> encampment. Here likewise grew a shrubby species of Xerotes with hard rush-like leaves, but allied to X.gracilis.[463]

Mitchell sketched his quandong-like shrub, naming it Eucarya murrayana. This plant was long known as Fusanus persicarius, but in recent revisions, Mitchell's name has been restored, so that the Quandong is now Eucarya acuminata and the Bitter Quandong is E.murrayana. Mitchell thus became the first explorer, apart from Cunningham, a professional botanist, to name and publish, albeit without the traditional Latin description, a native plant. Also on the Murray, he

> found a very beautiful, new, shrubby species of cassia, with thin papery pods and...the most brilliant yellow blossoms...I would name it C.heteroloba.[464]

Lindley accepted this, and the plant was so named, although it proved to be synonymous with Cassia eremophila which had precedence. Similarly, Mitchell named Pelargonium rodneyanum,

> which would be an acquisition to our gardens. I named it...in honour of Mrs. Riddell at Sydney, grand-daughter of the famous Rodney.[465]

On this expedition, Mitchell made his usual prophecies concerning the economy of the new country. He felt that the "quandong nut" and "gum acacia may in time, become articles of commerce"[466] and "having brought home specimens of most of the woods of the interior", Mitchell felt

> that several of the acacias would be valuable for ornamental work, having a pleasing perfume resembling that of a rose. Some are of a dark colour of various shades, and very compact; others light coloured and resembling in texture, box or lancewood...Specimens of these woods may be seen at Hallet's, No. 83, High Holburn.[467]

Mitchell had the usual hazards of bad weather, difficult terrain and constan negotiation of rivers to endanger his notes and specimens. He recorded the

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463 Mitchell: Three Expeditions, II, pp.100-1. Lindley named this Xerotes effusa, the Scented Mat-rush, now known as Lomandra effusa.
464 Mitchell: Three Expeditions, II, p.122.
465 op.cit., II, p.144.
466 op.cit., II, p.137. Mitchell may have been pleased to learn that "in time", Quandong fruits came into favour for jam and jelly, and the nuts were used for Chinese Checkers by a more recent generation. The Acacias became more noted for their tanning bark than for gum.
467 op.cit., II, p.137.

> valuable...services of the aborigines, who accompanied the party...They could strip from a tree...a sheet of bark, large enough to form a canoe ...By this means alone, most of our effects were transported across broad rivers—without any accident, even to any of my papers or dried plants.[468]

Returning to Sydney in November, 1836, Mitchell paid a tribute to Richardson's "indefatigable industry." The Surveyor-General also referred to the "long service in the cause of science" of this "old man"[469] and in January 1837, a conditional pardon was granted.[470] Mitchell himself applied for leave, sailed for England in May 1837 to see his journals through the press, and did not return to Sydney until 1841. With his own Survey Department working on an emergency depression budget, Mitchell shortly had the additional frustration of seeing his old rival in the field once more — a situation he quickly sought to match.

However clearly the general drainage pattern of N.S.W. had emerged, the nature of the centre of the continent remained a mystery. Not only the plant and animal life of the antipodean continent presented quaint paradoxes, but even its geography did likewise. Sturt felt that the Murray, "noble river" though it was, "seemed to have been misplaced, through such an extent of desert did it pass..."[471] Sturt, who had destroyed Oxley's thesis of an inland sea, now held the view that the far interior of the continent, beyond the Darling, "was occupied by a sea of greater or less extent, and very probably by large tracts of desert country."[472] This was surely a safe prediction in such a land of paradoxes.

Having acquainted Lord Stanley and his old patron, Sir Ralph Darling with his plan, Sturt obtained permission to organize an expedition which included a gunsmith, Daniel Brock, as collector, and John Harris Browne as surgeon.[473] The armchair explorers in London made some modifications to Sturt's proposals[474], but the advance party left Adelaide on 10 August 1844.

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468 op.cit., II, p.336.
469 Richardson was then 39, and five years Mitchell's junior. Apparently he was prematurely grey or stooped.
470 RAHS Newsletter, No. 24. Apr. 1964, p.3, article by A. J. Gray.
471 C. Sturt: Narrative of an Expedition into Central Australia...Lond., 1849, Vol. I, p.12.
472 Sturt: op.cit., I, p.32.
473 The expedition comprised 16 men, 11 horses, 30 bullocks, boat and boat carriage, carts, drays, dogs and a flock of sheep.
474 Sturt: op.cit., I, pp.56-7.

Sturt called at Moorundi to see Edward John Eyre, who accompanied the expedition along the Murray into New South Wales.[475] Sturt encountered a "sea of scrub" comprising plants which were "chiefly salsolaceous,"[476] and "trees and shrubs of the usual kind", with "a good deal of spinifex"[477] and "oat-grass."[478] The scene was in places happily relieved by "the amaryllis, then beautifully in flower".[479] Sturt had entered the shrub steppe of the blue-bush country around Lake Victoria.

Leaving the Murray with "its fine trees and grassy flats", Sturt followed the Anabranch, near which "there were sandy undulations covered with stunted cypress trees[480] or low brush", before following the Darling proper with its "box-tree flats"[481] and River Red Gums. On the Darling flats were found "numerous herbs, as spinach, indigofera, clover, etc. all indicative of a better soil."[482] Following the Darling through mulga and belah country towards Laidley's Ponds (Menindee) Sturt noted

> barren plains covered sparingly with salsolae[483] and atriplex[484]...sandy ridges covered with stunted cypress trees,[485] acaciae,[486] hakeae[487] and other similar shrubs

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475 Eyre would probably have led this expedition had Sturt been unable to do so. Eyre's own plan for exploring the centre provided for a "surgeon and naturalist" and a "painter and botanist". Eyre to Stanley, 22 Aug. 1844, HRA, XXIV, pp. 51 et seq.

476 Sturt: op.cit., I, p.89.

477 Sturt: op.cit., I, p.95. Porcupine Grass or Spinifex, Triodia irritans

478 e.g. Themeda sp.

479 Murray or Darling Lily, Crinum flaccidum, Wilcannia Lily, Calostemma luteum or Garland Lily, C.purpureum.

480 Callitris preissii.

481 Black Box, E.largiflorens, "the Gobero of Sir Thomas Mitchell" (Sturt).

482 Spinach or Warrigal Cabbage, Tetragonia tetragonioides and T.eremaea; Indigofera, perhaps Indigofera australis or Swainsona greyana; Clover--hardly, at this stage Trifolium sp. or Medicago sp. but probably Menindee Clover, Trigonella suavissima or Austral Trefoil, Lotus australis.

483 either Roly Poly, Salsola kali or chenopodiaceous plants generally--Atriplex spp., Bassia spp., Kochia spp., etc.

484 Saltbush.

485 Callitris preissii.

486 e.g. Mulga, Acacia aneura.

487 e.g. Needlewood, Hakea leucoptera.

which "proved...that the productions of (the country) were as unchanged as the soil."[488] Sturt was still some 45 miles south of Laidley's Ponds when, on 1 October 1844 he noted

> Our specimens, both of natural history and botany, were as yet very scanty; but we found a new and beautiful shrub in blossom on some of the plains...[489]

Crossing the mulga and saltbush country between Laidley's Ponds and "Stanley's Barrier Range", Sturt found a "good deal of grass" at first, "mixed with salsolaceous plants"; there were plains of "atriplex and rhagodiae",[490] with some trees including "a new species of casuarina"[491] and "a new species of caparis" (sic).[492] He also found the plant which is still associated with his name:

> we saw that beautiful flower the Clianthus formosa, in splendid blossom...It was growing midst barrenness and decay, but its long runners were covered with flowers that gave a crimson tint to the ground.[493]

At Parnari waterhole[494]

> there were some beautiful plants...we had previously met with so few things that we might here be said to have commenced our collection.[495]

Proceeding north to Flood's Creek, Sturt noted that "low bushes of rhagodia and atriplex were alone to be seen" at first, but later some "beautiful specimens of Solani and a few new plants." On the sand ridges were found pines,[496] "several very beautiful leguminous plants", hakeas and saltbushes. Reclimbing the Barrier Range, Sturt found clematis and jasmine.[497] At Flood's Creek Sturt was pleased to see his stock

> up to their knees in luxuriant vegetation. We there found a native wheat, a beautiful oat, and a rye, as well as a variety of grasses; and in hollows on the

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488 Sturt: Central Australia, I, p.119.
489 Sturt: op.cit., I, p.119. Sturt made many such general references whic are useless for determining species--e.g. "several species of very pretty and fragrant flowering shrubs" (p.149); "New" for Sturt, and other explorers, meant simply that he had not noticed it before; there is no scientific implication.
490 salsolaceous plants, rhagodia and atriplex, i.e. saltbushes.
491 Belah, Casuarina cristata or Bull Oak, C.luehmanni.
492 probably Wild Orange, Capparis mitchelli, or Hepine, C.lasiantha.
493 Sturt: Central Australia, I, p.155. Sturt's Desert Pea, Clianthus formosus.
494 on Stephen's Creek, 13 miles from Broken Hill.
495 Sturt: op.cit., I, p.165.
496 probably White Cypress, Callitris hugelii.
497 probably Clematis microphylla and Jasminum linearc.

STANLEY'S BARRIER RANGE: Mulga, Acacia aneura and saltbush on the Barrier Range, nine miles east of Broken Hill.
Photo.: L. G., Aug. 1968.

PARNARI WATERHOLE: It was at this camping place on Stephens Creek, 13 miles from Broken Hill, that Sturt in 1844 discovered "some beautiful plants...we had previously met with so few things that we might here be said to have commenced our collection." Plants now in the vicinity include: Pop Saltbush, Atriplex spongiosa; Cassia eremophila; Nightshades, Solanum ellipticum and S.sturtianum; Sida virgata; Warrigal Spinach, Tetragonia tetragonioides and Pussy Tails, Ptilotus incanus.
Photo.: L. G., Aug. 1968.

> plains a blue or purple vetch not unusual on sand ridges, of which the cattle were very found.[498]

Sturt made a collection of the fast-ripening grain on the Flood's Creek grasses, and crossed the mulga plain between this oasis and the Noonthorangee Range. He moved north, in fearful daytime temperatures to Rocky Glen on Preservation Creek near the present site of Milparinka. On the way, near Mt. Arrowsmith, surgeon Browne rode towards "some hills on our left...to collect some seeds of a purple Hibiscus."[499] Sturt was concerned that the "collection of natural history still continued scanty."[500] A new Grevillea, recognised

> from its habit...had taken the place of the gum-trees on the creeks, and the jasmine was everywhere common, but with the exception of a few solani and some papilionaceous plants, we had nothing either new or rare.[501]

Depot Glen on Preservation Creek, with "macadamized plains on either side" was an oasis in a land where "nothing but rhagodia and atriplex flourished." The cypresses had disappeared, and

> the brush consisted of several kinds acacia, casuarina, cassia, and hakeae, and these were more bushes than shrubs, for they seldom exceeded our own height.[502]

A new Grevillea[503] was collected, but excepting this, "we added nothing to our botanical collections."[504]

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498 Sturt: op.cit., I, pp.205-6. Probably Mitchell Grasses, e.g. Astrebla lappacea, A.pectinata or A.elymoides; Oat Grasses, e.g. Themeda australis or T.avenacea; or Spear Grasses, e.g. Stipa variabili The 'vetch' was probably Swainsona sp., e.g. S.phacoides or S.stipularis

499 Sturt: Central Australia, I, p.232. Either Sturt's Hibiscus, H.sturtii or Sturt's Rose, Gossypium sturtii.

500 Sturt: op.cit., I, p.232.

501 op.cit., I, pp.232-3. The Grevillea was Beefwood, G.striata; Jasmine, Jasminum lineare; Solani, Nightshades, e.g. Solanum sturtianum, S.ellipticum, S.chenopodium, and S.ferocissimum. The papilionaceous plants included Bird Flowers, Crotalaria cunninghamii, C.dissitiflora, and Swainsona greyana, S.laxa et al spp.

502 op.cit., I, p.251.

503 probably Grevillea juncifolia.

504 op.cit., I, p.259. Shortly after Sturt "found a beautiful little kidney bean...amongst the grass. It had a yellow blossom, and the seed was very small and difficult to collect, as it appeared to be immediately attacked by insects. Sturt: op.cit., I, p.262.

STURT'S PRESERVATION CREEK

STURT'S DEPOT GLEN flanked by vertical strata of slate. The permanent waterhole which sustained Sturt and his party for six months in 1845 is in the bed of Preservation Creek, seen through the trees (E.camaldulensis). The underground room was beside a dry tributary to the right of the area shown in the photograph.

WESTERN BEEFWOOD, Grevillea striata marked by Sturt's party to locate James Poole's grave. The obelisk was later erected beside the tree, and inscribed: "To the memory of James Poole seccond (sic) in command of Sturt's Exploring Party died here on the 16th of July 1845." The other monuments commemorate James Sherbrooke Cell, d.1 July 1882, 26 years; Mary (Winnie) Fuller, d.1 July 1922, 40 years; and Carlyon Murray Fuller, d.16 Nov. 1924, 11 years 8 mths. The latter two were the wife and son of Murray P. Fuller.

Photos. L. G., about 10 m. N.W. of Milparinka, Aug. 1968.

STURT'S PRESERVATION CREEK

Right: Western Beefwood, Grevillea striata beneath which James Poole was buried in July 1845. The early settlers used this tough slow-growing species for fence posts and shingles. This particular tree has apparently changed little in the last 120 years.

Photo.: L. G., Aug. 1968.

Below: Probable site of Sturt's underground room on a short dry tributary of Preservation Creek, near Depot Glen waterhole. Holes for rafters to support a roof are still discernible, and the remains of a fireplace may be seen on the left of the excavation. Sturt had a fireplace built to comfort the scurvy-stricken Poole in his last illness. Plants in the vicinity of Sturt's camp include Gidgee, Acacia cambagei; Cassia sturtii and C.phyllodinea; Blennodia trisecta; Eremophila goodwinii and E.freelingii; Heliotropium asperrimum; Crowfoot, Erodium cygnorum and Everlastings, Myriocephalus stuartii.

Photo.: L. G., Aug. 1968.

From January to July, 1845, Sturt remained a virtual prisoner, albeit a very active one,[505] at Depot Glen, the only place where there was sufficient water for his men, horses, bullocks, sheep and dogs. Searches for other water sources usually confirmed the same impression:

> [a] terrible place... [with] a few acacias...some straggling melaleuca, with hakeae and one or two other common shrubs, all of low growth; there was no grass, neither were the few herbs that grew on the hollows such as the horse would eat.[506]

Other plants were also noted.[507]

Signs of scurvy became evident among the leaders who habitually went on these excursions — Sturt, Poole and Browne. Sturt was

> anxious for the reappearance of vegetation, in the hope that we should be able to collect sow-thistles or the tender shoots of the rhagodia (sic)...We had, whilst it lasted, taken mint tea, in addition to the supply of tea to which we were obliged to limit ourselves, but I do not think it was wholesome.[508]

When preparing his journal for the press, Sturt recalled that at Lake Victoria, an aborigine had given George Davenport, one of the servants

> a large quantity of the fruit of the Fusanus, of which he made an excellent jam, too good to keep; but if we could have anticipated the disease by

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505 Almost continuous sorties were made in various directions by Sturt, John McDouall Stuart (draftsman), James Poole (2 I/C) and Robert Flood (stockman) to see whether further penetration of the interior were possible.

506 Sturt: op.cit., I, p.276, 23 miles north of the Depot. The Melaleuca was probably White or Black Tea Tree, M.glomerata or M.pubescens. Well did Sturt's wife comment, "But how Charles & his party get over the Hot & trying Season in an unknown region remains still a mystery to us." Note by Mrs. Sturt on her husband's letter of 26 Oct. 1844, Sturt Papers, ML. FM4/21.

507 e.g. a Mesembryanthemum "of a new variety, with flowers on a long slender stalk, heaps of which had been gathered by the natives for the seed." (sic) Pigface, Disphyma australe. It is inconceivable that "this is probably the first reference to 'nardoo'". (J. H. L. Cumpston: Charles Sturt, Melb., 1951, p.127). A grass, used as food by the natives, "'Panicum laevinode' of Dr. Lindley", (i.e. Native Millet, Panicum decompositum). "In the richer soil, a plant with roun striped fruit...of very bitter taste, a species of cucumber, was growing..." This was probably Ulcardo Melon Cucumis melo var.agrestis. It was unlikely at this time to have been the Paddy Melon, C.myriocarp from S. Africa.

508 The mint tea would have been from Wild Mint growing along the Murray and Darling, Mentha australis and/or M.diemenica and/or M.satureioides

STURT'S PRESERVATION CREEK

Right: Sturt made reference to a number of trees cut down around Depot Glen during the six months' enforced stay. The timber of some of the trees was used to repair the heat-shrunken wheels of the drays. This is one of several roughly-cut stumps in the vicinity of the Depot Glen water-hole. The tree is River Red Gum, E.camaldulensis.

Photo.: L. G., Aug. 1968.

Below: Mt. Poole (left background) still has part of Sturt's cairn of stones intact. The line of trees marks the course of Preservation Creek. Depot Glen is behind the rise in the left middleground; Poole's grave is beside the creek in the area shown on the extreme right of the photograph. Sturt's "macadamized plains" can be appreciated in the foreground.

Photo.: L. G., Aug. 1968.

> which we were afterwards attacked, its preservation would have been above all price.[509]

As it was, scurvy claimed Sturt's assistant, James Poole,[510] and Sturt attributed his own ultimate recovery on the return journey, to Browne's collecting "a large tureen full" of "a small acid berry" used as food by the aborigines.[511]

Released from Depot Glen by rain in July 1845, Sturt made two more northern sorties. One took him into the notorious Sturt's Stony Desert, and the other to Cooper's Creek,[512] and despite the rather terrifying conditions of these journeys, more plants were noted around Fort Grey and beyond.[513] Charles Sturt finally retreated, feeling that "a veil hung over Central Australia that could neither be pierced or raised", even by one who

> had run the Castlereagh, the Macquarie, the Lachlan, the Murrumbidgee, the Hume, the Darling and the Murray down to their respective terminations.[514]

Having launched into Preservation Creek the boat which he "vainly hoped would have ploughed the waters of a central sea",[515] Sturt retired to the Darling, and arrived back in Adelaide on 19 January 1846. Part of his dichotomous prediction was naturally enough realised:

> It is true that I did not find an inland sea as I certainly expected to have done, but the country as a desert was what I had anticipated, although I could not have supposed it would have proved of such boundless extent.[516]

Sturt's claim, "I pretend not to science, but I am a lover of it",[517] was shown to be something of an understatement during this trying expedition. Birds remained for him a chief interest, and the small desert marsupials also intrigued him, but he was aware that, despite its appearance,

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509 Sturt: Central Australia, I, p.100. One of the earliest references to Quandong jam from Eucarya acuminata.
510 Poole died while being taken south, and was buried at Depot Glen on 17 July 1845, beneath a Western Beefwood, Grevillea striata which is still (1968) growing. See photographs on pp.119,120.
511 Sturt: Central Australia, II, pp.108, 115. This was the Ruby, Barrier, Sturt or Berry Saltbush, Enchylaena tomentosa. See photograph on p.124.
512 also known as the Barcoo (E. B. Kennedy) or Victoria (T. L. Mitchell).
513 e.g. "a new melaleuca" (perhaps Broombush, M.uncinata); "a new Bauhinia" (Bean-tree, B.carronii); Samphire, Pachycornia tenuis.
514 Sturt: op.cit., II, p.2.
515 op.cit., II, p.101.
516 op.cit., II, p.129.
517 op.cit., I, p.ii.

PLANTS ASSOCIATED WITH CHARLES STURT

STURT'S DESERT PEA: "We saw that beautiful flower the Clianthus formosa, in splendid blossom...It was growing amidst barrenness and decay, but its long runners were covered with flowers gave a crimson tint to the ground."[518]

Photo.: L. G., between Wilcannia and Menindee, Aug., 1968.

STURT'S SALTBUSH: "Mr. Browne had found a large party of natives...He had observed some of them eating a small acid berry, and had procured a quantity for me in the hope that they would do me good, and...he good-naturedly went into the hills and gathered me a large tureen full, and to the benefit I derived from these berries I attribute my more speedy recovery from the malady under which I was suffering."[519]

Photo.: L. G., Menindee, Aug., 1968.

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518 Sturt: Central Australia, I, p.155. The plant is now known as Clianthus formosus. Cunningham named it C.dampieri.

519 Sturt: op.cit., II, pp.107-8. This is the Berry, Sturt, Barrier or Ruby Saltbush, Enchylaena tomentosa.

the interior did, after all, provide sustenance for his numerous stock. He also appreciated the accelerated life-cycles of the plants of arid areas. Despite tremendous hardships, he returned with botanical material which included valuable type specimens. Sturt was proud to acknowledge his "esteemed friend Mr. Brown"[520] who examined the collection. Brown found "about one hundred species", and he considered that

> Captain Sturt and his companion, Mr. Brown [e], seem to have collected chiefly those plants that appeared to them new or striking, and of such the collection contains a considerable proportion.[521]

In new genera, Brown found the collection "greatly exceeds the much more extensive herbarium, collected by Sir Thomas Mitchell in his last expedition As might be expected, some species could not be identified because of "the incomplete state of the specimens."[522] Brown supplied descriptions and names of the species he believed were new to science,[523] the first published accounts of botanical discoveries made in the arid mulga, saltbush and bluebush shrub steppe and savannah country of far western New South Wales.[524]

Having seen his journals through the press in 1838, and obtained a knighthood in 1839, Sir Thomas Mitchell returned to Australia in 1841, and immediately found his Department sadly reduced by economic depression. In 1843, he presented to Sir George Gipps a plan to seek "a good overland route between Sydney and the head of the Gulf of Carpentaria," in order to avoid the dangerous Torres Strait in maintaining communication with England, then "already connected...by steam navigation." To Mitchell's annoyance, Gipps referred the proposal to Lord Stanley, Secretary of State for the Colonies, and

> much time was thus lost, and, what was still worse, the naturalist to whom I had explained my plan, Dr. Leichardt.[525]

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520 Sturt: Central Australia, I, p.v.
521 Sturt: op.cit., II, Appendix, p.66.
522 ibid.
523 See Appendix V.
524 After a short period as Colonial Secretary of S.Aust., Sturt's eyesight again began to fail. In March 1853 he left for England where he died 16 June 1869.
525 T. Mitchell: Journal of an Expedition into the Interior of Tropical Australia in search of a route from Sydney to the Gulf of Carpentaria, Lond. 1848, p.4. I.e. Mitchell also "lost" the services of Leichhardt who led his own expedition to the north in 1844.

The urgency of the project was increased beyond measure when "it became known...that Captain Sturt was employed, with the express sanction of Lord Stanley" on an expedition "into the northern interior...and that he was actually then in New South Wales".[526] Gipps, "at length assented, in 1845," to the recommendation of the Legislative Council that Mitchell's plan should be implemented, and on 17 November 1845, a sizeable expedition left Parramatta to be joined at Boree by the Surveyor-General on 13 December. Edmund Kennedy was second in command, and William Stephenson was "Surgeon and Collector of objects of Natural History."[527] Mitchell once more followed the Bogan, meditating on the loss of Richard Cunningham ten years earlier, but not mentioning the grave marked by Lieutenant Zouch:

> The little pyramid of bushes was no longer there, but the name of Cunningham was so identified with the botanical history of almost all the shrubs in the very peculiar scenery of that part of the country, that no other monument seemed necessary...The shrubs told indeed of Cunningham; of both brothers, now dead; but neither the shrubs named by the one, nor the gloomy casuarinae trees that had witnessed the bloody deed, could tell more. There the Acacia pendula, first discovered and described by Allan, could only
>
> 'Like a weeping mourner stooping stand
> For ever silent, and for ever sad.'[528]

There were stations along the Bogan now, with stockmen and shepherds who spoke of the value of saltbush, and of the practice of cutting "Acacia pendula (or Myall trees, as they call them) for the cattle to feed on."[529] For Mitchell, "the vegetation of the Bogan now recalled former labours: the Atriplex semibaccata of Brown was a common straggling plant."[530] Many other species were noted along the Bogan, including the Burr-daisy:

> Calotis cuneifolia was conspicuous amongst the grass. This was the common burr, so detrimental to the Australian wool. Small as are the capitula of this flower, its seeds or achenia are armed with awns having reflexed hooks scarcely visible to the naked eye; it is these

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526 Mitchell: Tropical Australia, p.4.
527 There were 26 other men, 23 being convicts; 8 drays; 80 bullocks; 2 boats; 17 horses; 3 light carts and 250 sheep.
528 op.cit., p.24.
529 op.cit., p.12.
530 op.cit., p.23. Creeping Saltbush, "one of the native plants graziers are recommended to sow", S. H. Leigh & W. E. Mulham: Pastoral Plants of the Riverine Plain, Melb., 1965, p.49.

that are found so troublesome amongst the wool.[531]

Having made an extensive examination of the Bogan, Mitchell turned north-east towards the Macquarie. Between the rivers he made further botanical discoveries, especially near Duck Creek, where a camp was established:

> The leisure we enjoyed at this camp, enabled us to bestow more attention on the vegetable and animal productions of these remarkable plains, than had been given during my former journey.[532]

Mitchell noted

> that the saltwort plants, which were numerous, were not only efficacious in keeping the cattle...in the best possible condition; but as wholly preventing cattle and sheep from licking clay, a vicious habit to which they are so prone...Our sheep nibbled at the mesembryanthemum, and the cattle ate greedily of various bushes whereof the leaf was sensibly salt...[533]

Stephenson actually boiled leaves of Old Man Saltbush, Rhagodia parabolica to extract the salt, and the plant was found "very useful as a vegetable after extracting the salt sufficiently from it."[534]

Near Marra Creek was noted the Native Willow, Acacia salicina, "whereof the wood has a strong perfume resembling violets."[535] This suggests that Mitchell on this occasion confused the Native Willow or Cooba, A.salicina with Myall or Boree, A.pendula. Shortleaved Saltbush, Kochia brevifolia

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531 Mitchell: op.cit., pp.28-9. 7 Jan. 1846. Cf. Benth.: Fl. Aust., III, p.502, "said to be one of the worst burrs for sheep." Other Bogan plants noted were Roly Poly, Salsola kali; Grey Germander, Teucrium racemosum; Sweet Quandong, Eucarya acuminata; Swamp Lily, Ottelia ovalifolia; Budda, Eremophila mitchelli; Spear Grass, Stipa scabra; Blue or Tall Star Grass, Chloris ventricosa; Lesser Star Grass, C.acicularis; Wire Grass, Aristida calycina; Mulga Grass, Neurachne mitchelliana; Purple Topped Grass, Enneapogon nigricans; Short-leaved Saltbush, Kochia brevifolia; Pussy Tails, Ptilotus obovatus; Native Jasmine, Jasminum lineare; Alternanthera nodiflora; Native Orange, Capparis mitchelli.

532 Mitchell: Tropical Australia, p.52. Species noted included a Groundsel, Senecio cunninghamii; Hakea sp. (perhaps Needlewood, H.leucoptera); "Mr. Stephenson discovered here a very pretty new Trichinium with heads of hoary pink flowers," (Lamb Tails, Ptilotus semilanatus).

533 Mitchell: op.cit., p.53.

534 ibid. where Mitchell describes Stephenson's method of boiling, straining and evaporating "for the purpose of ascertaining the proportion of salt ...in the leaves".

535 Mitchell: op.cit., p.56. Probably the tree Mitchell called "rosewood acacia" was also A.pendula.

and Blady Grass, Imperata cylindrica var. major were also found. Closer to the Macquarie, Mitchell found more grasses,[536] as well as other species.[537] On the Macquarie itself, then "deep, muddy, and stagnant," further discoveries were made, including Wild Tobacco, Nicotiana suaveolens, a daisy, Minuria leptophylla, and "a fine new silvery Atriplex with broad, rounded leaves and strings of circular toothed fruits."[538]

Following the Macquarie to the Barwon, Mitchell crossed it, and "on this northern bank of the Darling we looked for novelty in botany, and found some interesting plants."[539] Not only the ground flora attracted Mitchell's attention:

> There appeared to be much novelty in the trees on this side of the Darling. The Angophora lanceolata was every where; Callitris grew about the base of the hills, and some very singular acacias, a long-leaved grey kind of wattle, the Acacia stenophylla of Cunningham...[540]

Skirting Narran Lake, Mitchell followed the Narran River across the 29th parallel. Both lake and river provided rich collecting fields, and Narran pines were used for bridging a "narrow channel."[541] Among the plants typical of the western landscape noted by Mitchell, as he moved into Queensland, were Bimble Box, E.populnea; Wilga, Geijera parviflora; "the 'Malga' tree of the natives; to the traveller the most formidable of scrubs";[542] Brigalow, Acacia harpophylla;[543] White Cypress, Callitris hugelii;

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536 e.g. Native Millet, Panicum decompositum; Sand Brome Grass, Bromus arenarius; Queensland Blue Grass, Dichanthium sericeum; Brown Top or Sugar Grass, Eulalia fulva.

537 e.g. "a salt plant...perhaps not distict from S(clerolaena) uniflora" (probably Bassia dicantha); Goodenia geniculata; Keraudrenia hookeriana; Burr-daisy, Calotis scapigera; a daisy, Rutidosis helychrysoides; Brunonia australis; Helichrysum apiculatum var.minor; Lignum, Muehlenbeckia cunninghamii (Sturt's "leafless bramble"); Loosetrife, Lythrum salicaria.

538 Mitchell: op.cit., p.64. 18 Feb. 1846. The Atriplex was Old Man Saltbush, A.nummularia.

539 e.g. Groundsel, Senecio cunninghamii; Bluetop, Morgania glabra R.Br.; Everlasting Daisy, Helichrysum bracteatum.

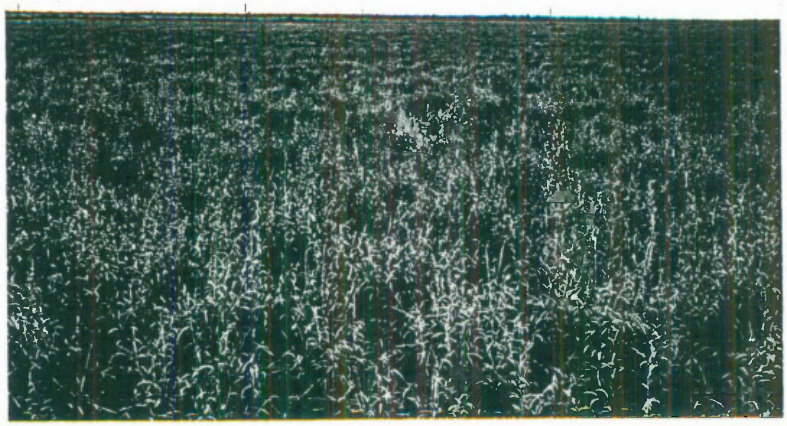
540 op.cit., p.81. Coolabah Apple, Angophora melanoxylon; White Cypress, Callitris hugelii and River Cooba, A.stenophylla. White Cypress still (1968) grows along the southern edge of Narran Swamp.

541 Mitchell: op.cit., p.93. Mitchell's "Callitris pyramidalis" was probably White Cypress, C.hugelii.

542 Mulga, Acacia aneura. Mitchell: op.cit., p.101.

543 "It is much to be regretted, that the specimens gathered...of the brigalow should have been so imperfect that they could not be described. If an Acacia, Mr. Bentham says, it is different from any he knows." Mitchell: op.cit., p.353.

VEGETATION OF THE BARWON RIVER



MITCHELL GRASS PLAINS: Plains near Brewarrina on the Barwon River. The dominant is Mitchell Grass, Astrebla lappacea, one of a number of species which commemorate the explorer in their vernacular names. Tree-lined Barwon River in background.
Photo.: L. G. May 1968.

WOODLAND IN THE COOLABAH AND BLACK BOX COUNTRY: In the left foreground and right middle-ground is Lignum, Muehlenbeckia cunninghamii; the low area in the foreground has small patches of Nardoo, Marsilea drummondii and Bassia sp. The dark tree in the middle background is Currant or Warrior Bush, Apophyllum anomalum, with Wilga, Geijera parviflora to the right.
Photo.: L. G., between Brewarrina and Walgett, May 1968.

NARRAN LAKE, EXPLORED BY MITCHELL IN 1846.

NARRAN LAKE: Bimble Box, E.populnea in foreground; the dead specimen at left has what appears to be an aboriginal 'shield mark'. Some patches of Nardoo, Marsilea drummondii and large quantities of Five-spined Saltbush or Black Roly Poly, Bassia quinquecuspis in dry bed of lake, with Galvanized or Blue Burr, Bassia birchii on the slightly higher ground around the ill-defined shoreline.

WOODLAND AT SOUTHERN END OF NARRAN LAKE: Bimble Box, E.populnea, Mulga, Acacia aneura and White Cypress Pine, Callitris hugelii. It would have been from this species of pine that Mitchell obtained his "sleepers...fourteen feet long" to enable a bridge for the carts to be built across "the narrow channel feeding the swamp."

Photos.: L. G., May 1968.

Quandong, Eucarya acuminata; Mistletoes, Amyema pendula and A.linearifolia; Western Pittosporum, P.phillyraeoides, and "the rare Enchylaena tomentosa...loaded with yellow berries."[544] The latter was the plant to which Sturt had attributed his deliverance from the total effects of scurvy only three months earlier had Mitchell known it.

During subsequent explorations along various Queensland rivers[545] Mitchell's botanical interest never flagged, as he noted many species including several which grew also in New South Wales.[546] Such discoveries do not necessarily indicate that Mitchell never saw these species in New South Wales but rather that he was at last able to procure complete specimens, with flower and fruit and well as foliage, so that descriptions could now be made. The most remarkable Queensland discovery was the Bottle Tree, named Delabechea by Mitchell, and sketched by Kennedy.[547]

Mitchell returned to Sydney by a more easterly route, without having reached the Gulf of Carpentaria. Botanically the expedition had been most successful. Mitchell's entire journal abounds in botanical observations and in descriptions of species believed to be previously unrecorded.[548]

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544 This was the Barrier, Sturt or Berry Saltbush. Other species noted in the Narran area included: Grey Raspwort, Haloragis glauca; Silky Saltbush, Kochia villosa; Cottony Saltbush, K.lanosa; Justicia procumbens; Pussy or Lamb Tails, Ptilotus alopecuroideus and P.obovatus; Native Jasmine, Jasminum lineare; Native Leek, Bulbine bulbosa; Canthium oleifolium; Golden Goosefoot, Chenopodium auricomum; Acacia leptoclada or sp.aff.: Kyllingia brevifolia; Budda, Eremophila mitchelli; Amaranthus mitchelli; Barcoo or Landsborough Grass, Iseilema membranaceum; Needle-grass, Triraphis mollis; Finger or Button Grass, Dactyloctenium radulans; Nepine, Capparis lasiantha; Jointed Cherry, Exocarpos aphylla.

545 The upper Narran, the Balonne, Culgoa, Maranoa, Warrego, Barcoo (Victoria) and Belyando Rivers.

546 e.g. Red Ash, Alphitonia excelsa; Carbeen, Eucalyptus tesselaris; Calandrinia balonensis; Bird Flower, Crotalaria mitchelli; Yakka or Fairy Grass, Sporobolus pallidus (now S.caroli); Acacia conferta; Wild Hops, Dodonaea boroniaefolia.

547 now Brachychiton rupestre.

548 Descriptions provided by George Bentham, Wm. J. Hooker, John Lindley, Prof. de Vriese, to whom Mitchell felt he could not "sufficiently express his sense of obligation". See Appendix VI.

Mitchell himself, William Stephenson and John Waugh Drysdale the storekeeper, did most of the collecting. References to Stephenson in the journal were numerous and friendly. He accompanied Mitchell on botanical excursions, was credited with several discoveries, and read the prayers on Sundays. It was therefore a sorry business when shortly after the return to Sydney, Mitchell had Stephenson arraigned before the court for withholding certain botanical and other biological material. The surgeon-naturalist was found not guilty.[549] In 1847, Mitchell presented to the British Museum "485 plants from New South Wales," apparently collected on this expedition,[550] and in 1852 he sent 160 specimens to the Australian Museum.[551]

The Barcoo or Victoria River required further investigation, and when compiling instructions for Edmund Kennedy to do this work, Mitchell enjoined him to preserve "specimens of the grasses, and of the flower or seed of new trees...with dates, in a small herbarium."[552]

The great "Golden Decade" of the fifties was to pass before the next major expedition traversed the more remote areas of New South Wales. This was the most extravagant, the most ambitious, the most romantic, and the most disastrous of them all. This was the expedition led by Robert O'Hara Burke, still the subject of new researches, publications and assessments. Only the botanical results will be considered here.

The Burke and Wills expedition crossed the Murray at Swan Hill into New South Wales on 11 September 1860, proceeded north to Balranald on the Murrumbidgee, thence to Pooncarie and along the Darling to Menindee,[553] an

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549 For an account of William Stephenson and the trial, see Appendix VII.

550 George Murray: The History of the Collections contained in the Natural History Departments of the British Museum Vol.I Lond. 1904, (Botany Section) pp.89,169.

551 N.S.W. Archives, 4/7577; also JRAHS, 1931, pp.155-6.

552 Mitchell: op.cit., p.410. Instructions to Mr. Surveyor E.B.C. Kennedy, 22 Feb. 1847. Further exploration of the Victoria River and Cooper's Creek were made in 1858 by Augustus Charles Gregory in his search for Leichhardt. Gregory collected some 70 plants during the search, including five which von Mueller described as new. V. & P. Leg.Ass. NSW., 1858-9, 2, pp.4-10 (1859). Gregory however, did not cross into N.S.W.

553 through country characterised by River Red Gum, E.camaldulensis and Black Box, E.largiflorens; by Belah, Casuarina cristata and Rosewood, Heterodendrum oleifolium; by Mallee, E.dumosa and E.oleosa; and by Bluebush, Kochia sedifolia and K.pyramidata.

THE VICTORIAN EXPLORING EXPEDITION, 1860. Personnel marked on this rare photograph are from l. to r.: Ludwig Becker, artist, naturalist and geologist; George J. Landells, the original second in command; Robert O'Hara Burke, leader; Herman Beckler, medical officer and botanist; William Strutt, the artist. There is evidence that Strutt, as well as Beckler, collected plants. This could well be the only photograph of Becker and Beckler. Even in such a sophisticated expedition as this, the difficulties of collecting, drying and transporting botanical material can be appreciated. William Strutt: Burke & Wills Album I, Dixson Library.

outpost already associated with Mitchell and Sturt. At Lake Pamamaroo a depot was established, and the first of the disastrous divisions of the expedition was made when a small party proceeded north through the mulga country to Mootwingee, thence through mulga and saltbush country to Torowoto Swamp, (about 40 miles east-south-east of Sturt's Depot Glen) across the 29th parallel into Queensland. The celebrated depot on Cooper's Creek (the lower section of Mitchell's Victoria River) was established, and from here, Robert O'Hara Burke, William John Wills, John King and Charles Gray made their noble, but ill-advised dash for the Gulf.

The expedition had left Melbourne on 20 August 1860 with Dr. Herman Beckler as medical officer and botanist, and Dr. Ludwig Becker as naturalist, artist and geologist.[554] Neither of them enjoyed an enviable reputation in the opinion of Dr. William Wills, embittered father of the dead explorer,[555] but it is clear that Beckler had been a most energetic collector on the northern rivers of New South Wales before joining the expedition to which he made a commendable botanical contribution.[556]

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554 A.Jackson: Robert O'Hara Burke and the Australian Exploring Expedition of 1860, Lond., 1862, p.12; W. Wills: A Successful Exploration through the Interior of Australia...from the Journals and letters of William John Wills, Lond., 1863, p.95.

555 Dr. Wm. Wills considered that Becker "was physically deficient, advanced in years, and his mode of life in Melbourne had not been such as to make up for his want of youth. I do not mean to imply that he indulged in irregular or dissipated habits. He possessed a happy gift of delineating natural objects with the pencil, but died before passing the boundaries of civilization, from causes unconnected with want or fatigue. Dr. Herman Beckler, who has since returned to his native country, was neither a man of courage, energy, nor of medical experience ..." Wills: Successful Exploration, p.93. This was hardly fair to Becker, who died 29 April 1861 from scurvy, in the Bulloo Stockade, besieged by hostile aborigines! Sir William Denison considered Becker "very odd-looking, with a large red beard," a conjurer, ventriloquist, singer and artist, "a most amusing person, talks English badly, but very energetically...one of those universal geniuses who can do anything; is a very good naturalist, geologist, &c....wild birds will come to him" at his call; "he is very fond of children." W. Denison: Varieties of Vice-Regal Life, Lond., 1870, I, p.170.

556 Bentham acknowledged Beckler as the collector of 773 species in Flora Australiensis. The specimens were from the Richmond, Clarence, Macleay, Hastings and Darling Rivers. See Appendix I. Beckler, despite his industrious collecting activities, resigned at Menindee, and Burke accepted his resignation understanding that Beckler had "positively refused to leave the settled districts" having done "his best until his fears for the safety of the party overcame him." Wills: op.cit., p. 124.

Nardoo, Marsilea drummondii growing in a swamp at Mitchell's Fort Bourke on the Darling River. Meal ground from the sporocarps of this fern sustained the two couriers near Torowoto Swamp and the two leaders at Cooper's Creek during the Burke and Wills Expedition 1860-1861.

Photo.: L. G., May 1968.

Sporocarps of the above Nardoo plants. The aboriginal practice of grinding these for meal to make 'nardoo cakes' was adopted by the abovementioned explorers.

GRAVE OF DOST MAHOMET, a Kashmiri cameleer who died at Menindee (Laidley's Ponds). By an interesting coincidence, the plant with the small berries at the left of the grave enclosure, is Sturt, Berry or Barrier Saltbush, Enchylaena tomentosa to which Sturt attributed his recovery from scurvy.

VIEW FROM DOST MAHOMET'S GRAVE TOWARDS LAKE PAMAMAROO. Burke and Wills established a base at the Lake, around which Herman Beckler collected many specimens. The plant on the right of the grave is Berry Saltbush, Enchylaena tomentosa; the shrubs in the background include saltbushes and Hop-bush, Dodonaea attenuata from which early settlers in the western districts made beer.

Photos.: L. G., Aug. 1968.

The botanical work of the naturalists was kept within fairly limited geographical limits for the very reasons indicated in Ernest Favenc's merciless criticism of Burke's leadership:

> Burke, during the most important part of his journey, left behind him his botanist, naturalist and geologist, and started without even the means...of following up any discoveries he might make. His sole thought evidently was to cross to Carpentaria and back, and be able to say that he had done so — a most unworthy ambition on the part of the leader of such a party, containing within itself all the elements of geographical research...After all the pains and cost expended...we have now the spectacle of the main body, including two of the scientific members, loitering on the outskirts of the settled districts; four men killing time on the banks of Cooper's Creek, and the leader and three others racing headlong across the country ahead...[557]

On 26 January 1861, William Wright led the Menindee party, including Becker and Beckler, north to Torowoto Swamp, and across the border to Bulloo, where Becker died on 29 April. Beckler was required to give relief to two couriers whom he found near Torowoto, "subsisting on about 1 pint of nardoo per day."[558] Here we have a separate instance of adopting the aboriginal use of the sporocarps of Nardoo, Marsilea drummondii, which were ground into meal for cakes. Burke, Wills and King were introduced to this food by the aborigines of Cooper's Creek. Wills recorded in his final notes:

> I am weaker than ever, although I have a good appetite and relish the nardoo much; but it seems to give us no nutriment...starvation on nardoo is by no means very unpleasant, but for the weakness one feels, and the utter inability to move one's self; for as far as appetite is concerned, it gives the greatest satisfaction...but the want of sugar and fat in all substances obtainable here is so great

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557 E.Favenc: The History of Australian Exploration from 1788 to 1888, Syd. 1888, pp.211-12.

558 J. H. Willis: "The Botany of the Victorian Exploring Expedition," in Proc. Roy. Soc. Vic., Vol. 75, Pt.2, 1960, p.252. In this valuable paper, Mr. Willis gave the first comprehensive account of the botanical results, just a century after the actual expedition. Since this paper is so recent, its contents are not repeated here.

that they become almost valueless to us as articles of food...[559]

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559 W. Wills: Successful Exploration, p.303. Entry by W. J. Wills of 29 June 1861—he died a day or so after. Wills also recorded (27 June 1861) that "the portulac...is an excellent vegetable." This would have been Pigweed or Purslane, Portulaca oleracea or P.intraterranea, or Broad-leaved Parakeelja, Calandrinia balonensis of which Mueller wrote, "Aborigines igitur fortasse seminibus ad panem utuntur in modum seminum Portulacae oleraceae." F. Mueller: Fragmenta Phytographiae Australiae, Melb., 1858-1881, X, p.71. ("Therefore the aborigines perhaps use the seeds for bread, in the same manner as seeds of Portulaca oleracea.") This Calandrinia has also been called "Nardoo," but Wills clearly distinguished it from the Nardoo plant which sustained him at Cooper's Creek. Misconceptions concerning Nardoo still persist. e.g. R. L. Heathcote: Back of Bourke, Melb., 1965 p.86 refers to "nardoo grass." Not appreciating at first the source of Nardoo, Wills recorded (10 May 1861): "I went out to look for the nardoo seed for making bread: in this I was unsuccessful, not being able to find a single tree of it...I however, tried boiling a large kind of bean which the blacks call padlu; they boil easily, and when shelled are very sweet, much resembling...the French chestnut..." Wills: op. cit., pp.284-285. This would have been Sesbania aculeata. F. M. Bailey felt that Burke and Wills "might easily have mistaken the spore cases of a Marsilea for the shelled-out seeds of Sesbania." (Proc. Linn. Soc. NSW, 1880-1, p.8). The Rev. Julian Tenison-Woods agreed: "It is hard to suppose that any nourishment would be obtained from the spore-cases of...(Marsilea) or that the natives would use it. Besides this the spore-cases are so few in number." Tenison-Woods believed that Nardoo was Sesbania aculeata. (Proc. Linn. Soc. NSW, 1882-3, p.82). However, there are seasons when the sporocarps of Marsilea drummondii are numerous (e.g. May 1968 in a swamp at Fort Bourke). Wills himself clearly distinguished between "nardoo" and "padlu", and furthermore, John McKinlay "brought back excellent material of the nardoo plant (Marsilea drummondii) which had helped to keep King alive after the deaths of Burke and Wills." (Willis: op.cit., p.251.) Cf. Bentham's note that the plant ranged "over the whole desert interior, the involucres known as a miserable article of food under the name of Nardoo. Gathered by numerous cultivators and cultivated in the Berlin Garden." A. Braun had "distinguished several varieties," which he later "raised...into ten distinct species." Bentham could not appreciate the different minute characteristics upon which such "splitting" was based. Benth.: Fl. Aust. VII, p.684. McKinlay's evidence was amply corroborated by Dr. Thomas L. Bancroft who visited Cooper's Creek in 1893 and learned "that the blacks...still made use of it [i.e. Marsilea] as in the days of Burke and Wills." Bancroft actually witnessed "the gins preparing Nardoo damper" which even "the civilised blacks...were not too proud to make and eat." Proc. Linn. Soc. NSW, Vol.VIII, 1893, pp.215-216. Wills also recorded (7 May 1861): "They (the natives) also gave us some stuff they call bedgery or pedgery; it has a highly intoxicating effect when chewed even in small quantities. It appears to be the dried stems and leaves of some shrub." This was Pituri, Duboisia hopwoodii, used "in the form of dry leaves, more or less powered, mixed with finely broken twigs." (J. H. Maiden: The Useful Native Plants of Australia, Syd., 1889, pp.168-9.)

Practically all of Herman Beckler's plants during this expedition, were collected between the Murray River and the Queensland border. His 475 or so specimens represented about 300 species,[560] which he collected at such points as Balranald, Menindee, Lake Pamamaroo, the Scrope Range, (east of Broken Hill), Mootwingee and Torowoto Swamp. These specimens were sent by river steamer[561] and other means, to Baron von Mueller who published some new species.[562] Disastrous though it was, with graves in its wake from Menindee to Cooper's Creek and beyond, the Burke and Wills Expedition gave the final great fillip to the exploration of eastern Australia. The five search parties[563] virtually completed the business of traversing such large tracts of unknown country which remained. Of these relief expeditions, the two of Alfred William Howitt passed through New South Wales. The first in 1861 had Dr. W. F. Wheeler as surgeon and botanical collector, who gathered little or no material in Beckler's old collecting grounds. In 1862-3, during his second expedition, Howitt had Dr. James P. Murray as surgeon and collector. Murray collected about 130 species, which however, appear to have come chiefly, if not entirely, from south-west Queensland or the north-east of South Australia. Howitt himself also made some collections.[564]

Thus was botanical discovery so closely linked with geographical exploration. The vast collections of plants, both living and dried, amassed from all over the Colony and shipped to England during the half century or so after Macquarie took office, not only satisfied the horticultural

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560 These plants are listed with current names in Willis: op.cit., pp.257-268. Beckler's first new discovery was published in Feb. 1861 in Mueller: Fragmenta, II, p.140 as Kentropsis eriacantha now known as Bassia eriacantha, a species of saltbush.

561 "The collection of plants and a small case, filled with different object of natural history by the late Dr. Becker, will be taken down by the steamer which is now on its way..." Beckler to the Exploration Committee, Menindee, 6 Aug. 1861. Willis: op.cit., p.252.

562 Mueller: Fragmenta, III, 1862-3, passim.

563 under A. W. Howitt, from Melbourne (twice); John McKinlay from Adelaide; Wm. Landsborough from the Gulf; Frederick Walker from Rockhampton.

564 In the Melbourne Herbarium, "there is evidence that during the main expedition and two relief parties under Howitt's leadership, some 708 separate collections of vascular plants were made. At least 393 species are involved--this total, including type specimens of 37 new species and 3 varieties." Willis: op.cit., p.248.

MOOTWINGEE, COLLECTING PLACE OF DR. H. BECKLER, 1861.

BURKE AND WILLS found permanent water in the rocks at the head of the dry watercourse shown on the left. Dr. Herman Beckler collected about 20 species here, including three type specimens upon which new species were founded.

DR. HERMAN BECKLER referred to this collecting place as "Mootwanji" and "Mutwanji." Bentham recorded this as "Mutanie Ranges" in Flora Australiensis. Mootwingee was a favourite camping ground of aborigines whose paintings and rock intaglios have made the place most important ethnologically.

Photos.: L. G., Aug. 1969.

THE KOONENBERRY MOUNTAINS, where Dr. Herman Beckler collected botanical material during the Burke and Wills Expedition. View looking east from the Tibooburra Road, 123 miles north of Broken Hill, across the vast saltbush plains.

Photo.: L. G., Aug. 1968.

THE DARLING RIVER AT MENINDEE (Laidley's Ponds). This section of the Darling was associated with Mitchell's exploration of the river in 1835, with the central Australian expedition of Sturt, 1844-1846, and with Burke and Wills's northern Australian expedition of 1860-1862. The banks are lined with River Red Gum, E.camaldulensis supported by Black Box, E.largiflorens further from the water.

Photo.: L. G., Aug. 1968.

curiosity of nurserymen and their influential clientele, but also provided[565] the basis of the taxonomic botany of New South Wales. Between 1810 and 1820 this material was chiefly channelled to England through the King's Botanist, the Colonial Botanists and obliging Governors. Most of it found its way to the Banksian herbarium, which later passed into the personal possession of Robert Brown, and then to the British Museum where it remained in Brown's care. After Banks's death, both Brown and Dr. John Lindley, appointed Professor of Botany at London University College in 1829, showed a keen interest in botanical material from New South Wales. From 1841, when Sir William Jackson Hooker brought his own collections[566] to Kew on becoming Director, the demand for herbarium specimens, as well as for living plants, from New South Wales increased.

The botanical work of the explorers here considered, was at first limited in its impact by lack of scientific communication, or by the lack of use of those media which were then available for the dispersal of knowledge. Thus the President of the British Association for the Advancement of Science told a meeting at Oxford in June 1847:

> Systematic botany is constantly receiving additions to the number of species.
>
> With respect to new species of plants received only in the state of specimens for the Herbarium, they have been in part obtained from China, South America, and New Zealand, but chiefly from Australia. The late expeditions into the interior of that great continent — expeditions so creditable to the enterprise, perseverance, and intelligence of their conductors — have, however, been but little productive, so far as we at present know, in the department of botany...nor is its (i.e. New Holland's) botany without distinctions of much interest, though as yet very imperfectly explored. It may be said, however, in reference to the results of these later expeditions, which have penetrated further inland, that they have not brought to our knowledge any peculiarities in the vegetable kingdom, so various and so striking as those which exist near the coasts, and which are sufficient to distinguish New Holland and the Australian colonies from the other regions of the world.[567]

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565 when taken with the classic Banks-Solander collections of 1770, and material collected by Brown and other workers in the foundation years of settlement.

566 these were purchased by the Government in 1866. W. B. Turrill: The Royal Botanic Gardens, Kew, Lond., 1959, p.49.

567 Address by Sir R. H. Inglis, in The Sydney Guardian, Vol.I, No.1, 1 June 1848.

A week or so after this address was delivered, a vessel sailed from Bremen for South Australia carrying a young chemist, Dr. Ferdinand Mueller. When Governor Latrobe, on Sir William Hooker's recommendation, appointed Mueller the first Government Botanist of Victoria in January 1853, a new era of Australian botany began. For the ensuing forty-three years Mueller was the acknowledged leader of botanical science in Australia, and it was he who lent thousands of specimens[568] collected by explorers and others, to George Bentham so that the immense amount of somewhat amorphous material then stored partly in Australia, partly on the Continent, but chiefly in England, could be systematised. So successful was this enormous undertaking that by the time Burke and Wills, leaders of the last major expedition to pass through New South Wales, were lowered into their common grave in January 1863, Bentham had already examined the printer's proofs of part of the first volume of his Flora Australiensis.[569]

As stated at the outset, the explorers put their botanical knowledge, however elementary, to practical use in the field. The actual collecting of specimens, virtually insisted upon since Earl Bathurst's Memorandum of 1816, was a more academic pursuit which doubtless caused many an explorer to curse the armchair organizers who so glibly ordered the collection and preservation of such perishable material, and the preparation of coloured drawings to show how the plants appeared in their living state. Yet there were profitable sidelines if one were astute enough to appreciate the horticultural possibilities of new botanical discoveries. Nurserymen and gentlemen gardeners, both within the Colony and in England, were no less appreciative of the botanical curiosities of the Antipodes than the worthy patrons, superintendents and directors of Kew, or the influential figures within the British Government itself.

It seems likely that these same instructions of Earl Bathurst led some to a more thorough understanding of the nature of their duties as explorers. Mitchell was certainly one who took his botanical duties ever more seriously, partly because of a real interest in the bush, and partly because in scientific discovery he saw the means of enhancing his chances of

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568 many of the actual specimens used by Bentham are still preserved in the National Herbarium, Melbourne.

569 see Charles Daley's paper in The Victorian Naturalist, Sept. 1927, p.130.

wider recognition. The foregoing evidence makes it clear that whether the explorers' botanical work was willingly and wittingly performed or not, it is upon their pioneer collections and observations that Australian field botany and botanical taxonomy are based, and in this same work are found the beginnings of Australian plant geography and ecology.

The story of Australian exploration has been written and re-written; it continues to attract the attention of historiographers and novelists. In this chapter the story has been told yet again, but this time as botanical exploration. It was but a short, and logical, step from appreciating what grew, to what grew where, and why it did so. Such questions Wentworth, Oxley, Sturt and Mitchell had recognised and had attempted to answer.[570] With the spread of settlement these questions became more

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570 e.g. Wentworth referred to changes in the vegetation as arising "most probably from some alteration in the substratum." Wentworth: Journal of a Journey across the Blue Mts. ML. C122. Oxley: "It would seem that particular productions of the vegetable as well as of the mineral kingdom run in veins nearly north and south through the country. This peculiarity has been remarked of other plants, besides the species of banksia." In his Statistical Account (1824), I, p.230, Wentworth expanded one of Oxley's references to geological formations by quoting some "judicious observations" from the Quarterly Review wherein it was pointed out that the "meridional distribution" was not confined to rocks, "but was equally noticeable in the trees and shrubberies, the same species and the same kind of grouping into clumps or thickets, being constantly observed to take place on the same meridian, and to differ on different meridians." The relationship between landforms, soil and vegetation had been seen, but it was yet to be learned after permanent settlement over a wide area, that the isohyets also follow a roughly "meridional" pattern. Sturt: "Whilst prosecuting my researches in the interior...I could not but be struck with the apparent connection between its geology and vegetation; so strong, indeed, was this connection, that I had little difficulty, after a short experience, in judging of the rock that formed the basis of the country over which I was travelling, from the kind of tree or herbage that flourished in the soil above it...The strong line that occasionally separates different species, and the sudden manner in which several species are lost at one point, to re-appear at another more distant, without any visible cause for the break...will furnish a number of interesting facts in the botany of New South Wales." Sturt: Two Expeditions, I, pp.xxx-xxxi. Mitchell: "I found, that these scrubs of casuarinae grew generally on rising grounds, and chiefly on their northern or eastern slopes. We saw little of the callitris tribe, after we had crossed the first hil beyond our last camp on the Nammoy." Mitchell: Three Expeditions, I, p.70. Mitchell tended more to observe how plants were distributed rather than to suggest why they were so, but this does not detract from his ability as an observer.

significant and attracted more attention, together with that other all-important question: of what particular significance were these plant discoveries to the settler, squatter and selector? Or, as one observer put it,

> The grand object of practical enquiry, is not what the learned may be pleased to call any object; but the use to which plain men can apply it, as conducing to domestic comfort, or commercial profit.[571]

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571 (Robert Mudie): The Present Picture of Australia...Lond., 1829,p.117.