

# ***This disastrous event staggered me: Reconstructing the botany of Ludwig Leichhardt on the expedition from Moreton Bay to Port Essington, 1844-45***

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**Abstract:** Ludwig Leichhardt had to abandon a large and important collection of botanical specimens during his Expedition from Moreton Bay to Port Essington. Here we attempt to assess the significance of the lost collection by identifying the botanical references in his detailed published journal from the journey. From Leichhardt's description of the plants and their habitats, and with our accurate knowledge of current distribution, it has been possible, in most cases, to identify his botanical references to a single species. In other cases there is lower degree of certainty. Well over one hundred of the species recorded in Leichhardt's journal would have been new to science at the time if specimens had survived. The record does identify some potential locations for species that would represent range extensions and suggests an indigenous status for a number of plant species that were previously considered exotic. Certainly Leichhardt was a talented botanist and his significant contribution to Australian natural science should be recognised.

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## **Introduction**

Ludwig Leichhardt, the German-born explorer of Australia in the 1840s has evoked a mixed reaction from historians and biographers. In the most recent and scholarly biography *The dauntless explorer*, Colin Roderick (Roderick 1988) has largely restored his character from previous aspersions and highly commended his exploratory achievements. Roderick's version of the record contrasts sharply with that of the accomplished ornithologist Alec Chisholm (Chisholm 1955) who championed the contribution of John Gilbert, Leichhardt's travelling companion and fellow naturalist. Gilbert is portrayed as a highly capable man of faultless integrity in contrast to the incompetent, deceitful and egotistical Leichhardt. In the preface to *Strange new world*, Chisholm's character assassination extends to Leichhardt's contribution as a naturalist: *One variant* [from the previous edition] *is a modifying of my tribute to Leichhardt's botanical work. His results, I am told by a leading botanist were "infinitesimal (sic) compared with those of Mitchell and certain other explorers" and the wonder is that so many plants were given his name.* Leichhardt may not have fulfilled his potential but commentators now regard Leichhardt as an extremely capable botanist who made a substantial and underrated contribution to the development of botanical knowledge in Australia (e.g. Barker and Barker 1990; Dowe 2005). In this paper we provide a more detailed examination of Leichhardt's contribution as a botanist during his most significant exploratory achievement, the Expedition from Moreton Bay to Port Essington.

## **Leichhardt's botanical background**

The Leichhardt family was of poor rural stock and did not have the money to provide education for their children. However, the intellectually gifted Ludwig was able to obtain a formal training through the generous patronage of the family of his English friend William Nicholson. He took full advantage of the opportunity and was obviously a diligent student at various institutions in Göttingen, Berlin, London and Paris between 1832 and 1841. The education gave Leichhardt grounding in anthropology, philosophy, comparative religion, languages and medicine, but his focus was on the natural sciences, including zoology, geology and botany. Probably the most important component of his formal botanical training was undertaken at the Jardin des Plantes in Paris under the tutelage of the distinguished botanical scholar Adrien Jussieu. Adolphe Brongniart, of the same institution, trained him in palaeobotany and Leichhardt later collected fossils and wood samples for him while in Australia.

Leichhardt arrived in Sydney in February 1842 and spent his first two and a half years travelling the recently settled areas between Sydney and the Moreton Bay district (now south-east Queensland), avidly devoted to the study of natural history. His interests were broad, encompassing geology, meteorology, palaeontology, anthropology, zoology and botany, and his journals and letters are a rich source of observations and thoughtful insights into the natural world.

Leichhardt had access to the limited botanical texts of relevance to Australia including the first seven volumes of

De Candolle's (1823–1873) *Prodromus systematis naturalis regni vegetabilis*, Robert Brown's (1810) *Prodromus florae Novae Hollandiae et insulae Van Diemen* and Endlicher's (1836–1841) *Genera Plantarum* (Arousseau 1968, p. 697, 876, 878, 905). In the company of his newly found friend and patron, Lieutenant Robert Lynd, Leichhardt engaged in extensive field-work and plant collecting and soon developed a thorough working knowledge of the Australian flora. For a while, he planned to produce (with Lynd) a Flora of Sydney (Arousseau 1968, p. 493, 513, 591). Leichhardt was obsessive and energetic, and his prodigious output of physical collections (botanical specimens, seeds, timbers, rocks, bones, fossils etc.) and his written observations on a wide range of topics, was only sustained by working '...from 7 in the morning until midnight' (Arousseau 1968, p. 778).

### The Port Essington Expedition

Leichhardt's first major expedition from Moreton Bay to Port Essington in 1844–1845 (Fig. 1), is regarded as one of the great Australian exploratory journeys and was diligently chronicled by Leichhardt in a widely read published journal (Leichhardt 1847a). The permanent members of the expedition were Leichhardt, John Gilbert an ornithologist sponsored by John Gould, John Roper, James Calvert, emancipated convict William Philips, an 18-year-old John Murphy and two Aborigines, Harry Brown and Charley Fisher. The party employed packhorses and bullocks to carry supplies and provide fresh meat. The journey took 14 and a half months, far more than the five to six months predicted by Leichhardt before the journey started. The mode of travel was almost always dictated by concerted efforts to locate a campsite where water was close at hand (McLaren 1996). To avoid haphazard travel for all the men and animals, a suitable campsite for the next night was located (usually by Leichhardt and one of the Aborigines) before the party at large proceeded. Hence campsites were often spaced within half a days travel. While scarcity of water was the main factor that slowed their progress, there is no doubt that the journey was also prolonged by Leichhardt's obsessive thirst for natural history. The party regularly stayed more than one day at a campsite, and at times there seemed no compelling reason other than to allow Leichhardt adequate time for botanical studies.

Leichhardt exhibited great leadership and fortitude on the expedition (Roderick 1988, McLaren 1996). He described his onerous personal duties in a letter to his friend and botanical agent Gaetano Durando:

*I was not the easy traveller, who has everything at hand, and can pay all his attention to botany. I was everything, leader of the party, bullock driver, having to load, and unload 3 bullocks sometimes several times during the day. All the cares of such a position were upon me, all the anxieties during difficulties and dangers. The arrangement of our camps, the serving out of our provisions, the killing of our*

*bullocks, the mending of the harness, the carrying on of my log, the daibook of my route, determining the latitude and longitude, and the nightly watches.—You will easily imagine, that even allowing I did my best, a man given entirely to one occupation could have done much more.* (Arousseau 1968, p. 869).

In a later letter, Leichhardt provided more detail of his botanical method:

*On my Expeditions almost every one assists in collecting plants and objects of natural history; but those who are not versed in botany will only take the most showy objects; I myself look out for the less conspicuous but perhaps equally interesting. Every 3–4 weeks I unite the dried specimens into families and the latter into sections, which enables me to compare and throw away those specimens, of which I have accumulated beyond the fixed number. I cannot go on ad infinitum in collecting, for my means of carriage are very limited.—Nor can I pay attention in drying, for every one of us has plenty to do besides.* (Arousseau 1968, p. 969).

His efforts appeared to yield substantial dividend as his botanical collection expanded.

*The length of time 14 ½ months enabled me to render the collection very perfect, as I remained long enough within the two Floras (that of the Eastern Interior, and that of the Gulf of Carpentaria, and of Arnheim' land) to see the flower, the fruit and seed of almost every one.—As my collection increased, I surrounded the different packages with green hide, which when dry, formed a fine box round them, and protected them from the hard usage to which they were exposed* (Arousseau 1968, p. 869).

As supplies dwindled, the loads were substituted with the biological specimens of Leichhardt and Gilbert. In the final stages of the journey the small number of remaining packhorses and bullocks were in poor health and in the last quarter of the journey on the Roper River a disaster struck. Three horses were drowned and then two days later another horse suffered the same fate. Without the means to carry the load, Leichhardt sacrificed the bulk of his plant collection. The loss of the specimens was a great tragedy for Australian botany and very exasperating for the passionate Leichhardt.

*This disastrous event staggered me, and for a moment I turned almost giddy; but there was no help. Unable to increase the load of my bullocks, I was obliged to leave that part of my botanical collection which had been carried by one of the horses. The fruit of many a day's work was consigned to the fire; and tears were in my eyes when I saw one of the most interesting results of my expedition vanish into smoke. Mr. Gilbert's small collection of plants, which I had carefully retained hitherto, shared the same fate. But they were of less value, as they were mostly in a bad state of preservation, from being too much crowded. My collection had the great advantage of being almost complete in blossoms, fruit, and seed, which I was enabled to ensure in consequence of the*



**Fig. 1.** Route of the Port Essington Expedition with major rivers, current place names and the geographic sections used in this paper identified. The Moreton Bay district is currently the area of south-east Queensland around Brisbane. The journey sections included in the text are 1. Condamine, 2. Dawson, 3. Comet-Mackenzie, 4. Peak Downs-Isaacs, 5. Suttor, 6. Burdekin, 7. Lynd-Mitchell, 8. Eastern Gulf of Carpentaria, 9. Western Gulf of Carpentaria, 10. Arnhem Land plateau, 11. Top End lowlands.

*long duration of our expedition, and of the comparative uniformity of the Australian Flora.* (Leichhardt 1847a, p. 445)

The letter to Durando gave more heart-wrenching detail.

*For the time came, when I had to open all my fine green hide boxes, to make a poor choice of the dried plants, and to throw the greatest number of them away unable to carry them any farther, as 4 of my pack horses drowned, and the means of carrying my collection of plants and geological specimens were consequently destroyed. I fully lost by this 4–5000 specimens* (Arousseau 1968, p. 869–870).

### The fate of the remnant collection

Bell (2004) suggested that Leichhardt's collections from the early part of the journey were sent back with Hodgson and Caleb who turned homeward from 'Dried Bullock Creek' on November 4 1844. While it does seem logical that Leichhardt would have sought to offload specimens, we could find no record of such a transaction in any journals of Leichhardt, Gilbert or Hodgson, nor have we located any specimens where the collecting date corresponds with this section of the Port Essington Expedition.

It is clear from Leichhardt's letters (Arousseau pp. 870, 899, 906, 968, 969, 983, 994) and notebook (Leichhardt 1842–1847; p. 47–48) that some portion of the plant collection from the Port Essington Expedition was retained and sent to Durando in Paris. Durando apparently passed the specimens on to Joseph Decaisne (Muséum d'Histoire Naturelle, Paris) who later reported that Leichhardt's specimens were 'too badly damaged for exact study' (Arousseau 1968, p. 1064).

Leichhardt requested of his friend Durando that a set of duplicates from his remnant Port Essington Expedition collection be sent back to him in Australia (Arousseau 1968, p. 906). Durando evidently did send back specimens to Australia, as some now reside in NSW and MEL.

We currently know only of 36 plant specimens from the Port Essington Expedition in Australian herbaria (Table 1). We have also gleaned an additional 16 citations of specimens that may reside in European or Australian herbaria (Table 1). It seems likely that numerous Port Essington Expedition specimens may yet be found in the Paris Herbarium, but as yet there has been limited investigation.

### Reconstructing the Botany

Because of the lost specimens the only possible means of reconstructing the botany of the Port Essington Expedition is through the pages of Leichhardt's journal. In this study we have attempted to provide current botanical names for the plant species that Leichhardt described in his journal during the 1844–1845 expedition. This effort to attribute botanical

names to the plants recorded in his journal is offered as a small tribute to Leichhardt's largely unrecognised botanical achievements.

We have used the 1847 edition of the Journal from the Port Essington Expedition, edited by Captain Phillip Parker King rather than the journal prepared by Leichhardt on his return to Sydney in 1846, although there appears to have been little editing of the botanical material from the original. References to plants were extracted from the journal, including any information that was useful to assist in the ascription of the plant to a current name including information on habit or habitat and co-occurring species. The current geographical distribution of Queensland plant species, as approximated by the Queensland Herbarium specimen database (HERBRECS), was a particularly useful aid in confirming (or otherwise) the postulated identity of species. There are only a few areas where the authors have revisited Leichhardt's route, so this study is mostly reliant on knowledge of the flora at regional scales. We have used published sources to assist in our determination of species, wherever possible. The journals of Leichhardt's second expedition (Bunce 1979, Sprod 1989) sometimes shed light on species observed during the Port Essington Expedition. Jackes (1990) attempted to identify some of the plants recorded by Leichhardt during a short section of the Port Essington Expedition, near the Mitchell River in north Queensland where John Gilbert was speared. Bell (2004) has ascribed Leichhardt's plant descriptions for the Condamine leg of the journey. Where our ascriptions disagree from these previous studies, a footnote is provided.

The expedition has been divided into 11 geographical sections generally relating to major river catchments or geomorphic units. At the start of each section, a summary description is provided using the context of modern place names with a brief description of the environments or habitats through which the party was travelling. McLaren (1993) was used to determine the route of the Port Essington Expedition and the location and timing of the camp-sites.

Individual plant references in the journal are only ascribed the first time they appear in each geographic section. The journal dates of subsequent references to the same plant are included as footnotes where the plant has been first ascribed in the text. This method considerably reduces the length of this paper, avoiding considerable repetition but allows the reader to readily identify all plant references in the journal at the scale of the geographical section. For example in the Condamine section, 'Bricklow' is ascribed as *Acacia harpophylla* the first time the name appears. There is a footnote at this ascription providing the dates of the 12 subsequent references to 'Bricklow' during that section. This system is applied for each leg, such that Bricklow is reidentified as *Acacia harpophylla* the first time the name appears during other geographic sections with footnotes to the subsequent references to that species during that section. If Leichhardt uses two names for the same species then each of those names are separately ascribed. Where a generic

or common name provided by Leichhardt has a different identity at another location we have reinterpreted subsequent uses of the name. For example, he applied the name 'rusty gum' to *Corymbia aureola*, *C. bleeseri*, *C. bloxsomei*, *C. bunites*, *C. curtipes*, *C. leichhardtii*, *C. peltata*, *C. pocillum*, *C. terminalis*, *C. trachyphloia* and *C. watsoniana* at various locations.

Where there is no reasonable doubt as to the identity of a taxon, the contemporary botanical name is provided without qualification. Where there is a minor doubt as to a species identity we preface the identification with 'probably' and where uncertainty is considerable we use the

preface 'possibly'. Where ascriptions could refer to more than one taxon, they are ordered from most likely to least likely, but where there are four or more species that could correspond to Leichhardt's reference, only the genus name is given (e.g. *Dodonaea* sp.). We have not ascribed family-level descriptions (e.g. 'chenopodiaceous plants'). We have not generally provided a rationale for our ascriptions as this would have resulted in a considerable expansion of an already lengthy paper. Species nomenclature follows that currently used by the Queensland Herbarium and the Northern Territory Herbarium in 2005.

**Table 1. Records of Leichhardt collections that can be unambiguously attributed to the Port Essington Expedition. Collections made at Port Essington after the completion of the journey are excluded. Herbaria cited below are: National Herbarium of Victoria (MEL), National Herbarium of New South Wales (NSW), Natural History Museum of London (BM), Royal Botanic Gardens, Kew (K), and Muséum National d'Histoire Naturelle, Paris (P). The original collecting name is provided in brackets. Specimen searches for the species in the following table has been comprehensive for MEL, NSW, BM and K.**

Current Name (Name cited in text reference)	Text reference	Herbarium where specimen is held, date and locality
<i>Acacia alleniana</i>		MEL, undated, Macarthur R Gulf of Carpentaria
<i>Acacia conspersa</i>		NSW, undated, Sterculia Ck, west coast of the Gulf near Limmen Bight
<i>Acacia galioides</i>		MEL, undated, without locality [species not known south of Peak Range]
<i>Acacia simsii</i>	'Also in Leichhardt's collection' Bentham (1864), Fl. Austral. 2: 382	Specimen not located
<i>Acacia subternata</i>		NSW, undated, without locality [species confined to Top End of N.T.]
<i>Alyxia spicata</i>		MEL, undated, without locality [species confined to northern Australia]
<i>Arthrostylis aphylla</i> ( <i>Fimbristylis aphylla</i> ) <i>Atalaya hemiglauca</i>		MEL, undated, West of the Gulf and Port Essington
<i>Bambusa arnhemica</i> ( <i>Bambusa arundinacea</i> )	'from the South Alligator River (Leichhardt)' Mueller (1867), Fragm. 6: 86	NSW, undated, Head of the gulf Specimen not located
<i>Bruguiera gymnorhiza</i>	'Port Essington and Limmen Bight river, Leichhardt' Bentham (1864) Fl. Austral. 2: 495	Specimen not located
<i>Cathormion umbellatum</i> ( <i>Pithecellobium moniliferum</i> )	'Along all the water courses round the Gulf of Carpentaria, Leichhardt' Bentham (1864), Fl. Austral. 2: 424	Specimen not located
<i>Cordia dichotoma</i> ( <i>Cordia ixiocarpa</i> )	'In low hills of the Gilbert River, Leichhardt' Mueller (1858), Fragm. 1: 59	Specimen not located
<i>Corymbia dumlopiana</i>		NSW, undated, Overland to Port Essington
<i>Crotalaria cunninghamii</i>		NSW, 1844, West side of the Gulf
<i>Erythrophleum chlorostachys</i> ( <i>Erythrophloeum laboucheri</i> ) (1864), Fl. Austral. 2: 297	'Also in Leichhardt's collection, and said to be his Leguminous Iron-bark tree' Bentham Specimen not located	

<i>Eucalyptus tetradonta</i>		NSW, undated, West coast of the Gulf
<i>Flemingia parviflora</i>	'Lynedoch [?] valley, Leichhardt' Bentham (1864), Fl. Austral. 2: 269	MEL, undated, Lynd R
<i>Gardenia wilhelmii</i> ( <i>Gardenia edulis</i> )	'On sunny plains of north-eastern Australia, Leichhardt' Mueller (1858), Fragm. 1: 54	Specimen not located
<i>Grevillea glauca</i>		BM, undated, Snowdrops last [camp], Suttor and down to the gulf
<i>Grevillea glauca</i> ( <i>Grevillea gibbosa</i> )	'Suttor, Cape & Burdekin rivers, Leichhardt' Bentham (1870), Fl. Austral. 5: 463	MEL, undated, first found at the Suttor and frequently along the Burdekin and upper Lynd
<i>Grevillea mimosoides</i>		BM, undated, first met at the upper Lynd - all round the Gulf
<i>Grevillea pteridifolia</i>		NSW, 22 May 1845, Burdekin River
<i>Grevillea pungens</i> ( <i>Grevillea leichhardtii</i> )	'N. Australia, Sandy scrubland west side of gulf [Carpentaria]; Leichhardt' Moore (1920), J. Linn. Soc. Bot. 45: 211 (1920)	BM, K, MEL, 2 October 1845, West coast of the Gulf
<i>Grevillea refracta</i>		NSW, undated, West coast of the Gulf of Carpentaria
<i>Grevillea rubicunda</i>		BM, undated, westward of the Gulf, tableland of South Alligator
<i>Hakea arborescens</i>		BM, undated, Upper Burdekin and Lynd on rocky slopes
<i>Hakea arborescens</i>		BM, undated, West coast of the gulf
<i>Heliotropium tanythrix</i>		MEL, undated, Northern Australia
<i>Ipomoea nil</i> ( <i>Ipomoea hederacea</i> )	'Queensland, Suttor and Burdekin rivers, Leichhardt' Bentham (1869), Fl. Austral. 4: 417	Specimen not located
<i>Isotoma gulliveri</i> ( <i>Laurentia gulliveri</i> )		P, undated, Norman and Gilbert rivers
<i>Larsenaikia ochreatea</i> ( <i>Gardenia ochreatea</i> )	'at the Isaacs River (Leichhardt)' Mueller (1869), Fragm. 7: 46	MEL, Isaacs River
<i>Laxmannia gracilis</i>		MEL, undated, Carpentaria, east Austr.
<i>Lophostemon grandiflorus</i>		MEL, undated, Gilbert R
<i>Bauhinia cunninghamii</i> ( <i>Bauhinia leichhardtii</i> )		NSW, The Bauhinia Plains of the Mitchell
<i>Macropteranthes montana</i> ( <i>Lumnitzera montana</i> )	'at the Lynd River, towards its mouth, Dr. Leichhardt' Mueller (1864), Fragm. 4: 173	MEL, undated, Upper Lynd
<i>Melochia pyramidata</i>		NSW, 1845, Datura camp on the Suttor
<i>Millettia pinnata</i> ( <i>Pongamia pinnata</i> )		MEL, undated, Mitchell R, Gulf of Carpentaria
<i>Mitrasacme elata</i>		MEL, undated, Tableland of the South Alligator R, #453
<i>Monochoria cyanea</i> ( <i>Limnostachys cyanea</i> )	'in Arnhem's Land, Leichhardt' Mueller (1858), Fragm. 1: 24. 'at the Burdekin River, Leichhardt' Mueller (1873), Fragm. 8: 44	Specimen not located
<i>Nelumbo nucifera</i>		NSW, 1845, East coast of the Gulf
<i>Olax aphylla</i>	'Arnhem's Land, Leichhardt' Bentham (1863), Fl. Austral. 1: 393 'It was discovered by Leichhardt at the South Alligator River' Mueller (1875), Fragm. 9: 151	Specimen not located

<i>Parinari nonda</i> ( <i>Parinarium nonda</i> )	'from the Upper Lind to Van Diemen's river, Gulf of Carpentaria, Leichhardt' Bentham (1864), Fl. Austral. 2: 426	MEL, undated, from the upper Lynd to Van Diemen's river
<i>Pogostemon stellatus</i>		MEL, 19 June 1845, round the lagoon, (12 Mile Lagoon) [Mitchell R ?]
<i>Pouzolzia hirta</i> ( <i>Pouzolzia quinquenervis</i> )	'tableland of South Alligator river and Upper Lind river, Leichhardt' Bentham (1873), Fl. Austral. 6: 187	Specimen not located
<i>Pouzolzia hirta</i> ( <i>Hyrtanandra lythroides</i> )	'At Lynd's River towards its source, and certainly at the South Alligator on tablelands, Dr. Leichhardt' Mueller (1866), Fragm. 5: 194	Specimen not located
<i>Rhizophora stylosa</i>		MEL, undated, From the mangrove swamps of Limmin Bight. Port Essington, Entrance Is. Port Essington, saltwater
<i>Roepera apiculata</i>		NSW, January 1845, Scrubs of the Comet River
<i>Rotala occultiflora</i> ( <i>Rotala occultiflora</i> var. <i>leichhardtii</i> )	'In the interior of north-eastern Australia, The Lynd (collector Leichhardt, Paris Herbarium)' Koehne (1883), Bot. Jahrb. Syst. 4: 387	MEL, undated, Lagoons of the Lynd and Mitchell (rivers)
<i>Rotala tripartita</i> ( <i>Ammannia pentandra</i> )	'grows at the Lynd River as already noted by Leichhardt' Mueller (1871), Fragm. 7: 147	Specimen not located
<i>Senna magnifolia</i>		MEL, undated, Northern Australia
<i>Terminalia</i> sp. [undetermined 'little tree' of family Combretaceae]		MEL, 1845, Head of Gulf
<i>Terminalia platyptera</i>	'Lynd river, Leichhardt' Bentham (1864), Fl. Austral. 2: 498	MEL, undated, Lynd River
<i>Tournefortia muelleri</i>		MEL, undated, without locality [species grows around Burdekin River and Top End of N.T.]
<i>Trianthema compacta</i>		MEL, undated, without locality [species grows around Gulf of Carpentaria and Top End of N.T.]
<i>Urena armitiana</i> ( <i>Urena lobata</i> var. <i>grandiflora</i> )	'Suttor and Burdekin rivers, Leichhardt' Bentham (1863), Fl. Austral. 1: 206	K, Burdekin and Suttor Rivers, tropical Australia

## Annotated extracts from the Port Essington Expedition (Leichhardt 1847a)

### Section 1. Condamine (Late September–November 4 1844)

The party set out from Jimbour in the Darling Downs on October 2 1844 in a generally westerly direction through alternating grassland and open woodlands until they hit dense brigalow scrub to the north-east of Warra. The expedition followed the edge of this scrub in a SW direction to a camp near Warra on October 4. They then travelled downstream along the Condamine and its tributaries avoiding the dense patches of brigalow scrub on the flood plain to a camp about 10km south-west of Chinchilla. The party headed north along tributaries of the Condamine. In places they were confounded by impenetrable brigalow scrub and had to retreat. The expedition made little progress during this section and due to heavy rain, they remained for 8 days at a single camp about 10km WNW of Chinchilla. They then travelled north-west through open mixed eucalypt forest, initially interspersed with patches of brigalow before entering Barakula State Forest on October 22, an area consisting of eucalypt forest with patches of cypress pine, underlain by sandstone. Generally they followed watercourses including Dogwood Creek. In the vicinity of the watershed (the imperceptible Great Dividing Range), they headed in a westerly direction until again striking areas of brigalow scrub at a location about 30km ESE of Wandoan. Here they headed north, remaining in eucalypt woodland and avoiding the scrubs on a section that included a 7-day camp during which they slaughtered a bullock and dried its meat. At this point two members (Hodgson and Caleb) left the expedition and returned to the Darling Downs.

#### Late September

Belts of open forest land, principally composed of the Box-tree of the Colonists (a species of Eucalyptus) [*Eucalyptus populnea*]<sup>1</sup>

...patches of scrub, consisting of several species of Acacias, and of a variety of small trees, appear to be the outposts of the extensive scrubs of the interior. There are particularly three species of Acacias, which bestow a peculiar character on these scrubs: the one is the Myal (*A. pendula*) [*Acacia pendula*]<sup>2</sup>—first seen by Oxley on Liverpool Plains, and afterwards at the Barwan, and which exists in all the western plains between the Barwan and Darling Downs—whose drooping foliage and rich yellow blossoms render it extremely elegant and ornamental. The second, the Acacia of Coxen, resembles the Myal (without its drooping character), its narrow lanceolate phyllodia rather stiff, its yellowish branches erect [*Acacia melvillei*]<sup>3</sup>. The third, is the Bricklow Acacia, which seems to be identical with the Rose-wood Acacia of Moreton Bay<sup>4</sup>; the latter, however, is a fine tree, 50 to 60 feet high, whereas the former is either a small tree or a shrub. I could not satisfactorily ascertain the origin of the word Bricklow (Brigaloe, *Gould*), but, as it is well understood and generally adopted by all the squatters between the Severn River and the Boyne, I shall make use of the name. Its long, slightly falcate leaves, being of a silvery green colour [*Acacia harpophylla*]<sup>5</sup>, give a peculiar character to the forest, where the tree abounds.

#### October 2

... the native tobacco in blossom [*Nicotiana megalosiphon* or *N. forsteri*].

#### October 3

...small plains alternate with a flat forest country, slightly timbered; melon-holes; marly concretions, a stiff clayey soil, beautifully grassed: the prevailing timber trees are Bastard box [*Eucalyptus coolabah*]<sup>6</sup>, the Moreton Bay ash [*Corymbia tessellaris*]<sup>7</sup>, and the Flooded Gum [*Eucalyptus tereticornis* or *E. camaldulensis*]<sup>8</sup>.

<sup>1</sup> See also October 7, 10

<sup>2</sup> See also October 3, 5, 7, 8, 9, 19, 20

<sup>3</sup> See also October 9

<sup>4</sup> The rose-wood Acacia of Moreton Bay is probably *Acacia harpophylla*. In the Moreton Bay District this species has greener leaves than in the Darling Downs. Hodgson (1846, p. 258) in his diary entry for October 7 refers to the 'rosewood' in reference to *A. harpophylla*. Gilbert (1844–1845) mentioned rosewood (probably referring to *A. harpophylla*) on October 18, October 19 and November 2 in his unpublished manuscript.

<sup>5</sup> See also October 3, 4, 5, 8, 9, 10, 11, 22, 23, 26, 27, November 4

<sup>6</sup> The term 'bastard' was commonly applied to half-barked trees during the nineteenth century, as it was generally supposed that they were derived from hybrids between rough and smooth barked species. Bell (2004) ascribed this to *Eucalyptus populnea*. See also October 9.

<sup>7</sup> See also October 9

<sup>8</sup> See also October 4, 9, 10, 22, 23



... the Loranthus and the Myal [probably *Amyema quandang*]<sup>9</sup> in immense bushes; Casuarina [*Casuarina cristata*]<sup>10</sup> frequent. In the forest, Ranunculus inundatus [*Ranunculus meristus*]; Eryngium with terete simple leaves, of which the horses are fond [*Eryngium plantagineum*]; Prasophyllum elatum, sweetly scented [probably *Prasophyllum patens*]<sup>11</sup>. A new composite with white blossoms, the rays narrow and numerous [possibly *Minuria integerrima*]<sup>12</sup>.

October 4

... a white Vitex in full blossom [*Eremophila mitchellii*]<sup>13</sup>. The flats most richly adorned by flowers of a great variety of colours: the yellow Senecios [probably *Senecio brigalowensis*], scarlet Vetches [possibly *Swainsona* spp.], the large Xeranthemums [*Xerochrysum bracteatum*], several patches of Gnaphalium [*Euchiton sphaericus*]<sup>14</sup>, white Anthemis-like compositae [possibly *Brachyscome dentata* or *Camptactra barbata*]: the soil is a stiff clay with concretions: melon-holes with rushes [*Juncus* spp.]; the lagoons with reeds [*Phragmites australis*]<sup>15</sup>.

October 5

A small orange tree, about 5–8' high [*Citrus glauca*], grows either socially or scattered in the open scrub, and a leafless shrub, belonging to the Santalaceae [probably *Anthobolus leptomerioides*], grows in oblong detached low thickets.

October 7

The well-known tracks of Blackfellows are everywhere visible; such as trees recently stripped of their bark, the swellings of the apple-tree [*Angophora floribunda*]<sup>16</sup> cut off to make vessels for carrying water, honey cut out, and fresh steps cut in the trees to climb for opossums.

October 8

... the sunshine plant (*Mimosa terminalis*) [*Neptunia gracilis*]<sup>17</sup> was frequent on the black soil; a Swainsonia [*Swainsona* sp.]<sup>18</sup>; an Anthericum, with allium leaf and fine large yellow blossoms [*Bulbine alata*]; and another species with small blossoms, (*Stypantra*) [possibly *Caesia vittata*]<sup>19</sup>.

October 9

... we saw also some Ironbark trees [*Eucalyptus crebra*]<sup>20</sup>.

<sup>9</sup> Leichhardt seems to be talking about the 'Loranthus' growing as a mistletoe on the 'Myal', because on October 20, he also refers to the 'Loranthus of the Myal'

<sup>10</sup> See also October 11, 19, 23

<sup>11</sup> Leichhardt is probably correct with his generic identification because *Prasophyllum* is often scented. Ground orchids are now extremely rare in these environments and have probably been eradicated by grazing and cultivation. The only *Prasophyllum* specimen at the Queensland Herbarium from the fertile habitats of the Darling Downs is from 'north of Oakey', dated 1969 and identified as *Prasophyllum patens*.

<sup>12</sup> Leichhardt collected *Minuria integerrima* on 'Plains of the Condamine' (specimen at Melbourne Herbarium, undated)

<sup>13</sup> We can be certain about the identity of Leichhardt's *Vitex*. The entry for 11 December 1846 (Sprod 1989, p. 134), on Leichhardt's second expedition stated 'The small tree I called the white Vitex has a 2 capsular seed vessel with polysperma capsules'. Daniel Bunce's diary entry for January 5 1847 recorded, in the vicinity of Chinchilla '...another very handsome pyramidal-growing tree, which we called white *Vitex*. The leaves were of a lively green, and when rubbed, emitted a strong bitter smell.' (Bunce 1979, p. 114). All of these descriptions are compatible with *Eremophila mitchellii*. The flower shape of *E. mitchellii* is similar to the widely cultivated European species *Vitex agnus-castus*. Furthermore *E. mitchellii* has a current distribution matching the geographic spread of Leichhardt's numerous records of 'Vitex', and it is a common species not otherwise described by Leichhardt. Leichhardt did confuse *Vitex* and *Stenochilus* (a synonym of *Eremophila*) because a reference to *Vitex* in the original handwritten manuscript (held in Mitchell Library) on October 19 was amended to *Stenochilus* in the published journal. See also October 5, 11, 24.

<sup>14</sup> See also October 23

<sup>15</sup> On March 10 1845, Leichhardt refers to the 'Reeds, similar to those of Europe'. There are a number of closely allied taxa in *Phragmites* some of which are cosmopolitan species, common in European wetlands. See also October 7

<sup>16</sup> Bell (2004) ascribed this to *Angophora leiocarpa*.

<sup>17</sup> On February 5, Leichhardt again mentions *Mimosa terminalis*, and in brackets, the sensitive plant.

<sup>18</sup> Bell (2004) ascribed this to *Swainsona galegifolia*.

<sup>19</sup> Bell (2004) ascribed this to *Dianella* sp.

<sup>20</sup> Leichhardt gives a fuller description on October 10: 'An Ironbark tree, with greyish fissured bark and pale-green foliage'. See also October 10, 22, 23, 24, 26, 28, November 4. Bell (2004) ascribed the reference on October 10 to *Angophora floribunda*.

## October 10

...*Sterculia heterophylla* [*Brachychiton populneus* subsp. *populneus*] is pretty frequent amongst the box and flooded gum, ...

Ironbark ridges here and there, with spotted gum [*Corymbia citriodora* subsp. *variegata*]<sup>21</sup>, with dog-wood (*Jacksonia*) [*Jacksonia scoparia*]<sup>22</sup> on a sandy soil, covered with flint pebbles, diversified the sameness. The grass was beautiful, but the tufts distant; the Ironbark forest was sometimes interspersed with clusters of Acacias [*Acacia* spp.]...

... the forest oak [probably *Allocasuarina luehmannii*] is abundant. Here I first met with *Hakea lorea*, *R.Br.*, with long terete drooping leaves [*Hakea lorea*] ... and with *Grevillea mimosoides*, *R.Br.*, also a small tree with very long riband-like leaves of a silvery grey [*Grevillea striata*].

## October 11

... we came to a Cypress-pine [*Callitris glaucophylla* or *C. endlicheri*]<sup>23</sup> thicket, which formed the outside of a Bricklow scrub. This scrub was, at first, unusually open, and I thought that it would be of little extent; I was, however, very much mistaken: the Bricklow Acacia, Casuarinas and a stunted tea-tree [*Melaleuca bracteata*], formed so impervious a thicket ...

Within the scrub there was a slight elevation, in which sandstone cropped out: it was covered with cypress-pine, and an Acacia, different from the Bricklow [possibly *Acacia tenuinervis*]. The Bottle-tree (*Sterculia*, remarkable for an enlargement of the stem, about three feet above the ground) [*Brachychiton rupestris*] was observed within the scrub: the white *Vitex* (?) and *Geigera Schott.*, a small tree, with aromatic linear-lanceolate leaves [*Geigera parviflora*] ...

*Fusanus*, a small tree with pinnate leaves [*Owenia acidula*]<sup>24</sup>, and *Buttneria*, a small shrub [probably *Keraudrenia collina*]<sup>25</sup>, were also found in these groves.

## October 19

On a botanical excursion I found a new *Loranthus*, with flat linear leaves [*Lysiana exocarpi* subsp. *tenuis*], on Casuarina [probably *Allocasuarina luehmannii*]<sup>26</sup>, a new species of *Scaevola* [*Scaevola spinescens*]<sup>27</sup>, *Buttneria*, and three species of *Solanum* [*Solanum* spp.]<sup>28</sup>. Mr Hodgson brought a shrubby *Goodenia* [*Goodenia grandiflora*]; another species with linear leaves, and with very small yellow blossoms, growing in moist places in the forest [*Goodenia gracilis* or *G. delicata*]; two shrubby *Compositae*; three different species of *Dodonaea* [*Dodonaea* spp.]<sup>29</sup>, entering into fruit; and a *Stenochilus*, *R.Br.* with red blossoms, the most common little shrub of the forest [probably *Prostanthera cryptandroides* subsp. *euphrasioides*]<sup>30</sup>.

## October 20

A bright yellow everlasting is very fine and frequent [possibly *Chrysocephalum apiculatum*].

<sup>21</sup> See also October 24

<sup>22</sup> See also October 22, 23

<sup>23</sup> See also October 11, 22, 24, 25, 28, November 3, 4

<sup>24</sup> *Fusanus* is a synonym of *Santalum*, which however does not have pinnate leaves. Leichhardt refers to 'Fusanus' again on October 26, '...its fruit (of the size of a small apple), when entirely ripe and dropped from the tree, furnished a very agreeable repast; the rind, however, which surrounds its large rough kernel, is very thin'. These characters confirm Mueller's opinion (in *Fragm.* 3: 14) that Leichhardt's 'Fusanus' is referable to his *Owenia acidula*.

<sup>25</sup> Bell (2004) ascribed this to *Rulingia* sp. See also October 19

<sup>26</sup> See also October 23

<sup>27</sup> See also October 22

<sup>28</sup> Bell (2004) ascribed this reference to *Solanum esuriale*, *S. semiarmatum* and *S. stelligerum*

<sup>29</sup> See also October 23.

<sup>30</sup> This is ascribed to *Eremophila longifolia* in Bell (2004), probably influenced by the fact that *Stenochilus* is a synonym of *Eremophila*. However, *E. longifolia* is a tall shrub and is not locally common in that area. *Prostanthera cryptandroides* subsp. *euphrasioides* is a small shrub common in the area, and has a flower shape akin to *Eremophila*, but its usual purple flower colour does not match Leichhardt's description. 'Prostanthera from Hodgsons Creek' is listed under an entry 'Plants of my Expedition' in Leichhardt's (1842–1847, p. 42) notebook and this location coincides with the October 19 journal entry and almost certainly coincides with his *Stenochilus*.

## October 22

... a species of *Dampiera*, with many blue flowers [*Dampiera stricta* or *D. adpressa*], which deserves the name of *D. floribunda*; here also were *Leptospermum* [*Leptospermum polygalifolium*]; *Persoonia* with lanceolate pubescent leaf [*Persoonia sericea*]; *Jacksonia* (Dogwood); the cypress-pine with a light amber-coloured resin (Charley brought me fine claret-coloured resin, and I should not be surprised to find that it belongs to a different species of *Callitris*)<sup>31</sup>; an *Acacia* with glaucous lanceolate one-inch-long phyllodia [*Acacia semilunata*]; and a *Daviesia* [*Daviesia* sp.]<sup>32</sup>; another *Acacia* with glaucous bipinnate leaves [probably *Acacia spectabilis*]; a white *Scaevola*, *Anthericum* [possibly *Arthropodium strictum*]<sup>33</sup>, and a little *Sida*, with very showy blossoms [*Sida* sp.].

## October 23

A new gum tree, with a rusty-coloured scaly bark [*Corymbia bloxsomei* or *C. watsoniana*], the texture of which, as well as the seed-vessel and the leaf, resembled bloodwood, but specifically different; the apple-tree (*Angophora lanceolata*) [*Angophora leiocarpa*]; the flooded gum; a *Hakea* with red blossoms [*Hakea purpurea*]; *Zieria* [*Zieria aspalathoides*]; *Dodonaea*; a crassulaceous plant with handsome pink flowers [*Calandrinia balonensis*]; a new myrtaceous tree of irregular stunted growth, about 30 feet high, with linear leaves, similar to those of the rosemary [*Lysicarpus angustifolius*]<sup>34</sup>; a stiff grass, peculiar to sandstone regions [probably *Triodia scariosa*, *T. marginata* or *T. mitchellii*]; and a fine *Brunonia* with its chaste blue blossoms [*Brunonia australis*]<sup>35</sup>, ...

... scattered tufts of *Anthistiria* [*Themeda triandra*]<sup>36</sup>, and the first appearance of the small grass-tree (*Xanthorrhoea*) [*Xanthorrhoea johnsonii*] ... narrow-leaved *Kennedyas* [probably *Hardenbergia violacea*], *Gnaphalium* in abundance; *Aotus* [*Aotus subglaucula*] in low bushes.

## October 24

Several *Epacridaceae* shrubs and species of *Bossiaea* [*Bossiaea brownii* or *B. rhombifolia* subsp. *concolor*] and *Daviesia* reminded me of the flora of the southern districts.

## October 25

An *Acacia* with spiny phyllodia, the lower half attached to the stem, the upper bent off in the form of an open hook [*Acacia triptera*], had been observed by me on the sandstone ridges of Liverpool Plains: and the *tout ensemble* reminded me forcibly of that locality. The cypress-pine, several species of *Melaleuca* [possibly *Melaleuca decora*, *M. nodosa* and *M. uncinata*], and a fine ironbark, with broad lanceolate, but not cordate, glaucous leaves, and very dark bark [*Eucalyptus fibrosa* subsp. *nubila*], formed a forest. An arborescent *Acacia*, in dense thickets [possibly *Acacia shirleyi*], intercepted our course several times.

## November 3

A *Goodeniaceae* shrub [*Goodenia grandiflora*], a pink *Hibiscus* [*Hibiscus sturtii*]<sup>37</sup>, and a fine prostrate *Sida* [*Sida* sp.], were found between the camp of the 27<sup>th</sup> October and Dried-beef Creek.

<sup>31</sup> Both *Callitris glaucophylla* and *C. endlicheri* occur in the area. Both typically have yellow resin, but both red and yellow resin can occur on the different parts of individual trees (G. Alsemgeest pers. comm.)

<sup>32</sup> See also October 24

<sup>33</sup> Bell (2004) ascribe this reference to *Bulbine alata*. However on the poor soils in the Barakula area, *Arthropodium milleflorum* or *A. strictum* are more likely.

<sup>34</sup> See also October 25

<sup>35</sup> See also October 28

<sup>36</sup> Bell (2004) ascribed this to *Themeda avenacea*, but that species is largely confined to heavy clay soils in this area.

<sup>37</sup> On December 25 1846 during the second expedition Leichhardt 'a fine but low pink hibiscus...were found, as formerly' in about the same location (Sprod 1989, p. 139)

## Section 2. Dawson (November 5-December 10 1844)

Now north of the Great Dividing Range they travelled WNW down Roche Creek passing about 12km north of Wandoan before heading north along Juandah Creek to its junction with the Dawson River. This was just to the south of Taroom, which they passed on November 12. The vegetation included open woodlands with patches of brigalow scrub (that were assiduously avoided) on the creek-flat, and ironbark woodland on the low ridges. The latter were often favoured for travelling, taking them in places some distances from the watercourses. The party followed along the broad floodplain of the Dawson River until the density of the brigalow scrubs resulted in a decision to leave the Dawson near its junction with Palm Tree Creek. The party travelled north along Palm Tree Creek then west along Robinson Creek. In places the creek-side vegetation included dense areas of fan-palms sometimes in moderately deep gullies constrained by rugged sandstone hills. In places they camped beside lagoons (i.e. Ropers Lakes and Lake Murphy named after members of the expedition) on the broad flat flood-plain, but in other areas they searched for a route that avoided the dense brigalow scrubs there. The party entered the rugged sandstone country at the southern end of the Expedition Range, skirting to the east of Robinson Gorge National Park (now part of Expedition NP). Initially their route generally followed the upper reaches of Robinson Creek, sometimes along the flats, but more usually picking higher ground. In places the rugged terrain typical of this area hampered travel. After leaving Robinson Creek, travel was generally in a northerly direction until they encountered Ruined Castle Creek flowing NNW, which they loosely followed before traversing some ridges into Comely Creek (Leichhardt's *Zamia* Creek), which they followed in a northerly direction west of Palmgrove National Park. The expedition was now traversing eucalypt woodland on relatively flat land to the east of the Expedition Range. Before long they headed westward up *Erythrina* Creek setting up a 3-day camp while Leichhardt searched for a route over the range. The difficult crossing of the rugged Expedition Range was accomplished and the party descended on its western side to the north of Arcadia Valley about 10km south of the Dawson Highway.

November 5

... a considerable creek flowing to the westward, bounded by extensive flooded gum [*Eucalyptus camaldulensis* or *E. tereticornis*]<sup>38</sup>-flats and ridges, clothed with a forest of silver-leaved Ironbark [*Eucalyptus melanophloia*]<sup>39</sup>. Large reedy [*Phragmites australis*]<sup>40</sup> lagoons...

November 6

Fine box [*Eucalyptus populnea*]<sup>41</sup> and apple-tree [*Angophora floribunda*]<sup>42</sup> flats were on both sides of the creek...

...several plains, with the soil and the vegetation of the Downs, but bounded on the northward by impenetrable Bricklow [*Acacia harpophylla*]<sup>43</sup> scrub.

... we passed over open ridges, covered with Bastard-box [*Eucalyptus orgadophila*]<sup>44</sup> and silver-leaved Ironbark: the former tree grows generally in rich black soil, which appeared several times in the form of ploughed land, well known, in other parts of the colony, either under that name, or under that of 'Devil-devil land,' as the natives believe it to be the work of an evil spirit.

November 7

... the valley from two to three miles broad, clothed with rich grass, and sprinkled with apple-tree, flooded-gum, and Bastard-box [*Eucalyptus coolabah*]<sup>45</sup>

A *Thysanotus* [*Thysanotus tuberosus*] with fine large blossoms ... The native carrot [*Daucus glochidiatus*]<sup>46</sup> is in seed; the *Eryngium* of Jimba [*Eryngium plantagineum*], and a leguminous plant, prostrate with ternate leaves and bunches of yellow flowers [*Rhynchosia minima*], were frequent; several beautiful species of everlastings were occasionally seen, and the little orange-tree of the Condamine [*Citrus glauca*]<sup>47</sup> grew in the scrub.

<sup>38</sup> See also November 7, 17, 19, 20, 27, 30, December 7, 9, 10

<sup>39</sup> See also November 6, 7, 14, 20, 27, 30, December 1, 7, 8, 9

<sup>40</sup> See also November 7, 17, 19, 20, 30, December 5, 9

<sup>41</sup> See also December 7, 9

<sup>42</sup> See also November 7, 20, 27, 30

<sup>43</sup> See also November 10, 14, 17, 20, December 1, 8, 10

<sup>44</sup> See also November 7, 20

<sup>45</sup> See also November 8, 10, 20

<sup>46</sup> See also December 8

<sup>47</sup> See also November 20

## November 10

The open forest was sometimes one large field of everlasting flowers with bright yellow blossoms; whilst the scrub plains were thickly covered with grasses and vervain [*Verbena gaudichaudii*]<sup>48</sup>.

... a species of Bauhinia, either shrubby or a small shady tree, with spreading branches; the pods are flat, of a blunt form, almost one inch in breadth, and from three to four inches long [*Bauhinia carronii*]<sup>49</sup>. The Bricklow seems to prevent the growth of almost all other vegetation, with the exception of a small shrub, linear lanceolate aromatic leaves [probably *Eremophila deserti*]. An Acacia, with long drooping, almost terete leaves [*Acacia stenophylla*]<sup>50</sup>, grew along the river; and Crinums [*Crinum flaccidum*] grew in patches amongst the everlasting flowers, on a sandy soil.

... strange forms of the Bottle-tree [*Brachychiton rupestris*]<sup>51</sup>; which imparted to the scene a very picturesque character.

... that part of the river where it commences to run, its bed was more confined, and was fringed by Melaleucas [*Melaleuca trichostachya*]<sup>52</sup> and drooping Acacias.

## November 14

... a creek with Corypha palms [*Livistona nitida*]<sup>53</sup>, growing to the height of 25 or 30 feet.

.. the hills are more open, and the vegetation composed of the silver-leaved and narrow-leaved Ironbark [*Eucalyptus crebra*]<sup>54</sup> trees and an open Vitex [*Eremophila mitchellii*]<sup>55</sup> scrub.

## November 17

... the fine waterhole ... not only shaded by stately Coryphas and flooded gums, but the drooping Callistemon [*Callistemon viminalis*], the creek Melaleuca, and the Casuarina [*Casuarina cunninghamiana*]<sup>56</sup>.

... plains ... composed of black soil ... and densely covered with Burr, (a composite plant) [*Calotis* sp.]<sup>57</sup> and Verbena, and scattered tufts either of Bricklow, or of Coxen's Acacia [*Acacia melvillei*] or of the bright green Fusanus, or of the darker verdure of Bauhinia, with here and there a solitary tree of a rich dark-green hue, from forty to fifty feet in height [*Cadellia pentastylis*].

The fat-hen (Atriplex) [probably *Atriplex muelleri*]<sup>58</sup> and the sow-thistle (Sonchus) [*Sonchus hydrophilus*]<sup>59</sup> grew abundantly on the reedy flats at the upper end of the creek; Grewia [*Grewia latifolia*], a prostrate Myoporum [*Eremophila debilis*], and a bean with yellow blossoms [probably *Vigna* sp.] were frequent all over the valley...

In the vicinity of the swamps of Palm-tree Creek, I noticed a grass with an ear much resembling the bearded wheat: with the exception of the cultivated Cerealia, it had the largest seed I ever met with in grasses [probably *Chionachne hubbardiana*]<sup>60</sup>; even my Blackfellow was astonished at its remarkable size.

<sup>48</sup> Leichhardt used both vervain and verbena to refer to the genus *Verbena* of which *V. gaudichaudii* is common in central Queensland. See also November 17, December 10

<sup>49</sup> See also November 10, 17

<sup>50</sup> See also November 10

<sup>51</sup> See also November 25, December 1, 10

<sup>52</sup> See also November 17, 25

<sup>53</sup> See also November 17, 25, 29, December 1, 9

<sup>54</sup> See also November 25

<sup>55</sup> See also November 20, December 8

<sup>56</sup> See also November 29, December 1, 7, 9

<sup>57</sup> See also November 20, December 10

<sup>58</sup> See also November 17, 19

<sup>59</sup> See also November 17, December 9, 10

<sup>60</sup> Bentham, in *Flora Australiensis*, cited a specimen of *Chionachne hubbardiana* collected by Leichhardt from the 'Dawson & Comet Rivers'

November 20

... a species of *Sterculia* grows to a large size, and is one of the most pleasing and ornamental trees of the country; it is probably different from, although nearly allied to *S. heterophylla* [probably *Brachychiton populneus* subsp. *trilobus*]<sup>61</sup>. Very disagreeable, however, was the abundance of Burr and of a spear-grass (*Aristida*) [*Aristida* sp.], which attached themselves to our clothes and blankets, and entered (particularly the latter) into the very skin. I have also to mention, that a yellow *Villarsia* [*Nymphoides crenata*] was found on one of the lakes; which were generally surrounded by high sedges.

November 25

The range was openly timbered with white-gum [possibly *Eucalyptus chloroclada*], spotted-gum [*Corymbia citriodora* subsp. *variegata*]<sup>62</sup>, Ironbark, rusty-gum [*Corymbia bunites* or *C. watsoniana*], and the cypress-pine [*Callitris glaucophylla*]<sup>63</sup> near the gullies; and with a little dioecious tree belonging to the Euphorbiaceae ... the 'Severn Tree': it had a yellow or red three-capsular fruit, with a thin fleshy pericarp, of an exceedingly bitter taste; the capsules were one-seeded [*Petalostigma pubescens*].

*Pomaderris* [*Alphitonia excelsa*] and *Flindersia* [*Flindersia australis*] were in fruit and blossom.

... the continuation of the range, which I found to be of a flat, sandy, and rotten character, having, with the exception of the Blackbutt, all the trees and other characteristics of the sandstone country of Moreton Bay: *Xylomelum* [*Xylomelum cunninghamianum*]<sup>64</sup>, *Xanthorrhoea* [*Xanthorrhoea johnsonii*], *Zamia* [*Macrozamia fearnsidei*], *Leptospermum* [*Leptospermum lamellatum*, *L. polygalifolium* or *L. sericatum*], a new species of forest oak, which deserves the name of *Casuarina villosa*, for its bark looks quite villous [*Allocasuarina inophloia*]; *Persoonia falcata*, *R.Br.*, a small tree about fifteen feet high with stiff glaucous falcate leaves, and racemose inflorescence [*Persoonia falcata*]; a dwarf *Persoonia*, with linear leaves [*Persoonia subtilis*], the stringy-bark [probably *Eucalyptus mediocris*], and a species of *Melaleuca* along the creek [*Melaleuca trichostachya*].

November 27

... ascended the range, ... covered with open forest, interspersed with thickets of *Acacias* [probably *Acacia catenulata* or *A. shirleyi*] and *Casuarinas* [probably *Allocasuarina torulosa*].

November 28

... a new species of *Dodonaea*, with pinnate pubescent leaves [*Dodonaea vestita*], was frequent.

November 30

... sandy slopes covered with Dogwood (*Jacksonia*) [*Jacksonia scoparia*] and spotted-gum.

December 1

...an oak-tree [*Casuarina cunninghamiana*] creek,

... the blady-grass [*Imperata cylindrica*], however, had begun to shew its young shoots, ...

... a prickly *Acacia* with pinnate leaves [probably *Acacia farnesiana*], much resembling the *A. farnesiana* of Darling Downs.

... an arborescent *Zamia*, with a stem from seven to eight or ten feet high, and about nine inches in diameter [*Macrozamia moorei*]<sup>65</sup>, ...

... I was surprised to find *Erythrina* [*Erythrina vespertilio*]<sup>66</sup>, which I had been accustomed to meet with only on the creeks, and at the outskirts of mountain brushes, near the sea-coast. The white cedar (*Melia Azedarach*) [*Melia azedarach*] grows also along *Zamia* Creek, with *casuarina*, and a species of *Leptospermum* [*Leptospermum polygalifolium*].

<sup>61</sup> See also November 20, December 1

<sup>62</sup> See also November 30, December 1

<sup>63</sup> See also November 28, December 1

<sup>64</sup> The species growing around Moreton Bay is *X. salicinum*

<sup>65</sup> See also December 9, 10

<sup>66</sup> See also December 9, 10

## December 3

In the rocky gullies, we found the following plants: a new species of *Grevillea*, having pinnatifid leaves with very long divisions, the blossoms of a fine red, and the seed-vessels containing two flat seeds, surrounded by a narrow transparent membrane [*Grevillea longistyla*]; *Leucopogon juniperinum* and *lanceolatum* [*Acrotriche aggregata*, *Leucopogon* sp. or *Monotoca scoparia*] a *Dodonaea* with long linear leaves [*Dodonaea filifolia* or *D. viscosa* subsp. *angustissima*] and *D. triquetra* [*Dodonaea viscosa* subsp. *spatulata*], were frequent.

## December 9

The forest was well grassed; and a small *Acacia*, about fifteen or twenty feet high, with light green bipinnate leaves (from which exuded an amber-coloured eatable gum) [*Acacia bidwillii*]<sup>67</sup> formed groves and thickets within it. A *Capparis*, a small stunted tree, was in fruit: this fruit is about one inch long and three-quarters of an inch broad, pear-shaped and smooth, with some irregular prominent lines [probably *Capparis loranthifolia* var. *loranthifolia*]. *Capparis mitchellii* [*Capparis mitchellii*] has a downy fruit, and is common in the scrubs. A small trailing *Capparis*, also with oblong eatable fruit [*Capparis lasiantha*] was first observed on a hill near Ruined Castle Creek, in lat. 25° 10': we met with it frequently afterwards. We were encamped in the shade of a fine *Erythrina*; and the *Corypha*-palm, *Tristania* [*Lophostemon suaveolens*]<sup>68</sup>, the flooded-gum, the silver-leaved Ironbark, *Tripetelus* [probably *Sambucus gaudichaudiana*], and a species of *Croton* [*Croton insularis* or *C. phebaloides*]<sup>69</sup>, grew around us. A species of *Hypochaeris* [possibly *Picris angustifolia* subsp. *carolorum-henricorum*] and of *Sonchus*, were greedily eaten by our horses; the large *Xeranthemum* [*Xerochrysum bracteatum*] grew on the slopes, among high tufts of kangaroo grass. A species of *Borage* (*Trichodesma zeylanica*), with fine blue flowers [*Trichodesma zeylanicum*], was first seen here; and the native raspberry [*Rubus parvifolius*] and *Ficus muntia* [*Ficus coronata*], were in fruit.

## December 10

The gully had all the characters of those of the Boyd; the same sandstone rock, the same abruptness, and the same vegetation; excepting, perhaps, a new *Grevillea*, with pinnatifid leaves and yellowish-white woolly flowers [*Grevillea sessilis*]<sup>70</sup>, which we found here.

... we found that the gullies opened into a broad flat valley; in which fields of fat-hen, the *Croton* shrub, the native Tobacco [*Nicotiana megalosiphon* or *N. forsteri*], *Erythrina*, fine specimens of flooded-gum, *Tristania*, and the Moreton Bay ash [*Corymbia tessellaris*], were growing in great abundance.

In crossing several of the scrub plains before mentioned, it was agreeable to observe that the dense vegetation which covered them was not the miserable Burr and the wiry Vervain, but *Senecios* [probably *Senecio brigalowensis*] and *Sonchus* (Sowthistle), which our horses greedily snatched as they waded through them...

In the gully which I descended, a shrub with dark-green leaves was tolerably frequent; its red berries, containing one or two seeds, were about the size of a cherry, and very good eating when ripe [probably *Erythroxyllum australe*].

... a species of *Clematis* [*Clematis glycinoides* or *C. microphylla*] tied the shrubs into an almost impenetrable maze.

<sup>67</sup> Leichhardt later referred to this species, on several occasions, as the 'Acacia of the Expedition Range'. The range of locations mentioned for this species is consistent with the known range of *Acacia bidwillii*.

<sup>68</sup> See also December 10

<sup>69</sup> See also December 10

<sup>70</sup> See also December 10

### Section 3. Comet-McKenzie (December 11 1844-January 17 1845)

*On the western side of the Expedition Range the party travelled in a westerly direction, over predominantly level terrain, sometimes traversing areas of brigalow scrub and in other places avoiding them by following watercourses. At one point they headed south searching for lost party members and camped for several days by a lagoon (probably Pink Lily Lagoon). A watercourse they followed led them to the Comet River, which they followed downstream to reach Rolleston on December 28. In this vicinity, the party witnessed the first expanses of well-grassed country since they had left the Darling Downs. Leichhardt named this area 'Albinia Downs', which now includes Albinia Downs NP. The party was heading north picking a suitable route generally following the Comet River downstream. In places the brigalow scrubs provided a barrier, although grasslands and woodlands on basalt away from the floodplain allowed easy travel. They followed the Comet River north until it met the Mackenzie River about 5km north of the town of Comet on the Capricorn Highway. They followed the Mackenzie River to the northeast generally staying within the floodplain until a point about 30km ENE of Comet where they camped for several days.*

December 14

The Myal [*Acacia pendula*]<sup>71</sup> was frequent; and the fruit of the small lemon-tree [*Citrus glauca*]<sup>72</sup> was ripe.

I followed the watercourse which connects the water-holes on which we encamped, and met every where with Bricklow [*Acacia harpophylla*]<sup>73</sup> scrub.

December 15

The Box-tree of Jimba-flats [*Eucalyptus populnea*]<sup>74</sup>, the Bricklow — in short, the whole vegetation of the scrubby country, west of Darling Downs, were still around us; and the Moreton Bay ash [*Corymbia tessellaris*] (a species of Eucalyptus) — which I had met with, throughout the Moreton Bay district, from the sea coast of the Nynga Nyngas to Darling Downs — was here also very plentiful.

December 16

... found the creek, with a deep sandy, but dry bed, full of reeds [*Phragmites australis*]<sup>75</sup>...

I looked into the Casuarina [*Casuarina cunninghamiana*]<sup>76</sup> thickets which occasionally fringed its bank, in search of water; but found none.

The country appeared flat, and was so openly timbered with fine flooded gum-trees [*Eucalyptus camaldulensis* or *E. tereticornis*]<sup>77</sup>, that we could see for a considerable distance.

The chains of water-holes within the scrub are covered with a stiff star-grass, having a great number of spikes rising from the top of the stem [*Leptochloa digitata*]<sup>78</sup>.

A stiff, wiry, leafless polygonaceous plant [*Muehlenbeckia florulenta*] grows in the shallow depressions of the surface of the ground, which are significantly termed by the squatters 'Melon-holes', and abound in the open Box-tree flats.

A small shrubby *Stenochilus* with very green linear lanceolate leaves and red tubulous flowers [*Eremophila maculata*], is frequent amongst the Bricklow.

December 20

Capparis Mitchelii [*Capparis mitchellii*] was found in blossom.

<sup>71</sup> See also December 24

<sup>72</sup> See also December 16, 22, 24

<sup>73</sup> See also December 15, 16, 19, 22, 24, 28, 31, January 3

<sup>74</sup> Sometimes Leichhardt referred to this species as 'true box'. See also December 16, 22, 23, 28, 30, January 1, 3, 4

<sup>75</sup> See also December 16, 21, 31

<sup>76</sup> See also December 28, January 6

<sup>77</sup> See also January 6

<sup>78</sup> See also December 24, January 4



December 21

... a beautiful blue *Nymphaea* [probably *Nymphaea gigantea*]<sup>79</sup> was found growing in the lagoon; and around it, among the reeds and high cyperaceous plants, a small labiate [probably *Basilicum polystachyon*], a Gomphrena [probably *Alternanthera* sp.], the native Chamomile, and a Bellis [possibly *Brachyscome basaltica*] were growing.

December 22

...farther on, the Bastard box [probably *Eucalyptus orgadophila*]<sup>80</sup> prevailed, with silver-leaved Ironbark [*Eucalyptus melanophloia*]<sup>81</sup>, and patches of Bricklow scrub, of Vitex [*Eremophila mitchellii*]<sup>82</sup> and of the native lemon. A small tree (a species of Acacia) was also seen about thirty or forty feet high, with slightly drooping branches, and lanceolate deep green phyllodia about one inch [*Acacia excelsa*]<sup>83</sup>.

December 23

The principal channel of the creek was lined with a species of Melaleuca, with slightly foliaceous bark [*Melaleuca* sp.].

December 27

Mr Calvert found a Bauhinia [*Bauhinia carronii*] in blossom; which was not only different from the Bauhinia found afterwards at Comet River, but also from that of the Mitchell.

December 29

We observed growing on the creek, the dwarf Koorajong (Grewia) [probably *Grewia latifolia*], a small rough-leaved fig tree [*Ficus opposita*], a species of Tribulus [*Tribulus terrestris* or *T. minutus*], and the native Portulaca [*Portulaca oleracea*]<sup>84</sup>. The latter afforded us an excellent salad; but was much more acid than I had found it in other parts of the country, where I had occasionally tasted it. The native melon [*Cucumis melo*] of the Darling Downs and of the Gwyder, grew here also.

December 30

A pea-plant, with ternate leaves, and fine yellow blossoms [*Rhynchosia minima*], was found near our camp.

The bronze-winged pigeon lived here on the red fruit of the Rhagodia [*Enchylaena tomentosa*] probably, and the black berries of a species of Jasmine [*Jasminum didymum*, *J. suavisimum* or *J. simplicifolium*]; and seems also to pick occasionally the seed vessel of a Ruellia [probably *Dipteracanthus australasicus* subsp. *corynothecus*], which is very frequent on all the flats of Comet Creek.

December 31

The immediate neighbourhood of the creek was in some places open, in others covered with a shrubby Acacia, with long glaucous, and rather fleshy phyllodia [*Acacia salicina*].

Yesterday we met with a new leguminous shrub. It belongs to the section Cassia, and has a long pinnate leaf, the leaflets an inch long, and half an inch broad. Its pods were about a foot long, half an inch broad; and every seed was surrounded by a fleshy spongy tissue, which, when dry, gave to the pod a slightly articulate appearance [*Cassia brewsteri*]<sup>85</sup>. The seeds, when young, had an agreeable taste, and the tissue, when dry, was pleasantly acidulous, and was eaten by some of my companions without any ill effect, whilst others, with myself, were severely purged. To day I found the same plant in form of a tree, about thirty feet high...

January 1, 1845

I found a red Passion flower, with three-lobed leaves, the lobes rounded [*Passiflora aurantia*]: it was twining round the trunk of a gum tree, and rooted in a light sandy alluvial soil. A new species of Bauhinia, with large white blossoms growing in small

<sup>79</sup> See also January 10

<sup>80</sup> See also January 14

<sup>81</sup> See also December 23, January 4, 14

<sup>82</sup> See also January 3

<sup>83</sup> See also January 14

<sup>84</sup> See also December 30

<sup>85</sup> See also January 10

groves, or scattered in the scrub, particularly near the creeks, was conspicuous for its elegance, and was the greatest ornament of this part of the country. It is a tree about twenty-five feet high, with long drooping branches; the foliage is of a rich green colour, and affords a fine shade [*Bauhinia hookeri*]. A climbing Capparis, with broad lanceolate leaves, had also large white showy blossoms [*Capparis lasiantha*]; and a fine specimen of this plant was seen growing in the fork of an old box tree, about twelve or fifteen feet from the ground; it was in fruit, but unfortunately was not yet ripe. There was also another species of the same genus, with yellow blossoms, in other respects very similar in appearance to the first [*Capparis lasiantha*]. The white cedar [*Melia azedarach*] was still abundant.

January 2

I moved my camp to the water-hole, near which I had met with the natives, and halted at the outside of a Bauhinia [*Bauhinia carronii* or *B. hookeri*] grove.

January 3

I noticed a small tree (*Santalum oblongatum*, *R.Br.*), very remarkable for having its branches sometimes slightly drooping, and at other times erect, with membranous glaucous elliptical leaves, from an inch to an inch and a half long, and three-quarters broad, with very indistinct nerves, and producing a small purple fruit [*Santalum lanceolatum*]<sup>86</sup>, of very agreeable taste. I had seen this tree formerly at the Gwyder, and in the rosewood scrubs about Moreton Bay, and I also found it far up to the northward, in the moderately open Vitex and Bricklow scrubs.

January 4

In the channels within the scrub I found a large supply of water, in holes surrounded by sedges and a broad-leaved Polygonum [probably *Persicaria orientalis*], amongst which grew a species of Abutilon [*Abutilon* sp.] ... In the scrub I found a plant belonging to the Amaryllideae (*Calostemma luteum*?) with a cluster of fine yellow blossoms [*Calostemma luteum*].

January 5

Marsilea [*Marsilea* sp.] grows everywhere on the flats; and a fine little pea plant with a solitary red blossom [probably *Indigofera linifolia*], was found amongst the basaltic rocks round the water-hole. We observed, growing along the creek, another species of Portulaca, with linear fleshy leaves, erect stem, and small yellow flowers [*Portulaca filifolia* or *P. australis*] and a half-shrubby Malvaceous plant, with small clustered yellow blossoms [*Sida subspicata*]; the latter is common at the outside of scrubs in the Moreton Bay district. We also remarked, within the scrub, a small tree, with bright-green foliage, and three-winged capsules slightly united at the base [possibly *Terminalia oblongata*]<sup>87</sup>; and another small tree, with deep green coloured leaves, and two-winged capsules united in all their length; the last is nearly allied to *Dodonaea* [possibly *Dodonaea viscosa*]<sup>88</sup>.

January 7

..well-watered country, but still occupied by scrub; in which the Capparis, with its large white sweet-scented blossoms, was very frequent; but its sepals, petals, and stamens dropped off at the slightest touch. Its fruit was like a small apple covered with warts, and its pungent seeds were imbedded in a yellow pulp [*Capparis loranthifolia* var. *bancroftii*], not at all disagreeable to eat.

<sup>86</sup> In a letter to Captain P.P. King on 12 August 1846, Leichhardt noted 'Santalum lanceolatum with blue edible berries was only observed on the East coast'. (Aurousseau 1968, p. 889)

<sup>87</sup> This reference and the following seem confused. *Terminalia oblongata* is a common species that coincides approximately with this locality, but has a two-winged seed

<sup>88</sup> This reference and the previous seem confused. *Dodonaea* has two or three-winged capsules and should be known to Leichhardt. On the second expedition in the same vicinity he identified 'the sapindaceous (?) tree with bright green leaf forms rather an open scrub'. (February 28 1847, p. 176), and then later, 'The green tree with winged seed which is thought as belonging to the sapindaceae has one straight embryo and belongs probably to the Acerineae' (February 28 1847, Sprod 1989, p. 176). Bunce, a member of Leichhardt's second expedition, referred to *Dodonaea* around this locality (February 20 1847, p. 141 and March 1 1847, p. 143 Bunce 1979). These references seem compatible with *Dodonaea* of which only *D. viscosa* is common in this area

January 9

...we encountered sandy hills covered with a dense low scrub and cypress-pine [*Callitris glaucophylla*]<sup>89</sup>. The latter almost invariably grows on the slight sandstone elevations in a scrubby country.

January 10

A very stiff high grass [possibly *Arundinella nepalensis*] became very general along the river. On the plains there were fields of native carrots, now dry; also of vervain [*Verbena gaudichaudii*] and burr [*Calotis* sp.].

January 12

The Acacia, with very long linear drooping leaves [*Acacia stenophylla*], that had been observed at the Dawson, re-appeared both on Comet Creek and the banks of the Mackenzie.

January 13

I observed a new species of Flindersia, a small tree about thirty feet high, with thin foliage and very regular branches, forming a spire [*Flindersia dissosperma*]<sup>90</sup>.

January 14

In the bed of the river, which was here broad and sandy, a bean was gathered, bearing racemes of pink blossoms, and spreading its long slender stem over the ground or twining it round shrubs or trees: its pods were from three to five inches long, and about half an inch broad, containing from four to six seeds, very similar to the horse-bean [*Canavalia papuana*]. This plant was afterwards found growing in the sandy beds, or along the bergs of almost all the broad rivers, and was always a welcome sight; for the seeds, after roasting and pounding them, afforded us a very agreeable substitute for coffee.

We passed over some very fine flats of Bastard-box [*Eucalyptus coolabah*], silver-leaved Ironbark, and white gum [probably *Eucalyptus tereticornis*]<sup>91</sup>...

On a White-gum, which has long lanceolate leaves, I found a species of Loranthus, with leaves resembling those of the silver-leaved Ironbark (*Eucalyptus pulverulentus*) [*Dendrophthoe homoplastica*]...

January 16

...came to some fine lagoons, which were surrounded by a deep green belt of Nelumbiums [*Nelumbo nucifera*]<sup>92</sup>. This plant grows, with a simple tap root, in the deep soft mud, bearing one large peltate leaf on a leaf stalk, about eight feet high, and from twelve to eighteen inches in diameter, the flower-stalk being of the same length or even longer, crowned with a pink flower resembling that of a Nymphaea, but much larger: its seed-vessel is a large cone, with perpendicular holes in its cellular tissue, containing seeds, about three quarters of an inch in length.

#### Section 4. Peak Downs-Isaacs (January 18-March 7 1845)

Leaving the Mackenzie River they travelled generally NW over sandstone ridges avoiding occasional brigalow scrubs on the flats but following dry watercourses in search of water holes. On January 28 they camped near Mt Demipique, the southernmost peak of the Peak Ranges, 35km NE of Capella. The party headed NNW through open downs surrounding the spectacular tors of the southern Peak Range, which Leichhardt named after members of his party. This watershed was dry and the party, desperate for water turned north taking them back into low sandstone ranges running NNW. On their northerly course they came upon Hughes Creek, which they followed eastward to the vicinity of the Saraji Coal Mine, situated on extensive clay sheets that supported dense brigalow scrub. They travelled through the scrub along Hughes Creek until they reached its junction with the Isaacs River where they camped and reconnoitred for 6 days. The party headed up the Isaacs River generally in a northward direction. The country surrounding the narrow floodplain was predominantly eucalypt woodland interspersed with belts of brigalow. The party crossed the Peak Downs Highway on the 25 February passing by the mining town of Moranbah where basaltic soils support open eucalypt woodland and in places open grassland. Further north

<sup>89</sup> See also January 10

<sup>90</sup> On the second trip, Leichhardt observed 'Flindersia pyramidalis...., which I had seen at the Mackenzie' (Sprod 1989, p. 164)

<sup>91</sup> See also January 14

<sup>92</sup> See also January 16

the party passed by the Goonyella coal mine, before heading northeast up the Isaacs River towards the northern end of the parallel Kerlong and Carborough Ranges. The party camped at a narrow gorge that separates these north-south ranges from the Denham Range that runs northeast.

January 18

In a short time, we reached an open Bricklow [*Acacia harpophylla*]<sup>93</sup> scrub containing many dry water-holes.

...continued our route through patches of Bricklow scrub, alternating with Bastard-box forest [*Eucalyptus cambageana* or *E. orgadophila*]<sup>94</sup>, and open Vitex [*Eremophila mitchellii*]<sup>95</sup> scrub, in which the Moreton Bay ash [*Corymbia tessellaris*]<sup>96</sup> was very plentiful. About eight miles from our camp, we came upon an open forest of narrow-leaved Ironbark (*E. resinifera*) [*Eucalyptus crebra*]<sup>97</sup> and Bastard-box, covering gentle slopes...

... occasional ridges of open silver-leaved Ironbark [*Eucalyptus melanophloia*]<sup>98</sup> forest. Among the latter was a rather stunted gum-tree, with a black scaly butt [probably *Corymbia dallachiana*]; it was very frequent, and greatly resembled the Moreton Bay ash.

...crossed a fine creek, with a reedy [possibly *Phragmites australis*]<sup>99</sup> bed, along which lightly timbered flats extended...

We rode the whole day through a Bricklow thicket, which, in only three or four places, was interrupted by narrow strips of open country, along creeks on which fine flooded-gums [*Eucalyptus camaldulensis* or *E. tereticornis*]<sup>100</sup> were growing.

In a recently deserted camp of the Aborigines, we found an eatable root, like the large tubers of Dahlia [*Cissus opaca*]<sup>101</sup>, which we greedily devoured...

We were then on a high box-tree [possibly *Eucalyptus populnea*] ridge, in view of a thick scrub....

A Grevillea (*G. ceratophylla* R.Br.?) with pinnatifid leaves, a small tree from fifteen to twenty feet high, and about four inches in diameter [*Grevillea parallela*]<sup>102</sup>; a Melaleuca about the same size, with stiff lanceolate leaves, about two inches long and half an inch broad, and slightly foliaceous bark [*Melaleuca nervosa*]<sup>103</sup>; and an Acacia with glaucous bipinnate leaves [possibly *Acacia storyi*], of the section of the brush Acacias of Moreton Bay—grew on the sandy soil along the ridges, and a handsome Convolvulus with pink flowers [possibly *Polymeria pusilla* or *Convolvulus graminetinus*] adorned the rich plain south-east of Mount Stewart.

Charley found many nests of the native bee, full of the sweetest and most aromatic honey we had ever tasted. The wild Marjoram [*Ocimum tenuiflorum*]<sup>104</sup>, which grows abundantly here, and imparts its fragrance even to the air, seemed to be the principal source from which the bee obtained its honey.

Extensive flats of rotten ground, but beautifully clothed with tufts of grass, openly timbered with Moreton Bay ash and flooded-gum, ascend into gentle grassy slopes of silver-leaved Ironbark and bloodwood [probably *Corymbia clarksoniana*]<sup>105</sup>, and then rise into sandstone ridges with Acacia [*Acacia shirleyi* or *A. catenulata*]<sup>106</sup> thickets and shrubby plants peculiar to the sandstone formation. An Acacia with very large falcate, glaucous phyllodia [possibly *Acacia cretata*], and the Euphorbiaceous Severn-tree [*Petalostigma pubescens*], were very plentiful; and Crinum [*Crinum flaccidum*]<sup>107</sup> grew in thousands on the sandy flats.

<sup>93</sup> See also January 18, February 3, 12, 29

<sup>94</sup> See also January 18, 26, February 3, 7, 8, 15, 22, 29, March 5

<sup>95</sup> See also February 12

<sup>96</sup> See also January 18, February 15

<sup>97</sup> See also January 18, 26, 30, February 2, 3, 6, 8, 15, 29, March 5, 7

<sup>98</sup> See also January 18, March 5

<sup>99</sup> See also January 18, 26, February 13, 15, 22, 24, 26, March 5

<sup>100</sup> See also January 18, 30, February 13, 15, 26

<sup>101</sup> See also February 13 where Leichhardt described the plant more fully 'The yams proved to be the tubers of a vine with blue berries; both tubers and berries had the same pungent taste, but the former contained a watery juice, which was most welcome to our parched mouths. A similar tuber was found near Mount Stewart on the 18th January'.

<sup>102</sup> See also February 12

<sup>103</sup> See also January 26

<sup>104</sup> See also January 18, March 7. Chisholm (1955) ascribed this to *Ocimum sanctum*, a synonym of *O. tenuiflorum*

<sup>105</sup> See also February 15

<sup>106</sup> See also February 3

<sup>107</sup> See also January 30

January 26

On the ridges, we observed *Persoonia* with long falcate leaves [*Persoonia falcata*]; the grass-tree (*Xanthorrhoea*) [*Xanthorrhoea johnsonii*]<sup>108</sup>; the rusty gum [*Corymbia leichhardtii*]<sup>109</sup>, and the *Melaleuca* of Mount Stewart.

These pools were generally lined with patches of a narrow-leaved tea tree [probably *Melaleuca bracteata*]; and were full of basaltic pebbles.

January 27

The plains in the neighbourhood of our intended camp were richly grassed; and a species of *Hypoxis* [*Hypoxis arillacea*] and the native Borage (*Trichodesma zeylanica*, R. Br.) [*Trichodesma zeylanicum*] adorned them with their bright yellow and blue blossoms.

On the ridges which bounded the plain to the westward, I met with *Acacia pendula* [*Acacia pendula*]; and I may here remark that this appears to be the most northern limit of its habitat<sup>110</sup>.

January 29

John Murphy brought the flower of a yellow *Hibiscus* from Roper's Peak [*Hibiscus divaricatus* or *H. heterophyllus*]; it is certainly a new species.

January 30

Nature looks quite refreshed; the grass is so green, and the modest blue *Ruellia* [*Brunoniella australis*] so plentiful...

January 31

... the creek went to the north-east, several other creeks joining it; that, lower down, it was lined with *Casuarinas* [*Casuarina cunninghamiana*]<sup>111</sup>

February 2

In passing the foot of the peaks, we found a species of *Grewia* (Dwarf Roorajong) [*Grewia latifolia* or *G. retusifolia*] covered with ripe fruit; the fruit is dry, but the stringy tissue which covers the seed, contains a slightly sweet and acidulous substance of a very agreeable taste. The fig-tree with a rough leaf [*Ficus opposita*], had plenty of fruit, but not yet ripe. *Erythrina* [*Erythrina vespertilio*]<sup>112</sup> was both in blossom and in seed.

I passed some gentle well-grassed slopes of narrow-leaved Ironbark and spotted gum [*Corymbia citriodora* subsp. *citriodora*]...

February 3

I observed on the ridges an *Acacia*, a small tree, from thirty to forty feet high, and from six to nine inches in diameter, and easily distinguished by its peculiar rough frizzled bark [*Acacia rhodoxylon*], similar to that of the *Casuarina* found at the ranges of the Robinson. It has a dark sweet-scented heartwood, like that of the Bricklow and the Myal and other *Acacias*, which I had previously met with.

February 5

*Acacia farnesiana* [*Acacia farnesiana*] grew in low shrubs along the plains, stretching its flexible branches over the ground; *Mimosa terminalis* (the sensitive plant) was very plentiful, and more erect than usual [possibly *Neptunia monosperma*]; a species of *Verbena*, with grey pubescent leaf and stem [*Verbena macrostachya*], was also abundant.

<sup>108</sup> See also February 12, 15

<sup>109</sup> See also February 6

<sup>110</sup> An accurate observation by Leichhardt

<sup>111</sup> See also January 13, 15, 24

<sup>112</sup> See also February 6

## February 6

In a hollow between the two rocky protuberances on the west side of the hill, a noble fig-tree spread its rich dark-green shady foliage [*Ficus rubiginosa* or *F. virens*]...

## February 7

On the sandstone range I found *Balfouria saligna* R.Br., a shrub or small tree, with long, linear-lanceolate leaves, and rather drooping branches, covered with very fragrant yellow blossoms; its seed-vessels varied from three to six inches in length, were terete, tapering to a point, and filled with silky seeds [*Wrightia saligna*]. The same little tree was subsequently observed, growing round the head of the gulf of Carpentaria, and also at Arnheim's Land. Another shrub (Gardenia?), with opposite, oval, rather rough leaves, and white or light yellow blossoms [*Larsenaikia ochreatea*], like those of the Jasmine in shape and fragrance, had been observed once before, but was very common between this latitude and Port Essington; at which place a species of *Guettarda*, resembling it very much, but with larger flowers, grows along the beach.

## February 8

In one of the glens among the ridges I observed a new gum-tree, with a leaf like that of the trembling poplar of Europe, and of a bright green colour, which rendered the appearance of the country exceedingly cheerful [*Eucalyptus platyphylla*]<sup>113</sup>. It is a middle-sized tree, of irregular growth, with white bark; but the wood, not being free grained, was unfit for splitting.

## February 12 (pp. 143–146)

... on the upper part of Hughs's Creek, we first met with the drooping tea-tree (Melaleuca Leucodendron?) [*Melaleuca leucadendra* or *M. fluviatilis*], which we found afterwards at every creek and river; it was generally the companion of water, and its drooping foliage afforded an agreeable shade, and was also very ornamental.

Brown brought the fruit of a tree, which, according to his account, had the simple pinnate-leaf of the red cedar (*Credela*) with a dark purple-coloured fruit, half an inch long, and one inch in diameter, with a thin astringent pericarp: the stony seed-vessel consisted of many carpels, which, if I remember rightly, were monosperme [*Pleiogynium timorense*]<sup>114</sup>. It belongs probably to an Ebenaceous tree. We again enjoyed some fine messes of *Portulaca* [*Portulaca oleracea*].

## February 12 (p. 148)

In the scrub, *Fusanus* was observed in fruit [*Owenia acidula*], and the *Stenochilus* [*Eremophila maculata*] and the white *Vitex* in blossom; from the latter the native bee extracts a most delicious honey. A small tree, with stiff alternate leaves scarcely an inch long, was covered with red fruit of the form of an acorn, and about half an inch long, having a sweet pericarp with two compressed grain-like seeds, which had the horny albumen of the coffee, and were extremely bitter [*Diospyros humilis*].

## February 15

The nature of the soil was easily distinguished by its vegetation: the Bastard box [*Eucalyptus coolabah*], and Poplar gum grew on a stiff clay...

... the forest oak (*Casuarina torulosa*) [probably *Allocasuarina littoralis*], together with rusty-gum [*Corymbia aureola*, *C. trachyphloia* or *C. leichhardtii*], were frequent on the sandy ridges.

Charley had, during my absence from the camp, had an interview with the natives, who made him several presents, among which were two fine calabashes which they had cleaned and used for carrying water; the larger one was pear-shaped, about a foot in length, and nine inches in diameter in the broadest part, and held about three pints [*Lagenaria siceraria*]<sup>115</sup>.

## February 24

In the hollows along the Isaacs, we found a new species of grass from six to eight feet high, forming large tufts, in appearance like the oat-grass (*Anthistiria*) of the Liverpool Plains and Darling Downs; it has very long brown twisted beards, but is easily distinguished from *Anthistiria* by its simple ear [*Heteropogon triticeus*]; its young stem is very sweet, and much relished both by horses and cattle.

<sup>113</sup> See also February 8, 12, 15

<sup>114</sup> See also March 5

<sup>115</sup> This gourd may have been transported from another region.

February 26

I found a shrubby prickly Goodenia, about four or five feet high [*Scaevola spinescens*], growing on the borders of the scrub.

Undated (1–4 March)

A yellow [*Hibiscus divaricatus* or *H. heterophyllus*], and a pink Hibiscus [*Hibiscus* sp.] were frequent along the river.

March 5

... came through a narrow mountain gully, the passage of which was very much obstructed by tea-trees [probably *Melaleuca bracteata* or *M. trichostachya*].

The Corypha palm [*Livistona decora*]<sup>116</sup> is frequent under the range.

### Section 5. Suttor (March 8-April 1 1845)

Having traversed the Denham Range the party was now at the headwaters of Suttor Creek and had entered the catchment of the Burdekin River. The party headed west along Suttor Creek, at first encountering areas of dense brigalow scrub. In the vicinity of 'Suttor Creek' homestead the party left the stream travelling overland in a westerly direction through open plains and brigalow scrub, before coming to the upper reaches of the Suttor River upstream of its junction with Suttor Creek. The party followed the Suttor River downstream mostly through eucalypt woodland and brigalow scrub. Sandstone and acid volcanic rock supporting shrubby forest bordered the upper Suttor to the north-west contrasting with broad featureless flats on the lower reaches where the river separates into numerous anabranches. Downstream of the junction with the Belyando, the Suttor River flows north and the flood plain narrows. In this vicinity the party would have seen their last extensive brigalow scrub. The lower Suttor River becomes constrained by a landscape of low hills comprising metamorphosed sediments, granite and sandstone supporting eucalypt woodland. The Cape River and then the Sellheim River join the Suttor before its junction with the Burdekin River. The confluence of these streams is now under the water of the Burdekin Dam. Ten kilometres before reaching the Burdekin they diverted from the course of the Suttor River traversing to the east of Mount McConnell.

March 8

As we followed the creek about nine miles farther down, it became broader, and the Casuarinas [*Casuarina cunninghamiana*]<sup>117</sup> were more frequent. Its bed was sandy, occasionally filled with reeds [*Phragmites australis*]<sup>118</sup>...

March 10

The variety of grasses is very great; the most remarkable and succulent were two species of Anthistiria [*Themeda triandra* and *T. avenacea*], the grass of the Isaacs [*Heteropogon triticeus*], and a new one with articulate ears and rounded glumes [probably *Mnesithea rottboellioides*]. A pink Convolvulus, with showy blossoms [*Polymeria pusilla* or *Convolvulus graminetinus*], is very common. Portulaca, with terete leaves [*Portulaca filifolia* or *P. australis*], grows sparingly on the mild rich soil.

Were a superficial observer suddenly transported from one of the reedy ponds of Europe to this water-hole in Suttor Creek, he would not be able to detect the change of his locality, except by the presence of Casuarinas and the white trunks of the majestic flooded-gum [*Eucalyptus camaldulensis*]<sup>119</sup>. Reeds, similar to those of Europe, and Polygonums [*Persicaria* spp.]<sup>120</sup> almost identical as to species, surround the water, the surface of which is covered with the broad leaves of Villarsia [probably *Nymphoides indica*], exactly resembling those of *Nymphaea alba*, and with several species of Potamogeton [*Potamogeton* spp.].

There were occasional tracts of 'devil-devil' land, and patches of scrub, which, at no great distance, united into one mass of Bricklow [*Acacia harpophylla*]<sup>121</sup>.

<sup>116</sup> formerly *Livistona decipiens* (see Dowe and Jones 2004)

<sup>117</sup> See also March 10, 13, 15

<sup>118</sup> See also March 10, 12, 13, April 2

<sup>119</sup> See also March 13, 15, 17, 20, 25, 27

<sup>120</sup> See also March 20, 25

<sup>121</sup> See also March 12, 17

## March 12

This scrub, like those already mentioned, varies in density and in its composition; the Bricklow acacia predominates; but, in more open parts, tufts of *Bauhinia* covered with white blossoms [*Bauhinia hookeri*], and patches of the bright green *Fusanus* [*Owenia acidula*] and silvery Bricklow, formed a very pleasing picture. The bed of the Suttor was rather shallow, sandy, and irregular, with occasional patches of reeds; its left bank was covered with scrub; but well grassed flats, with Bastard-box [*Eucalyptus coolabah*] and Ironbark [probably *Eucalyptus crebra*], were on its right.

## March 13

... low ridges, covered either with scrub or with a very stunted silver-leaved Ironbark [*Eucalyptus shirleyi* or *E. melanophloia*]<sup>122</sup>...

... A *Melaleuca* with very small decussate leaves, a tree about twenty-five feet high [*Melaleuca tamariscina*], was growing on the scrubby ridges.

A *Ruellia*, with large white and blue flowers [*Dipteracanthus australasicus* subsp. *australasicus*], adorned the grassy flats along the Suttor.

## March 15

The scrub is generally an open *Vitex* [*Eremophila mitchellii*]<sup>123</sup>; a fine drooping tea-tree [*Melaleuca fluviatilis* or *M. leucadendra*]<sup>124</sup> lines the banks of the river...

The Mackenzie-bean [*Canavalia papuana*] and several other papilionaceous plants, with some new grasses, grow in it.

The most interesting plant, however, is a species of *Datura* [*Datura leichhardtii*], from one to two feet high, which genus has not previously been observed in Australia. I also found species of *Heliotropium* [*Heliotropium* sp.] of a most fragrant odour.

## March 17

The Bricklow is here a real tree, but of stunted growth, with regularly fissured bark, like that of the Ironbark (*Eucalyptus resinifera*). It has long broad falcate phyllodia, whilst another species of the same size has an irregularly scaly bark, with small phyllodia, but of a grayer colour [*Acacia cambagei*] than those of the common Bricklow. Both species grow promiscuously together.

Where the river left the scrub, it entered into a wild water-worn box flat, and cut up into several irregular channels, lined by a dense thicket of narrow-leaved *Melaleucas* [*Melaleuca bracteata* or *M. trichostachya*] of stunted growth and irregular shapes. The Box-tree itself is here a different species, the bark has deeper fissures, and the young wood is very yellow [*Eucalyptus coolabah*]<sup>125</sup>. I shall distinguish it by the name of 'Water-box,' as it grows exclusively near creeks, or on the neighbouring flats. I first observed it at the Mackenzie; its bark strips freely, but the stem is too short and irregular to be of any use.

... a long broad sheet of water stretched in sweeps through a dense *Bauhinia* [*Bauhinia carronii*] and Bricklow scrub, which covered its steep banks.

## March 19

On the plains I found two new species of *Sida*; and, on the tea-trees, a new form of *Loranthus*, with flowers in threes on a broad leafy bract, scarcely distinguishable from the real leaves [*Diplatia furcata*].

## March 20

The water-holes were surrounded by high *Polygonums*; blue *Nymphaeas* [probably *Nymphaea gigantea*]<sup>126</sup> were observed in several of them ...

<sup>122</sup> See also March 14, 27

<sup>123</sup> See also March 23

<sup>124</sup> See also March 19, 25, 27

<sup>125</sup> See also March 20, 23

<sup>126</sup> See also March 25



## March 23

The melon-holes of the box-flats were frequently over-grown with the polygonaceous plant [*Muehlenbeckia florulenta*], mentioned at a former occasion; and the small scrub plains were covered with a grey chenopodiaceous plant from three to four feet high [probably *Salsola kali*]. The stiff-leaved Cymbidium [*Cymbidium canaliculatum*] was still very common, and two or three plants of it were frequently observed on the same tree; its stem is eatable, but glutinous and insipid.

On the banks of the more or less dry water-holes grows an annual leguminous plant, which shoots up into a simple stem, often to the height of twelve feet; its neck and root are covered with a spongy tissue; its leaves are pinnate, a foot or more in length, with small leaflets; it bears mottled yellow flowers, in axillary racemes [*Sesbania cannabina*]<sup>127</sup>; and long rough, articulate pods, containing small, bright, olive-green seeds [*Aeschynomene indica*]<sup>128</sup>. I first saw this plant at Limestone, near Moreton Bay, and afterwards at the water-holes of Comet River. It was extremely abundant in the bed of the Burdekin, and was last seen on the west side of the gulf of Carpentaria; I could, however, easily distinguish three species of this plant.

## March 25

It was here we first met with *Caryea arborea* (Roxb.), a small tree from fifteen to twenty feet high, with elliptical leaves of soft texture, four inches long, and two in breadth; its fruit was about two inches long, contained many seeds, and resembled that of the Guava. Its leaves, however, had neither vernation nor the pellucid dots of Myrtaceous trees [*Planchonia careya*]. At the junction of the creek, a great number of small *Corypha* palms [*Livistona lanuginosa*] were growing, and my companions observed the dead stems of some very high ones, whose tops had been cut off by the natives, probably to obtain the young shoot.

... uniting into one deep channel, with long reaches of water surrounded by Polygonums, and overgrown with blue Nymphaeas, Damasoniums [*Caldesia oligococca*], and Utricularias [*Utricularia* spp.]...

## March 27

The country back from the river is formed by flats alternating with undulations, and is lightly timbered with silver-leaved Ironbark, rusty gum [*Corymbia leichhardtii*], Moreton Bay ash [*Corymbia tessellaris*]<sup>129</sup>, and water box.

## March 28

At some old camping places of the natives, we found the seed-vessels of *Pandanus*, a plant which I had never seen far from the sea coast; and also the empty shells of the seeds of a *Cycas* [*Cycas cupida* or *Livistona lanuginosa*]<sup>130</sup>. Mr. Calvert, John Murphy, and Brown, whom I had sent to collect marjoram, told me, at their return, that they had seen whole groves of *Pandanus* trees; and brought home the seed-vessel of a new Proteaceous tree. I went to examine the locality, and found, on a sandy and rather rotten soil, the *Pandanus* abundant, growing from sixteen to twenty feet high, either with a simple stem and crown, or with a few branches at the top [*Pandanus* sp.]. The Proteaceous tree was small, from twelve to fifteen feet high, of stunted and irregular habit, with dark, fissured bark, and large medullary rays in its red wood: its leaves were of a silvery colour, about two inches and a half long, and three-quarters broad; its seed-vessels woody and orbicular, like the single seed-vessels of the *Banksia conchifera*; the seeds were surrounded by a broad transparent membrane [*Grevillea glauca*]<sup>131</sup>. This tree, which I afterwards found everywhere in the neighbourhood of the gulf of Carpentaria, was in blossom from the middle of May to that of June. The poplar-gum, the bloodwood [probably *Corymbia clarksoniana*], the melaleuca of Mt. Stewart [*Melaleuca nervosa*], the Moreton Bay ash, the little Severn tree [*Petalostigma pubescens*], and a second species of the same genus with smooth leaves [*Petalostigma banksii*], were growing on the same soil. The grasses were very various, particularly in the hollows: and the fine bearded grass of the Isaacs grew from nine to twelve feet in height [*Heteropogon triticeus*]. Charley brought me a branch of a *Cassia* with a thyrse of showy yellow blossoms [*Cassia brewsteri*], which he said he had plucked from a shrub about fifteen feet high.

<sup>127</sup> Leichhardt seems to be including two species in a single description, as affirmed by a footnote: They belong probably to the two genera, *Aeschynomene* and *Sesbania*.

<sup>128</sup> *Sesbania cannabina* and *Aeschynomene indica* have similar habitats.

<sup>129</sup> See also March 28

<sup>130</sup> *Cycas cupida* is a rare species known to occur within 50 km of this location but is not known to occur near rivers. Leichhardt may have misidentified the large endocarps of the palm *Livistona lanuginosa*, although these are not known to be edible.

<sup>131</sup> a supplementary description is provided in a letter from Leichhardt to William Macarthur on the 18 July 1846: 'a small rather stunted tree with the dark fissured bark of the Ironbark tree: it has long lanceolate rather blunt leaves, with a silvery down at their lower surface. Its seed vessels resembled those of *Banksia serrata* (two round woody shells) or *conchifera*, its blossoms were white and formed long racemes. (Arousseau 1968, p. 884)

## Section 6. Burdekin (April 2-May 21 1845)

The party headed in a northerly direction up the Burdekin River that maintains a permanent stream for almost its entire length. Before the course of the river turns to the northwest, the stream cuts through dissected rocky granodiorite hills that made travelling difficult. After the turn in the river, a long stretch continues through granodiorite hills, but with a broader floodplain. On April 10, the party crossed the Flinders Highway to the east of Charters Towers and about 20km to the NW entered some rugged basalt areas, including the tail end of the geologically recent Toomba flows where Dalrymple National Park is situated. In places the party either left the river or travelled in its bed because of the difficulties of finding a course through this rugged rocky landscape. In general these rugged landscapes away from the river supported eucalypt woodland, although the areas of bare rock support dry rainforest. To the north of the Toomba flow, the basalt is older and more weathered, which allowed for easier travel to the junction of the Burdekin and Basalt Rivers. The party continued to follow the Burdekin in a northerly direction past its junction with the Star River, Running River, Clarke River and Christmas Creek through a hilly landscape dominated by metamorphosed sediments with occasional Tertiary sandstones. The area includes many stony ridges and gullies that often forced the party away from the stream itself to higher ground. Travel was particularly difficult in the area known as Hell's Gate where the Burdekin swings in a westerly direction through a rhyolite gorge. On April 30 they passed by Greenvale where the river flat of the Burdekin is mostly broad with open timbered flats. Upstream of the Dry River the Burdekin effectively runs along the divide between basalt to the west and metamorphosed sediments and occasional acid volcanics to the east. The eucalypt woodlands are more open and grassy on the basalt and the party generally followed up the western side of the stream, although the rockiness of this terrain made travel with the horses difficult. Near the junction of Reedy Brook and the Burdekin River, large lagoons prompted Leichhardt to name this area the 'Valley of Lagoons'. To the north of these lagoons is a basalt lava field (the tail of the geologically recent Kinrara basalt flow) that caused Leichhardt to spend two days determining a route that avoided the fresh basalt lava (supporting dry rainforest) and rock fields (supporting open eucalypt woodland). In places, ridges descending from the northern end of Pelican Lake Range interspersed the flat basalt and alluvium. On the 16 May they left the Burdekin and headed north up Anthill Creek which continued the separation of the basalt plains to the west and the hills of metamorphics and granites to the east. While the party camped near the head of Anthill Creek in the vicinity of 'Glen Harding' homestead, Leichhardt searched for a route that would provide water. They then headed overland for a long days travel in a NNW direction, through granitic and basaltic geologies, passing by G.W. swamp, Native Wells swamp, then through a long stretch of open woodland on basaltic terrain, before arriving at the head of Rudd Creek (the Separation Creek of Leichhardt) in the catchment of the Herbert River. After a two-day rest they headed west through more heavily timbered granitic country crossing the Great Dividing Range and the Kennedy Highway.

April 2

Mr. Gilbert found a large calabash attached to its dry vine [*Lagenaria siceraria* or *Benincasa hispida*], which had been carried down by the waters.

April 3

Among the patches of brush which are particularly found at the junction of the larger creeks with the river, we observed a large fig-tree, from fifty to sixty feet high, with a rich shady foliage; and covered with bunches of fruit [*Ficus racemosa*]<sup>132</sup>. The figs were of the size of a small apple, of an agreeable flavour when ripe, but were full of small flies and ants. These trees were numerous, and their situation was readily detected by the paths of the natives leading to them: a proof that the fruit forms one of their favourite articles of food. The drooping tea trees [*Melaleuca fluviatilis* or *M. leucadendra*]<sup>133</sup>, which had increased both in number and size, grew in company with an arborescent Calistemon [*Callistemon viminalis*]<sup>134</sup>, along the water's edge; and a species of Eucalyptus, somewhat resembling *Angophora intermedia* [possibly *Corymbia setosa*], was discovered at this spot: it occurs frequently to the northward, and is common round the gulf of Carpentaria. The small Acacia tree of Expedition Range [*Acacia bidwillii*]<sup>135</sup> was frequently seen in the forest, and was covered with an amber-coloured gum, that was eatable, but tasteless: *Hakea lorea* (R. Br.) [*Hakea lorea*]<sup>136</sup>, and *Grevillea ceratophylla* (R. Br.) [*Grevillea parallela*]; the Ebenaceous tree [*Pleiogynium timorense*]<sup>137</sup>, and that with guava-like fruit (lareya) [*Planchonia careya*], were all numerous. The bed of the river was covered with the leguminous annual [*Sesbania cannabina*] I noticed at the Suttor; it grew here so high and thick that my companions were unable to see me, though riding only a few yards from them.

<sup>132</sup> See also April 5, 7, 8, 12, 14

<sup>133</sup> See also April 9, 23, May 1, 6, 11, 21

<sup>134</sup> See also May 9

<sup>135</sup> See also April 9

<sup>136</sup> See also April 21, May 1

<sup>137</sup> See the more detailed description of February 12

April 4

... open narrow-leaved Ironbark forest [*Eucalyptus crebra* or *E. xanthoclada*]<sup>138</sup> on a granitic sand...

April 5

We observed the poplar-gum again in the open forest, and a fine drooping loranthus [*Amyema miquelii*] growing on it. Pandanus [*Pandanus* sp.]<sup>139</sup> was also very frequent, in clusters from three to eight trees.

... the top of the hill, which is wooded with a silver-leaved Ironbark [*Eucalyptus shirleyi* or *E. melanophloia*]<sup>140</sup>, ...

April 6

... several sandy creeks, in which a species of Melaleuca [*Melaleuca* sp.], and another of Tristania [*Lophostemon grandiflorus*] were growing...

April 8

Besides the clustered fig, and another species with rough leaves and small downy purple fruit [*Ficus opposita*] there were a species of Celtis [*Celtis paniculata*]; the Melia azederach (White Cedar) [*Melia azedarach*]; a species of Phyllanthus (a shrub from six to ten feet high) [*Breynia oblongifolia*, *Flueggea leucopyrus* or *Bridelia leichhardtii*]<sup>141</sup>; an Asclepiadaceous climber, with long terete twin capsules [possibly *Gymnanthera oblonga* or *Secamone elliptica*]; and several Cucurbitaceae, one with oblong fruit about an inch long, another with a round fruit half an inch in diameter [probably *Cucumis melo*], red and white, resembling a gooseberry [*Diplocyclos palmatus*]; a third was of an oblong form, two inches and a half long and one broad [probably *Momocordia charantia*]; and a fourth was of the size and form of an orange, and of a beautiful scarlet colour [*Trichosanthes pentaphylla*]<sup>142</sup>: the two last had an excessively bitter taste. ...

April 9

The country was openly timbered; the Moreton Bay ash [*Corymbia tessellaris*]<sup>143</sup> grew along the bergue of the river, where a species of Grewia [probably *Grewia retusifolia*]<sup>144</sup> seemed its inseparable companion. The flooded-gum [*Eucalyptus camaldulensis*]<sup>145</sup> occupied the hollows and slopes of the river banks, which were covered with a high stiff grass [possibly *Arundinella nepalensis*]<sup>146</sup> to the water's edge, and the stream was fringed with a thicket of drooping tea trees, which were comparatively small, and much bent by the force of floods, the probable frequency of which may account for the reduced size of the tree. The ridges were covered with rusty Gum [*Corymbia leichhardtii*] and narrow-leaved Ironbark. An Erythrina [*Erythrina vespertilio*]<sup>147</sup> and the Acacia of Expedition Range were plentiful.

April 10

A shrubby Clerodendron [*Clerodendrum floribundum*] and an arborescent Bursaria, covered with white blossoms [*Bursaria incana*] adorned the forest.

<sup>138</sup> See also April 7, 9, 12, 14, 16, 18, 19, May 5, 10, 11

<sup>139</sup> See also April 13, May 16 and 17

<sup>140</sup> See also April 9, 19, 22

<sup>141</sup> No *Phyllanthus* sp. achieves this size. On Leichhardt's second expedition he refers to a 'phyllanthus with red fruit' in the Dawson area (30 Jan., Sprod 1989, p. 159). This can certainly be ascribed to *Breynia oblongifolia*

<sup>142</sup> All specimens of *Trichosanthes pentaphylla* at the Queensland Herbarium are from higher rainfall environments, although Mueller collected it from the 'Burdekin River' (Telford 1982). Leichhardt described the flowers on April 13. See also April 19

<sup>143</sup> See also April 12, 23, May 2, 10

<sup>144</sup> See also May 20

<sup>145</sup> See also May 2, 3, 11, 21

<sup>146</sup> See also April 13, May 1

<sup>147</sup> See also April 14

April 11

Farther on, however, we occasionally met with patches of *Vitex* scrub [*Eremophila mitchellii*]<sup>148</sup>, and crossed some stony ridges.

On the rocky crest of the hill, I gathered the pretty red and black seeds of a leguminous climbing shrub (*Abrus precatorius*) [*Abrus precatorius*].

April 12

Box-tree [probably *Eucalyptus brownii*]<sup>149</sup> flats and open *Vitex* scrub extended along its banks, and the latter according to Mr Roper's account changed into dense Bricklow [*Acacia harpophylla*] scrub.

The basalt ceased to the westward of the limestone hill, and was succeeded by considerable flats of Ironbark, Moreton Bay ash, and Bloodwood [*Corymbia clarksoniana* or *C. erythrophloia*]. The *Capparis* [possibly *Capparis canescens*] still exhibited a few showy flowers.

April 13

Some days ago I found, for the first time, *Spathodea alternifolia* (R. Br.) [*Dolichandrone alternifolia* or *D. heterophylla*], which we continued to meet with throughout the remainder of our journey. I saw but one flower of it, but its falcate seed-vessels, often more than a foot long, were very numerous.

A Bottle-tree with a *Platanus* leaf (*Sterculia*?) [*Brachychiton australis*]<sup>150</sup> grew in the scrub on the field of basalt, and was in full blossom. A pretty species of *Commelina* [*Commelina ensifolia* or *C. lanceolata*], on the flats, a cucurbitaceous plant with quinquepalmate leaves and large white blossoms, grew along the river, the approaches of which were rendered almost inaccessible by a stiff high grass. Charley brought me the long flower-stalk of *Xanthorrhoea* [*Xanthorrhoea johnsonii*] from some ridges, which were, doubtless, composed of sandstone.

April 16

In the thicket which covered the rock, I observed *Pomaderris* of Moreton Bay [*Alphitonia excelsa*].

April 18

Among the shrubs and grasses, a downy *Abutilon* [*Abutilon calliphyllosum*, *A. leucopetalum* or *A. nobile*] was easily distinguished by its large bright yellow blossoms.

April 19

Mr. Phillips found a flesh-coloured drupaceous oblong fruit, about half an inch long, with a very glutinous pericarp, containing a slightly compressed rough stone [*Cordia dichotoma*]: in taste it resembled the fruit of *Loranthus*, and the birds, particularly the cockatoos, appeared very fond of it. We all ate a great quantity of them, without the slightest injury. It grew on a small tree, and had a persistent calyx.

April 20

I had the pleasure of finding some very interesting plants on its summit; particularly a small *Acacia* with verticillate leaves [*Acacia galioides*], which Dr. Binoe, the surgeon of H. M. S. *Beagle*, had found on the north-west coast; and two other *Acacias* equally new to me [*Acacia* spp.], and which were afterwards found to extend to the heads of the South Alligator River.

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<sup>148</sup> See also April 12, 14, 16, 23

<sup>149</sup> On April 13, Leichhardt noted 'The box (*Eucalyptus*), on the flats along the creek, the soil of which is probably formed of the detritus of basaltic rock, had a lanceolate glossy leaf, uniting the character of the box with glossy orbicular leaves growing generally on the whinstone soil of the northern parts of the colony, and of the box with long lanceolate leaves which prefers stiff flats on the tributary creeks of the Hunter.' This description clearly pertains to *Eucalyptus brownii* as probably do other references to 'box' in this section. See also April 13, 14, 16, 25, May 1, 2, 5, 11

<sup>150</sup> See also May 3, May 6

April 21

...on the rocky slopes I found a new species of *Hakea*, having linear lanceolate leaves with axillary fascicles of small brownish flowers [*Hakea arborescens*]<sup>151</sup>: it was an arborescent shrub, from three to six feet high; and is nearly allied to *H. arborescens* (R. Br. *Prodr.* p. 386).

April 22

I have mentioned a small round eatable tuber, which I found in the basket of a native gin on the 2nd January. I here found it to be the large end of the tap root of a *Potamogeton* [probably *Triglochin* sp.], or a plant nearly allied to that genus; I found it with another interesting water-plant, with foliated spikes of blue flowers [*Monochoria cyanea*], in a small water-hole near our last camp.

April 23

These flats were separated by shallow gullies, and some *Casuarina* [*Casuarina cunninghamiana*]<sup>152</sup> creeks ...

April 30

Several familiar forms of plants were discovered; also a new *Eucalyptus*, with a glaucous suborbicular subcordate leaf, and the bark of the rusty gum [*Corymbia peltata*]: a stunted or middle-sized tree, which grew in great abundance on the ranges ...

A large tree, with dark green broad lanceolate stinging leaves [*Dendrocnide photinophylla*], grew on its banks; it resembled the nettle tree, but belonged to neither of the two species growing in the bushes of the east coast.

May 1

A species of *Acacia* with narrow blunt phyllodia, about an inch long, with spinous stipules [*Acacia victoriae*]; *Hakea lorea*, and the *Grevillea mimosoides* (R. Br.), with very long linear leaves [*Grevillea striata*], were frequent.

May 2

...the dry channel of a river, with reeds [*Phragmites australis*]<sup>153</sup> and occasional water-holes...

May 3

After turning round the field of lava to the eastward, we entered into a large flat, with patches of narrow-leaved tea tree [*Melaleuca bracteata*]<sup>154</sup>, with reedy swamps and fine flooded-gum trees, and made our camp at a strong running brook, without trees, but densely surrounded with reeds, ferns, and pothos<sup>155</sup>.

At the foot of the eastern hills, however, deep holes existed in a water-course, with black blocks of basalt heaped over each other, on which the fig tree [probably *Ficus virens*]<sup>156</sup> with its dark green foliage formed a shady bower, most delightful during the heat of the day.

A native low shrubby Mulberry [*Pipturus argenteus*]<sup>157</sup> was found in this scrub, the fruit of which was good to eat, but of very small size.

From the top of the hills I enjoyed a most beautiful view of the valley of the river, with its large lagoons covered with *Nymphaeas* [*Nymphaea gigantea* or *N. violacea*]<sup>158</sup> and *Damasoniums* [*Caldesia oligococca*].

<sup>151</sup> See also May 21

<sup>152</sup> See also April 23, 30, May 1, 2, 9, 10, 11, 21

<sup>153</sup> See also May 3, 4, 5, 6, 11, 21

<sup>154</sup> See also May 5, 20

<sup>155</sup> In Gilbert's unpublished journal he states 'Here we first saw the genus of *Plothos* a species of *Nymphaea*'. This may be a misunderstanding on Gilbert's part. The identity of pothos (spelt as plothos on May 6) is uncertain.

<sup>156</sup> See also May 11

<sup>157</sup> See also May 11

<sup>158</sup> See also May 6, 11, 15

May 4

During one of the last stages, we discovered a leguminous tree, with the dark fissured bark of the Ironbark, but with large bipinnate leaves, the leaflets oblong, an inch in length; the pods broad and thin, and two or three inches long [*Erythrophleum chlorostachys*]: this tree is common all over the northern part of the continent, and was found growing abundantly around Victoria, the principal settlement of Port Essington.

May 5

I followed the base of the basaltic table land, along which the brook came down, and, after a two miles' ride on its banks, through oak trees [*Casuarina cunninghamiana*]<sup>159</sup>, low fern trees [possibly *Cycas desolata*]<sup>160</sup>, and several bush trees, found that it came down a valley deeply cut into the table land.

May 10

Tristania [probably *Lophostemon suaveolens*], with pubescent leaves round some lagoons...

May 11

Oak trees and drooping Melaleucas [*Melaleuca fluviatilis* or *M. leucadendra*] grew abundantly in its bed, and along the banks.

I have to mention that a species of *Sciadophyllum*, nearly allied to *Sc. lucidum*, (*Don. iii. p. 390.*) was found in the lava scrub of the valley of lagoons: it was a small tree with digitate leaves, composed of from eleven to thirteen oblong acuminate, glabrous leaflets, which were about five inches long; and it attracted the attention of my companions as much by its ornamental foliage at its numerous terminal racemes of bright scarlet flowers [*Schefflera actinophylla*].

The upper parts of the small creeks, which come down in these plains, were full of water, and had their source generally between heaps of bare basaltic rocks, surrounded by rich grass, and a scanty scrub of *Pittosporum* [possibly *Denhamia pittosporoides*], of the native mulberry, of the fig-tree, and of several vines, with *Polypodiums*, *Osmundas* [probably *Cyclosorus interruptus*], and *Caladiums* [*Alocasia brisbanensis*]<sup>161</sup> growing between them.

...a great number of rocky basins within the basalt, and surrounded by its black blocks, formed evidently so many lagoons during the wet season, as sedges and *Polygonums* [*Persicaria* sp.]—always inhabitants of constantly moist places—grew abundantly in most of them

May 16 and 17

*Pandanus spiralis* fringed the scattered water-holes; and *Grevillea chrysoendron*, (*R. Br.*) [*Grevillea pteridifolia*]<sup>162</sup> formed a wreath, of pale silver-colour, round the swamps, but grew on sandy soil.

May 20

The stringy bark tree [*Eucalyptus tetradonta*], and *Tristania* [*Lophostemon grandiflorus* or *L. suaveolens*] were growing on the sandy soil, and the latter near watercourses.

<sup>159</sup> See also May 11, 16 and 17

<sup>160</sup> It seems possible that Leichhardt is referring here to a cycad. His observation of these 'low fern trees' was made while reconnoitering with Charley. Cycads were seen by the party on May 3, as testified by Gilbert in his diary entry for May 3: 'the Basalt, on a flat, was a fine species of *Zamia*, having glaucous leaves, some of them having stems from four to six feet in height, it was confined to an area not more than half a mile around, it is certainly a very elegant plant, the seed of which proves to be one of the articles of food among the Natives.' This is undoubtedly *Cycas desolata* P.I. Forst., a species rediscovered in 1992 and formally described in 1995. Leichhardt did not note this species in his published journal but did note its presence in retrospect, when comparing it with the cycads at Port Essington. 'The *Cycas* appears to be of different species from that at least of the Burdekin' (Webster 1986, p. 33). It is also conceivable that this could be a tree fern. If this were the case the most obvious candidate would be *Cyathea cooperi*, which has been collected in a more mesic environment about 40 km distant from this location.

<sup>161</sup> See Leichhardt's letters (Aurousseau 1968, Vol. 2, p. 683) for full description.

<sup>162</sup> See also May 20

May 21

Large blocks of granite crested the summits of the hills, and their slopes were covered with Acacia thickets [*Acacia shirleyi*], and arborescent Hakeas and Grevilleas. A dwarf Acacia, with rhomboid downy phyllodia, an inch long [probably *Acacia humifusa*], grew between the rocks.

### Section 7. Lynd-Mitchell (May 22-June 25 1845)

The party entered the watershed of the Gulf of Carpentaria near the headwater of Nobbs Creek that they followed for a short distance to the Lynd River. They followed down the valley of the Lynd that dissects low ranges of metamorphics, rhyolite and sandstone supporting eucalypt woodlands. In places, the rugged topography kept the party a little back from the river itself. The stream breaks out from the ranges onto the flat plains of the Gulf of Carpentaria hinterland about 20 km south of the 'Bulimba' homestead. The landscape of the lower Lynd is typical of the region and is comprised of a matrix of *Melaleuca* and *Eucalyptus* dominated woodlands with occasional treeless plains. The party continued to follow the Lynd River until near its junction with the Mitchell River, which they bypassed on the 15 June. The party travelled down the Mitchell River but well back from the southern bank to avoid gullies, passing by a number of lagoons associated with the floodplain. They followed the river to a point about 25km WNW of 'Koolatah' where Leichhardt decided that they had proceeded too far to the north and should head west to the coast where they could follow the coast of the Gulf of Carpentaria in their desired direction.

May 22

At the westerly creek I found a rose-coloured Sterculia, with large campanulate blossoms and tomentose seed-vessels [*Brachychiton albidus* or *B. chillagoensis*]<sup>163</sup>: the tree had lost all its foliage. I had met with this species on the rocky ranges of Moreton Bay (at Mount Brisbane), but there it was a low shrub, whereas in this place, and all round the gulf of Carpentaria, it formed a middle sized tree with spreading branches. A new Hakea, with long thin terete leaves (different from *H. lorea*) [*Hakea persiehana*] and *Grevillea chrysodendron* [*Grevillea pteridifolia*], grew along the creek. *Grevillea ceratophylla* (R. Br.) [*Grevillea parallela*] and another *Grevillea*, with a compound terminal thyrus, and long lanceolate falcate leaves [*Grevillea mimosoides*], grew on the slopes, in company with a *Xylomelum* [*Xylomelum scottianum*], with smooth and smaller seed-vessels than those of *X. pyriforme*. The rocky ridges were occupied by the stringy-bark [*Eucalyptus tetradonta*]<sup>164</sup>, fine Cypress-pine trees [*Callitris intratropica*], the stunted silver-leaved Ironbark [*Eucalyptus shirleyi*]<sup>165</sup>, a *Eucalyptus*, with very scanty foliage, orange-coloured blossoms, seed-vessels longitudinally ribbed, and as large as the egg of a fowl; its butt was covered with a lamellar bark, but the upper part and the branches were white and smooth [*Eucalyptus chartaboma*]; also by another *Eucalyptus*, with a scaly butt like the Moreton Bay ash, but with smooth upper trunk and cordate ovate leaves [*Corymbia confertiflora*]<sup>166</sup>, which was also new to me; we called it the Apple-gum. We frequently met with the grass tree (*Xanthorrhoea*.) [*Xanthorrhoea johnsonii*].

May 26

The ranges formed the banks of the river itself, and even entered its bed, which gradually enlarged and was frequently formed by several channels fringed with large drooping tea trees [*Melaleuca leucadendra*, *M. fluviatilis* or *M. argentea*]<sup>167</sup>.

May 27

As soon, however, as the river had fairly left the basaltic formation, fine large flats of a light sandy soil succeeded on both sides; on which *Pandanus spiralis* [*Pandanus* sp.]<sup>168</sup> grew in great abundance, and to a larger size than we had seen before.

Among the new and interesting scrubs and trees which we met with at almost every step, I shall only mention a small *Grevillea*, from one to two feet in height, with pubescent pinnatifid leaves, and a simple or compound thyrus of scarlet flowers [*Grevillea dryandri*]; *Cochlospermum gossypium*, the native cotton tree of Port Essington, whose bright showy

<sup>163</sup> See also May 27; the species he mentions seeing at Mt Brisbane is *Brachychiton bidwillii*

<sup>164</sup> See also May 27, June 3, 6, 8, 9, 13, 14, 16, 20

<sup>165</sup> See also June 3

<sup>166</sup> See also June 6, 11, 13, 20

<sup>167</sup> See also May 27, June 8, 9, 23, 25

<sup>168</sup> See also May 31

yellow blossoms and large capsules full of silky cotton, attracted our attention; its leaves are deciduous, and the trees were entirely leafless [*Cochlospermum gregorii*]<sup>169</sup>; a fine species of Calytrix on the rocks [*Calytrix leptophylla*], and two of Loranthus on the drooping tea tree, the drooping foliage of which one of them imitated, whilst the other belonged to the group I mentioned as found at the Suttor, with its flowers inserted on a leafy bract [*Diplatia grandibractea*].

*Exocarpus latifolius* [*Exocarpos latifolius*]<sup>170</sup> is so different from *E. cupressiformis*, in its foliage and aspect, that I did not suspect their near relation, until I found blossom and fruit: the ripe kernel as well as its yellow succulent leaf-stalk have a very agreeable taste; a leguminous shrub, about five or six feet high, with purple blossoms gathered into terminal oblong heads [*Cullen badocanum* or *Psoralea spicigera*]; this would be an ornament to our gardens. Along the river we discovered a large tree, about forty or fifty feet in height, with rather singularly disposed horizontal branches and rich dark green foliage; its leaves were oblong acute, and frequently a foot long; its flowers formed dense heads, which grew into a fleshy body marked with the arcoles of every flower. It is either *Sarcocephalus* or *Zuccarinia*, or nearly allied to them [*Nauclea orientalis*]<sup>171</sup>. The tree has never been seen on easterly waters, but it was the invariable companion of all the larger freshwater rivers round the gulf. A fine species of *Gomphrena* [probably *Gomphrena flaccida*] was found in the sandy bed of the river. A species of *Terminalia*, a fine shady tree, with spreading branches and broad elliptical leaves [*Terminalia platyphylla*], grew along the sandy creeks; and another smaller one with Samara fruit [*Terminalia platyptera*] preferred the rocky slopes. Both of these, and a third species growing on the west side of the gulph, which I shall have to mention hereafter, supplied us with fine eatable gum, and a fourth species, with smooth leaves, had an eatable fruit of a purple colour [probably *Terminalia subacroptera*].

Heaps of rocks with clusters of trees, particularly the smooth-leaved fig tree [*Ficus rubiginosa*], the rose-coloured *Sterculia*, *Exocarpus latifolius*, were scattered over the slopes, or grew on the summits...

...bustards were numerous on the small flats between basaltic hillocks, where they fed on the ripe fruit of *Grewia* [probably *Grewia retusifolia*]<sup>172</sup>.

#### May 31

Proceeding, we travelled over a broken and very stony country, with a stiff soil, but mixed with so much sand that even the Severn tree [*Petalostigma pubescens*]<sup>173</sup> grew well. There was another small tree, the branches of which were thickly covered with bright green leaves; it had round inferior fruit, about half an inch in diameter, which was full of seeds [*Gardenia vilhelmii*]<sup>174</sup>: when ripe, it was slightly pulpy and acidulous, and reminded me of the taste of the coarse German rye bread. In consequence of this resemblance, we called this little tree the Bread tree of the Lynd. I ate handfulls of this fruit without the slightest inconvenience. A species of *Pittosporum* [possibly *Denhamia pittosporoides*], and several *Acacias*, *Pandanus*, and the leguminous Ironbark [*Erythrophleum chlorostachys*], were scattered through an open forest of Ironbark [probably *Eucalyptus cullenii*]<sup>175</sup> and lanceolate box [*Eucalyptus leptophleba* or *E. microneura*]<sup>176</sup>. I observed here a very ornamental little tree, with drooping branches and linear lanceolate drooping leaves three inches long; it very much resembled a species of *Capparis* that I had seen at the Isaacs. Its blossoms are very small, and the calyx and corolla have each five divisions; the stamens are opposite the petals; it bore a fruit like a small apple, with a hard outside, but pulpy and many seeded within, like *Capparis*; the calyx was attached to the base of the fruit [*Siphonodon pendulus*].

The highest flood-marks we observed were from six to eight feet above the level of the bed; these marks were on the trunks of *Casuarinas* [*Casuarina cunninghamiana*], *Melaleucas*, and flooded-gum [*Eucalyptus camaldulensis*]<sup>177</sup>, which grew along the channel. The country in general had a winterly appearance; and the grass round the camp was dry, but I observed the fine grass of the Isaacs [*Heteropogon triticeus*]<sup>178</sup>...

#### June 2

The river divided several times into anabranches, flowing round, and insulating rocky hills and ridges. It was much better supplied with water, and contained several large reedy [*Phragmites vallatoria*] lagoons. An elegant *Acacia*, about thirty or

<sup>169</sup> See also June 5, 20

<sup>170</sup> See also May 27

<sup>171</sup> See also June 5, 9, 23

<sup>172</sup> See also June 19

<sup>173</sup> See also June 13

<sup>174</sup> See also June 13

<sup>175</sup> Jackes (1990) ascribed this to *Eucalyptus crebra*. See also May 31, June 5, 6, 8, 14

<sup>176</sup> See also June 3, 5, 6, 9, 11, 13, 14, 16, 20, 25

<sup>177</sup> See also June 13, 20

<sup>178</sup> See also June 9



thirty-five feet high, grew on its small flats: it had large drooping glaucous bipinnate leaves, long broad pods, and oval seeds, half black, and half bright red [*Adenantha abrosperma*].

#### June 3

In their dillies I found the fleshy roots of a bean, which grows in a sandy soil, and has solitary yellow blossoms [probably *Eriosema chinense*]; the tuber of a vine, which has palmate leaves [*Cissus opaca*]; a bitter potato, probably belonging to a water-plant [possibly *Tacca leontopetaloides* or *Triglochin* sp.]...

#### June 5

The clustered fig tree [*Ficus racemosa*]<sup>179</sup> of the Burdekin became again more frequent; but *Sarcocephalus* was the characteristic tree of the river. The Acacia of Expedition Range [*Acacia bidwillii*]<sup>180</sup> and of the upper Lynd, grew to a comparatively large size in the open forest.

The bean of the Mackenzie [*Canavalia papuana*] was very abundant in the sandy bed of the river; we roasted and ate some of its fruit; it was, however, too heavy, and produced indigestion: Mr. Phillips pounded them, and they made an excellent substitute for coffee, which I preferred to our tea, which, at that time, was not very remarkable for its strength.

#### June 6

On the small flats, the apple-gum grew with a few scattered Moreton Bay ash trees; on the bergues of the river we found the white cedar (*Melia azedarach*)[*Melia azedarach*], Clerodendron [*Clerodendrum floribundum* or *C. tomentosum*]; an asclepiadaceous shrub with large triangular seed-vessels [probably *Tylophora erecta*]; and, on the hills, the blood-wood [*Corymbia* sp.]<sup>181</sup> and stringy-bark.

#### June 8

A new species of *Melaleuca* [probably *Melaleuca stenostachya*] and also of *Boronia* [*Boronia bowmanii*] were found, when entering upon the sandstone formation.

#### June 9

The stringy-bark became even numerous on the flats, in consequence of the more sandy nature of the soil: but the hills were scrubby, and Mr. Gilbert reported that he had even seen the Bricklow [possibly *Acacia julifera* subsp. *gilbertensis*]. The grass of the Isaacs grew from twelve to fifteen feet high, in the hollows near the river, which was, as usual, fringed with *Sarcocephalus*; a species of *Terminalia* [*Terminalia* sp.]; the drooping tea-tree; and with an *Acacia* [probably *Acacia platycarpa*]<sup>182</sup> which perfumed the air with the fragrant odours of its flowers.

#### June 13

A species of *Stravadium* attracted our attention by its loose racemes of crimson coloured flowers, and of large three or four ribbed monospermous fruit; it was a small tree, with bright green foliage [*Barringtonia acutangula*]<sup>183</sup>, and was the almost constant companion of the permanent water-holes. As its foliage and the manner of its growth resemble the mangrove, we called it the Mangrove Myrtle.

#### June 16

...we came to several very fine lagoons; one of which was several miles long, and apparently parallel to the river: it was exceedingly deep, and covered with the broad leaves of *Villarsia* [*Nymphoides indica* or *N. crenata*]<sup>184</sup> and *Nymphaea* [*Nymphaea gigantea* or *N. violacea*]<sup>185</sup>...

<sup>179</sup> See also June 23

<sup>180</sup> Jackes (1990) tentatively ascribed this to *Acacia holosericea*. See also June 13, 14, 15, 16

<sup>181</sup> See also June 13, 16, 20

<sup>182</sup> See also June 11

<sup>183</sup> See also June 23, 24

<sup>184</sup> See also June 19

<sup>185</sup> See also June 19, 24

In crossing one of the creeks we found a species of *Acacia* (*Inga moniliformis*, D. C. Prod. Vol. II. p. 440, where it is described as having been found at Timor.), with articulate pods and large brown seeds; it was a small tree with spreading branches, and a dark green shady foliage [*Cathormion umbellatum*]<sup>186</sup>: it occurred afterwards on all the creeks and water-holes until we reached our destination.

June 19

The country along the Mitchell was an immense uninterrupted flat with a very clayey soil, on which the following plants were frequent: viz. *Grevillea*, *Cerotaphylla* [*Grevillea parallela*], and *Mimosoides* [*Grevillea striata*], a *Melaleuca* with broad lanceolate leaves [*Melaleuca viridiflora*], *Spathodea* [*Dolichandrone alternifolia* or *D. heterophylla*]<sup>187</sup> and a *Balfouria*, *R. Br.* [probably *Wrightia saligna*]<sup>188</sup>.

June 20

Plains covered with high dry grass alternated with an open forest; in which we observed *Spathodea*, *Bauhinia* [*Bauhinia cunninghamii*]<sup>189</sup>, a *Balfouria*, groves of *Cochlospermum gossypium*, and several other trees, which I had seen in the scrubs of Comet River; among which was the arborescent *Cassia* with long pods [possibly *Cassia brewsteri*]<sup>190</sup>.

A pretty yellow *Ipomoea* [*Merremia hederacea*]<sup>191</sup> formed dense festoons between the trees that fringed the waters.

June 21

...past several fine lagoons, richly adorned by the large showy flowers of a white *Nymphaea* [possibly *Nymphaea violacea*], the seed-vessels of which some families of natives were busily gathering...

... John Murphy and Brown brought the leaves of the first palm trees we had seen on the waters of the gulf. They belonged to the genus *Corypha* [*Corypha utan*]<sup>192</sup>; some of them were very thick and high.

June 25

... we entered into a flat covered with stunted box, and intersected by numerous irregular water-courses. The box was succeeded by a *Phyllanthus* [probably *Flueggea virosa*] scrub, through which we pushed...

## Section 8. Eastern Gulf of Carpentaria (June 26-August 20 1845)

*The party traversed open plains passing several large lagoons associated with drainage lines some of which are named, including Diamond Creek and Tea Tree Creek, an upper tributary of the Nassau River. It was in the vicinity of the latter location that aborigines attacked the party on the night of June 28. Gilbert was killed and other party members were seriously wounded. After a few days recuperation the party continued in a south-westerly direction crossing Station, Cattle, Surprise and Salt Arm Creeks. Their travel must have been hampered by the serious injuries of Roper and Calvert, but their spirits were lifted by the presence of mangroves and other tidal communities that indicated the proximity of the coastline (about 20 km to the west). The party followed a broad arc taking them in a more southerly direction before they arrived at the Staaten River about 3km south-west of Galbraith homestead on July 7. They crossed the Staaten River at low tide before crossing Van Rook Creek, Bull Creek and Middle Creek before reaching the Gilbert River (Leichhardt's Van Diemen River) about 25km NW of the 'Stirling' homestead. The party continued in a southerly direction across the Smithbourne River (Leichhardt's Gilbert River), and then gradually to the south-west where they crossed the numerous channels including McLellans Creek before reaching Walker Creek (Leichhardt's Carron River), near where they camped for two nights to allow the debilitated Roper to recuperate. They continued in SSW direction crossing the Norman River on July 20 just north of the Gulf Development Road about 20km south of Normanton. They proceeded in a generally westerly direction crossing the Bynoe River (Leichhardt's Big Plain Creek) and Flinders River just north of their separation. They then headed south up Armstrong Creek to avoid*

<sup>186</sup> Jackes (1990) tentatively ascribed this to *Acacia bidwillii*.

<sup>187</sup> See also June 20

<sup>188</sup> See also June 20

<sup>189</sup> Later in this paragraph Leichhardt gives a fuller description, 'A *Bauhinia*, different from the two species I had previously seen, was covered with red blossoms, which, where the tree abounded, gave quite a purple hue to the country'.

<sup>190</sup> This record is a long way distant from the currently known distribution of *C. brewsteri*

<sup>191</sup> Compare this reference to July 12

<sup>192</sup> See also June 23, 24, 25

this salty waterless country before heading west again to L Creek, upstream from Inverleigh homestead. In this area they witnessed the vast treeless grasslands of the Gulf Plains. They then curved back to the northward through more wooded country and over Pongdestre, M and Punchbowl Creeks. Alternately crossing treeless plains and wooded flats in a west and then north-westerly direction the party reached the Leichhardt River (mistakenly identified by Leichhardt as the Albert [or Maet Suyker] River) on August 4 about 25 km north of 'Armraynald' homestead. However they were again required to travel south in search of freshwater and did not cross the Leichhardt River until they had reached a point about 20km WNW of 'Wernadinga' homestead. Heading in a north-westerly direction the party crossed Millar Creek and Beames Brook about 20km south-west of Burketown. All these streams flow into the Albert River but Leichhardt was just to the south of the major stream, which would have allowed for its identification. After a short distance they crossed the Nicholson River marking the end of expanses of open grassy plains.

#### June 26

On our way we passed some very fine long water-holes; some of which were surrounded with reeds [probably *Phragmites vallatoria*], and others covered with the white species of *Nymphaea* [possibly *Nymphaea macrosperma*]<sup>193</sup>; groves of *Pandanus spiralis* [*Pandanus spiralis*]<sup>194</sup> occupied their banks.

#### June 27

We travelled eight miles W.S.W. over a succession of plains separated by belts of forest, consisting of bloodwood [probably *Corymbia polycarpa*]<sup>195</sup>, box [*Eucalyptus microtheca*, *E. chlorophylla* or *E. tectifera*]<sup>196</sup>, apple-gum [*Corymbia confertiflora*]<sup>197</sup>, and rusty-gum [probably *Corymbia curtipes* or *C. terminalis*]<sup>198</sup>. Some plains were scattered over with *Bauhinias* [*Bauhinia cunninghamii*]<sup>199</sup>.

The lagoon was covered with small white *Nymphaeas*, *Damasoniums* [*Caldesia oligococca* or *C. acanthocarpa*], and yellow *Utricularias* [*Utricularia aurea*, *U. gibba* or *U. muelleri*] ...

#### June 28

A small myrtle tree with smooth bark [*Asteromyrtus symphyocarpa*]<sup>200</sup>, and a leafless tree resembling the *Casuarina* [*Calycoplepus casuarinoides*], grew plentifully on its banks.

At the end of our stage, we came to a chain of shallow lagoons, which were slightly connected by a hollow. Many of them were dry; and fearing that, if we proceeded much farther, we should not find water, I encamped on one of them, containing a shallow pool; it was surrounded by a narrow belt of small tea trees, with stiff broad lanceolate leaves [probably *Melaleuca viridiflora*]<sup>201</sup>.

#### July 1

Box-tree flats of various sizes were separated by long tracts of undulating country, covered with broad-leaved tea-trees, *Grevillea ceratophylla* [*Grevillea parallela*]<sup>202</sup>, and *G. mimosoides* [*Grevillea striata*]<sup>203</sup>, and with the new species of *Grevillea*, with broad lanceolate leaves [*Grevillea mimosoides*]<sup>204</sup>. We had to skirt several impassable thickets and scrubs of tea-tree [*Melaleuca* spp.]<sup>205</sup>, in one of which *Pandanus* abounded.

...fine water-holes covered with *Villarsias* [*Nymphoides crenata* or *N. indica*]<sup>206</sup>.

<sup>193</sup> See also June 27

<sup>194</sup> See also June 26, July 1, 2, 3, 4, 20, August 3

<sup>195</sup> See also July 4, 5, 20, 28, August 9, 20

<sup>196</sup> See also July 1, 2, 4, 5, 7, 8, 9, 12, 13, 14, 17, 19, 22, 23, 31, August 1, 2, 4, 9, 16, 18, 20

<sup>197</sup> See also July 4, 9, 12, 13, 20, August 1

<sup>198</sup> See also August 3, 4

<sup>199</sup> See also July 8, 13, 28

<sup>200</sup> See also July 2, when Leichhardt mentions 'clustered orange blossoms'

<sup>201</sup> See also July 1

<sup>202</sup> See also July 13

<sup>203</sup> See also July 7, 13, 25

<sup>204</sup> See also July 4

<sup>205</sup> See also July 1, 2, 3, 5, 7, 13, 14, 17, 18, 19, 20, 22, August 9

<sup>206</sup> See also August 20

July 2

I found *Verticordia*, a good sized tree [*Thryptomene oligandra*], and a *Melaleuca* with clustered orange blossoms and smooth bark, which I mentioned as growing on the supposed Nassau.

July 3

... some fine rocky water-holes, in which I discovered a yellow *Villarsia* [*Nymphoides crenata*], resembling in its leaves *Villarsia inundata*, R. Br.<sup>207</sup>

*Pandanus* was, as usual, very frequent; but a middle sized shady wide spreading tree, resembling the elm in the colour and form of its leaves, attracted our attention, and excited much interest. Its younger branches were rather drooping, its fruit was an oblong yellow plum, an inch long and half an inch in diameter, with a rather rough kernel [*Parinari nonda*]<sup>208</sup>. When ripe, the pericarp is very mealy and agreeable to eat, and would be wholesome, if it were not so extraordinarily astringent. We called this tree the 'Nonda,' from its resemblance to a tree so called by the natives in the Moreton Bay district. I found the fruit in the dilli of the natives on the 21st June, and afterwards most abundantly in the stomach of the emu. The tree was very common in the belt of forest along the creek.

July 4

We travelled seven miles in a south-west direction, to lat. 16° 15' 11", over an entirely flat country, covered with a very open forest of box, of bloodwood, and of the stiff-leaved *Melaleuca*, with the arborescent *Grevillea* already mentioned, and with a species of *Terminalia* with winged fruit [*Terminalia platyptera*]. In the more sandy tracts of bloodwood forest, grew the *Nonda*, the *Pandanus*, and the apple-gum. The shallow creek was surrounded by a scrub of various myrtaceous trees, particularly *Melaleucas* [*Melaleuca* spp.]<sup>209</sup>. The creek afterwards divided into water-holes, fringed with *Stravadium* [*Barringtonia acutangula*]<sup>210</sup>, which, however, lower down gave way to dense belts of *Polygonum* [*Persicaria* sp.]<sup>211</sup>.

July 5

Tea-tree hollows extended along the outskirts of the plains. In one of them, we saw *Salicornia* [*Halosarcia indica*, *H. halocnemoides* or *H. pergranulata*]<sup>212</sup> for the first time, which led us to believe that the salt water was close at hand. Having crossed the plains, we came to broad sheets of sand, overgrown with low shrubby tea-trees, and a species of *Hakea* [*Hakea arborescens*], which always grows in the vicinity of salt water.

Beyond the sands, we saw a dense green line of mangrove trees extending along a salt water creek...

July 7

...travelled two or three miles through a fine bloodwood and *Nonda* forest, the verdant appearance of which was much increased by the leguminous Ironbark [*Erythrophleum chlorostachys*]<sup>213</sup>, which grew here in great perfection.

We soon came to a salt-water river, with a broad sandy bed, perfectly free of vegetation, although its banks were fringed with drooping tea-trees [*Melaleuca argentea* or *M. leucadendra*]<sup>214</sup>.

A well grassed open forest extended along both sides of the river; and, at its left, large deep *Nymphaea* [*Nymphaea violacea*, *Nymphaea gigantea* or *N. macrosperma*]<sup>215</sup> lagoons were parallel to it. South of the Staaten, we travelled over a forest country, similar to that of former stages, and which might be aptly distinguished by the name of *Grevillea* Forest; as *Gr. mimosoides* (R. Br.) is its characteristic feature; though a rather stunted stiff-leaved tea-tree [*Melaleuca nervosa*, *M. acacioides* or *M. citrolens*] was more numerous. Some slight rises were covered with thickets of the *Acacia* of Expedition Range [*Acacia bidwillii*].

<sup>207</sup> The name *Villarsia inundata* does not exist i.e. it was not published by Robert Brown, nor any other author

<sup>208</sup> See also July 4, 5, 7, 8, 19

<sup>209</sup> See also July 17, 19

<sup>210</sup> See also July 7

<sup>211</sup> See also July 9, 22, 23, August 2, 4, 6, 9

<sup>212</sup> See also July 18, 23, 25, 30, August 4

<sup>213</sup> See also August 20

<sup>214</sup> See also July 7, 9, 12, 17, 20, 28, August 18, 19, 20

<sup>215</sup> See also July 9, 17, 19, August 1, 20

We encamped on a good sized creek, on which grew the articulate podded Acacia [*Cathormion umbellatum*]<sup>216</sup>, the Mangrove Myrtle (Stravadium), and the drooping tea-tree.

#### July 8

...we passed a strip of Blackwood [*Corymbia polycarpa*]<sup>217</sup> forest, with many Nonda trees; and crossed a small creek. The latter part of the stage was again over a large box-flat, intersected by shallow grassy depressions, timbered with flooded-gum [*Eucalyptus camaldulensis*]<sup>218</sup>. We saw on the rising ground some open scrub, with scattered Bauhinias and Cochlospermums [probably *Cochlospermum gregorii*].

#### July 9

We travelled thirteen or fourteen miles south by west to latitude 17° 0' 13", at first crossing a box-flat, and after that a succession of greater or smaller plains, separated by a very open Grevillea forest. These plains were well grassed, or partly covered with a species of Euphorbia [*Chamaesyce coghlanii* or *C. mitchelliana*], which was eaten by our horses and cattle; and also with the long trailings of the native melon [*Cucumis melo*]; the fruit of which tastes very tolerably, after the bitter skin has been removed; but when too ripe, the fruit is either insipid or nauseous.

The apple-gum, which we had missed for some time, again made its appearance, accompanied by another white gum, with long narrow leaves [possibly *Corymbia bella*]<sup>219</sup>. As we approached the creek, at which we afterwards encamped, the vegetation became richer, and the melon-holes enlarged into dry water-holes, which were frequently shaded by the Acacia with articulate pods (*Inga moniliformis*). The two species of Terminalia [*Terminalia platyphylla*, *T. platyptera*, or *T. subacroptera*]<sup>220</sup>, of the upper Lynd, were numerous; and a small green looking tree, which we found growing densely along the creek, had wood of a brown colour, which smelt like raspberry jam [*Excoecaria parvifolia*]<sup>221</sup>; and, upon burning it, the ashes produced a very strong lye, which I used in dressing the wounds of my companions. This tree was found in great abundance on all the rivers and creeks round the gulf, within the reach of salt water; and when crossing Arnheim Land, though less frequently.

#### July 12

We crossed a small river with a course west by north; it had a broad sandy bed, numerous pools of water, and steep banks: the latter were covered with Sarcocephalus [*Nauclea orientalis*]<sup>222</sup> and drooping tea-trees.

Its water-holes were surrounded by the Nelumbiums of the Mackenzie [*Nelumbo nucifera*], and by a fine yellow Ipomoea, with larger flowers than that described as growing at the Mitchell [*Merremia gemella*]. We gathered a considerable quantity of Nelumbium seeds, which were very palatable, and, when roasted and pounded, made a most excellent substitute for coffee.

#### July 13

...a succession of plains of various sizes, extending mostly to the westward, and very open undulations scattered over with rather stunted trees of Grevillea mimosoides, G. ceratophylla, Terminalia, Bauhinia, and Balfouria? an apocynaceous tree [probably *Wrightia saligna*].

<sup>216</sup> See also July 9, 23, 28, 30, August 18

<sup>217</sup> Blackwood is a misprint. Leichhardt clearly wrote 'bloodwood' on the original hand written manuscript (Mitchell Library, Sydney)

<sup>218</sup> See also August 3

<sup>219</sup> See also July 12

<sup>220</sup> See also July 13, 31, August 2, 6, 19

<sup>221</sup> Jackes (1990) ascribed this to *Cathormion umbellatum*, which is currently known as the raspberry jam tree by some in the region today. However, the current usage of this name refers to the sap rather than the smell of the wood as referred to by Leichhardt. Furthermore Leichhardt's raspberry jam tree cannot be *Cathormion* as he has already clearly described that tree (see June 16). The habitat and distribution of *Excoecaria parvifolia* match very well that described by Leichhardt. The wood of *E. parvifolia* does have a sweet fruity smell, though not precisely like 21<sup>st</sup> century raspberry jam. The fact that Leichhardt failed to mention milky latex is the only point against this identification, but it is possible that the sap was not obvious during the middle to late dry season when the party travelled through the species' range. See also July 23, 24, 25, 28, 30, August 4, 8, 9, 16

<sup>222</sup> See also August 18, 19

July 18

...undulating Grevillea forest, which changed into tea-tree thickets, and stunted tea-tree scrubs, on a sandy soil with Salicornia, Binoe's Trichinium [probably *Omegandra kanisii*]<sup>223</sup>, and several other salt plants.

July 19

...a succession of stunted tea-tree thickets and tea-tree forests, in which the little bread-tree of the Lynd [*Gardenia wilhelmii*]<sup>224</sup> was common.

The Nonda tree had disappeared north of the Van Diemen, and the emu here feeds on the fruit of the little Severn tree [*Petalostigma pubescens*]<sup>225</sup>, which is so excessively bitter, as to impart its quality to the meat, and even to the gizzard and the very marrow.

We now commenced collecting the gum of the broad-leaved Terminalia [*Terminalia platyphylla*]<sup>226</sup> of the upper Lynd...

July 20

...hills were composed of iron-sandstone; their summits were generally very openly timbered with apple-gum and a new white-barked tree<sup>226a</sup>; but their bases were covered with thickets of the little Severn tree. The intervening flats bore either a box-tree with a short trunk branching off immediately above the ground [*Eucalyptus chlorophylla* or *E. microtheca*]; or a middle-sized tea-tree, with a lanceolate leaf [possibly *Melaleuca nervosa*], or thickets of stunted tea-tree. We travelled full thirteen miles without water, or any decided water-course. We passed several dry water-holes shaded by the broad-leaved Terminalia; and saw many Acacias twenty-five and thirty feet in height, with a slender trunk, and an elegant drooping foliage [*Acacia sutherlandii*]: it very much resembled the Acacia of Expedition Range; but the drooping habit and more distant leaflets of its bipinnate leaves, showed at once their difference.

July 23

Salicornia grew along the small gullies into which the tide flowed; some struggling stunted mangroves were on the opposite side; and the plains along the right side of the river were occupied by a scanty vegetation, consisting of Phyllanthus shrubs [probably *Flueggea virosa*], scattered box, and the raspberry-jam trees.

July 25

I passed some low stunted forest, in which a small tree was observed, with stiff pinnate leaves and a round fruit of the size of a small apple, with a rough stone [*Owenia reticulata*], and a very nauseous rind, at least in its unripe state. To the westward of this belt of forest, we crossed extensive marshes covered with tender, though dry grass, and surrounded by low Ironstone ridges, openly timbered with stunted silver-leaved Ironbark [*Eucalyptus pruinosa*]<sup>227</sup>, several white gums [*Eucalyptus leucophloia* or *Corymbia capricornia*], and Hakea lorea, *R. Br.* [*Hakea lorea*] in full blossom. We had not seen the latter for a long time, although Grevillea mimosoides, with which it was generally associated, had been our constant companion.

July 28

In turning again towards the river, we crossed a large plain, from which pillars of smoke were seen rising above the green belt of raspberry-jam trees which covered the approaches to the river. After passing some forest of Moreton Bay ash [*Corymbia bella*]<sup>228</sup>, bloodwood, clustered box [*Eucalyptus chlorophylla* or *E. microtheca*]<sup>229</sup>, Acacia (*Inga moniliformis*), and a few Bauhinias, we came to another salt-water creek...

<sup>223</sup> *Trichinium* is an old name for *Ptilotus*, and the recently described *Omegandra* was confused with *Ptilotus murrayi*. Unfortunately the reference to Bynoe has not been resolved. There are no Leichhardt or Bynoe specimens in the herbaria at Kew or the British Museum for either *Omegandra kanisii* or *P. murrayi*. Leichhardt always mentioned this species in relation to saltmarsh, i.e. with Salicornia. *Omegandra kanisii* seems to be the only likely candidate that has the correct habitat. See also July 24, 30, August 4

<sup>224</sup> See also July 20

<sup>225</sup> See also July 20, August 1, 20

<sup>226</sup> See also July 20, 30, August 9, 18

<sup>226a</sup> Leichhardt's route notes (Leichhardt 1844–45) indicate that this 'new white-barked tree' had opposite leaves. The identity of this tree is unknown

<sup>227</sup> See also July 30, 31, August 1, 2, 3, 8, 9

<sup>228</sup> Some forms of *C. bella* with rough basal bark resemble *C. tessellaris*, the Moreton Bay Ash

<sup>229</sup> See also July 30

July 31

A fine plain extended along it, on which I observed *Acacia Farnesiana* [*Acacia farnesiana*] of Darling Downs, the grass of the Isaacs [*Heteropogon triticeus*], and several grasses of the Suttor. The holes of the creek were shaded by large *Terminalias*, and by a white gum, with slightly drooping foliage of a pleasing green colour [*Eucalyptus camaldulensis*]<sup>230</sup>.

August 2

Brown collected a good quantity of the gum of *Terminalia*, and the seeds of the river bean [probably *Canavalia papuana*]<sup>231</sup>, which made an excellent coffee.

August 3

...passed over ironstone ridges covered with stunted silver-leaved Ironbark; and a species of *Terminalia*, a small tree, with long spatulate glaucous leaves, slightly winged seed-vessels [*Terminalia canescens*], and with an abundance of fine transparent eatable gum...

A native had carved a representation of the foot of an emu in the bark of a gum-tree [probably *Eucalyptus camaldulensis*]<sup>232</sup>...

August 4

In a patch of rusty-gum forest we found *Acacia equisetifolia* [possibly *Acacia galioides*]<sup>233</sup>, and the dwarf *Grevillea* of the upper Lynd [*Grevillea dryandri*] in blossom; the thyrsi of scarlet flowers of the latter were particularly beautiful.

August 6

The rough-leaved fig tree [*Ficus opposita*], the white cedar [*Melia azedarach*], and a stiff-leaved *Ipomoea* with pink blossoms [probably *Ipomoea gracilis*]<sup>234</sup>, grew on its sandy banks; and some low straggling mangroves at the water's edge.

...a good supply of *Convolvulus* roots [possibly *Ipomoea gracilis* or *I. brassii*], and of *Terminalia* gum behind them.

August 8

The salt-water Hibiscus, a species of *Paritium*, *Adr. Juss.* (*Hibiscus tiliaceus?* *Linn. D.C. Prodr. I. p. 454*) [*Hibiscus tiliaceus*] grew round the water-holes. We found the same little tree at the salt-water rivers on the west coast of the gulf, and at Port Essington. I had formerly seen it at the sea coast of Moreton Bay; its bark is tough and fibrous, and the heart-wood is brown with a velvety lustre.

August 18

...a creek in which we recognised a *Casuarina* [*Casuarina cunninghamiana*]<sup>235</sup>, which tree we had not seen since we left the Mitchell.

A narrow belt of brush, with drooping tea-trees, the *Corypha* palm [*Livstonia rigida*]<sup>236</sup>, the *Pandanus* [*Pandanus aquaticus*]<sup>237</sup>, and *Sarcocephalus*, grew along the water's edge.

August 19

The plains were well-grassed, but full of melon-holes. I observed on them a few small trees, belonging to the Sapindaceae, with pinnate and rather drooping leaves, with a light grey bark [*Atalaya hemiglauca*], exuding a good eatable gum.

<sup>230</sup> See also August 1, 2, 3

<sup>231</sup> See January 14

<sup>232</sup> See also August 4

<sup>233</sup> We have assumed that the unpublished name *A. equisetifolia* refers to a plant having whorled leaves like *Equisetum*. However, he uses the name on the second expedition (6th January) [see Sprod 1989, p. 148] in the vicinity of Barakula State Forest, where no *Acacia* of this form is known to occur.

<sup>234</sup> There is a form of *Ipomoea gracilis* probably deserving specific rank with rather 'stiff leaves' that occurs in a limited area precisely where Leichhardt made this record (R. Johnson pers. comm.)

<sup>235</sup> See also August 19

<sup>236</sup> See also August 19

<sup>237</sup> On September 6, Leichhardt refers to 'water *Pandanus*, which we first observed at Beame's Brook'. See also August 19

## Section 9. Western Gulf of Carpentaria (August 21-October 20 1845)

For this leg of the journey the party was following the coast of the Gulf of Carpentaria in a north-westerly direction. Beyond the Nicholson River, *Melaleuca* species typically dominate and the party altered their course in order to avoid the scrubby sections. Making relatively rapid progress they crossed a succession of minor streams including Eight Mile Creek (Leichhardt's Turner's Creek), which they reached on September 2. At this point they were within 10km of the coast of the Gulf of Carpentaria and on the edge of the coastal salt-flats. Seeking to avoid this waterless country they adjusted their route to the south-west for a day, and re-entered the *Melaleuca* forest. Travelling just north of west they crossed Lagoon Creek, Settlement Creek (Leichhardt's Wentworth Creek) and Camel Ck before crossing the Northern Territory border on September 6. Their route was in mostly flat terrain behind the tidal zone but there were occasional sandy ridges with stringybark forest and belts of cypress pine. The major streams that they crossed were the Calvert River (Leichhardt's Van Alphen River), the Robinson River (Leichhardt's Abel Tasman Creek) and the Macarthur River. The latter was forded on September 26 not far upstream of Borooloola. In this area they came in contact with aboriginal people who were familiar with knives and guns presumably as a result of interchange with Maccasan seamen from Indonesia. On October 6 they reached the Limmen Bight River where the killing of an exhausted bullock required Leichhardt to abandon his paper for drying plants, duplicate zoological specimens, and his rock and wood specimens. When the party reached the Roper River at the south-western corner of the Gulf of Carpentaria they headed upstream in a westerly direction and left the coast for the last time before their destination.

### August 22

The composition of the scrub depended on the nature of the soil. The narrow-leaved tea-tree [probably *Melaleuca citrolens* or *M. acacioides*], in shrubs from five to seven feet high, and the broad-leaved tea-tree [*Melaleuca viridiflora*]<sup>238</sup> from twenty to twenty-five feet high, grew on a sandy loam, with many ant-hills between them; the little Severn tree [*Petalostigma pubescens*]<sup>239</sup> and the glaucous *Terminalia* [*Terminalia canescens*]<sup>240</sup> preferred the light sandy soil with small ironstone pebbles, on which the ant-hills were rare, or entirely wanting; the raspberry-jam tree [*Excoecaria parvifolia*]<sup>241</sup> crowded round water-holes, which were frequently rocky; and the bloodwood [probably *Corymbia polycarpa*]<sup>242</sup>, the leguminous Ironbark [*Erythrophleum chlorostachys*]<sup>243</sup>, the box [*Eucalyptus microtheca*, *E. tectifca* or *E. chlorophylla*]<sup>244</sup>, and apple-gum [*Corymbia confertiflora*]<sup>245</sup>, formed patches of open forest.

### August 25

Here we passed several tea-tree [*Melaleuca* sp.]<sup>246</sup> swamps, dry at this time, level, like a table, and covered with small trees, and surrounded by a belt of fine box-trees and drooping water-gum trees [*Eucalyptus camaldulensis*]<sup>247</sup>.

...came at last to a creek and to a small river, along which we travelled until darkness compelled us to encamp. It had fine water-holes, and was densely shaded with drooping tea-trees [*Melaleuca argentea* or *M. leucadendra*]<sup>248</sup>...

We moved our camp to this lagoon, which was covered with Villarsia leaves [*Nymphoides crenata* or *N. indica*]<sup>249</sup>...

The apple-gum, the box, and the Moreton Bay ash [*Corymbia bella*] composed a very open well-grassed forest...

<sup>238</sup> See also August 25, 27, 28, September 6, 7, 11, 15, 19, 21, 29, October 12, 15

<sup>239</sup> See also August 25, September 24

<sup>240</sup> Probably the species that provided gum, as referred to later in this passage: 'We collected a great quantity of *Terminalia* gum, and prepared it in different ways to render it more palatable. The natives, whose tracks we saw everywhere in the scrub, with frequent marks where they had collected gum—seemed to roast it.'

<sup>241</sup> See also September 11, October 18, 19, 20

<sup>242</sup> See also August 27, September 2, 5, 6, 8, 9, 14, 16, 19, 24

<sup>243</sup> See also September 5, 9, 14, 21, October 15

<sup>244</sup> See also August 25, September 4, 8, 10, 15, 18, 21, 24 October 9, 14, 15, 17, 19, 20

<sup>245</sup> See also August 25, September 5, 8

<sup>246</sup> See also August 27, 28, September 2, 3, 5, 6, 12, 13, 14, 16, 18, 19, 21, 24, 27, 29, October 2, 9, 14, 15, 16, 17

<sup>247</sup> See also September 4, 21

<sup>248</sup> See also August 29, 30, September 3, 4, 5, 6, 8, 12, 19, 21, 27, 29, October 13, 14, 18, 19

<sup>249</sup> See also August 27



August 27

Half way we crossed a broad watercourse, with long tracks of burnt grass. The Pandanus [probably *Pandanus spiralis*]<sup>250</sup> and the bloodwood grew on its limited flats.

...a deep pool of water, covered with Villarsia leaves, and surrounded by Polygonums [*Persicaria* sp.]<sup>251</sup>.

August 29

A low shrubby Acacia with sigmoid phyllodia [*Acacia wickhamii*] was frequent on the hills.

The crops of the large cockatoos were filled with the young red shoots of the Haemodorum [*Haemodorum coccineum*], which were almost as pungent as chillis, but more aromatic; the plant abounded on the sandy soil.

August 30

Salicornia [*Halosarcia indica*, *H. halocnemoides* or *H. pergranulata*]<sup>252</sup> grew in abundance...

September 2

...passing some of the usual tea-tree scrub, to an undulating country, with scattered shrubs of the salt water tea-tree [*Melaleuca acacioides*]<sup>253</sup>, which grew particularly on the sandy heads of salt water creeks.

It was on this stage that we first met with a leafless species of Bossiaea, from three to five feet high, with compressed stem, and branches of the habit of Bossiaea scolopendrium, with yellow blossoms, and smooth many-seeded pods little more than an inch long [probably *Bossiaea bossiaeoides*]<sup>254</sup>. This shrub was one of the principal components of all the scrubs we passed from this place to Limmen Bight, and was also found, though less frequently, towards the centre of Arnheim's Land.

September 3

But we crossed four good sized dry creeks, lined with drooping tea-trees and white-gum [*Eucalyptus camaldulensis*]<sup>255</sup> trees.

September 4

After crossing a small sandy creek, along which grew a few Sarcocephalus [*Nauclea orientalis*]<sup>256</sup>...

September 5

...came to a thick stringy-bark [*Eucalyptus tetradonta*]<sup>257</sup> forest, on a sandy soil, with a hard sandstone cropping out frequently.

But, from the broken pieces of granite of our last camp, it became evident that a rocky primitive country, like that of the upper Lynd, could not be very distant. Even the vegetation agreed well with that of the same locality; as the dwarf Grevillea, *G. chrysodendrum* [*Grevillea pteridifolia*]<sup>258</sup>, and the falcate Grevillea [*Grevillea mimosoides*] of the upper Lynd, were here again observed.

<sup>250</sup> See also August 27, 30, September 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 18, 19, 24, 26, 27, October 2, 9, 14, 15, 17

<sup>251</sup> See also September 13, October 19

<sup>252</sup> See also September 2, 15, 16, October 6, 18

<sup>253</sup> See also October 6 where Leichhardt more fully describes this species as having 'an odour very much resembling that of a Blackfellow'

<sup>254</sup> See also September 10, 29, October 2

<sup>255</sup> Also referred to as 'white water-gum'. See also September 4, 15, 16, 21

<sup>256</sup> See also September 4, 24

<sup>257</sup> See also September 6, 7, 8, 9, 10, 11, 14, 19, 20, 21, 27, 29, October 2, 9, 15, 17

<sup>258</sup> See also September 6, 8, October 14

## September 6

This channel was fringed with the water Pandanus [*Pandanus aquaticus*]<sup>259</sup>, which we first observed at Beames's Brook; the sandy bed was covered with drooping tea-trees and *Grevillea chrysodendrum*. Charley shot a bustard, the stomach of which was filled with seeds of *Grewia* [*Grewia retusifolia*], with small yellow seeds, and some beetles.

## September 7

... covered with white [*Nymphoides indica*] and yellow Villarsias [*Nymphoides crenata*] and yellow Utricularias [*Utricularia aurea*, *U. gibba* or *U. muelleri*]. The rose-coloured Sterculia [*Brachychiton paradoxus*]<sup>260</sup>, and a smooth broad-leaved Terminalia [*Terminalia platyphylla*]<sup>261</sup>, were observed on the sandy flats of the creek; and a small fan-leaved palm (*Livistona humilis*, *R. Br.*) [*Livistona inermis*], a small insignificant trunkless plant, growing between sandstone rocks, was here first observed. A taller species of this palm [probably *Livistona humilis*], as we subsequently found, formed large tracts of forest on the Cobourg Peninsula, and near the Alligator rivers.

## September 8

The first and last parts of the stage were scrubby, or covered with a dense underwood of several species of *Acacia*, *Grevillea chrysodendrum* and a species of *Pultenaea* with leafless compressed stem [*Leptosema bossiaeoides* or *Jacksonia dilatata*]<sup>262</sup>.

In the scrub, I again observed *Fusanus* [*Owenia reticulata* or *O. vernicosa*] with pinnate leaves.

The well-known kangaroo grass (*Anthisteria*)[*Themeda triandra*] forms still one of the principal components of the pasture.

*Xyris* [probably *Xyris complanata*], *Philydrum* [*Philydrum lanuginosum*] a species of *Xerotes*<sup>263</sup> and an aromatic spreading herb [probably *Limnophila fragrans*], grew in great abundance round the water.

A species of *Crotalaria* two or three feet high, with simple woolly oblong or oblongo-lanceolate leaves, and with a beautiful green blossom [*Crotalaria cunninghamii*] of the form and size of that of *Kennedyia rubicunda*, grew in the bed of the river.

## September 9

Its flats were well-grassed, and very openly timbered with bloodwood, stringy-bark, leguminous Ironbark then in blossom, and a large tree with white smooth bark, spreading branches, and pinnate leaves [probably *Canarium australianum*]. The salt water Hibiscus (*Paritium*) [*Hibiscus tiliaceus*]<sup>264</sup> and *Acacia* (*Inga moniliformis*)[*Cathormion umbellatum*], were also in blossom.

## September 10

At the left side of the river, we saw four or five fine *Cycas* palms [*Cycas angulata*]<sup>265</sup>, from eight to ten feet high, and the stem from six to nine inches in diameter.

The appearance of the Cypress pine [*Callitris intratropica*]<sup>266</sup>, which formed groups within the stringy-bark forest, and particularly on the rises and sandy slopes, was of a most striking character. A new species of *Grevillea* [possibly *Grevillea heliosperma*] and also of *Calythrix* [*Calythrix exstipulata* or *C. brownii*] were found in blossom.

## September 13

...interrupted by three creeks, the first dry, the second with pools of brackish water, and the third with chains of *Nymphaea* [*Nymphaea violacea* or *N. macrosperma*]<sup>267</sup> ponds within and parallel to its bed.

<sup>259</sup> See also September 29, October 19

<sup>260</sup> See also September 20, 12, 22, 24, 27, 29

<sup>261</sup> See also October 18

<sup>262</sup> See also October 2

<sup>263</sup> *Xerotes* is synonymous with *Lomandra*, but no species of *Lomandra* occur in this part of Australia.

<sup>264</sup> See also October 19

<sup>265</sup> See also September 15, 16, 18, 19

<sup>266</sup> See also September 10, 11, 13, 15, 16, 18, 19, 21, 24, 27, 29, October 2, 16, 17

<sup>267</sup> See also September 24, October 2, 9, 11, 12, 13, 18

September 15

The foot-path conducted us from one *Zamia* [*Cycas angulata*] grove to another...

September 19

Here we again observed the gum-tree with orange blossoms and large ribbed seed-vessels, which we found at the upper Lynd, and had called Melaleuca gum [*Eucalyptus miniata*]<sup>268</sup>.

September 22

By a mere accident, we discovered a remarkable medicinal property of the glutinous secretion of the seed-vessels of a drooping *Grevillea* [possibly *Grevillea mimosoides*].

September 24

The bean [*Canavalia papuana*] of the Mackenzie grew plentifully along the river, and was covered with ripe seeds.

...we came again into the open box and tea-tree forest, mixed with bloodwood and gum.

It was here that I again met with a species of *Banksia* [*Banksia dentata*], on the sandy flats immediately below the sandstone ranges, which was either a variety of *B. integrifolia*, or a species very nearly allied to it.

Brown and John had returned with a good supply of beans, and of the large eatable roots of a *Convolvulus* [probably *Ipomoea brassii*] growing on the plains.

September 29

*Acacia neurocarpa* [*Acacia holosericea* or *A. neurocarpa*]<sup>269</sup> and a species of *Cassia* [*Senna oligoclada*, *S. costata* or *S. planitiicola*], which we had observed since leaving Seven Emu River, grew on the sands.

...came sooner than I expected to Sterculia Creek: which name I had given to the creek on which we were encamped, in reference to the groves of *Sterculias* of both species, rose-coloured as well as heterophylla [*Brachychiton diversifolius*], which grow on its banks.

October 2

It was during this stage, and among the scrub and underwood of the sandy hills, that we first met with *Grevillea pungens* (*R. Br.*) [*Grevillea pungens*], a shrub from two to five feet high, with pale-green pinnatifid pungent leaves, and racemes of red flowers. *Flagellaria indica* L. [*Flagellaria indica*]<sup>270</sup>, was very abundant near the creek; and our bullocks fed heartily upon it: particularly in this most wretched country, where the grass was scanty and hard.

October 9

We observed some springs, with but little water however, though densely surrounded with ferns (*Osmunda*) [probably *Cyclosorus interruptus*]. After about seven miles, we were stopped by a fern swamp full of fine box-trees with a thick jungle of high stiff grasses and ferns (*Blechnum*) [probably *Blechnum orientale*]. A small running creek formed its outlet, and contained a chain of deep ponds covered with *Nymphaeas* with the latter species most common and surrounded with *Typha* (bull-rush) [probably *Typha domingensis*]<sup>271</sup>, the youngest part of the leaves of which is very tolerable eating.

October 10

A species of *Hibiscus* [*Hibiscus zonatus*] with large pink flowers, but small insignificant leaves, and another small malvaceous shrub [possibly *Abelmoschus moschatus*] with white flowers grew round the camp.

<sup>268</sup> See also September 27

<sup>269</sup> See also October 14

<sup>270</sup> See also October 3, 12, 19

<sup>271</sup> See also October 12, 13, 17

October 12

...we arrived at a creek with a fine pool of water, which, notwithstanding its Nymphaeas, Charas [*Chara* sp.], and Typhas, was slightly brackish and bitter.

October 14

At the end of the stage, the uniform colour of the country was interrupted by the green line of a river-bed, so pleasing and so refreshing to the eye, with the rich verdure of its drooping tea-trees and myrtles [probably *Asteromyrtus symphyocarpa*]...

Brown found a *Eugenia* with large white blossoms and large coriaceous oblong lanceolate shining leaves; it was a tree of thirty or forty feet high, with a grey bark, and a good hard wood. It was growing at the upper part of the creek on which we were encamped last night. Its fruit was two inches in diameter, with longitudinal ribs, scarlet red, and very eatable when dropt from the tree, but when gathered on the tree, it had an aromatic pungency [*Syzygium suborbiculare*]. This tree was very common along the well watered creeks of Arnheim's Land; particularly along the South Alligator River, and at Raffles Bay. Brown brought from the same locality a *Melastoma* [*Melastoma malabathricum*] which, according to him, was a shrub, three or four feet high.

October 17

We followed a very promising *Pandanus* creek, in which the presence of *Typha* (flag, or bulrush) and a new species of *Sesbania* [probably *Sesbania formosa*] indicated the recent presence of water.

October 18

*Salicornia* and Binoe's *Trichinium* [probably *Omegandra kanisii*]<sup>272</sup> indicated the neighbourhood of salt water; but the grass was good and mostly young.

October 19

*Casuarinas* [*Casuarina cunninghamiana*] drooping tea-trees, the mangrove myrtle (Stravadium) [*Barringtonia acutangula*] and raspberry-jam trees grew either on the flats, or formed open groves along the banks...

When we came to the end of the lagoon, which was bounded on the left by a stony rise of flaggy Psammite, I observed a green belt of trees scarcely 300 yards to the northward; and on riding towards it, I found myself on the banks of a large fresh water river from 500 to 800 yards broad, with not very high banks, densely covered with salt water *Hibiscus* (*Paritium*), with a small rubiaceous tree (*Pavetta*?) [probably *Pavetta brownii*], which filled the air with the jasmine-like fragrance of its blossoms; with *Flagellaria*, water *Pandanus* and a leguminous climber with bunches of large green blossoms (*Mucuna*?—*D.C. Pr.*) [*Mucuna gigantea*].

## Section 10. Arnhem Land plateau (October 21 - November 20 1845)

*The section started disastrously for Leichhardt with the drowning of four of the pack animals in the Roper River and as a consequence, the discarding of the major part of his botanical collection. They continued up the Roper, crossing the many tributaries, including the Wilton River, which flows from the southeastern slopes of the Arnhem Land Plateau. The sandstone plateau is highest in the north-west and dips towards the east and south where it merges with the surrounding terrain. Thus the rugged nature of the country they were entering would not have been obvious as they left the Roper on October 28 to head north-west up Flying Fox Creek. From the watershed at the headwaters of this stream they continued north-west to Snowdrop Creek (so named for a favourite bullock which was butchered there), close to the plateau summit. The plateau is mostly exposed sandstone but on level areas there is heath on shallow sand and forests in infilled gullies with deeper sand. There are also remnants of the lateritic surface, which originally overlaid the sandstone, that support stringybark forest akin to the lowlands. The intense heat of the late dry season and the rugged terrain must have severely tested the exhausted and footsore men and their animals. Following Snowdrop Creek to its junction with the Katherine River they travelled north-west to Gimbat Creek where they entered Kakadu National Park. Following this creek through rugged sandstone they found a descent from the plateau down the steep escarpment probably to the west of Twin Falls.*

<sup>272</sup> See discussion for July 18

October 21

Open box-flats [probably *Eucalyptus tectifera*]<sup>273</sup> were bounded by ridges two or three miles from the river. At the opposite side, ranges were seen with some rocky bluff hills.

October 22

About two miles and a-half from our last camp, we had to cross a running Casuarina [*Casuarina cunninghamiana*]<sup>274</sup> brook...

October 23

...the creek formed a dry sandy bed, covered with Casuarinas; it was joined by two Pandanus [probably *Pandanus spiralis*]<sup>275</sup> creeks with steep deep channels...

About a mile up the river, a ledge of rocks crossed the bed, over which a considerable stream formed a small fall and rapids; above this was a fine sheet of water, overhung with shady tea-trees [probably *Melaleuca argentea* or *M. leucadendra*]<sup>276</sup>, Casuarinas, and Pandanus...

October 24

I gathered the large vine-bean [*Mucuna gigantea*] with green blossoms, which had thick pods containing from one to five seeds. Its hard covering, by roasting, became very brittle; and I pounded the cotyledons, and boiled them for several hours. This softened them, and made a sort of porridge, which, at all events, was very satisfying.

October 25

The country was well grassed, and openly timbered with white gum [probably *Corymbia bella*]<sup>277</sup>, box, and leguminous Ironbark [*Erythrophleum chlorostachys*]<sup>278</sup> but occasionally broken by deep gullies, which were fringed with the articulate-podded Acacia (*Inga moniliformis*)[*Cathormion umbellatum*]<sup>279</sup>, and the broad-leaved Terminalia [*Terminalia platyphylla*]<sup>280</sup>.

Thick high reeds [*Phragmites vallatoria*]<sup>281</sup> covered the approaches of the river, and the lower parts of the gullies; and noble Casuarinas rivalled the drooping tea-tree [*Melaleuca argentea* or *M. leucadendra*]<sup>282</sup> in beauty. *Grevillea pungens* (*R. Br.*)[*Grevillea pungens*] was observed on the hills; it is, therefore, not particular to the coast scrub. A species of native tobacco with smaller blossoms than that of the Hunter, and with its radical leaves spreading close over the ground [possibly *Nicotiana megalosiphon*], was growing on the open spaces round the water-holes.

October 26

As we approached the river, we passed some sandstone hills covered with a dense scrub exactly like that of the sea coast south of Limmen Bight. It was principally composed of several species of Acacia of *Grevillea chrysodendron* (*R. Br.*)[*Grevillea pteridifolia*], and of the *Bossiaea* with broad stem [*Bossiaea bossiaeooides*]. All along the outside of the scrub, we observed old camps of the natives; several of whom were seen crossing the plains.

The bed of the river became excessively wild: the Pandanus channel was still full of water, and running; but the dry bed was full of rocky water-holes or chains of them, composed of, and scattered over with blocks of sandstone; and overgrown with most magnificent Casuarinas with tea-trees [*Melaleuca* spp.]<sup>283</sup> and flooded-gum [probably *Eucalyptus camaldulensis* or *Corymbia bella*] (or its representative).

<sup>273</sup> See also October 22, 25, 29, 30

<sup>274</sup> See also October 23, 25, 26

<sup>275</sup> See also October 23, 26, 27, 30, November 1, 2, 3, 6, 10, 14, 16, 20

<sup>276</sup> See also October 26

<sup>277</sup> See also October 30, November 20

<sup>278</sup> See also November 6

<sup>279</sup> See also October 30

<sup>280</sup> See also November 3, 20

<sup>281</sup> See also November 1

<sup>282</sup> See also November 1, 2, 3, 6, 10, 14, 19

<sup>283</sup> See also November 1, 5

## October 28

We now followed the direction of some smoke which rose behind a large mountain; passing on our way, over an undulating country clothed with a forest of the broad-leaved tea-tree [*Melaleuca viridiflora*]<sup>284</sup>, and a scrubby flat with large melon-holes fringed with raspberry-jam trees [*Excoecaria parvifolia*] and through a gap between two high ranges, in which there was a small dry creek that turned to the north-east. From a large Polygonum [*Persicaria* sp.] water-hole which had recently become dry, a swarm of whistling ducks rose, probably scared by our approach.

## October 29

The Acacia of Expedition Range was plentiful in the large flat and at the wells of the natives, and formed a fine tree [*Acacia valida*]: its seeds, however, were shed, and had been roasted by the late bush fire.

## October 30

It was fringed with Pandanus, Acacia (*Inga moniliformis*) and with an arborescent Vitex with ternate leaves [*Vitex glabrata*].

On the flat summit of the sandstone ranges, we observed the Melaleuca gum [*Eucalyptus miniata*]<sup>285</sup>, the rusty gum [*Corymbia* sp.]<sup>286</sup>, the mountain Acacia [possibly *Acacia valida*]<sup>287</sup>, and Persoonia falcata, (*R. Br.*)[*Persoonia falcata*]<sup>288</sup>.

During the night, a great number of flying-foxes came to revel in the honey of the blossoms of the gum trees [*Eucalyptus* sp.]<sup>289</sup>.

## October 31

I found a species of fern (*Taeniopsis*) [possibly *Lindsaea ensifolia* or *Taenitis blechnoides*] along the creek, and a species of Mimosa [probably *Neptunia major*] about three feet high had been observed on the plains and the flats of the Roper.

## November 1

It was a broad creek, with a stream about three feet deep, and from seven to ten yards wide, with a firm and sandy bed; its banks were shaded by large gum-trees, and Sarcocephalus [*Nauclea orientalis*]<sup>290</sup> and thick reeds, and a stiff blady grass fringed its waters.

## November 2

The creek wound between baked sandstone hills, and was alternately enlarging into Nymphaea [*Nymphaea violacea* or *N. macropserma*]<sup>291</sup> ponds, and running in a small stream over a pebbly or sandy bed. Pandanus, drooping tea-trees, Terminalias [*Terminalia platyphylla*, *T. erythrocarpa* or *T. microcarpa*.], Acacias [*Acacia* sp.], and Sarcocephalus gave it a rich green appearance. The apple-gum [*Corymbia confertiflora*]<sup>292</sup> and Eugenia with ribbed scarlet fruit [*Syzygium suborbiculare*]<sup>293</sup>, grew on the flats. Methorium *Endl.* was found, in leaf and size resembling the hazel-nut; it had showy red and white blossoms [probably *Helicteres isora*]. The clustered fig-tree [*Ficus racemosa*] was abundant along the creek; but its ripe fruits were rare at this time of the year.

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<sup>284</sup> See also October 29

<sup>285</sup> See also November 5, 6, 10, 11, 14, 17

<sup>286</sup> See also November 4

<sup>287</sup> See also November 4

<sup>288</sup> See also November 14

<sup>289</sup> See also October 30, November 1

<sup>290</sup> See also November 2, 3

<sup>291</sup> See also November 2, 3, 4, 5

<sup>292</sup> See also November 4, 7

<sup>293</sup> See also November 13

## November 3

Polyphragmon [*Timonius timon*], which was first met with at the upper Lynd; *Careya arborea* [*Planchonia careya*]<sup>294</sup>, *Hakea arborescens* [*Hakea arborescens*], and *Coniogeton arborescens* [*Buchanania obovata*]<sup>295</sup>, were observed.

## November 4

The whole valley, though narrow, was beautifully grassed. *Trichodesma* [*Trichodesma zeylanicum*], *Grewia* [probably *Grewia retusifolia*]<sup>296</sup>, *Crinum* [probably *Crinum uniflorum*]<sup>297</sup>, and the trefoil of the Suttor<sup>298</sup>, grew on the flats; the apple-gum, rusty-gum, the mountain Acacia and *Fusanus* [*Owenia vernicosa* or *O. reticulata*]<sup>299</sup>, the last in blossom, grew on the ridges.

## November 5

After following the creek, on which we had encamped, to its head, we passed over a scrubby stringy-bark [*Eucalyptus tetrodonta*]<sup>300</sup> forest; and, whenever we came to watercourses going to the eastward, we turned to the north-west and westward.

We, therefore, followed a watercourse to the southward, winding between two ranges to the westward and southward, and continued again to the north-west, which brought us to a tributary of the creek we had just left, and in which we found large water-holes covered with *Nymphaeas* and *Villarsias* [probably *Nymphoides indica*].

The Melaleuca-gum, the Cypress-pine [*Callitris intratropica*]<sup>301</sup>, *Fusanus* [possibly *Owenia vernicosa*] and *Banksia* [*Banksia dentata*]<sup>302</sup> abounded in the stringy-bark forest, and along the creeks; and the flats round the water-holes were covered with a dark green sedge [possibly *Dapsilanthus spathaceus*], which, however, our cattle did not relish so much as, from its inviting verdure, I had anticipated would have been the case.

## November 6

The ridges at the head of this western creek were covered with an arborescent *Capparis* [*Capparis umbonata*], the ripe fruit of which tasted very like strawberries; but those which were not ripe were very pungent. Another little tree belonging to the *Hamelieae* *D.C.*, with large white fragrant blossoms, and fruit about two inches long and one broad, with numerous seeds nestling in a pulpy substance [probably *Gardenia megasperma*], was very abundant. In its ripe state, the pulp turned black; I ate some of it, but although it proved to be harmless, it was not good. The little bread-fruit of the upper Lynd, no doubt belonged to the same class of plants.

## November 7

The apple-gum, a bloodwood [possibly *Corymbia polycarpa*] and the poplar-gum (?) [*Eucalyptus bigalerita* or *E. tintinnans*] grew round our camp; the grasses were tender, but formed distinct tufts; *Crinum* [*Crinum angustifolium*] was plentiful.

## November 9

A pretty little *Sida* [*Sida* sp.], a *Convolvulus* [possibly *Merremia incisa* or *Polymeria ambigua*], and *Grewia*, were growing amongst the young grass. Mr. Calvert saw the *Livistona* palm [*Livistona inermis*].

## November 11

A fine shady *Eucalyptus* [*Allosyncarpia ternata*]<sup>303</sup>, with a short barrel, but large spreading branches, and with the grey bark of the box, grew between the rocks along the creek.

<sup>294</sup> See also November 20

<sup>295</sup> See also November 16, 20

<sup>296</sup> See also November 9

<sup>297</sup> See also November 7

<sup>298</sup> Leichhardt makes no reference to a 'trefoil' when in the Suttor River area

<sup>299</sup> See also November 5

<sup>300</sup> See also November 5, 6, 11, 14

<sup>301</sup> See also November 9

<sup>302</sup> See also November 10, 14, 17

<sup>303</sup> See also November 19.

November 13

The flying-fox lived here on a small, blue, oval stone-fruit, of an acid taste, with a bitter kernel; it grew on a tree of moderate size [*Elaeocarpus arnhemicus*]. Very small specimens of the Seaforthia [*Hydriastele wendlandiana*] palm were here observed for the first time...

November 14

John told me that he had found the ripe fruit of *Exocarpus cupressiformis*; which I doubted very much, as I had not seen the slightest trace of it since we left the Dawson, although *Exocarpus latifolia* [*Exocarpos latifolius*] was very frequent all over the sandy table-land. But we gathered and ate a great quantity of gibong (the ripe fruit of *Persoonia falcata*), and some small yellow figs of the glossy-leaved fig-tree [probably *Ficus virens*]. I observed a *Eucalyptus* of rather stunted growth, with broad, almost oval leaves, and long, narrow seed-vessels [*Eucalyptus phoenicea*].

November 19

I appeased my craving hunger, which had been well tried for twenty hours, on the small fruit of a species of *Acmena* [possibly *Syzygium eucalyptoides* subsp. *eucalyptoides*] which grew near the rocks that bounded the sandy flats, until my companions brought my share of stewed green hide.

November 20

In the rocky gullies of the table land, we had observed a great number of shrubs, amongst which a species of *Pleurandra* [*Hibbertia* sp.], a dwarf *Calythrix* [probably *Calytrix decussata*], a prostrate woolly *Grevillea* [*Grevillea rubicunda*]; and a red *Melaleuca* [*Petraeomyrtus punicea*], were the most interesting. Near the slope by which we entered the valley, a species of *Achras* [probably *Pouteria sericea*] was found, but with a much smaller fruit than that of Port Jackson.

### Section 11. Top End lowlands (November 22-December 17 1845)

*With the sandstone escarpment behind them, the party met Jim Jim Creek, which they followed until they reached the coastal floodplain of the South Alligator River. Some aboriginal people pointed them in a roughly northerly direction through open forest on lateritic plains. On this course they crossed catchments emerging onto the floodplain of the East Alligator River far too near the coast to allow for a crossing. Camped near Van Diemen Gulf on December 1 and 2 their spirits were lifted by further meetings with aboriginal people that spoke some English. They guided them south-east to a safe crossing of the East Alligator on December 6 at the bar known as Cahills Crossing. From here they headed northward across the floodplain and came upon herds of recently naturalised Asian water buffalo. Further amicable interchanges with curious aboriginal people guided them to the narrow neck that joins Cobourg Peninsula to the mainland. Amidst the excitement as their journey neared its end they mistakenly detoured around the convoluted northern coastline of the Cobourg Peninsula before eventually arriving at their desired destination, the small outpost of European civilization at Victoria Settlement on the southwestern side of Port Essington.*

November 23

The *Eugenia* with scarlet fruit [*Syzygium suborbiculare*]<sup>304</sup>, and another species with rose-coloured fruit [*Syzygium eucalyptoides* subsp. *bleeseri*]<sup>305</sup> of most exquisite taste—particularly when the seed was abortive, and the pericarp more developed—were abundant on the flats of the river; and *Acmena* with smaller fruit and thin acidulous rind [possibly *Syzygium eucalyptoides* subsp. *eucalyptoides*], grew straggling on the ridges.

November 24

The river gradually increased in size, and its bed became densely fringed with *Pandanus* [*Pandanus spiralis*]<sup>306</sup>; the hollows and flats were covered with groves of drooping tea-trees [*Melaleuca* spp.]<sup>307</sup>.

<sup>304</sup> See also November 25, December 2, 8, 16

<sup>305</sup> See also December 2

<sup>306</sup> See also November 24, 26, 27, 30, December 1, 3, 4, 8, 10, 14

<sup>307</sup> See also November 24, 27, December 3, 8, 9, 10, 14, 15, 17



November 25

The Livistona palm [*Livistona humilis*]<sup>308</sup> and Cochlospermum gossypium [*Cochlospermum fraseri*]<sup>309</sup> grew on the ridges; the tea-tree [*Melaleuca* sp.]<sup>310</sup>, the stringy-bark [*Eucalyptus tetradonta*]<sup>311</sup>, the leguminous Ironbark [*Erythrophleum chlorostachys*]<sup>312</sup> and Eugenia were useful timber.

November 26

*Livistona inermis* [*Livistona humilis*]<sup>313</sup>, R. Br. formed small groves...

We crossed the plain to find water, but the approaches of the river were formed by tea-tree hollows, and by thick vine brush, at the outside of which noble bouquets of Bamboo [*Bambusa arnhemica*] and stately Corypha palms [*Livistona benthamii*] attracted our attention.

November 27

I saw here a noble fig-tree [probably *Ficus virens*] under the shade of which seemed to have been the camping place of the natives for the last century.

Its level bed was composed of a stiff bluish clay, without vegetation, mostly dry, and cracked by the heat of the sun; but its depressions were still moist, and treacherously boggy; in many parts of this extensive level, rose isolated patches, or larger island-like groves of Pandanus intermixed with drooping tea-trees and interwoven with Ipomaeas [possibly *Merremia gemella*] or long belts of drooping tea-trees, in the shade of which reaches of shallow water, surrounded by a rich sward of grasses of the most delicate verdure, had remained.

November 28

The country was most beautifully grassed: and a new species of Crinum [probably *Crinum angustifolium*] and several leguminous plants, diversified with their pretty blossoms the pleasing green of the flats and the forest.

November 29

The first part of the stage was more hilly, and intersected by a greater number of creeks, going down to west and north-west, than the latter part, which was a sandy, level forest of stringy-bark and Melaleuca gum [*Eucalyptus miniata*]<sup>314</sup>. The little gooseberry-tree (*Coniogeton arborescens*, D.C.) [*Buchanania obovata*]<sup>315</sup> the leguminous Ironbark, a smooth broad-leaved Terminalia [*Terminalia ferdinandiana*], Calytrix [probably *Calytrix exstipulata*]<sup>316</sup>, and the apple-gum [*Corymbia confertiflora*] were plentiful.

A grass, well known at the Hunter by its scent resembling that of crushed ants, was here scentless [possibly *Capillipedium parviflorum*]; a little plant, with large, white, tubular, sweet-scented flowers, grew sociably in the forest, and received the name of 'native primrose' [probably *Larsenaikia suffruticosa*]<sup>317</sup>; a species of Commelina, [probably *Commelina ensifolia*] and a prostrate malvaceous plant with red flowers [probably *Abelmoschus moschatus*]<sup>318</sup>, and a species of Oxystelma [possibly *Gymnanthera oblonga* or *Tylophora erecta*], contributed by their beauty and variety to render the country interesting.

<sup>308</sup> See also November 30, December 1, 14, 16, 17

<sup>309</sup> See also December 13

<sup>310</sup> See also November 26, 28, December 1, 2, 3, 9, 13, 14

<sup>311</sup> See also November 29, December 1, 9, 10, 17

<sup>312</sup> See also November 29 December 13, 17

<sup>313</sup> See also November 29

<sup>314</sup> See also December 17

<sup>315</sup> See also December 14, 17

<sup>316</sup> See also December 14

<sup>317</sup> See also December 1

<sup>318</sup> See also December 1

## December 1

A species of *Acacia* [*Acacia* sp.]<sup>319</sup> and stringy-bark saplings formed a thick underwood.

The open lawns were adorned by various plants, amongst which we noticed a species of *Drosera*, with white and red blossoms [*Drosera petiolaris*], a *Mitrasacme* [*Mitrasacme connata* or *M. nudicaulis*], a narrow-leaved *Ruellia* [*Brunoniella linearifolia*], the white primrose [*Larsenaikia suffruticosa*], the red prostrate malvaceous plant, a low shrubby *Pleurandra* [*Hibbertia* sp.], and an orchideous plant [*Dendrobium affine* or *Cymbidium canaliculatum*]<sup>320</sup>—one of the few representatives of this family in the Australian tropics; the most interesting, however, was a prostrate *Grevillea*, with oblong smooth leaves, and with thyrse of fine scarlet flowers; which I consider to be *Grevillea Goodii*, *R. Br.*[*Grevillea goodii*].

## December 2

The natives were remarkably kind and attentive, and offered us the rind of the rose-coloured *Eugenia* apple, the cabbage of the *Seaforthia* palm [*Carpentaria acuminata* or *Hydriastele ramsayi*], a fruit which I did not know, and the nut-like swelling of the rhizoma of either a grass or a sedge [*Eleocharis dulcis*]<sup>320</sup>. The last had a sweet taste, was very mealy and nourishing, and the best article of the food of the natives we had yet tasted. They called it 'Allamurr' (the natives of Port Essington, "Murnatt"), and were extremely fond of it. The plant grew in depressions of the plains, where the boys and young men were occupied the whole day in digging for it.

The men armed with a wommala, and with a bundle of goose spears, made of a strong reed [*Phragmites vallatoria*]<sup>321</sup> or bamboo (?), gave up their time to hunting.

## December 4

The *Seaforthia* palm [*Carpentaria acuminata*] raised its elegant crown far above the patches of vine brush which we passed at the river side of the ridges.

After a delay of two hours, we again started, and travelled in a due south direction towards some thick smoke rising between two steep and apparently isolated rocky hills: they were about four miles distant, and, when we arrived at their base, we enjoyed the pleasing sight of large lagoons, surrounded with mangrove myrtles (*Stravadium*) [*Barringtonia acutangula*], with *Pandanus*, and with a belt of reeds and *Nelumbiums* [*Nelumbo nucifera*]<sup>322</sup>.

## December 6

We observed a great number of long conical fish and crab traps at the crossing place of the creek and in many of the tributary salt-water channels; they were made apparently of *Flagellaria* [*Flagellaria indica*].

We found a new *Eugenia*, a tree of rather stunted growth, with broad opposite leaves, and fruit of the size of an apple, of a delicate rose-colour [possibly *Syzygium eucalyptoides* subsp. *bleeseri*], and when ripe, a most delicious refreshment during a hot day. We had frequently met with this tree on sandstone ridges, and in sandy soils, but had never before found it in fruit.

## December 7

The arborescent *Vitex* with ternate leaves [*Vitex glabrata*], which I had first met with at the Flying-Fox Creek of the Roper, was also observed here.

## December 9

*Mitrasacme elata* [probably *Mitrasacme nudicaulis*] and all the other little plants I have before mentioned, were growing in the stringy-bark forest.

## December 10

When the women returned at night, they did not bring 'Allamurr,' or, as it was here called, 'Murnatt,' but plenty of 'Imberbi,' the root of *Convolvulus* [possibly *Ipomoea gracilis* or *I. graminea*] which grow abundantly in the plain...

<sup>319</sup> See also December 17

<sup>320</sup> See also December 8

<sup>321</sup> See December 4

<sup>322</sup> See also December 5

## December 13

For some miles, we followed a beaten foot-path, which skirted the large plain, and then entered the forest, which was composed of rusty-gum [probably *Corymbia bleeseri*], leguminous Ironbark, *Cochlospermum gossypium* and a small apocynaceous tree (*Balfouria*, Br.) [*Wrightia saligna*]; we crossed several salt-water creeks which went down to Van Diemen's Gulf.

Its water was so impregnated with the astringent properties of the gum-trees [*Eucalyptus* sp.]...

After pitching our tents, our guides went out, and returned with a small Iguana (Vergar), and with pods of the rose-coloured *Sterculia* [*Brachychiton megaphyllus*] which they roasted on the coals.

## December 14

Scattered *Pandanus* and drooping tea-trees grew on their banks as far as the fresh water extended; when they were succeeded by the salt-water tea-tree [*Melaleuca acacioides*]<sup>323</sup> and the mangrove, covering and fringing their beds, which enlarged into stiff plains, without vegetation, or into mangrove swamps. The latter were composed of *Aegiceras* [*Aegiceras corniculatum*], *Bruguiera* [probably *Bruguiera gymnorrhiza*], and *Pemphis* [*Pemphis acidula*].

They were all composed of a clayey ironstone, and clothed with patches of scrub, formed principally of *Calythrix*, and with a more open forest of Cypress pine [*Callitris intratropica*]<sup>324</sup>, white-gum [*Corymbia bella* or *C. grandifolia*], tea-trees, bloodwood [*Corymbia nesophila*] *Livistona* palms, *Pandanus*, with shrubby *Terminalias* [probably *Terminalia pterocarya*] and *Coniogetons*.

## December 15

To ascertain this, I rode down the creek with Charley: it became more open; limited flats of sandy alluvium were clothed with the refreshing verdure of young grass, and with groves of *Banksias* [*Banksia dentata*]<sup>325</sup> its hollows were fringed with large drooping tea-trees.

## December 16

... on the sandy flats towards the hilly forest; where we also found a new tree, a species of *Anacardium* which the natives called 'Lugula;' it bore a red succulent fruit, formed by the enlargement of the stalk, with a greyish one-seeded nut outside, like *Exocarpus* [*Semecarpus australiensis*]. The fruit was extremely refreshing; the envelope, however, contained such an acrid juice that it ate into and discoloured my skin, and raised blisters wherever it touched it.

In the forest, we met with some few small *Seaforthia* [*Hydriastele ramsayi*]<sup>326</sup> palms, the young shoots of which we obtained with great difficulty, not then knowing how easily the natives strip them of the surrounding leaves and leafstalks.

## December 17

The forest was principally composed of stringy-bark, the leguminous Ironbark, *Melaleuca*-gum with underwood of *Acacias*, *Coniogeton*, *Pachynemas* [probably *Pachynema complanatum*]<sup>327</sup> *Pultenaeas* [possibly *Jacksonia dilatata*] and *Careya* [*Planchonia careya*]. A tree very much resembling the real Ironbark (*Eucalyptus resinifera*) was observed at the Warwi [*Eucalyptus jensenii*]; but I expect it will be found entirely different.

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<sup>323</sup> See also December 15

<sup>324</sup> See also December 17

<sup>325</sup> See also December 17

<sup>326</sup> See also December 17

<sup>327</sup> '*Pachynema complanatum*' is listed under an entry 'Plants of my Expedition' in Leichhardt's (1842–1847, p. 42) notebook.

**Table 2. Species that have been assigned unambiguously to Leichhardt's references in the journal of the Port Essington Expedition with a high level of certainty, according to each geographic section.**

**Condamine:** *Acacia harpophylla*, *Acacia melvillei*, *Acacia pendula*, *Acacia semilunata*, *Acacia triptera*, *Angophora floribunda*, *Angophora leiocarpa*, *Aotus subglauca*, *Brachychiton populneus* subsp. *populneus*, *Brachychiton rupestris*, *Brunonia australis*, *Bulbine alata*, *Calandrinia balonensis*, *Casuarina cristata*, *Citrus glauca*, *Corymbia citriodora* subsp. *variegata*, *Corymbia tessellaris*, *Eremophila mitchellii*, *Eryngium plantagineum*, *Eucalyptus coolabah*, *Eucalyptus crebra*, *Eucalyptus fibrosa* subsp. *nubila*, *Eucalyptus populnea*, *Euchiton sphaericus*, *Geijera parviflora*, *Goodenia grandiflora*, *Goodenia grandiflora*, *Grevillea striata*, *Hakea lorea*, *Hakea purpurea*, *Hibiscus sturtii*, *Jacksonia scoparia*, *Leptospermum polygalifolium*, *Lysiana exocarpi* subsp. *tenuis*, *Lysicarpus angustifolius*, *Melaleuca bracteata*, *Neptunia gracilis*, *Owenia acidula*, *Persoonia sericea*, *Phragmites australis*, *Ranunculus meristus*, *Scaevola spinescens*, *Themeda triandra*, *Verbena gaudichaudii*, *Xanthorrhoea johnsonii*, *Zieria aspalathoides*

**Dawson:** *Acacia bidwillii*, *Acacia harpophylla*, *Acacia melvillei*, *Acacia stenophylla*, *Allocasuarina inophloia*, *Alphitonia excelsa*, *Angophora floribunda*, *Brachychiton rupestris*, *Bracteantha bracteantha*, *Cadellia pentastylis*, *Callistemon viminalis*, *Callitris glaucophylla*, *Capparis lasiantha*, *Capparis mitchellii*, *Casuarina cunninghamiana*, *Corymbia citriodora* subsp. *variegata*, *Corymbia tessellaris*, *Crinum flaccidum*, *Daucus glochidiatus*, *Dodonaea vestita*, *Dodonaea viscosa* subsp. *spatulata*, *Eremocitrus glauca*, *Eremophila debilis*, *Eremophila mitchellii*, *Eryngium plantagineum*, *Erythrina vespertilio*, *Eucalyptus coolabah*, *Eucalyptus crebra*, *Eucalyptus melanophloia*, *Eucalyptus orgadophila*, *Eucalyptus populnea*, *Ficus coronata*, *Flindersia australis*, *Grevillea longistyla*, *Grevillea sessilis*, *Grewia latifolia*, *Imperata cylindrica*, *Jacksonia scoparia*, *Leptospermum polygalifolium*, *Livistona nitida*, *Lophostemon suaveolens*, *Bauhinia carronii*, *Macrozamia fearnsidei*, *Macrozamia moorei*, *Melaleuca trichostachya*, *Melia azedarach*, *Nymphoides crenata*, *Persoonia falcata*, *Persoonia subtilis*, *Petalostigma pubescens*, *Phragmites australis*, *Rhynchosia minima*, *Rubus parvifolius*, *Sonchus hydrophilus*, *Thysanotus tuberosus*, *Trichodesma zeylanicum*, *Verbena gaudichaudii*, *Xanthorrhoea johnsonii*, *Xylomelum cunninghamianum*

**Comet-Mackenzie:** *Acacia excelsa*, *Acacia harpophylla*, *Acacia pendula*, *Acacia salicina*, *Acacia stenophylla*, *Arundinella nepalensis*, *Callitris glaucophylla*, *Calostemma luteum*, *Canavalia papuana*, *Capparis lasiantha*, *Capparis loranthifolia* var. *bancroftii*, *Capparis mitchellii*, *Cassia brewsteri*, *Casuarina cunninghamiana*, *Citrus glauca*, *Corymbia tessellaris*, *Cucumis melo*, *Dendrophthoe homoplastica*, *Enchylaena tomentosa*, *Eremophila maculata*, *Eremophila mitchellii*, *Eucalyptus coolabah*, *Eucalyptus melanophloia*, *Eucalyptus populnea*, *Ficus opposita*, *Flindersia dissosperma*, *Leptochloa digitata*, *Bauhinia carronii*, *Bauhinia hookeri*, *Melia azedarach*, *Muehlenbeckia florulenta*, *Nelumbo nucifera*, *Passiflora aurantia*, *Perisarcia orientalis*, *Phragmites australis*, *Portulaca oleracea*, *Rhynchosia minima*, *Santalum lanceolatum*, *Sida subspicata*, *Tribulus terrestris*, *Verbena gaudichaudii*

**Peak Downs:** *Acacia farnesiana*, *Acacia harpophylla*, *Acacia pendula*, *Acacia rhodoxylon*, *Brunoniella australis*, *Casuarina cunninghamiana*, *Cissus opaca*, *Corymbia citriodora* subsp. *citriodora*, *Corymbia leichhardtii*, *Corymbia tessellaris*, *Crinum flaccidum*, *Diospyros humilis*, *Eremophila maculata*, *Eremophila mitchellii*, *Erythrina vespertilio*, *Eucalyptus coolabah*, *Eucalyptus crebra*, *Eucalyptus melanophloia*, *Eucalyptus platyphylla*, *Ficus opposita*, *Grevillea parallela*, *Heteropogon triticeus*, *Hypoxis arillacea*, *Lagenaria sicecaria*, *Larsenaikia ochreatea*, *Livistona decora*, *Melaleuca nervosa*, *Ocimum tenuiflorum*, *Owenia acidula*, *Persoonia falcata*, *Petalostigma pubescens*, *Pleiogynium timorense*, *Portulaca oleracea*, *Scaevola*

*spinescens*, *Trichodesma zeylanicum*, *Verbena macrostachya*, *Wrightia saligna*, *Xanthorrhoea johnsonii*

**Suttor:** *Acacia cambagei*, *Acacia harpophylla*, *Aeschynomene indica*, *Caldesia oligococca*, *Canavalia papuana*, *Cassia brewsteri*, *Casuarina cunninghamiana*, *Corymbia leichhardtii*, *Corymbia tessellaris*, *Cymbidium canaliculatum*, *Datura leichhardtii*, *Diplatia furcata*, *Dipteracanthus australasicus* subsp. *australasicus*, *Eremophila mitchellii*, *Eucalyptus camaldulensis*, *Eucalyptus coolabah*, *Grevillea glauca*, *Heteropogon triticeus*, *Livistona lanuginosa*, *Bauhinia carronii*, *Bauhinia hookeri*, *Melaleuca nervosa*, *Melaleuca tamariscina*, *Muehlenbeckia florulenta*, *Owenia acidula*, *Petalostigma banksii*, *Petalostigma pubescens*, *Phragmites australis*, *Planchonia careya*, *Sesbania cannabina*

**Burdekin:** *Abrus precatorius*, *Acacia bidwillii*, *Acacia galioides*, *Acacia harpophylla*, *Acacia shirleyi*, *Acacia victoriae*, *Alocasia brisbanensis*, *Alphitonia excelsa*, *Amyema miquelii*, *Brachychiton australis*, *Bursaria incana*, *Caldesia oligococca*, *Callistemon viminalis*, *Casuarina cunninghamiana*, *Celtis paniculata*, *Clerodendrum floribundum*, *Cordia dichotoma*, *Corymbia leichhardtii*, *Corymbia peltata*, *Corymbia tessellaris*, *Dendrocnide photinophylla*, *Diplocyclos palmatus*, *Eremophila mitchellii*, *Erythrina vespertilio*, *Erythrophleum chlorostachys*, *Eucalyptus camaldulensis*, *Eucalyptus tetrodonta*, *Ficus opposita*, *Ficus racemosa*, *Grevillea parallela*, *Grevillea pteridifolia*, *Grevillea striata*, *Hakea arborescens*, *Hakea lorea*, *Lophostemon grandiflorus*, *Melaleuca bracteata*, *Melia azedarach*, *Monochoria cyanea*, *Phragmites australis*, *Pipturus argenteus*, *Planchonia careya*, *Pleiogynium timorense*, *Schefflera actinophylla*, *Sesbania cannabina*, *Trichosanthes pentaphylla*, *Xanthorrhoea johnsonii*

**Lynd-Mitchell:** *Acacia bidwillii*, *Adenantha abrosperma*, *Barringtonia acutangula*, *Boronia bowmanii*, *Callitris intratropica*, *Calytrix leptophylla*, *Canavalia papuana*, *Casuarina cunninghamiana*, *Cathormion umbellatum* subsp. *moniliforme*, *Cissus opaca*, *Cochlospermum gregorii*, *Corymbia confertiflora*, *Corypha utan*, *Diplatia grandibractea*, *Erythrophleum chlorostachys*, *Eucalyptus camaldulensis*, *Eucalyptus chartaboma*, *Eucalyptus shirleyi*, *Eucalyptus tetrodonta*, *Exocarpos latifolius*, *Ficus racemosa*, *Ficus rubiginosa*, *Gardenia wilhelmii*, *Grevillea dryandri*, *Grevillea mimosoides*, *Grevillea parallela*, *Grevillea pteridifolia*, *Grevillea striata*, *Hakea persiehana*, *Heteropogon triticeus*, *Bauhinia cunninghamii*, *Melaleuca viridiflora*, *Melia azedarach*, *Merremia hederacea*, *Nauclea orientalis*, *Petalostigma pubescens*, *Phragmites vallatoria*, *Siphonodon pendulus*, *Terminalia platyphylla*, *Terminalia platyptera*, *Xanthorrhoea johnsonii*, *Xylomelum scottianum*

**Eastern Gulf of Carpentaria:** *Acacia bidwillii*, *Acacia farnesiana*, *Acacia sutherlandii*, *Asteromyrtus symphyocarpa*, *Atalaya hemiglauca*, *Barringtonia acutangula*, *Calycopsepus casuarinoides*, *Canavalia papuana*, *Casuarina cunninghamiana*, *Cathormion umbellatum* subsp. *moniliforme*, *Corymbia bella*, *Corymbia confertiflora*, *Corymbia polycarpa*, *Cucumis melo*, *Erythrophleum chlorostachys*, *Eucalyptus camaldulensis*, *Eucalyptus pruinosa*, *Excoecaria parvifolia*, *Ficus opposita*, *Gardenia wilhelmii*, *Grevillea dryandri*, *Grevillea mimosoides*, *Grevillea parallela*, *Grevillea striata*, *Hakea arborescens*, *Hakea lorea*, *Heteropogon triticeus*, *Hibiscus tiliaceus*, *Livistona rigida*, *Bauhinia cunninghamii*, *Melia adzedarach*, *Merremia gemella*, *Nauclea orientalis*, *Nelumbo nucifera*, *Nymphoides crenata*, *Owenia reticulata*, *Pandanus aquaticus*, *Pandanus spiralis*, *Parinari nonda*, *Petalostigma pubescens*, *Terminalia canescens*, *Terminalia platyphylla*, *Terminalia platyptera*, *Thryptomene oligandra*

**Western Gulf of Carpentaria:** *Acacia wickhamii*, *Banksia dentata*, *Barringtonia acutangula*, *Brachychiton diversifolius*, *Brachychiton paradoxus*, *Callitris intratropica*, *Canavalia papuana*, *Casuarina cunninghamiana*, *Cathormion umbellatum*, *Corymbia bella*, *Corymbia confertiflora*, *Crotalaria cunninghamii*, *Cycas angulata*, *Erythrophleum chlorostachys*, *Eucalyptus camaldulensis*, *Eucalyptus miniata*, *Eucalyptus tetradonta*, *Excoecaria parvifolia*, *Flagellaria indica*, *Grevillea mimosoides*, *Grevillea pteridifolia*, *Grevillea pungens*, *Grewia retusifolia*, *Haemodorum coccineum*, *Hibiscus tiliaceus*, *Hibiscus zonatus*, *Livistona inermis*, *Melaleuca acacioides*, *Melaleuca viridiflora*, *Melastoma malabathricum*, *Mucuna gigantea*, *Nauclea orientalis*, *Nymphoides crenata*, *Nymphoides indica*, *Pandanus aquaticus*, *Petalostigma pubescens*, *Philydrum lanuginosum*, *Syzygium suborbiculare*, *Terminalia canescens*, *Terminalia platyphylla*, *Themeda triandra*

**Arnhem Land plateau:** *Acacia valida*, *Alloxyncarpia ternata*, *Banksia dentata*, *Bossiaea bossiaeooides*, *Buchanania obovata*, *Callitris intratropica*, *Capparis umbonata*, *Casuarina cunninghamiana*, *Cathormion umbellatum*, *Corymbia confertiflora*, *Corymbia* sp., *Crinum angustifolium*, *Elaeocarpus arnhemicus*, *Erythrophleum chlorostachys*, *Eucalyptus miniata*, *Eucalyptus phoenicea*, *Eucalyptus*

*tetradonta*, *Excoecaria parvifolia*, *Exocarpos latifolius*, *Ficus racemosa*, *Grevillea pteridifolia*, *Grevillea pungens*, *Grevillea rubicunda*, *Hakea arborescens*, *Hydriastele wendlandiana*, *Livistona inermis*, *Melaleuca viridiflora*, *Mucuna gigantea*, *Nauclea orientalis*, *Persoonia falcata*, *Petraeomyrtus punicea*, *Phragmites vallatoria*, *Planchonia careya*, *Syzygium suborbiculare*, *Terminalia platyphylla*, *Timonius timon*, *Trichodesma zeylanicum*, *Vitex glabrata*

**Top End Lowlands:** *Aegiceras corniculatum*, *Bambusa arnhemica*, *Banksia dentata*, *Barringtonia acutangula*, *Brachychiton megaphyllus*, *Brunoniella linearifolia*, *Buchanania obovata*, *Callitris intratropica*, *Carpentaria acuminata*, *Cochlospermum fraseri*, *Corymbia confertiflora*, *Corymbia nesophila*, *Drosera petiolaris*, *Eleocharis dulcis*, *Erythrophleum chlorostachys*, *Eucalyptus jensenii*, *Eucalyptus miniata*, *Eucalyptus tetradonta*, *Flagellaria indica*, *Grevillea goodii*, *Hydriastele ramsayi*, *Kailarsenia suffruticosa*, *Livistona benthamii*, *Livistona humilis*, *Melaleuca acacioides*, *Nelumbo nucifera*, *Pandanus spiralis*, *Pemphis acidula*, *Phragmites vallatoria*, *Planchonia careya*, *Semecarpus australiensis*, *Syzygium eucalyptooides* subsp. *bleeseri*, *Syzygium suborbiculare*, *Terminalia ferdinandiana*, *Vitex glabrata*, *Wrightia saligna*

## The record of plants and their distribution

A summary of the plants that can be unambiguously assigned to species from Leichhardt's journal of the Port Essington Expedition indicates a tally for the entire journey of 262 species (Table 2).

There are a few species that have not been relocated in the areas they were recorded by Leichhardt. Some may have become locally extinct e.g. *Trichosanthes pentaphylla* on the Burdekin River, but others undoubtedly await rediscovery, a notable possibility being *Sambucus gaudichaudiana* in the Expedition Range area (see December 9, 1844). J. Dowe recently relocated *Livistona decora* in the Carborough Range, after being alerted to the reference recorded by Leichhardt on March 5, 1845. Leichhardt described a stiff-leaved form of *Ipomoea* from the Gulf of Carpentaria on August 6, 1845 that may correspond to specimens of an undescribed species of limited distribution (R. Johnson pers. comm.)

Detailed interpretation of the impact of European settlement is difficult using the Port Essington Expedition journal as a baseline. Leichhardt provides relatively few clues about the abundance of the taxa that he observed and there has been no systematic botanical survey of Leichhardt's route to generate modern data on the distribution of the plants that Leichhardt observed. The presence of contemporary Herbarium collections certainly suggests that the majority of the plant species described by Leichhardt could still be found in the general locality of Leichhardt's records after 160 years of dramatic landscape change. This is perhaps not surprising in view of the fact that most of the species described in the journal are long-lived woody species. However, some of these tree and shrub species have undoubtedly suffered major decline. The brigalow (*Acacia harpophylla*) scrubs have been cleared to less than 10% of their former area (Wilson *et al.* 2002), but the species remains relatively common as regrowth, and roadside remnants are widely scattered throughout its former vast range. Within the brigalow and associated vegetation some elements have become rare with clearing. The distribution of Ooline (*Cadellia pentastylis*) was always patchy but it occurs on fertile soils in the Brigalow Belt region and its populations have been greatly reduced, including those in the Taroom district where Leichhardt recorded the tree on November 17, 1844. Leichhardt's sighting of a ground orchid in the genus *Prasophyllum* on the basaltic grassland plains of the Darling Downs (October 3, 1844) is notable. This area has been the subject of vegetation survey over recent years (including Fensham 1998), and no ground orchids were found in that habitat, suggesting that they are now exceedingly rare or locally extinct.

In Australia, a common definition of an indigenous plant is one that was present before European settlement. Following that definition, it seems highly likely that any plant recorded by Leichhardt beyond areas of settlement should be deemed an indigenous species. The following species have previously been considered exotic species by some authors, but on the evidence presented here should therefore be recognised

as indigenous: *Acacia farnesiana*, *Aeschynomene indica*, *Cucumis melo*, *Datura leichhardtii*, *Ipomoea nil*, *Lagenaria siceraria*, *Melochia pyramidata*, *Ocimum tenuiflorum*, *Portulaca oleracea*, *Salsola kali* and *Verbena gaudichaudii*.

## Leichhardt's botanical contribution to Australia

During his relatively brief time in Australia, Leichhardt collected thousands of good-quality plant specimens. The early specimens were collected between February 1842 and September 1844, at various places between Sydney and Moreton Bay. While this collection undoubtedly included 'new' species, most specimens would have been of known species, and hence not so eagerly sought by European botanists. The Port Essington Expedition, however, traversed country remote from European settlement and many of the species Leichhardt collected would have been new to science. If the plant collection from the Port Essington Expedition had survived and new species described, it would have been comparable with the north Australian collections of Brown in the Investigator in 1801–02 and the later collections of Mueller made on the Gregory expedition in 1858, and Leichhardt's name would have been much more widely recognised in botanical circles.

Of the plant species that can be unambiguously determined from the Port Essington Expedition journal, 120–150 were completely unknown at the time, and would have represented the first botanical specimens. These include, for example, *Lysicarpus angustifolius*, *Cadellia pentastylis*, *Grevillea longistyla*, *Acacia rhodoxylon*, *Petraeomyrtus punicea* and *Hydriastele ramsayi*. The botanical references in the journal are biased towards trees as they formed obvious landmarks that summarised the nature of the country that was being traversed. It was obviously impractical for Leichhardt to mention the plants of lesser stature in his journal, as they would be of little interest to most readers, and it would have increased the amount of text perhaps two-fold. However, Leichhardt indicated that his dried plant collection (of 4–5000 specimens by the time the party reached the Roper River) included many of 'the less conspicuous' species. Some collections of these less conspicuous herbaceous plants, not mentioned in the journal, have survived e.g. *Arthrostylis aphylla* and *Mitrasacme elata* (Table 1). To achieve 4–5000 specimens between Jimbour and Roper River, Leichhardt must have collected an average of 11–13 specimens per day. This would be a reasonable effort for a botanist who had no other duties on the expedition, but is remarkable when one considers Leichhardt's myriad other chores and duties.

The final major collecting effort by Leichhardt was during the aborted Swan River expedition of 1846–47. This expedition followed almost the same route as the Port Essington Expedition, but only as far as the Peak Range (Fig. 1). Most of the collections from this journey survive, with many specimens in Australian herbaria. The journey was disastrous in many respects. The party was beset by

debilitating sickness, marauding insects, and spent much of their time chasing errant stock animals in wet and muddy conditions; the morale of the party and Leichhardt's leadership were undermined by nasty infighting (Sprod 1989). It is not surprising that Leichhardt described the specimens from that expedition as 'very much injured' (Aurousseau 1968, p. 976).

Leichhardt had great botanical talents, and was familiar with many Australian genera. The Sydney area was an ideal place to learn the Australian flora, as it was the only part of the continent where the flora was relatively well known and has a broad spectrum of genera representing the eastern areas of the continent at least. His journeys to Moreton Bay introduced him to some of the tropical families and genera, and this held him in good stead during the Port Essington Expedition. Throughout the journal, his identifications are for the most part either close to the mark or correct for the day. There are a few glaring misidentifications such as the tree he clearly described as *Pleiogynium timorense* (Anacardiaceae), but considered it 'probably Ebenaceous' i.e. of the family Ebenaceae. He failed to discriminate some eucalypt species he saw during the expedition. For example, he lumped several well-marked species, such as the box-barked *Eucalyptus pruniosa* as 'silver-leaved ironbark', and a range of bark types as 'rusty gum'. However, concepts of eucalypt taxonomy were only beginning to emerge at the time. It is interesting to note that Leichhardt used all of the current terms for bark groupings in eucalypts (gum, bloodwood, stringybark, ironbark and box) in his journal. He had almost certainly picked up the terms from squatters and timber-getters he had met in his travels where they had become vernacular in the early decades of European settlement. The Port Essington Expedition journal may well represent the first widely read published account of these names and was almost certainly influential in the widespread adoption of this scheme for describing eucalypts.

Leichhardt had a generally enlightened and sympathetic attitude to aboriginal people. His journal has a plethora of carefully observed ethnobotanical observations. These original documentations of traditional plant use could be the subject of another interesting analysis and publication.

Leichhardt's background in the natural sciences distinguished him from the other major explorers of his era and his desire to describe and understand the natural world was the primary motive for his explorations; even if he was probably somewhat less humble than this passage in a letter would have us suppose:

*...whatever I have done has never been for honour. I have worked for the sake of science, and for nothing else; and I shall continue to do so even if not a soul in the world pays any attention to me.* (Aurousseau 1968, p. 993–994)

There is little doubt that Leichhardt had the potential to make some outstanding published contributions to science. However, Leichhardt died a young man in his mid-30s, and

during his short life, obsessive ambitions for exploration overshadowed almost everything else. Leichhardt died during his third major expedition, an infamous and ill-fated attempt to cross the continent from east to west (Lewis 2006). His short life did not allow him to turn his prodigious talent and intellect to product in terms of formal botanical publication, despite clearly stated intentions in that direction:

*But let me only get back from Swan River and I shall call on many people and then we will both go together to England and gather like bussy bees all the knowledge which might be available for New South Wales; I want very much to coin my 'impressions de voyage' into exact science.* (Aurousseau 1968, p. 888–9).

One of his few publications was a broad geographical overview of the landscapes observed along the route of the Port Essington Expedition (Leichhardt 1847b), a truly remarkable document prescient of the land systems studies that commenced with Christian and Stewart (1952) and biogeographic regions (e.g. Thackway and Cresswell 1995). Despite his premature death the reputation of Ludwig Leichhardt as a great natural scientist should be affirmed.

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## References

- Aurousseau, M. (1968) *The letters of F. W. Ludwig Leichhardt, Volumes II & III.* (Cambridge University Press: Cambridge).
- Baker, R.M. & Barker W.R. (1990) Botanical contributions overlooked: the role and recognition of collectors, horticulturists, explorers and others in the early documentation of the Australian flora. In Short, P.S. (Ed.) *History of systematic botany in Australasia*, pp. 37–85. (Australian Systematic Botany Society: South Yarra).
- Bell, J. (2004) (Ed.). *From Jimba to Dried beef Creek: Leichhardt's travels in the Chinchilla District 1844–1848.* (Chinchilla Shire Library: Chinchilla).
- Brown, R. (1810) *Prodromus florae Novae Hollandiae et insulae Van Diemen...* (J. Johnson and Co: London).
- Bunce, D. (1979) *Travels with Dr Leichhardt.* (Oxford University Press: Melbourne).

- Candolle, A.P. de *et al.* (1823–1873) *Prodromus systematis naturalis regni vegetabilis*. 17 Volumes (Treutell & Würtz: Paris).
- Chisholm, A.H. (1955) *Strange new world: the adventures of John Gilbert and Ludwig Leichhardt*. (Angus & Robertson: Sydney).
- Christian, C.S. & Stewart, G.A. (1952) General report on survey of Katherine-Darwin regions, 1946. *CSIRO Australian Land Research Series 1*.
- Dowe, J.L. (2005) Ludwig Leichhardt's Australian plant collections, 1842–1847. *Austrobaileya* 7: 151–163.
- Endlicher, S.F.L. (1836–1841) *Genera Plantarum secundum ordines naturales disposita*, parts 1–18. (Fr. Beck: Vienna).
- Fensham, R.J. (1998) The grassy vegetation of the Darling Downs, south-eastern Queensland, Australia. Floristics and grazing effects. *Biological Conservation* 84: 301–310.
- Gilbert, J. (1844–1845) Diary. Leichhardt's Expedition to Port Essington, 1844–45. Typed transcript, Mitchell Library, State Library of New South Wales, Sydney.
- Hodgson, P. (1846) *Reminiscences of Australia : with hints on the squatter's life*. (W.N. Wright: London).
- Jackes, B.R. (1990) Retracing the botanical steps of Leichhardt and Gilbert in June 1845. In P.S. Short (Ed.) *History of systematic botany in Australasia*, pp. 165–169. (Australian Systematic Botany Society: South Yarra).
- Leichhardt, L. (1842–1847) Unpublished notebook. Mitchell library ML C154, Microfilm MAV/FM4/3092.
- Leichhardt, L. (1844–45) Field book, 1844–45, used on the exploration journey from Moreton Bay to Port Essington. Original held by the Mitchell Library, State Library of New South Wales at ML C158.
- Leichhardt, L. (1847a) *Journal of an overland expedition in Australia from Moreton Bay to Port Essington*. (T. & W. Boone: London).
- Leichhardt, L. (1847b) Lectures on the geology, botany, natural history, and capabilities of the country between Moreton Bay and Port Essington. *Tasmanian Journal of Natural Science* 3: 81–113.
- Lewis, D. (2006) The fate of Leichhardt. *Historical Records of Australian Science* 17: 1–30.
- McLaren, G. (1993) Retracing Leichhardt. Field notes Vol. 1 and Vol. 2. The development of the traditions of scientific research and bushmanship in 19<sup>th</sup> century Australia, with special reference to the contributions of Ludwig Leichhardt (1994). PhD thesis. Curtin University of Technology, Perth.
- McLaren, G. (1994) *Beyond Leichhardt. Bushcraft and the exploration of Australia*. (Fremantle Arts Centre Press: South Fremantle).
- Roderick, C. (1988) *Leichhardt the dauntless explorer*. (Angus & Robertson: North Ryde).
- Sprod, D. (1989) *Proud Intrepid Heart. Leichhardt's first attempt to the Swan River*. (Blubber Head Press: Hobart).
- Telford, I.R. (1982) Cucurbitaceae In Flora of Australia. Volume 8 Lechythidales to Batales. (Australian Government Publishing Service: Canberra).
- Thackway, R. & Creswell, I. D. (1995) An Interim Biogeographic Regionalisation for Australia: A Framework for Setting Priorities in the National Reserves System Cooperative Program, Version 4.0. (Australian Nature Conservation Agency: Canberra).
- Webster, E.M. (1986) *An explorer at rest. Ludwig Leichhardt at Port Essington and on the homeward voyage 1845–1846*. (Melbourne University Press: Melbourne).
- Wilson, B.A., Neldner, V.J. & Accad, A. (2002) The extent and status of remnant vegetation in Queensland and its implications for statewide vegetation management and legislation. *Rangeland Journal* 24: 6–35.

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