

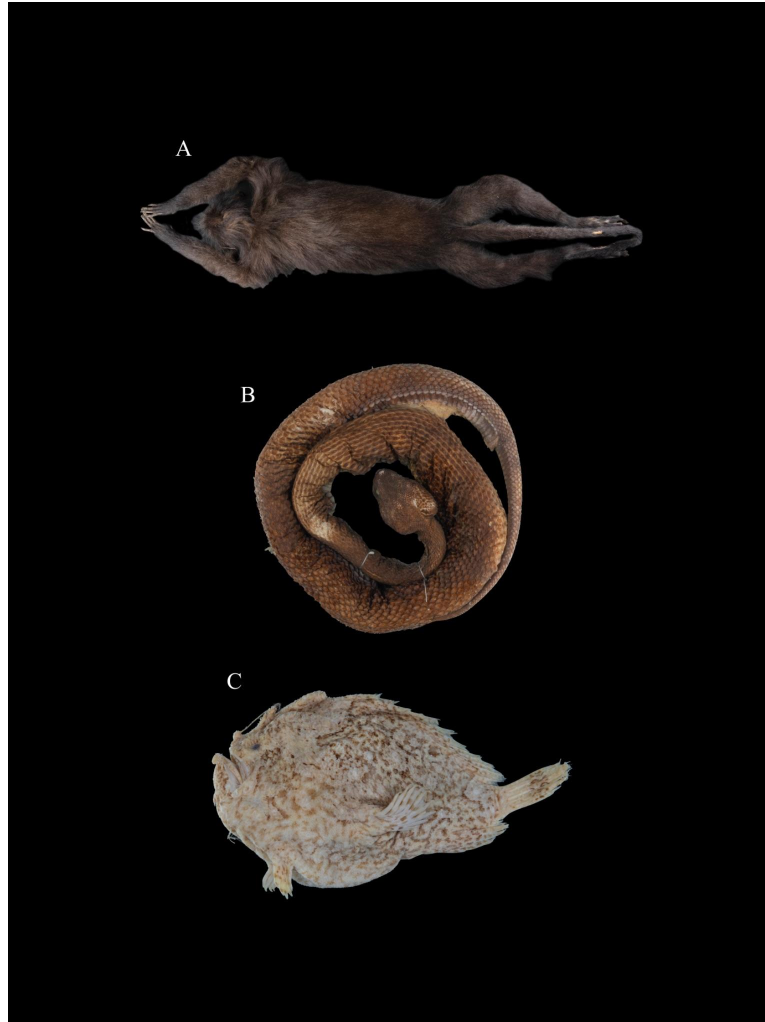
Timestamps in Singapore's (Natural) History

Singapore celebrates 61 years of independence this year. While the nation's founding in the early 1800s is rooted in colonialism, the post-independence period has seen this small tropical colony transform into a vibrant, multi-racial and cosmopolitan city-state. Singapore's landscape has been extensively altered—from its humble origins in early history, to flourishing trading port and plantations, and eventually the towering skyscrapers that dominate much of its urban landscape today. The changes on the island were not limited to its physical environment: a poignant reminder that our nation's history is deeply driven by major political, economic, and cultural shifts. We expand on this narrative by raising the question: How has local biodiversity been discovered, studied, and shaped alongside human activity? Much of the country's early natural heritage can be uncovered through natural history specimens that have been carefully preserved over the centuries in museums around the world. At the same time, these historical collections reflect colonial networks. While these objects no longer physically reside in Singapore, they each belong to part of the extensive network that connects Singapore with the rest of the world. Individual specimens stand testament to time, offering us a glimpse into the species that have co-existed (and, for some, continue to co-exist) on the same island as us, over the past two centuries. Here, we explore some points in Singapore's timeline through the lens of natural history.

1819

The founding of modern Singapore

Most are familiar with Sir Thomas Stamford Raffles for his involvement in the founding of modern Singapore. Landing on the shores of Singapore on 29 January 1819, Raffles considered it to be geographically suited for a British trading port. Today, several institutions have immortalised the name of Raffles, in honour of his achievements. Yet, less are acquainted with Raffles's enthusiasm and interests in the collection of cultural artefacts and natural history objects. During his short time in Singapore, Raffles (and his network of naturalists) acquired some of the earliest zoological specimens known from the island. One example is *Presbytis femoralis* (scientifically named in 1838 using Raffles's material) and commonly known as the Raffles's banded langur in honor of its collector. It was also in 1819 that the first animal species to be scientifically described from Singapore, was given a scientific name. *Cliona patera*, commonly known as the Neptune's Cup, was a large goblet-shaped sponge named by English army officer and naturalist Thomas Hardwicke. Alongside Raffles', Hardwicke's specimens represent some of the [oldest known extant animal specimens from Singapore](#).



Some of the earliest extant animal specimens from Singapore. Type specimen of the Raffles's banded langur, collected by Raffles. Two specimens collected by Hardwicke: the type of the mangrove pit viper, and a spot-tail frogfish.

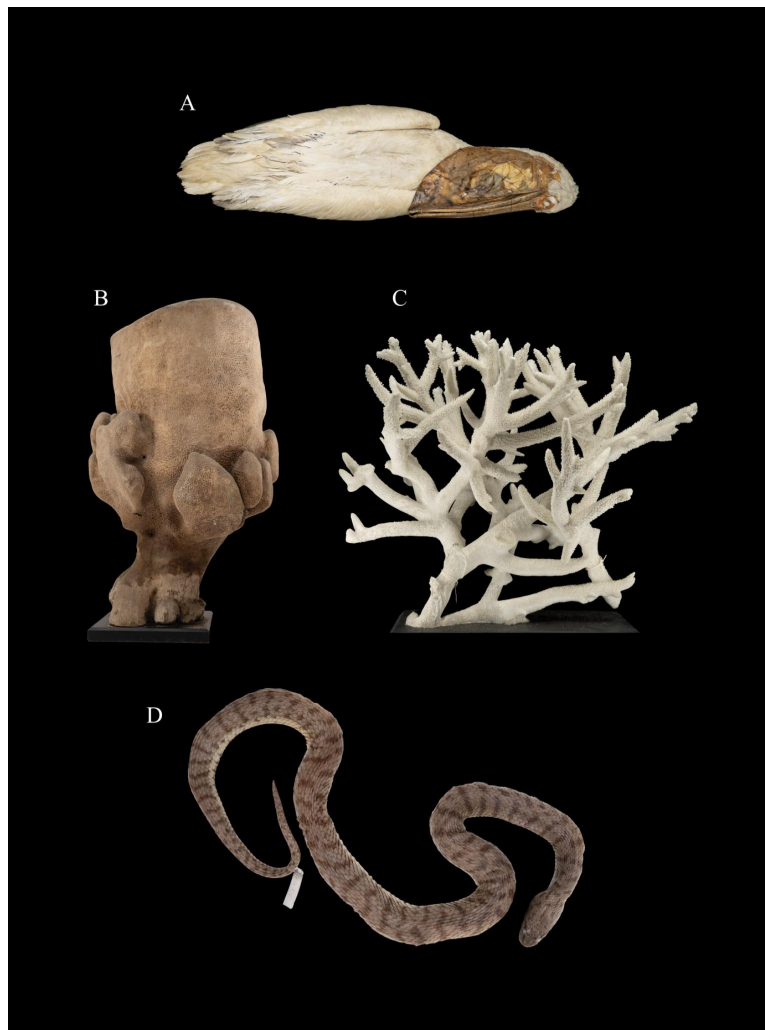
SIGNIFY: [\[A: *Presbytis femoralis*\]](#) [\[B: *Trimeresurus purpureomaculatus*\]](#) [\[C: *Lophiocharon trisignatus*\]](#)

1842

United States Exploring Expedition stops over in Singapore

The 19th century saw the golden age of natural history and expeditionary sciences in Europe and the United States, where numerous ships embarked on journeys around the world in pursuit of exploration and scientific discoveries. Famous examples include HMS *Beagle*, on which Charles Darwin voyaged to South America and beyond, later inspiring his theory of evolution. Amongst the earliest of many expeditions and vessels that visited Singapore was the United States Exploring Expedition (1838–1842). Also known as the US Ex. Ex. or the Wilkes Expedition, it achieved several scientific and navigational milestones. For the first time in history, more than 1,500 miles of the Antarctica coastline was charted, demonstrating without doubt that

Antarctica was a continent. In the expedition's gruelling journey that circumnavigated the globe, tens of thousands of natural history objects were collected, leaving behind a legacy of meticulous documentation of biodiversity that eventually formed the foundational collection of the Smithsonian Institution¹. The US Ex. Ex. made a brief stop in Singapore, arriving on 19 February 1842 before departing one week later on 26 February 1842. The crew marveled at the cultural and natural sights of the bustling Singapore, collecting many zoological and botanical specimens that are now housed in the Smithsonian National Museum of Natural History.



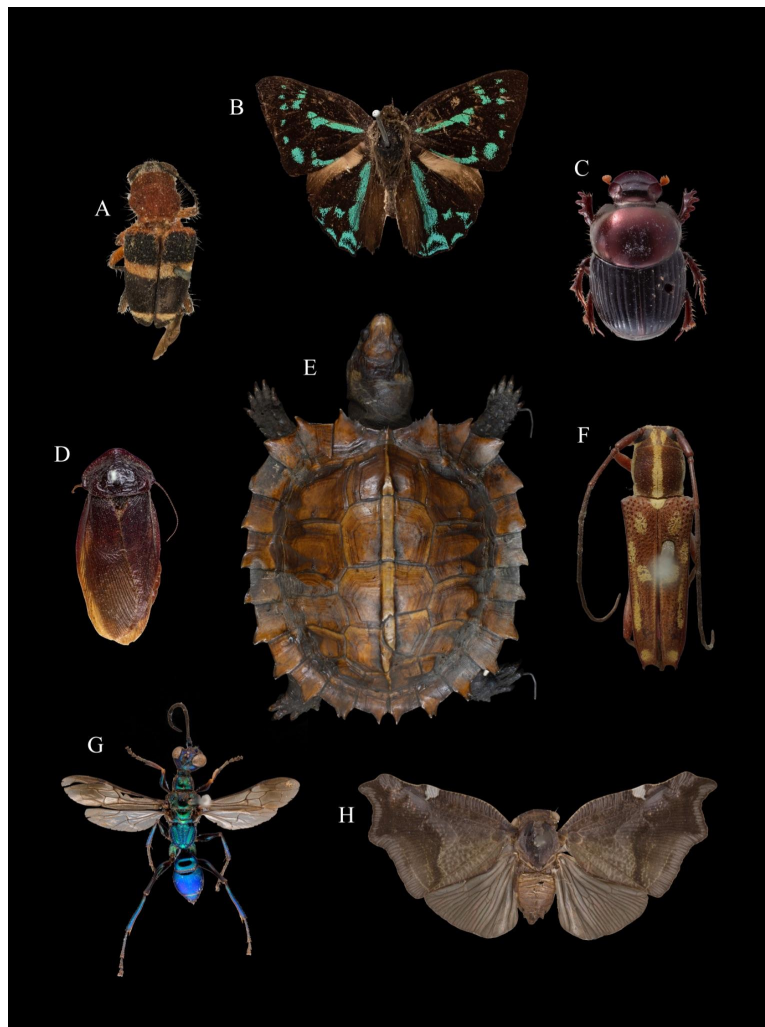
Specimens collected on the US Ex. Ex. in Singapore. Several stony coral species collected from Singapore on this expedition were described as new to science by James Dwight Dana, who was the on board geologist, mineralogist and zoologist.

SIGNIFY: [A: *Pelecanus onocrotalus*] [B: *Cliona patera*] [C: *Madrepora secunda*] [D: *Cerberus schneiderii*]

1854

Wallace sets foot in Singapore

To early naturalists in the 1800s, the Malay Archipelago was nature's paradise of rare, exotic flora and fauna. This attracted many collectors and naturalists, including significant figures such as Alfred Russel Wallace. Wallace is best known for having independently formulated the theory of evolution by natural selection, despite his modest background that contrasted sharply with contemporary Charles Darwin. A great naturalist, Wallace had a deep fascination for the natural world—he sold much of his collections to fund his travels in fervent pursuit of knowledge. His vast collection of materials, now scattered across the globe, provide snapshots of Singapore's rich historical biodiversity. Over his [multiple visits to Singapore between 1854 and 1862](#), Wallace amassed a large collection of specimens (largely insects), many of which were new to science.



A selection of specimens collected by Alfred Russel Wallace in Singapore. Wallace sold the majority of his specimens, and many were acquired by museums in the United Kingdom.

SIGNIFY: [\[A: *Hemitrachys bizonatus*\]](#) [\[B: *Simiskina phalena*\]](#) [\[C: *Onthopagus rutilans*\]](#) [\[D: *Perisphaerus flexicollis*\]](#) [\[E: *Heosemys spinosa*\]](#) [\[F: *Glenea myrrhis*\]](#) [\[G: *Ampulex smaragdina*\]](#) [\[H: *Pochazia emarginata*\]](#)

1877

First rubber tree planted in Singapore

Commercial agriculture constituted much of Singapore's economic activity during the late-19th and early-20th centuries. A variety of cash crops were cultivated on the island during this period, including gambier, pepper, nutmeg, coffee, coconut and pineapple². Between 1870 and 1890, rubber plants were experimented with in an effort to enhance their commercial viability. Fueled by the increased use of electricity and automobiles, the demand for rubber increased rapidly. On 11 June 1877, 11 rubber seedlings from the Kew Gardens in England were sent to the Botanic Gardens in Singapore, where the first rubber trees in Singapore were planted³. The rise of rubber cultivation can be traced to the efforts of famed botanist Henry Nicholas Ridley—the first director of the Singapore Botanic Gardens—whose unrelenting fervour led to breakthroughs in how the latex was extracted, thereby revolutionising the rubber industry in the Malay Peninsula. Known as the “father of the rubber industry”, Ridley also had a keen interest in animals, and actively collected and studied a wide range of fauna, including insects and reptiles.



A selection of specimens collected by Ridley. Some, such as the earwig *Diplatys ridleyi* Kirby, 1903, were named in his honor.

SIGNIFY: [\[A: *Gonophora* sp\]](#) [\[B: *Calliophis intestinalis*\]](#) [\[C: *Rhynophorus trifolatus*\]](#) [\[D: *Oligomantis orientalis*\]](#) [\[E: *Diplatys ridleyi*\]](#) [\[F: *Iridotaenia sumptuosa*\]](#)

Commercial plantations continued to flourish alongside the boom in trade until the 1970s, when industrialisation took precedence. This decline continued well into the late 1970s, when small, privately owned rubber plantations were phased out by the government, closing the chapter on Singapore's legacy of plantation agriculture. Nonetheless, specimens collected opportunistically on plantations and on plantation products serve as a reminder of Singapore's agricultural past.



Specimens that were collected opportunistically from plantations and plantation products. The ant was collected on a pineapple while the weevil was found destroying sugar cane. The snake was collected by [CPW Flynn](#).

SIGNIFY: [\[A: *Tetramorium simillimum*\]](#) [\[B: *Raclinia indica*\]](#) [\[C: *Myocalandra porcata*\]](#)

1942

Start of the Japanese Occupation in Singapore

The Second World War was a turbulent time in world history. On 15 February 1942, the British surrendered Singapore to the Japanese. Thousands of Allied soldiers were taken prisoner, and amongst them was 26 year-old [Thomas Graham Howarth](#). A specialist in butterflies and moths, Howarth was responsible for preserving the most important parts of the collections at the Natural History Museum in London at the onset of war. He enlisted in the Royal Army Medical Corps and was posted to Singapore in 1941. Howarth was tasked with helping combat malaria on the island, and his efforts contributed to Singapore becoming malaria-free. After Singapore fell and he became a prisoner of war, he collected insects to stave off boredom and keep up his morale. Over the next six months, Howarth secretly amassed a collection of over 1,500 butterflies and moths and hid them in cigarette tins. He was later transferred to Korea as a forced labourer before liberation in 1945.



Butterflies collected by TG Howarth in Tanglin and Changi. The butterflies and moths that he collected in Singapore are housed in the Natural History Museum, London.

SIGNIFY: [\[A: *Eurema hecabe*\]](#) [\[B: *Heliconius clytia*\]](#)

1951

Bukit Timah gazetted as a protected nature reserve

Frances Elizabeth Somerville Alexander, [Singapore's first female geologist](#), was employed by the government in 1949 to survey the granite resources on the island for post-war reconstruction. Amidst public disagreements on the encroachment of quarries into Bukit Timah forest, the government appointed a committee to evaluate the granite resources on the island. The final report was released in 1951, containing Alexander's assessment of the island's plentiful granite capacity, which ultimately led to the decision to conserve Bukit Timah. In her island-wide geological surveys, Alexander also uncovered mollusc fossils. These are some of the few fossil specimens from Singapore that are still known to be in existence.



Fossils of molluscs collected by FES Alexander from Huat Choe Village, Jurong Road, Singapore.

SIGNIFY: [\[A: *Cassianella* sp\]](#) [\[B: *Modiolus* sp\]](#)

The report also recommended the gradual closure of quarries in the vicinity of Bukit Timah, and provided impetus for the enactment of the Nature Reserves Act of 1951. For the first time in Singapore's history, nature reserves were accorded legislative protection⁴. Today, Bukit Timah Nature Reserve remains home to the rarest flora and fauna on the island.



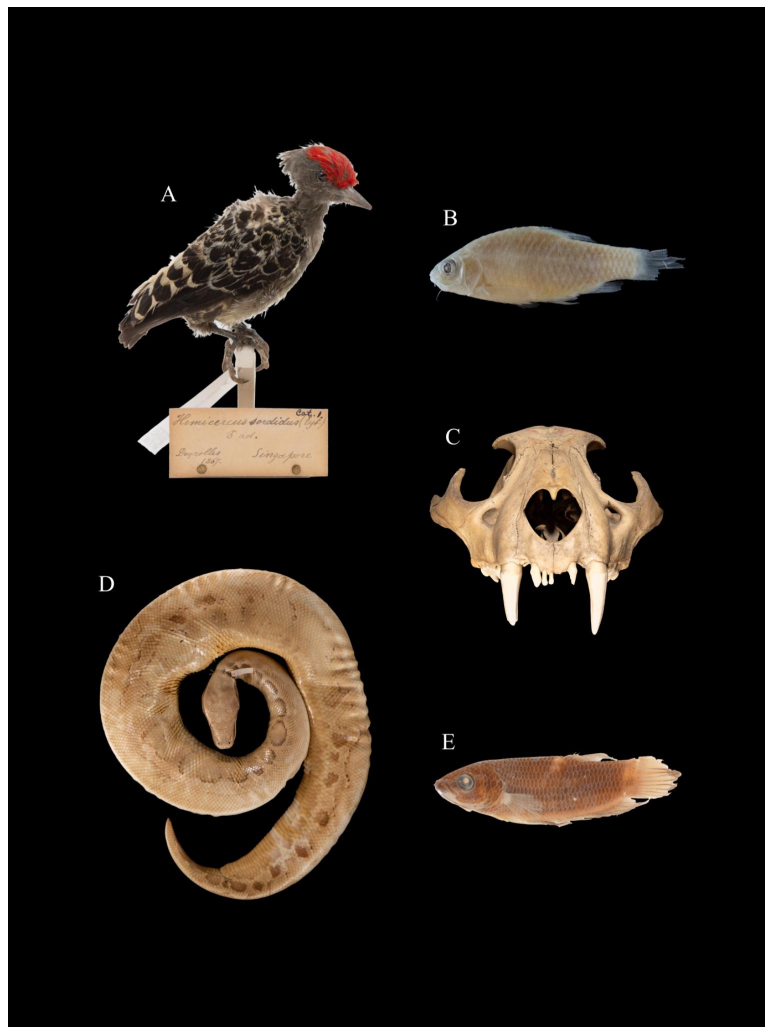
Selection of specimens collected from Bukit Timah Nature Reserve, including the endangered Singapore freshwater crab that is endemic to the island.

SIGNIFY: [\[A: *Johora singaporensis*\]](#) [\[B: *Epitoxasia coomani*\]](#) [\[C: *Myrmoteras barbouri*\]](#)

1965

Independence and nation-building

Post-war Singapore saw rapid population growth and industrialisation, leading to dramatic transformations in the landscape. Agricultural plantations and urban slums were eventually replaced with factories and manufacturing plants, and high-rise buildings, respectively. Land reclamation, which had been first implemented since Raffles's time, intensified, leading to further loss of coastal habitats (including Jurong Industrial Estate in the 1960s and Sungei Pandan in the 1970s). Eventually, this would result in the island losing more than 95% of its original forests: Singapore has paid a high price for economic success, with the loss of habitats and, consequently, part of its rich biodiversity⁵.



Examples of species that are locally extinct in Singapore, including the grey-and-buff woodpecker, bigspot barb, Indochinese leopard, Tomi mouthbrooder, and blood python.

SIGNIFY: [\[A: *Hemicircus concretus sordidus*\]](#) [\[B: *Barbodes dunckeri*\]](#) [\[C: *Panthera pardus delacourii*\]](#) [\[D: *Python brongersmai*\]](#) [\[E: *Betta tomii*\]](#)

Although many localities have been lost or changed over time, specimens once collected from these places have survived. These can offer us glimpses or clues of what these places may have looked like in the past.



Selection of specimens collected from localities that have been lost or changed over time, including Pulau Blakang Mati (currently known as Sentosa Island) and Pulau Brani (a southern island near Keppel Harbour slated for redevelopment). The snail was collected in the mid 1860's by German malacologist Eduard von Martens, who noted they were found "on the muddy bank of the streamlet, close to its mouth, near the new church, east of the town". This likely refers to St Andrew's Cathedral, located in the present day central business district. The crab was collected on the [HMS Alert](#) between 1881 to 1882 at an unspecified beach in Singapore.

SIGNIFY: [A: *Rhizopsommia nuda*] [[B: *Optedicerus breviculum*](#)] [[C: *Trivirostra oryza*](#)] [[D: *Macrophthalmus brevis*](#)]

While it is impossible to restore lost biodiversity and their habitats to their original state, the importance of conservation is increasingly recognised today. Local species recovery programmes have seen successes, for instance in the case of the Raffles's banded langur⁶. Species once thought to have been lost have also been rediscovered, such as the Selangor mud snake⁷. These successes demonstrate how historical specimens and data can continue to augment conservation efforts, by providing baselines for understanding biodiversity.

Research and text by: Lydia X. Gan

References:

¹<https://biblioasia.nlb.gov.sg/all-sections/vol-15-issue-2-jul-sep-2019-american-expedition/>

²<https://biblioasia.nlb.gov.sg/all-sections/vol-17-issue-1-apr-jun-2021-agriculture/>

³<https://www.nlb.gov.sg/main/article-detail?cmsuuid=a8ceea4c-1c8b-4c9a-885c-b85038b39e4c>

⁴<https://www.nlb.gov.sg/main/article-detail?cmsuuid=0c96eac2-2c65-4d1b-81b2-bf49eb626175>

⁵<https://www.sciencedirect.com/science/article/abs/pii/S0169534704002666>

⁶<https://www.straitstimes.com/singapore/environment/once-nearly-extinct-rare-raffles-banded-lanur-numbers-in-s-pore-set-to-double-to-150-by-2038>

⁷https://lkcnhm.nus.edu.sg/wp-content/uploads/sites/11/app/uploads/2020/01/sbr2020_165-167.pdf?fbclid=IwAR3WSU9hnjaaOEh1kkSrXu4zH5QajeqKvRFQ80oCrtzcz7kOvpRH51KFjPw