

Botanical collecting in the central Pacific Ocean region, Part II

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This article is a continuation of Gardner (2007), which summarized botanizing activities in the central Pacific Ocean region up to the year 1800. One correction to that article is also noted. Part II covers the nineteenth century up to the 1870s.

The first important nineteenth century expedition of discovery in our region was made under the command of Louis Isidor Duperrey. His second-in-command, Jules Sébastien César Dumont D'Urville, was also the official botanist, and was to be assisted by surgeons Prosper Garnot and René Primavere Lesson. Their ship the *Coquille* sailed from Toulon in 1822. They passed through the Tuamotus and the Societies, and went on past Niue and Rotuma without landing. France was regained in 1825. D'Urville, with Bory St Vincent and Adolphe Brongniart, wrote the three botanical volumes relating this expedition's work. The part concerning the flowering plants (Brongniart 1829–34) has fine illustrations of a number of grasses, including *Digitaria setigera* from the Carolines, *Garnotia stricta* from Tahiti, *Lepturus repens* from Borabora and the Carolines, *Microstegium glabratum* from Borabora, and *Pennisetum macrostachyum* from Buru I. in the Moluccas.

D'Urville commanded the next French expedition, and in the same ship, but with this renamed *Astrolabe* in memory of La Pérouse. The younger brother of R. P. Lesson, P. A. Lesson, sailed as assistant-surgeon and naturalist, along with J. R. C. Quoy and J. P. Gaimard. The expedition left Toulon on 25 April 1826, to reach King George Sound in southwestern Australia on 7 October 1826 and then Sydney in early December 1826. They sailed from Sydney on 17 December, and after spending some time in New Zealand headed north, to sight Eua and Tongatapu on 16 April 1827. The *Astrolabe* was nearly lost on the reef of the latter island, but got free and a stay was made there for several weeks. The expedition left Tongan waters on 20 May, to pass through first the small islands southeast of Viti Levu, and then Koro, Ngau, Kandavu, Vatulele and Malolo, between 26 May and 11 June 1827. The expedition went on westwards, making a visit to Vanikoro to collect the relics of La Pérouse. Marseilles was regained on 25 March 1829.

D'Urville published a 5-volume account of the expedition, and there were two volumes of botany, one by Achille Richard and the other by Richard and Lesson. In the section *Sertum Astrolabianum* of this second volume which deals with floras other than that of New Zealand, no Fijian plants are listed, but there is a list for Tonga, which includes a number of

grasses: "*Cenchrus echinatus*, *Eleusine indica*, *Digitaria sanguinalis*, *Panicum ...*, *Oplismenus burmanni* (sic), *Saccharum officinale* " (Richard 1833–4, p. viii).

The collections from D'Urville's voyage are at P. A few D'Urville and Lesson collections from Tonga are cited by Hemsley (1894), but no Fijian collections, apparently, were made.

The voyage of the *Blonde*, commanded by Captain George Anson, Lord Byron, had as its melancholy purpose the bearing home of the bodies of the Hawaiian king and queen, who had died of measles during their trip to London. It also carried a botanical collector, James Macrae, in the employ of the Horticultural Society of London. On the homeward journey the *Blonde* made a day's stop at Mauke in the Cook Islands, on 9 August 1825, an island already with a London Missionary Society presence. Byron's account of the trip (1826) contains only the most general notes on vegetation, and does not mention whether any plants were collected on Mauke. In his preface he states that the few notices the book contains on botany are due not to Macrae but to Andrew Bloxham, brother of the chaplain of the *Blonde* "who, if not a learned naturalist, deserves the praise of a diligent and sensible collector". The Mauke collections of these two botanists, if any, are likely to be at BM.

George Bennett, an Englishman who settled in Australia to become that country's best-known amateur naturalist, made a number of extensive sea voyages in his youth. He had qualified as a surgeon in Glasgow in 1828, but is occasionally mistakenly described as a missionary, probably because his first voyage to the Pacific was made in the ship *Tuscan*, on a survey of Wesleyan mission stations in the Southern Hemisphere. His journal notes, as they appear in the compiled account of that voyage (Montgomery 1831), indicate that the *Tuscan* called in very briefly at Mangaia, Atiu and Rarotonga in June 1824, but no mention is made of any collecting there.

In 1830 on another voyage Bennett made a brief stay on Rotuma Island. In an article and a later travel book (Bennett 1832; Bennett 1860: 386–92) he described something of the island's vegetation and flora, though giving no details about any specimens obtained. St John (1954) said that Bennett's "small and incidental" plant collection was lodged at B (Botanisches Museum Berlin-Dahlem) but he would be referring to George Bennett's (younger ?) brother Frederick Debell Bennett, who himself set

out in 1833 on a Pacific voyage, also on the *Tuscan*; he did not however visit our region of interest (cf. Miller 1970). George Bennett's material from Rotuma, if any, is probably at BM, K or LINN.

The second expedition commanded by Dumont D'Urville was made in the ships *Astrolabe* and *Zélée* and carried the naturalists J. B. Hombron, H. Jacquiot and É. Le Guillou. Departure was made from Toulon in 7 September, 1837. After hazardous adventuring towards the Antarctic they turned northwest to traverse the Marquesas and the Societies. They then entered Samoan waters, and visited the Manu'a islands and Tutuila, and then anchored at Apia on Upolu on 25 September 1837. The ships left Apia on October 2, passed between Apolima and Savaii, and sighted Vava'u in Tonga on October 4. Four days were spent there, then the ships sailed south to the Ha'apai islands group, where they anchored on the north side of Lifuka. Leaving there, they passed Kao and Tofua on October 12 to enter Fijian waters on about October 14, where they made coastal explorations and short shore visits until 29 October. After exploring among Melanesia and the Caroline Islands, and sailing south to Adélie Land in Antarctica and then to New Zealand, they turned for home, to gain their home port late in 1840.

According to Smith (1979), Fijian collections from this voyage, very few in number and mostly if not entirely from Ovalau, are mainly at P, with scattered duplicates elsewhere.

D'Urville was killed in a railway accident before the account of the voyage was written. Two volumes on the botany of the expedition appeared but they have no relevance to the central Pacific region.

The United States Exploring Expedition, often called the Wilkes Expedition after its commander, the tireless but unsympathetic Lieutenant Charles Wilkes, marked a major advance in our knowledge of the natural history of the Pacific. There were six vessels in this expedition, its flagship being the *Vincennes*, a former sloop-of-war. Wilkes's objectives were to chart the large areas of the Pacific Ocean now being regularly entered into by American whalers, sealers and merchants, and to carry out a range of scientific activities. To the latter end, a number of naturalists, geologists and artists were carried, the botanical work being done by Charles Pickering, William Dunlop Brackenridge and William Rich.

The *Vincennes* (other ships have a slightly different chronology) reached Samoa on 7 October 1839, at Rose Island. Tutuila was reached on 11 October, and surveys were carried out here and on Upolu, Manono and Sava'i until 10 November, when departure was made for Sydney. After exploring southwards and returning to Sydney, the expedition touched on New

Zealand at the Bay of Islands, then sailed past Raoul Island (known then to English-speaking mariners as "Sunday Island") in the Kermadecs. Tongatapu and Eua were reached on 24 April 1840. Departure was made from Nuku'alofa in the former island on 4 May.

Fijian collections were made during three months between early May and mid-August 1840. A popular account of the expedition, including its chronology, is Viola and Margulis (1985), and a more scholarly one, detailing for example the complications in the publication of the results, is that of Stanton (1975). Collections of some quality and abundance were made in Tonga, Samoa and Fiji: "On looking over the botanical specimens on the day of departure [from Fiji], Brackenridge, now recovered from the fever that had laid him low for many weeks, was pleased to discover that six hundred species had been collected and preserved" (Stanton 1975: 213).

Unfortunately, there was much delay in working up the botany, and the specimen labelling cannot now be entirely relied on. Rich proved inadequate to his task, having done nothing "but smoke cigars & tell Stories during the Expedn" (John Torrey, quoted by Stanton, 1975). Eventually, Wilkes was prevailed upon to engage Asa Gray, who in 1854 produced a partial account of the flowering plants. Published as the fifteenth of the Expedition's scientific volumes this confirmed Gray's reputation as America's premier botanist. A corresponding Atlas of illustrations was produced in 1856. A volume on ferns was produced by Brackenridge in 1854, and another volume by Gray, on a miscellany of lower plants, appeared in 1874. The rest of Gray's account of the flowering plants (including the grasses) was never published but his manuscript remains at GH (Gray Herbarium, Harvard University).

The U.S. Exploring Expedition collections, which seldom if ever bear the actual collector's name, are to be found at US (U.S. National Herbarium, Smithsonian Institution) and GH, with duplicates at K, P, NY (New York Botanical Garden) and probably elsewhere (Smith 1979).

The voyage of the "Venus" under the command of Captain Abel Aubert Dupetit-Thouars, in 1836–1839, reached Mangaia in the Cook Islands on 21 September 1838 and Rarotonga soon after, before going on to New Zealand. If collections were made by naturalist Adolphe Néboud in the Cooks they are probably now at P.

The long surveying expedition of H.M.S. *Sulphur* left England in December 1836. It began under the command of Captain Frederick William Beechey, but because of sickness he was replaced at Valparaíso by the commander of the second vessel, Captain Edward Belcher. Naturalists on board were George Barclay, botanical collector, and Richard Brinsley

Hinds, surgeon. From the Societies, they reached Rarotonga on 14 May 1840, where they landed in the morning and stayed until the afternoon of the next day. They moved on to Vava'u in Tonga and overnighted there on 21 May. They then passed into Fijian waters on May 27.

No collections from the *Sulphur* voyage appear to be known for Rarotonga. For Tonga, Hemsley (1894) indicates that there are a moderate number of *Barclay* specimens, at BM. It seems that all the Fijian collections were made on the islet of Nukulau. Collections from both Tonga and Fiji are deposited at BM, with some duplicates at K.

In a preliminary botanical account of the voyage Bentham (1843) noted Barclay's Tongan collections, including a few common grasses. Hinds contributed an appendix to Belcher's account (1842;1843); it consists of a series of descriptions of the vegetation in various regions of the world, mostly without species names or detailed localities.

It can be pointed out that Hemsley (1894: 167) refers to collections having been made in Tonga, when they cannot have been. Firstly, he says there is material got by Banks & Solander — this would have to refer to Cook's Second or Third Voyages. Secondly, he says that K contains Tongan specimens collected by "James Macrae, who travelled for the Horticultural Society of London, 1824–26 [voyage of the *Blonde*]"; this might refer to specimens from Mauke, or perhaps from Hawaii. Thirdly, he says that K contains "a small number labelled 'Beechey', who was Captain of H.M.S. *Blossom* 1825–1828". The voyage of this latter vessel (naturalists Lay and Collie) passed from Societies directly to the Hawaiian Islands without visiting any part of central Oceania, so perhaps the reference is to the *Sulphur* voyage.

Vegter (1976) contains an entry for the English collector Andrew Matthews (d. 1841), indicating that he collected from Tonga as well as from the Societies and the Marquesas. The voyage concerned is that of H.M.S. *Seringapatam* (Waldegrave 1833), which in 1830 called in at Tongatapu and Vava'u. Hemsley (1894: 167) cites a number of specimens and gives the date 1841 for them, which is presumably the year they were donated. The Matthews (or "Mathews") collections, which are sometimes labelled merely "A. M.", are said to be mostly at K.

Captain Sir James Everard Home, a British naval officer commanding H.M.S. *Calliope*, was stationed in the Pacific region from 1841 or '42 until his untimely death in Sydney in late 1853. According to his own account (Home 1853) he was present in Samoa and Tonga in 1844 (probably for the first time). In the second half of 1852 he took a peacemaking voyage through the central Pacific, calling in for various times at Tonga (Tongatapu, Vava'u), Samoa (Upolu),

Fiji (Ovalau, Moala, Viwa, Viti Levu (Rewa town), Ovalau again, Vanua Levu (Sandalwood Bay and inland to Bua), back to Ovalau, Tongatapu again, then Niue, Futuna, and then (after an interval of several days), Rotuma.

Specimens collected by Home from Tonga are mistakenly cited by Hemsley (1894:167) under the year "1851". Some from Fiji are cited in Seemann's "Flora Vitiensis" (1865–73) though Home is not mentioned in the introductory notes to that work. In the first publication on the plants of the Wallis & Futuna Islands, Seemann (1864) cited Home's collections as all coming from Uvea. This was repeated by Smith & St John (1971), and by Morat & Veillon (1985). The latter authors point out that although Home (1853) mentioned visiting only Futuna, one of his specimens comes from a (named) locality on Uvea.

Home is known also to have collected in China, Timor, New Caledonia, Norfolk Island and New Zealand. His modest number of collections are mostly at BM, though others (duplicates ?) are known from K and elsewhere.

In 1852, H.M.S. *Herald* under Captain Henry Mangles Denham left for what was to be a nine years long surveying expedition in the central and western parts of Australasia and the Pacific. On board as naturalists were John Macgillivray, who had made two previous voyages to this region, and William Grant Milne, plant collector. Macgillivray, a rough diamond but a good observer and the keeper of a copious journal, was the prospective author of a narrative account of the expedition, but part way through the voyage, in Sydney, he was dismissed, and it is only recently that such an account (David 1995) has appeared.

Relevant to the central Pacific region are the collections Macgillivray and Milne made in a number of the Fijian islands, in September–November 1854, June 1855–February 1856, and June 1856–February 1857. According to Smith (1979) these are mainly at K, with occasional duplicates at BM (at least for Macgillivray). Note that a collection of *Bikkia tetrandra* by Milne from "Futuna" was cited by Seemann (1865–73) and St John and Smith (1971), but this would have come not from the Wallis and Futuna Islands but from Futuna I. in the New Hebrides.

William Henry Harvey, an Irish botanist who became Professor of Botany at the University of Dublin, made an extended world trip in the mid-1850s. An avid collector, Harvey was preeminent in the study of marine algae (and would go on to produce an account of the Wilkes Expedition algal collections), but he knew land-plants well too, having spent six years at Cape Town working on the South African flora.

According to the letters he wrote on this trip (Ducker 1988) Harvey left Sydney early in the second half of 1855, to visit first Tongatapu (arriving there on July 27th), then Lifuka and Vava'u. He then made a short visit to Fiji, arriving there on October 15th. In one of these letters he says that on Tonga he devoted himself chiefly to algae, but at Fiji "altogether to the land flora".

Harvey's collections are presumed to be partly at TCD (Trinity College, Dublin), but there is what appears to be a complete set of the Fijian material at BM, with some duplicates at K and GH (Smith 1979). A few instances of his Tongan plants are cited by Hemsley (1894).

Berthold Carl Seemann, a German who worked first as a gardener at Kew, obtained the post of naturalist on HMS "Herald" and made voyages to South America and the Arctic. He was selected by W. J. Hooker, Director at Kew, to accompany a British Government Mission being sent to Fiji to consider the proffered cession of those islands. Seemann was told to take particular note of the economic prospects that Fiji's plants presented. The visit, which took in numerous of the Fijian islands during a stay of 6 months, began propitiously on May 14 1860 at Lakemba, when Seemann and his assistant Jacob Paul Storck collected a bag of 50 species.

Seemann wrote two popular accounts of his visit and then, between the years 1865 and 1873, produced (by subscription, since government assistance was not forthcoming) his magnificent *Flora Vitiensis*. He consulted the Banks and Solander specimens and Solander's manuscript "Flora of the Society Islands" and also saw other Polynesian and Melanesian collections in BM and K; these materials are often cited in his footnotes. Seemann's first set of specimens is at K, with a good duplicate set at BM; some specimens are at GH, P and elsewhere (Smith 1979).

Jacob Storck stayed on in Fiji, becoming a planter and keeping up his scientific interests and collecting, though in fairly irregular fashion (Smith 1979). He died in Fiji in 1893. A biographical note (Anon. 1907) implies that specimens of his might well be found at BRI, K, MEL, BR and US. It also states that: "To Mr Storck belongs the credit of introducing the China bamboo [*Bambusa vulgaris*] into Fiji, which has now spread all over the islands ...".

Eduard O. Graeffe, a Swiss zoologist, was employed by Hamburg's merchant-trading firm Godeffroy and Sons, who had their own Museum (and Journal). He travelled for some years in the central Pacific, between Wallis and Futuna, Samoa, Fiji, Tonga and possibly elsewhere. Collections of his from Uvea and Viti Levu, made in 1862, are the subject of a list by Seemann (1864), and he is known to have collected

on Futuna in 1866 and 1867 (Morat & Veillon 1985). In 1865, Graeffe was in the first party to cross Viti Levu (Boyd 1920; Graeffe 1986) and on the first evening, at the island of Nukumoto on the Rewa River, this group enjoyed the company of Jacob Storck "who even at that early period was engaging in cultivating imported plants of economic value" (Boyd 1920). The collections Graeffe was making on this trip, unfortunately, had to be abandoned because of the fear of a raid by rebel Fijians from Bau (Boyd 1920).

For Tonga, Hemsley (1894: 167) cites Graeffe material collected "about 1862". Graeffe's Samoan collecting dates remain obscure, and unfortunately some specimens seem to have muddled labels (Smith 1979: 47). His specimens are to be found at HBG (Institut für Allgemeine Botanik, Hamburg), MEL (Royal Botanic Gardens, Melbourne), K, L (Rijksherbarium, Leiden) and W (Naturhistorisches Museum, Vienna).

The Cook Islands (named by the Russian geographer Krusenstern in 1824) had been known in part from the discoveries made by Cook and Bligh (who discovered Aitutaki in 1789). However, the largest island in this group, Rarotonga, apparently remained unbotanized until some time into the missionary phase of settlement. The first plant collections appear to be those of the Reverend Wyatt Gill, who arrived on Rarotonga in 1852 and went on to Mangaia (Gill 1876). Hemsley (1885) lists without any date seven *Gill* collections from Rarotonga, including the omnipresent grass *Cenotheca lappacea*. These are presumably at K.

Reverend Samuel J. Whitmee of the London Missionary Society began making plant collections in Samoa in the early 1870s, perhaps because of encouragement from von Mueller of Melbourne, whom he visited in 1870. Whitmee and his assistant Frits Jensen also collected elsewhere in the Pacific, but it seems likely that Jensen's "Niue" collections are mostly from Lifou in the Loyalty Is. (Mabberley 1990). There is Whitmee/Jensen material at BM, K, MEL and OXF.

Finally, noted here especially because they are not mentioned by Smith (1979) are two Germans who collected in the 1870s for the Godeffroy Museum: J. Theodor Kleinschmidt, who collected in Fiji, and J. Stanislaus Kubary (Fiji, and perhaps also Samoa and Tonga) Their original collections are at HBG (Chaudri et al. 1972).

Correction

My suggestion (Gardner 2007: 169) that the Forsters collected *Pemphis acidula* on Niue is probably wrong — the only locality associated with their specimens of this plant is Takaroa atoll in the Tuamotu Islands (Nicolson & Fosberg 2004). They must have seen it

two months later during their very brief landing on Niue's rocky west coast, where it is still abundant,

but perhaps were unwilling to risk being speared just for the sake of a plant they already had got.

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Becoming intimate with the Index

Maureen Young

The Auckland Botanical Society Newsletter was first published in December 1943, and in February 1988 the title was changed from Newsletter to Journal. An Index to all the Newsletters was published in August 1991. In June 2000 the Index was updated in Volume 55, covering 1988 – June 2000. By the end of 2007 those members of the Society who find the Journal a useful resource were becoming frustrated by the fact that the 14 issues since 2000 had not been indexed. I offered to take on the job – a simple enough undertaking, I thought. However, as in many of life's endeavours, the simple things have a habit of becoming complicated, and on the suggestion that a comprehensive Index that included all of the Newsletters and Journals be produced, I found that I had a large amount of work on my hands.

Thanks to modern technology, the first step was to scan the two existing indices – so wonderfully quick and easy compared to the drudgery of retyping the

whole lot. I understand that there are intelligent modern scanners that can reproduce what is actually written, but the scanner I used obviously had a lower IQ than this ideal, and it had a particular horror of correctly reading italics. For example, the word "*humifusum*" came out as "JIIIIJlflflsllm", and even interpreting regular font was a struggle. Poor Betty Allen invariably came out as Belly Alien! So the first task was to go through the whole document and change gobbledegook into English (or Latin or Greek).

The second tiresome task was to tackle the numbering. The first index went from 001 to 989. The second index started at no, not 990, that would make things too easy. It also started at 001. Drat! I now had to add 989 to every number in the second index so that the two flowed seamlessly together. But that is easy, I can hear you say – computers have an automatic numbering feature. Well so they do, and I made use of it for the