

THE BOTANICAL RESULTS OF
CAPTAIN COOK'S THREE VOYAGES
AND THEIR LATER INFLUENCE

by William T. Steam

The contribution to knowledge deriving from a scientific expedition depends not only upon the quantity and quality of material gathered but also and equally upon the skill and speed with which this is studied and the resulting information published. As the gap between collecting and publication increases, so likewise does the probability of later duplicated effort making the original work of little or no practical value--historically interesting, a waste indeed of both labor and expenditure. A sad example of this is provided by the Spanish voyage to the Pacific Ocean under the command of Alessandro Malaspina in 1789-93. Its objectives were both scientific and political, as were those of Cook's voyages, which it sought to emulate. These included a survey of the Spanish possessions in the Pacific, their natural history, their mutual political and economic relations and the best routes for commercial navigation. On the voyage itself most of its aims were successful. Nevertheless, as said elsewhere, "in histories of Pacific exploration Malaspina's voyage usually receives the least attention, for no recording of undiscovered islands, no series of published charts, no major narratives stand to its credit. This was not the fault of its enterprising commander Alessandro Malaspina (1754-1809), an Italian aristocrat who spent most of his life in the service of Spain. The expedition was expertly planned, very well equipped and brilliantly staffed, and was potentially the most important to leave Spain."¹ It carried Thaddaeus Haenke, Luis Née, and Antonio Pineda as naturalists. Their devoted labors during the voyage came virtually to nothing in Spain on their return because of a lack of appreciation or mismanagement by officials; moreover an intrigue at the Spanish Court, apparently caused by jealousy of Malaspina's popularity and achievement, led to his imprisonment from 1796 to 1803. Consequently the only major botanical result of so much painstaking work in little-known regions on the expedition itself is C. Presl's *Reliquiae Haenkeanae* published not in Spain but in Bohemia in 1825-35, by which time other botanists had already described and named many of the new species. Thus the specimens collected by Haenke at Nootka Sound, Vancouver, in 1791 had to wait until 1825-35 for recording.

¹W. T. Steam, An introduction to K. B. Presl's *Reliquiae Haenkeanae*, prefixed to facsimile of *Reliquiae Haenkeanae* (Amsterdam: A. Ascher, 1973).

The Malaspina voyage is indeed an extreme case of frustrated effort. Nevertheless, none of the eighteenth-century Pacific exploring voyages, even those of Bougainville, Cook, Vancouver, and d'Entrecasteaux, yielded natural history results commensurate with the collections and observations diligently made upon them. The reasons for these relative failures are various and complex, attributable partly to the characters of the leading persons concerned, partly to the inadequate organization of research at this time, partly sometimes to political and social circumstances. These must all be kept in mind when assessing the contribution to biological knowledge made by Cook's three voyages of discovery. Each one took able naturalists into then unexplored regions of the Pacific abounding with plants and animals new to science and presenting unimagined opportunities for collecting and recording. Each one brought back to England a wealth of specimens, notes, and drawings. As Whitehead has remarked, "there is indeed a lamentable contrast between the determination, courage, good planning and great care that attended the collection of all this material, and the series of delays, misfortunes, dissensions, intrigues (and at times downright malice) that so beset the publication of the results of the journals as well as of the scientific results."² In consequence, the far from negligible biological aspects of Cook's three voyages have tended to be obscured by the success of his cartographical work and his attention to health at sea. Nevertheless, despite piecemeal and incomplete publication, the botanical and zoological material from these voyages made a contribution to knowledge which, although it could have been much greater, remains important. It thus still merits study, as recent illustrated publications have made evident.³

The three voyages of Cook were, however, very different as regards their immediate impact and later influence despite having the Pacific Ocean with its continental bounds and multitudinous islands as their common field of enquiry and Cook as their commander. The contrasts

²P. J. Whitehead, *Forty Drawings of Fishes Made by the Artists Who Accompanied James Cook on His Three Voyages to the Pacific* (London: British Museum, 1968).

³A. C. Begg and N. C. Begg, *Dusky Bay*, 2nd ed. (Christchurch, New Zealand: Whitcombe & Tombs, 1968); W. Blunt and W. T. Stearn, *Captain Cook's Florilegium* (London: Lion & Unicorn Press at Royal College of Art, 1973); E. D. Merrill, *The Botany of Cook's Voyages* (Waltham, Mass.: Chronica Botanica, 1954); W. T. Stearn, "A Royal Society Appointment with Venus in 1769: The Voyage of Cook and Banks in the *Endeavour* in 1768-1771 and Its Botanical Results," *Notes and Rec. Royal Society*, London, 24 (1969), 64-90; W. T. Stearn, "Sir Joseph Banks (1743-1820) and Australian Botany," *Rec. Australian Academy of Science*, 2 (1974), iv, 7-24; and Whitehead as indicated in footnote 2.

illustrate the interplay of personalities and circumstances. The pioneering first voyage of 1768-71 in the *Endeavour* had wealthy young Joseph Banks and the erudite, genial Daniel Solander as its naturalists. The second of 1772-75 in the *Resolution* and *Discovery* had the erudite but easily disgruntled, self-opinionated Johann Reinhold Forster (rightly designated "the tactless philosopher" by Hoare)⁴ his brilliant, amiable, over-shadowed son George, and their competent, steady Swedish assistant, Andreas Sparrman, in many respects like his older compatriot Solander. The third and fatal voyage of 1776-80 had the consumptive naval surgeon William Anderson and the gardener David Nelson. These were men of very different character and achievement. Fortunately the generic names *Andersonia*, *Banksia*, *Forstera*, *Nelsonia*, *Solandra*, and *Sparmannia* impartially commemorate them all. The first voyage brought back the best, the most extensive, and the most valuable material but produced little of immediate biological importance. The second resulted in a publication immediately fixing the names of many plant genera but little else then. The third yielded virtually nothing at the time but even in 1976 provided material for the description of extinct Hawaiian species.

Cook's First Voyage

The avowed object of Cook's first voyage of global circumnavigation was astronomical, i.e., to observe in 1769 from a Pacific Ocean island the transit of the planet Venus across the disc of the sun, but its secret and political object was to search for the hypothetical great southern continent and ascertain its existence or otherwise because this could affect the balance of power in Europe between Britain and France. The British government made no provision for biological exploration. The natural history results were entirely due to the participation in the voyage of a private citizen, Joseph Banks (1743-1820), recommended by the Royal Society to the Admiralty as "a gentleman of large fortune who is well-versed in natural history." He took with him Daniel Solander as scientific companion; H. Spöring as naturalist secretary, H. Buchan and Sydney Parkinson as artists, and two white and two black servants. He also took a good working library of natural history books, of which those by Solander's teacher, Linnaeus, would have been the most useful, and masses of collecting equipment. The

⁴Michael E. Hoare, *The Tactless Philosopher, Johann Reinhold Forster, 1729-1798* (Melbourne: Hawthorne Press, 1976).

Endeavour sailed from Plymouth on 26 August 1768 and many years passed before another ship left England so well furnished with scientific personnel and equipment. The voyage carried them to Madeira, Brazil, Tierra del Fuego, Tahiti, New Zealand, eastern Australia from Botany Bay to Cape York, and Java; everywhere possible they collected all they could and accordingly brought back to England on 15 July 1771 such a quantity of specimens, drawings, and notes as had never reached Europe before.

Banks planned to make this new knowledge available by publication but planned to do so in the grand style with superb folio engraved plates of the plants befitting the magnitude of the voyage. Herein one can detect the influence upon Banks of his social position and his earlier antiquarian interests; the *Endeavour* voyage had been for him the equivalent on a grander scale of the Grand-Tour customary in the education of an aristocratic young Englishman; large engraved illustrations became an essential feature of eighteenth-century works on antiquities. Unfortunately such illustrations made the whole of Banks's ambitious undertaking a costly failure. On the voyage, Solander wrote Latin descriptions of the plants that remain admirable: J. D. Hooker in the *Flora Novae-Zelandiae*⁵ stated that "his descriptions have never been surpassed for fulness, terseness and accuracy" and, coming from an authority on the New Zealand and Antarctic flora so scholarly and experienced as Hooker, that is praise indeed. A student of Linnaeus at Uppsala and well versed in the master's methods, Solander allocated the new genera and species to their positions within the Linnaean sexual system of classification and coined names for them which remaining too long unpublished have, as Hooker remarked, "in most cases been replaced by others, often applied with far less judgment." He had worked so hard on the voyage that the task of revising and completing his manuscripts and preparing them for publication when back in London cannot have daunted him. His completed manuscripts carefully transcribed and ready for printing, together with the descriptions made on the voyage are in the British Museum (Natural History), London. Those entitled *Primitiae Florae Terrae del Fuego*, *Primitiae Florae Insularum Pacifici*, and *Primitiae Florae Novae Zelandiae* could well have been published at the time without illustrations, as were most of the works of Linnaeus, and would have made a sound foundation for later publications. Extracts from these published by Blunt and Stearn exemplify their quality and indicate what was lost by their nonpublication ear-

⁵J. D. Hooker, *Flora Novae-Zelandae*, I (1853), iii.

lier.⁶ Solander also prepared descriptions of Australian plants, few of them published, however, before 1900! The quantity of New Zealand and Australian plants needing illustration almost overwhelmed the artist, Sydney Parkinson; he had to content himself with sketching the general habit of a plant to indicate the position and pose of its leaves, flowers, and fruits and then to paint carefully a few details of these to serve as guides for the preparation of complete colored drawings later. This he never had the opportunity to do. He died at sea between Java and the Cape of Good Hope on 26 January 1771, one of the many victims of malaria and dysentery caught during the enforced stay of the *Endeavour* at Batavia. Banks accordingly had to employ a group of artists in London to make completed drawings before the engravers could work on them. Under Solander's supervision they did this admirably, but it caused delay.

The number of plants collected, described, and portrayed is impressive. On Madeira during a stay of five days they got 230 species, of which twenty-three were determined as new to science and of which Parkinson made twenty-two colored drawings. Despite difficulties of going ashore there, Rio de Janeiro, Brazil, yielded them 300 species, of which Parkinson drew thirty-five. At Tierra del Fuego, with a much poorer flora, they found, in January 1769, 104 species of flowering plants (*phanerogams*), six ferns, a *lycopodium*, and thirty-four mosses, etc., twenty-nine being then illustrated. Their stay in Tahiti lasted from April to July 1769 and Parkinson made fourteen sketches and 114 colored drawings of plants. Coastal New Zealand provided about 400 species; Parkinson illustrated 205. The landing on 3 May 1770 in New South Wales at Botany Bay, so named by Cook in allusion to the many astonishing new plants found there by Banks and Solander, acquainted them with yet another entirely new flora; hard-pressed Parkinson managed to illustrate eighty-four. Their stay at the Endeavour River, Queensland, from June to August 1770, while the reef-damaged *Endeavour* was being repaired, gave them better opportunities for botanizing because they had time to go further inland; here Parkinson illustrated 141 species. These Endeavour River drawings are especially valuable as they portray from life many species later described by various authors from the dried specimens.⁷ In Java, despite sickness, they likewise collected plants, of which Parkinson illustrated seventy-four. The deaths of Parkinson and Spöring and the illness of Banks and So-

⁶Blunt and Steam, 1973.

⁷Steam, 1969.

lander then brought botanical work on the voyage almost to an end. They had little opportunity to examine the plants of the Cape of Good Hope and St. Helena. Nevertheless, the botanical material resulting from the voyage was estimated to include about 3000 herbarium specimens and 955 drawings by Parkinson; 110 new genera and 1300 new species were represented. The scale of this addition can be gauged from Linnaeus's *Species Phatarum* (1753), having included 1098 genera and some 5900 species as the total for the whole known world in 1753.

Back in London, after a voyage to Iceland in 1772, Banks put in hand the preparation of folio volumes on the plants of the voyage. A first task was the completion of Parkinson's drawings. This took several years to do. Then came the engraving of the copper plates and that took even longer. Engraving plates with elaborate shading instead of coloring was necessarily a slow, highly skilled, and costly business which often delayed the appearance of illustrated works. The plates engraved for Banks by D. Mackenzie, G. Sibelius, G. Smith, and others are masterpieces of the engraver's art, as can be seen from the prints in *Captain Cook's Florilegium*.⁸ By 1778, about 550 plates had been engraved, so Banks told the younger Linnaeus then in London. Solander died on 13 May 1782 with the engraving of the plates not yet completed and none of his manuscript *Floras* printed. Banks had become president of the Royal Society in succession to Sir John Pringle and more and more diverse matters occupied his attention, but he still intended to publish the work. Thus he wrote in November 1784 that "it can be completed in two months if only the engravers can come to put the finishing touches to it." In all, 742 copper plates were engraved, most of which have survived and are now in the British Museum (Natural History), London. What happened thereafter to end all activity on what would have been the most impressive British botanical publication of the eighteenth century, a major contribution to the botany of the Pacific Ocean, is obscure and unlikely ever to be elucidated. The sad fact remains that the long-awaited fruit of Solander's intellectual labors and Banks's vast expenditure on the voyage and afterwards came to nothing then. All one can say about this failure is that, if Banks's ambition for the grandeur of the work had been less and Solander had had more ambition to see his manuscripts printed, then Cook's first voyage of discovery would have shone as botanically the most successful then made.

⁸Blunt and Steam, 1973.

Cook's Second Voyage

Meanwhile, Cook had completed his second voyage, that of 1772-75, and the two Forsters, who had sailed with him aboard the *Resolution* in circumstances hard to endure, both for them and for Cook, had brought back their own harvest of specimens, sketches, and notes from the Pacific area. These included some 785 gatherings of plants and some 300 botanical drawings by George Forster, as well as much zoological material. Cook's track on this voyage coincided only in part with his previous one. Thus he did not touch Australia and Java but reached the New Hebrides and New Caledonia, which has a rich (now endangered) endemic flora. Tahiti, New Zealand (with a long fruitful stay in 1773 at Dusky Sound),⁹ and Tierra del Fuego were visited on both voyages, and thus inevitably the Forsters and Sparrman collected in these places many species found earlier. Forster and his son had originally little botanical knowledge but, profiting from the erudition and experience of Sparrman, who, like Solander, had studied under Linnaeus at Uppsala, they had prepared concise descriptions, with drawings of floral parts, for seventy-six new genera, about fifteen or more of which had been carefully described and named in Solander's unpublished manuscripts. Banks and Solander welcomed the two Forsters back--Sparrman had stayed in South Africa--gave them facilities for work in Banks's rich library and herbarium, and treated them generously. No inhibitions about publishing restrained the Forsters; they had a vested interest in quick publication, and indolence was not one of their failings. They arrived back in England on 30 July 1775 and within four months, i.e., in late November or early December 1775, they had got six copies printed in folio of a work entitled *Characteres Generum Plantarum quas in Itinere ad Insulas Maris Australis collegerunt, descripserunt, delinearunt Annis MDCCLXXII-MDCCLXXI Johannes Reinoldus Forster et Georgius Forster*. One of these, now in the King's Library at the British Library (formerly the library of the British Museum), London, they presented to King George III, to whom, presumably in the hope of royal favor, they had dedicated it with a long fulsome introduction. Later they sent one to Linnaeus, who received it in April 1776, but apparently none to Banks, although inclusion in his much-used library might have given it some claim to effective publication in 1775. One cannot accept the existence of one copy locked away and guarded in a king's private library and five others in the

⁹Begg and Begg, 1968.

hands of the authors as "distribution of printed matter (through sale, exchange or gift) to the general public or at least to institutions with libraries accessible to botanists generally" (*Int. Code Bot. Nomencl.* article 29). However the work was put on sale as a quarto volume on 1 March 1776, which can reasonably be taken as the date of valid publication of the new names in the *Characteres* and not 29 November 1775.¹⁰

Elizabeth Edgar has provided an English translation of its Latin preface.¹¹ This and George Forster's *Voyage round the World* (1777) state that the richness of the flora and fauna of the Cape of Good Hope, a "treasure house of natural history," convinced the Forsters that it would be beyond their powers to collect, describe, portray, and preserve (all at the same time) the multitudes of plants and animals here and in the regions yet to be visited, many of them likely to be new for science. Here, however, they had the good fortune to meet the likeable and competent young Swedish doctor Andreas Sparrman (1748-1820), *optimus et eruditissimus juvenis Andreas Sparrmannus, M.D. Upsaliensis, Magni Illustrisque Linnaei discipulus*, now enthusiastically investigating the Cape flora after a voyage to China as a ship's surgeon. Forster offered to pay him £50 a year and his expenses, his major task to be the description of the plants while Forster dealt with the animals and George drew both. Despite the attraction for him of the Cape, the wider prospect of the Pacific Ocean, lured Sparrman into acceptance. Beaglehole has referred to Forster's "needless engagement of Sparrman at the Cape as an assistant."¹² Without him, however, the botanical harvest of the voyage might have been small, for he was an energetic collector, not enfeebled by poverty and ill health as the over-worked boy George had been, and neither of the Forsters then possessed his botanical knowledge and experience. In fact, it would seem not unfair to attribute the major botanical results of Captain Cook's first and second voyages, though unfortunately not their publication, to Linnaeus's well-trained "apostles," Solander and Sparrman.

¹⁰H. St. John, "The Date of Publication of Forster's *Characteres Generium Plantarum* and Its Relation to Contemporary Works," *Naturaliste Canad.* 88 (1971), 361-581. See also F. A. Stafleu and R. S. Cowan, *Taxonomic Literature: A Selective Guide*, vol. 1 (Utrecht: Bohn, Scheltema and Holkema, 1976).

¹¹Elizabeth Edgar, "Preface to *Characteres Generium Plantarum* by J. R. and G. Forster, 1776, a Translation," *New Zealand Jour. Bot.*, 7 (1969), 311-315.

¹²J. C. Beaglehole, ed., *The Journals of Captain James Cook*, 3 vols. (Cambridge: The Hakluyt Society, 1955-1967), II (1961), *The Voyage of the Resolution and Adventure, 1771-1775*.

Although the *Characteres* according to its title-page has the two Forsters as its authors, George stated in 1792 that his father had had no share in the plant descriptions and that he and Sparrman had made them while his father busied himself with the animal species collected.¹³ Whoever was responsible, the *Characteres*, despite its shortcomings, remains a very important work. Here were first published the genera *Cyrtandra*, *Donatia*, *Euodia*, *Embothrium*, *Epacris*, *Dentella*, *Carpodetus*, *Dichondra*, *Commersonia*, *Schefflera*, *Phormium*, *Ripogonum*, *Cahnia*, *Acronychia*, *Haloragis*, *Polyscias*, *Tacca*, *Leptospermum*, *Barringtonia*, *Drimys*, *Plagianthus*, *Thelymitra*, *Balanophora*, *Artocarpus*, *Elatostemma*, *Aleurites*, *Meryta*, *Maba*, *Melicytus*, *Myroxylon*, *Pennantia*, *Aciphylla*, *Coprosma* and *Breynia*. Most of these are now well-known genera, some of them, such as *Schefflera* and *Elatostema*, large and widespread. A number had been described much better in Solander's manuscripts, but in their haste to publish the Forsters conveniently ignored this probability and thus have had their generic names and themselves as authors permanently imprinted on tropical botany.

Harsh words have been written about the Forsters and their conduct, but in considering this it is essential to distinguish between father and son. Johann Reinhold Forster (1729-1798) went on Cook's second voyage through the lucky chance that Banks did not. Earlier he had taught at the celebrated Warrington Academy for sons of dissenters excluded on religious grounds from the universities of Oxford and Cambridge, which was far from being "a small girls' school" as described by St. John.¹⁴ Here, as everywhere, Forster was his own worst enemy. To quote Beaglehole, "dogmatic, humourless, suspicious, pretentious, contentious, censorious, demanding, rheumatic, he was a problem from any angle,"¹⁵ not least for his unfortunate son George (1754-1794), who wrote in 1787 of "his active mind, his fiery temper, his contempt for money and his perpetual want of it . . . the situation can hardly be imagined where he might be said to be perfectly at his ease and in the enjoyment of real happiness." Nevertheless, Forster was a widely learned, very industrious, and observant scholar and perceptive, too, when his own interests and the characters of his fellowmen were not involved. In his later years at Halle he made important contributions to geographical and anthropological knowledge as Hoare's admirable, well-documented biography makes evident. George was seventeen years

¹³Hoare, 1976, p. 176.

¹⁴St. John, 1971.

¹⁵Beaglehole, II, xlii.

old when he accompanied his father as assistant, having already suffered much hardship, but he had become a skilled draftsman and on the voyage itself he provided numerous excellent drawings of its birds, fish, and plants.¹⁶ So vivid an impression did the isles of the Pacific make upon this highly intelligent, hard-working, sensitive, and artistic lad that years later his reminiscences filled young Alexander von Humboldt (1769-1859) with a burning desire to see and investigate the tropics. He and Humboldt traveled together down the Rhine and from Holland to England in 1790. To the end of his long life Humboldt remembered that journey and mused over his companion's tragic career. In 1846 he wrote that "gifted with refined aesthetic feeling, and retaining the fresh and living pictures with which Tahiti and the other fortunate islands of the Pacific had filled his imagination . . . George Forster was the first gracefully and pleasingly to depict the different gradations of vegetation, the relations of climate, and the different articles of food in their bearing on the habits and manners of different tribes. . . . The companionship I enjoyed on this journey, the sudden passion that seized me for everything connected with the sea, and for visiting tropical lands, all exerted a most powerful influence." That may indeed have been the most important even though indirect long-term scientific result of Cook's second voyage. There is a marked contrast between the meager published results of that and the other two voyages, and of Humboldt and Bonpland's expedition to South America and Central America in 1799-1804, which produced eighteen botanical volumes between 1805 and 1834, i.e. within a comparatively short time after their return to Europe.¹⁷

Apart from his share in the authorship of the *Characteres Generum Planterum*, George Forster published four small botanical works arising out of Cook's second voyage: a thesis at the university of Halle in 1786 *Dissertatio inauguralis botanico-medica de Plantis esculentis Insularum Oceani Australis* (Halle) followed by a bookseller's issue, *De Plantis esculentis Insularum Oceani Australis Commentatio botanica* (Berlin); *Florulae Insularum Australium Prodrromus* (Göttingen, 1786); two papers in *Novi Commentarii Societatis Regiae Scientarium Gottingensis* 9 (1789), i.e., "*Fasciculus plantarum magellicarum*" (pp. 13-24) and "*Plantae atlanticae ex insulis Madeira, Sti. Jacobi, Adscensionis, Stae Helenae et*

¹⁶Begg and Begg, 1968; T. Iredale, "George Forster's Paintings," *Australian Zool.* 4 (1925), 48-53; and Whitehead, 1968.

¹⁷W. T. Stearn, *Humboldt, Bonpland, Kunth and Tropical American Botany* (Lehre: J. Cramer, 1968).

Fayal reportatae" (pp. 46-74). These show how much his botanical knowledge had advanced since the voyage. They describe many species which Banks and Solander had collected on the first voyage but, being published, they have an importance in botanical literature denied to Solander's more thorough but unpublished work.

A number of Forster specimens passed into the hands of the Swedish physician Abraham Bäck and thence to the younger Linnaeus, who described them in his *Supplementum Plantarum* (1781) but attributed them not to the Forsters but to the donor "Eques Bäck."¹⁸ This understandably annoyed J. R. Forster, who inserted an attack on Bäck in George's *De Plantis esculentis* unbeknown to George, when seeing that work through the press; this embarrassed George, who considered his father's action disgraceful, and it has puzzled later authors. The same work contains descriptions of many species based on specimens of Cook's first voyage collected by Banks and Solander. It was printed during the younger Linnaeus's stay in London.

Difficulties with the British authorities created by Forster led him to return to Germany in July 1780, taking his long-suffering family with him. His pig-headedness frustrated the efforts of his friends and alienated others. Unfortunately he had also created in the mind of Cook a hearty dislike for naturalists such as him aboard ship, so different from "the gentlemen" Banks and Solander of the first voyage. No naturalist purely as such was appointed for the third voyage. "Curse the natural philosophers and all science into the bargain" appears to have been the hasty reply of Cook, F.R.S., when questioned whether any naturalist would accompany him on that voyage. Instead, the Scottish surgeon William Anderson (1750-1778),¹⁹ who had been surgeon's first mate in the *Resolution* on the second voyage, had to serve both as the ship's doctor and naturalist on this one, doing that to which Banks, Solander, and Spöring on the first voyage and the Forsters and Sparrman on the second voyage had been able to devote their undivided attention and necessarily doing it not so well. He may be considered the first of a succession of naval surgeon-naturalists.

¹⁸A. W. Exell, "Specimens Attributed to Bäck in the *Supplementum Plantarum*," *J. Bot.* 69 (1931), 227-230; and H. O. Juel, "Notes on the Herbarium of Abraham Bäck," *Svenska Linné-Sällsk. Arrsskr.* 7 (1924), 68-82.

¹⁹J. J. Keevil, "William Anderson, 1774-1778, Master Surgeon, Royal Navy," *Ann. Medical Hist.*, N. S. 5 (1933), 511-524.

Cook's Third Voyage

The track of the third voyage (1776-1780) in the *Resolution* and *Discovery*, unlike the two earlier ones, was predominantly in the North Pacific, for his South Pacific sweeps as far as the Antarctic ice had disproved the existence of the supposed inhabitable great southern continent there, but the Northwest passage remained to be investigated. His route touched the Cape, Kerguelen Island, Tasmania, New Zealand, the Hawaiian Islands, and the northwest coast of North America extending from British Columbia northward into the Bering Strait. It thus included three hitherto unvisited areas, Tasmania, the Hawaiian Islands, and northwest America, with rich interesting floras as potentially fruitful of discovery as those of the earlier voyages. They yielded little for science then. It would be unfair to blame Anderson much for this. On some occasions he was probably too busy with his medical duties and with making zoological and ethnological observations and vocabularies of native languages; on others he may have been too unwell himself and accordingly lacked energy and incentive. He died at sea on 3 August 1778, aged about thirty, a victim of tuberculosis, like Clerke and Vancouver later, and was greatly mourned by his shipmates, for, as Cook wrote, "he was a sensible young man, well skilled in his profession, and had acquired much knowledge in other sciences." His specimens, possibly including many collected for him by the gardener, David Nelson, came eventually into the herbarium of Banks. Had he lived he would probably have published them himself. Nelson made an especially important collection in Hawaii which, although it consisted of only 130 specimens, nevertheless included some sixteen *taxa*, probably all now extinct, described as new by Harold St. John in 1976.

The most interesting of Anderson's finds was the Kerguelen Island cabbage (*Pringlea antiscorbutica* Hooker fil.), a member of the *Cruciferae*, endemic to that remote and desolate island of the southern Indian Ocean. In his journal he remarked that "it has not only the habit but the watery acrid taste and other qualities of the antiscorbutic plants [*Cruciferae*] and yet differs essentially from the whole tribe that we all look'd upon it as a production entirely peculiar to, that place," as it certainly is. Anderson distinguished it as a new genus which he named *Pringlea* in honor of Sir John Pringle (1707-1782), physician general to the British army, the author of a standard work, *Observations on Diseases of the Army* (1752), and President of the Royal Society from 1772 to 1778, with whom Anderson had become acquainted (cf. Britten, 1916). His manuscript '*Genera nova Plantarum*' was never published

and the name *Pringlea* had to await publication until adopted by J. D. Hooker in 1845!

Thus from Cook's three voyages there arrived in London many hundreds of herbarium specimens gathered in the South Atlantic and the Pacific region, together with drawings and manuscripts, which represented many new genera and species but which yielded immediate publication of none, apart from the hastily produced *Characteres Generum Plantarum* of the Forsters. Most of this material became the property of Sir Joseph Banks (created a baronet in 1781). He also received many specimens from elsewhere and they all competed for the attention of his botanist-librarians, in succession Solander, Dryander, and Robert Brown, all hardworking botanists of great ability. After the death of Solander there was no incentive to study and publish the Cook material in preference to other material, especially as the major preoccupation of Solander and then Dryander was the preparation of the first edition of William Aiton's *Hortus Kewensis* (1789), a task requiring great botanical knowledge and scholarship, for which they received little credit. Ker-Gawler wrote in 1823²⁰ that "in the very title-page we see them robbed of the reward of their erudition . . . to give immortality and renown to vulgar ignorance, the names of native dunces being suffered to usurp the place belonging to the genius and talent of another land." The tasks that confronted them were too many and big to receive equal attention. Well-staffed botanical institutions did not exist then; the tradition, stemming from the massive achievements of Ray and Linnaeus, was that of the dedicated worker single-handedly accomplishing all despite other duties. By the last quarter of the eighteenth century, major taxonomic undertakings needed, for their completion within a reasonable time, an amount of collaboration without precedent, and an awareness of this did not become evident until well into the nineteenth century. Thus the failure to exploit fully the potentialities for research resulting from expeditions both then and later was a natural consequence of a lack of enough suitably employed botanists on the one hand, and on the other a lack of the strong imperialist motivation behind, for example, the great floristic works of the Hookers and their associates at Kew in the nineteenth century.

This does not mean that the specimens gathered on Cook's three voyages remained unstudied. Banks's library and herbarium conveniently placed for visitors at Soho Square in London were open for consultation by all interested persons, British and foreign alike, who wished

²⁰ *Botanical Register*, 9 (1823), sub. t. 729.

to use them; the literature of the period abounds- in references to them. Among those who found in the Banksian herbarium many undescribed species, which they later described and published, were the younger Linnaeus, Joseph Gaertner, Olof Swartz, Robert Brown and Augustin Pyrame de Candolle. Later, after the Banksian herbarium had passed into the keeping of the British Museum, J. D. Hooker consulted the Cook voyage specimens from New Zealand and Tierra del Fuego, R. J. Lowe those from Madeira, and George Bentham those from Australia. Botanists interested in the plants of these areas continue to consult them. The recent creation of a large national park in the Cooktown area of Queensland, Australia, is directly linked to awareness of its scientific and historic importance through association with publications based upon the specimens collected here in 1770 by Banks and Solander on Cook's *Endeavour* voyage.

Results and Influence

The influence of Cook's voyages on botany was also far-reaching in an indirect manner. He charted the way that others could follow. Thus, although Cook's landing in 1778 at Nootka Sound on the island later to bear the name of his midshipman Vancouver then gave no botanical results worth mentioning, he had established its position. Culnett came to Nootka in July 1787, thereby providing his surgeon Archibald Menzies with the opportunity to botanize there. Menzies came again in 1792 with Vancouver, now captain of the *Discovery*, and botanized further. His collections contained many species then new to science, later described from his material, among them *Chamaecyparis nootkatensis*, *Disporum smithii*, and *Pyrola picta*.

The participation of Banks in Cook's first voyage of discovery had an especially important effect, because it led him, as the influential president of the Royal Society, to establish the tradition that exploring ships of the British Royal Navy should carry a naturalist, usually a medical man, to make biological collections and observations. This tradition stemmed from Linnaeus, who had encouraged and helped his students to voyage abroad as naturalists. Thanks to this, Archibald Menzies sailed aboard the *Discovery* with Vancouver (who had twice sailed with Cook); Robert Brown on the *Investigator* with Flinders; Charles Darwin on the *Beagle* with FitzRoy; Joseph Hooker on the *Erebus* with Ross; and T. H. Huxley on the *Rattlesnake* with Stanley. Such voyages proved of great scientific importance, not simply for the valuable collections amassed but also for the opportunities they presented to the re-

ceptive and creative minds of those naturalists for observing the diversity and variation of living creatures in many different regions of the world and for thinking about their morphology and their distribution. It was not coincidental that the two doughty champions of the theory of evolution, Huxley and Hooker, had spent formative years on those voyages like Darwin himself. Cook set high standards of navigation and surveying for those who served under him and for those who followed him. The naturalists who sailed with him and after him manifested like standards of excellence in their work of collection and observation. Thereby they honored that great naval tradition associated with Cook and directly and indirectly made contributions to biology as far-reaching in their detail and influence as were his to the geography of the Pacific region.

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