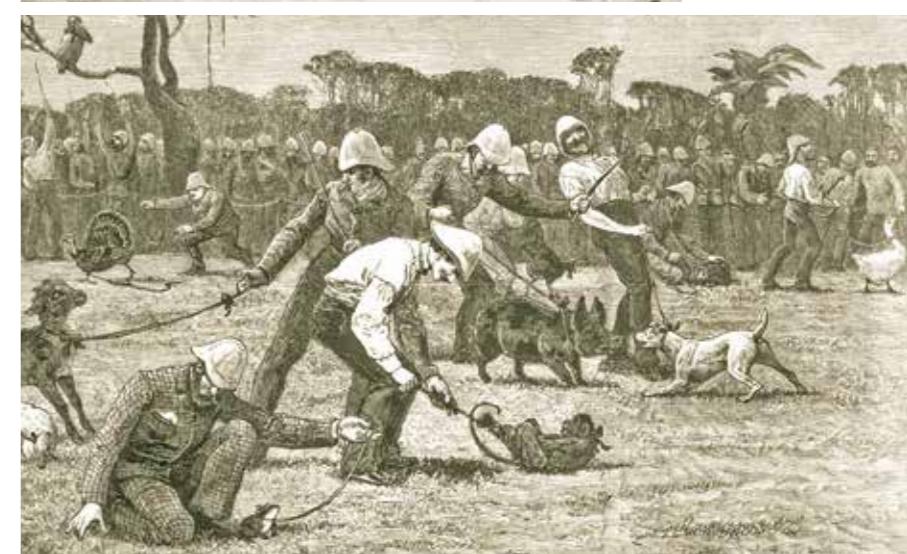
Europeans and Americans began to make inroads into the wildlife trade scene in Southeast Asia in the late 19th century. In his memoir, American animal collector Charles Mayer described how he broke the local monopoly in Singapore by going directly to Palembang, a city in Sumatra, to collect animals. These animals were stored temporarily in a house on Orchard Road in Singapore before being shipped to American circuses or Australian zoos.⁴ American hunter, animal collector, actor and producer Frank Buck, who starred in the 1932 film *Bring 'Em Back Alive* – about his animal collecting efforts – had a similar modus operandi in place during the interwar years. He maintained a compound in Katong to house his wild animals while he travelled to Borneo, Malaya and the Dutch East Indies to hunt.

Despite the entrance of these foreign animal dealers, local animal traders continued to play an important role. In fact, there was sometimes a symbiotic relationship between foreign animal dealers and local animal traders, as seen in Buck's accounts of his dealings with Chop Joo Soon Hin, a bird shop on North Bridge Road. Buck described the trader as an “old friend” who often provided him with information about auctions of exotic wildlife.⁵ However, unlike foreign animal dealers such as Mayer and Buck, these local traders left minimal archival traces of their activities.

Colonial Office records reveal that Singapore was the centre of the thriving wildlife trade in 1933, making up almost all the exports of birds and other animals, and importing at least 60 percent of birds and almost 98 percent of other animals compared to other territories in the Straits Settlements and British Malaya.⁶ The



(Facing page) Even in the late 1950s, Rochor Road remained the go-to place for pet birds and, in this case, even a pet leopard. *Tong Seng Mun Collection, courtesy of National Archives of Singapore*.



(Left) An 1872 print of a Malay bird seller waiting for steamers to arrive so that he could sell his birds to disembarking passengers. *Illustrated London News Collection, courtesy of National Archives of Singapore*.

(Below) Animals were also used as a form of entertainment. Shown here is a group of European men using their pets to compete in an animal race. This print titled “A Menagerie Race at Singapore” was first published in the 20th August 1881 issue of British newspaper, *The Graphic*. Courtesy of National Archives of Singapore.

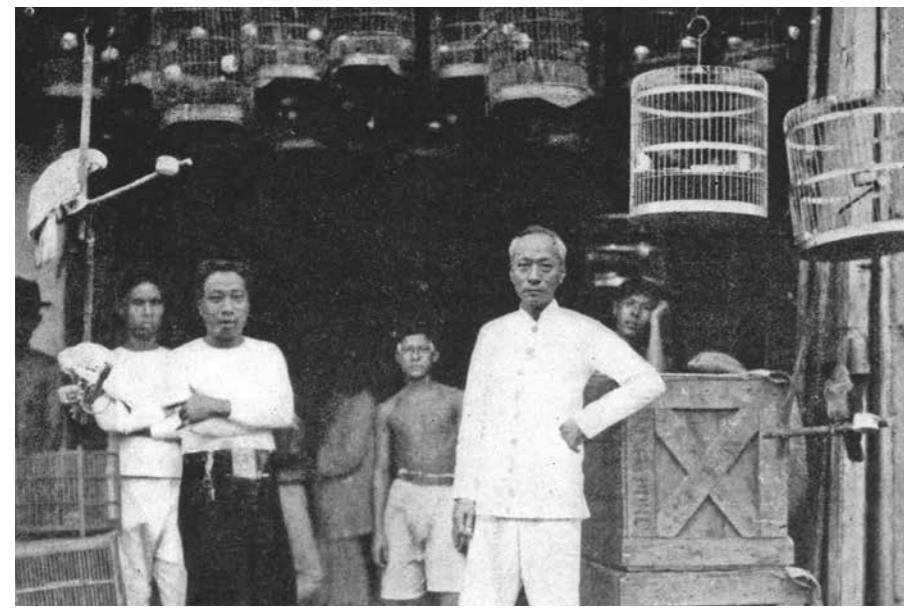
exports to Europe and North America also reflected how Singapore's wildlife trade was plugged into the international demand for exotic animals.

The lackadaisical and indifferent attitudes towards the wildlife trade began to change as animal welfare movements became active during the colonial period. Some of the strongest critics of the wildlife trade were also champions of animal welfare and were among the most influential members of society. They included people like prominent businessman Tan Cheng Lock, a vocal member of the Straits Settlements Legislative Council who likened the “cruel commercial exploitation of wild life”

in Singapore to a “slave trade” in these “poor denizens of the forest”.⁷

The heightened interest in animal welfare issues during the interwar period was also evident from the interest it aroused during Legislative Council proceedings in the late 1920s and well into the 1930s. In 1927, a five-man committee was appointed to investigate the alleged prevalence of cruelty to animals. The committee produced a four-page report that described the situation at bird shops, abattoirs and ports. Although the report concluded there was “not a prevalence of cruelty” except for “accidents” caused by “carelessness”, not everyone agreed with this finding.⁸

Chop Joo Soon Hin at 532 North Bridge Road was one of the shops that the 1933 Wild Animals and Wild Birds Committee investigated. The shop was frequented by American animal dealers. *Image reproduced from Buck, F.H. (1922, August). A Jungle Business. Asia: The American Magazine of the Orient, 22 (8), 633–638.*



In 1928, in response to that report, Tan Cheng Lock spoke up on the subject of "humane slaughtering" of animals.⁹ The next year, he and fellow Legislative Council member Husein Hasanally Abdoolcader advocated an update to the Ordinance on Cruelty to Animals, which resulted in a new Prevention of Cruelty to Animals Bill presented to the Legislative Council in 1930.¹⁰

This animal welfare movement was not simply about people's sentiments towards animals. The British viewed it as a "mark of civilisation" that differentiated them from the "barbaric" Asians. In 1924, a letter to *The Straits Times* roundly criticised the "mental attitude of the Asiatics" in disparaging terms, claiming that they had allegedly ignored a crippled dog that had been run over and was lying in front of a Chinese house and within 50 yards of the Siglap police station. The letter writer eventually shot the dog to put it out of its misery.¹¹

Although Europeans and Americans were also involved in the wildlife trade, the voices disparaging the wildlife trade tended to blame it on non-Europeans, commenting that the "disgraceful cruelty" was perpetuated just to "fill the pockets of those, most of whom (perhaps all), are not even British subjects".¹² The countless reports of Asians being fined for cruelty towards animals also reflected the widespread stereotypical view of the callous Asian vis-à-vis the enlightened British.¹³ The involvement of Europeans and Americans in the illegal animal trade was hardly reported, pointing to the racial bias and discrimination faced by the Asian community.

Legislating the Protection of Wildlife

Legislation to protect wildlife in the Straits Settlements dates back to 1884, when the Wild Birds Protection Ordinance was passed. The Wild Animals and Birds Protection Ordinance issued in 1904, which superseded the 1884 legislation and now included animals, vested the government with the power to declare closed seasons for hunting certain wildlife. These laws, however, only prohibited hunting and did not address the inherent problems related to the trade in non-indigenous wildlife. Only after pressure from officials in the Dutch East Indies and London did the Straits Settlements government take action to implement legislation protecting non-native species.

In Singapore, the commission unanimously agreed on the need to regulate and license wild animal and bird shops operating on the island. In February 1931, Hubback had accompanied Colina Hussey, Vice-President of the Society for the Prevention of Cruelty to Animals, on a visit to various bird and animal shops owned by Asians that were located along Rochor Road and North Bridge Road. Hubback concluded that there was "serious overcrowding" as well as the presence of birds, such as the crowned pigeon, that were prohibited for export from the Dutch East Indies.¹⁴

The *Report of the Wild Life Commission of Malaya* was published in 1932. Described as an exhaustive inquiry prepared with "extraordinary thoroughness" which reached "somewhat forbidding proportions", the three-volume publication contained a general survey of the status of wildlife in Malaya, lists of wildlife enactments in other countries and in Malaya, and a comprehensive draft Enactment for the Preservation of Wild Life.²⁰ Although the report briefly noted the issues with the wildlife trade, it also highlighted that the magnitude of the problem in Singapore warranted a separate investigation.²¹

Singapore "consider the desirability of legislative action prohibiting the importation into the Colony of orangutans".¹⁵

In response, the British colonial government passed laws to limit wildlife trade. During the first reading of the proposed Wild Animals and Birds (Amendment) Bill in the Legislative Council meeting on 24 March 1930, which sought to prohibit the unlicensed importation of orangutans, Attorney-General Walter C. Huggard said that the "object of this amending Bill... is to enable this Government to co-operate with the Government of the Netherlands East Indies".¹⁶ By 1933, the list of animals and birds prohibited for importation from the Dutch East Indies under the Schedule of the Wild Animals and Birds Ordinance had increased to 28 species from just the solitary orangutan previously.¹⁷

Within British Malaya, the conservationist movement was led by Theodore Hubback, a Pahang planter and former big-game hunter who became an "indefatigable champion of Malayan wildlife".¹⁸ As Chairman of the Wild Life Commission of Malaya in 1930, Hubback conducted interviews in Singapore and throughout the various states of Malaya between August 1930 and March 1931, gathering accounts from Europeans and Malays as well as elite Chinese and Indian residents on wildlife issues.

The Wild Animals and Wild Birds Committee

On 21 July 1933, Governor of the Straits Settlements Cecil Clementi appointed a committee to inquire and make recommendations on "(a) The import and export trade in Wild Animals and Wild Birds in Singapore... and (b) The suitability or otherwise of the methods adopted in Singapore... for the transport, housing and care of Wild Animals and Wild Birds... so as to ensure humane treatment [of them]."²² The Wild Animals and Wild Birds Committee comprised Chairman Theodore Hubback; and members Frederick Nutter Chasen, Director of the Raffles Library and Museum; Tan Cheng Lock; Municipal Commissioner Harry Elphick; and Municipal Veterinary Surgeon James Thompson Forbes.²³

The committee's terms of reference were to inquire and report on the retail trade in wild animals and wild birds, "with special reference to the control and supervision desirable so as to ensure humane treatment for them". The *Report of the Wild Animals and Wild Birds Committee* was completed on 22 December 1933 and presented before the Legislative Council on 16 April 1934.²⁴

The scope of the committee's investigations was limited to businesses such as the Asian animal traders on Rochor Road, which had been the subject of "much adverse criticism... in the local press". Although private zoos such as those owned by Herbert

de Souza on East Coast Road and William Basapa in Punggol were mentioned, these were considered "beyond the scope of small retail traders".²⁵

The committee's focus on the Rochor Road shops and the conspicuous absence of foreign animal dealers mirrored the government's discriminatory attitudes towards non-Europeans involved in the business. Unlike the Rochor Road traders, the committee believed that private zoo proprietors such as de Souza and Basapa and foreign animal dealers like Buck did not ill-treat their animals, and hence excluded them from specific scrutiny and investigation. To support this, the report cited Government Veterinary Surgeon George Rocker, who said that "the *bona fide* agent and dealer in wild animals for zoological gardens and collectors usually carried[d] on his business in a satisfactory manner... [because] the high monetary value of his stock for an animal kept under unfavourable conditions rapidly depreciates in marketable worth".²⁶

This assumed distinction between "*bona fide*" agents and "*unscrupulous*" Asian animal traders, however, reflected the committee's personal biases rather than reality. One of the shops the committee took to task was Chop Joo Soon Hin, operating at 532 North Bridge Road and mentioned in Frank Buck's *Bring 'Em Back Alive* as a key local animal shop frequented by American wildlife dealers.²⁷ As a supplier to well-known animal dealers, it is difficult

to imagine how the proprietor of Chop Joo Soon Hin could not be considered a *bona fide* agent who was aware of the value of his animals.

Moreover, developments in the late 1930s revealed that the private zoos which the committee exempted from scrutiny were not necessarily above the ill-treatment of animals. For instance, in 1938, the Singapore Rural Board commented on the "appalling stench" emanating from the poorly ventilated cages of the Punggol Zoo.²⁸

The *Report of the Wild Animals and Wild Birds Committee* cited how Asians attempted to strike back – on the rare occasion that they did. It mentioned a letter submitted by four local animal traders – Chop Joo Soon Hin, Chop Kian Huat and Co, Chop Guan Kee and Chop Cheng Kee – objecting to the committee's suggestion of a central market for the bird and small-mammal trade. In addition to their concerns regarding the "prevailing bad state of business" and the necessary readjustment of operating hours, one of their moral justifications for the rejection of a central market was that "many species of birds, such as the canary, [could not] withstand the breeze and as a result their feathers [would] wither and they [would] soon collapse".²⁹

The committee easily picked apart this argument by pointing out that the Asian shopkeepers neglected the welfare of other animals in their perhaps misplaced

(Below) Orangutans were illegally imported into Singapore in the early decades of the 20th century. Their continued smuggling from the Dutch East Indies was an impetus for the 1933 Wild Animals and Wild Birds Committee. *Lim Kheng Chye Collection, courtesy of National Archives of Singapore.*

(Below right) Theodore Hubback (right) was a Pahang planter and former game hunter. Here he is seen posing with a dead elephant. Hubback later became an "indefatigable champion of Malayan wildlife" and Chairman of the Wild Animals and Wild Birds Committee. *Image reproduced from Hubback, T.R. (1912). Three Months in Pahang in Search of Big Game (between pp. 58 and 59). Singapore: Kelly & Walsh, Limited. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 799.295113 HUB; Accession no B0283576E).*



concern for the canaries which, after all, did not seem to experience any severe effects from exposure to strong winds.³⁰ Positioning the welfare of the birds as a central argument showed a creative, but unfortunately unsuccessful, attempt by Asian dealers at pushing back.

The committee made four broad recommendations: construct a central market for the sale of animals; restructure the system of authority overseeing the wildlife trade by placing it under the governance of a central Malaya-wide body; refine legislations to prosecute smugglers of wildlife; and issue licences for the importation of protected species of wildlife and the operation of private zoos in Singapore.³¹

The Reluctance to Regulate

Despite favourable public opinion lauding the formation of the Wild Animals and Wild Birds Committee, none of the report's recommendations were subsequently implemented.

One of the main reasons for its failure was the reluctance at various levels of government – comprising the Legislative Council, the Executive Council and the Municipal Commission – to take responsibility for, and to implement, the recommendations. The Municipal Commissioners discussed the committee's recommendations in a meeting on 4 May 1934 but concluded that "expenditure from the Municipal Fund for the establishment of a market for the purposes proposed [that is, the sale of birds and small mammals not for food] would be illegal".³² As *The Straits Times* commented:

"The report followed years of agitation in the Press... against a

very disgraced state of affairs. There had been almost complete unanimity in urging that something should be done... But the optimists failed to make allowance for the reluctance of public bodies to undertake anything which they might conveniently push on to someone else. Apparently the ball of responsibility was tossed to and fro between the Government and the Municipality until public interest in the question became dim."³³

There was also little financial incentive to regulate the wildlife trade and its associated products as these were not economically valuable to Singapore. In 1933, the value of imports of "Animals not living for food" was \$172,377 while exports totalled \$31,935. This was about 0.05 percent of the total value of imports

into the colony and just 0.009 percent of total exports. In comparison, rubber and gutta percha collectively made up about 6 percent of total imports and 21 percent of total exports.³⁴ Furthermore, the revenue received from licensing shops selling wild animals and birds in 1933 was about \$78, a mere pittance when compared to the revenue from opium that year, which was almost \$4.3 million.³⁵

The proposal of a central agency to oversee wildlife trade in the whole of Malaya was also seen as a direct challenge to the decentralisation policy championed by Governor Cecil Clementi Smith beginning in 1930.³⁶ The report was viewed as another instance of "kick[ing] against the bricks" of decentralisation and was not to be taken too seriously.³⁷

The personality and methods of Hubback, the committee's chairman, did not

Report of the Wild Animals and Wild Birds Committee, Singapore, 1933. The committee was convened to inquire and report on the retail trade in wild animals and wild birds, and to ensure their humane treatment. Image reproduced from Hubback, T.R., et al. (1934). *Report of the Wild Animals and Wild Birds Committee, Singapore, 1933.* Singapore: Government Printing Office. Collection of the National Library, Singapore. (Call no.: RRARE 338.3728 SIN; Accession no.: B02978387K).



NOTES

- 1 Elephants were imported and traded in the region before colonial rule from places as near as Java and Melaka to as far away as India. See Boomgaard, B. (1997). Hunting and trapping in the Indonesian archipelago, 1500–1950. In P. Boomgaard, F. Colombeij & D. Henley (Eds.), *Paper landscapes: Explorations in the environmental history of Indonesia* (p. 195). Leiden: KITLV Press. (Call no.: RSEA 304.2809598 PAP); Andaya, B.W. (1979). *Perak, the abode of grace: A study of an eighteenth-century Malay state* (pp. 77–78). Kuala Lumpur: Oxford University Press. (Call no.: RSING 959.5131 AND)
- 2 Newbold, T.J. (1839). *Political and statistical account of the British settlements in the Straits of Malacca, viz. Pinang, Malacca, and Singapore; with a history of the Malayan states on the peninsula of Malacca* (Vol. II, p. 190). London: John Murray. Retrieved from BookSG. (Call no.: RRARE 959.5 NEW; Accession no.: B03013424F)
- 3 Hornaday, W.T. (1993). *The experiences of a hunter and naturalist in India, Ceylon, the Malay Peninsula and Borneo* (p. 8). Kuala Lumpur: Oxford University Press. (Call no.: RSING 910.4 HOR)
- 4 Mayer, C. (1922). *Trapping wild animals in Malay jungles* (pp. 25–30, 33–34, 93). London: T. Fisher Unwin Ltd. Retrieved from BookSG. (Call no.: RRARE 799.29595 MAY-[JSB]; Accession no.: B29267011F)

- 5 Buck, F., & Anthony, E. (1930). *Bring 'em back alive* (p. 18). Garden City, N.Y.: Garden City Pub. (Call no.: RSEA 799.2 BUC)
- 6 For the detailed breakdown, see Table 1 in Tan, F. (2014). The beastly business of regulating the wildlife trade in colonial Singapore. In T. Barnard (Ed.), *Nature contained: Environmental histories of Singapore* (p. 151). Singapore: NUS Press. (Call no.: RSING 304.2095957 NAT)
- 7 *Proceedings of Straits Settlements Legislative Council* (p. B43), (1933, March 6). (Accession no.: R.M.I.E/67; Microfilm no.: NL1126). Accessed at the National Archives of Singapore.
- 8 *Proceedings of Straits Settlements Legislative Council* (pp. C206–207), (1927, October 31). (Accession no.: R.M.I.E/61; Microfilm no.: NL1123). Accessed at the National Archives of Singapore.
- 9 *Proceedings of Straits Settlements Legislative Council* (pp. B93–B94), (1928, August 27). (Accession no.: R.M.I.E/62; Microfilm no.: NL1124). Accessed at the National Archives of Singapore.
- 10 *Proceedings of Straits Settlements Legislative Council* (pp. B125–B127), (1929, October 7). (Accession no.: R.M.I.E/63; Microfilm no.: NL1124); *Proceedings of Straits Settlements Legislative Council* (p. B32), (1930, May 12). (Accession no.: R.M.I.E/64; Microfilm no.: NL1125). Accessed at the National Archives of Singapore.
- 11 Humanity in the east. (1924, August 10). *The Straits Times*, p. 10. Retrieved from NewspaperSG.
- 12 Cruelties of the bird trade. (1931, October 20). *The Singapore Free Press and Mercantile Advertiser*, p. 8. Retrieved from NewspaperSG.
- 13 A plea for the wild. (1931, October 28). *The Singapore Free Press and Mercantile Advertiser*, p. 8. Retrieved from NewspaperSG. Further instances of such reports in the 1930s include A callous Chinese: Exemplary sentence for cruelty to ducklings. (1930, April 26). *The Straits Times*, p. 12; Cruelty to animals: Indian menagerie owner fined. (1930, November 27). *The Straits Times*, p. 12; Cruelty to birds: Two Chinese fined for overcrowding. (1933, June 15). *The Straits Times*, p. 16; Smile disappeared: Chinese fined for cruelty to birds. (1934, January 13). *The Singapore Free Press and Mercantile Advertiser*, p. 6. Retrieved from NewspaperSG.
- 14 Dammerman, K.W. (1929). *Preservation of wildlife and nature reserves in the Netherlands Indies* (pp. 88–91). Weltevreden: Emmink. (Call no.: RCLOS 591.9598 PAC)
- 15 Prohibition of the importation of orang utan from Dutch East Indies into the Straits Settlements: Letter from K.W. Dammerman to C. Kloss. (1928, September 11). (Record reference no.: C.S.O. Museums 8366/1928; Microfilm no.: MSA 1139/10). Accessed at the National Archives of Singapore; Prohibition of the importation of orang utan from Dutch East Indies into the Straits Settlements: Letter from W. Daniels to Colonial Secretary of Straits Settlements. (1929, August 16). (Record reference no.:

A live elephant, nicknamed Babe, being transported from Singapore to San Francisco in the 1920s. Image reproduced from Buck, F.H., & Anthony, E. (1930). *Bring 'Em Back Alive* (facing p. 220). Garden City, N.Y.: Garden City Pub. Collection of the National Library, Singapore. (Call no.: RSEA 799.2 BUC).



win him many allies or supporters either. He was perceived as having a "lack of balance" and "misdirected enthusiasm".³⁸ His insistence on corresponding directly with members of parliament in England, rather than following the official protocol of holding prior discussions with the Governor of the Straits Settlements and the High Commissioner in Malaya, created further tensions.³⁹

Although there were laws to control the smuggling of wild animals and birds from the Dutch East Indies by the 1930s, it was difficult to regulate an illicit trade along a porous border that had historically been difficult to police. The inability to prosecute the individuals in possession of such animals unless proof of illegal importation was obtained meant that many smugglers went scot-free.⁴⁰

The attempt in 1933 to curb the wildlife trade in colonial Singapore was

- 16 *Proceedings of Straits Settlements Legislative Council* (p. B19), (1930, March 24). (Accession no.: R.M.I.E/64; Microfilm nos.: NL1124, NL1125). Accessed at the National Archives of Singapore.
- 17 Straits Settlements. (1933, June 30). *Straits Settlements government gazette* (Gazette Notification 1283). Singapore: Government Printing Office. (Call no.: RRARE 959.51 SGG; Microfilm nos.: NL1240, NL1241)
- 18 Kathirithamby-Wells, J. (2005). *Nature and nation: Forests and development in Peninsular Malaysia* (pp. 198–199). Honolulu: University of Hawaii Press. (Call no.: RSEA 333.75095951 KAT)
- 19 Malaya. Wild Life Commission. (1932). *Report of the Wild Life Commission* (p. 46). Singapore: Government Printing Office. (Call no.: RRARE 591.9595 MAL; Microfilm nos.: NL26030 [v. 1]; NL9935 [v. 1–3]; NL1934 [v. 3])
- 20 The wild life report. (1932, August 15). *The Straits Times*, p. 10. Retrieved from NewspaperSG.
- 21 Hubback, T.R., et al. (1934). *Report of the Wild Animals and Wild Birds Committee, Singapore, 1933* (p. 17). Singapore: Government Printing Office. (Call no.: RRARE 338.3728 SIN; Accession no.: B02978387K; Microfilm no.: NL26231)
- 22 Straits Settlements. (1933, July 21). *Straits Settlements government gazette* (Gazette Notification 1412). Singapore: Government Printing Office. (Call no.: RSEA 959.51 SGG; Microfilm nos.: NL1240, NL1241)
- 23 *Proceedings of Straits Settlements Legislative Council* (p. B32), (1930, March 24). (Accession no.: R.M.I.E/64; Microfilm nos.: NL1124, NL1125). Accessed at the National Archives of Singapore.
- 24 *Proceedings of Straits Settlements Legislative Council*, 24 Mar 1930, p. B32.
- 25 Hubback et al., 1934, pp. 7–8.
- 26 Hubback et al., 1934, p. 11.
- 27 Hubback et al., 1934, pp. 14–15. Also see *The Singapore Free Press and Mercantile Advertiser*, 20 Oct 1931, p. 8.
- 28 'Appalling stench' in Ponggol zoo cages. (1938, November 11). *The Singapore Free Press and Mercantile Advertiser*, p. 3. Retrieved from NewspaperSG.
- 29 Hubback et al., 1934, pp. 14–15.
- 30 Hubback et al., 1934, pp. 14–15.
- 31 Hubback et al., 1934, pp. 15–20.
- 32 Minutes of the Proceedings of the Municipal Commissioners (p. 178), (1934, May 4). (Microfilm no.: NA436). Retrieved from National Archives of Singapore website.
- 33 Lost, stolen or strayed. (1935, September 13). *The Straits Times*, p. 10. Retrieved from NewspaperSG.
- 34 The percentage was calculated based on total imports of \$330,661,128 and total exports of \$346,471,451. The total import of raw rubber and gutta percha was estimated at \$22,251,167 and total export estimated at \$73,726,509. Statistics from The Foreign Trade of Malaya. (1934). See Straits Settlements. (1933). *Straits Settlements annual reports* (pp. 700, 702–703). (Accession no.: R.M.I.D/73; Microfilm no.: NL2922). Accessed at the National Archives of Singapore.
- 35 The sum of \$78 was based on the \$1 annual licence fee according to the Animal and Bird Shop By-Laws and the Prevention of Cruelty to Animals Department Annual Report figure of 78 shops being licensed in 1933. The revenue from opium licensing is taken from Straits Settlements. (1934). *Straits Settlements Blue Book* 1933 (p. 85). (Accession no.: RM: IF/64; Microfilm no. NL3143). Retrieved from National Archives of Singapore website.
- 36 Smith, S.C. (1995). *British relations with the Malay rulers from decentralization to Malayan independence 1930–1957* (pp. 22–23). Kuala Lumpur: New York: Oxford University Press. (Call no.: RSEA 959.5105 SM1)
- 37 Note by E. Gent. (1934, January 16). *Preservation of wildlife*. (Reference no.: CO717/961; 13329/1933). Accessed at the National Archives of Singapore.
- 38 Letter from John Kempe to Colonial Office. (1934, April 29). *Preservation of wildlife*. (Reference no.: CO717/104/13, 33359/1934). Accessed at the National Archives of Singapore.
- 39 Letter from T. Hubback to C. Clementi. (1931, July 14). *Preservation of game*. (Reference no.: CO717/78/13; 82352/1931). Accessed at the National Archives of Singapore.
- 40 Hubback et al., 1934, p. 9.
- 41 Hubback et al., 1934, p. 9.
- 42 Malay village at world fair. (1938, December 18). *The Straits Times*, p. 17. Retrieved from NewspaperSG.

Ishak Ahmad and the Story of Malayan Waters

As a senior officer in the Fisheries Department, Ishak Ahmad was instrumental in spurring the growth of the Malayan fishing industry.

Anthony Medrano sheds light on his contributions.



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most people in Singapore know of Yusof Ishak, the former journalist and politician who became the country's first president. However, less well known is the fact that his civil servant father, Ishak Ahmad, was also a significant figure in the history of Singapore and Malaya.

Ishak spent 27 years in the Fisheries Department and worked his way up to its highest rungs. His service was duly recognised when he was awarded the Medal of the Civil Division of the Most Excellent Order of the British Empire in 1939.¹

However, it was perhaps his work on behalf of the fishermen of Singapore and Malaya that he is best remembered for. During his long career with the Fisheries Department, Ishak acquired a vast knowledge of the many kinds of fish found in Malayan waters and this information helped the government understand where and when economically important species could be found. He was also passionate about helping local fishermen, and did so both directly and indirectly. In fact, at a 1939 event honouring him after he had been awarded the medal, Ishak described himself as a "servant of the public, particularly that public which comprised the fishermen".²

Ishak's knowledge of Malayan fishes and their habitats—and the economic lives that both supported—played a key role in shaping the process of urban and social change in interwar Singapore and Malaya. And the legacy of Ishak's biodiversity knowledge has figured prominently in the publication of important environmental works such as *An Introduction to the Sea Fishes of Malaya* (1959).³

Malaya's Edible Ocean

Fish consumed as food powered the rise of urban Singapore, with the surrounding seas, reefs and estuaries feeding Malaya's economic transformation and its concur-

A Malay fisherman casting his net, 1954. By the 1930s, it was estimated that Japanese companies controlled more than 50 percent of the fish supply in Singapore, threatening the livelihoods of local fishermen. Courtesy of National Archives of Singapore.

rent environmental and demographic changes from the late 19th century to the end of the interwar period. For the nearly 30 million Indian and Chinese workers who came to Singapore and the region to tap rubber, extract tin, move cargo in and out of ports, open shops and ply the streets, fish was an essential source of protein.⁴ Seafood was also a major component of the local Malay community's daily meal, with products such as *ikan bilis* (anchovy) and *belachan* (shrimp paste) crucial ingredients in many home-cooked dishes.

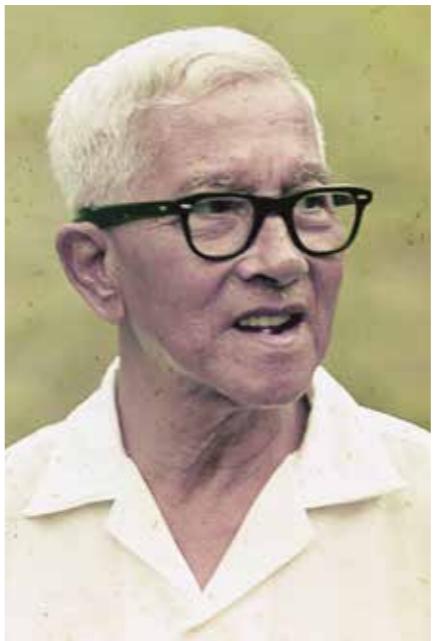
Local fishermen, primarily Malay, were initially the main people involved in catching this important protein but during the interwar years, these fishermen began to come under pressure from Japanese competition.

1926 was a pivotal year that impacted the livelihoods of local fishermen. That year, severe weather made for a poor fish harvest. In one weekend in July alone, six typhoons were reported to have passed through the South China Sea.⁵ Heavy monsoon rains also restricted the number of days local fishermen could go out to their *kelong*, the traditional fishing method practised by most fishermen at the time. This created a crisis in the supply of fish, impacting the livelihoods of communities across Malaya. These fishermen suffered economically, physically and materially through the loss or damage to their fishing apparatus such as the stakes and platforms.⁶

Okinawan Fishermen in Malaya

The impact of the fish shortage would have been far worse had it not been for one group: the Okinawan fishermen in Malaya. In the early decades of the 20th century, Japan began making inroads into the fishing industry in Southeast Asia to relieve overpopulation in the country's fishing villages as well as to tap on the Southeast Asian market for marine products.⁷

The Japanese fishing community in Singapore was largely comprised of young men from the town of Itoman on the island of Okinawa. These Okinawan fishermen had been migrating to Singapore since 1921 to work in the fisheries here.⁸ By 1926, there were 292 Okinawan fishermen registered in Singapore, making up more than half of the fishing community of 411 Japanese fishermen here.⁹ These Okinawan Japanese fishermen represented a minute percentage of the entire fishermen population in Malaya, yet it was this group that made up the greatest impact in the fishing scene.¹⁰



(Left) Ishak Ahmad, 1960s. A senior officer in the Fisheries Department, he was also the father of the first president of Singapore, Yusof Ishak. Yusof Ishak Collection, courtesy of National Archives of Singapore.

(Below) The Japanese *muro ami* fishing method revolutionised the capture of fish in Malayan waters. A type of reef fish called *ikan delah* (*Caesio* spp.), which had been quite expensive to purchase, became a cheap and abundant source of protein. Photo by BEDO. Retrieved from Wikimedia Commons (CC BY-SA 4.0).

(Bottom) A Chinese fisherman with his catch, 1951. Ministry of Information and the Arts Collection, courtesy of National Archives of Singapore.



dominant suppliers of fresh fish to both urban and rural markets.¹²

Muro ami fishing revolutionised the capture of fish in and around Malayan waters. Ecologically, this new fishing method targeted offshore coral reefs, a zone of the ocean that had previously been untouched by local fishermen. Economically, it exploited a type of reef fish called *ikan delah* (*Caesio* spp.) that was quite expensive to purchase and rarely found in local markets.¹³

After the advent of *muro ami* fishing, though, *ikan delah* became a cheap and abundant source of protein, constituting about 30 percent of the total weight of

fish sold in Singapore in 1928.¹⁴ By the late 1930s, this share accounted for more than 50 percent.¹⁵

Japanese fishing companies began contributing to the supply of fish in Malaya. By the 1930s, for example, it was estimated that Japanese companies controlled more than 50 percent of Singapore's fish supply.¹⁶ On seeing how these Okinawan fishermen and their operations upended the livelihoods of local fishermen, Ishak saw an opportunity to help them.

From Kuala Trong to Singapore

Born in 1887 in Kuala Trong, Perak, a mangrove-rich estuarine village north of Kuala Lumpur and about 15 km from the Chinese mining town of Taiping, Ishak entered the colonial government service as a Malay Clerk in the District Office in Taiping in 1906 before joining the Fisheries Department in 1914.¹⁷

Growing up by a river in Kuala Trong, Ishak became deeply anchored in a world of fish and water. He understood the ways in which this estuarine ecology supported the economic life of Malays, from providing food to facilitating trade. Similarly, he likely witnessed how upstream changes affected Kuala Trong's fish supply and impacted the communities that depended on the river's aquatic life for food and commerce.

As early as the 1890s, Malaya's rubber boom was transforming Perak. Among other things, this commodity expanded the reach of colonial development. New roads were built, new rail tracks were laid, forests were cleared and migrants were recruited to work on newly planted rubber estates. At the same time, Perak's tin industry was on the rise but so was the runoff that flowed from the mines around Larung and Matang downstream into the waters near Kuala Trong.¹⁸ Ishak came to see how fish was not only the heartbeat of Malay life – because they were free to catch and abundant – but also how their availability could change and, in the process, jeopardise the livelihoods of residents in places such as Kuala Trong.

In 1923, Ishak and his young family moved from Perak to Singapore, where he was appointed as a Senior Fishery Officer with the Fisheries Department. This relocation would prove transformative, both in terms of Ishak's career and his political work. It also meant new opportunities for his children. For Ishak, however, the question of Singapore's fish supply loomed large because it was increasingly unclear how local fishermen were to figure within Malaya's rapidly changing protein economy.

Fishermen working on a *kelong*, 1951. A *kelong* is an offshore platform built mainly of wood and driven into the sea bed using wooden piles. Local fishermen use *kelong* to fish. Bigger ones may also function as dwellings for their families. Ministry of Information and the Arts Collection, courtesy of National Archives of Singapore.



Interwar Singapore was a city on the move, a city on the rise. But at the heart of these urban and demographic changes was an island society wholly dependent on the mass provision of fish. In 1900, Singapore's population was 228,000. By 1940, this figure had grown to 680,000, making Singapore the second largest city in terms of population in Southeast Asia, behind Bangkok. Critical to feeding the hungry city were the Japanese fishermen, more specifically the Okinawans, who controlled Malaya's supply of fresh sea fish. The head of this expatriate fishing community was Tora Eifuku, a scientist who had arrived in Singapore in 1914 as part of a Japanese fisheries expedition that sought not only to survey the food potential of Malayan waters, but also to establish Japanese fishing companies in the colonial port city.

The survey itself was completed two years later (1916), and while the government team returned to Japan, Eifuku remained in Singapore to launch his own fishing company. By 1926, he was operating a transregional network of *muro ami* fleets, ice factories and refrigeration plants.¹⁹

Comprised largely of Okinawan fishermen, Eifuku's operations Taichong Kongsi was the largest fishing company registered in interwar Singapore at the time.²⁰ While Chinese fishmongers con-

trolled the distribution of fish through a network of stalls, buyers and vendors, it was Eifuku and other Japanese companies that provided the majority of the fresh fish in Singapore. In addition, a combination of lorries and rails linked Okinawan-caught fish (packed on Japanese-made ice) to the rubber plantations, Malay markets, and the tin and iron mines of interior Malaya.²¹

The combination of scale, mobility, capital and technology enabled Eifuku's cartel, and other Japanese companies like his, to dominate the late interwar supply of fish in Singapore and Malaya. This squeezed out the local fishing communities, who were unable to compete with the Okinawan fishermen in terms of freshness, quantity and price. Losing out to the Japanese was a huge blow as it affected their livelihoods.²²

Partly in response to the plight of these fishermen and their dislocation within Singapore and Malaya's changing fishing economy, Ishak decided to become politically involved. After moving to Singapore in 1923, he became a founding member of the Kesatuan Melayu Singapura (KMS; Singapore Malay Union), the colony's first Malay political association and established in 1926.²³

KMS was led by Mohamed Eunos bin Abdullah, a one-time harbourmaster and postmaster who became the organisa-

tion's first president as well as the founding editor of *Utusan Melayu*, Singapore's first daily Malay-language newspaper. The association sought to advance the interests of the local Malay community.²⁴ For Ishak, KMS was an important platform. It enabled him to communicate his concerns about the uncertain future of local fishermen as well as why their livelihood was at stake.

Knowing Malayan Waters

Ishak's knowledge of Malayan seas and the promise these waters held for the economic life of Malaya was especially deepened through his work with the Fisheries Department in the 1920s and 30s. During this period, Ishak conducted biological surveys off Pulau Tioman, tuna experiments in Terengganu and *kelong* inspections around Pulau Ketam, off the coast of Selangor, among other activities. In Singapore, he participated in a Malay-language radio programme that championed Malaya's edible ocean.²⁵

In 1926, Ishak played an important role in the first survey expedition conducted by the Fisheries Department to explore, map and index the economic fauna of Malayan waters.²⁶ At the centre of these scientific investigations was the

S.T. Tongkol, a coal-powered steamer built to search and identify suitable fishing grounds and to test the use of European trawls.

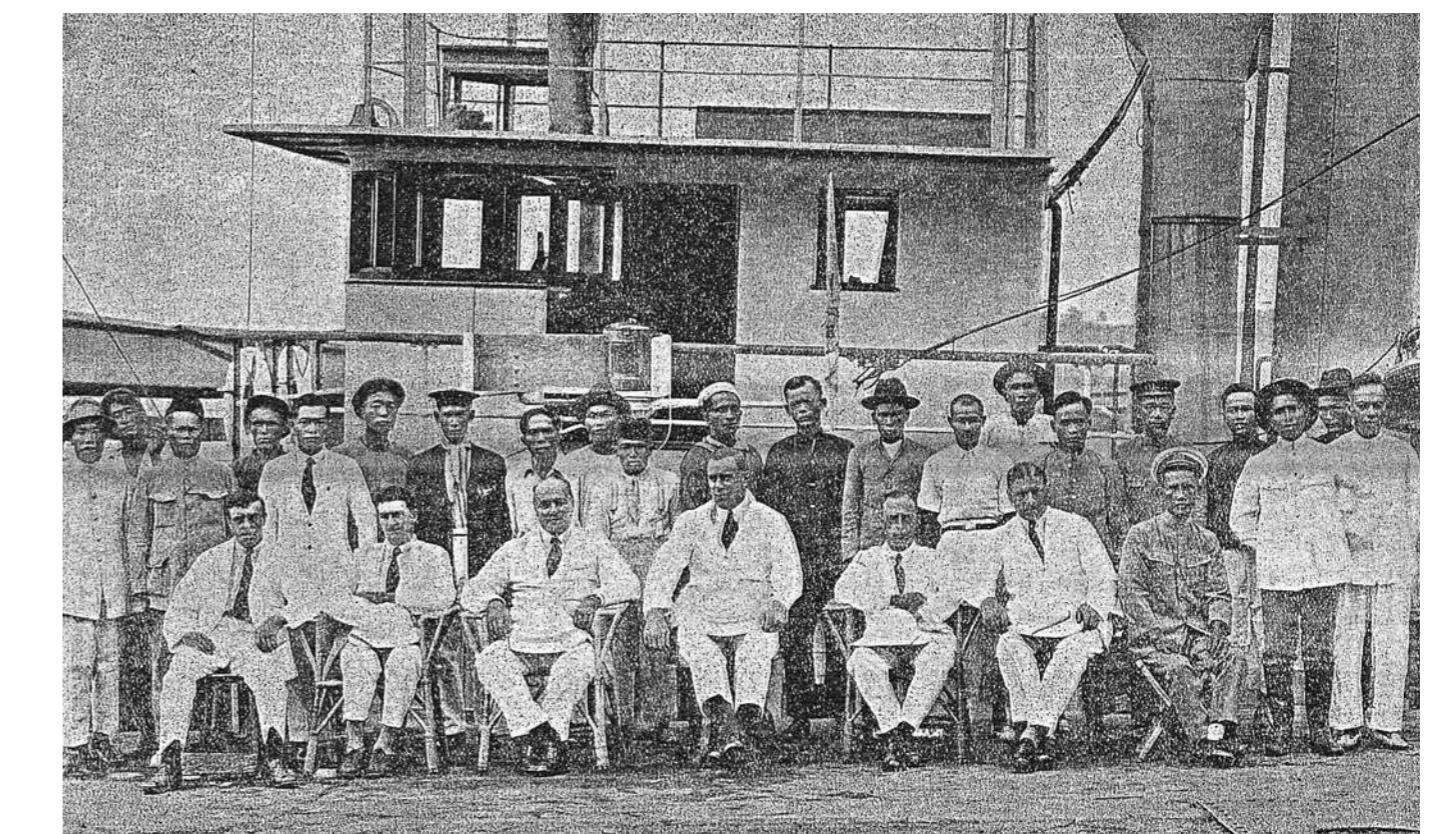
Ishak served a vital scientific as well as economic role in the expedition.²⁷ As the only Malay member, the combination of his linguistic skills (he also spoke Hokkien and Teochew), cultural expertise and knowledge allowed him to translate (or approximate) the species of fish caught in vernacular terms. While other members of the *S.T. Tongkol* were concerned with technical and technological matters, such as the efficacy of European trawls in Malayan seas, Ishak was the expedition's official taxonomiser.

His focus was on "making sense" of the ocean's marine products in ways that rendered them familiar to Malay and non-Malay speakers alike.²⁸ As a result, Ishak produced the Malay names of more than 75 fish species.²⁹ In doing so, he brought a vernacular sensibility that only a local could achieve in the creation of modern taxonomic records. In the case of the Jew-fish (a class of groupers), for instance, he identified three types commonly known to Malays: *Gelama ticus*, *Gelama panjang* and *Gelama pisang*.³⁰

Knowing a fish's name in Malay (and whether it was poisonous or not) was cru-

cial to fitting the species within the local food supply and marketing it on land.³¹ In this way, Ishak's scientific work had real economic implications for both the *S.T. Tongkol* and Singapore's Clyde Terrace Market on Beach Road, the expedition's main distribution point for its caught fish. From this central market, city officers operated a year-round public auction. Buyers included stallholders from Clyde Terrace and other local fish markets, contractors supplying ocean liners and cargo ships, and Singapore's first supermarket, Cold Storage.³²

Through the public auction, boxes of edible fish – weighed and identified by their Malay names – were sold and distributed throughout Malaya. On average, 17 tons of fish were sold per day at Singapore's various fish markets. From late May to late December in 1926, the *S.T. Tongkol* landed almost 200,000 pounds of food fish, netting – through the public auction system – a tidy sum of nearly \$30,000.³³ Ishak's Malay names for the various types of fish – rather than their English approximations such as smelt, herring, perch, sole or grunter – facilitated the marketing and dispensing of the fish supply caught by the *S.T. Tongkol*.



Crew of the *S.T. Tongkol*. Ishak Ahmad (in white top and black hat) is standing second from the right. The coal-powered steamer was used to search and identify suitable fishing grounds in the first survey expedition conducted by the Fisheries Department in 1926. Accessed at the National Archives of Malaysia.

In the end, as it turned out, the surrounding seafloor's abundance of mud, sea-fans, sponges, corals and especially seagrass rendered Malayan waters resistant to European trawls, leading to a fiscal loss and the eventual sale of the *S.T. Tongkol* to the government in Ceylon in 1929.³⁴

On the whole, however, the *Tongkol* expedition was invaluable as it developed a scientific understanding of Malayan waters and the fishes that were indigenous to these waters. Economically important to this new understanding was knowing where Malayan fishes thrived in terms of their preferred habitats (ecology) and preferred depths (bathymetry) as well as when these economic species were abundant (in terms of their preferred seasons). Harnessed by Ishak and others in the Malayan Fisheries Department, the scientific data derived from the *Tongkol* expedition in the late 1920s was used to strengthen the local fishing industry and therefore boost the local fish supply.

Ishak's Legacy

The late interwar period was a pivotal time. In 1933, Ishak was appointed to act as Director of Fisheries when the incumbent W. Birtwistle was on leave for eight months.³⁵ As acting Director, Ishak was in charge of a colonial service that recognised the strategic food value of Malayan waters as well as how fish supplies were needed – and increasingly so – without disruption and delay. From his experience on the ground, Ishak also knew that the

Malayan system of producing, marketing and distributing fish depended heavily on the work of Japanese companies and the Okinawan fishermen they employed, and how this impacted the Chinese, Malay and Indian fishermen in Singapore.

Ishak extended government assistance to local fishing communities, thereby helping them to tap the wealth of Malayan seas to feed the growth of cities like Singapore. In 1937, for example,

he sought to offset the dominance of Japanese-caught fish by refitting the department's experimental vessel, *Kembong*, with an on-board refrigeration plant so that it could transport fresh fish supplies from Terengganu and Kelantan to Singapore.³⁶ By improving access to distant hungry markets, Ishak was boosting the livelihoods of Malaya's east coast fishing communities. He extended similar refrigeration schemes to Chinese fisher-

men who worked the Strait of Melaka, particularly around Pulau Pangkor.

As a result of his distinguished career in public service, including two stints as acting Director of Fisheries, Ishak was awarded the Malayan Coronation Medal in 1937³⁷ and the Medal of the Civil Division of the Most Excellent Order of the British Empire in 1939. With more than 100 people in attendance, including a popular Malay musical orchestra, the KMS hosted an afternoon tea celebration at the Kota Raja Malay School in February 1939 in recognition of Ishak's service to Singapore and Malaya.³⁸

That same year, Ishak played a central role in establishing Malaya's first fisheries school in Tanah Merah that, among other things, sought to "modernise" traditional fishing methods and equip local fishermen with new technology and knowledge.³⁹ Likewise, he founded a Malay school for the children of Pulau Sudong's fishing community.⁴⁰ After a long and decorated career, Ishak retired from the Fisheries Department in 1941.

But even in retirement, Ishak's life remained intertwined with the story of Malayan waters. A closer look at the year 1959 reveals this intimate connection. In that year, Ishak's eldest son, Yusof, was appointed Yang di-Pertuan Negara (Head of State) after Singapore was granted internal self-government. Another son, Abdul Aziz, who once worked in the Fisheries Department before the war, was the Federation of Malaya's first Minister for Agriculture, a post he held



from 1955 to 1963. As minister, Abdul Aziz oversaw the management of inshore and offshore fisheries – much like his father did in the 1930s.

It was under Abdul Aziz that the Ministry of Agriculture published *An Introduction to the Sea Fishes of Malaya* (1959). This publication recognised Ishak's "wealth of knowledge and experience" as a cultural and scientific repository borne from his lifelong association with Malayan waters. Prior to its publication, Ishak had "consented to examine the manuscript

and made many valuable comments which have been incorporated in the finished work" as the foreword notes.⁴¹

From cataloguing the fish diversity of Malayan seas as a scientific member of the *Tongkol* expedition in the 1920s to sharing his wealth of knowledge and experience with a global community of ichthyologists in the 1950s, Ishak's life and contributions are critical to appreciating how we know what we know about the waters around us today. ♦

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MAN VS NATURE

SPECULATIVE FICTION AND THE ENVIRONMENT

Jacqueline Lee surveys the landscape of Singapore's speculative fiction to see how authors address environmental concerns in their novels and short stories.



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As the threat of climate change looms, global warming and other environmental issues are increasingly taking centre stage in popular discourse. It is also a subject that many writers of speculative fiction frequently explore in their work.

Speculative fiction is a broad category of writing that contains supernatural, fantastical or futuristic elements, and includes subgenres such as science fiction, fantasy, horror and the supernatural.¹ Yeow Kai Chai, the poet and former director of the Singapore Writers Festival, notes that speculative fiction "compels us to imagine and ask questions about the fate of humanity, the environment and alternate realities".²

The genre has become increasingly mainstream in Singapore in recent years. In May 2017, *The Straits Times* reported that at least eight such home-grown novels and anthologies had been published in the previous six months.³ One such novel – Nuraliah Norasid's *The Gatekeeper*⁴ – even clinched the Epigram Books Fiction Prize in 2016, and Best Fiction Title and Best Book Cover Design at the Singapore Book Awards in 2018.

In addition to the efforts of individual writers, there have also been local platforms that promote speculative fiction. An important vehicle was *LONTAR: The Journal of Southeast Asian Speculative Fiction*. Published in Singapore, the journal was active between 2013 and 2018. Its editor, Jason Erik Lundberg, has been a longtime advocate of speculative fiction in the city-state.⁵

Oil and Petrohorror

While speculative fiction that tackles environmental issues have become popular in

The multiple awards won by *The Gatekeeper* shows that speculative fiction has become a mainstream genre in Singapore. Shown here is an illustration of Ria, the medusa from the novel drawn by the author Nuraliah Norasid. Image reproduced from Nuraliah Norasid. (2015). *Ria, a Novel and an Exegesis* (p. 334) [PhD dissertation]. Singapore: Nanyang Technological University. Collection of the National Library, Singapore. (Call no.: RCLOS 808.3 NUR).

recent times, there are some examples that go back to the immediate post-war years.

In the essay "An Oily Mirror: 1950s *Orang Minyak* Films as Singaporean Petrohorror", Yogesh Tulsi argues that films about the *orang minyak* ("oily man" in Malay) that were popular during the golden age of Malay cinema in Singapore (1950s–60s) are dramatisations of a "horrible petromodernity" and its destruction of traditional ways of life.⁶

The *orang minyak* is described as a supernatural creature coated with shiny black grease who abducts young women at night, and is able to climb walls and evade capture due to his slippery skin. While seemingly based on Malay folklore, the first mention of *orang minyak* in local newspapers was in *Berita Harian* in 1957.⁷

The figure was at first described to be covered in hair oil, and later coconut oil and soot, before its description coalesced into black crude oil (as portrayed in the *orang minyak* movies), possibly in an "unconscious attempt to represent oil's increasing ubiquity" at the time.⁸ According to Tulsi, oil represents modernity and, by extension, the *orang minyak* represented the threat of modernity.

Loss of Biodiversity

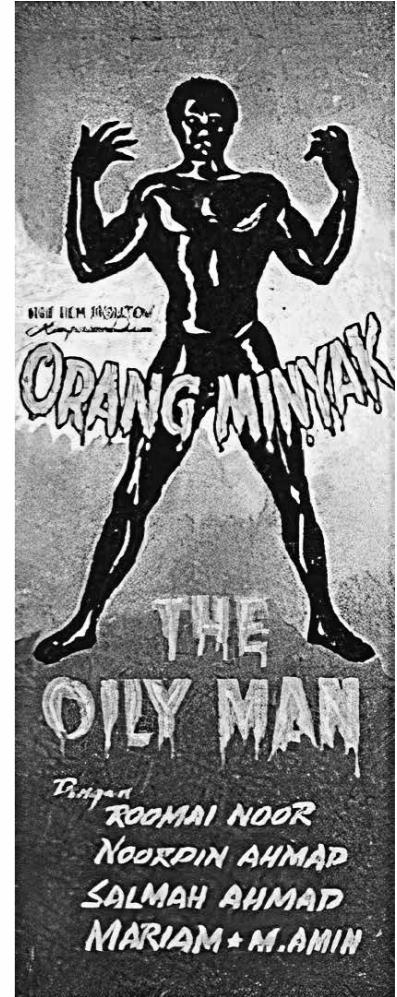
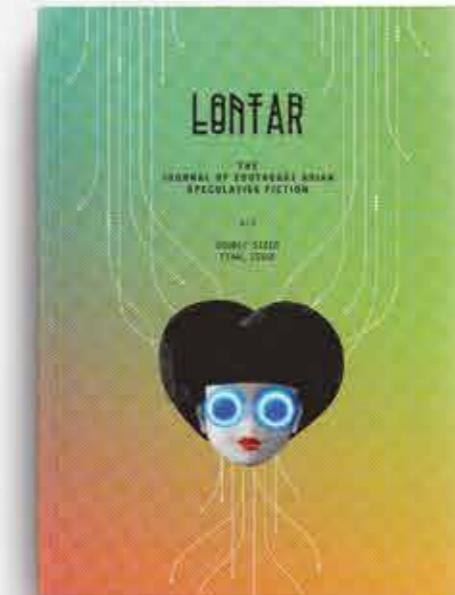
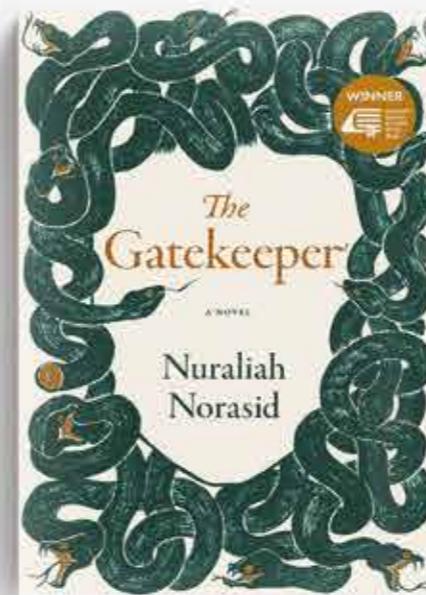
A popular theme in general science fiction is the loss of biodiversity. One of the best known examples is Philip K. Dick's 1968 novel, *Do Androids Dream of Electric Sheep?* (this novel became the basis for the cult 1982 movie *Blade Runner*). Likewise, large-scale extinction is also a recurring theme in Singaporean speculative fiction.

In Melissa De Silva's short story "Blind Date" (2016), the extinction of local wildlife species parallels the extinction of Eurasians in a Singapore that relies on robots and where steel is used everywhere in place of natural materials. In this version of Singapore, the population census reports only two remaining Eurasians – 75-year-old Martin Desker and 66-year-old Gerald Pereira. Meanwhile, animals like the Sambar deer and the Raffles' malkoha (a species of bird) are implied to be extinct, appearing as holograms programmed to pop up at intervals and accompanied by audio commentary.⁹ (Sambar deer have been listed as a vulnerable species on The International Union for Conservation of Nature Red List of Threatened Species since 2008, so this scenario is not that far-fetched.¹⁰)

(Below) *The Gatekeeper* by Nuraliah Norasid clinched the Epigram Books Fiction Prize in 2016, and Best Fiction Title and Best Book Cover Design at the Singapore Book Awards in 2018. Nuraliah Norasid. (2018). *The Gatekeeper*. Singapore: Epigram Books. (Ebook available from NLB OverDrive).

(Below right) *LONTAR: The Journal of Southeast Asian Speculative Fiction* was published in Singapore between 2013 and 2018. Its editor, Jason Erik Lundberg, has been a longtime advocate of speculative fiction in Singapore. Shown here is the cover of the last issue (No. 10; 2018). Lundberg, J.E. (Ed.). (2013–18). *LONTAR: The Journal of Southeast Asian Speculative Fiction*. Singapore: Epigram Books. Collection of the National Library, Singapore. (Call no.: RSING 828.995903 LJSASF).

(Above right) The promotional standee for *Orang Minyak* (*The Oily Man*), a Malay film directed by L. Krishnan and released in 1958. According to Malay folklore, the *orang minyak* is a supernatural creature coated with shiny black grease. He abducts young women at night, and is able to climb walls and evade capture due to his slippery skin. Image reproduced from Millet, R. (2006). *Singapore Cinema* (p. 43). Singapore: Editions Didier Millet. Collection of the National Library, Singapore. (Call no.: RSING q791.43095957 MIL).



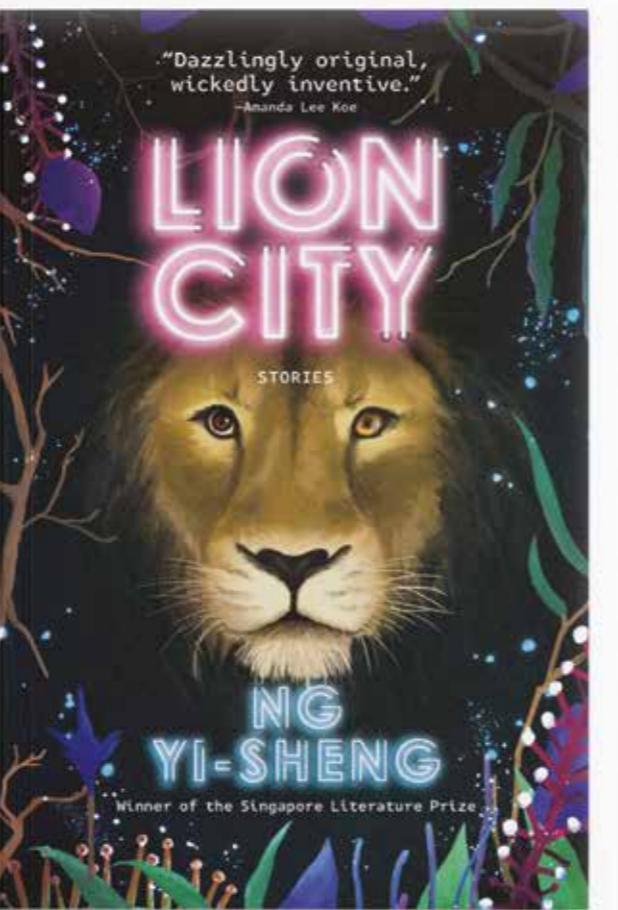
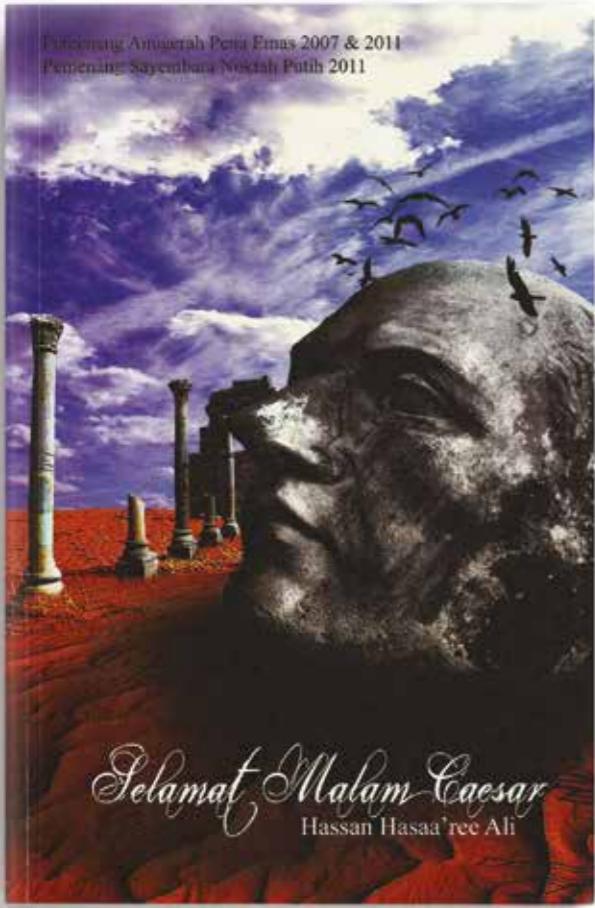
De Silva lightly interweaves the issues of environmental destruction and deforestation into the narrative. In the story, Martin and Gerald arrange to meet in a cafe (their "blind date"). Later, they sit in a "breathing dome" at Fort Canning and observe the "pallid sun hanging behind the veil of gases".

At the cafe, Martin reacts against all this technology, noting it was all "very impressive, but he often felt humanity had become obscured by these wonderful technological doodahs. Even the two coffees he'd ordered over the past hour had come with sugar molecules in a steel vial. You were supposed to spray it into your drink and escape with zero calories. He'd had to ask for real sugar. Nonsense. Metal. What on earth was wrong with glass? Or wood? Surely anyone would prefer beautiful grain that told the life story of a tree? But of course, anything made from natural timber these days would cost the earth."¹¹

Ng Yi-Sheng's *Lion City* (2019) also deals with a time where many animals have become extinct. In its titular short story, the narrator is given a behind-

(Below) Hassan Hasaa'ree Ali's Malay short story "Doa.com" in *Selamat Malam, Caesar* presents an imaginative solution to address the scarcity of land for burials in Singapore. The book was shortlisted for the Singapore Literature Prize for Malay Fiction in 2014. Hassan Hasaa'ree Ali. (2013). *Selamat Malam, Caesar*. Singapura: Akademi Anuar Othman. Collection of the National Library, Singapore. (Call no.: Malay RSING 899.283 HAS).

(Below right) *Lion City* by Ng Yi-Sheng is an anthology of short stories. In the titular story, the narrator is given a behind-the-scenes look at the "animals" in the Singapore Zoo, which are actually robots. Ng, Y.-S. (2019). *Lion City*. Singapore: Epigram Books. (Ebook available from NLB OverDrive).



the-scenes look at the "animals" in the Singapore Zoo. It is revealed that the insides of these animals are made up of "wire mesh, cable spaghetti and the like, silicon garbage, the city's detritus".¹² They wear synthetic skins and are programmed to look and act like real animals. The narrator interacts with a simulacrum of a lion cub, remarking on its similarity to a "genuine little Simba, whiskers and all". In this alternate universe, the Singapore Zoo – and along with other zoos around the world – has been fooling unsuspecting visitors for decades by using robotic animals. It also reveals that the giant panda has been extinct for a century.

Land Scarcity

Land scarcity is a recurring theme among Singaporean writers. In Clara Chow's 2017 short story "Welcome, 265 Aggregate Scorers", the shortage of land in Singapore has pushed the country to reclaim land aggressively, to the point where the narrator notes how land reclama-

tion projects have "gone crazy". In fact, the country has reclaimed so much land that there is no actual sea left between the country and its neighbours. Instead, giant screens projecting the seascape have been installed. With the country "nudg[ing] up against its neighbours apologetically", Singapore has to erect screens so that "we could keep our modesty while resisting the urge to peer into other nations' messy bedrooms".¹³

Constraints arising from the scarcity of land also provide the background for Hassan Hasaa'ree Ali's 2013 Malay short story "Doa.com", which presents an imaginative solution to address the paucity of land for burying the dead. In the story, technology has advanced to such a stage that it was possible to build an underground graveyard complex for the remains of the dead. Family and friends cannot visit the graves in person, but they can go online to Doa.com and select a prayer that will be played through a speaker to the underground grave. The

cost of each prayer depends on how potent the prayer is claimed to be.¹⁴

Land scarcity (and alternative energy) is the theme of the 2012 short story "Chapter 28: Energy" by The Centipede Collective comprising writers Olivia Lee and Brandon Chew. In the story, the government made cremation compulsory for all newly deceased because of land scarcity. Then a law is passed to exhume all cemeteries to free up even more land for industrial, residential and commercial use. By 2040, as all columbaria have reached full capacities, Singaporeans are encouraged to scatter ashes in the waters around the island.¹⁵

While witnessing his father's cremation, one ingenious researcher in Singapore comes up with an alternative energy source inspired by cremations. Harvesting the latent energy found in dead bodies to make a liquid called NecrOil that can create batteries and power cars, Singapore becomes a "model for energy regeneration", studied by scientists and research-

ers all over the world. An added bonus of this new technology is that Singapore no longer has any dead bodies to dispose of as these are automatically converted into NecrOil. "Chapter 28: Energy" is a satire on Singapore's often quoted "only natural resource" – its people – to literally power the next generation.¹⁶

Rising Sea Levels

An oft-cited consequence of climate change is the rise in sea levels which threatens low-lying coastal areas. In percent of landmass lies less than five metres above sea level. The Centre for Climate Research Singapore projects that the country could experience "more intense and frequent heavy rainfall events, and [a] mean sea level rise of up to 1 metre by 2100".¹⁷ Thus, the possibility that large parts of Singapore could end up being submerged by water is a very real one.

In Wayne Rée's 2018 short story "Satay", Singaporeans have been forced by rising sea levels to take refuge in the country's skyscrapers. In the story, Rafi and his father, a satay seller, live in what is implied to be a repurposed Marina Bay Sands. The hotel becomes a literal stratification of the hierarchy of Singaporean society: the privileged upper classes live on the top floors of the 56-storey building, enjoy parties by the infinity pool and are referred to as "upper-level families". The poorer people live on the lower floors, though not too low because 31 floors of the building are submerged in the sea.

Rafi and his father live on the 40th floor and are considered middle class.

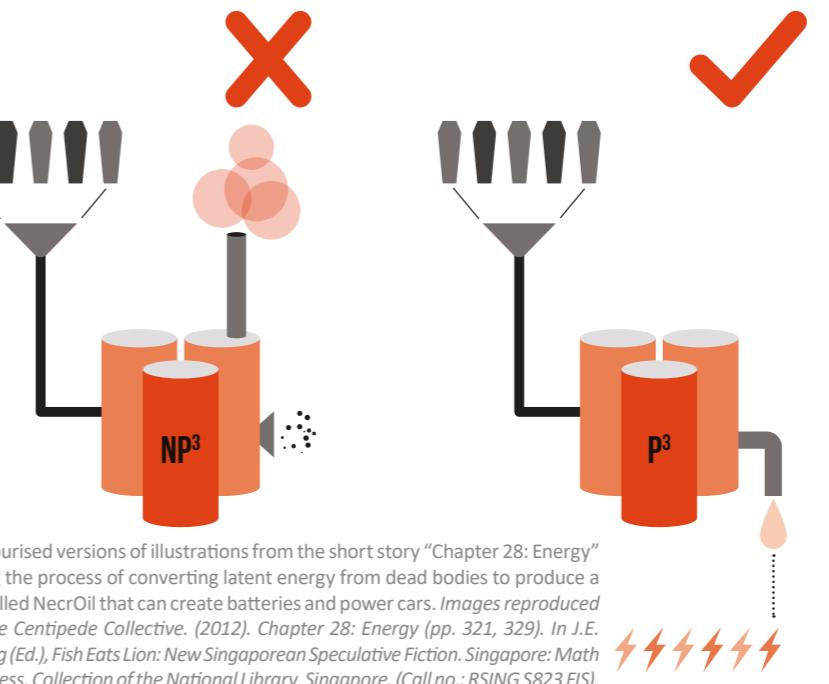
Rafi's father's satay is very popular and this helps earn them friends across all levels, and crucially, some special privileges and patronage from the upper-level residents as they are hired to grill satay for parties on the rooftop.

In one scene, Rafi stands on the rooftop – his father has been hired to provide satay for the upper-level residents – and observes how "the evening light played off the tops of the other mostly submerged skyscrapers, the waves lapping gently against the sides of what was left of the buildings".¹⁸

While "Satay" explicitly portrays a flooded Singapore, rising sea levels are implied in Patricia Karunungan's 2018 short story "Agatha". The protagonist, Agatha, and other characters in the story live in a high-tech indoor facility and the only glimpse of the outside world shows "an expanse of barren land with buildings rising distantly through the haze".

Most of the narrative takes place in this indoor facility, and the story ends abruptly with characters forced to make difficult decisions. As the flooding worsens over time, a crisis point is reached and the Singapore government decrees that all convicted and suspected criminals will be executed, and that all life support in hospitals will go offline.

The government also announces that it will deploy a dome, with the implication being that this dome is a last resort, as a way to somehow protect at least some residents of Singapore against the impending "siege of the sea".¹⁹



The colourised versions of illustrations from the short story "Chapter 28: Energy" showing the process of converting latent energy from dead bodies to produce a liquid called NecrOil that can create batteries and power cars. Images reproduced from The Centipede Collective. (2012). Chapter 28: Energy (pp. 321, 329). In J.E. Lundberg (Ed.), *Fish Eats Lion: New Singaporean Speculative Fiction*. Singapore: Math Paper Press. Collection of the National Library, Singapore. (Call no.: RSING 5823 FIS).

A Dystopian Future

What these works demonstrate is that Singaporean speculative fiction is a rich resource for studying the environmental crises of this century. Over the last decade, writers here have been engaging with the threat of climate change by exploring possible futures. They have been looking at existing trends – global warming, rising sea levels, mass extinction of animals – and extrapolating them into the future to draw a dire picture of what Singapore, and the world, could look like.

Through their prose, the writers ask the all-important question – "What if?" What if sea levels rise and low-lying parts of Singapore become submerged? What if most flora and fauna on earth have been wiped out? What if Singapore runs out of land? Having raised these issues, perhaps the next question to ask is – "What now?" ♦

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THE NATURE OF POETRY

AN ODYSSEY ACROSS TIME

Michelle Heng takes us on a journey to see how poets writing in English have charted the changing contours of Singapore and Malaya over the course of the 20th century.

Some residents of Singapore undoubtedly take the greenery in the city-state for granted, perhaps imagining that the island has always maintained a neat and manicured coiffure, with overgrowth trimmed to precision and denuded of inconvenient fauna.

Many a poet has documented, however, the slew of urban-renewed makeovers that have no doubt contributed to the

"Garden City" moniker. Poet-cartographers have captured the many iterations of the landscape's continuous transformation – physical and otherwise – over the years.¹

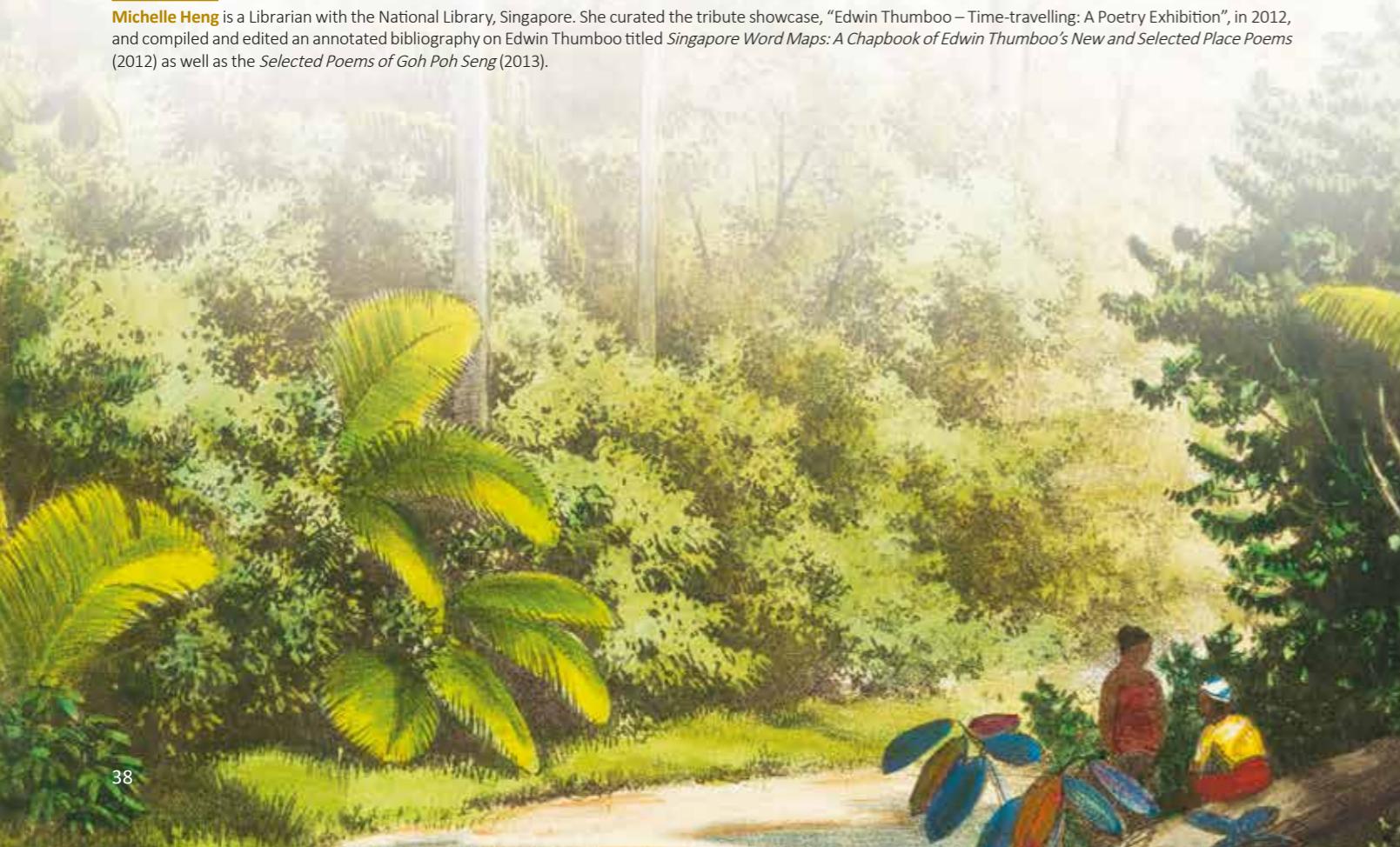
The motifs explored include a collective memory of Singapore's (and Malaya's) flora, fauna, and the deep, almost primal communion humans share with nature – juxtaposed alongside key historical moments as well as tales from the myths

and legends enshrouding the island's origins. These extend to more current dialogues on sustainability, green plans and urban gardening amid changing climates.

In the Beginning: Nature vs Nurture

Literary musings on nature have often been closely intertwined with Singapore's history.² The intimate relationship between nature and lyricism is evident at

Michelle Heng is a Librarian with the National Library, Singapore. She curated the tribute showcase, "Edwin Thumboo – Time-travelling: A Poetry Exhibition", in 2012, and compiled and edited an annotated bibliography on Edwin Thumboo titled *Singapore Word Maps: A Chapbook of Edwin Thumboo's New and Selected Place Poems* (2012) as well as the *Selected Poems of Goh Poh Seng* (2013).



the start of the island's recorded history in the 17th-century *Sulalat al-Salatin* (*Genealogy of Kings*), better known as *Sejarah Melayu* (*Malay Annals*). One of the chapters describes the founding of the city of Singapura (Sanskrit for "Lion City") on the island of Temasek around 1299 by Sang Nila Utama, the mythical prince of Palembang, when he and his attendants caught sight of the *singa*, or lion, upon their arrival.³ The *Sejarah Melayu* is one of the most significant Malay historical works, and also hailed as one of the finest literary works written in Malay.⁴

The development of nature-themed lyrical works continued with literary contributions to various homegrown publications. An early encounter of nature poetry can be traced to the start of the 20th century in a poem titled "Nature's Secret" by one "Gak-Stok-Sin" that appeared in the December 1907 edition of *The Straits Chinese Magazine: A Quarterly Journal of Oriental and Occidental Culture*.⁵ "Nature's Secret" appears to have mimicked contemporary English poetry of that era with invocations of the wind, the sea and what seems to be a nod to a familiar literary symbol, the willow tree, as seen in the second stanza:⁶

Winds and waves and willow tree
Pray unveil the mystery,
Of that deep soul-thrilling song
Winding without words along
Which entralls the sons of men
Though its meaning none can ken.⁷

It is noteworthy that this poem is one of several literary works appropriating the language of the colonial administrators yet deftly made English its own.⁸ The poet attempted to "nurture" seemingly untameable forces of nature by artfully "bending" these into a tidy array of lyrical lines. By essaying creative forays in an adopted tongue⁹ – albeit through some form of mimicry – early poets in the colony charted a new course for later generations of homegrown poet-cartographers.

Clanging Trains Signal Changes to Kampong Idyll

One of the oldest poems written by a homegrown poet, "F.M.S.R." was published in 1937 by a poet who used the pseudonym "Francis P. Ng". The influences of Modernism on "F.M.S.R." are evident in its form and certainly resonates with the dark undertones seen in T.S. Eliot's "The Waste Land".¹⁰ Through dogged detective work, researcher Eriko Ogihara-Schuck

established that Francis P. Ng was actually Teo Poh Leng, who was born in Singapore in 1912 and who died in 1942 at the start of the Japanese Occupation (1942–45).¹¹

"F.M.S.R." describes a train journey between Singapore and Kuala Lumpur – operated by the Federated Malay States Railways (FMSR) – and expresses the frustrations of a subject living under British colonial rule. The poem brings to the fore aspects of life in Malaya such as post-World War I privations, and a country struggling to deal with a tide of growing industrialisation and deforestation looming over a previously tranquil landscape. A closer look at these lines hint at his disdain for a homeland that has become a playground for a consumerist society:

Nowadays monarchy and democracy
Are mere appellatives for mediocrity,
So's the aristocracy
Of wealth: these millionaires,
What numskulls they must be
Who are unawares of their own idiocy.
Unwittingly they come, unobserving
see
The same wares they did leave behind
at home,
To meet foreign jeers,
To see tigers and snakes in Singapore
And drink Tiger Beers.
But our tigers have grown timorous
And dare not come forth to meet the
amorous
Whimsicality of the rich visitor.

So to the Ponggol Zoo she goes
To meet living tigers, snakes and
armadilloes:
Or dead tigers guarding garish adver-
tisement panels;
Or Raffles Museum to stare at stupid
animals.¹²

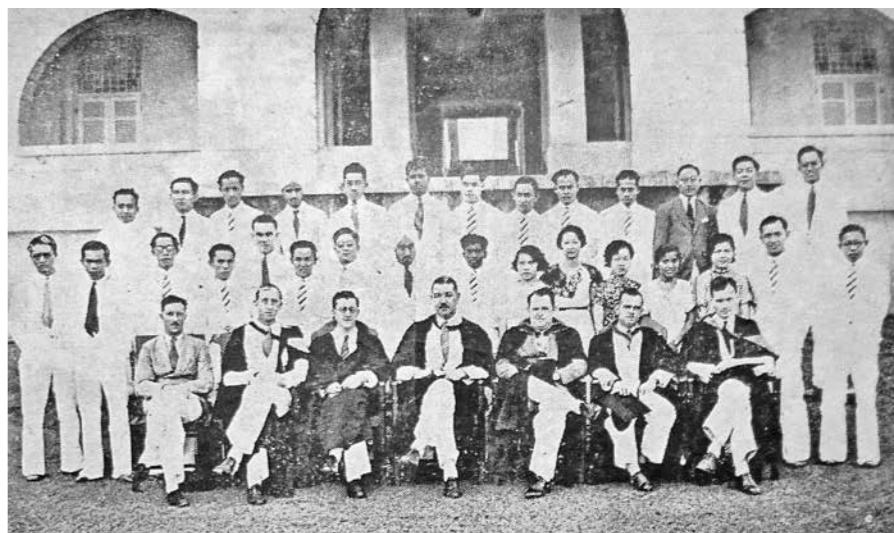
The tigers and other wild animals that previously roamed the Malayan countryside have not only been defanged and stripped of their potency, they have become symbols of consumerism as a well-known homegrown beer label. In addition, a menagerie of tropical fauna ("living tigers, snakes and armadillos") have now become mere exhibits at Ponggol Zoo or reduced to lifeless, taxidermied specimens at Raffles Museum for gawking visitors.

Teo's elaborate use of imagery of lifeless animals continues in Canto VIII as the poet describes how the serpentine locomotive "Dragging its rigid length like a snake/Hissing, wounded in the spine, moving –/Leaving writhing marks of crimson lake: Johore Bahru, Kluang, Gemas..." cuts noisily through a serene, agrarian Malayan landscape presaging much ruin as it pierces through "prostituted jungles" and "imitated tunnels".¹³

In a dramatic climax near the end of this long poem, the unnamed narrator alights at Kuala Lumpur and we learn that the train he was just riding in has collided with another in "a terrific smash", thereby cementing the poet's notion that:

(Facing page) This print titled "Road Near Selita" (1869) by the Austrian diplomat and naturalist Eugen von Ransonnet was published in his *Skizzen aus Singapur und Djohor (Sketches: Singapore and Johor)* in 1876. It shows a road in Selita (Seletar), Singapore, as observed by von Ransonnet, who described it as a most attractive road cutting through tropical vegetation. Courtesy of the National Museum of Singapore, National Heritage Board.

(Below) Teo Poh Leng (also known as Francis P. Ng) is in this photo taken of the staff and graduates of Raffles College in 1934. He is unidentifiable to date as no photos of him have been found. Image reproduced from *Raffles College Union Magazine*, July 1934, Vol. 4, No. 10, between p. 42 and p. 43.



The world's the train, a crepitating blaze,
A polluted place,
And all its saints are no less sinners...¹⁴

It has been suggested that this climatic scene in Canto IX highlights the destructive effects of British rule,¹⁵ and that the poet's introspection is reflected in the grim picture he paints of Singapore and Malaya in the 1930s. Unwittingly, the poem also foregrounds the tragic days of the Japanese Occupation and the eventual loss of Britain's Southeast Asian colonies in the following decade.¹⁶

Resilience in Times of War

The poet of "F.M.S.R." is mourned by his brother, Teo Kah Leng, in the 1955 poem "I Found a Bone". A dramatic poem with a regular rhyme scheme, the poet uses Biblical imagery for his testimony of historical events as seen in the lines below:

I held the arm bone in my hand,
And let "my warm tears fall;

(Below) Teo Kah Leng's poem, "I Found A Bone", was published in the Holy Innocents' English School Annual in 1955. Courtesy of Montfort Schools.

(Right) Photo of Teo Kah Leng taken in front of Holy Innocents' English School, late 1940s to early 50s. He wrote "I Found A Bone" in the aftermath of the Japanese Occupation. Courtesy of Anne Teo.

My brothers were slain at
Ponggol Beach,
My brothers Peter and Paul.¹⁷

This haunting poem about a man who finds a fragment of an arm bone on Punggol beach was one of the few clues linking Teo Kah Leng and Teo Poh Leng as siblings and, sadly, confirmed the untimely death of the latter during the Sook Ching massacre at the onset of the Japanese Occupation.¹⁸ The poem bears witness to the once pristine seaside village of Punggol (spelt "Ponggol" in the poem) and hints at the leisurely lifestyle that it was once known for.

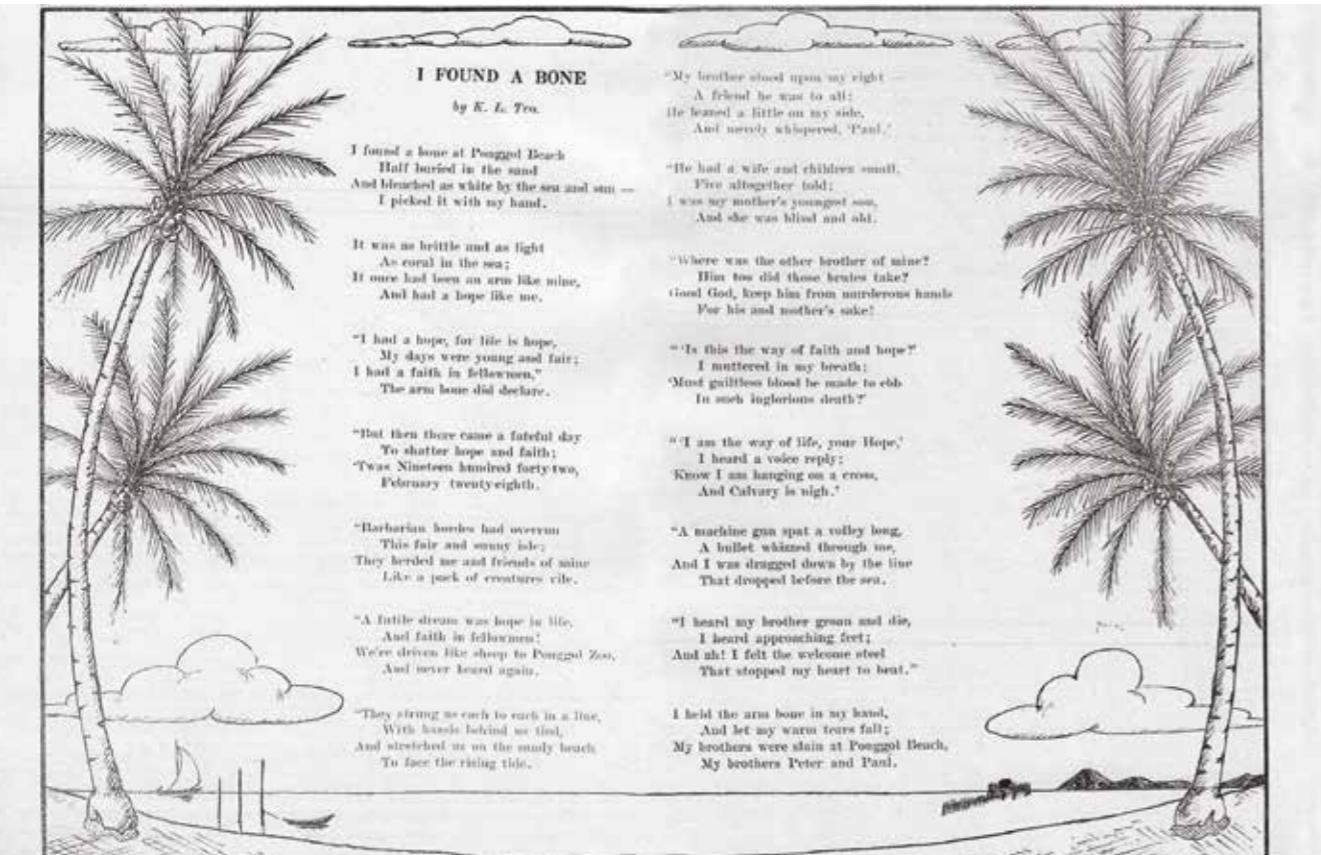
Coincidentally, the two poems by the Teo siblings both mention Ponggol Zoo, one of the earliest public zoos in Singapore, established in 1928 by wealthy pioneering trader William Lawrence Soma Basapa.¹⁹ The following lines from "I Found a Bone" describe in stark detail the brutal massacre site that Punggol beach is later remembered for:

"A futile dream was hope in life,
And faith in fellowmen!

We're driven like sheep to
"Ponggol" Zoo,
And never heard again.

"They strung us each to each in a line,
With hands behind us tied,
And stretched us on the sandy beach
To face the rising tide.²⁰

The war is also one of the subjects of Lim Thean Soo's "Lallang", published in 1953. Here, the poet uses a sharply defined image from nature and explores the common tropical weed's hardy qualities (now usually spelt lalang), which have weathered both the vagaries of harsh weather and brutal invasions:²¹



I have breathed since times the granite cooled its temper;
The primal sun scorched me.
I have traced the last oceanic invasion;
The ancient rains soaked me.
Monster herds, human tribes:
Chinese fleets, Malay drums;
European cannons, Samurai swords!
—Did not they appear only yesterday?
And I grew used to war, man's endless game.
But I am the lallang
Do not ever suffer
No wrong is done to me
I know no misery.²²

Written in the aftermath of a dark period in Singapore's history, the prickly tenacity of the familiar lalang grass registers an emotive appeal to readers here. An unlikely triumph against marauders and invaders, the self-renewing lalang reflects the spirit of a tenacious people who are survivors of war and other turbulent episodes.²³

Imagination Comes Alive in "The Cough of Albuquerque"

What is arguably the most significant work to prominently feature the local landscape is "The Cough of Albuquerque", a maiden attempt at writing a long poem by one of Singapore's best-known pioneer poets, Edwin Thumboo.

Born in Singapore in 1933, Thumboo's idyllic childhood spent in the foot-hills of Mandai inspired much of the lush imagery observed in his poem, which was first written in the mid-1950s and revised decades later.²⁴

The "Albuquerque" in the poem refers to Afonso de Albuquerque, commander of the Portuguese forces that captured the Sultanate of Melaka in 1511. The version of Albuquerque in the poem, however, is an old warrior who fantasises about a princess living on Mount Ophir.²⁵

"The Cough of Albuquerque" showcases Thumboo's youthful vision of forging a new Malayan experience with a forceful interplay of imagery, symbolism and myth-making. He evokes scenes of untamed wilderness found in a pre-independence Malayan landscape shrouded in the mists of homegrown folklore, tales of Western explorer-generals and mythic legends, and "attempts to do for Malayan culture what W.B. Yeats did for Ireland".²⁶

The poem's title takes inspiration from the death-in-life imagery invoked by an old man in an arid season as seen in T.S. Eliot's "Gerontion". The "Cough" in the poem's title is an allusion to a line in "Gerontion":



(Above left) In 2006, Edwin Thumboo donated 15 sets of sepia-toned authorial drafts of "The Cough of Albuquerque" to the National Library Board. The typescripts shown here include Thumboo's handwritten edits. These provide glimpses into the careful and considered pursuit of his craft. Collection of the National Library, Singapore. (Call no.: RCLOS 378.12095957 THU-[ET]; Accession no.: B20056083B).

(Above right) Portrait of Edwin Thumboo, c. 1958, during the time when he was working at the Income Tax Department. Collection of the National Library, Singapore. (Call no.: RCLOS 378.12095957 THU-[ET]; Accession no.: B20056083B).

"The goat coughs at night in the field overhead;/Rocks, moss, stonecrop, iron, merds." The goat, a symbol of white-hot fertility, is brought into sharp relief by the bone-dry sterile wasteland found in the next line.²⁷

Thumboo's poem is arranged in five sections of 50 to 60 lines each and gives full play to the poet's weaving of myth, history, images and symbols, as well as philosophy and spirituality in a rich tapestry of individual and collective experiences.

Alternating between the familiar "durian-hot" environs of the Malayan landscape and the dream-like scenery in mythical places, Thumboo's keen observations of nature is evident through the "evocation of landscape through a few sharply defined images in nature".²⁸

In the first section, the subject in the poem takes a lyrical hike, first through a landscape more commonly seen in Western literary traditions, peppered with references to classical mythological figures like "Dido and her pyre"²⁹ and a "Cabalistic eye, old guardian of the door" that if read as "symbols of a colonial inheritance, augur a collapse".³⁰

As the subject of the poem ventures further on his hike, he encounters imagery more redolent of a tropical Malayan landscape upon which a post-colonial identity might be established. Here, the poet as lyrical cartographer discards the earlier mentions of Greek mythic figures³¹ and

maps a distinctive terrain with descriptions that are immediately recognisable to readers in this part of the world:

No – just durian-hot,
Lallang trimmed by fire.
Iguana far from ooze
Creepers loose their coil
Merbak, mateless on the branch,
Nonya bought her fan
To milk the little shade.³²

In Section IV of the poem, the subject proclaims his identity, discards his colonial inheritance and declares a national belonging:³³

... This is my country
Before the roots threw grapnel
And I feel the stream from Terbrau near

Chempaka blooms;
There, old tembusu bright with superstition
Now sunlight marching through.
I'll plant my feet.

The cough of Albuquerque,
Wind stiff with remorse:
A new beginning touch my shoulder.³⁴

Place names such as Terbrau in Johor allude to Singapore's close relationship with its northern neighbour. Meanwhile, a

visitation of sunlight brightens the mood of the poem and brings about a "new beginning" with the dispelling of mythic dangers lurking within the terrain suggested by the imagery of the ancient tembusu trees "bright with superstition".

Tides of Change

With Singapore's independence in 1965, the push for development, especially mass resettlement projects that created unfamiliar landscapes and neighbourhoods, gave rise to disquieting responses in homegrown poetry.³⁵ Offering an alternative view to the industrious, purpose-filled atmosphere of a newly independent nation, the late poet-novelist-playwright Goh Poh Seng's verse chips away at the gleaming facade of this island nation to reveal the rusty scaffold beneath. In his 1976 poem "Singapore",³⁶ we witness the relentless tides of change that have swept through the country during its nation-building years as the poet laments the tainting of a simpler way of life, now threatened by the allure of commerce:

Towards the sea's fresh salt
the river bears pollution
whose source was simple hills

Whose migration was tainted
when man
decided to dip his hand

Nourishing his wants
a commercial waterway
greased with waste³⁷

Echoing similar sentiments, Arthur Yap's 1980 poem "Old Tricks for New Houses"³⁸ makes a wry remark on the land reclamation initiatives to develop residential estates:

the sea can't reach you now
& it'll be further away next year.
your neighbours will hang crabshells
on their pomegranate plants as saline
testimony,
your proximate goodwill will be good
& help salt away the years in happy
homes.³⁹

In many of Yap's poems, the promise of economic success and material gains is often compromised by scenes of stagnation and a sense of alienation.⁴⁰ The remnants of marine life described in "Old Tricks for New Houses" are left hanging as pomegranate plants lining the corridors of public housing estates – built on reclaimed land – as a mere memory of the natural landscape.

Clean-up Campaigns and Green Plans

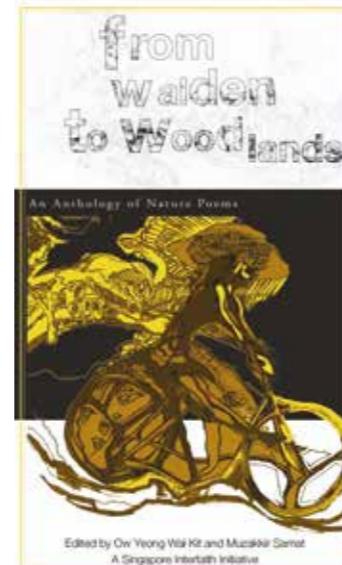
The Singapore of today, with its manicured gardens, roadside greenery and tamed landscape, is vastly different from the one that inspired Thumboo and the poets of the immediate post-war period. Today's poets, are in fact, inspired by the process of mastering nature, as the works in the 2015 anthology *From Walden to Woodlands* demonstrate. These poems draw inspiration from the flora, fauna and habitats native to Singapore and explore our relationship with the environment at large.⁴¹

In Eric Tinsay Valles' "Singapore River on Exhibit", a poem published in 2015 and inspired by an exhibition at the Asian Civilisations Museum, the poet pays tribute to what must have been abundant aquatic life teeming beneath the murky waters of the Singapore River (before it was cleaned up), alongside the multicultural, multilingual tapestry of commerce taking place along its shores:

Majestic in the middle of a frame,
A green streak undulating like grass
snake,
pristine on uncluttered canvas,
you draw *orang laut* dreaming of
tomorrow
on a boat pulling away in the muddy
water
until they are washed away from the
scene.
They bend down, count the day's
catch,
watch you run past them.⁴²

Here, the Singapore River is observed from a safe (and clean!) distance within a frame at an exhibition. However, this is not another poem decrying the ravages of prog-

The poems in this anthology draw inspiration from the flora, fauna and habitats native to Singapore, and explore our relationship with the environment. Ow Yeong, W.K., & Muzakkir Samat. (2015). *From Walden to Woodlands: An Anthology of Nature Poems*. Singapore: Ethos Books. Collection of the National Library, Singapore. (Call no.: RSING S821 FRO).



ress, but a lyrical musing that ponders on the river's versatility and enduring mystique:

Cycles of drought and rain, urban
renewal
neither detain your dance nor silence
your hum.
You are slighted by tourists distracted
by the Merlion
spitting in envy at the floating Sands
garden.
Shoot a spray at the passing glory
as you rush home to the strait.
Twigs of time scrape against imagery
as you pass by and through me.⁴³

The Singapore River, in the eyes of this poet, hums with life despite its present urban-renewed look and smoothly glides past the gleaming glass-and-steel of Marina Bay Sands. Its dignity inspires the poet to "write blank verses" having witnessed the changing tides of history. Valles' poem, while unapologetically highlighting the tourist attractions that have sprung up near the river, pays tribute to an enduring natural landmark.

Nature in the Home

Homegrown poetry increasingly reflects a sense of peaceful negotiation even as poets engage in an ongoing dialogue with the constant changes brought about by urban renewal initiatives across the island.

Aaron Maniam's 2019 poem, "My Mother's Garden",⁴⁴ is one such poem that finds comfort in domesticity in its juxtaposition of familial love with the imagery of nature set within the safe embrace of the poet's own garden:

Only today, I realise how this place
And your gentle, parenting patience
Taught me my first metaphors:

The skyline showing the early signs of dramatic changes along the Singapore River in the 1960s. The tallest building is the Bank of China, designed in the Art Deco style. George W. Porter Collection, courtesy of National Archives of Singapore.



Bird's nest, elephant ears , fingers
Greener than leaf or pasture resisting
Incursions from shaving brushes
And grass alive with animal spirits –
[...]

Years of grafted stems, crafted stories,
Dug to root and reality in this new
place:

All your loves, labours, litanies
Defying name and number as they

grow, grow.⁴⁵

In these lines, flora, fauna and faith in the nurturing qualities of domestic bliss

come together to provide continuity and growth for the elderly and younger members of the family. Situated within the safety of the family home, the poet pays homage to a motherly figure who has nurtured not merely plants and birds but also the members of her household. The poem renews faith that charity – reflected through the nurturing of nature – starts within the family unit, and flourishes along a growth trajectory to the wider world beyond.

Bringing the winding odyssey of past lyrical-sojourners at the beginning of this exploratory journey to a close, Maniam's poem is reflective of a later generation of poets who negotiate the curves ahead with a growing, confident voice, armed with an established identity right at home. ♦

NOTES

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- 6 Holden, 2009, p. 8.
- 7 Gak-Stok-Sin. (1907, December). Nature's secret. *The Straits Chinese Magazine*, 11 (4) 131–175, p. 150. Singapore: Koh Yew Hean Press. (Call no.: RRARE 959.5 STR; Accession no.: B03057023I)
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- 45 Maniam, 2019, p. 37.

FINDING MAGIC EVERYWHERE

According to **Farish A. Noor**, many of the beliefs and rituals described in Walter Skeat's book *Malay Magic* may not be considered particularly "magical".

Originally published in 1900, Walter William Skeat's *Malay Magic* was conceived as a comprehensive description of Malay beliefs, folklore and customs. Among other things, it covers customs and rites relating to various aspects of the natural world.

For example, Skeat writes about how Malay *pawang* (shamans) detect perfumed agarwood (also known as eaglewood), or locally, *gaharu*.¹ The perfume is created by a disease that infects the inner heartwood of the aquilaria tree, making it impossible to tell if a tree is valuable from the outside, hence the need for a *pawang*. According to Skeat, the process involves the *pawang* burning incense and repeating a charm or formula until the right tree is found.

Skeat's work was considered groundbreaking but some scholars have critiqued the work for positioning Malay knowledge and practices as "charms" and "rituals", where in many cases they were simply traditions through which practical experience and scientific information were passed on.

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During the colonial era, data-collecting and knowledge-building went hand-in-hand with conquest and territorial expansion. This was as true of the British Empire as it was with the other European powers – like the French, Dutch and Portuguese – who expanded their spheres of influence across Southeast Asia.

In tracing the development of colonial knowledge during the age of Empire, Thomas Richards noted that "the British may not have created the longest-lived empire in history, but it was certainly one of the most data-intensive".²

Empires were built not only by force of arms, but also by colonial scholars and data-collectors who brought with them a host of preconceived culturally specific notions about the Asian Other. Consequently, their works tended to portray non-Western societies as different, alien and strange.

One such scholar was Walter William Skeat, an anthropologist of the Malay Peninsula whose detailed works laid the foundation for later ethnographic studies of the region. His studies on Malay culture, language and belief systems were, at the time, regarded as being among the most comprehensive and thorough ever produced.

While not denying the near-exhaustive scope of Skeat's work, my view is that colonial knowledge production was rarely a truly consultative process that engaged different knowledge systems in a dialogue of equals. Instead, it was an unequal process where non-Western belief systems and knowledge systems were often deliberately downplayed and shunned; these tended to be perceived as antiquated myths, outdated folklore and even arcane "magic". We can see this in the work of Skeat and his collaborator, Charles Otto Blagden.

Malay Magic as a Form of Colonial Knowledge-Power and Othering

*Malay Magic: Being an Introduction to the Folklore and Popular Religion of the Malay Peninsula*³ marked the beginning of Skeat's partnership with Blagden, an English Orientalist and linguist known for his expertise in Southeast Asian languages – notably Malay and the Mon language of Burma (now Myanmar). Blagden wrote the preface and also saw the book through the final stages of its publication.

Malay Magic was the result of the fieldwork that Skeat had undertaken in the Malay interior, notably in the kingdom

(Facing page) A Malay *pawang* of the Straits Settlements, c. 1900. *Lim Kheng Chye Collection*, courtesy of National Archives of Singapore.

(Below) The title page of *Malay Magic* by Walter William Skeat. Skeat, W.W. (1900). *Malay Magic: Being an Introduction to the Folklore and Popular Religion of the Malay Peninsula*. London: Macmillan and Co., Limited. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 398.4 SKE; Accession no.: B02930611K).



of Selangor and the areas bordering the kingdoms of Pahang and Perak. Skeat and Blagden would later collaborate while studying the aboriginal peoples of the Malay Peninsula, and the outcome of their joint research is the co-authored work, *Pagan Races of the Malay Peninsula*, published in 1906.⁴

Skeat begins *Malay Magic* with a quotation from Rudyard Kipling's *The White Man's Burden*, which sets the tone for the rest of his inquiry:

"The cry of hosts (we) humour
Ah! Slowly, toward the light."⁵

Thus from the outset, the dialectical pairing of light and darkness is introduced, bringing with it the values and the trains of thought derived from a Western Enlightenment project that would come barrelling down upon the body of Malay beliefs, customs and knowledge.

In his preface to *Malay Magic*, Blagden noted that Skeat's aim was to collect into a book of Malay folklore "all that seemed to him most typical of the subject amongst a considerable mass of materials, some of which lay scattered in the pages of

other works, others in unpublished native manuscripts, and much in notes made by him personally".⁶ To that end, Skeat had consulted all "the principle authorities" on the subject. These experts on things Malay and Malayan – who included Straits Settlements Colonial Secretary William Edward Maxwell (1892–95), as well as colonial administrators Frank Athelstane Swettenham and Hugh Charles Clifford, both of whom later became governors of the Straits Settlements – all happened to be Englishmen.⁷

Skeat provided the list of works that he had consulted at the end of the book, where Orientalist and numismatist William Marsden, linguist and poet John Leyden and second Resident of Singapore John Crawfurd (1823–26) – all employees of the British East India Company – were also cited as his main sources of information.⁸

Skeat and Blagden were particularly interested in the beliefs and customs of the Malays in particular as their research was conducted within the domain of what was then British Malaya. The beliefs of other non-Malay communities (notably Chinese migrants) were deemed of secondary importance.⁹

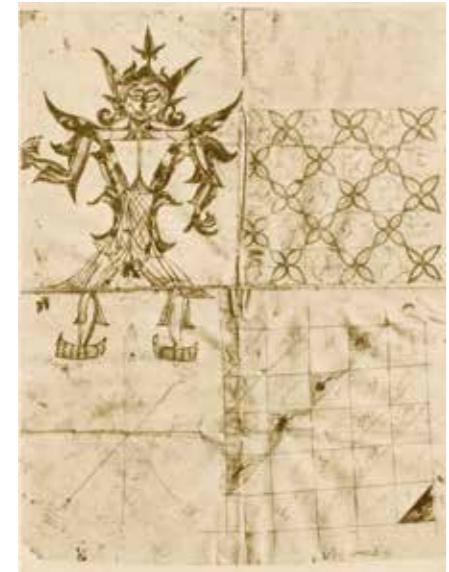
Dissecting Malay Magic

The organisation of *Malay Magic* is systematic, beginning with an account of Malay beliefs about the creation of the world and natural phenomena, followed by the place of Man in the universe. From the third chapter onwards, Skeat devotes most of his attention to the Malay magician or shaman (*pawang*) and his relationship with the supernatural world before moving on to the Malay pantheon, the rites and rituals of Malay life in relation to the natural world, and magic rites affecting the life of Man.

At times, however, just where the boundary between the natural and supernatural lies is somewhat unclear in Skeat's account. Many of the taboos and restrictions (including sartorial norms and rules of language use) that he talks about had less to do with magic or matters arcane, and more to do with social conventions and modes of identity construction in Malay society.¹⁰

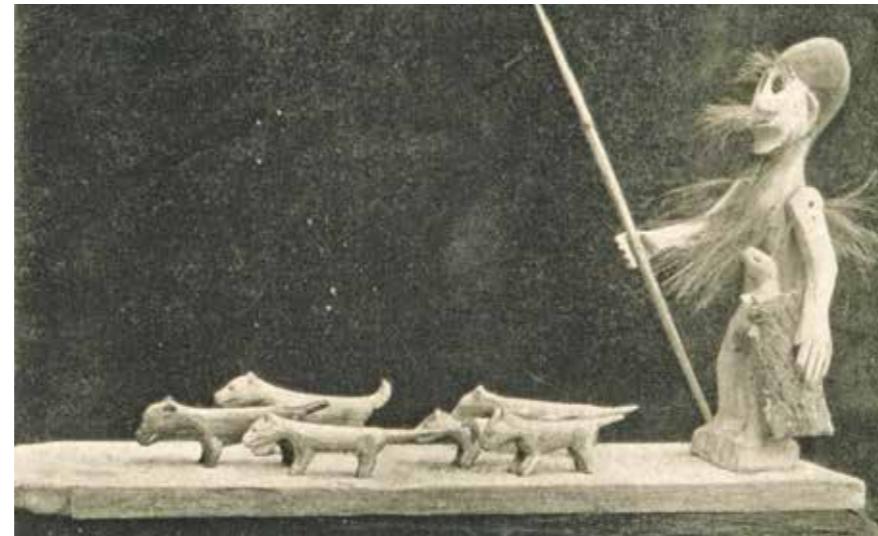
Quite early on in the text, the reader can see how Skeat's attempt at universalising Malay beliefs and customs is one that compares Malay beliefs and cultural praxis with other non-Western cultures deemed primitive and less civilised to Europeans. For instance, when he points out that in Malay society, the head of a person is considered the most important part of the body, and that patting a person on the head is regarded as insulting, his immediate point of comparison was the communities of Polynesia.¹¹ One might ask, though, whether an ordinary Englishman at the time would be happy to be patted on the head by complete strangers for no apparent reason.

Skeat framed the object of his inquiry (the Malay and his beliefs) in the category



(Below) The Spectre Huntsman (*hantu pemburu*) roams the forest carrying a spear in his right hand and with his dogs in search of a quarry. Its appearance is the harbinger of disease or death. *Image reproduced from Skeat, W.W. (1900). Malay Magic: Being an Introduction to the Folklore and Popular Religion of the Malay Peninsula (after p. 116). London: Macmillan and Co., Limited. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 398.4 SKE; Accession no.: B02930611K).*

(Bottom) An illustration from *Malay Magic* which shows diagrams used by *pawang* for divination. The top left figure has different points drawn on its anatomy for divination means. The bottom left diagram is used like a compass with the diviner counting around it from point to point. The diagrams on the right are two different types of "magic squares". *Image reproduced from Skeat, W.W. (1900). Malay Magic: Being an Introduction to the Folklore and Popular Religion of the Malay Peninsula (after p. 554). London: Macmillan and Co., Limited. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 398.4 SKE; Accession no.: B02930611K).*



of the unscientific, irrational and superstitious. It is against that backdrop of native primitivism that Skeat introduces the figure of the Malay magician, who

"is a functionary of great and traditional importance in a Malay village, though in places near towns the office is falling into abeyance".¹² In this description, he introduces a second binary, which is that of the rural-urban divide. Although Skeat recognised that the *pawang* occupied a position in society that placed him at an equally high standing with members of the aristocracy and royalty,¹³ he nonetheless located the magician in a domain of its own, associated with all things supernatural and esoteric.

By the time we reach the second half of Skeat's near-exhaustive study of Malay customs and practices, we encounter his detailed descriptions of Malay cultural activities and pastimes, such as children's games and nursery rhymes, card games, board games – including chess, of all things – and buffalo fights and cockfighting. That cockfighting made its way into his study of Malay magic says something about how Skeat was perhaps over-extending himself. Nursery rhymes, card games and cockfighting may have been part of the Malay cultural praxis in general, but if cockfighting was indeed

a form of magical activity, then one can only conclude that there was a lot of magic going on at the dockside pubs of London too.

From here, it does not require much effort for the present-day reader to see that in Skeat's data-gathering, a lot of object-framing was going on as well. Because Skeat had laid as his foundational premise the notion that the Southeast Asian mind was one that was fundamentally unscientific, it followed that anything and everything the Malays did was suffused with the elements of the magical, esoteric and mysterious.

Skeat's propensity to find magic wherever he looked is perhaps most evident in the section of his work where he discusses the role of the *pawang* of the tin mines. In chapter five, Skeat devotes an entire section on minerals in the natural world and mining charms. It is here that he writes about the "mining wizard", an individual of considerable importance in the mining districts of Perak and Selangor.¹⁴

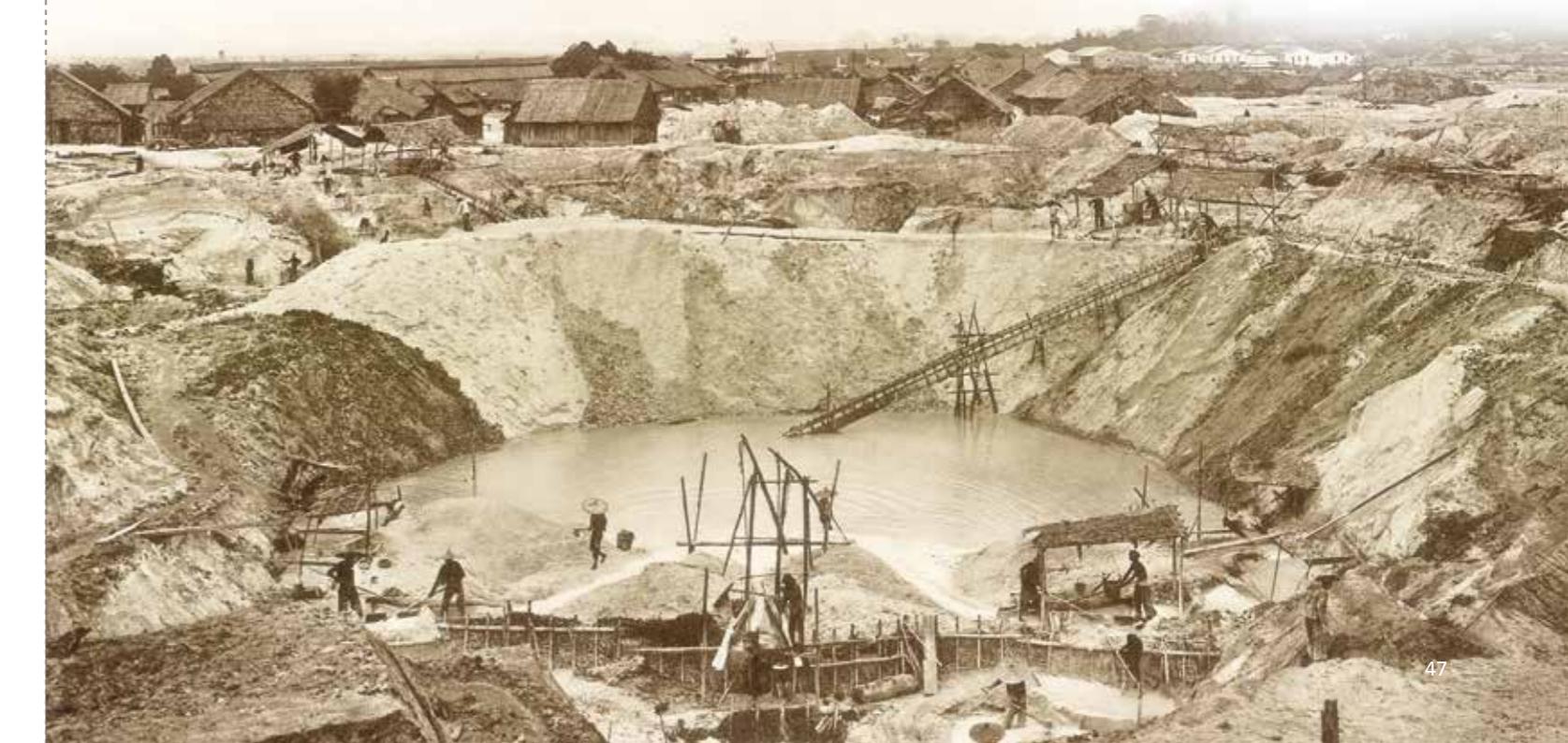
Yet upon closer reading, it seems that the role of the famous "mining wizard" in the tin-mining districts was closer to that of a factory foreman, whose duty was "to carry out certain ceremonies, for which he is entitled to collect the customary fees, and enforcing certain rules for the breach

of which he levies the customary fines".¹⁵

The rules (or taboos/*pantang*) enforced by the *pawang* of the mines are listed by Skeat as follows (paraphrased), with the fines or penalties enclosed in brackets:¹⁶

1. No bringing cotton or raw cotton to the mines (\$12.50);
2. No wearing of black coats/shirts (\$12.50);
3. No using of earthenware or clay gourds for carrying water (\$12.50);
4. No gambling anywhere in or near the mines (\$12.50);
5. The building of aqueducts is to be done away from the mines (\$12.50);
6. No using of the *bahasa pantang* (forbidden language) of the *pawang* (\$12.50);
7. No smearing charcoal on the faces of miners (\$12.50);
8. No wearing of the clothes of other miners (one *karong* [sack] of tin sand);
9. A broken *chupak* (measure) of the mine should be replaced or repaired within three days (one *bhara* of tin);
10. No bringing of weapons of any kind to the mine or the smelting-house (\$1.25);
11. No wearing of coats at the smelting-house (\$1.25);

Tin mining in Ipoh, Perak, c. 1910. In chapter five of *Malay Magic*, Walter William Skeat discusses the role of the "mining wizard" or *pawang*, an important individual in the mining districts of Perak and Selangor. Retrieved from Southeast Asian & Caribbean Images (KITLV), Leiden University Libraries (CC BY 4.0).



the influx of migrant workers brought in by the British.

The tin mines of Perak and Selangor were male-dominated spaces that were full of poor and underpaid miners who were either local Malays or Chinese migrants. Being spaces of evident economic and power differentials (between the mine owners and the mine workers), and whose conditions were at the same time hot, damp, dusty and unsanitary, workers were vulnerable to bouts of malaria, beri-beri and other diseases. Such places were potential tinderboxes.

Under such circumstances, most of the rules of the so-called "mining wizard" make sense to us today as they presumably did then as well: the prohibition of gambling and bearing weapons, and the stealing of rice and clothes, etc., were all intended to foreclose the possibility of theft, fighting and murder among the miners. Likewise, the prohibition of wanton destruction of property (such as the slashing of posts) and the wearing of coats in the smelting-house (where the burning furnace would be active) seems a perfectly logical way of preventing workplace accidents and the unnecessary loss of human life among the underpaid miners.

Given the commonsensical nature of the "mining wizard's" restrictions and rules, Skeat does not concede the possibility that these regulations were not so different from the health and safety regulations enforced at coalmines back in England, or the rules on board a vessel of the Royal Navy.

The closest we get to a more mundane account of the life and work of the *pawang* of the tin mines is when Skeat writes about the political economy of the mining industry in colonial Malaya at the time, and how the *pawang* was in the enviable position of being able to exploit his rank and status in the face of foreign capital.¹⁷ Yet at no point in his narrative does Skeat acknowledge the fact that the territory of Perak had been a contested one during the Perak War (1875–76), which extended British political influence over the Malay Peninsula.

Back in England, proponents of further British capital penetration – aided and abetted by a bellicose British press that was clamoring for the annexation of Perak – had been baying for greater control over the tin deposits. Nor does Skeat acknowledge that the Malays knew the lay of their land better than foreigners, and that some Malays knew where tin deposits could be found thanks to their understanding of their own geography.

Magic and Primitivism in the British Empire

Primitivism tends to be sticky, and it can remain in the minds of those who believe in it and then find it wherever they look. Skeat wasn't the first, or the only Westerner to become fixated by the view that the people of the Malay Peninsula were the bearers and reproducers of some form of Asiatic essentialism: such ideas had been in circulation since the 18th century, thanks to the work of men like William Marsden, Stamford Raffles¹⁸ and John Crawfurd.

These notions would eventually become sedimented and entrenched in the writings of subsequent British colonial scholar-functionaries stationed in British Malaya, such as historian Oliver William Wolters, Frank Athelstane Swettenham and Richard Olaf Winstedt. These ideas also had consequences on the ground. It was Winstedt who – as Assistant Director of Colonial Education in the Straits Settlements and Federated Malay States – would introduce the so-called “rural bias” to the colonial education system on the grounds that the Malays would be better served if they were taught vocational courses in farming and animal husbandry rather than science and history.

Although Skeat and his fellow scholars were living and working in a Malaya that had been by then seemingly “domesticated” and “civilised” by colonial rule, it is important to remember that behind that

history of pacification and domestication was also a history of violence and subjugation. That none of these men cared to speak or write about the historical circumstances that brought the British Empire to the doorsteps of the Malay Archipelago is a glaring omission that points to the myopia evident in their scholarly works. These men were not in Malaya by chance: all of them were functionaries in a colonial administrative system that locates them firmly in the centre of the machinery of the Empire.

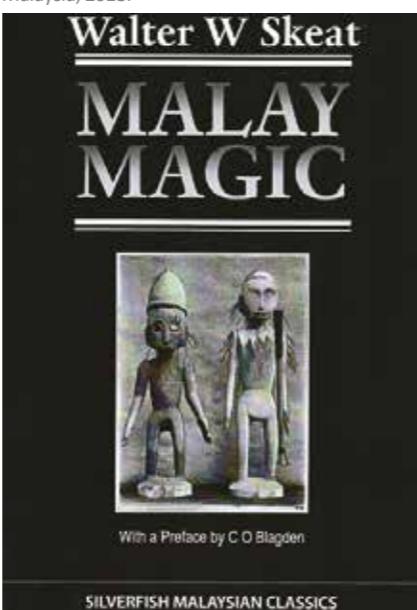
Skeat's work was indeed vast and near-exhaustive, but the problem does not lie in the scope of his scholarly ambitions, but rather in the lens which was brought to bear upon the objects of his study. Simply put, if one were to approach something by seeing it as a problem right from the outset, one will undoubtedly encounter problems wherever one looks.

The same can be said of Skeat's quest for traces of the magical, arcane and supernatural in his study of Malay society. Persuaded by his own view that the Malays (and other Southeast Asians) were an agrarian people whom he perceived as historically behind the nations of Western Europe, Skeat uncovered traces of magic in almost everything he looked at. But we cannot dismiss the very real possibility that what Skeat saw and understood as “magical” in the Malay world was in fact mundane and ordinary to the Malays themselves.¹⁹ ♦

NOTES

- 1 Agarwood is the dark resinous heartwood of the aquilaria tree. It is formed when the aquilaria tree becomes infected with a type of mould. Prior to infection, the heartwood is odourless, relatively light and pale coloured. As the infection worsens, the tree produces a dark aromatic resin called aloes or agar. Agarwood is used as a raw material for incense, perfume and medicine.
- 2 Thomas, R. (1993). *The imperial archive: Knowledge and the fantasy of empire* (p. 4). London: Verso Press. (Not available in NLB holdings)
- 3 Skeat, W.W. (1900). *Malay magic: Being an introduction to the folklore and popular religion of the Malay Peninsula*. London: Macmillan and Co., Limited. Retrieved from BookSG. (Call no.: RRARE 398.4 SKE; Accession no.: B02930611K)
- 4 Skeat, W.W., & Blagden, C.O. (1906). *Pagan races of the Malay Peninsula*. London: Macmillan and Co., Limited. (Call no.: RCLOS 301.209595 SKE)
- 5 Skeat, 1900, p. vi.
- 6 Skeat, 1900, p. vi.
- 7 Skeat, 1900, pp. xiv–xv.
- 8 On page 675 of *Malay Magic*, Skeat lists the “chief authorities” quoted in his work, and perhaps not surprisingly – with the exception of Klinkert's and Wall's Malay dictionaries – they were all the works of fellow Englishmen.
- 9 There are few instances where Skeat writes about the interaction between the Malays and Chinese in colonial Malaya then, and it becomes evident early on that the belief systems of the Chinese were of lesser concern to him. When discussing the topic of Malay shrines (*keramat*), he noted that “I have never yet, however, heard of any shrine dedicated to a Chinaman, and it is probably that this species of canonisation is confined (at least in modern times) to local celebrities professing the Muhammadan religion, as would certainly be the case of the Malays and Javanese mentioned. [...] It is true

Malay Magic by Walter William Skeat. This edition was published by Silverfish Books in Kuala Lumpur, Malaysia, 2018.



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From Gambier to Rubber

PLANTATION AGRICULTURE IN SINGAPORE

Timothy Pwee takes us on a tour through pepper, gambier, nutmeg, pineapple and rubber plantations that were once common in 19th-century Singapore.

being a free port astride a major trading route between the Indian Ocean and the South China Sea enabled Singapore to flourish in the 19th century. While Singapore's wealth was clearly built on trade, this tends to overshadow the fact that for much of the 19th and well into the 20th century, commercial agriculture was a significant economic activity on the island as well.

The first topographical survey of Singapore Town – conducted by colonial architect George D. Coleman in 1829 and which yielded the *Map of the Town and Environs of Singapore* in 1836 – showed large plots of land

dedicated to agriculture on the outskirts of settled areas. There were paddy fields on the eastern banks of the Kallang River, while to the east of these fields, land had been cleared for the growing of sugar and cotton. In addition, the area south of the paddy fields was used for the cultivation of the betel vine. Around what is now the Orchard Road area were gambier plantations.¹ About a decade later, coconuts had taken over the paddy fields, according to Government Surveyor John Turnbull Thomson's 1844 map of Singapore town and the adjoining districts. Meanwhile, pineapples were being grown on Pulau Blakang Mati (present-day Sentosa) and there were nutmeg orchards in the Claymore district (today's Orchard Road).²

Since the arrival of the British in 1819, large swathes of land in Singapore had been used for the cultivation of commercial crops – the most important of which were pep-

per, gambier, nutmeg, coconut, pineapple and rubber. While plantation agriculture is no longer practised in Singapore, these long-gone plantations have had a significant impact on Singapore's economy, environment and biodiversity.

Gambier and Pepper – a Close Connection

The earliest recorded plantations in Singapore were devoted to growing gambier. When Stamford Raffles landed here in 1819, he found that he had been preceded by the Chinese, mostly Teochew, who were growing the crop.³

At the time, gambier was being planted in the region, including on the Riau Islands and in Penang, so it would not have been surprising to encounter gambier planters in Singapore. In 1822, the first Resident, William Farquhar, writes of a Chinese gambier plantation west of Government Hill

(today's Fort Canning). That same year, James Pearl, the captain of the ship *Indiana* that brought Raffles to Singapore, purchased land on the western side of the hill from the gambier planter Tan Ngun Ha. Pearl began to acquire more plots on the hill from Chinese gambier planters until he owned the entire hill. Today, this hill in Chinatown is known as Pearl's Hill.⁴

Gambier is a fast-growing shrub whose foliage can be harvested in about 14 months. The leaves and twigs are first boiled and the resulting paste is then dried. The final product, popularly called catechu, contains both tannins and catechin.

In the early 19th century, catechu was mainly used as an additive in the betel quid. The catechu and lime were smeared on the betel leaf (known locally as *sireh*), which was then

Timothy Pwee is a Senior Librarian with the National Library, Singapore. He is interested in Singapore's business and natural histories and is developing the library's donor collections around these areas.

wrapped around small slices of areca nut. Betel chewing was a habit that was popular in the region at the time.⁵

Much of the produce went to Batavia (now Jakarta) in the Dutch East Indies and distributed throughout the region. However, this came to a sudden halt in 1827 with the imposition of restrictive duties by the Dutch. This caused a crash and many gambier plantations, including those in Singapore, went out of business.⁶

The industry revived in the 1830s though as gambier was discovered to be a good source of tannic acid, used for tanning leather and dyeing textiles. Demand from England, and later the Americas, caused a boom regionally. Among the beneficiaries was businessman Seah Eu Chin. In 1835, he purchased an 8-mile (almost 13 km) stretch of land between River Valley Road and Bukit Timah Road for his gambier plantations. This made him the largest gambier planter in Singapore, earning him the moniker "Gambier King".⁷

Commonly grown alongside gambier is pepper. Although pepper was a much more profitable crop, the plant takes three years before it can be harvested. Additionally, the pepper plant is a vine that requires frames for support to grow upwards and also needs to be fertilised regularly. The boiled gambier leaves provide much-needed fertiliser for pepper plants which is why the two crops are often grown together; gambier would be planted while waiting for the pepper vines to start bearing fruits.

Unfortunately, growing gambier and pepper takes a significant toll on the land

as the crops exhaust the soil drastically and render it infertile after about 15 years. In addition, the purification of gambier catechu required so much firewood that the forests surrounding gambier plantations would be stripped of wood for fuel. This meant moving elsewhere to start the cycle all over again.

The result was a pattern of shifting cultivation that started from the Singapore River area and eventually spreading across the island until practically the entire island had been exploited. By the 1860s, Singapore's gambier output had begun to decline as planters moved to Johor. However, it was only at the close of the 19th century that gambier planting finally faded into oblivion.⁸

The Blighted Nutmegs

Another cash crop that was cultivated in 19th-century Singapore was nutmeg, which was one of the major spices that drove the colonial enterprise in Southeast Asia. Two spices are actually produced from the plant: nutmeg and mace. The nutmeg spice comes from the seed, while mace comes from the aril, the red lacy layer surrounding the seed. Both nutmeg and mace are similar in taste, with mace described as being more delicate. Given its desirability and profitability, nutmeg was an obvious crop for the pioneer merchants in Singapore to cash in on.

After Raffles established a trading post on Singapore, he sent over nutmeg seeds and saplings from Bencoolen (now Bengkulu), on the island of Sumatra, where he was Lieutenant-Governor. Nutmeg

(Facing page) A gambier and pepper plantation in Singapore, c. 1900. Pepper and gambier are often grown together. The boiled gambier leaves provide the much-needed fertiliser for pepper plants. Pepper vines also entwine around the gambier plants for support as they grow. Courtesy of the National Museum of Singapore, National Heritage Board.

(Below) The gambier shrub looks quite nondescript, with the most notable feature being its bright yellow inflorescence. Jessica Teo, NParks Flora&FaunaWeb.



plantations were then established along what is today's Orchard Road and in Tanglin. Although the nutmeg trees had thrived initially, there were later problems with blight.

When William Montgomerie, Assistant Surgeon with the Bengal Native Infantry, returned to Singapore in 1835, he found that the nutmeg trees planted on Raffles' instructions a decade and a half earlier had been neglected and were diseased.⁹ He estimated that there were about 25,000 nutmeg trees in Singapore with only a few hundred being over 10 years old.¹⁰

One reason for the large number of new trees from the 1830s onwards is that the lease periods for land were initially shorter. It was only in 1828 that the government started giving out longer land leases of 20 years, with the option to renew for another 30 years.¹¹ George Windsor Earl, writing in *The Eastern Seas* in 1837, observed that "there are no European planters in the island of Singapore; nor is it probable that any British-born subject will venture to engage in agricultural speculations, since the system of land tenure would destroy all confidence, and all hope of profit in the planter".¹²

However, the longer land leases from 1828 onwards appeared to have given some Europeans the assurance that they could plant nutmeg saplings and reap some profit when the trees matured and bore fruit. In 1834 for instance, a plot of land in the Duxton area of Tanjong Pagar that

had been planted with nutmeg trees was offered at an auction with a 15-year lease that began in 1827.¹³ Montgomerie bought the land and planted more nutmeg trees. In 1843, the government started issuing what is now called freehold land, and by the time of Montgomerie's passing in 1856, his plot in Duxton had become freehold land. He must have purchased the freehold title to it, most likely in 1842 when the original lease expired.¹⁴

Although Singapore was now a nutmeg producer, its output trailed behind Penang which was already producing enough nutmeg to meet the demand from Britain by 1842. This caused the price of nutmegs in Penang to plummet from \$10–\$12 per thousand to \$4–\$5 per thousand.¹⁵ This did not deter planters, and the mania for planting nutmeg trees in Singapore continued unabated. John Cameron's 1865 *Our Tropical Possessions in Malayan India* noted: "What had been flower gardens and ornamental grounds of private residences were turned over, and nutmegs planted to within a stone's throw of the house walls. Besides this, large tracts of jungle, at a distance of four or five miles from town, were bought up from Government, cleared at great expense, and turned into plantations. Some of these newly reclaimed properties... changed hands at exorbitant prices."¹⁶

However, from the 1850s, the nutmeg trees were again plagued by the mysterious blight that blackened branches and killed the fruits. During that decade, nutmeg plantations were decimated just as the original nutmeg trees planted in the 1820s had been. In 1897, Director of the Botanic Gardens Henry Nicholas Ridley diagnosed these symptoms as being caused by the nutmeg beetle (*Phloeosinus ribatus*).¹⁷

Coconuts on Sandy Beaches

Another important plantation crop grown in Singapore in the 19th century was coconut. An 1841 *Singapore Free Press and Mercantile Advertiser* report noted that "[no] trees of this kind can well be more flourishing than those in the plantations which stretch along the seashore to the N.E. of the Town – and which growing on the Island called Blakang Mati", and estimates that "[t]here are perhaps about 50,000 trees now planted out and occupying about 660 acres of land".¹⁸

In 1849, it was estimated that coconut plantations occupied 2,658 acres in Singapore, even larger than the area used for nutmeg plantations which took up 1,190 acres.¹⁹ Coconut was the second largest crop by acreage behind gambier and pepper (by far the largest at 27,000 acres).

A history of Joo Chiat identifies Francis Bernard as the pioneer coconut estate planter on the eastern coast of Singapore.²⁰ The son-in-law of first Resident William Farquhar, Bernard started planting coconuts in 1823 and was fol-

(Below) Detail from the 1836 *Map of the Town and Environs of Singapore* showing the land east of the Kelang (Kallang) River planted with rice. However, the land was soon dominated by coconut plantations. The map was drawn by Jean-Baptiste Athanase Tassin, a renowned French lithographer and cartographer, and printed in Calcutta. It was based on George D. Coleman's 1829 survey of Singapore, which is the earliest known topographical survey of Singapore town. This map is useful in showing the various crops produced on the outskirts of the town in the 1830s. *Survey Department Collection*, courtesy of National Archives of Singapore.

(Below right) The black seed of the nutmeg fruit is ground to make the nutmeg spice, while the red aril around the seed is used to make another spice known as mace. Locally, the flesh is eaten pickled as *buah pala*. Courtesy of Boo Chih Min, NParks Flora&Fauna Web.



lowed in the subsequent decades by other Europeans such as Thomas Dunman (the first Commissioner of Police in Singapore from 1856 to 1871) and Chinese businessmen like Hoo Ah Kay²¹ (better known as Whampoa). Dunman's estate was one of the biggest, stretching from today's Fort Road to Tanjong Katong Road and reaching inland to Dunman Road, which was named after him.

As Singapore's long and sandy south eastern coast was conducive for growing coconuts, these plantations became characteristic of the area. Unfortunately, these plantations also eventually wiped out the coastal forests.²²

Smaller coconut plantations were found elsewhere on the island, like a 30-acre nutmeg and coconut estate on Bukit Timah Road, which was put on auction in 1845.²³ Planting different types of crops in one plantation was not uncommon. In the early decades especially, planters would experiment with different crops. Jose d'Almeida, a Portuguese naval surgeon who arrived in Singapore in 1825 and set up a dispensary in Commercial Square (now Raffles Place), was one such example. He later became a landowner and one of Singapore's leading merchants. On his Confederate Estate in Tanjong Katong, he tried but failed with cotton before turning to coconut.²⁴

Pineapples and the Canning Industry

The pineapple, indigenous to South America, was one of the native food plants from the Americas, like chilies, potatoes and tomatoes, that was spread by Europeans to the rest of the world in the 17th century. Surprisingly, it was Singapore's third largest crop by acreage in 1849.²⁵

Pineapple seems to have been a popular fruit and was originally cultivated by the Bugis on the southern islands and in Telok Blangah as can be seen from mid-19th century maps of the area. The earliest mention of pineapple cultivation appears to be a *Singapore Chronicle* article by second Resident John Crawfurd, published around 1824.²⁶ John Cameron states in *Our Tropical Possessions in Malayan India* that the pinneries in Telok Blangah belonged to the Temenggong and these were mainly for sale in Singapore.²⁷

Ownership of the offshore-island estates is less clear although accounts in the mid-1800s agree that they were cultivated by the Bugis.²⁸ English navigator George Windsor Earl's 1837 account suggests that there might be Javanese cultivators as well: "On the coast of the island to the eastwards

of the town, and also on the little islets off the harbour, are small agricultural settlements of Bugis and Javanese."²⁹

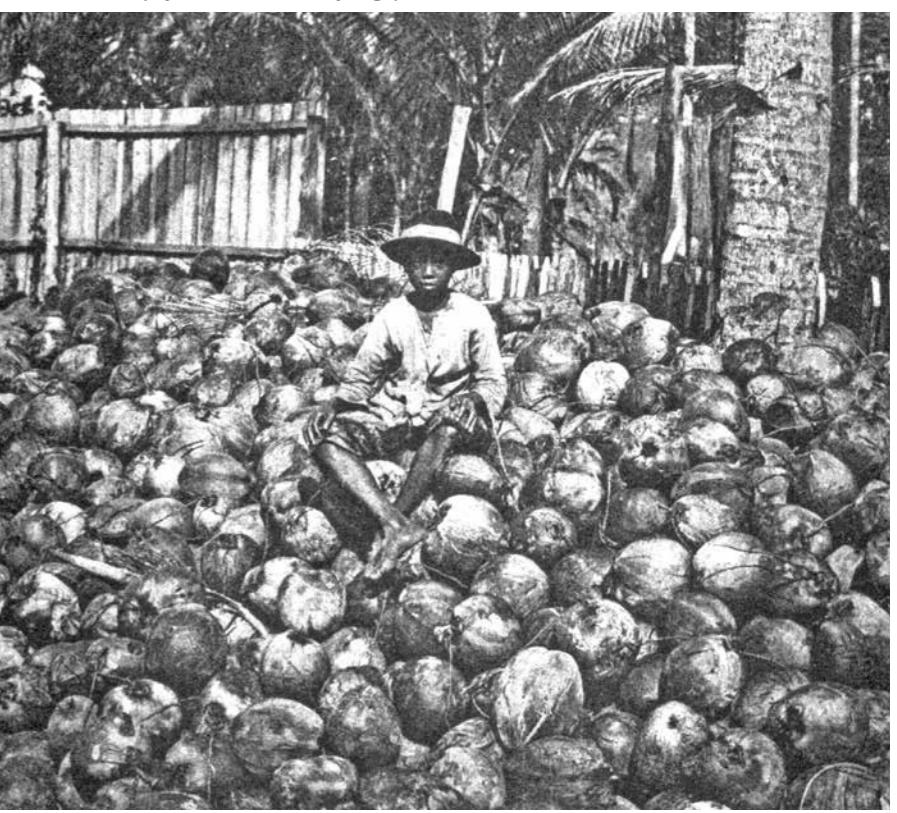
Writing in 1841, Joseph Balestier, the first American Consul to Singapore, and William Montgomerie, then Head of the Medical Department in Singapore, noted that although the pineapples growing on the island "are of a superior quality... are large [and] sweet and well flavoured" and

"eagerly consumed by the lower classes", they also cautioned that the pineapple is "not a wholesome fruit and... assisted the cholera in the ravages it made here last spring; when it is believed from six to seven hundred natives died of that dire disease".³⁰

At the time, there was no hint of the fruit being exported but there was apparently a small export market to China for the pineapple leaf fibre.³¹ Called *piña* in the

(Below) A young worker sitting atop harvested coconuts in a coconut estate in Singapore, 1922. *Lim Kheng Chye Collection*, courtesy of National Archives of Singapore.

(Bottom) Freshly harvested pineapples in Singapore being transported by a bullock cart to be sold, 1900s. Pineapples grown in Singapore and the Malay Peninsula became a major canned export from the 1900s onwards. *Courtesy of National Archives of Singapore*.



Philippines, it was often combined with silk or cotton to weave into textiles. From the 1870s onwards, when the British developed Pulau Blakang Mati into a defence post to protect shipping passages due to its strategic location, the Bugis-owned pineapple gardens on the island appeared to have gone into retreat.

It was only with the advent of canning or tinning technology that the pineapple became exportable in the days before air freight and nitrogen storage. The high acidity of pineapple made it ideal for preventing the growth of *Clostridium botulinum*, an anaerobic bacterium that produces the deadly botulinum toxin. If not properly sterilised, this bacterium thrives in canned food and its toxin can cause paralysis and even death.

A certain Frenchman, known only as Laurent, began canning pineapples in Singapore around 1875 but this effort was short-lived.³² Another Frenchman, a war veteran and seaman named Joseph Pierre Bastiani, started exporting canned pineapples from Singapore to Europe in the mid- to late 1870s.

Pineapples grown in Singapore and the Malay Peninsula became a major canned export from the 1900s. In 1907 alone, 846,000 cases of preserved pineapples were exported from Singapore as “pineapples grown in the Straits Settlements are favoured in the European markets,” noted *The Straits Times*.³³

The pineapple estates that were established to supply this new canning industry were Chinese-owned and located inland rather than along the rocky coast.³⁴ These pineapple estates helped build the fortunes of several people, notably that of Tan Kah Kee.³⁵ Tan, who later became a philanthropist and prominent leader of the Chinese community in Singapore, started a pineapple cannery called Sin Lee Chuan in Sembawang and established Hock Shan Plantation in 1904. Blessed with an acute business acumen, Tan sensed the opportunity of rubber and quickly interplanted rubber trees in his pineapple plantation. He made a fortune selling it off as a rubber estate (with rights to continue harvesting the pineapples).

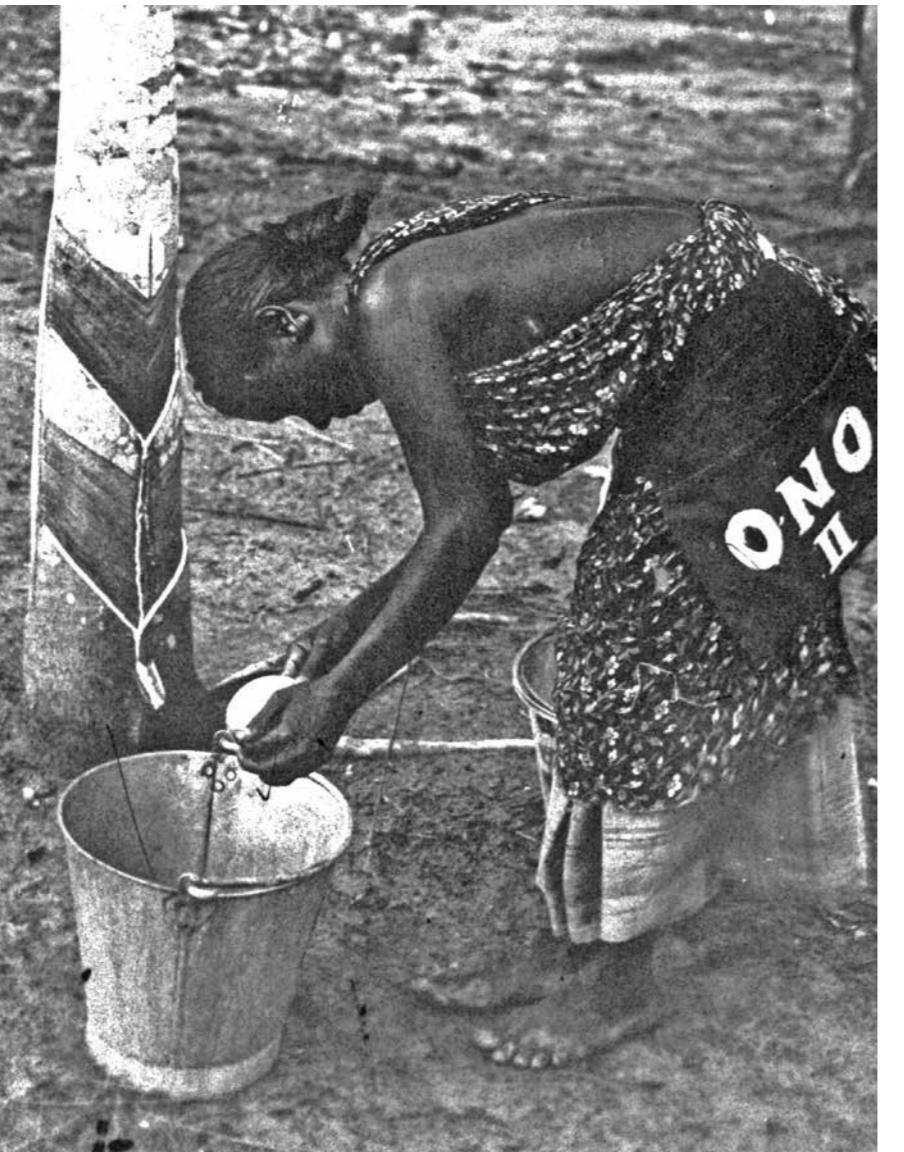
It soon became a common practice for rubber plantation owners to plant pineapples while waiting for the rubber trees to mature as this allowed them to earn some revenue in the initial years. Tan became a pineapple canning tycoon, controlling over 70 percent of the output in Singapore,³⁶ before an embargo during World War I (1914–18) disrupted trade. His

son-in-law, Lee Kong Chian,³⁷ would also go into the pineapple plantation business but would focus his work on the peninsula where Lee Pineapple still operates today. Like rubber, pineapple's viability would be ended by Singapore's expanding population and industrialisation.

The Rise of Rubber

After the blight killed off nutmeg trees in Singapore, coconuts and pineapples became the dominant choices for Singapore's plantations. In addition, other less common crops like tapioca and Liberian coffee were planted as well. However, the increasing use of electricity and the rise of the automobile sparked a boom in a new commodity that provided both insulation for electric wires and pneumatic tyres – rubber.

A worker tapping latex in a rubber plantation in Singapore, 1930s. Henry Nicholas Ridley, Director of the Singapore Botanic Gardens (1888–1912), invented the “herringbone” technique that allowed rubber trees to be tapped at regular intervals without causing the trees any harm. The herringbone-pattern incisions can be clearly seen on the trunk of the tree. *Lim Kheng Chye Collection, courtesy of National Archives of Singapore*.



Ridley, Director of Singapore's Botanic Gardens, persuaded local merchants to try growing Pará rubber which eventually became a major cash crop in both Singapore and the peninsula. Ridley's first convert was Tan Chay Yan, who became the first rubber planter in Malaya.³⁸ In 1898, Tan started Asahan Estate in Melaka after a successful trial run at Bukit Lintang two years earlier. In Singapore, Tan subsequently entered into an agreement with other prominent Chinese merchants to establish Sembawang Rubber Plantations Limited, and Tempines Para and Coconut Plantations Limited in 1910.³⁹

Although rubber could yield significant profits for plantation owners, the initial outlay was very high as rubber plantations tied up huge amounts of capital in the land,

maintenance, labour and basic processing of the latex into transportable sheets. There were, however, eager British investors willing to put their money into rubber companies that promised regular dividends. London brokers quickly coordinated the floating of companies to buy over Malayan rubber plantations and engage local agents to manage these plantations. This allowed for huge plantations with the accompanying economies of scale to flourish. If the original local owners wanted to continue investing in the plantations, they would accept shares in the London company in lieu of part of the purchase price.

Two London-based companies, Bukit Sembawang Rubber Company Limited and Singapore United Rubber Plantations Limited, were formed to acquire the companies of Tan Chay Yan's coalition in exchange for shares in these London companies. The holdings of the London companies, plus further acquisitions of neighbouring

estates, totalled over 12,000 acres by 1912.⁴⁰ Combined, this made them one of Singapore's largest landowners, whose holdings stretched from Jurong to Changi.

But the rubber trade in Singapore soon hit a major speedbump. Japan's growing military might and Britain's pivot away from an alliance with the Japanese to the United States made it necessary to construct a naval base in Southeast Asia for the British Imperial Fleet should it need to fight in the Pacific. Construction of the naval base in Sembawang, along with associated defences like airfields, meant the compulsory acquisition of large chunks of land from Bukit Sembawang and Singapore United companies in 1923. More acquisitions happened over the years as the military presence in Singapore grew.

When the Japanese Occupation (1942–45) ended, the rapid growth of Singapore's population necessitated the clearing of more land for homes and for

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DEFORESTATION

IN 19TH-CENTURY SINGAPORE



Manmade climate change is usually seen as a modern phenomenon. In fact, rising temperatures as a result of rampant deforestation were already evident in Singapore two centuries ago, says **Chia Jie Lin**.

The year was 1873 and Singapore's wells had almost run dry. The Impounding Reservoir (present-day MacRitchie Reservoir) on Thomson Road, a major source of potable water and completed six years earlier, failed to carry water to the town because water levels had dropped to extremely low levels.¹ Water was so scarce that the poor resorted to drinking filthy canal water, exacerbating the cholera epidemic that killed at least 448 people that year.²

How did this situation come to be? In the decades following the arrival of the British in 1819, vast swathes of primary forest were cleared for the planting of cash crops such as gambier and pepper, leading to the mass displacement and extinction of native flora and fauna. The rampant deforestation brought about unprecedented ecological effects – including water scarcity.

Cultivating the Colony

The dissolution of the Dutch East India Company at the turn of the 19th century created new opportunities for the British to challenge the commercial dominance of the Dutch in the East Indies (present-day Indonesia). Men like Stamford Raffles and William Farquhar arrived in search of new colonies. The tropical climate of Malaya was seen as conducive for the cultivation of spice plantations, which the British sought to fashion after the Dutch-controlled Moluccas (Maluku).³

"The rain falling here in showers throughout the year, and not confined to one season, gives a perpetual verdure to vegetation, cools the surface of the earth," wrote surgeon Robert Little in an essay published in *The Journal of the Indian Archipelago and Eastern Asia* in 1848.⁴ Raffles and Farquhar had envisioned Singapore as a spice island and were keen to develop

commercial plantations of spices and other crops for trade and profit.

In 1822, Raffles and Nathaniel Wallich, a Danish surgeon and naturalist who had previously been Superintendent of the Royal Gardens in Calcutta, India, established a botanical garden on Government Hill (now Fort Canning Hill) for the "experimental cultivation of the indigenous plants of Singapore" such as nutmeg and cloves.⁵ The island's European and Chinese residents followed suit, and attempted to grow nutmeg until an infestation in the 1850s and 60s decimated the nutmeg plantations.⁶

It was pepper and gambier plantations, however, that were the main drivers behind the large-scale clearing of inland primary forests on the island. The cultivation of these two crops had begun in late 18th-century Singapore with the arrival of Teochew planters. After fleeing Chinese clan wars on the Riau islands, they settled in remote river estuaries across Singapore and began planting gambier and pepper alongside Malay planters.

In his correspondences with Raffles' Acting Secretary L. Nelson Hull in 1822, Resident and Commandant of Singapore William Farquhar wrote that Temenggong Abdul Rahman had granted "various Malays and Chinese" permission to clear the ground

This print titled "Jungle Fire Near Bukit Timah" (1876) by Austrian diplomat and naturalist Eugen von Ransonnet-Villez was published in his *Skizzen aus Singapur und Djohor (Sketches: Singapore and Johor)* in 1876. The burning of vast swathes of primary forest to clear the land for crop cultivation was a familiar sight in 19th-century Singapore. Image reproduced from Ransonnet-Villez, E. (1876). *Skizzen aus Singapur und Djohor. Braunschweig: Druck und Verlag von George Westermann*. Retrieved from BookSG. Collection of the National Library, Singapore. (Call no.: RRARE 959.51 RAN; Accession no.: B03013662J).

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A painting of the gambier plant from the William Farquhar Collection of Natural History Drawings, 1803–18. Gift of G.K. Goh. Courtesy of the National Museum of Singapore, National Heritage Board.

for plantations. Farquhar further reported that some 20 plantations were already present in Singapore when he first arrived with Raffles in 1819.⁷

The founding of a free port on the island transformed the regional market for gambier, causing the centre of trade to shift from Riau to Singapore. Fuelled by their displeasure with rising Dutch taxes in Riau, Chinese planters also began migrating en masse from Riau to Singapore to trade and cultivate gambier.⁸

These planters brought with them their practice of shifting cultivation, in which primary forest was cleared to cultivate crops. When the soil became exhausted of nutrients, usually by the 15th year of production, and timber and firewood supplies nearby became scarce, these farmers moved onto new virgin land.⁹ Joseph Bales-tier, the first American Consul to Singapore, compared the pepper and gambier planter to a "locust", leaving "a tract of desolation behind him".¹⁰

From 1835 to the 1890s, Singapore was a major production centre for gambier, the cultivation of which afforded employment opportunities for Chinese immigrants – either as plantation owners who became *kangchu* (港主; headman or literally "lord of the river") or labourers. Most of the immigrants ended up in the latter category.

In the 1830s, the relocation of the gambier market from Riau to Singapore, as well as the lifting of trade tariffs on gambier, encouraged extensive cultivation.¹¹ As a result, by the late 1840s, large expanses of primary forest in Singapore had been

indiscriminately cleared and there were some 400 pepper and gambier plantations across the island. The highest recorded land area for cultivated gambier was 24,220 acres in the 1850s, while that for cultivated pepper amounted to 2,614 acres in the same decade.¹² By 1855, Singapore was home to an estimated 12.5 million gambier trees and 1.5 million pepper vines in over 540 documented plantations – 27 times more than the estimated 20 plantations that existed on the island a little over three decades ago.¹³

These plantations were not merely land-intensive, but also timber-intensive. Trees were felled for timber, fuel and charcoal in gambier-producing factories, resulting in the widespread disappearance of dipterocarp primary forests (lowland rainforest on dry land) and freshwater swamp forests.

In his 1883 *Report on the Forests of the Straits Settlements* that led to the demarcation of Singapore's first forest reserves and the creation of a Forest Department,¹⁴ Nathaniel Cantley, then Superintendent of the Singapore Botanic Gardens, wrote that small areas of cultivated land known as *bangsal* (Malay for a "shed" or "lean-to shelter") typically used up approximately 2,500 pounds of timber per day for pepper kilns and boiling gambier. These *bangsal* served as dwellings for the labourers and a place where they could prepare gambier. Over time, the area of land deforested for firewood for a plantation would have been equivalent to the size of the corresponding plantation itself.¹⁵

Environmentalism Takes Root

Environmental studies by British colonial officials first emerged out of efforts to better understand and govern their colonies in Southeast Asia to maximise commercial agricultural output.¹⁶ Such studies focused on areas such as native plant and animal species, tropical diseases and meteorological observations; the latter involved measurements of rainfall, atmospheric pressure, and air and earth temperatures.

In the 19th century, meteorological explorations served many functions within the British Empire. The British Association for the Advancement of Science and the Royal Society sought to advance "the science of terrestrial magnetism", which was of great importance to the empire's maritime interests. Meanwhile, medical officers in the colonies recorded temperatures and air pressures to study the relationship between tropical climates and the incidence of diseases.¹⁷

However, scientific concerns regarding the environmental impact of deforestation can be traced to 17th-century European academic circles. In 1664, landscape architect John Evelyn, known as one of Britain's first environmentalists, published *Sylva, or A Discourse of Forest-Trees, and the Propagation of Timber*¹⁸ under the newly established Royal Society. Evelyn argued that the extensive growth of glassworks, iron industries and shipbuilding – all of which were heavy in timber usage – threatened the forests of Britain. Such concerns, coupled with the environmental costs of deforestation, continued into the next century and, by the early 1800s, had become an established domain for scientific study.

Scientists working in Europe and America linked extensive forest clearance for agriculture to climatic issues such as lower rainfall and higher water evaporation rates, the latter due to the lack of tree cover. The Prussian polymath and naturalist Alexander von Humboldt, who investigated the relationship between deforestation and climatic change in the New World and Central Asia, warned in 1849 that "by felling trees which cover the tops and sides of mountains, men in every climate prepare at once two calamities for future generations – the want of fuel and the scarcity of water".¹⁹

Adverse climatic effects were similarly felt in the wake of mass deforestation across British colonies in Southeast Asia. By the mid-19th century, colonial officials and foresters in the Straits Settlements began to attribute these environmental changes to widespread deforestation.²⁰

In an 1848 essay on the "probable effects" of unchecked land clearance on Penang's climate published in *The Journal of the Indian Archipelago and Eastern Asia*, James Richardson Logan, the editor of the journal, wrote: "Nature when left to herself provides a compensatory influence in the dense leafy forests, but if these are consigned to destruction, every successive drought will prove more baneful than the preceding." In the same report, Logan observed that Singapore's governor had forbidden "the further destruction of forest on the summit of hills", likely to ameliorate destructive effects like erosion, siltation and even flood-induced famines.²¹

Among the earliest observers of this "destruction of forest" on Singapore's hilltops was naturalist Alfred Russel Wallace, renowned for his discovery of the theory of evolution. Wallace first arrived in Singapore on 20 April 1854 to collect bird and insect specimens and Bukit Timah soon became a favourite hunting ground.

In a letter dated 9 May 1854, Wallace wrote: "Here portions of the forest, which originally covered the whole island, and which is rapidly disappearing, still exists, and it is in them that I find my only good hunting-grounds." He further remarked that Bukit Timah offered a "good view" of

the island's rapidly proliferating pepper and gambier plantations and "it is apparent that but few years can elapse before the whole island will be denuded of its indigenous vegetation, when its climate will no doubt be materially altered (probably for the worse), and countless tribes of interesting insects become extinct".²²

Wallace's predictions were realised. By the turn of the 20th century, some 90 percent of Singapore's primary forest cover had been lost. Timber resources had become so scarce that planters struggled to find even simple wooden stakes to support gambier and pepper vines. Hundreds of square kilometres of abandoned pepper and gambier plantations had become secondary forest (*belukar*), invaded by lalang and brushwood that were dry and easily flammable. Forest fires broke out so frequently, especially during prolonged dry weather, that the Forest Department began experimenting with planting new species like the *Syzygium grande* (sea apple) and *Gluta rengas* trees along the forest edges to act as fire breaks.²³

Another consequence was that the temperature in the town centre began to increase. In his study of temperature readings of Singapore made by officers of the East India Company, John Turnbull Thomson,

Government Surveyor of the Straits Settlements, observed that the temperature of Singapore town and its surrounding areas had increased by 2.48 °F (1.38 °C) in just two decades from the early 1820s to 40s.

Thomson suggested that the temperature increase was caused by "the country within 3 miles of the town being now clear of jungle and cultivated, which formerly was covered with primeval forest".²⁴ Europeans settlers in Singapore's urban core sought respite from the heat of the town by retreating to the jungle, coastal or hillside bungalows, which afforded breezy and cooler surroundings.

"By resorting to the neighbourhood of the jungle a degree at least of reduction in the temperature may be secured. In such places as Selita [Seletar]... lying well in the interior, and with the primeval forest all around them, the additional coolness is palpable, and cannot be less than two or three degrees," wrote John Cameron in *Our Tropical Possessions in Malayan India*.²⁵

Such observations and accounts illustrate what we know today as the urban heat island effect – a phenomenon where cities with little greenery have warmer temperatures than rural, forested areas, due to their dense concentration of pavements and buildings that absorb heat.²⁶

Workers in a pepper plantation in Malaya, 1890s. Pepper was planted alongside gambier as the cultivation of either crop alone was not economically viable. Plantation workers used the waste produced from the boiling of gambier leaves as fertiliser for pepper vines. The latter also entwine themselves around the gambier plants for support as they grow. Gretchen Liu Collection, courtesy of National Archives of Singapore.



Gambier production, 1890s. Small areas of cultivated land known as *bangsal* (Malay for a “shed” or “lean-to shelter”) typically used up approximately 2,500 pounds of timber per day for pepper kilns and boiling gambier. These *bangsal* served as dwellings for the labourers and a place where they could prepare gambier. *Gretchen Liu Collection, courtesy of National Archives of Singapore.*



Dry Wells and Droughts

One key casualty of deforestation was Singapore's rapidly diminishing water supply. The destruction of much of the island's mangroves, freshwater swamps and streams, and other natural water bodies meant the loss of crucial water sources for consumption, plantation agriculture, sanitation and other municipal needs.²⁷

In 1879, Colonial Engineer and Surveyor-General John Frederick Adolphus McNair was tasked by Colonial Secretary Cecil Clementi Smith to investigate the state of natural forests in the Straits Settlements, partly to seek “conclusions... as to the climatic influence of forests or the effect of their clearances on the rainfall”. Although the island had been “greatly denuded of trees”, McNair found that there was “no marked diminution” in the volume of rainfall in Singapore.²⁸

However, in his 1883 report on deforestation, Cantley wrote that a decrease in forested areas “economises the water supply” – an indirect reference to a cyclic relationship between rainfall and forest density.²⁹ He also noted that experiments conducted outside Singapore had revealed that greater tree cover and shade led to higher rainfall, as “accounted for by the fact that when a cloud containing vapour comes in contact with the cool air over the forest or woodland, contraction takes place, the aqueous particles are forced together and fall in the shape of rain”.³⁰ The same experiments found that bare, deforested

land was not conducive to cloud formation, thus bringing no rain.

Such environmental effects continued to be hotly debated in European academic circles. Colonial Treasurer Allan Skinner remarked that while some believed that the loss of timber had “diminished the supply of rain”, this theory was dismissed by others who cited continued rainfall patterns and the difficulties of ascertaining localised climate effects.³¹ While widespread global deforestation would certainly have a knock-on effect on the climate around the world, colonial administrators and writers believed that it was unlikely that, given Singapore's diminutive size, deforestation here would have an immediate impact on rainfall patterns in the region.

That said, Singapore was struck by droughts several times – in 1842, 1849, 1855 and 1864 – typically due to the dry season lasting from February to March each year.³² These took on an increased intensity in the latter years of the 19th century. “Singapore was suffering badly from want of water, the season was unusually dry,” wrote medical assistant J.J.L. Wheatley in 1885 in the *Journal of the Straits Branch of the Royal Asiatic Society* regarding the abject conditions of the 1873 drought. “Nearly all the wells such as they were – many being mere pits a few feet deep without any protective wall – had almost run dry.”³³

Another prolonged drought hit the island in 1877, causing fruit and rice harvests to fail and the loss of plant species under

Irvine Rowell, Principal Civil Medical Officer of the Straits Settlements, reported a “long drought” in March, a “somewhat dry” August and an “unusually dry” October. He wrote that there was “little doubt” that “forest desiccation” – an archaic expression for “destruction” – influenced rainfall, but like Skinner found it difficult to ascertain the exact effects of extensive forest clearing on rainfall in Singapore.³⁴

Within a mere eight decades, the deforestation of Singapore's primary forests for agricultural purposes and commercial profit had brought about unprecedented ecological destruction. An island once described as being “covered with the mighty forest trees” had been degraded into a lalang wasteland, beset by water shortages and forest fires.³⁵ Such developments were catastrophic not only for flora and fauna, but also imperilled the humans living on the island, especially the impoverished who had limited access to clean water.

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Environmental discourse from the 17th to 19th centuries contains early theories on the phenomenon we now know today as disruptions to the global water cycles (or movement of water in the atmosphere), most likely exacerbated by human destruction of the environment and climate change. With the progress of science, scientists can now attribute droughts to mass deforestation, with some postulating that severe droughts across the world will soon be inevitable, should mass deforestation of areas like the Amazon continue.⁴³

The relationship between forests and the climate is complex. A look at the environmental history of Singapore can offer a window into how nature in the 19th century was an object of consumption, and how this unhindered exploitation of natural resources devastated the environment and those who lived within it. These are lessons that remain relevant today. ♦

OF PARKS, GARDENS AND TREES THE GREENING OF SINGAPORE

Singapore is justly known for its tree-lined streets, its colourful roadside flowers and the abundance of parks in the city centre and in housing estates. The current greening efforts can be traced to 1967 when then Prime Minister Lee Kuan Yew introduced the "Garden City" vision. Over time, that vision evolved from "Garden City" to "City in a Garden" and the current "City in Nature", which is part of the larger environmental sustainability Singapore Green Plan 2030.¹

While the "Garden City" vision only dates back five decades, the practice of creating gardens and parks as well as the planting of trees in the city is something that goes back some 200 years.

The First Garden on Government Hill

Just a few years after Stamford Raffles landed on Singapore's shores in 1819, the British took steps to set up a botanic garden. The garden was the brainchild of Raffles and the Danish surgeon and naturalist Nathaniel Wallich, who had previously been Superintendent of the Royal Gardens in Calcutta, India.

Raffles allocated a "most advantageous site", as he put it, on Government Hill (now Fort Canning Hill), for the new garden. According to Wallich, the garden was set up for the "experimental cultivation of the indigenous plants of Singapore". This effort followed the long-established British tradition of setting up botanic gardens in its colonies to experiment with growing commercially valuable crops and for the study of native plants.²

Within a year of its establishment in 1822, the botanic garden in Singapore had grown to occupy the 19 hectares of land that Raffles had allocated, cultivating crops such as nutmeg, cocoa and cloves. However, the garden – under the supervision of Scottish surgeon William Montgomerie – was shut down in 1829 because of its high cost of upkeep, coupled with a lack of funding and government support, particularly after Raffles' permanent departure from Singapore in June 1823.³

In 1836, another botanic garden was created on a much smaller plot on Fort Canning. Led by the Singapore Agri-

cultural and Horticultural Society, where Montgomerie was vice-president, the 2.8-hectare garden was primarily used to grow nutmeg. A decade later, however, this garden was also abandoned after the price of nutmeg declined.⁴

The Singapore Botanic Gardens

About two decades later, in 1859, the Agricultural and Horticultural Society set up a landscaped ornamental and leisure garden on a 23-hectare tract in Tanglin. This took root and eventually became the Singapore Botanic Gardens (SBG). In 2015, it was declared a UNESCO (United Nations Educational, Scientific and Cultural Organization) World Heritage Site.

Its first superintendent, Lawrence Niven, organised flower shows and horticultural fairs in the gardens to attract more visitors. He also added many features such as the Swan Lake, Bandstand Hill and the interconnecting curving pathways.⁵

After the Straits Settlements government took over the management of the gardens in 1874, it continued to

grow under the stewardship of directors such as Henry James Murton (1875–80), Nathaniel Cantley (1880–88) and Henry Nicholas Ridley (1888–1912).

Murton expanded the gardens with a 41-hectare northern extension in 1879. He also established the Economic Garden the same year for the research and conservation of plants with economic potential, such as coffee, sugarcane and pará rubber. In addition, Murton set up a zoo within the gardens' compound, which at its peak between 1875 and 1878, housed around 150 animals, including leopards and a tiger.⁶

Cantley established nurseries and launched a tree-planting programme to reforest parts of the land that had previously been cleared by plantation owners (Cantley had authored an 1883 report on deforestation that led to the demarcation of Singapore's first forest reserves and the creation of a Forest Department). For the tree planting programme, he picked trees like teak, American rain tree and mahogany for their ability to produce qual-

ity timber to support construction work and other commercial activities such as furniture making.⁷ It should be mentioned that Cantley was more concerned about safeguarding Singapore's timber supply rather than environmental protection and conservation.⁸

Ridley continued efforts to reforest the reserves. By the time the Forest Department was transferred to the Collector of Land Revenue in 1895, the amount of land designated as forest reserves (forest land set aside for timber reserves) had increased from 8,000 acres in 1884 to nearly 12,000 acres.⁹ Ridley also helped develop the botanical and horticultural research arm of the gardens by turning it into a centre for rubber distribution and enlarging its herbarium collection with plants that he had gathered from his expeditions around the island. One of his most important additions to the gardens was the orchid hybrid known as *Vanda Miss Joaquim*, later designated as Singapore's national flower in 1981.¹⁰ The orchid had been cultivated by Agnes Jo-

A panoramic shot of East Coast Park taken in 2016, one of Singapore's biggest parks. It was built in the 1970s on reclaimed land. Photo by Chensiyan. Retrieved from Wikimedia Commons (CC BY-SA 4.0).

quim, who crossed the *Vanda hookeriana* with the *Vanda teres* to produce the orchid that Ridley subsequently named *Vanda Miss Joaquim*.¹¹

Another influential director of the Botanic Gardens was Richard Eric Holttum (1925–42, 1946–49). Holttum started the orchid-breeding programme and also managed to get the control of the forest reserves returned to the Botanic Gardens. However, after the handover in 1939, there were only three remaining reserves – Bukit Timah, Kranji and Pandan.¹²

Roadside Trees, Parks and Recreational Spaces

The Botanic Gardens also worked with the Singapore Municipality (succeeded by the Singapore Municipal Commission in 1887) to plant roadside trees in the 1860s. Some of the trees planted include the cotton tree, angsana tree, flame of the forest and rain tree. These were planted along major thoroughfares such as Orchard Road, Scotts Road, Anderson Road, Jalan Besar and Balestier Road.¹³

The Singapore Botanic Gardens, c. 1900s. It was founded by the Agricultural and Horticultural Society in 1859 as a landscaped ornamental and leisure garden on a 23-hectare tract in Tanglin. Lim Kheng Chye Collection, courtesy of National Archives of Singapore.



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The Municipal Commission was also responsible for the upkeep and planning of recreational spaces for the public. Prior to the 1920s, there were only a handful of such spaces like the Padang, the sea-front garden at Connaught Drive (today's Esplanade Park), Dhoby Green (a grassy strip near Dhoby Ghaut), People's Park, Finlayson Green and the area around Dalhousie Obelisk.¹⁴

Private individuals also created notable gardens. Whampoa Gardens, owned by prominent Chinese businessman and community leader Hoo Ah Kay (better known as Whampoa), was located on the grounds of his lavish mansion on Serangoon Road. The garden was described as beautifully landscaped and contained many exotic tropical flowers and plants. It was opened to the public during the Lunar New Year.

Another private garden was the Alkaff Lake Gardens off MacPherson Road, which was opened to the public in 1929. Owned by the wealthy Arab merchant Syed Shaik Alkaff, it was a Japanese-style garden that had a lake for rowing boats, neatly landscaped paths and tea houses.¹⁵

Following the release of the 1918 Housing Commission report, which called for the creation of more recreational spaces for residents who were otherwise largely confined to their "dark airless houses", the Municipal Commission began to create more parks, starting with Katong Park, which was completed in 1927.¹⁶ In the 1930s, the commission also built Farrer Park and King George V Park in Fort Canning.¹⁷

After the Japanese Occupation (1942–45), the Municipal Commission, which was renamed City Council in 1951, continued to increase green recreational spaces and enhance existing parks. Between 1955 and 1961, the City Council added more amenities and landscaping to King George V Park, Katong Park and Esplanade Park.¹⁸

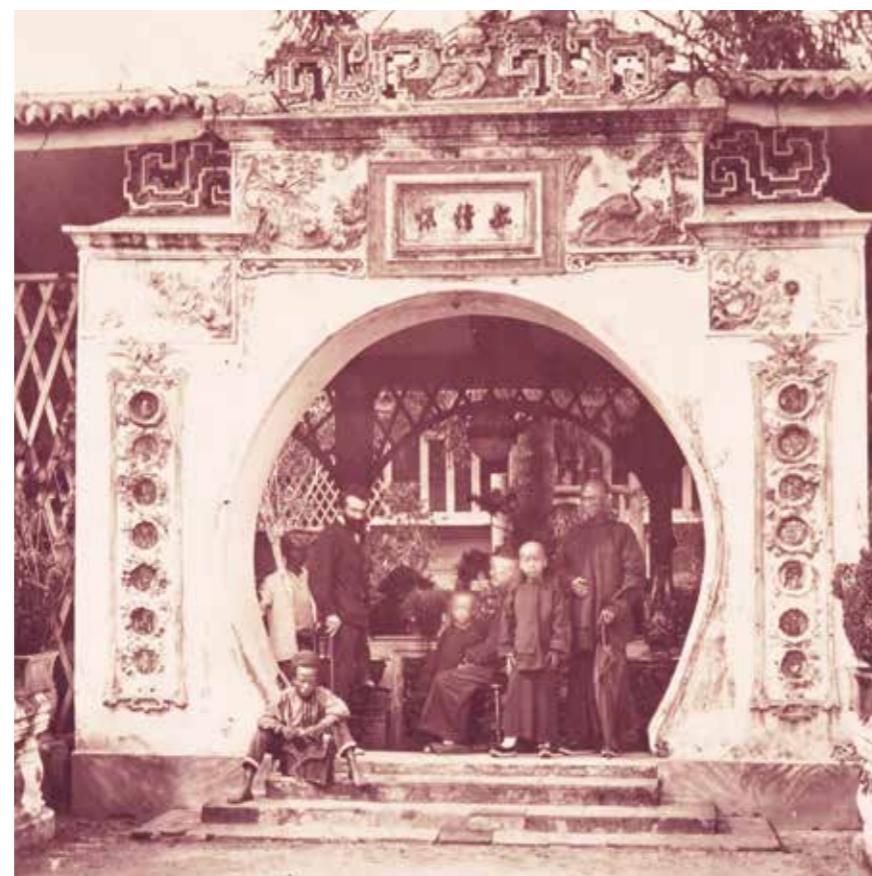
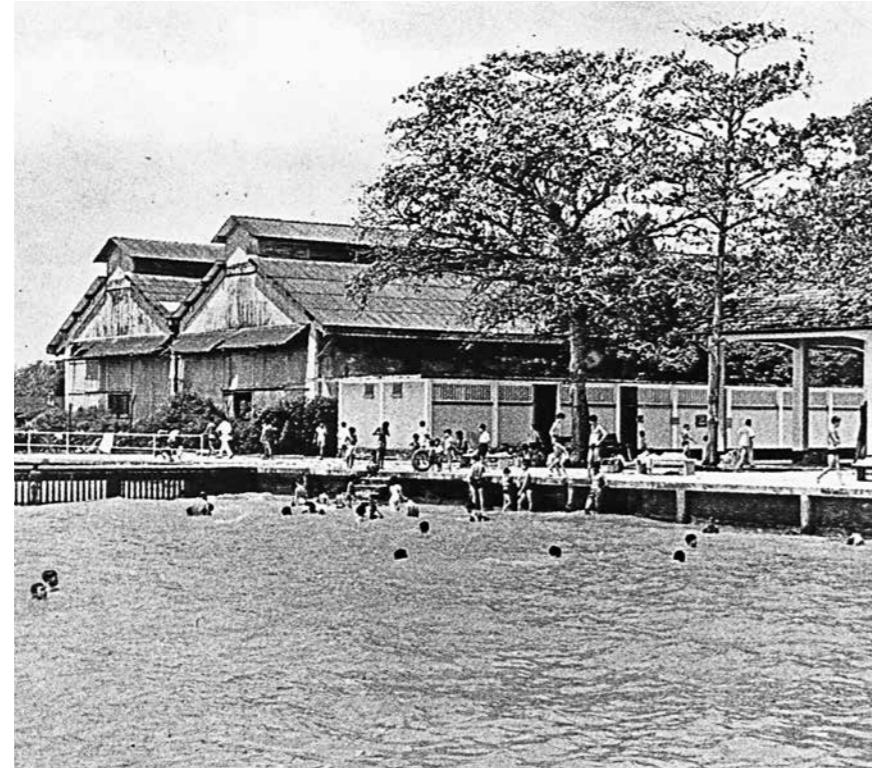
Creating a Garden City

Despite these efforts, the city area was mostly a concrete jungle. Singapore's first Master Plan, released in 1958, sought to address this problem by almost quadrupling the land set aside for recreation from 274 hectares in 1953 to 1,050 hectares by 1972. These were to be located along the coasts of Bedok, Changi and Pasir Ris as well as the fringes of the built-up central area.¹⁹

In 1959, the newly elected government formed by the People's Action Party embarked on efforts to beautify Singapore. Between 1959 and 1966, several new green spaces such as the Duxton Plain Parkway, Crawford Park, Model Traffic Playground,

(Below) Katong Park, c. 1950s. Completed in 1927, the park had landscaped footpaths, playgrounds, a bandstand and even a swimming enclosure extending about 30 m into the sea. *Tan Kok Kheng Collection, courtesy of National Archives of Singapore*.

(Bottom) A garden pavilion in Whampoa Gardens on Serangoon Road, mid-19th century. The garden was owned by Chinese businessman and community leader Hoo Ah Kay (also known as Whampoa), and was a beautifully landscaped garden with many exotic tropical flowers and plants. *Courtesy of the National Museum of Singapore, National Heritage Board*.



Prime Minister Lee Kuan Yew watering the *jambu laut* sapling that he had just planted in Tanjong Berlayar, 1975. Tree Planting Day was made an annual event in 1971. *Ministry of Information and the Arts Collection, courtesy of National Archives of Singapore*.

Mount Faber Scenic Park and the garden above Raffles Square underground carpark were built.²⁰ The government also launched a tree planting campaign in 1963. However, Singapore would not have an official greening policy until the "Garden City" vision articulated by then Prime Minister Lee Kuan Yew in 1967.²¹

As Lee noted at the announcement of the "Garden City" vision, there were many advantages to adding more greenery to the country: "[A]part from making life more pleasant, you give Singapore a very good reputation, then people come, they stay. Wherever you want to go in the region, you can use this place as a base. Your hotel trade will boom and hotels create employment and you help solve your unemployment problem."²²

The plan was carried out in two phases. The first saw the large-scale planting of roadside trees and shrubs by the Parks and Trees Unit of the Public Works Department, which became the Parks and Recreation Department (PRD) in 1975. The trees included species that could grow fast and endowed with shady crowns, such as the *angsana* tree, *rain tree*, *flame of the forest* and the *frangipani*. Shrubs like the *bougainvillea*, the *red Ixora*, the *bamboo orchid* and the *Cassandra* were also grown.²³ By 1970, over 55,000 new trees had been planted, increasing to some 158,600 in 1974 and 1.4 million by June 2014.

Today, tree planting efforts are headed by the National Parks Board (NParks), which was formed in 1990 to manage Singapore's national parks. It was expanded in 1996 to incorporate the roles of the PRD, including planting roadside trees and developing recreational spaces and parks.²⁴

The second phase of the "Garden City" plan, from the mid-1970s onwards, involved the creation of parks throughout the island. These new parks were larger and equipped with a wide range of facilities to meet the diverse recreational needs of different population groups.

The largest of such parks are known as regional parks and they range from 10 hectares to 200 hectares. These parks include East Coast Park, Mount Faber Park, and MacRitchie Reservoir Park.²⁵ Then there are the community parks like Toa Payoh Town Park, Bishan-Ang Mo Kio Park and Yishun Neighbourhood Park located near housing estates. Ranging from 1,000 sq m to 40 hectares, these parks are aimed at residents living in the vicinity.²⁶ In the city area, there is another type of park ranging from 1,000 sq m to 30 hectares in size. Parks such as the Merlion Park and the Fort Canning Historic Park beautify the cityscape and function as "green lungs" for the built-up city environment.²⁷

The efforts to plant roadside trees and build parks were supplemented by laws to protect the greenery. In 1971, the Trees and

Plants Act was enacted to protect existing and newly planted trees. The legislation was expanded in 1975 to mandate that developers had to set aside green spaces around buildings, roads and open-air car parks. Today, the laws that protect nature include the Parks and Trees Act (2005), the Animals and Birds Act (2002), and the Wildlife Act (2000). These are administered by NParks.²⁸

Up Close and Personal with Nature

From the 1990s, the "Garden City" vision went beyond planting trees and building parks to include ways to bring the community closer to nature. This shift was sketched out in the 1991 Concept Plan by the Urban Redevelopment Authority (URA) which aimed to transform Singapore into an island city where nature, waterbodies and urban development are woven seamlessly together.

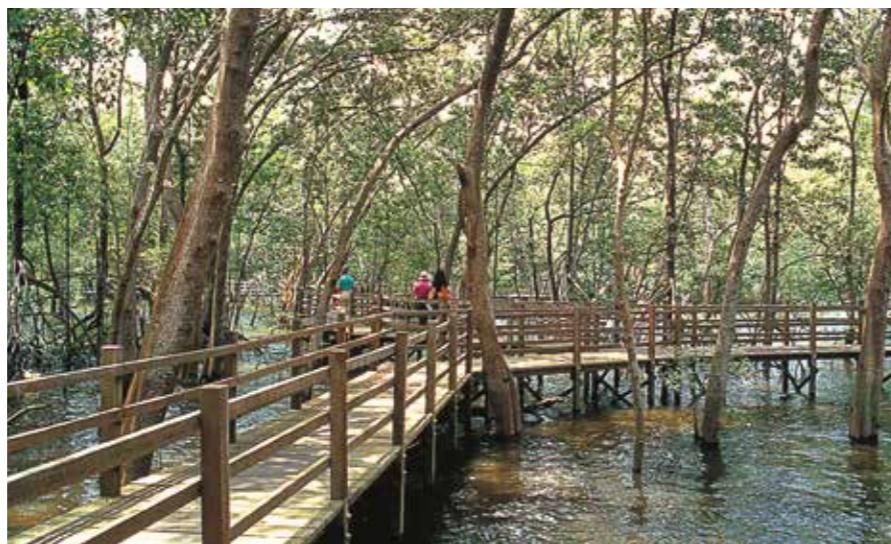
One of the first initiatives taken by NParks was the introduction of the Park Connector Network (PCN) in 1991. These are green corridors that allow park users to walk, skate, jog, or cycle from one park or nature site to another for leisure.²⁹ The first park connector, completed in 1992, was the 7-kilometre stretch linking Bishan-Ang Mo Kio Park to Kallang Riverside Park. Today, there are around 70 park connectors in Singapore stretching over 340 km, and this is set to increase to 500 km by 2030.

Many of the existing park connectors also link to water canals, rivers and reservoirs that have been transformed under the Active, Beautiful and Clean (ABC) Waters Programme introduced by the Public Utilities Board in 2006. The programme aims to create beautiful and clean streams, rivers and lakes with picturesque community spaces for all to enjoy.³⁰ As Prime Minister Lee Hsien Loong noted when he launched the programme: "By linking up our water bodies and waterways, we will create new community spaces that are clean, pleasant, and bustling with life and activities."³¹

A prime example is the transformation of a stretch of the Kallang River that was once a concrete canal by the edge of the Bishan-Ang Mo Kio Park into a naturalised and meandering river in 2012. The river is now home to different species of water birds and dragonflies.³²

The 1991 Concept Plan also pledged to safeguard Singapore's natural environment by conserving 3,000 hectares of nature sites. Comprising wooded areas, bird sanctuaries, mangrove swamps, waterbodies and nature reserves, these 19 nature sites were identified after the release of Singapore's first environmental blueprint – the Singapore Green Plan – in 1992.³³

Today, Singapore has 24 nature sites, including four nature reserves – Bukit Timah Nature Reserve, Central Catchment Nature Reserve, Sungei Buloh Wetland Reserve and Labrador Nature Reserve – as well as 20 nature areas found throughout the main island and also on the offshore islands of Pulau Tekong, Pulau Ubin and Sisters'



(Above) The boardwalk at the Sungei Buloh Wetland Reserve. The reserve opened as a nature park in 1993, was gazetted as a nature reserve in 2002 and became Singapore's first ASEAN Heritage Park the following year. It is home to some of the world's rarest mangroves and is a stopover point for migratory birds escaping the northern winter on their way to Australia. Courtesy of the Singapore Tourism Board.



(Right) An aerial view of Bishan-Ang Mo Kio Park, one of the largest urban parks in central Singapore, with Bishan housing estate in the background. The park, which is popular with residents living nearby, has a naturalised 3-kilometre meandering river, lush greenery, a wide variety of flora and fauna, and pond gardens and river plains. Courtesy of the Singapore Tourism Board.

Islands. These nature sites are conserved under the Parks and Trees Act.

of all new residential projects have joined LUSH. These buildings include Oasia Hotel Downtown in the city-centre and JEM shopping mall in Jurong East.

Becoming a City in a Garden

Singapore's "Garden City" vision eventually evolved into the "City in a Garden" concept, which was introduced in 2011. This vision was about "connecting our communities and our places and spaces through parks, gardens, streetscapes and skyscraper greenery... bring[ing] the green spaces and the biodiversity closer to our homes and workplaces," said Prime Minister Lee Hsien Loong. "[W]e are determined that our people should be... in touch with nature, to be never far from green spaces and blue waters,

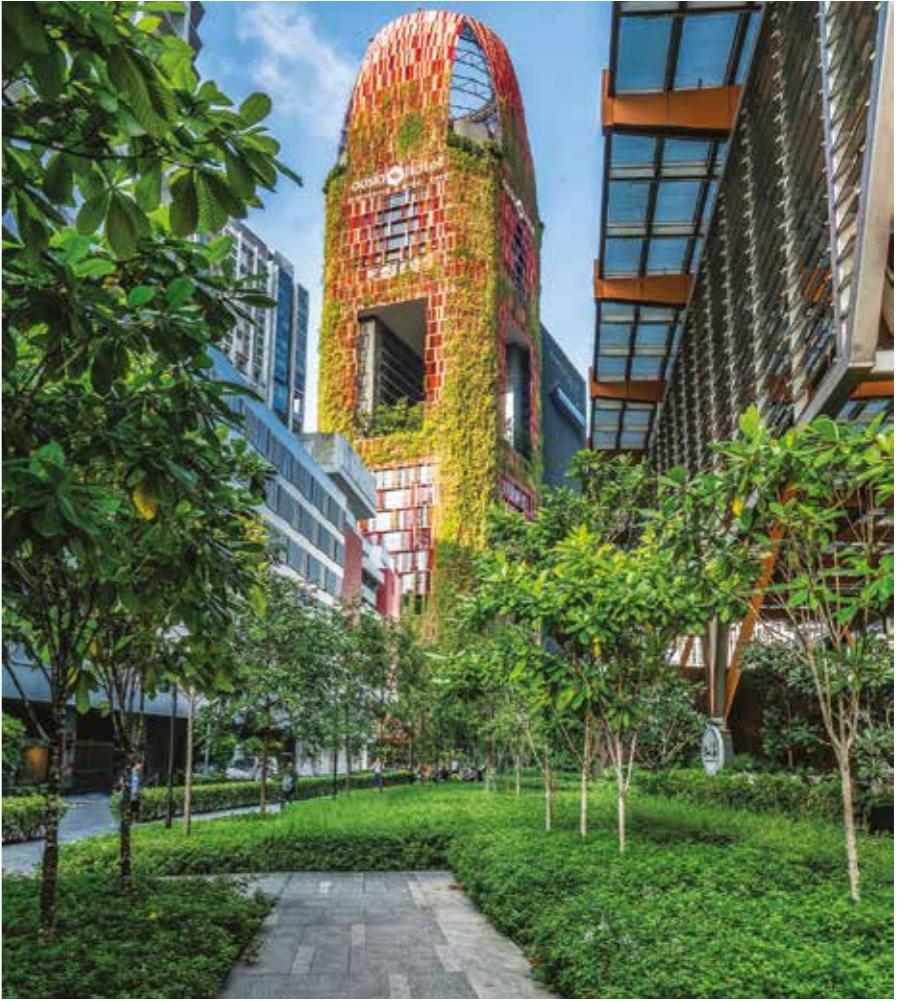
where they can relax, recharge, where they can let their children and pets run around safely, and where they can take glamorous wedding pictures."³⁶

The commitment to green Singapore can be seen in the creation of Gardens by the Bay on a prime site in Marina Bay. Comprising three public gardens – Bay South, Bay East and Bay Central – and occupying 101 hectares in total, Gardens by the Bay was conceptualised in 2005 and completed in 2012 as a new public green space in the city area. With its two futuristic, cavernous glass domes and 18 gigantic concrete-and-steel vertical gardens called Supertrees, Gardens by the Bay represents the realisation of the "Garden City" vision and its transition into "City in a Garden".

The practice of integrating greenery into the built environment was applied to public housing estates via the Biophilic Town Framework. Developed in 2013 by the Housing & Development Board (HDB), the framework aims to create nature-centric public housing estates with ample greenery to reduce heat and noise, and to allow for community farming and the appreciation of nature. Previously, greenery was incorporated into the HDB living environment only through the provision of green spaces for mostly recreational activities. The biophilic framework was piloted in Punggol Northshore District in 2015 and then adopted in the planning and design of Bidadari's Woodleigh neighbourhood in 2016. In 2018, it was announced that the framework would be rolled out to all newly launched housing projects.³⁷

(Below) The Oasia Hotel Downtown with lush foliage on its facade, 2019. In 2009, the Urban Redevelopment Authority introduced the Landscaping for Urban Spaces and High-Rises (LUSH) programme to integrate greenery and biodiversity into the facade of buildings. Photo by 100pp. Retrieved from Wikimedia Commons (CC BY-SA 4.0).

(Bottom) The Supertree Grove at Gardens by the Bay, 2012. Ranging from 25 m to 50 m tall, some of these structures act as vertical gardens and are able to harvest rainwater and solar energy. Courtesy of Gardens by the Bay.



City in Nature and the Singapore Green Plan

In 2020, a new vision for greening Singapore was announced. "We want to transform Singapore into a City in Nature to provide Singaporeans with a better quality of life, while co-existing with flora and fauna on this island," said then Second Minister for National Development Desmond Lee.³⁸

This would be achieved by having even more nature parks, enhancing the natural environment in new and existing parks and gardens, integrating nature into the built environment and making green spaces even more accessible. By 2030, it is envisioned that Singapore would have another 200 hectares of nature parks, up to 200 hectares of skyscraper greenery, one million more trees planted, up to 500 km of park connectors created, and all households would be a 10-minute walk from a park.³⁹

The "City in Nature" strategy is also one of the key pillars in the Singapore Green

NOTES

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Plan 2030). Launched in February 2021, the Green Plan is the country's latest 10-year blueprint to advance the national agenda of sustainable development amid the challenges of climate change.

The evolution from "Garden City" to "City in a Garden" to "City in Nature" shows how greening the country has become a major priority over the decades. The government moved from just planting trees to setting up parks, expanding these green areas and thinking of nature in the larger context of both landscaped gardens and natural habitats.

The latest Singapore Green Plan takes it one step further by merging the trend towards more greenery with the need for sustainability in the face of the challenges arising from climate change. If the plan succeeds, residents in Singapore will be able to enjoy a considerably greener environment, and the country itself will be closer to realising its vision for sustainable development. ♦

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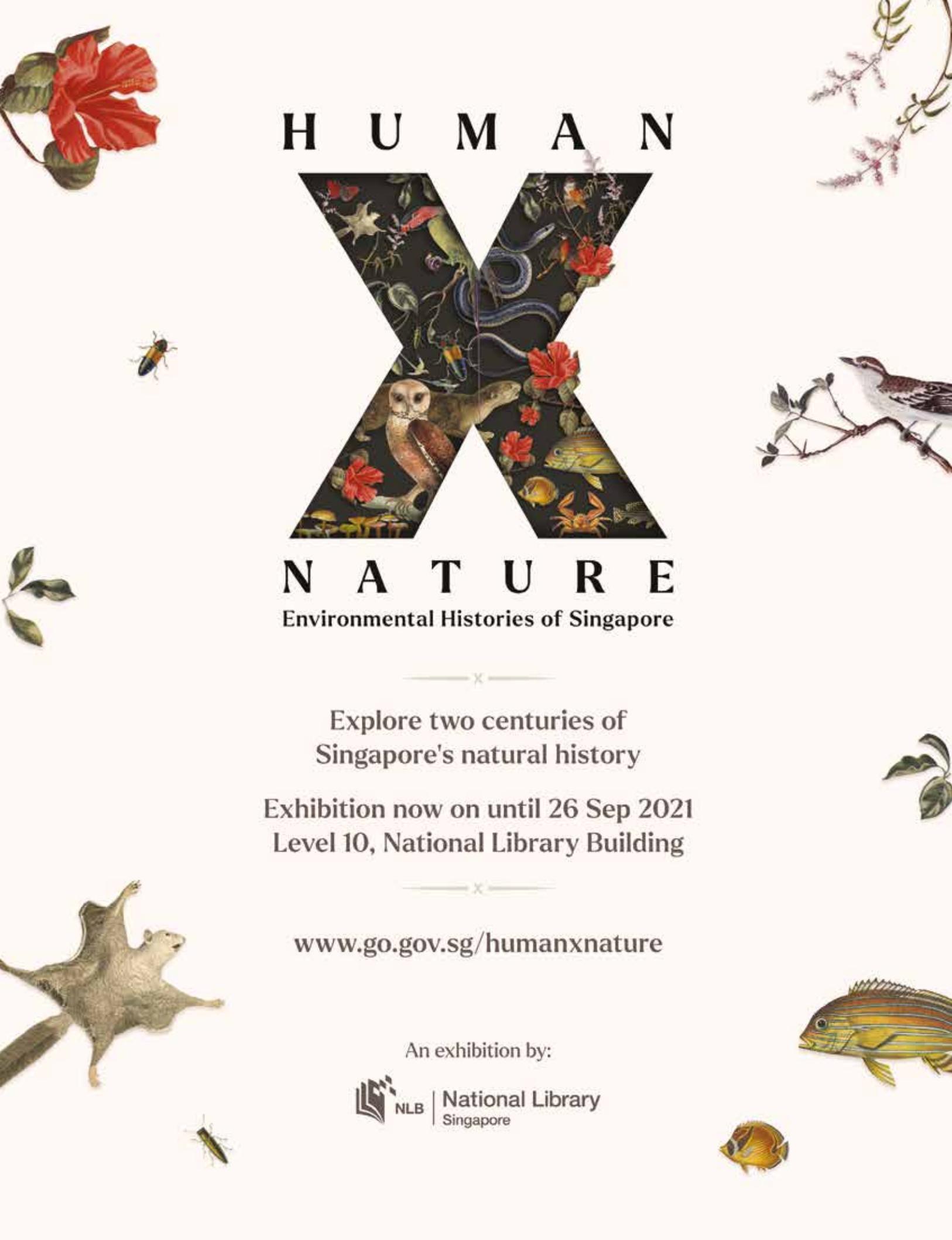
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