

The 2008 Banks Memorial Lecture: Sir Joseph Banks and the transfer of crop plants

A. R. Ferguson¹

Sir Joseph Banks (1743–1820) is one of the most interesting figures of the late 18th and early 19th centuries (Carter, 1988). In New Zealand, he is remembered mainly for accompanying Cook on the first voyage of the *Endeavour* and for being one of the most famous botanists ever to have come to this country. In Australia, he is commemorated by the spectacular genus *Banksia* (Fig. 1), and he has sometimes been described as the father of Australia because of his involvement in the establishment of the first convict settlement in New South Wales.



Fig. 1 *Banksia integrifolia*. Photo: Jack Hobbs, Auckland Botanic Gardens.

He even appeared on the first Australian \$5 notes produced. In the United Kingdom, he is best known as the President of the Royal Society of London for more than 40 years and, despite being a landed gentleman and an amateur not a professional scientist, as the single most influential figure in British science for much of that time.



Fig. 2 Sir Joseph Banks Bt. Painted by Benjamin West, probably in December 1771, engraved by John R. Smith, London, Molteno Colnaghi, this version published in 1788. Hand-coloured mezzotint 610 × 380 mm. Reference Number: C-017-016. *Alexander Turnbull Library, Wellington, New Zealand*. Banks is wearing a fine flax cloak from New Zealand and is surrounded by souvenirs of his voyage to the South Seas. The book at his feet is opened to an illustration of the New Zealand flax, *Phormium tenax*.

Banks and the voyage of the *Endeavour*

Banks (Fig. 2) and his party, consisting of his botanical colleague Dr Daniel Solander, the artists Sydney Parkinson and Alexander Buchan, his secretary, Herman Spöring, and four servants, accompanied Lieutenant James Cook on the first of the great voyages of exploration. It was not just a voyage of geographic discovery but also one of scientific discovery, the first of what were to become routine, government-sponsored voyages of scientific discovery, even if on that first voyage, Banks himself had made a major contribution to the costs, more than his annual income from

his land. The *Endeavour* spent three years away from home, about six months in New Zealand waters, and Banks' journal (Beaglehole, 1962) with its accounts of the Maori and of the landscape is of great historic importance and complements Cook's official journal.

The *Endeavour* was only a small ship and living accommodation was very cramped. It must have been difficult for Banks and the other naturalists to be jammed together for months on end in such a small space with their many books, their collecting equipment and their ever-increasing collections. It is now hard for us to realise just how exciting it must have been for Banks and his colleagues to be exposed to new countries, unimagined animals, novel plants and most of all, new cultures. Salmond (1991) has emphasised this clash of cultures that occurred with the first contacts of the Europeans and the Maori, the mutual incomprehension, the misunderstandings and the mutual curiosity. This clash is symbolised by a delightful watercolour, possibly by Banks, showing an English officer bartering a piece of tapa cloth for a magnificent crayfish (for illustration see Salmond, 1991).

Banks was as interested in people as he was in plants and he carefully recorded the appearance and behaviour of the inhabitants of these newly discovered countries – new at least to the Europeans. He was a great observer, he watched their ceremonies, he described their language, studied their clothes, their dwellings, the crops that they cultivated. He admired the people: he wrote, for example, that in Tahiti, "... the eyes of the women especially are full of expression and fire..." (quoted from Beaglehole, 1962: vol. I, p. 334).

¹ The New Zealand Institute for Plant and Food Research Ltd, Mt Albert, Private Bag 92 169, Auckland; fergusonr@rnzih.org.nz

Banks was a young man, only 25 when the *Endeavour* left England, and he seems to have taken an only too keen an interest in the proclivity of the Tahitians to "... enjoy free liberty in love". In Tahiti, "Love is the Chief Occupation" (quoted from Beaglehole 1962: vol. II, p. 330). "The scene that we saw was the truest picture of an Arcadia of which we were going to be kings that the imagination can form" (quoted Fara, 2003a: p. 111). Banks relates how he was on one occasion clad only in a loin cloth but "... had no pretensions to be ashamed of my nakedness for neither of the women were a bit more covered than myself" (quoted Beaglehole, 1962: vol. I, p. 289). Like any boastful young man he revelled in his exploits: "The foremost woman... then ... quickly unveiling all her charms gave me a most convenient opportunity of admiring them by turning herself gradually round" (quoted Beaglehole, 1962: vol. I, p. 275).

Banks and Dr Solander were the first European botanists to visit New Zealand, but botanically the results of their visit here and to Australia must be considered disappointing in terms of the publications produced (Stearn, 1977). Banks and Solander were the first to explore scientifically whole new floras, they collected hundreds of specimens during the three years of the voyage; indeed their collections increased the known flora of the world by nearly a quarter. They collected 110 new genera and 1300 new species whereas Linnaeus had previously listed only about 6000 species. Their artists, especially Parkinson, prepared many illustrations, but the scientific treatment of these new floras never eventuated. Banks spent a fortune having more than 700 copper plates engraved – at times, Banks thought it would take only a couple more months for his team of ten engravers to complete the illustrations (Stearn, 1977) – and had the Flora been published it would have been the most magnificent botanical publication of the 18th century. In the end it was two centuries later that *Banks' Florilegium* was finally published in colour (Adams, 1986). The *Florilegium* is historically fascinating, less valuable perhaps artistically and scientifically largely irrelevant. Banks published little, he did not contribute greatly to

scientific knowledge but he devoted much of his life to promoting science and scientists.

The *Endeavour* returned to England in July 1771 and Banks and Solander rapidly became celebrities, with Cook generally receiving less attention from the popular press. Banks and Solander were received by George III at Windsor and then less formally at Richmond where they were able to describe to the fascinated King what they had seen. This was the start of Banks' long and deep friendship with the King. In November, Banks and Solander both received Honorary Doctorates of Law from Oxford. However, not all the publicity was positive: both Banks and Solander were caricatured, Banks being portrayed as an effeminate "Macaroni" or fop with ass's ears attempting to catch a butterfly (for illustration see Fara, 2003b). There were also satirical and salacious verses published concentrating on the free sexual behaviour of Tahitian women and Banks' frequent falls from grace. It was suggested that his previous excessive enthusiasm for women had been replaced by an excessive enthusiasm for plants. This was only partly true: Banks may well have developed an excessive enthusiasm for plants but he seems to have retained his enthusiasm for women: he broke off an engagement entered into before he left on the *Endeavour*, paying a large sum as recompense for this breach of promise, but quickly acquired a mistress by whom he had a child.

Banks and science in Britain

Banks had hoped to accompany Cook on his second voyage to the Pacific, going so far as to arrange for an attractive young lady to join him on the voyage disguised as a man. However, Banks and the Navy were unable to compromise on his unrealistic demands for alterations to the *Resolution*, alterations that would have made her unseaworthy so, apart from a relatively short trip to Iceland, Banks' exploring days were over.

Instead he rapidly became an establishment figure (Fig. 3). He had the power, the wealth and the connections to ensure that things happened. He was not a politician but his genuine friendship with the King with their shared interests in

farming and the royal garden at Kew lasted for many years until the Kings' final illness and decline into insanity. Banks had been a Fellow of the Royal Society since he was 23 and then at the age of 35 was elected President, remaining in this position for more than 40 years. He was a Vice-President of the Linnean Society and a founding member of the Royal Horticultural Society. He had a fine library and correspondents throughout the known world. Some 20,000 of his letters are now known but it is thought that these may represent only one fifth of his total correspondence. He was able quickly to collate information on a variety of scientific or technical subjects, interpret the information accumulated and then ensure that good use was made of that information (Métailié, 1994).



Fig. 3 Sir Joseph Banks, the establishment figure of later life. Unknown artist, after Thomas Phillips. 1820s? Oil on canvas 953 × 743 mm. Reference Number: G-656. Alexander Turnbull Library, Wellington, New Zealand. Banks is wearing the badge and ribbon of the Order of the Bath.

He was *de facto* Chief Scientist of Great Britain for many years – he was the person to whom the Government turned whenever it wanted advice on matters scientific. He was also their chief adviser of colonial affairs. He was adviser to the East India Company. He was made a baronet in 1781 and in 1795 was appointed to the Order of the Bath, a very rare honour for one who was neither a military man nor a diplomat, and second only to the Garter. In 1797, he was made a member of the Privy Council, another indication of his high standing at the Court and with the Government. He dominated British science (Fara, 1997; Smith, 2003).

Mackay (1985) has pointed out that the voyage on the *Endeavour* with Cook had a profound influence on Banks. He learnt about the sea, ships and sailors. He learnt the importance of careful, trained observation. He learnt a tremendous amount about the plants and animals of the Pacific and Australia and he gained experience in organising voyages of exploration. He himself travelled little again but he knew what was required and for 20 or more years Banks essentially directed all British voyages of discovery. He had the knowledge and the geographic experience. He chose many of the leaders of the expeditions and they owed him a great debt of gratitude. He was the driving force behind most of the British journeys of scientific exploration at the end of the 18th century: Flinder's circumnavigation of Australia, Vancouver's exploration of the American west coast, journeys to Asia and to Africa, of which Mungo Park's was the most famous. "Being the first man of scientific education who undertook a voyage of discovery and that voyage of discovery being the first which turned out satisfactorily in this enlightened age, I was in some measure the first who gave that turn to such voyages" (quoted Métaillé, 1994: p. 157).

Banks and botanic gardens

Banks had an interest in plants as a schoolboy, an interest that developed further when he was at Oxford. He came from a farming background (he had extensive estates in Lincolnshire) and he looked at new countries and new plants with the eyes of a farmer. Although plants fascinated him, he was also aware of their economic potential. Banks was a vigorous supporter of promoting plant transfer for economic reasons. This would integrate the developing empire with the industries of Britain, contribute to the wealth of the mother country, and help to destroy the monopolies of rival European powers. He wrote: "It is difficult, in my opinion, to point out an undertaking really replete with more benevolence, more likely to add comforts to existing people, and even to augment the number of those for whom the bounties of creation were intended, than that of transporting useful vegetables from one part of the earth to another where they do not exist" (quoted Gascoigne, 1994:

p. 204). Banks was also keen to see agricultural improvement. He wrote: "I think no experiments promise more public utility than those for improving the breeds of vegetables" (quoted Elliott, 1994: p. 123).

Successful transfer of plants required a network of botanic gardens and experimental farms around the world, as plants would have suffered during long sea voyages. Banks had taken command at Kew where he was in effect superintendent for decades (Desmond, 1994), and he transformed the gardens into a centre for the global exchange of exotic plants. In 1768 there were 3400 species listed at Kew; in 1789, 5600 species; in 1813, 11,000 species, a good measure of his diligence in seeking new acquisitions. With assistance from bodies such as the War Office and the East India Company he organised the establishment of a series of botanic gardens in the West Indies, at St Helena, in Australia, in Ceylon and India. During the reign of George III, many thousands of plant species were introduced into cultivation in Britain, far more than in any preceding period (Elliott, 1994). This was largely through the work of various collectors Banks had sent out from Kew. And this was not disinterested academic research. Banks wanted "... that as many of the new plants as possible should make their first appearance at the Royal Gardens" (quoted Desmond, 1994: p. 115); he was intent on promoting the interests of the Empire. He wrote: "I certainly wish that my Countrymen should make discoveries of all kinds in preference to the inhabitants of other Kingdoms" (quoted Gascoigne, 1998: p. 175). He successfully promoted the belief that scientific discoveries gave the potential for economic benefit. The report of the House of Commons Committee on Transportation (1785) concluded: "... all the Discoveries as well as great Commercial establishments now existing in different parts of the Globe ... have opened the way to the greatest National Advantages."

At least 126 collectors working outside Europe sent back plants to Banks or to Kew and of these, 21 were specifically commissioned and sent on scientific expeditions (Mackay, 1996). These men and the botanic gardens in various colonies became

part of the network facilitating the exchange of plants between different parts of the empire. Banks often paid their salaries himself and later their pensions (Smith, 2003).

The breadfruit and the *Bounty*

A good example of Banks' work and that of the botanic gardens in facilitating the transfer of exotic plants is the story of the breadfruit (Fig. 4). This is a remarkable story, the British government twice sending a naval ship around the world for the sole purpose of collecting a novel plant and the first voyage being curtailed by what is probably the most famous naval mutiny in history.



Fig. 4 The breadfruit, *Artocarpus altilis* (after a drawing by Sydney Parkinson, completed at Tahiti in 1769). Engraving, 345 x 300 mm, very similar to Plate XI entitled "A branch of the bread-fruit tree with the fruit". In: John Hawkesworth *An Account of the Voyages ... in the Southern Hemisphere ...*, London, W. Strahan and T. Cadell, 1773. Photo: private collection.

During the 18th century, the West Indies had become dependent on a single crop, sugar, and this industry was in turn dependent on thousands of slaves. The plantation owners were keen to have alternative crops and to provide their slaves with cheaper and more reliable sources of food. Banks himself may have told them of the breadfruit he had seen in Tahiti: "In the article of food these happy people may almost be said to be exempt from the curse of our forefather; scarcely can it be said that they earn their bread with the sweat of their brow when their cheifest sustenance Bread fruit is procurd with no more trouble than that of climbing a tree and pulling it down" (quoted from Beaglehole, 1962: vol. I, p. 341). To Banks at least, Tahiti must have seemed to be truly Arcadia.

In 1772 the Captain-General of St Vincent wrote to Banks asking for assistance in introducing the breadfruit into the West Indies colonies. Dr Daniel Solander, who had accompanied Banks on the voyage of the *Endeavour*, then wrote to the Society for the Encouragement of Arts, Manufactures and Commerce, praising the breadfruit, which he stated he had eaten daily while in Tahiti. The Society offered a gold medal and the West Indian merchants offered a fund for anybody successfully taking living plants of the breadfruit from the Pacific to the West Indies.

The need for cheap food for the slaves became even more pressing after the revolt of the North American colonies and the banning of trade. Alternatives were needed for the supplies that had previously been imported from the American colonies as otherwise profits from sugar would be prejudiced. Cheap food for the slaves would give the British sugar producers a competitive advantage. In 1784, a West Indies planter again approached Banks saying: "The acquisition of the best kind of the Breadfruit would be of infinite Importance to the West India Islands in affording ... a wholesome and pleasant Food to our Negroes ..." (quoted by Mackay, 1985: p. 126). Banks in turn approached the King. As usual, Banks' advice was taken and the Admiralty agreed to send a ship to Tahiti to collect breadfruit plants. Banks himself oversaw the selection of a suitable if rather small ship and then detailed the arrangements to be made to house the plants, and selected the gardener and the gardener's assistant who would look after the plants. His draft instructions began: "As the sole object of Government in *Chartering* this vessel in our Service at a very considerable expense is to furnish the West Indian Islands with the Bread-Fruit & other valuable productions of the East, the Master & Crew of her must not think it a grievance to give up the best part of her accommodations for [the housing of the breadfruit plants] ... It is necessary therefore that the Cabin be appropriated to the sole purpose of making a kind of Greenhouse, & the key of it given to the Gardiners ..." (quoted in Frost, 1993: p. 42).

Banks also provided detailed instructions for the obtaining and maintenance of the plants and the *Bounty* was modified according to his directions (Frost, 1993). He recommended the appointment of Lieutenant William Bligh (Fig. 5), who had served as master of the *Resolution* under Cook, to lead the breadfruit expedition. Bligh was well aware that his expedition was not just an expedition of scientific exploration. He wrote: "The object of all the former voyages to the South Seas, undertaken by command of his present majesty, has been the advancement of science, and the increase of knowledge. This voyage may be reckoned the first, the intention of which has been to derive benefit from those distant discoveries" (Bligh, 1792: p. 5).



Fig. 5 Lieutenant William Bligh, by John Smart, pencil and watercolour, engraved 1803, 146 x 83 mm, NPG 4317. Photo: National Portrait Gallery, London, England.



Fig. 6 Transplanting of the bread-fruit trees from Otaheite. Painted and engraved by Thomas Gosse, London, 1796, Reference C-036-003. Mezzotint 525 x 608 mm. Photo: Alexander Turnbull Library, Wellington, New Zealand.

In October 1788, after a very long voyage taking ten months, the *Bounty* finally arrived in Tahiti where she spent the next six months. A garden was quickly established and shoots from the roots of the breadfruit plants were potted up (Fig. 6). The following April, the *Bounty* left Tahiti with 1015 splendid young breadfruit plants on board. All to no avail. Three weeks later came the mutiny, Bligh and 18 others were cast adrift in the *Bounty's* launch while the mutineers sailed off, throwing overboard the breadfruit plants which had been raised with such care.

Amazingly, Bligh managed to sail the launch to Timor nearly 6000 km away before returning to England. Banks did not give up, "... the King has already order'd a ship to be prepar'd to visit the South Sea Islands a second time in order to bring the breadfruit, to the West Indies" (quoted Mackay, 1985: p. 137).

Bligh was again in command, this time with two ships, the *Providence* and a tender, the *Assistant*. On the voyage from Tahiti, many of the breadfruit plants died but in due course 544 plants were successfully landed at Kingstown, St. Vincent for the botanic garden there, and another 633 at various places in Jamaica. All were in excellent condition. In addition, 700 plants of different kinds were brought back to London "... for his Majesty's Garden at Kew." The breadfruit thrived in their new environment and as an exercise in applied science and in intercontinental plant transfer on a grand scale, it was a great success. Regrettably, however, the slaves never really took to breadfruit and would eat them only when other food was unobtainable. Breadfruit, however cooked, tend to be insipid and require a sauce or accompanying dishes to make them palatable.

Banks and the settlement of Australia

Banks was also much involved with the development of the first colony in Australia and he has sometimes been described as the "Father of Australia". For many years, the critical importance of his role in the development of the Empire was appreciated much more in Australia than in Britain.

In 1779, Banks suggested New South Wales as a suitable location for a convict colony and he played a critical part in the final decision of August 1786 when the government had decided on the transportation of convicts to Botany Bay, a site recommended by Banks. He thought it had a good climate, there was sufficient fertile soil, fish were readily available, there was plenty of fresh water and there were few native inhabitants.

The American War of Independence meant that the American colonies could no longer serve as a dumping ground for convicts. The prisons in Britain were packed, as were the appalling ship's hulks that had taken the overflow. There was an urgent need to dispose of these prisoners because of the risk of disease or revolts, but the alternative destinations proposed proved unsuitable. What was wanted was "... any distant part of the Globe, from whence their Escape might be difficult, and where, from the Fertility of the Soil, they might be enabled to maintain themselves, after the First Year, with little or no aid from the Mother Country" (quoted Carter, 1988: p. 163). Disposing of unwanted convicts seems to have been the main aim in setting up the new colony, although some Australian historians have suggested there may also have been other more strategic aims.

It was a remarkably optimistic move to set up a new colony in Australia so far from Europe predominantly with convicts, very few of whom had any experience in gardening or agriculture (Frost, 1993). Only one of those sent in the First Fleet was a professional gardener and he was an inexperienced 20-year-old: yet it was expected that the new colony should quickly become self-sustaining. It was many years since the proposed site of Botany Bay had been visited and heavy reliance was placed on Banks' assertion that the soils around Botany Bay were suitable. After all, he had extensive landholdings and was a good judge of agricultural requirements, even though he was relying on his memories of 20 years previous. There was no time to send out reconnaissance, because the return voyage would take 18 months. The eleven vessels of the First Fleet

under the command of Captain Arthur Phillip eventually sailed in 1787 with 756 convicts on board.

"Banks... has sometimes been described as the 'Father of Australia'"

Banks had overestimated the suitability of Botany Bay. The anchorage there was not safe and the soils were obviously infertile. Phillip quickly moved to Port Jackson (now Sydney Harbour) but even there the soil was less fertile than expected. Development was slow and the young colony underwent long periods with limited food supplies. When Captain Phillip sent back reports listing his needs, the British government responded quickly after consultation with Banks and sent out a frigate carrying 1000 tons of supplies, seed and animals as well as 25 convicts selected because they were artificers (craftsman or skilled workmen) or gardeners. This frigate struck an iceberg and, worse, the flagship of the original fleet was wrecked at Norfolk Island. The loss of the two ships was almost fatal to the colony. Only the arrival of another supply ship in 1791 helped speed up the colony's development to self sufficiency.

Banks judged that the climate in New South Wales would be similar to that of Southern France and he specified in great detail the plants that should be sent out. During the early development of the colony, Banks continued to exert much influence particularly in the choice and sending out of plants, vegetables, grains and fruits, and domestic animals (Frost, 1988, 1994). One example is his having Merino sheep sent to New South Wales (Carter, 1964). Merinos came originally from Spain and Banks had been responsible with great effort and considerable subterfuge for acquiring a nucleus stock for the formation of a flock of Merino sheep for the King. Banks wanted to free Britain from its dependence on Spain for superfine wools, to promote national self-sufficiency, and to promote national economic independence (Gascoigne, 1998). Progeny from the royal flock

contributed to the development of the Australian fine wool industry. All of Banks' efforts in Australia were despite his turning down of any formal or official governance role in New South Wales, although early administrators corresponded frequently with him and recognised the importance of his advice and the even greater importance of his patronage. For the rest of his life, Banks continued to show a close interest in the development of the Australian colony.

This exchange of plants between Australia and the northern hemisphere has been termed the Antipodean exchange, even if the economic benefits were essentially one way and to the agricultural benefit of Australia. Banks enthusiastically arranged for plants to be sent from Australia to Britain but these eventually proved to be of little commercial benefit. This exchange is in some ways analogous to the earlier Columbian exchange – the movement of plants and animals between the New World of the Americas and the Old World.

Banks and tea

Tea started appearing in England about 1645 and was probably sold publicly for the first time in 1657. Initially, it was only for the very rich but it soon became popular. At the beginning of the 18th century, about 100,000 lb of tea were imported each year into Britain – enough for something like 25 million cups of tea. One hundred years later, at the beginning of the 19th century, imports totalled 30 million lb per year. The acquisition of tea now took about 5% of the gross national product and taxes on tea met half the costs of the Royal Navy at a time when Britannia really was ruling the waves.

The British wanted tea, vast quantities of tea, and in return the Chinese wanted not goods but copper, gold, or, in particular, silver. This resulted in a massive outflow of bullion from Europe to China, at the end of the 18th century. The need for a counterbalancing trade was obvious to everybody but the Chinese. The solution was opium. The East India Company, which had a monopoly on British trade with China, encouraged production of opium in India for shipment to China. No matter that the

Chinese authorities forbade the entry of opium into their country, the tea traders demanded “free trade” and the fortunes that opium brought them. As a result of the attempts of the Chinese authorities to stop the inflow of opium and the corruption of their people, war followed, and the outgunned Chinese were forced to agree to the establishment of free ports and the entry of opium. At its peak, the opium industry in India, a government monopoly, employed almost a million workers and something like 2 million lb of opium were exported in 1830. Opium was exchanged for tea and everyone but the Chinese government was happy.

There was another solution to the problem of the drain of bullion going to China: rather than search for commodities that the Chinese would exchange for tea, develop a tea industry in a territory controlled by Britain. India was the obvious choice. This was another example of introducing a valuable economic plant into a British colony, although in this case transferring an economically important plant from an Asian country in which, at that time, access was very limited to a colonial dependency where production could be controlled. Banks was, of course, again involved. He argued on phytogeographic grounds that the most suitable place in India for experimental plantings of tea would be the area between Bengal and Bhutan. There was also the advantage that “... in the whole of India Labour appears to be as cheap as in China” (quoted Gascoigne, 1998: p. 114). Banks therefore recommended the importation of skilled Chinese tea growers and producers to train locals. In 1792, Lord Macartney left England on his famous, if unsuccessful, embassy to Peking and Banks used this as a cover for what is perhaps best described as commercial espionage. Lord Macartney wrote in his journal (Sunday 17 November, 1793): “I have given directions to have some young tea plants taken up, if possible, as also the varnish tree and tallow tree, with an intention of sending them to Bengal ... so that one day or other they may be reckoned among the commercial resources of our own territories” (quoted Cranmer-Blyng, 2004: p. 132). Plants were successfully grown at Calcutta but the

project foundered, and even though large numbers of plants were later introduced from China through the efforts of Robert Fortune, the tea industry in India developed only with abolition of the monopoly of the East India Company on trade with China. Types of tea plants occurring naturally in the north of India were used extensively in the development of the Indian tea industry.

The New Zealand flax

“But of all the plants we have seen amongst these people that which is the most excellent in its kind, & really excels most if not all that are put to the Same uses in other Countries, is the plant which serves them instead of Hemp and flax” (Beaglehole, 1962: vol. II, p. 10). Banks was very enthusiastic about the potential of flax (Fig. 7) and often promoted its possibilities: “... so usefull a plant would doub[t]less be a great acquisition to England”.



Fig. 7 Der Neuseeländische Flachs (*Phormium tenax*). Hand-coloured copper engraving, 230 × 170 mm, from Friedrich Justin Bertuch's *Bilderbuch für Kinder* [Picture book for Children] originally published 1792–1810, 12 volumes, Weimar, Germany, Bureau of Plant Industry. This plate is probably c. 1820 as the accompanying text states that *Phormium* first flowered in Europe at Haarlem in 1814. Photo: private collection.

The proposal in 1786 for a convict settlement in New South Wales, *Heads of the Plan for Botany Bay*, probably largely prepared by Banks, included the comment: “... considerable advantage will arise from the cultivation of the New Zealand hemp or flax plant ... the supply of which would be of great consequence to us as a naval power...” (quoted

O'Brian, 1987: p. 216) and the initial instructions for the *Bounty*, when it was sent to collect breadfruit, stated that “Her first destination will be New Zealand, where she is to take on board 2 tubs of Flax plants” (quoted Frost, 1993: p. 43). A flax industry was accordingly established on the convict settlement of Norfolk Island, where *Phormium tenax* also occurs naturally and two Maori men were kidnapped and taken there in 1793 to advise on processing. They were of little use: they were of high rank and the dressing of New Zealand flax (harakeke) was women's work of which they knew little (Salmond, 1995). Furthermore, the Norfolk Island flax did not provide good fibre and the rope produced was not of sufficient durability. New Zealand flax has been successfully introduced to a number of countries but commercial exploitation has reduced to a small scale.

The significance of Banks

Banks was much more than the rather callow young botanist who sailed to New Zealand with Cook. He had his faults but he was a great man, at his prime a powerful man, the dominant figure of British science for many years. He was an Imperialist, a “High Tory”, supporter of his landed class but he believed that what he was doing was for the good of his country. His opponents may have found him domineering or autocratic, scientifically limited, but there was no doubting his honesty and integrity. He worked for what he considered the public good, not just his personal interests. “... a man is never so well Employ'd, as when he is labouring for the advantage of the Public; without the Expectation, the Hope, or Even a wish to derive advantage of any Kind from the Result of his exertions” (quoted in Smith, 2003: p. 41).

His reputation has waxed and waned but in recent years his role in British science of the late 18th century and in the development of the second British Empire has been re-examined and his importance confirmed. Many of his attempts at plant domestication or the transfer of economic plants from one part of the world to another were only moderately successful, or, if successful, did not lead immediately to economically important developments. Thus the transfer at

vast expense of the breadfruit to the West Indies was technically a triumph, but of little practical consequence. Many of his ideas, such as the establishment of a tea industry in India, came to fruition only after his death. His chain of botanic gardens really proved their worth only later in Victorian times (Brockway, 1979). Many plants can have commercial potential but numerous factors, including luck, can determine whether that potential is realised. Probably Banks' greatest contributions were the encouragement of the voyages of scientific discovery, the fostering of plant and animal improvement, the nurturing of the young colony of New South Wales and the promotion of self sufficiency of the global British Empire.

Acknowledgements

I thank M. Pesonen and T. Holmes for assistance in preparing the illustrations.

References

- Adams, B. (1986). The flowering of the Pacific. Being an account of Joseph Banks' travels in the South Seas and the story of his florilegium. Sydney, Collins and British Museum (Natural History).
- Beaglehole, J.C. (ed.) (1962). The Endeavour journal of Joseph Banks 1768–1771. Sydney, The Trustees of the Public Library of New South Wales in conjunction with Angus & Robertson.
- Bligh, W. (1792). A voyage to the South Sea, undertaken by command of his Majesty, for the purpose of conveying the breadfruit tree to the West Indies, in his Majesty's ship the Bounty ... London, published by permission of the Lords Commissioners of The Admiralty (facs. reprint 1979, Richmond, Hutchinson of Australia).
- Brockway, L. (1979). Science and colonial expansion. The role of the British Royal Botanic Gardens. London, Academic Press.
- Carter, H. (1988). Sir Joseph Banks 1743–1820. London, British Museum (Natural History).
- Carter, H.B. (1964). His Majesty's Spanish flock. Sydney, Angus & Robertson.
- Cranmer-Byng, J.L. (2004). An embassy to China. Being the journal kept by Lord Macartney during his embassy to the Emperor Ch'ien-lung 1793–1794. London, The Folio Society (new edition of original version of 1962).
- Desmond, R. (1994). The transformation of the Royal Gardens at Kew. Pp. 105–115. In: Banks, R.E.R. et al. (eds.). Sir Joseph Banks: a global perspective. Kew, London, The Royal Botanic Gardens.
- Elliott, B. (1994). The promotion of horticulture. Pp. 117–131. In: Banks, R.E.R. et al. (eds.). Sir Joseph Banks: a global perspective. Kew, London, The Royal Botanic Gardens.
- Fara, P. (1997). The Royal Society's portrait of Joseph Banks. *Notes and Records of the Royal Society of London* 51: 199–210.
- Fara, P. (2003a). Joseph Banks: Pacific pictures. *Endeavour* 27(3): 110–112.
- Fara, P. (2003b). Sex, botany & empire. Cambridge, Ikon Books Ltd.
- Frost, A. (1988). The growth of settlement. Pp. 109–139. In: Smith, B.; Wheeler, A. The art of the First Fleet & other early Australian drawings. Melbourne, Oxford University Press in conjunction with the Australian Academy of the Humanities and the British Museum (Natural History).
- Frost, A. (1993). Sir Joseph Banks and the transfer of plants to and from the south Pacific, 1786–1798. Melbourne, The Colony Press.
- Frost, A. (1994). The planting of New South Wales: Sir Joseph Banks and the creation of an Antipodean Europe. Pp. 133–147. In: Banks, R.E.R. et al. (eds.). Sir Joseph Banks: a global perspective. Kew, London, The Royal Botanic Gardens.
- Gascoigne, J. (1994). Joseph Banks and the English Enlightenment: useful knowledge and polite culture. Cambridge, Cambridge University Press.
- Gascoigne, J. (1998). Science in the service of empire: Joseph Banks, the British State and the uses of science in the Age of Revolution. Cambridge, Cambridge University Press.
- Mackay, D. (1985). In the wake of Cook: exploration, science & empire, 1780–1801. Beckenham, Kent, UK, Croom Helm.
- Mackay, D. (1996). Agents of empire: the Banksian collectors and evaluation of new lands. Pp. 38–57. In: Miller, D.M.; Reill, P.H. (eds.). Visions of empire: voyages, botany, and representations of nature. Cambridge, Cambridge University Press.
- Métailié, G. (1994). Sir Joseph Banks – an Asian policy? Pp. 157–169. In: Banks, R.E.R. et al. (eds.). Sir Joseph Banks: a global perspective. Kew, London, The Royal Botanic Gardens.
- O'Brian, P. (1987). Joseph Banks: a life. London, Collins Harvill.
- Salmond, A. (1991). Two worlds: first meetings between Maori and European 1642–1772. Auckland, Viking.
- Salmond, A. (1995). Self and other in contemporary anthropology. Pp. 23–48. In: Fardon, R. (ed.). Counterworks: managing the diversity of knowledge. London, Routledge.
- Smith, D. (2003). Sir Joseph Banks – a personal hero. *The Linnean* 19(4): 31–41.
- Stearn, W.T. (1977). The botanical results of Captain Cook's three voyages and their later influence. *Pacific Studies* 1: 148–162.

This article is based on part of the 2008 Banks Memorial Lecture, *The greatest service which can be rendered any country.*

Dr Ross Ferguson is a scientist at the former HortResearch, now The New Zealand Institute for Plant and Food Research Ltd, and has spent much of his professional life working on kiwifruit biology. He is also currently Vice-President of the Royal New Zealand Institute of Horticulture.