SIR JOSEPH BANKS AND THE BOTANY OF CAPTAIN COOK'S THREE VOYAGES OF EXPLORATION

by Phyllis I. Edwards

Joseph Banks (1743-1820) whose early youth was spent at Reevesby Abbey, near Boston, in Lincolnshire, was a member of a family who, for generations, had been deeply involved in public affairs and concerned with agricultural improvements. Banks' school days at Harrow and later Eton were undistinguished. From Sir Everard Home (1822) we learn how the young Joseph became suddenly aware of the beauty of a country lane in full flower and of his subsequent determination to learn botany. The women herb gatherers around Harrow gave him his first instruction, receiving sixpence for every piece of information. His mother's copy of John Gerard's famous *Herbal* (1598) with its woodcuts of the plants he was gradually beginning to recognize became his constant joy and companion. Another family friend, Lord Brougham (1845), states that his subsequent school holidays were spent collecting plants, insects, and other zoological specimens, the commencement of what was later to become a famous herbarium and natural history collection.

In 1760, Joseph Banks went up to Oxford and it was while there that his father died in September 1761. The inheritance of the family estates would appear to have enabled him to afford the botanical instruction he so desired and which was not being provided by Professor Humphrey Sibthorp at Oxford. Through Professor John Martyn of Cambridge University, Banks obtained the services of Israel Lyons, a young man distinguished in botany and who according to Nichols (1812) went to Oxford in July of 1764 to deliver a series of lectures which were attended by some sixty students.

On his father's death Banks' mother moved to Paradise Walk in London, close to the famous Society of Apothecaries Garden in Chelsea. The young Banks would have lost no time in becoming acquainted with its renowned superintendent, Philip Miller (1691-1771). Miller was not only an outstanding gardener but also a most able botanist and author of the celebrated *Gardener's Dictionary*, a work which met with universal praise as being a dictionary of both horticulture and botany. In the Chelsea Physic Garden and its stoves, Banks could have seen exotic plants from many lands and, I guess, would have felt the first stirring of a desire to visit these far away places.

While still at Oxford, Banks became acquainted with Daniel Carl Solander, the favorite pupil of the illustrious Swedish naturalist Carl Linnaeus. Solander initially came to London in 1760 to catalogue the plants in the garden of Peter Collinson and to assist John Ellis with his work on corallines. In 1764, however, he was offered an assistant's post at the British Museum and never returned to his native Sweden. At some period Solander would, no doubt, have recounted to Banks the exploits of various Linnean pupils and their contribution to the advancement of botanical science and thereby further whetted this budding naturalist's desire to travel on some expedition to places whose natural history was, as yet, unknown. The "Grand Tour of Europe," fashionable among men of Banks's social standing, had no appeal for him; instead, he joined an old Eton school friend, Lieutenant Constantine John Phipps on H.M.S. *Niger,* to go on a fishery protection patrol in Newfoundland and Labrador--an expedition which added the first foreign plants to his herbarium and taught Banks the difficulties of transporting living plants and seed from one place to another. Lysaght gives an excellent account of this voyage and reproduces the superb water color drawings that Banks had executed on his return,[1] the first indication of the importance that Banks was to attach to supplementing written descriptions with competent drawings made under supervision. When Banks returned from Newfoundland and Labrador and bought a house in New Burlington Street in 1767, it was Solander who introduced him to the London scientific community and other eminent naturalists such as Thomas Pennant, John Ellis, John Lightfoot, and James Lee. It was while he was away that Banks, a mere twenty-three years of age, was elected a Fellow of the Royal Society. He attended his first meeting of the Society in February of 1767 and perhaps heard of the projected voyage to the Pacific to observe the transit of Venus. His dreams of some grand expedition suddenly became clothed in reality. Here then was the opportunity for him to make his contribution to natural science. Detailed plans for his participation were discussed so that when the Royal Society in June of 1768 requested the Admiralty to have its observers conveyed to Tahiti, they also asked that Banks and his suite of seven be allowed on board, including Solander; Herman Diedrich Sporing, a son of a Finnish professor of medicine as amanuensis; Sydney Parkinson as botanical draughtsman; and Alexander Buchan as figure and landscape artist.

[1]Averil M. Lysaght, ed., *Joseph Banks in Newfoundland and Labrador, 1776: His Diary, Manuscripts and Collections* (London: Faber and Faber, 1971.

Cook's first voyage was something new, the first English voyage of both geographical and scientific exploration. The natural history and botanical collections brought back were the most extensive up to that date. They had tremendous public and scientific impact for long afterwards. The botanical collection was readily available for study in Banks' London home together with the various related manuscripts and drawings. The *modus operandi* on the voyage was as Banks himself states "we sat till dark at the great table with the draughtsman opposite and showed him in what way to make his drawings ourselves made rapid descriptions[2] [according to the Linnean method] of all the details . . . while the specimen was fresh." Spöring, the amanuensis, then made fair copies[3] of the species from a particular region arranging them according to the Linnean system. He also made the *Index speciminum plantarum Otaheite reliquarumque Insularum Oceani Pacifii, Index speciminum plantarum Insulae Otaheite and Index Plantae Novae Hollandiae bound with Solander's Plantae Otaheitenses and Plantae Novae Hollandiae* respectively. Spöring unfortunately died on the return journey. J. B. Marshall considers that the *Primitiae florae Novae Zelandiae* is in the hand of Sigismund Bacstrom another contemporary amanuensis and was thus made after the return of the *Endeavour*.[4] Two further amanuenses, A and B,[5] made a transcript of *Plantae Australiae (Novae Hollandiae),* with each species on a separate sheet, obviously ready to be arranged in Linnean order. It is these fair copies that have been referred to by some authors as "ready for the printer." In 1772, Reverend William Sheffield, keeper of the Ashmolean Museum in Oxford, wrote to Reverend Gilbert White, "and what is more extraordinary still, all the new genera and species contained in this vast collection described, and the descriptions fairly transcribed and fit to be put to the press."[6] Marshall quotes a letter from Banks to Clas Alströmer in Sweden, dated 1784, in which he refers to these "floras" as being finished and in the presses.[7] This reference to a press could mean the putting of these "floras" between cheek-boards and placing them in a press se-

[2]Initial descriptions still extant are *Plantae Terra del Fuego, Plantae Australiae (Novae Zealandiae), Plantae Australiae {Novae Hollandiae), Plantae Javenenses, Plantae lnsulae* (St. Helena), *Plantae Otaheitenses,* and *Plantae Insularum Oceani Pacifici.*

[3]Fair copies: *Primitiae florae Maderenses, Primitiae florae Brasilienses, Primitiae florae Terra del Fuego, Primitiae florae Insularum Oceani Pacifici.*

[4]J. B. Marshall, "The Handwriting of Sir Joseph Banks, his scientific staff and his amanuenses," *Br. Mus. (Nat. Hist) Bot. Ser.,* 6, No. 1 (1978).

[5]Marshall, 1978.

[6]Lysaght, 1971.

[7]Marshall, 1978.

cured by a screw and with straps. It most certainly has nothing to do with having them ready for the printer. Spöring also entered short diagnoses of new species collected in Solander's own copy[8] of the second edition of Linnaeus's *Species plantarum,* 1762. Reference is made to these annotations in the "fair copies," e.g. manuscript and page number. There are some further manuscripts in the British Museum (Natural History) relating to the Botany of this voyage. One is in Banks' hand and is entitled "Catalogue of the plants collected in Maderia, Brazil, Terra del Fuego, Society Islands arranged for each locality in the order of Linnaeus's *Species plantarum,* Ed. 2, 1762." Another is "A systematic enumeration of all the plants collected on Capt. Cook's first voyage prepared by Sigismund Bacstrom and Jonas Dryander"[9] [Monandria and Diandria only]; and a third, a list compiled by Solander of the plants obtained at the Cape "*Index plantarum Capensium.*" How the 360 Cape specimens were obtained is uncertain. Banks and Solander were only at the Cape for a month and as Banks states in his journal he did not have "an opportunity of even making one excursion owing in great measure to Dr. Solander's illness." Beaglehole states in a footnote: "While so many others were convalescing or drawing near their end; Lieutenant Gore, with one attendant, a slave belonging to Mr. Christoffel Brand . . . made an excursion . . . to the top of table-hill . . . and brought some curious plants . . . to Banks."[10] Brand may have arranged other such collecting trips. He was obviously anxious to assist Banks as later correspondence indicates; in March 1772, he sent plants collected by Skene, surgeon on the East Indiaman *Morse* and Captain Cook refers in November of 1772 to a fine collection made for Banks.

It is interesting to note that the paper used to dry and finally store the plant specimens was from a commentary on Milton's *Paradise Lost!* Banks and Solander kept a special reference collection during the voyage. These were small pieces of a considerable number of the species they had collected, several of which were mounted on one sheet, no doubt a device to enable them to obviate over duplication. They appear to have only maintained this particular collection up to New Zealand; if the practice was continued, then the specimens have not survived.

These sheets were later bound into a volume. As these specimens are rarely consulted, they are in a relatively good state of preservation. They

[8]Marshall, 1978.

[9]Jonas Carlsoon Dryander (1748-1810), curator-librarian to Sir Joseph Banks from 1782 to 1810.

[10]James Cook, *The Journals of Captain James Cook,* ed. J. C. Beaglehole, 3 vols. (Cambridge: The Hakluyt Society, 1955-1967). Hereafter referred to as "Beaglehole." See volume 1.

all bear a label in Bacstrom's hand with a reference to Solander's own copy of the second edition of the *Species plantarum* which I have mentioned earlier. The Banksian set of *Endeavour* voyage specimens is scattered through the herbarium of the British Museum (Natural History). Those voyage specimens mounted in Solander's life time bear a name in his hand, generally with the word "Mss" after it, this refers to his manuscript descriptions in the floras mentioned earlier but in some instances may refer to his extensive Slip Catalogue.[11] Some past authors have consulted the Solander manuscripts and have quoted data therein without acknowledging the source. The Slip Catalogue contains descriptions of *Endeavour* voyage plants from Brazil, Tierra del Fuego, New Zealand, and Tahiti, only a few from Java and South Africa and very few from Australia.[12] There is a fairly wide distribution of specimens from this voyage.[13] Banks himself, gave specimens to a number of eminent botanists to further their researches, such as Charles Louis l'Heritier de Boutelle and Joseph Gaertner for his important *De Fructibus et Seminibus plantarum*, (1788-1807). The British Museum (Natural History) has distributed duplicates on a number of occasions. Changes in the concept of a species has meant that some duplicates have later proved to be new species!

When Alexander Buchan, the figure and landscape painter, died in Tahiti, Sydney Parkinson was responsible for all the pictorial records made on the voyage. Spöring, who fortunately was a competent draughtsman, assisted Parkinson by making some zoological drawings. The added responsibilities and the extensive haul of plant species in New Zealand and Australia prevented Parkinson from making finished drawings of all the plants selected for illustration. In consequence he made a rough pencil sketch, adding sufficient color to enable a completed drawing to be made later. When Parkinson contracted a fever in Batavia and died on

[11]This "Slip Catalogue" also contains descriptions by Dryander, and in the hand of Bacstrom and other unknown amanuenses. Dryander also amends Solander's entries as he occasionally does Solander's flora descriptions. This is mainly to update them with reference to works published after Solander's death in 1782 but also sometimes to express his own personal view as to the genus to which the particular specimen belongs.

[12]Marshall, 1978.

[13]Found in the Auckland Institute and Museum, Dominion Museum (Wellington), National Herbarium (New South Wales), British Museum (London), Royal Botanic Garden (Edinburgh), Botanisches Museum (Berlin), Botanische Anstalten Universität (Halle), Botanical Museum (Copenhagen), Muséum National d'Histoire Naturelle (Paris), Naturhistoriska Riksmuseum (Stockholm), Naturhistorisches Museum (Vienna), Smithsonian Institution (Washington, D. C.), Missouri Botanic Garden (St. Louis), and the Indian Botanical Garden (Howrah).

the homeward journey, Banks had to employ a number of natural history artists[14] to make the finished drawings for his sketches. Parkinson made a total of 280 finished drawings and 679 pencil sketches.[15] Banks had grandiose ideas for the publication of folio size, illustrated floras of the areas visited on the voyage. He employed two engravers G. Sibelius and D. MacKenzie who made 742 fine engravings. A considerable number of these copper plates have survived and are in the British Museum (Natural History). There is a list, in Bacstrom's hand entitled "Catalogue of drawings of plants of Cook's first voyage," annotated by Solander and Dryander and including a list in Dryander's hand of the copper plates engraved and to be engraved. In 1973, twenty-nine engravings were recently used by the Royal College of Arts Lion and Unicorn Press for their sumptuous folio *Captain Cook's florilegium*. Between 1900-05, the British Museum (Natural History) published lithographs of the 319 Australian engravings as *Illustrations of Australian plants collected in 1770 during Captain Cook's Voyage.* The text by James Britten was based on the manuscript descriptions of Solander. Data on the finished drawings indicates that some were still being made as late as 1783 so it is not surprising to find Banks writing the following letter to a Swedish correspondent. "The botanical work with which I am at present occupied is nearing its conclusion. Solander's name will appear next to mine on the title page because everything has been brought together through our common industry. . . . Since all the descriptions were made while the plants were fresh there is nothing left to do beyond completing those drawings which are not yet finished, and entering the synonyms in the books which we did not have with us or have just come out. All that remains to do is so little that it can be completed in two months if only the engraver can be brought to putting the finishing touches to it."[16] There has naturally been

[14]James Miller, Frederick Polydore Nodder, Thomas Burgis, John Clevely, and John Frederick Miller.

[15]

Area Represented:	*Finished Drawings*	*Sketches*
Madeira	23	1
Brazil	35	--
Tierra del Fuego	78	--
Tahiti	114	14
New Zealand	30	191
Australia	--	330
Java	--	143

[16]Joseph Banks, "Über Solander," *Berlinische Monatsschrift*, 6 (1785), 247-48, and translated by R. Rauschenberg, "Daniel Carl Solander, the Naturalist on the *Endeauour* Voyage," *Isis,* 58 (167), 367-74.

speculation by Beaglehole and others as to why these volumes were never published.[17] It has been suggested that Banks lost interest and that he was not a professional scientist, but no one has considered the possibility of a purely economic cause as the reason for the failure to publish. Banks possibly spent around £l0,000 on having the finished watercolor drawings and engravings made. Could not the final cost of the projected ten folio volumes have finally been considered by Banks to stretch even his ample purse too far? Although the volumes would have appeared over a number of years, I doubt they would have found many purchasers in England and Europe, especially in view of the Anglo-French war. The publications of these volumes, I feel, could have only been made if Banks had been prepared to finance the project in the sure knowledge that he would recoup very little of the expense involved. To merely publish Solander's text which Dryander could easily have completed, would have been an alternative, but one, I suppose, not acceptable to Banks. I can hardly imagine it was not suggested to him as it would have met the wishes of those botanists eager to have the account of the results of such an important voyage. Further it would have prevented the derogatory remarks cast at Solander for not having finalized the texts of the floras and seen to it that these descriptive accounts at least were published, if need be, at his own expense. Today, such a suggestion appears unreasonable but somewhat later, in 1805, the Admiralty decreed that Robert Brown, the naturalist on Matthew Flinder's voyage that circumnavigated Australia between 1800-03, should publish his flora at his own expense, with a tragic result that only a part was printed! Failure to complete the publication of the floras was therefore not solely due to the cost factor. Stearn states "Failure to publish Solander's manuscripts as a whole soon after completion was a loss to science, for his descriptions are superior in detail and clarity to most of the descriptions of these plants published later and taken together they would have provided in one place a sound starting point for later investigation."[18]The plants described in Solander's "Flora" of Tierra del Fuego were eventually recorded by twenty-one authors between 1776 and 1846. The same is true regarding the plants described in Solander's "Flora" of New Zealand. A copy of Solander's "Flora" of Australia inscribed *"Plantae Novae Hollandiae"* was made by Robert Brown (d. 1858) and studied by him during the Matthew Flinder's voyage. Banks gave

[17]J. C. Beaglehole, ed., 2 vols. *The* Endeavour *Journal of Sir Joseph Banks, 1768-1771* (Sydney: Angus and Robertson, 1962).

[18]W. T. Stearn, "The Botanical Results of the *Endeavour* Voyage," *Endeavour,* 27 (1968), 3-10.

Brown permission to select a reference collection of *Endeavour* voyage specimens. These were small, but nevertheless representative pieces which Brown had roughly mounted onto sheets of tough brown cartridge paper. A number of these sheets have recently been located in the Herbarium of the British Museum (Natural History) by J. B. Marshall.[19] In 1810, when Brown was compiling his *Prodromus florae Novae Hollandie,* he not only recorded the plants he collected but also those collected by Banks and Solander.

Cook's second voyage (1772-75) was designed to prove the existence or nonexistence of Dalrymple's great southern continent, *Terra Australia.* Banks and Solander, with an even larger suite of assistants, were to have sailed with Cook. As the controversy leading to Banks' withdrawal has been well recorded, there is no need for me to discuss it here. The £4,000, which Parliament was to have given to Dr. James Lind, who also withdrew, was transferred to the naturalist John Reinhold Forster who was known to be willing to go and for whom the Royal Society signed a testimonial "recommending [Forster] as a proper person for going on the expedition." Forster's one condition was that he was able to take with him his eighteen year old son Johann George Adam. Forster senior appreciated the need for drawings to supplement his descriptions and since George was a competent draughtsman, George needed to accompany his father. Somewhat later, the Forsters realized their allotted task would be beyond their joint labors to perform satisfactorily, therefore, at the Cape of Good Hope, he engaged further assistance, that of Anders Sparmann, a Linnean pupil and a particularly able botanist. After the voyage, Forster's appointment was generally considered a great mistake. English writers of today continue in the same vein. Beaglehole refers to Forster as a "patently conspicuous phenomenon of Cook's second voyage" and "one of the Admiralty's vast mistakes." Forster's contemporaries concentrated on the quarrelsome, debt-ridden, hack-writing man and made little mention of his academic achievements. Happily, the recent commemoration of the Cook voyages has led to a re-examination of Forster by P. Gathercole, A. L. Kaeppler, P. J. P. Whitehead and now, in detail, by Michael Hoare. The discovery by Hoare of Forster's Resolution journal in the Staatsbibliothek der Stiftung Preussischer Kulterbesitz in Dahlem, Berlin, a transcript of which, will be published by the Hakluyt Society, will enable Forster to state his own account of events on the voyage and will go a long way to

[19]P. I. Edwards, "Robert Brown (1773-1858) and the Natural History of Matthew Flinder's Voyage in H.M.S. *Investigator* 1801-03," *Journ. Soc. Bibl. Nat. Hist.,* 7 (1976), 385-407.

rebalance the less than favorable account of Cook and the very damaging one of the astronomer William Wales. Hoare's new book, *The Tactless Philosopher: John Reinhold Forster,* establishes why Forster was chosen for the voyage and by detailing Forster's fundamental contributions to Antarctic, Pacific, and Australian natural history and the ethnology of the region, Forster was anything but "one of the Admiralty's vast mistakes."[20]

Forster senior, who was forty-five and often feeling the effects of the inclement weather and the cold and damp living conditions aboard the Resolution, left his son George and Sparmann to do the majority of the plant collecting. The herbarium collection made on this second voyage was less extensive than on Cook's first voyage, partly because there were far fewer land falls but also because it was sometimes the wrong time of the year for collecting plants in flower and fruit. Nevertheless, their collection contained the first examples of the flora of the New Hebrides, New Caledonia, Society Islands, Easter Island, Tonga, Cook, and Marquesas Islands. From a manuscript list in Banks's hand "List of plants given me by J.R. and J.G.A. Forster when I looked at their specimens in January 1778 and compared them with my herbarium" [236 species] one could infer that in January of 1778 was the first time the Forsters and their herbarium went to Banks' London home, 32 Soho Square. I shall refer to this list again later. A further undated list in J. R. Forster's hand is entitled "Catalogue of a collection of plants presented to Joseph Banks by J.R. Forster and G. Forster" [255 species]. A rough check between this latter list and the index to the Forster's *Characteres* volume shows that the majority of the genera are represented in this collection. These two lists relate to separate collections of plants. At the sale of the herbarium collection of Alymer Burke Lambert in 1842, the British Museum purchased the collection of G. Forster's plants in the possession of Professor Heyne of Göttingen, his father-in-law, from whom Lambert acquired it in 1798. When George Forster left England, which was in advance of the rest of the Forster family, the boat on which he was travelling sank off Jutland and George tells Banks "the loss of my herbal has never been replaced, as I had in it most of those specimens of which there are now no duplicates, except those that you had at the revisal of our herbals."[21] This could mean that the Banksian herbarium may contain the sole surviving specimen of some Forster species. Miller quotes Lambert as saying that he had ac-

[20]Michael E. Hoare, *The Tactless Philosopher: Johann Reinhold Forster, 1729-98* (Melbourne: Hawthorne Press, 1976).

[21]Dawson-Turner transcripts of correspondence of Sir Joseph Banks in the British Museum (Natural History), I, fo. 308-10.

qnired the entire herbarium of George Forster and, therefore, the types of George's *Prodromus.*[22] Lambert was mistaken. According to F. G. Schroeder of the Systematisches-Geobotanisches Institut, Göttingen, the holotypes of the *Prodromus* are in Göttingen.[23] At the Lambert sale, the Museum also purchased the herbarium of Peter Simon Pallas. Again, Lambert remarks, "George Forster sent Pallas fine specimens of all the plants gathered during the voyage,"[24] this, of course, is incorrect. In fact, Lambert adds, "I find several specimens not in his own herbarium which I purchased from Heyne." Regarding Forster types Carolyn states, "The situation is very confused, and it seems impossible to state, for sure, that any particular specimen was the one and only element used by J.R. and J.G.A. Forster in drawing up their various diagnoses."[25] Forster specimens are to be found in a number of other institutions. His personal herbarium was acquired by the Royal Botanic Gardens, Kew, from the Liverpool Corporation in 1885. It was initially purchased in 1808 by John Shepperd, Curator of the Liverpool Botanic Garden.[26] In 1885, Britten states that this collection of 785 species included a large proportion of the plants whose descriptions were published by the Forsters.[27] Liverpool Museum retained a few of the specimens from this Forster collection. The specimens in the Linnean Society of London are those given by George Forster to the younger Linnaeus and by his father to Abraham Bäck, J. R. Forster gave specimens to his pupil C. L. Willdenow and to K. P. J. Sprengel.[28] These were in the Herbarium of the Botanisches Garten and Museum, Berlin, but only the Willdenow herbarium, which was evacuated, survived the 1939-45 war. Meyer gives a general account of the Forster plants in the

[22]H. S. Miller, "The Herbarium of Aylmer Burke Lambert: Notes on its Acquisition, Disposal, and the Present Whereabouts," *Taxon,* 19 (1970), 489-553.

[23]Hoare, 1976.

[24]A. B. Lambert, "Some Account of the Herbarium of Professor Pallas," *Trans. Linn. Soc. London,* 10 (1811), 256-65.

[25]R. C. Carolin, "J. R. Forster and J. G. A. Forster and their Collections," *Proc. Linn. Soc. New South Wales,* 88 (1963), 108-11.

[26]H. Stansfield, *Handbook and Guide to the Herbarium Collections in the Public Museums Liverpool* (Liverpool: n.p., 1935). See also his article, "A Botanist with Captain Cook in the South Pacific, 1772-75," *Bull. Liverpool Public Library, Mus. Arts Comm.,* 2 (1953), 5-25.

[27]James Britten, "The Forster Herbarium," *Journ. Botany, London,* 23 (1885), 360-68.

[28]D. E. Meyer, "Über die beiden Forster und die von Ihnen Gesammelten Pflanzen in Herbar von Willdenowia," *Willdenowia,* 1 (1957), 778-80.

Willdenow herbarium[29] and Hiepko a detailed account with the current names of the species.[30] The specimens in the Botanisches Institute of Kiel University were given by G. Forster to J. J. P. Moldenhawer and those in the Institute of Systematic Botany, Uppsala by J. R. Forster to C. P. Thunberg. G. Forster gave a collection of 220 specimens to G. L. L. Buffon in 1779, specimens which were used in 1832-34 by A. Richard when writing his *Essai d'une flore de la Nouvelle-Zélande.*[31] Mitrofanova gives a brief account of the G. Forster collection currently in Moscow State University, which was transferred there from the Moscow Medical-Surgical Academy, in 1841,[32] and M. N. Karavaev records the Forster collections in the Akademija Nauk in Leningrad.[33] There are only twenty-four Forster specimens in the United States. These are in the type collection of the Academy of Natural Sciences in Philadelphia.[34] They would appear to have been donated in 1834 by Thomas Nuttal who acquired them from Lambert. Further Forster specimens are in the Botanisches Institut, Universität, Leipzig, and the Naturhistorisches Museum, Vienna.

A set of 301 drawings made by George Forster was purchased by Banks for £420. These are now in the British Museum (Natural History). According to Banks, his collection contained the original drawings for George's *Fasciculus plantarum magellanicum*, 1787. The preface to the *Characteres* volume states: "to assist our memory we began describing and illustrating the characters of the new genera in a separate book." Sprengel claimed he had the original drawings for the Forster's *Characterers*, possibly the separate book.[35] These characters are included in the Banksian collection of drawings. George Forster planned a major work on the voyage botany, *Icones plantarum in itinere ad Insulas maris Australis collectarum* but it was virtually stillborn. Some 131 engravings were made and pulls from them taken but it does not appear to have been published in the strict sense of the word. Only two copies are known. Lambert had a set of

[29]Meyer, 1957.

[30]P. von Hiepko, "J. R. and G. Forster *Gesammelte Pflanzen im Herbar Willdenow in Berlin,*" *Willdenowia,* 5 (1969), 279-94.

[31]Achille Richard, "Essai d'une flore de la Nouvelle-Zealande," *Voyage de découvertes de l'Astrolabe . . . Botanique,* I (1832-33), Paris.

[32]N. S. Mitrofanova, "On J. R. and G. Forster's Botanical Collections in Moscow," *Bot. Zhurnal,* 44 (1959), 135-37.

[33]M. N. Karavaev, "G. Forster as a Botanist and the Forster Collections in the Akademya Nauk," *Trudy Inst. Istorii Estestvoznaniji i Techniki,* 36 (1961), 176-201.

[34]Joan Apfelbaum, *Collections of J. R. and J. G. A. Forster in the Herbarium of the Academy of Natural Sciences of Philadelphia* (Philadelphia: Academy of Natural Sciences, 1971).

[35]Kurt Sprengel, *Geschichte der Botanik,* 2 vols. (Leipzig: F. A. Brockhaus, 1817-18), II, 342.

131 engravings, these were bought by Bolm for £1-2-0 at the Lambert sale and is probably the set sold by Friedlander in 1869 to the Botanic Garden in Leningrad.[36] The other set of 129 plates is bound in with the Banksian collection of Forster drawings. On J. R. Forster's death, seventy-seven pencil sketches of plants were sold to Duke Ernst II of Saxony-Gotha and Alternburg. These drawings form Chart A1212 in the Forschungs-Bibliothek, Gotha.[37]

The Forsters and Sparmann worked on describing and illustrating their plant collections in the manner of Banks, Solander, and Parkinson on Cook's first voyage. Their "*Descriptiones plantarum, quas in itinere ad maris australis terras suscepto collegit descripsit et delineat Johannes Reinaldus Forster"* form MSS 1303-5 in the Muséum National d'Histoire Naturelle in Paris. In a letter, George Forster informed C. F. Voss that his father had no part in the descriptions for the *Characteres genera plantarum,* but had merely written the preface and apologia. The work was hurriedly written on the voyage; the descriptions are short and inadequate, and the locality often omitted. Sprengel in his *Geschichte der Botanik,* states that Forster expressed his regrets at publishing the *Characteres* before he had obtained Banks's opinion and consulted his collections.[38] The work described a number of plants collected by Banks and Solander and Banksian jealousy was probably behind Cook's endeavor to persuade the Forsters to stop publication. Lord Sandwich, first Lord of the Admiralty, however, gave them his official support. E. D. Merrill and subsequent authors have accused the Forsters of botanical piracy.[39] Regarding the *Characteres,* Merrill states that George "not only ignored the long and detailed technical descriptions of Solander but published his own new binomials under absurdly short diagnoses." Since the work was compiled on the voyage, this is, of course, nonsense. The first edition of the *Characteres* was a folio edition of some six copies, published around December of 1775.[40] Copies of this edition are in the British Museum (King's Library) and in the Linnean Society of London. The octavo edition of 1776 is really a second edition.

[36]F. Herder, "Verzeichnis von G. Forsters Icones Plantarum in Itinere ad Insulis Maris Australis Collectarum," *Acta Horti Petrop.,* 9 (1884), 495-510.

[37]Gerhard Steiner and Ludwig Baege, *Vögel der Südsee* (Leipzig: Insel-Ferl., 1971), pp. 64 and 66, and footnote 47.

[38]Sprengel, 1818, p. 342.

[39]E. D. Merrill, *The Botany of Cook's Voyages and its Unexpected Significance in Relation to Anthropology, Biogeography and History, Chronica Botanica, XIV (5/6)* (Waltham, Mass., 1954).

[40]H. St. John, "The Date of Publication of Forster's *Charactares Generum Plantarum* and its Relation to Contemporary Works," *Nat. Canadien,* 98 (1971), 561-81.

The bitter controversy between the Forsters, the Admiralty and Banks, together with other more personal circumstances, led the Forster family to leave England in July of 1780 and prevented the more immediate publication of further botanical results of Cook's second voyage. It was 1786 before George Forster's *Florulae insularum australium prodromus* appeared, a work which was the chief cause for Merrill's claim of botanical piracy, a claim which hinges on Merrill's assumption that the Forsters had free access, between 1775 and 1777, to the Banksian collections. Hoare states that nowhere is there a shred of evidence that the Forsters were given access to Banks' collections.[41] In view of Banks' attitude before the voyage, when he refused to give the Forsters any information, though he was prepared to answer questions, such access, after the voyage, would seem even less likely to have been given. I have mentioned the list in Banks' hand "of plants given me by J. R. and J. G. A. Forster when I looked at their specimens in January 1778 and compared them with my herbarium." This comparison would have shown a number of specimens in the Banksian Collection to be represented by only imperfect ones in the Forster collection. Forster in a footnote to the *Plantae obscurae,* as he calls these imperfect specimens, states that he has added the names given by Solander to the Banksian specimen. Banks and Solander may have had no objection to the Forsters noting these names. The twenty-three Solander names with Forster descriptions, names credited to Forster, are more difficult to explain. Some may, however, refer to the duplicate specimens, "duplicates of your own collecting as you can conveniently spare," that George in November of 1780 asked Banks to send him to compensate for the loss of his own collection. "I do not mean species we did not find, but only such as were common to both our collections."[42] Especially requested were specimens of breadfruit, New Zealand flax, *Sophora tetraptera, Melaleuca,* and the winter's bark. Forster continues, "Only since my descriptions and Dr. Sparmann's must be put into some order, before they are published, I should be greatly assisted in this business, by specimens of the above plants." Banks sent him some specimens in May of 1782 saying, "I was sorry to find that Nelson had not brought me good specimens of the breadfruit and flax, and that those before in my possession which I can spare were not good, I shall send you however, such as I can part with,

[41]Hoare, 1976.
[42]Dawson-Turner ms., I, fo. 308-10.

but fear they will not be so good as I could have wished.[43] Here again these specimens could have had Solander names, to which Forster would naturally have added his description. Unfortunately, for my argument, the duplicates Forster specifically requested in his letter to Banks do not appear among Merrill's list of twenty-three Solander binomials used by Forster. Banks' reply does not indicate either the number of specimens or the names of the species he sent to Forster. Specimens of the three *Trichomanes* species listed by Merrill are in the British Museum (Natural History) and are at Göttingen and are, therefore, not species Forster would have requested. All the twenty-three species are from the Society Islands. The fair copy of the Solander descriptions for the Society Islands flora would have been available for consultation. So did the Forsters consult it without permission as Merrill states? George in his letter to Banks of November 1780, however, says, "It is not my inclination to interfere with the discoveries of others or to borrow feathers, and, if things had gone according to my wish, we might have made common cause in natural history and spared a premature publication [presumably the *Characteres*]." Is this the occasion when either George or his father did "borrow feathers?" It is interesting to note that there are no Solander descriptions of Forster plants, presumably because of their known intention to publish accounts of their collection.

The objective of the third voyage was to ascertain whether there was a Northwest Passage. "Curse the natural philosophers and all sciences" was Captain Cook's reply when asked about a naturalist accompanying the third voyage, probably the reason why no official naturalist or natural history artist was appointed. William Anderson (d. 1778), surgeon on the Resolution, acted as an enthusiastic and competent one. He had been surgeon's mate on the second voyage, and in all probability learned a considerable amount from the Forsters and from Sparmann. Anderson's herbarium collection which included plants from both voyages, came into the possession of Banks but the specimens were not incorporated into this herbarium. They suffered considerable neglect before the worthwhile remnants were rescued by James Britten (d. 1924) and incorporated into the herbarium of the British Museum (Natural History).[44] Anderson made Latin descriptions of the plants he considered new to science. His manuscripts entitled *"Descriptiones sue characteres specifiers"* and *"Genera*

[43]Dawson-Turner ms., I, fo. 132-33.

[44]James Britten, "William Anderson and the Plants of Cook's Third Voyage," *Journ. Botany, Lond.,* 54 (1916), 345-52, and also his "Short Notes, William Anderson and Cook's Third Voyage," *Journ. Botany, Lond.,* 55 (1917), 54.

nova plantarum seu descriptiones characterum naturalium plantarum adhuc incognitarum in itinero nostrovisa 1776, 1777" are in the British Museum (Natural History). Anderson's new genera were later published as *Eucalyptus, Goodenia, Coorea* and *Bauera.* L'Heritier de Brutelle for example described the genus *Eucalyptus* in his *Sertum anglicum,* 1788-1792, from a tree brought back by Anderson and grown at the Royal Gardens, Kew, and from herbarium material brought back by David Nelson. John Webber (d. 1793), the figure and topographical artist, made one plant drawing, *Pringlea antiscorbutica,* a genus named in honor of Sir John Pringle, President of the Royal Society, 1772-78. *Pringlea antiscorbutica* was a valuable anti-scurvy plant found on Kerguellen.

Anderson, who was consumptive, died in August 1778 through weakness engendered by the extreme cold of the conditions within the Arctic Circle. Anderson kept a very detailed journal that contained observations on every branch of natural history, folklore, and philology. When the official account of the voyage came to be written, Lord Sandwich directed that Anderson's journal be given to the editor who was authorized to avail himself of the information it contained.

The companion vessel *Discovery* had on board a young gardener, David Nelson (d. 1789) who was familiar with the plants growing in London nursery gardens and who Banks employed to collect herbarium specimens and seeds for the Royal Gardens at Kew. At the Cape, Nelson met another Banksian collector Francis Masson and together they went on his first collecting trip. After this expedition, Anderson wrote to Banks "Nelson is a person who understands botany, who will be able to procure for you every new article in that branch, a task I have not the vanity enough to expose myself again to, but shall nevertheless continue to collect whatever it presents itself." There is a list, in Solander's hand, of seeds collected by Nelson, arranged under locality and of the recipients to whom they were sent. Solander made a catalogue of plants collected on Captain Cook's third voyage, *Plantae Insula Desolationis, Plantae* Terra *Diemens, Plantae Novae Zealandae, Plantae Insulae Modoo, Plantae Insularurn Otakootae* and *Palmerston, Plantae Insulae Amicorum, Plantae Insularum Societatis, Plantae Tzchutski, Plantae Kamscatkensis, Plantae Macao, Plantae Pulo Condore.* Eleven species Nelson collected in Canton **and** Macao are recorded in Bretschneider's work,[45] while those from the Sandwich Islands were consulted by B. C. Leeman when writing his *Flora vi-*

[45] Emilii Bretschneider, *History of European Botanical Discoveries in China.,* 2 vols. (London: S. Low, Martson and Co., 1898).

tensis between 1865-73, and those from Australia by J. D. Hooker for his *Flora of Tasmania* (1860). More recently, Nelson's important collection from Hawaii is being studied by H. St. John.[46] Many new and interesting species were grown from Nelson's seed collection, including such well known plants as *Acacia verticillata* (Nelson's mimosa) and *Cordyline australis.*

What were the main influences of Cook's three voyages on Sir Joseph Banks? On the return voyage, the *Endeavour* called at the Cape of Good Hope. Although the Dutch introduced a number of Cape plants into cultivation in Holland, Banks soon realized that there were many more that would flourish in our gardens and stoves. The floral riches of the Cape, of course, were not unknown, but few actual plants had reached British gardens and greenhouses. Banks, who was unofficial Superintendent of the Royal Gardens at Kew persuaded George III to send a botanical collector to the Cape and Francis Masson sailed out with the Forsters, arriving at the Cape in October of 1772. His first tour lasted until March of 1775; his second one from 1786-95. Being suspicious of its real objective, the Dutch naturally did not take kindly to such British activity. Consequently, Masson's movements were restricted. In 1776, Masson published an account of three journeys on his first tour, but there is no similar record of those undertaken on his second tour. His letters to Sir Joseph Banks, however, in the Brabourne collection in the Mitchell Library, Sydney,[47] give some indication of the localities he visited and from which the consignments of seeds, bulbs, etc. were collected. Among the many plants Masson was responsible for introducing were a large number of Ericas, *Senecio* species from which the florists' *cineraria* has been developed and *Pelargonium* species from which horticulturalists have bred the geraniums which adorn our gardens in summer time. The extensive collection of interesting plants, collected from Botany Bay and the general topography of the region, would have influenced Banks during the discussions which lead up to the foundation of the penal settlement in 1788. The Parkinson sketches and later the finished drawings that Banks had executed stimulated interest in the Australian flora and the desire to successfully cultivate some of these strange plants.

The first plant introduced into cultivation from Australia was *Banksia serrata.*[48] The famous nursery firm of Lee and Kennedy of the Vineyard,

[46]H. St. John, "Biography of David Nelson and an Account of his Botanizing in Hawaii," *Pacific Sci.,* 30 (1976), 1-5.

[47]Vol. 18, 1789-96.

[48]A. M. Coates, *The Quest for Plants* (London: Studio Vista, 1969).

Hammersmith had six Australian species in cultivation around the time of founding of the penal settlement in 1788.[49] There would also have been a small number in cultivation in the Royal Gardens at Kew. The Mitchell Library correspondence shows that, after the foundation of the settlement, Banks received, for Kew, a continuous flow of small quantities of seed of interesting plants sent by such officials in the new colony as Governor Arthur Philip, Colonel William Paterson, and Governor Gidley Philip King. But it was the vast quantity of living material sent back by Peter Good (d. 1803), the gardener on Matthew Flinders's voyage, that circumnavigated Australia between 1801-03, which necessitated the provision of a special house to display the many unusual plants being raised and flowered for the first time. The Botany Bay House, as it became known, was for many years a special attraction in the Royal Gardens. The Department of Botany, British Museum (Natural History), has Good's copies of the lists of seed sent to Banks and Goods excellent journal kept on the voyage. The latter is being prepared, by me, for publication by the Museum. Peter Good has never been given the honor he so justly deserves and I hope this volume 'will rectify this sad omission. Such an interest was aroused among private gardeners that James E. Smith between 1793-95 published *A specimen of the botany of New Holland* which gave some cultural details and had illustrations by James Sowerby. Banks naturally realized that new plants of horticultural and economic value could be obtained from other regions under British influence.

Through the good offices of the East India Company, Banks received consignments of living material from a number of the Company's officers such as Dr. Alexander Duncan, Thomas Main and John Reeves in China, William Roxburgh in Calcutta, and Capt. M. Hogan in Bengal.[50] The Company also enabled him to send William Kerr to China in 1803. Many of the living plants put aboard the Company's East Indiamen did not survive the journey home. Kerr was, however, responsible for introducing such well known plants as the Banksian rose and the Tiger Lily.

The traffic in living material was, however, by no means one way. Between 1780 and 1787, some 15,000 slaves in the West Indies died of starvation or of diseases contracted by a scanty and unwholesome diet. Both Captain Cook and Banks had been most impressed by one of the Tahi-

[49]These were *Casuarina stricta (C. quadrivalvis)* (1775), *Banksia oblongifolia* (1788), *Banksia serrata* (1788), *Fabriciu laevigata (Leptospermum laevigatum), Lambertia formosa,* and *Melaleuca armillaris.* See E. J. Wilson, *James Lee and the Vineyard Nursery* (London: Hammersmith Local History Group, 1961).

[50]Brabourne Collection, Mitchell Library, Sydney.

tians' staple foods--the breadfruit. Planters in the West Indies had been for some time urging the government to relieve the disastrous situation existing in the islands. The King sought Banks' advice. Although the breadfruit had to be propagated by suckers, Banks's solution was to send an expedition to Tahiti to propagate a large number of young plants there and then to transfer them to the West Indies. We are all familiar with the tragic fate of Captain Bligh on the *Bounty* in 1787. The second attempt in I791 was, however, highly successful. "Wherever the breadfruit grows in the West Indies, it stands as a living token to those South Sea islanders whose participation in this historic venture continues to feed thousands in each succeeding generation of West Indians."[51] This is the most famous of such transfers. The Banksian correspondence in the Brabourne Collection in the Mitchell Library show such transfers had become, in fact, a commonplace procedure. Few vessels left England for New South Wales without supplies of seed and, whenever possible, living plants in pots and boxes to maintain and to augment the horticultural and economic wealth of the new colony. Peter Good on the Flinders voyage took out a number of berried fruits in a portable greenhouse. William Kerr took out with him a number of European fruit trees and other economic plants from Kew and established them on Portuguese Macao where Europeans were forced to reside outside the tea season. Plants were also sent to the East India Company's gardens in Calcutta and others to St. Helena to improve its ability to act as a revitualing station for British shipping. A large collection of plants, under the care of Christopher Smith and Peter Good went from Kew to Calcutta in 1796, and Good returned with an equally extensive collection for the Royal Gardens. In an undated memorandum from Reverend John Walker, F.R.S. (1731-1803), entitled "Essay on the translation of plants from the East to the West Indies," Walker stresses the importance of introducing spice plants into the West Indies, a suggestion that was carried through with great thoroughness by Christopher Smith at the time in charge of the Honorable East India Company's garden in the Mollucea islands occupied by the British from 1796 to 1802.[52] The nutmeg, for example, was first introduced into Penang and then to St.

[51]D. Powell, "The Voyage of the Plant Nursery, HMS Providence, 1791-93." *Bull. (Sci. Ser.) Inst. Jamaica*, 15 (1973).

[52]Short extract from one of Smith's lists in the Braboume collection in the Mitchell Library: "Dec. 1796, 1,827 one-to-four-year-old nutmeg trees collected in Banda Isles; Jan. 1797, 575 clove plants, 146 sago plants, 155 nutmeg plants (for Bengal) collected in Amboyna, 270 nutmeg and two large clove plants for St. Helena and Kew; Jan. 1798, 1,395 plants: nutmeg, clove, chocolate, lichi, sago (for Madras)."

Vincent in the West Indies in 1802. In some of these transfers, the Royal Gardens acted as a staging post, a role that was to be expanded when these gardens came under government control in 1841. At this later period, one of the major transfers was rubber from Brazil via Kew to the Malay peninsula. The Brabourne collection in the Mitchell Library also shows how eager Banks was to obtain information on economic plants and their culture and to follow this up by arranging with the King to send gardeners out from Kew to British possessions overseas to experiment on the culture of economic plants to be introduced from or to be introduced to other regions. The Polish-born gardener Anton Panteleon Hove (fl. 1785-98), for example, was sent out to India to study the cultivation and preparation of cotton and to obtain plants and seeds of the best varieties for introduction into the West Indies. Charles Favargill, Simon Benstead, Joseph Seymour, William Halgarth, and Mark Everson, in the employ of the Honorable East India Company, were sent to India to cultivate hemp. They had problems and it was to Banks that they wrote in June of 1803 for assistance! The Honorable East India Company was naturally interested in plants of commercial value such as hemp, but it was Banks who added another dimension, that of the importance to the expanding British Empire outside the control of the Honorable East India Company, such as the breadfruit to the West Indies. His personal knowledge of the use made by natives of endemic species enabled him not only to suggest possible introductions but to request information on useful plants in one area for possible introduction into another.

During the Banksian era the number of species introduced into cultivation in the Royal Gardens increased dramatically from 5,000 species listed in William Aiton's *Hortus Kewensis* in 1789 to 11,013 species in the second edition published in 1814. The Royal Gardens at Kew under Sir Joseph's guidance and the financial support of "farmer" George III were being converted from a purely Royal pleasure garden into a botanical one. Through the successful cultivation of a wide range of plants from many different climates and soil conditions, horticultural science made a substantial advance. This success was, in no small measure, due to the skill and devotion of the Royal Gardens' two head gardeners, William Aiton (d. 1793) and his son William Townsend Aiton (d. 1849). Banks thus laid the foundation for what had become the world's most famous botanic garden, the Royal Botanic Gardens at Kew.

The collection by Banks and Solander of so many unfamiliar plants on Cook's first voyage was a great stimulus to taxonomic botany. How many more strange plants remained to be collected from other regions? With

substantial financial assistance from George III, Banks was determined to find out. James Bowie and Francis Masson were sent to collect at the Cape. The latter collected later in the Canaries and the West Indies. In 1800, George Caley was sent to the new colony in Australia and remained till 1810. He made an extensive collection in and around Port Jackson. Scientifically, however, the most important collection of that period other than the Cook voyage collections was that made by Robert Brown, the naturalist on the Flinders voyage. Brown later became Banks' third curator-librarian and ultimately the first keeper of the Banksian herbarium at the British Museum. Brown's collections in Australia and Tasmania were, however, all made in coastal areas. It was Alan Cunningham, King's botanist, who first opened up the botanical riches of the interior. He arrived in Australia in 1816 just four years prior to Banks' death. Important herbarium collections were forwarded to Banks by the medical officers of the Honorable East India Company: Patrick Russell and William Roxbourgh, Superintendent of the Company's garden in Calcutta. Roxburgh and his successors at the garden, Nathaniel Wallich and John Forbes Royle, were to lay the foundations of Indian botany. Banks obtained further collections by purchase: important historic collections of Paul Hermann (d. 1695) made in Ceylon and the *Hortus cliffortianus,* the first major collection containing exotics studied by the famous Swedish botanist Carl Linnaeus. The Banksian herbarium was arranged according to Linnaeus's sexual system of plant classification by two of his famous pupils, Solander, and, when he died, by Jonas Carlsson Dryander. Solander, Dryander, and Banks's third curator, Robert Brown, named and described many of the new acquisitions. Their extensive manuscripts are in the Department of Botany, British Museum (Natural History). These three botanists were responsible for a large number of the descriptions of new species published in England during their terms of office. The two editions of Aiton's *Hortus Kewensis* were largely prepared by them. The Banksian herbarium was always available for study; many came and consulted it and discussed their problems with Banks and his curators. Few were debarred its use. By the establishment of this vast and historic collection and its study by his curators, Banks made an outstanding contribution to taxonomic botany. Had Banks not participated in Captain Cook's first voyage, he may only have formed a mainly European herbarium. Of course, he may have emulated his predecessor as President of the Royal Society, Sir Hans Sloane (d. 1753) and acquired what is now an historic collection in the Department of Botany, British Museum (Natural History), but this in itself would not have contributed in any substantial measure to the advancement of taxonomic research.

From around the mid-eighteenth century, there was a growing realization among zoologists and botanists of the value of having accurate drawings made of appearance and structure of new species, especially those likely to be designated type specimens. The drawings brought back from Captain Cook's first voyage had not only a tremendous impact scientifically but also among the intelligentsia in general and through them on the art and the literature of the period. Banks naturally stressed the importance of attaching artists to voyages of exploration. As I have stated earlier, Captain Cook persuaded the Admiralty to abandon this principle for the third voyage, but when Banks proposed the circumnavigation of Australia in 1798 the Admiralty again agreed to the appointment of scientific personnel and a natural history painter, Ferdinand Lucas Bauer, one of the finest botanical artists of all time. Unlike Sydney Parkinson, Bauer only made detailed pencil sketches on the voyage assisted by a unique system of color notes. On his return, Bauer was commissioned by the Admiralty to make a number of finished water color drawings which Banks stipulated were to be executed under the supervision of Robert Brown. These drawings were presented by the Admiralty to the British Museum in 1843 and are now in the Department of Botany, British Museum (Natural History). The officers of the East India Company followed this Banksian principle and there exist in the India office, Royal Botanic Gardens, Kew, and the Department of Botany, British Museum (Natural History), extensive collections of superb drawings made by native Indian artists from fresh material and under supervision, Only a very small selection, however, have been published. Banks acted as technical advisor for the publication of *Plants of the Coast of Coromandel,* 1795-1820, a sumptious folio describing 300 plants collected and described by William Roxburgh. Banks also received a small but continuous flow of drawings from those resident in New South Wales, Norfolk Island, and Tasmania. A number of these are currently in the Thomas Watling and Port Jackson painter collections in the British Museum (Natural History).[53] Some of these drawings are important, being all that remains of the type on which the description was based. A study of Banks's scientific papers, especially those in the Mitchell Library, may establish the artists of some of these drawings who were responsible for forwarding them to Banks and where the plants and animals were collected. As I have stated earlier, many new species of plants were grown and flowered in the Royal Gardens at Kew. It is not surprising, therefore, that Sir Joseph should have wished to install a resident artist there to record some of them, and who better than Franz An-

[53]Banksian Ms. 34, British Museum (Natural History).

dreas Bauer, brother of Ferdinand, and perhaps the finer artist of the two. Bauer thus became the first of a continuous line of famous resident artists working at this garden. In 1796, Bauer published his *Exotic plants cultivated in the Royal Gardens, Kew*, depicting plants introduced from the Cape and from Australia, the latter largely due to living material sent to Banks by Governor Arthur Philip. The drawings made by Francis Bauer, both during Banks's lifetime and afterwards, were presented to the British Museum by Queen Victoria in 1841. They are now in the Department of Botany, British Museum (Natural History).

So far, I have made no mention of the North American continent because living plant material already reached England during the previous century and a large number of east coast American plants had already been introduced into cultivation in England prior to the Banksian era. James Petiver (1658-1718), an apothecary of Aldersgate, and Peter Collinson (1694-1768), a cloth merchant, were the English importers. John Bartram (1699-1777) and his son, William Bartram (1739-1823), were the initial suppliers of seeds and root stock. They founded the first "nursery" in America on their property on the Schurrykill river, near Philadelphia. In spite of the American War of Independence one finds the Aitons requesting Banks to order, for the Royal Gardens, a list of species from the nurseryman, Moses Marshall (1758-1813), operating in Chester county, Philadelphia! Although the west coast of America was opened up by the Lewis and Clark expedition, 1805-06, neither George III nor Banks sent a collector to this part of America. After Banks's death in 1820, the Horticultural Society of London took over Banks's role of sending out botanical collectors and it was to this particular part of America that David Douglas (1799-1834), "Douglas of the Fir," was sent to explore in 1832. And what a harvest he reaped!

I think this very brief sketch indicates ways in which participation in Captain Cook's first voyage influenced Banks. It also shows, though I have only dealt with the botanical aspect, why Banks can, in fact, be considered as England's scientific director of the period for botany, the prototype of the Director of the Royal Botanic Gardens, Kew, of today. No more fitting memorial could be devised for Banks, who from the very outset, was determined to study botany and for the rest of his life was to contribute to the advancement of this science. I do not agree with Beaglehole that Banks had an amateur's approach to science and, even if this were true, some of the great advances in science have been made by amateurs, so the term should not be applied to Banks in any disparaging sense, which is what Beaglehole appears to imply.

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