

1770:2020

**250th Anniversary of the
Endeavour Voyage**

**The visit to Botany Bay and
its botanical legacy**



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Australian Plants

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Cover images

Front cover: *Banksia ericifolia* – engraving from Banks' *Florilegium*

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Specimen collected at Botany Bay April 1770 by Banks and Solander and named by Solander as *Isostylis ericifolia*.

Original drawing by Sydney Parkinson April / May 1770. Watercolour completed by Charles White, London 1780s.

Back cover: *Banksia ericifolia* – Australian Botanic Garden, Mt Annan. Photo by Dr Brett Summerell.

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Editorial

Merle Thompson OAM

In this issue and the Summer issue 2020/21 (Vol 30 No 245) we mark the 250th anniversary of the voyage of the HM Bark *Endeavour* under the command of (then) Lieutenant, later Captain, James Cook in 1768–1771 and, in particular, its explorations along the east coast of continental Australia in 1770. The Summer issue will feature the Queensland section of the voyage.

It can be said without doubt that this visit changed the face of Australia – the land and its people.

This journal is entitled *Australian Plants* and that is our focus. We are considering the importance of that visit to our knowledge and understanding of the flora of the east coast of Australia. It is totally beyond our scope and inappropriate to delve into other aspects of the history, ecology and social and community life of Australia in this journal, but we should all be cognisant of the importance of that visit and its resulting impact in all spheres. For it was a recommendation following that visit that resulted in England sending the First Fleet to establish a settlement at Botany Bay. The settlement established at Sydney Cove, a little to the north of Botany Bay, 18 years later was the first by Europeans and from that small beginning, modern Australia developed.

In the process the lives and culture of the Australian Aboriginal people, who had been here for at least 40,000–60,000 years, were severely impacted. The land itself has been transformed progressively over the subsequent 230 years by the development of cities, by agriculture and mining, land clearing and changed fire regimes. Many plant and animal species have become extinct; others have been introduced, in some cases with disastrous results such as rabbits, foxes and cane toads, and there are thousands of species of introduced plants, some of which are used for agriculture and horticulture and others which have become naturalised or are weeds. Yet we have a vibrant, progressive nation in which we are proud with successes in science and across all spheres of knowledge, in the arts, in sport and in many aspects of society. We will all have different assessments of the pluses and minuses resulting from the 1770 visit and later settlement.

The visit of the *Endeavour* is the first recorded visit of Europeans to the east coast. There had been previous visits to Tasmania and the west coast and in the north of the continent Aboriginal people had regular contact with peoples to the north. European people had seen

small numbers of plants from Tasmania and Western Australia from specimens taken back from earlier voyages.

On 2 December 1642 Abel Tasman was at Blackman's Bay on the Forester Peninsula in Tasmania. His interest was food and his crew collected "various samples of vegetables ... fit to be used as pot-herbs." He also wrote about the gum exuding from trees which we know as kino on eucalypts.

It is believed that the earliest specimens of Australian plants belonged to Vlamingh who visited the Swan River area of Western Australia in 1697. Two specimens held in Geneva and originally thought to be ferns from Java are in fact *Acacia truncata* and *Synaphaea spinulosa* which are endemic to the south-west of Western Australia.

William Dampier on his first visit in 1688, near King George's Sound (Albany) in the south of Western Australia, was the first English person to describe Australian plants. He, also, described kino and called it "dragon's blood". When he returned in 1699 he both made sketches and collected specimens which are still held at the Sherardian Herbarium in Oxford. They include some which, at some point in the history of their nomenclature, have borne his name: *Clianthus dampieri* (syn *C. formosus* and now *Swainsona formosa* – Sturt's Desert Pea), *Dampiera incana* and *Beaufortia dampieri*.

From the late 17th Century to the early 19th Century there was considerable interest in botany and plant collecting. One of the foremost institutions encouraging collection, housing specimens and growing seeds collected around the world was Kew Gardens.

The botanical importance of the *Endeavour* voyage derives from the participation of Joseph Banks and that his party included another botanist, Daniel Solander, and two artists. In later articles we discuss these men and their accomplishments. Doug Benson writes about the scientific approach of Banks and Solander at Botany Bay and how their natural history collections played an important part in the development of systematic biology.

In 1988 I curated an exhibition for the Australian Plants Society NSW for the Bicentenary of settlement. I named it "Terra Australis...or Terra Banksia", from a letter from Linnaeus to John Ellis, Fellow of the Royal Society, in 1771 – "Plants from Banksia in Terra Australis; for the new-found country ought to be named 'Banksia' from its discoverer". One might not quite go as far as Linnaeus but without doubt the botanical work on the *Endeavour* voyage played a very important role in introducing the rest of the world to the wonderful and diverse flora of eastern Australia.

Introduction – The purpose and nature of the voyage

Merle Thompson OAM, Editor

Background to the voyage

The period in which the voyage of the *Endeavour* took place is often known as the "Age of Enlightenment" because of the resurgence of interest in learning, literature and scientific discovery.

A major influence in scientific pursuits within Britain was the Royal Society. This organisation was founded as a 'learned society' on 28 November 1660 and from 1663 was known as 'The Royal Society of London for Improving Natural Knowledge'. One had to be nominated in order to be a Fellow of the Royal Society based on the merits of your scientific work. This tradition continues to the present.

On 1 May 1766 Joseph Banks (later Sir Joseph) was elected to the Royal Society at the very young age of 23. The following article by Rhonda Daniels explores Sir Joseph's life and legacy.

The scientific world was interested in determining the distance between Earth and the sun. Such a calculation would be possible when the planet Venus passed in a direct line between the earth and the sun. Previous attempts had failed in 1639 and 1761. The next transit was predicted to occur in June 1769 with the subsequent one not until 1874. The Royal Society had recommended three points of observation: Norway, Hudson Bay (Canada) and one in the Southern Pacific with Tahiti being selected.

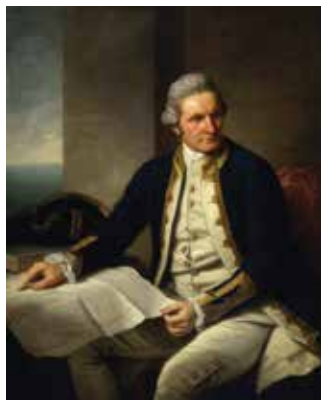
The Royal Society considered this of such great importance that it approached the king, George III who was interested in science, to support an expedition to coincide with the transit. He donated funds and provided a naval vessel.

The Admiralty purchased a collier, the *Earl of Pembroke*, which was commissioned and renamed *Endeavour*. It was considered suitable as it was strong with a shallow draft.

The next important decision was who to appoint the person to command the expedition. The two principal contenders were Alexander Dalrymple, who had seafaring and scientific credentials but was not a naval officer and James Cook of the Royal Navy. The decision of the Admiralty was for Cook to lead the expedition.

James Cook was a tall man of over 6'. He came from a relatively

poor family in Yorkshire and, after initially learning the grocery trade, he gained an apprenticeship in seafaring, working on colliers and gaining experience in cartography. In 1755 he enlisted in the Navy as Britain was becoming embroiled in the Seven Years' War. Over the years he impressed both the Admiralty as a ship's master and in cartography and the Royal Society as a mathematician because of the quality of his calculations relating to an eclipse of the sun. He was promoted to Lieutenant prior to sailing.



Cook had two sets of orders. One set was open and required him to proceed to Tahiti to observe the Transit of Venus. Cook also had a second set of orders which were sealed and not to be opened until the first task was complete.

These orders commenced: *Whereas the making Discoverys of countries hitherto unknown, and the Attaining a Knowledge of distant Parts which though formerly discover'd have yet been but imperfectly explored, will redound greatly to the Honour of this Nation as a Maritime Power ... and Whereas there is reason to imagine that a continent or Land of great extent, may be found to the southward of the Tract lately made by Captn Walls in His Majesty's ship the Dolphin*

You are to proceed to the southward in order to make discovery of the continent above-mentioned until you arrive in the Latitude of 40°, unless you sooner fall in with it. But not having discover'd it or any Evident signs of it in that Run, you are, to proceed in search of it to the Westward between the Latitude before mentioned and the latitude of 35° until you discover it, or fall in with the Eastern side of the Land discover'd by Tasman and now called New Zeland.

If you discover the Continent above-mentioned ... You are to employ yourself diligently in exploring as great an Extent of the Coast as you can ...

You are also carefully to observe the Nature of the Soil, and the Products thereof ... the Seeds of the Trees, Fruits and Grains as you may be able to collect



Map of Australia as known before the Endeavour voyage

Banks and his party

Joseph Banks lobbied to be permitted to go on the voyage and this was granted. He took with him an entourage comprising Daniel Carl Solander [see later article] as botanist and mentor, H.D. Sporing as personal secretary, two landscape and natural history artists Alexander Buchan and Sydney Parkinson, two of his tenants and two negro servants. He also took a natural history library and an exceptional amount of zoological and botanical collecting equipment.

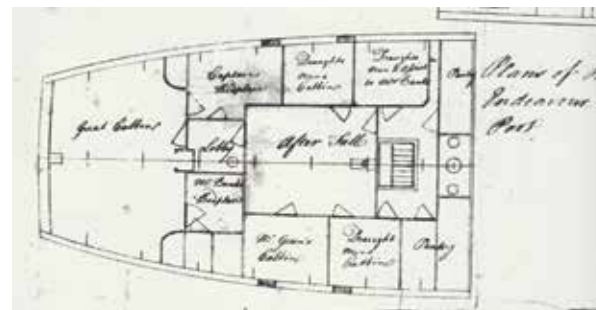
Some have speculated that Banks knew of the sealed orders and that this added to his determination to be involved.

The ship

The ship was 97' 8" (29.77 m) long and 29' 2 in (8.89 m) wide, described as about one and a half cricket pitches.

Cook had to share the "Great Cabin" with Banks and his party and provide space for them to work on their collections. When one reads this term "Great Cabin" one would anticipate a large area but, in reality, it was only perhaps a bit less than 5' by 6' at the front and slightly more at the back or about 1.4 m by a bit over 2 m at the widest. [estimated from the following diagram which had a scale of 1:48].

Cook's own cabin was what we might term a "broom closet". The below deck quarters for the men were crowded and low roofed. When I toured the replica *Endeavour* I had difficulty standing in some areas and I am only 4'10".



The Endeavour replica.
Photo: Lawrie Smith

The voyage

The *Endeavour* sailed from Plymouth on 26 August 1768. In November they reached Rio de Janeiro where they collected 300 specimens despite being refused permission to land. In January they reached Tierra del Fuego and again made collections but the two negro servants

tragically died in a snow storm. On 13 April they reached Tahiti and successfully conducted the required task in relation to the transit of Venus.

Cook was then able to study the sealed orders and proceeded as directed. On 7 October they sighted New Zealand and circumnavigated both islands thus proving that New Zealand was not part of the great southern continent.

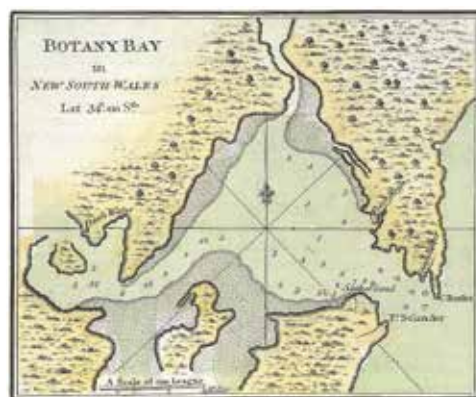
Anthropological and scientific work

During each of their visits to lands en route it was their practice to observe the people and collect artefacts to reflect the society and life of the peoples. Alexander Buchan's role was to complete drawings of landscapes, the people and culture items. He died in Tahiti. Following his death some of the task of recording of these items fell to Sydney Parkinson whose original role was to be the natural history artist, drawing the fauna and flora.

Further information on the art and artists is contained in the later article on the art and artists of the *Endeavour* voyage.

The *Endeavour* in Australia

The first sighting of the east coast of Australia was on 19 April 1770. On 29th they went ashore at Botany Bay. Cook's journal shows that he named it Stingray Bay but changed it to Botany Bay because of "the great quantity of plants & ca Mr Banks and Dr Solander collected in this place." The volume of material was such that they hardly had sufficient paper to dry the specimens despite having what is described as "a job lot of Milton's 'Paradise Lost'".



Cook's map of Botany Bay.

They remained at Botany Bay until 6 May and then began a slow voyage up the east coast carefully mapping as they went. All later landings were in what is now Queensland and will be described in the Summer issue.

Batavia

The damage to the ship sustained when it ran aground on the Great Barrier Reef meant that when it reached Batavia in Java it was necessary to stay for about two months for repairs to be undertaken. Having had almost no illness for the entire journey to that point, in Batavia many of the crew had malaria and dysentery with 40 being ill. Seven died during the stay and 23 en route to Cape of Good Hope. The deaths included Sydney Parkinson.

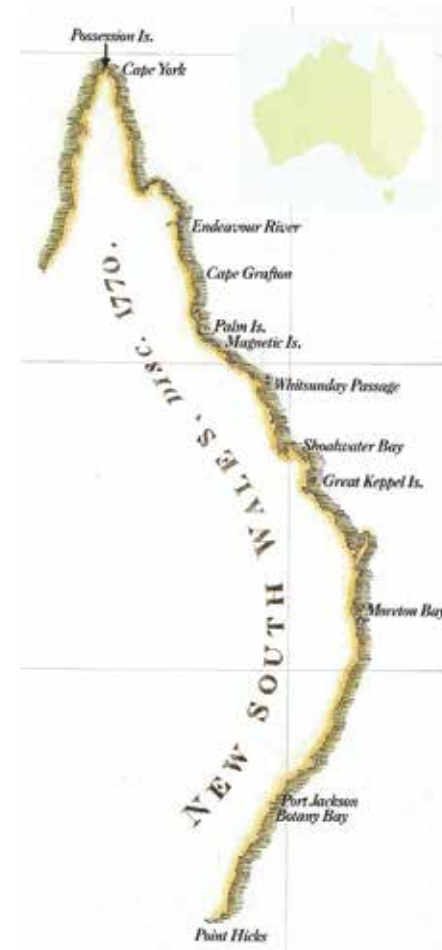
Return to England

The *Endeavour* landed in England on 13 July 1771 having been away for nearly three years. For much of this time they were at sea or at landings where they had limited, if any, contact with the inhabitants. They had no communication with home. They were far more isolated than astronauts in space. Cook survived but Banks and Solander were the only survivors from Banks' party.

What are the legacies of the voyage? From the perspective of Australian Aboriginal people the fact that Cook over-reacted to the circumstances confronting him and fired his musket at the people of Botany Bay is particularly disturbing (although following another incident at the Endeavour River there was a reconciliation). Additionally, the voyage led to later British colonisation with its devastating effects on the lives and culture of our First Nations Peoples.

Cartographically, there is Cook's map of eastern Australia.

From a maritime point of view, it is often said that one legacy is that others learnt from Cook's insistence on fresh food where



possible and those foods which reduced the incidence of scurvy on long voyages. He was more humane with his crew with milder punishments, fewer floggings and he encouraged the wearing of warm, dry clothes which assisted in maintaining good health. He also was more accurate in calculating longitude than others. From a scientific point of view we still have the natural history collections, the associated knowledge of the flora and fauna of the countries visited and the art works produced by Buchan in the early stages and by Parkinson until his death on the return journey after Batavia. This includes the engravings in what is known as *Banks' Florilegium* which we describe in a later article.

The legacy of botanical collection and identification

Sir Joseph Banks' lifelong passion for botany was naturally heightened by his voyage on the *Endeavour* and his fascination for all the new species collected in Australia. In both a personal capacity and as the Honorary Director of Kew Gardens from 1772 he was influential in the employment of several explorers and botanical collectors who extended the knowledge of Australian plants.

Many of their botanical collections and seeds of plants they gathered in their travels were sent to Kew. In fact, some plants were found growing at Kew which were not identified in Australia again for many years. The story of *Eucalyptus pulverulenta* is an interesting example.

Banks personally paid George Caley to come to Australia in 1800 as a botanical collector.

Robert Brown: ...He accompanied Flinders on his historic voyage to chart the coast of Australia 1801-1803 and stayed in Australia until May 1805. He published the results of his collecting in his famous "*Prodromus Florae Novae Hollandiae*" in 1810. He succeeded Dryander as Banks' librarian, and on Banks' death in 1820 inherited his library and herbarium. This was transferred to the British Museum where Brown became the first Keeper of the Botanical Department.

Alan Cunningham went on several expeditions on behalf of Kew and became one of the most successful explorers and collectors in Australia for over 20 years from 1816 including being ship's botanist on HMS *Mermaid* under Phillip Parker King from 1817 to 1820.

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<i>Botany Bay Australia's Heritage in Stamps</i>	Australia Post

Sir Joseph Banks: his life and legacy

Rhonda Daniels

Rhonda is a member of the Australian Plants Society NSW, Sutherland Group – the home of the meeting of two cultures at Kurnell and of Joseph Banks Native Plants Reserve at Kareela which was established in 1970 for the 200th anniversary.

Most people know Joseph Banks collected Australian plants at Kurnell and Botany Bay with James Cook in 1770, but how did he come to be on the voyage, what did he do afterwards and what his legacy?

His early life

Joseph Banks was born in 1743 as the only son of a wealthy landowning family in Lincolnshire. He explored the countryside of the family estate Revesby and his passion was natural history, particularly botany. He studied at Oxford, focusing on natural history and with extra tuition in botany from a Cambridge lecturer, but did not receive a degree.

When his father, a member of the House of Commons, died young in 1761, Joseph inherited the family fortune and pursued his passion to the full. On a trip to Newfoundland and Labrador in 1766 to collect plants, animals and rocks, he gained valuable experience in storing specimens. The same year he was elected a Fellow of the Royal Society which became very influential in his life. The Royal Society was founded in the 1660s to improve and communicate scientific knowledge.

The voyage

It was the Royal Society which initiated an expedition to Tahiti for the scientific purpose of observing the transit of Venus. Banks obtained permission from the British Admiralty to join the voyage which is covered in another article in this issue. A few points highlight Banks' passion and character. Banks paid for his own passage and a party of seven, plus extensive supplies for collecting specimens, at extraordinary cost. Swedish botanist Daniel Solander was Banks' guest.

Banks, physically tall and imposing, maintained good relations with all during the three years on the cramped *Endeavour*, including with the more mature Cooks and Solander. When the expedition set off in August 1768, Banks was 25 years old, Solander 35 years old (1733–1782) and James Cook 40 years old (1728–1779).

Returning home

After three years away, Banks arrived home in July 1771, aged 28

years, to great public acclaim. In 1772, he travelled to Scotland, Wales and Iceland collecting more and more curiosities. This was his last sea voyage. Banks then settled into life as a patron of the natural sciences. Banks commissioned one of the most well-known portraits of Captain Cook (by Nathaniel Dance in 1776), which was hung prominently in his London home.

Patron of the sciences

Banks became President of the Royal Society in 1778, a position he held for 41 years until his death in 1820. He was a great networker, facilitator, benefactor and supporter of natural history and science. It is hard to convey the range of his interests and his influence. He ran his own agricultural estates, which continued to generate wealth, and he was interested in agricultural issues including sheep breeding. He advised King George III on the Royal Botanic Gardens, Kew, and many other issues including Australia. Recognising his contributions, he was made a baronet in 1781, and invested as a Knight of the Order of the Bath in 1795.

As well as his role at Kew in which he initiated and supported many voyages of collection, Banks was a trustee of the British Museum, another prominent scientific institution. He was involved in and supported many learned societies including the Linnean Society, founded in 1788, and the Horticultural Society, founded in 1804, and was also active in European societies.



Joseph Banks, by Joshua Reynolds c.1771–73.



Sir Joseph Banks, by Thomas Phillips c.1808–09, displayed in the State Library of NSW Portrait Gallery.

He was a prolific letter writer (up to 50 a week in his own hand) and hosted many dinners to facilitate sharing information, all in the name of scientific discovery. In his later years, he suffered from gout, but remained intellectually rigorous.

Interest in Australia

Banks advocated for Botany Bay as a colony and maintained his interest in Australia throughout his long life, including correspondence with several early governors of NSW and other prominent people in the colony, although he himself never had any property or assets in Australia. He encouraged investigation of the colony's natural history and paid plant collectors including George Caley, Robert Brown and Allan Cunningham. He nominated Robert Brown as a naturalist to accompany Matthew Flinders on his circumnavigation of Australia in 1802–3.

A strange episode which illustrates Banks' wide-ranging interests and influence is his connection to the infamous mutiny on the *Bounty*. Banks initiated an expedition in 1787 to collect breadfruit trees from Tahiti to send to the Caribbean as a cheap and nutritious food source. He appointed William Bligh, a member of Cook's third voyage, to the crew. This expedition was not successful, and a second expedition was made in 1791 with Bligh as captain of the *Bounty*. The mutiny occurred on this second voyage. Later, Banks successfully recommended Bligh be appointed governor of NSW in 1806.

Personal life

Banks married the wealthy Dorothea Hugessen (c1758–1828) in 1779 and had no children. His only sister, Sophia, also known as a collector, lived with the Banks household. When Banks died in 1820 aged 78 years, he left his extensive collections to the Natural History Museum, and his carefully organised correspondence was dispersed. The State Library of NSW has an online archive of Banks' papers at www.sl.nsw.gov.au/banks. The library's Portrait Gallery displays a large portrait by Thomas Phillips of Banks showing him in his maturity as president of the Royal Society.

He was considered to be unusually likeable, and was generous, enthusiastic and energetic. With Banks' wealth, it was no doubt easy to be generous but he met his various obligations and more, maintaining contact with and interest in the welfare of the many people he met including supporting Solander's sister. A sign of his character is the successful *Endeavour* voyage, and his long, active tenure as president of the Royal Society in the age of enlightenment.

His legacy

Although Banks collected plants and was associated with plants, he was not a botanist himself. Banks commissioned over 700 engravings of the plants he had collected, known as Banks' Florilegium, but they were never published in his lifetime. Banks was likely affected by the early death of his close friend and respected colleague Daniel Solander in 1782, aged only 50 years. Another article in this issue explores the Florilegium.

His legacy is as a patron of the natural sciences who supported and encouraged scientific discovery. Joseph Banks is commemorated in the genus *Banksia*, named in 1782 by Carl Linnaeus, son of Carl Linnaeus, with the *Banksia serrata* collected at Kurnell as the type specimen. *Banksia* species, except one, are only found in Australia. Banks is also commemorated in over 80 species names including *Grevillea banksii*, a parent of many popular garden cultivars, *Eucalyptus banksii*, *Drosera banksii* and *Viola banksii*. His wife Dorothea is commemorated in *Rosa banksiae*, collected on a Banks-funded expedition in China.

Banks is commemorated in many place names. Places in Sydney named after Banks include Cape Banks at the head of Botany Bay (itself named by Cook for the wealth of collecting there) and the Sydney suburbs of Bankstown

(named Banks' Town in 1795 by Governor Hunter after Flinders and Bass explored the Georges River), Banksia and Banksmeadow. The suburb of Revesby is named after Banks' now demolished estate. There is also the federal electorate of Banks. At Sir Joseph Banks Park at Botany on the shores of Botany Bay, there is a lovely sculpture of Banks in action, with the greyhound who accompanied him on his great voyage.



Grevillea banksii
Photo: Lawrie Smith



Sculpture at Sir Joseph Banks Park, Botany in eastern Sydney.

Joseph Banks Native Plants Reserve at Kareela in Sutherland Shire was established in the late 1960s to commemorate the bicentenary of Cook's landing in 1770. The year 2020 marks the 250th anniversary of Banks' visit and the 50th anniversary of the reserve, and also 200 years since Banks' death in 1820. The reserve showcases the beauty and diversity of many species of Australian plants including species of local *Banksia* in an accessible garden setting.

The Sir Joseph Banks Society in the UK (www.joseph-banks.org.uk) works to raise Banks' profile and recognise his achievements.

More information

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Daniel Carlsson Solander

Merle Thompson OAM Editor

To most people the voyage of the *Endeavour* revolves around Cook and Banks but from a botanical perspective the role of Daniel Solander is of as great, or greater, importance.

Solander was born in Pitea, Sweden, on 19 February 1733. His early education was predominantly from his father, a clergyman, until he enrolled at Uppsala University in 1750 where he studied languages and humanities. The professor of botany was Carl Linnaeus, the person who developed the first classification system for plants which involved binomial nomenclature of two Latin names. He was very impressed with Solander and persuaded him to study natural history. Solander was regarded as his best pupil.

Before completing his PhD Solander went to London in 1760 where he worked at the British Museum cataloguing the natural history collections and was appointed assistant librarian in 1763. He declined the chair of Botany at St Petersburg and as successor to Linnaeus at Uppsala.

Through his work and associations such as the Royal Society he had become acquainted with Joseph Banks and was appointed as the botanist in Banks' party on the *Endeavour*. While he was an employee, he was also a friend to Banks and his tutor in botany. He knew the Linnaean classification system and Latin, which Banks did not.

In other articles we have described the collection, preservation and drawing of specimens. It was Solander, aided by their large scientific library, who did the botanical descriptions and naming of the plants they collected, using the Linnaean system. Of the species collected around 1,300 were new to science.

After the *Endeavour* left Batavia and so many crew died, Solander was desperately ill and confined to his room when they reached Cape Town. Yet he continued his classification work, describing 369 species.

The scientific approach to collection, as described by Doug Benson, in the following article, and his application of the Linnaean system of nomenclature make the botanical results of the *Endeavour* voyage



extremely important. However, the fact that they were never published countered the ground-breaking nature of the work.

On their return to England Solander worked as Banks' secretary and librarian and worked on the collections and the classification of the plants. He had a very meticulous approach and developed a system using what were known as Solander slips, thousands of which are stored at the Natural History Museum.

Linnaeus was very disappointed that the work was not published. He was concerned that such an important collection would be lost.

Some writers contend that it was the fame and involvement in the social life of London that meant the work took longer to complete. Banks and Solander had many meetings with the King to discuss their discoveries and they were generally feted. Solander was known for his conviviality.

He and Banks were planning to go on the next voyage to the south seas but Banks' disputes over ships and equipment meant that they withdrew. Instead they did a shorter voyage to Iceland, where again, they made a significant natural history collection.

On 8 May 1782 Solander died of a stroke in Banks' home. Banks' grief at this loss contributed to the delay in preparing the art of the voyage for publication.

What then is Solander's legacy. Of major significance is his identification and classification of plants undertaken during the voyage and the compilation of his manuscript into the floras for the regions.

Despite the adulation shown to Solander in England after the voyage, there is little recognition in terms of place names or monuments. Cape Solander is one of the headlands of Botany Bay and a monument has been erected near the landing site. A small number of plants bear his name as the species name. There is a library and garden at the Royal Botanic Gardens, Sydney but overall, we could say that his importance to botany is not fully recognised in history or in the public perception.

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Joseph Banks and Daniel Solander at Botany Bay:

How serious was the science in 1770; where did they actually go?

Doug Benson

Doug is an Honorary Research Associate at the Royal Botanic Gardens and Domain Trust, Sydney. For many years he was a botanist/ plant ecologist at the National Herbarium of NSW, Royal Botanic Gardens Sydney, working on vegetation mapping of plant communities and conservation issues particularly for rare species in the Sydney area. Like many botanists, he is interested in botanical history.

Abstract

The *Endeavour* voyage was specifically equipped for the scientific exploration and recording of both astronomical observations (the transit of Venus at Tahiti) and biodiversity, and by the time it reached Botany Bay it is evident that its scientific methodology for recording biodiversity was being fully implemented (after experience in South America and New Zealand). In this paper the application of this approach as applied at Botany Bay is explored, and, in particular, the scientific methodology employed for the collections by the systematic geographic spread of collection sites in Botany Bay.

Introduction

The arrival of Lieutenant James Cook and the *Endeavour* at Botany Bay in April 1770 marks the beginning of European exploration of eastern Australia and provided a focus for the later British convict settlement of Sydney in 1788. The *Endeavour's* voyage was also an important milestone in the advance of 18th century Enlightenment science, not just for the astronomical observations on the Transit of Venus, its aim in Tahiti at the instigation of the Royal Society, but through the systematic collection and description of living things by naturalists. These natural history collections provided a spectacular boost to the international development of systematic biology, the branch of biological science that deals with the description and classification of living organisms.

Systematic biology began in the 18th Century with the systematic description of biological specimens by Carl Linnaeus (1707-1778) in Sweden in several publications, *Systema Naturae* (1735) and others, listing all the plant and animals known at that time. He advanced his ideas through his lectures and importantly, through his students – one of whom was Daniel Solander. Linnaeus' work was a response to the Enlightenment, a time of worldwide exploration which fitted well with the collecting trips needed for progressing systematic science. James

Cook's three voyages were classical examples of expeditions with both exploration and scientific collection objectives, but there were similar voyages by French (e.g. La Perouse) and Spanish authorities. The amount of material collected stimulated the development of biological classifications, beginning with artificial systems such as that of Linnaeus, but leading to the natural system of French botanist Antoine Laurent de Jussieu (1748-1836), published as *Genera Plantarum* in 1789, and adopted by the English botanist Robert Brown in the early 19th Century. Robert Brown himself was employed as a botanist and librarian by Joseph Banks and carried out methodical collecting and description with Mathew Flinders circumnavigation of Australia (1801-1805). The framework of systematic biology that was developed would underpin Charles Darwin's evolutionary theory in the *Origin of Species* in 1859.

The *Endeavour* expedition had been primarily promoted by the Royal Society for astronomical science, the mapping of the east coast of Australia, and visit to Botany Bay was directed by the Admiralty; the biological collections were the result of the inclusion of the young, wealthy, enthusiastic naturalist, Joseph Banks who financed and organised his own support team. He employed the botanist Daniel Solander (Linnaeus' best student), as well as artists, Sydney Parkinson and Alexander Buchan, greatly enhancing the scientific abilities of the expedition. During the first part of the exploration, in South America, Banks was recognising a flora and fauna already known, and some already described in Linnaeus' books, but as new lands, Terra del Fuego, Tahiti, New Zealand were visited, the number of new species increased. The Australian flora as encountered at Botany Bay however was totally new; with many plant families and genera quite different to those then known.

In all, the collections from the *Endeavour* voyage comprised over 1,000 zoological specimens and 30,382 botanical specimens, representing around 3,600 species of which at least 1,300 from 110 genera were new to science. Sydney Parkinson made over 900 drawings and completed approximately 270 water-colour sketches.

In Australia, the 1770 *Endeavour* visit is seen as a significant national event in Australian history – the first contact with the eastern side of the continent with Aboriginal people, and the first collections of eastern Australian flora and fauna. While recognising that Cook's three voyages were all worldwide explorations, the particular scientific work being considered here is that resulting from Botany Bay.

How significant was the work at Botany Bay? The aim of this paper is therefore to look at the scientific actions and results of the visit of

the *Endeavour* to Botany Bay in the context of its contribution to the development of systematic biology in the late Eighteenth Century. The *Endeavour* expedition was equipped for scientific exploration, and by the time it reached Botany Bay, the systematic recording of biodiversity was in full swing. The application of this approach as applied at Botany Bay is explored in this paper, in particular the scientific methodology employed for the collections and the geographic spread of collection sites in Botany Bay (traditionally seen as confined to the Kurnell landing site). The biological collection and recording methods demonstrated at Botany Bay would be used for the next two centuries until the era of modern technology, computers, digital cameras, global positioning systems and drones.

Botany Bay, sources of information and assessment of the *Endeavour* visit

The original journal accounts of James Cook (Beaglehole, 1968), Joseph Banks (Beaglehole, 1962) and Sydney Parkinson, (Parkinson, 1773) have been read in conjunction with original herbarium specimen data and access to previously unavailable specimens at the National Herbarium of New South Wales, online sources and contextual on-ground knowledge of the Botany Bay geography. It might be expected that 250 years after the *Endeavour* visit, past research on its collection and activities would have left little to explore. However the databasing program and access to specimens collected in 1770 held at the National Herbarium of NSW have provided new insights both in the context of the Kurnell site as explored in Benson & Eldershaw (2007), and in the scientific methods used by Cook and Banks at Botany Bay.

Original 1770 specimen of *Banksia integrifolia*, now held in the National Herbarium, Royal Botanic Gardens, Sydney



Application of systematic biology survey methods at Botany Bay in 1770

During a long professional career I have had extensive experience in vegetation survey, mapping and recording in the Sydney area and beyond (western Sydney, Blue Mountains etc), as well as historical vegetation patterns around Botany Bay and Kurnell, though most of the original vegetation has now been destroyed for suburban Sydney. In reading the original accounts of Banks and Cook it is surprising how similar the approach used for their biological survey was to the vegetation surveys used in the late 20th Century though since then modern electronic technology, rapid data analysis, digital cameras, and global positioning devices have driven mass site data collections, with stratified sampling on scales unimaginable to Banks, or indeed unimaginable until the 1990s. However it is clear that the *Endeavour* voyage methods could be regarded as setting the benchmark for future survey for the next 200 years, at least up until about 1990, and that the 1770 Botany Bay survey can be seen as a prime example of this scientific method in practise.

The main components of traditional vegetation survey (pre-1990) included allowing adequate time for survey, a series of specimens collected and processed methodically, specimen data and images recorded systematically, and stratification of sites to ensure a wide range of habitat/localities were sampled. These components are discussed below in the context of the activities of Cook, Banks and Solander during the 1770 Botany Bay visit.



A view from the NSW Golf Club. Photo: Dan Clarke

1. Adequate time allowed for survey

After striking the east coast of Australia on 19 April, the *Endeavour* made first landfall in Botany Bay on 29 April 1770. Cook evidently planned to spend a number of days here, at least 7, as there appear to be no plans to leave until the 5th when contrary winds delayed them for a day. The visit appears to be planned to make Botany Bay the "type site" for the description of east coast of New Holland and adequate time is allowed for the scientists to make collections in various parts of the bay, and to process their specimens. At the time, Cook did not realise the importance of the plant variety at Botany Bay. His initial naming of the Bay as Stingray Harbour, then Stingray Bay, gave way to Botanists Bay and Botany Bay, his response to the botanists' evident excitement.

Although the *Endeavour* made a number of subsequent landfalls (10 more) on eastern Australia, these were all of short duration (about a day) to collect water. The exception is the six week stay at Endeavour River forced upon them by the damage to the ship on the Great Barrier Reef.

2. Specimens collected and processed methodically

Presenting the young Joseph Banks as the enthusiastic young scientist running around collecting specimens of everything he could, ignores the seriousness with which the collecting and recording were being done, particularly by the time *Endeavour* had reached Botany Bay. While Banks was an 'amateur' scientist at this stage (his university studies were never completed), he had employed the trained naturalist Dr Daniel Solander as a tutor and companion. Solander had trained under Linnaeus, who regarded him as his best student. He had a good knowledge of Linnaeus' publications and working methods.

It was Autumn with fewer plants in flower than Spring or Summer but at least 132 different plant species were collected at Botany Bay, an ongoing effort needing adequate collection of material for duplicates, and continual changing of drying and pressing papers, somewhat hampered by wet days. On May 3, Joseph Banks...*carried all the drying paper, near 200 Quires of which the larger part was full, ashore and spreading them upon a sail in the sun kept them in this manner exposed the whole day...*

3. Specimen data and images recorded systematically

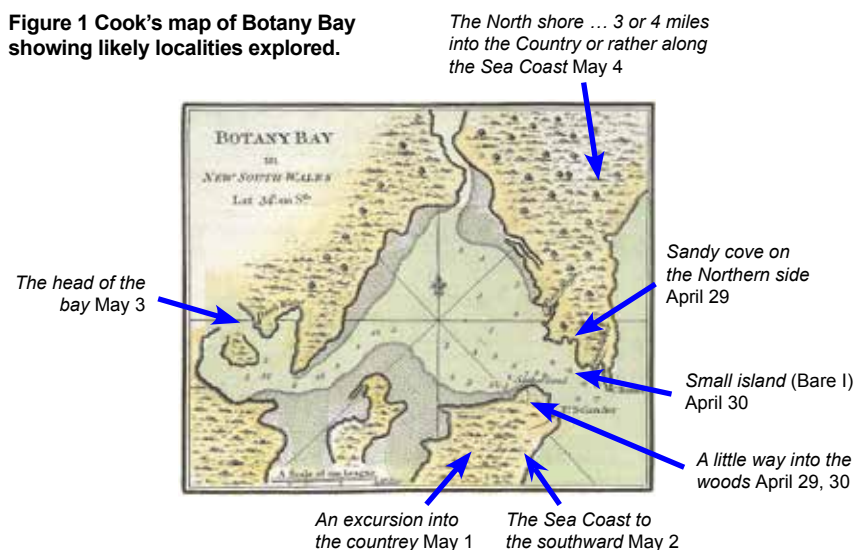
Information needed to be recorded from the fresh specimens before they were dried and in the field Solander kept track of the specimens with labels and prepared preliminary Latin descriptions of the new

species in preparation for subsequent publication (Banks did not know Latin). The artist Sydney Parkinson prepared illustrations of specimens – preliminary sketches from live material incorporating natural colours (or annotated with colour chart symbols) for later final watercolour drawings. Banks intended these to be reproduced as copperplate lithographs later in England, a grand project not finished in Banks' time, but recently completed in 1980-1990 as the *Banks' Florilegium*.

4. Stratification of sites; a wide range of habitat / localities sampled

To characterise the range of geographical variation, modern surveys stratify sample sites across the area. The *Endeavour's* collecting is generally perceived as being concentrated around the landing and watering site at Kurnell. However, there was much more exploration of the Bay than is generally recognised. During the eight days in Botany Bay, visits and plant collecting were made to various parts of the Bay, including Bare Island (Banks 29 April); *the Sea Coast to the south* (Cook, Banks and Solander 3 May); *the head of the Bay* (Cook, Solander and Munkhouse 3 May); *ashore on the NW side of the bay* (Banks 4 May); *and the North shore, 3 or 4 miles into the Country or rather along the Sea Coast* (Cook 5th May). The general location of these explorations can be worked out from the brief geographical descriptions in the journals and confirmed with some of the specimens collected and the nature of their habitats and distribution.

Figure 1 Cook's map of Botany Bay showing likely localities explored.



Were all the collections made at Kurnell, or other parts of Botany Bay?

There are few details of where particular species were collected around Botany Bay (specimens are at best simply labelled *Botany Bay*), but various day excursions by Cook, Banks or Solander radiated out to different parts of the Bay. This would be in line with general plant collecting strategies in a new area where the aim is to find all the species possible by searching all different habitats in the area to maximise chances of finding new species. In the first two days at Botany Bay, Banks visits not only Kurnell, but the northern side of the Bay, probably landing in either Yarra or Frenchmans Bay, and specifically landing on Bare Island, areas with sandstone and shoreline habitats.

Most of the species collected have been subsequently recorded on the Kurnell Peninsula near the landing place. Labelled specimens are all marked *Botany Bay* or *New Holland* but many species are relatively widespread across Sydney and could have come from many places around the Bay. However, a number of species with narrow habitat requirements provide evidence for Botany Bay sites other than Kurnell. *Bauera capitata*, a NSW North Coast species, has only ever been recorded in the Sydney area from La Perouse, on the northern side of the Bay (last recorded in 1913 but now extinct there). *Bauera rubioides*, though generally more widespread, has also been recorded from La Perouse. Neither species has been recorded from Kurnell. These species are likely to have been collected on the La Perouse peninsula.



Other species collected in 1770 and since recorded as occurring at La Perouse, but not Kurnell, are *Lambertia formosa*, *Stackhousia viminea*, *Utricularia biloba* and *Schoenus paludosus*. These species are likely to have been collected from Eastern Suburbs Banksia Scrub vegetation that is restricted to sand deposits on the northern side of Botany Bay, particularly between Botany and La Perouse. For example on the 4 May, Banks is *ashore on the NW side of the bay, where we*

Lambertia formosa. Photo: Karlo Taliana

went a good way into the countrey which in this place is very sandy and resembles something our Moors in England, as no trees grow upon it but everything is covered with a thin brush of plants about as high as the knees. (Banks' Journal). This may have been some of the Eastern Suburbs Banksia scrub near Botany.

On the 3rd day they went inland probably along the land along the current Captain Cook Drive which would have passed the edge of saltmarsh, *Juncus* and *Casuarina* and the sandy alluvium on the south. These areas provided landscapes suitably described as lawns and meadows and ... *The excursion into the countrey on 1/5 was probably along the edge*



Banksia scrub. Photo: Dan Clarke



Left: *Acacia terminalis* – a species collected on 4 May 1770
Photo: Ralph Cartwright

Table 4 Banks and Solander's likely collection and excursion sites around Botany Bay, 29 April- 5 May1770, with dates, possible distances travelled and particular species likely to have been collected

B=Banks's journal, C=Cook's

Date, time	People	Trip description	Area/possible distance	Species likely
29 April morning	Banks, Solander	<i>A little way into the woods and found many plants</i> B	Kurnell landing site <1 km	General sandstone, sandy beach and foreshore species
29 April afternoon	Banks, Cook	<i>Sandy cove on the Northern side</i> B	Yarra/ Frenchmans Bay <0.5 km	General sandstone species
30 April morning	Banks, Solander	<i>Into the woods</i> B	Kurnell landing site 1 km	
30 April evening	Banks	<i>Small island</i> B	Bare Island <0.5 km	Shells
1 May all day till between 3 and 4 o'clock	Banks Solander, Cook	<i>Excursion into the country</i> B	Along Kurnell Peninsula perhaps to Woollooware, 10 km	<i>Diversified with woods, lawns and Marshes</i> -C, Towra Point saltmarsh River mangrove <i>Aegiceras corniculatum</i>
2 May afternoon	Cook, Banks Solander	<i>Little excursion along the Sea Coast to the southward</i> C	Cape Solander to Potter Point ?5 km	Sandstone species
3 May all day	Cook, Solander	<i>the head of the Bay ... and travel'd some distance inland</i> C	Kogarah ?Hurstville Towra Point ?5km	<i>Calotis lappulacea</i> , <i>Glossogyne tannensis</i> , <i>Senecio linearifolius</i> & probably <i>Glycine tabacina</i> <i>Syzygium paniculatum</i>
3 May evening	Banks	<i>A small excursion</i> B	Kurnell landing site <1 km	Quails
4 May morning	Banks	<i>In the woods botanizing as usual</i> B	Uncertain, poss near the ship at Kurnell as Cook had planned to sail on this day	
4 May afternoon	Banks, Cook	<i>The North shore...3 or 4 miles into the Country or rather along the Sea Coast...C NW side of the bay... a good way into the country</i> B	?Banksmeadow, ?Maroubra 8 km	<i>Barren heath, marshes and morasses Acacia terminalis subsp. terminalis</i> Thin brush of plants about as high as the knees B heath vegetation
5 May all day	Banks, Solander	<i>Collecting specimens of as many things as we possibly could to be examind at sea</i> B	Uncertain,	

of Towra Point Nature Reserve and the country *diversified with woods, lawns and Marshes*, would have included salt meadows, saltmarsh and Casuarina woodland now present in Towra Point Nature Reserve.

Table 1 sets out Banks and Solander's likely collection and excursion sites around Botany Bay, 29 April–5 May1770, with dates, possible distances travelled and particular species likely to have been collected.

Towra Point and *Syzygium paniculatum*

'*Mangroves about the head of the harbour.*' described by Cook would have been at Towra Point and Georges River and the likely locality for the 1770 specimen of River Mangrove, *Aegiceras corniculatum*, collected. On 3rd Cook and Solander visited *the head of the Bay* probably landing beyond Kogarah Bay and reaching better country on the slopes towards Hurstville. Here some specimens of shale-indicating plants not ever recorded at Kurnell could have been collected. *Calotis lappulacea*, *Glossogyne tannensis*, *Senecio linearifolius* and probably *Glycine tabacina*. These species generally grow on clay soils such as on the Wianamatta Shale, and may have grown and been collected in 1770 from alluvial forest on the lower Georges River or from shale ridgetops near Hurstville, such as appears to have been visited by Cook and Solander on 3rd May.

On their return they stopped to try to meet a group of Aborigines collecting shellfish, at a site with a *Spring of water*. A freshwater site is shown on Cook's map on Towra Point, and it was almost certainly here that specimens and ripe fruit of *Syzygium paniculatum* (the first species of *Syzygium* collected in Australia and the first to be formally described by Gaertner in 1788 with the type based on Banks and Solander's specimen from Botany Bay).

Banks reports that during an excursion to *various parts of the harbour* on 3 May, Cook and Solander *found also several trees which bore fruit of the Jambosa kind, much in colour and shape resembling cherries. Of these they ate plentifully, and brought home also abundance, which we ate with pleasure, though they had little to recommend them but a slight acid*, writes Banks.



The *Jambosa* fruit has been identified as *Syzygium paniculatum*, a now nationally listed rare species, and an isolated natural clump of *Syzygium paniculatum* trees at Towra Point is now considered to be the type locality of *Syzygium paniculatum* Gaertn. Lifespans of *Syzygium paniculatum* are not known but they are long-

Fruit of *Syzygium paniculatum*
Photo: Dan Clarke



Syzygium paniculatum This tree is at Yarra Bay, not Towra Point, and is thought to be at least 100 years old but not 250 years. Photo: Dan Clarke

lived and could be some of the trees that Cook and Solander saw; probably the closest actual living botanical connection we have with the *Endeavour* visit.

Another botanical link is *Viola banksii* described recently with Kurnell as the Type locality in recognition of Banks' and Solander's 1770 Botany Bay collection (Thiele & Prober 2003).

Beachfront species which might have been collected on the same excursion are *Rhagodia candolleana*, and *Atriplex cinerea*, later recorded from Lady Robinsons Beach on the western side of Botany Bay (no recent collections since 1900). *Lobelia dentata*, a sandstone ridge species conspicuous after fire but not evident in long unburnt sites, might have been collected in the lower Georges River.

Several other species including *Lepidium pseudohyssopifolium* (now rare, last collected Shellharbour 1949) *Melanthera biflora* and *Atriplex cinerea* (now rare, the 1770 collection is the northern limit) are species of rocky coastal foreshores, and could have been collected along the relatively low ocean foreshores north from La Perouse.

Melaleuca quinquenervia is currently regarded as reaching its southern geographical limit at Botany Bay; It is certainly native to Rose Bay



Above: *Viola banksii* [Syn *V. reniformis*]. Photo: Dr Brett Summerell

on Sydney Harbour, but there is no specimen in Banks' collections at Botany Bay (though it was collected by Banks in Queensland). As three other *Melaleuca* species were recorded at Botany Bay, and it was likely to have been fruiting in April-May, its omission is a surprise. Two plants growing at Kurnell in 1965 were regarded as native but recent genetic testing shows these are planted specimens sourced from further north (Marlien Van Der Merwe pers. comm.)

Finally, *Bidens pilosa* is a most interesting record. This species is widespread in disturbed sites in eastern Australia and currently regarded as an introduced species perhaps encouraged by George Bentham's assertion in 1866 *This species is very common as a weed over most warm countries...., and may therefore have been introduced into Australia by cultivation.* However, the identification of 1770 specimen material from Botany



Seed heads of *Bidens pilosa*
Photo: Dr Brett Summerell

Bay (the specimen is held in the National Herbarium of NSW) is surely strong evidence that it is a pre-European occurrence, and should be considered a native species in NSW. Robert Brown appears to have collected *Bidens pilosa* at Newcastle in 1804 and does not seem to have considered it as introduced (Vallance et al. 2001).

From the above it is clear that despite the 250 year gap it is possible for a modern scientist to understand and experience the thinking and objectives that have confronted past scientists and the way they were dealt with, especially with an understanding of motives and landscape. Recently Margaret Cameron-Ash (2018) has contended that Cook did not publicly reveal some of his discoveries to ward off foreign powers, particularly France. She suggests that he tried to keep the existence of the fine harbour of Port Jackson secret, using Phillip's reference to *Islands* in correspondence in 1787. Phillip in May 1787 in discussing plans with the Home Office commented "*It must be left to me to fix at Botany Bay, if I find it a proper place-- if not, to go to a Port a few leagues to the Northward, where there appear'd to be a good Harbour, and several Islands-- as the Natives are very expert at setting fire to the grass, the having an Island to secure our Stock, would be a great advantage, & there is none in or off, Botany Bay.*"

This reference was noted in 1889 by historian George Barton, who realised that Phillip had confused a number of locations. "*Phillip had evidently read Captain Cook's account [in Hawkesworth] of the attempt made by the natives on the Endeavour River to burn his tents by setting fire to the grass, on the 9th July, 1770, because he would not give them any turtle. But as Cook made no mention of "several islands" in Port Jackson, while he described Port Stephens as an inlet sheltered from all winds, with "three small islands" at the entrance, Phillip was probably thinking of that port.-Hawkesworth, vol. iii, p. 508.*" (Barton 1889 p 46).

Clearly if Cook had intended to hide its potential value for harbour development, he would not have named it "Port" Jackson and described it as "a good Harbour". Cameron-Ash fantasizes that on one day Cook walked alone from Botany Bay to Bellevue Hill and Sydney Cove and via Tempe and Newtown to Pyrmont on another, and kept it a secret from everyone. While the routes are feasible, a careful assessment of the daily movements, likely sites visited around Botany Bay does not allow time for the leader to wander off on two days, nor would the most important person allow himself to be out of contact and support in an unknown place. In the Great cabin of the *Endeavour* there would have been reports and talk of the daily activities of the naturalists and gentlemen, as always happens in research field today. Cameron-Ash's

assertions are an unjustified insult to scholars and scientists who have studied Cooks meticulous work.

Plant species collected at Botany Bay and extant presence there today

The site of the *Endeavour* anchorage at Botany Bay is documented on Cook's map of Botany Bay, as well as sites with fresh water so it is clear that Cook and the sailors explored many parts of the Bay. At the same time, if naturalists were with the party, it is likely that plant collections were made. Although much of this area is now suburban Sydney, natural vegetation still survives in Kamay Botany Bay National Park at the end of Kurnell peninsula, and the southern extremity of the northern headland at La Perouse, and nearby Towra Point Nature Reserve. These areas include the sandstone headlands named by Cook, Cape Banks (northern headland) and Point Solander (southern headland) also indicating the significant impact that the site had had on the botanists at the time.

Native vegetation in Kamay Botany Bay National Park remains mainly on the Sydney Hawkesbury Sandstone soils with some small areas of perched dune sands. These soils are very sandy, low in essential plant nutrients and low water-holding capacity, but with characteristic vegetation that has evolved over millions of years; sclerophyllous woodland, heath and scrub with a high component of shrubby species of plant families Proteaceae, Ericaceae, Myrtaceae and Fabaceae and a wide range of plant communities including Endangered Ecological Communities. The windswept heaths on the sandstone plateaus, with their backdrop of the Blue Pacific, and their changing mosaic of vegetation patterns; heath, scrub and small perched swamps, provide inspiration to botanists and tourists today; it is easy to imagine that they had a similar impact on Banks and Solander.

Except for *Syzygium paniculatum*, no actual individual plants that Banks and Solander collected specimens from, can now be identified. Out of the 132 species of which Banks and Solander collected specimens or recorded, natural populations of 114 still occur in their natural habitat around Botany Bay today, 102 at Kurnell and a further 12 at La Perouse. The populations of all these species are directly descended from those plants collected by Banks. These include populations of species for which the Banks and Solander specimens have subsequently become type specimens including *Banksia serrata*, *Banksia integrifolia* and *Banksia ericifolia*, *Corymbia gummifera*, *Leptospermum arachnoides* and *Leptospermum laevigatum*, *Angophora costata*, *Melaleuca*

armillaris, *Melaleuca nodosa*, *Syzygium paniculatum*, *Philydrum lanuginosum* and *Viola banksii* (growing wild at Kurnell near Cook's stream; (Thiele & Prober 2003).

General impressions, vegetation 1770–2020.

There are relatively few references to the vegetation and landscape; Banks' journal is concerned mainly with descriptions of interactions with the Aboriginal people; his and Solander's botanical descriptions of the specimens collected were recorded separately from the journal entries. The journal of the *Endeavour* artist, Sydney Parkinson (1773), includes a brief description of the general landscape of Botany Bay with similar comments to those of Banks and Cook: *The country is very level and fertile; the soil, a kind of grey sand; and the climate mild: and though it was the beginning of winter when we arrived, every thing seemed in perfection. There is a variety of flowering shrubs; a tree that yields gum; and a species of palm, [Borassus flabellifer,] the berries of which are of two sorts; one small, eaten by the hogs, and the other, as large as a cherry, has a stone in it; it is of a pale crimson colour, and has the taste of a sweet acid. We also found a species of Salvia Fortea.* The palm doubtless refers to the fan palm *Livistona australis*, and the berry, as large as a cherry, to the fruit of *Syzygium paniculatum*, brought back from Towra Point by Solander and Cook and shared with colleagues. *Salvia Fortea* may refer to *Plectranthus parviflorus*, an herbaceous plant of moist sheltered sites collected by Banks.

Today the surviving areas of heath, woodland and wetland vegetation in Kamay Botany Bay National Park are much as they were when Banks and Solander explored, except for the actual landing place site with its dominating Pines, that would be unrecognisable to them. The main ecological features remain – landscapes dominated by Sydney Hawkesbury Sandstone, the low nutrient sandy soils, the estuarine influences of bay and ocean, and the periodic burning that would have accompanied Aboriginal occupation. Changes in the flora since that time have been the fragmentation of the bush and the encroachment of exotic weed species either deliberately introduced in misguided planting projects (such as *Eucalyptus microcorys* Benson & Eldershaw 2005) or accidentally introduced and now spreading. Cook would doubtless be impressed by our city, but I'm not sure what Banks would say!

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Figure 2 Specimen of *Bidens pilosa* collected by Banks and Solander at Botany Bay in 1770.

The art and artists of the Endeavour voyage

Sydney Parkinson and Banks' Florilegium

Merle Thompson OAM Editor, whose interest in where plants grow and why, history and botanical art come together in this topic

On any voyage of discovery it is important to record information on the places visited and what is found. Cook's instructions included specific references to the necessity to carefully observe the "Nature of the Soil and the Products thereof" beasts, fowls, fishes, minerals or valuable stones and "Specimens of the Seeds of the Trees, Fruits and Grains".

He was also to observe the "Genius, Disposition, Temper and Number of the Natives".

The instructions required him to take home specimens of minerals and valuable stones and of the seeds of the vegetation but beyond this there did not seem to be instructions regarding anything other than written descriptions. However, Joseph Banks' party included two natural history and landscape artists who were able to record visually what was observed.

Alexander Buchan had the role of portraying people, both as portraits and in community, and landscapes. Sydney Parkinson was to portray the natural history subjects – the flora and fauna. However, a few days after reaching Tahiti, only about eight months into the three-year voyage and before they ventured into lesser known areas, Buchan died. He was epileptic and had a chronic "disorder in the bowels". Parkinson took over some of the tasks which Buchan would have performed but Herman Sporing, who was officially Banks' secretary, also had artistic skills and his work provided additional visual records of the places and people.

From the perspective of Australian plants, it is Sydney Parkinson who is our focus. What do we know of Parkinson? In the book "*Sydney Parkinson – Artist of the Endeavour Voyage*" edited by DJ Carr we learn a little of Parkinson's background and early life in Carr's Preface and in the chapter "Sydney Parkinson and his fellow artists" by Wilfred Blunt.

Sydney Parkinson was born around 1745 to a Scottish Quaker family; his parents were Joel and Elizabeth. In 1766 when Sydney was around 20 or 21 Elizabeth, by now a widow, moved to London. Prior to this he had been apprenticed as a woollen draper. It is thought that he may have studied art in Edinburgh under William de la Cour as his landscapes have a sense of design which suggest that influence.

Some of his flower paintings were exhibited in London at the Free Society in 1765. A major development in Sydney's life was that he was engaged by James Lee to teach his teenage daughter. Lee was well known for his nursery at Hammersmith which was frequented by Joseph Banks. Parkinson was introduced to Banks who commissioned him to paint some of his zoological specimens collection from his earlier voyage to Labrador and Newfoundland. This connection led to Parkinson's selection to accompany Banks on the *Endeavour*.

Parkinson, in his journal, noted that when he was leaving for the *Endeavour voyage* Lee's advice to him was to "minute everything he saw and trust nothing to his memory".

The volume of work he produced is prodigious. The British Library holds many pencil sketches, and wash drawings of a topographical or ethnographical nature, some unsigned and it is not necessarily clear which are attributable to Parkinson and which to Buchan or Sporing. The Natural History Museum houses at least 950 botanical and 296 zoological drawings and paintings or unfinished sketches which are ascribed to Parkinson.

Banks approved of Parkinson's dedication. He wrote in his journal on 12 May 1770, just after having left Botany Bay "*In 14 days just one*



The two known portraits:

Left: Possible self-portrait

Above: As a boy. From the frontispiece of his journal, published by his brother.

draughtsman has made 94 sketch drawings, so quick a hand has he acquired by use". On returning to England he wrote: *S. Parkinson certainly behaved to me, during the whole of the long voyage, uncommonly well, and with unbounded industry made for me a much larger number of drawings than ever I expected*".

His description of the daily schedule included the following: *"From 4 or 5, when the cabin has lost the odour of food ...we sat till dark by the great table with our draughtsman opposite and showed him in what way to make his drawings, and ourselves made rapid descriptions of all the details of natural history while our specimens were still fresh"*. The specimens were then pressed. They had 200 quires of drying paper but this was scarcely enough. Banks added: *"When a long journey from land exhausted fresh things, we finished each description and added the synonyms to the books we had. These completed accounts were immediately entered by a secretary in the books in the form of a flora of each of the lands we visited."*

During the early part of the voyage Parkinson was able to complete most of his drawings but this was not fully the case in New Zealand. Once they reached Australia the volume of new species to record was



Above: Parkinson's initial sketch of *Correa reflexa*.
Left: The watercolour version completed by John Frederick Miller.

almost overwhelming and many of the paintings were unfinished. In these circumstances he made pencil sketches of the plant and its habit and more detailed coloured sketches of the parts such as leaf, flower or fruit. If this was not possible, he wrote notes on the colour. He also wrote annotations, generally on the back of each drawing, where also the botanical name ascribed by Solander was written, along with the location in which the plant was found.

Parkinson's work as botanical illustration or botanical art

*The emphasis of botanical illustration is on science rather than visual art. Botanical illustration is always a true and lifelike representation of a plant. It should highlight a plant's particular distinguishing features which enable botanists to tell one plant from another.*¹

Helen Hewson² writes: *The beauty of flowers has inspired artists for centuries. For scientists, however, the purpose of illustrating flowers is more to capture their fundamental essence than to portray their beauty. Over the centuries these two objectives have merged.there is no clear distinction between botanical illustration and botanical art.*

We each have our own reaction to a work of art. How attractive is the drawing as art? Does it move one emotionally? Then there is the scientific element – the quality in terms of accurate representation – generally including small representations details of the flower, seed vessel or leaf.

Many experts do not regard Parkinson's work as the greatest either scientifically or artistically. But from a personal perspective I find some of his drawings artistically satisfying and evocative. Some individual works, such as the iconic *Banksia serrata*, are stunning. Of course, with the unfinished drawings we must acknowledge that the artists employed by Banks to complete the drawings also added to the quality of the final print. But if you look at the pencil sketch of this iconic item then you can see that the basic outline was Parkinson's own work.

In one sense I almost feel that it does not matter if they are not the greatest examples of botanical art. The wonder is that anyone could produce sketches in the confines of such a small ship sharing facilities with the captain, crew, Banks, Solander and Sporing. Ships don't stay still even at anchor. They rock and roll, and when at sea they toss and pitch. How could anyone produce such work under those conditions? And without even his own table. For me Parkinson is an inspiration.

¹ www.botanicalartandartists.com

² *Australia: 300 Years of Botanical Illustration*



Original *Banksia serrata* specimen.



Parkinson's original drawing.



Banksia serrata flower head. Photo: Margaret Baker



Open fruiting body. Photo: Ralph Cartwright



J G Studholme,³ wrote “*Astonishingly accurate botanically (one can imagine Banks and Solander’s watchful eyes poring over his shoulder), Parkinson also had the gift for setting down each specimen on the page so that it takes on an added dimension as a delightful flower picture. His death deprived the world of natural history of an artist or exceptional ability.*”

Sir Rutherford Robertson, President, XIII International Botanical Congress in the Foreword to Carr’s book wrote: *It is one thing to be able to depict an animal or a plant ... in the unhurried and quiet abstraction of the studio or museum, quite another to draw and paint with unusual distinction in the confines of a small vessel with limited resources, overcrowded with officers and crew, let alone the scientists aboard. To cope with the sudden arrival of perishable objects whose colours must be recorded at once or fade beyond recollection ... to observe minutely and record accurately the important details of specimens, the full study of which might not be undertaken for decades and to do this not only successfully but brilliantly requires genius. Such a genius was Sydney Parkinson.*

In contrast Wilfred Blunt contrasts Parkinson’s work with that of Ferdinand Bauer who went on Matthew Flinders voyage around Australia in 1801. Blunt regards Bauer and his brother Franz as “the greatest botanical draughtsmen of all time”. While he admits that Bauer was away for five years, his output was far less than Parkinson’s and he did not die in transit, he states: “*But the fact remains that to place a Bauer beside a Parkinson is to be compelled immediately to admit that we are contrasting the work of a genius with that of a very competent and conscientious craftsman.*”

After seeing the first prints Blunt wrote about the prints from Parkinson’s drawings: “*Nonetheless, the best plates made after the Endeavour drawings ... are tremendously impressive, and of course of the greatest scientific importance in that they constitute (in their entirety) a comprehensive botanical record of so famous a voyage.*”

One might also add that Parkinson died at the tragically young age of 26 without the time to finish his drawings. And at that age he really was still only learning his craft.

Botanical results from the voyage

Not only was the volume of plant material collected during the voyage enormous, the extent of the new knowledge was extraordinary. The

plants identified included around 1,300 species not previously known and about 110 new genera. Parkinson’s illustrations numbered nearly 1,000.

For the first couple of years after their return little was done to progress work on the specimens or the drawings. Even Linnaeus expressed concern to his friend John Ellis that the specimens might be lost or *destroyed before the work was published, especially if Banks and Solander went on Cook’s second voyage which was already being planned.*

Fortunately Banks and Kew Gardens resumed interest and Banks engaged a team of five artists to make finished colour drawings from the outlines and notes that Parkinson had created during the voyage. Of the 955 botanical drawings only 250 were completed in colour while the remaining 675 were only sketches with his notes. The artists had to use Parkinson’s notes on colour and also refer to the pressed specimens. It was a long and demanding process.

Banks engaged 15 – 18 engravers to start the long, and expensive, process of transferring the images to copper plates using a burin, a sharp engraving tool. The skilled engraver varied the thickness and depth of the incision as the deeper and wider incisions would allow more ink to be applied resulting in darker areas and shallower incisions leading to lighter areas. This detailed work often required the use of a magnifying glass. By late 1784 or 1785 Banks stated that there was only a little left to complete and the *Florilegium* would be ready for publication in a few months. He was insistent that it all be completed prior to publication rather than a staged release.

Why didn’t the project progress to completion? It is not entirely clear, but some say he just lost interest. He had already spent £7,000, a considerable fortune, but there is a suggestion he had allocated £10,000. He was very busy with Kew Gardens and the Royal Society. Working on the collection was emotionally difficult after Solander’s death in 1782. Britain was in a period of uncertainty after the French revolution and with the approach of the Napoleonic wars decreasing the income from his estate and his workers would have been called up for military service. The delay meant that later botanists published the plant information. Whatever the reason, neither the artist nor the botanists lived to see publication. Solander died in 1789, having completed the manuscript of his work but without seeing the art work which brought the plants to life.

Trial proofs were made and stored with the original drawings at the British Museum of Natural History (BMNH – now NHM).

³ *Australian Antique Collector* January-June 1981

Initial publications

In the first few years of the 20th Century, around 120 years after the plates had been engraved, 319 lithographs of Australian plants were made using the trial proofs. These were black and white and did not do full justice to the drawings. Accompanying text was by James Britten of the BMNH.

In 1973, initiated by William T Stearn, a subscribed edition of 30 plants was published and titled *Captain Cook's Florilegium*, limited to 100 copies which took several years to fulfil, having been first mooted by Alecto and the Royal College of Art in 1963. The original plates were used for this work. Later there was a deluxe edition with an additional 12 plates.

Fulfilment

The intricacies of considerations on processes, financial risks etc leading to the initiative to print the full set of 738 of the 753 plates remaining are far too complex to delve into in this article but to cut a long story short:

Joe Studeholme of Alecto Historical Editions considered monochrome prints then master-printer Edward Egerton-Williams considered hand colouring light monochrome prints which was too time-consuming. The technique eventually used was à la poupée in which all colours are printed at once. The need for careful comparison with Parkinson's original drawings and colour notes and the specimens, meant that each print could take up to two months. A "dolly" of cloth is used to work the ink into the plate. Once the quality of work was seen the Museum of Natural History agreed to embark on the project. It was estimated the whole project would take six to eight years.

There were to be 110 sets with 100 for sale and a guarantee of no further sets for at least 50 years. Parts 1-15 (337 plates) are the Australian plants, the last prints being completed in March 1984. Each plate is 18 inches by 12 inches (724 mm x 556 mm). It was financially very risky but once Kerry Packer agreed to finance the 20 sets allocated to Australia printing could go ahead.

Full sets were purchased by libraries and institutions including the National Library of Australia and the State Library of NSW

In 1986 a set which was allocated for sale to the public was displayed at the Blaxland Gallery in the Grace Bros department store in Sydney. The prices ranged from \$250 to \$5,000 for *Banksia serrata*. I believe most were sold, including one to me.

Two years later another set was auctioned by Sotheby's. The catalogue for this sale provides a miniature representation of every print. On the strength of this I say that I have a complete set of *Florilegium* prints.

In 1986 Brian Adams released a book entitled *Flowering of the Pacific*. Section One contains details on the voyage. Section Two covers the lives of Banks and Solander in Britain after the voyage and the history of the *Florilegium*. A one-hour documentary of the same name and showing how the publication of the *Florilegium* was undertaken was produced for Australian Broadcasting Corporation television. It was sold as a VHS.



Banksia integrifolia

It may have taken two centuries but the drawings of Parkinson showing the wonder of the plants collected by Banks and Solander are now printed in their full glory. At first, however, it was only libraries and institutions with access other than the individually purchased items. Now with modern technology and the internet the prints can be viewed on the websites of a number of the institutions.

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- | | |
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A Walk in the Kamay–Botany Bay National Park

John Arney, Activities Co-ordinator, APS Sutherland Group

Background: While much of the area in which Banks and Solander collected is now suburban development three areas are retained as fairly natural – the Towra Point Nature Reserve and two areas within the Kamay – Botany Bay National Park – the northern headland near La Perouse and the southern headland near Kurnell. The Reserve is the largest and most diverse estuarine wetland complex in NSW, representing around half of the remaining mangrove area near Sydney, and most of the saltmarshes remaining in the region.

The southern portion of Kamay–Botany Bay National Park is located on the Kurnell peninsula in Sutherland Shire, and is readily accessible to the majority of our Group members by a 15 to 25-minute drive by car. In early September, 2017, a bushfire (suspected arson) burned around 350 ha – or about two thirds of the southern heathlands portion of the park, and so, with the promise of exploring an area under fire recovery, we scheduled a group walk there in June 2018.

On the day of our outing we walked around 4 km return, part single trail, part loop, and gathered a list of over 100 different plant names. This result piqued our interest – how many of these plants would be on the Banks–Solander collection of 132 species from their visit in 1770 (*Benson and Eldershaw 2007*).

After checking, we found that we had 50 of the Banks–Solander plants on our list, so, where were the others? A couple more trips by individuals, a



Astroloma pinifolium. Photo: John Arney

mixed group outing in November 2018 by NSW members and, a follow-up in 2019 along the same route has seen our list grow to 154 individual species, 78 of which are found in the Banks–Solander collection.

For these outings we start our walk at the Visitors Centre and make our way to the coast via part Yena trail, then a bush-link track, part Polo trail to Cape Solander before returning via the full Yena trail. The abundance of plants on this walk showcases the broad assemblage of species across several plant communities and is highly recommended to visitors. These communities include “Kurnell Dune Forest”, “Coastal Dune Heath”, “Swamp Forest” and “Sydney Sandstone Ridgetop Woodland”. Additionally, there are small pockets that have several species commonly associated with “Littoral Rainforest”.

Post fire, one of the more interesting phenomenon was to witness the explosive return of *Commersonia hermanniifolia*, a low height shrub that usually has smallish leaves and is described as rare, being a fire responder that progressively dies back in the following years. A trait of this species is to produce large, tri-lobed, leaves in the year after fire – these bearing almost no resemblance to its usual small leaves in later years. In fact, so different was its appearance in early 2018 that a number of people became alarmed that a new weed had descended on the park.

In 1770, Banks and Solander collected all around Botany Bay and therein lies the challenge to track down and fix the location of the full complement of 132 species. A different walk, to the south, along the coast from Cape Solander carpark, to Cape Baily lighthouse, would doubtlessly add several names of the target species to our list. The best time to visit the area, floristically, is around mid June through to early September, however, late spring is still good. Whales can usually be seen in good numbers on their annual northwards migration at Cape Solander, close inshore, from June till the end of July. On the day of the Sutherland Group visit on 23 June, 2018, 44 whales had been spotted by 2 pm. A note of caution, the area gets very busy at weekends during the whale season.

The current list of plants for this walk is available from the Group for interested members, along with a map that is divided into eight sections, (1 to 8), with these numbers cross-referenced to the plants. Contact: John Arney, APS Sutherland Group, Email: johnarney@ozemail.com.au.

There is also the challenge for you to add to the list.



Note: In the 1960s I worked as an apprentice electrician on the then new, high voltage substation at Kurnell. Little did I know that 55 years later I would be wandering through the bush, less than 2 kilometres away, having traded the kilowatts for "what's that?"

Pimelia linifolia. Photo: John Aitken

Syzygium paniculatum: In Doug Benson's article he mentions that the trees which Banks and Solander saw might still be in existence. No-one in our circle has been able to confirm this. However, in 1989 a few trees were located within the Kurnell region and their location kept secret to reduce the risk of vandalism. There are some areas within Kamay NP with restricted access and we hope that is where these trees are and that they are safe. Ed



Woolllsia pungens. Photo: John Aitken



Epacris microphylla. Photo: Ralph Cartwright



Persoonia lanceolata.
Photo: Ralph Cartwright

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