Dinner speech by The Hon. Justice Brian J Preston
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'Language, learning and life: linked losses'

to the
Forum on Indigenous Knowledge and Biodiversity in India and Australia
UTS Faculty of Law, Sydney

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I am honoured and privileged to be the keynote dinner speaker to the India-Australia Forum on indigenous knowledge and biodiversity. The subject matter of the forum is important and is an area in which I have a keen interest.

I have entitled my speech, with an alliterative flourish, 'Language, learning and life: linked losses'. My speech has a syllogistic structure. My major premise is a statement of general principle that the conservation of biological diversity is dependent in part on the conservation of the languages and traditional ecological knowledge of indigenous and local communities. My minor premise is a case study. The arrival of the First Fleet to Sydney in 1788 to found the colony of New South Wales caused a loss of the local indigenous language and traditional ecological knowledge of the native flora and fauna of the Sydney area. My conclusion is that humanity's collective knowledge of biodiversity and its use and management has been impoverished and the conservation of the biological diversity of the Sydney area has been impeded by this loss of language and traditional ecological knowledge.

Language, traditional ecological knowledge and biological diversity are linked. The conservation of biological diversity is dependent in part on the conservation of indigenous and local communities' languages and traditional knowledge, innovations and practices regarding biological diversity. The arrival of the First Fleet in Australia in 1788 and the founding of the colony at Sydney led to a loss of the indigenous *Dharuk* language and traditional ecological knowledge of the native flora and fauna of the Sydney area. As a consequence, humanity's collective knowledge of

biodiversity and its use and management has been impoverished and the conservation of the biological diversity of the Sydney area has been impeded.

The links between linguistic, cultural and biological diversity

Language is the means by which different cultures conceptualise, interpret, understand and change the natural and social world, and communicate such a worldview to others. If a plant, animal or object in the natural world is important in the life of a culture, it and its important attributes and qualities are named.[1] Those plants, animals and objects enter the world of communication and meaning by their names, qualities and attributes (that is to say, by reports of their internal and external relations and interactions).[2]

The study of the folk categorisation and naming of plants, animals and objects in the natural world is called cognitive ethnobiology.[3] Ethnobiological categorisation and naming of natural objects are based on perceptual recognition of salient discontinuities and affinities in nature and on observation of the morphological, ecological and behavioural characteristics of local, animal and plant species.[4]

This observation and recognition of the morphological, ecological and behavioural characteristics of local plant and animal species is part of a culture's traditional ecological knowledge. Traditional ecological knowledge comprises the traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use and management of biological diversity. Traditional ecological knowledge is 'the basis for local-level decision-making in areas of contemporary life, including natural resource management, nutrition, food preparation, health, education, and community and social organization'.[5]

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[1] Luisa Maffi, 'Linguistic Diversity' in D A Posey (ed), *Cultural and Spiritual Values of Biodiversity*, (UNEP and Intermediate Technology Publications, 1999) 21.
[2] Gregory Bateson, *Mind and Nature: A Necessary Unity*, (Bantam Books, 1979) 68.
[3] Maffi, above n 1, 27-28.
[4] Maffi, above n 1, 28.
[5] D A Posey, 'Introduction: Culture and Nature – the Inextricable Link' in D A Posey (ed), *Cultural and Spiritual Values of Biodiversity*, (UNEP and Intermediate Technology Publications, 1999), 9.

The indigenous or local community's language is critical to the community being able to express and communicate their traditional ecological knowledge. A loss of the linguistic tools to express and communicate traditional ecological knowledge heralds a loss of that knowledge.[6] A loss of traditional ecological knowledge, in turn, impedes the conservation and sustainable use and management of biological diversity.

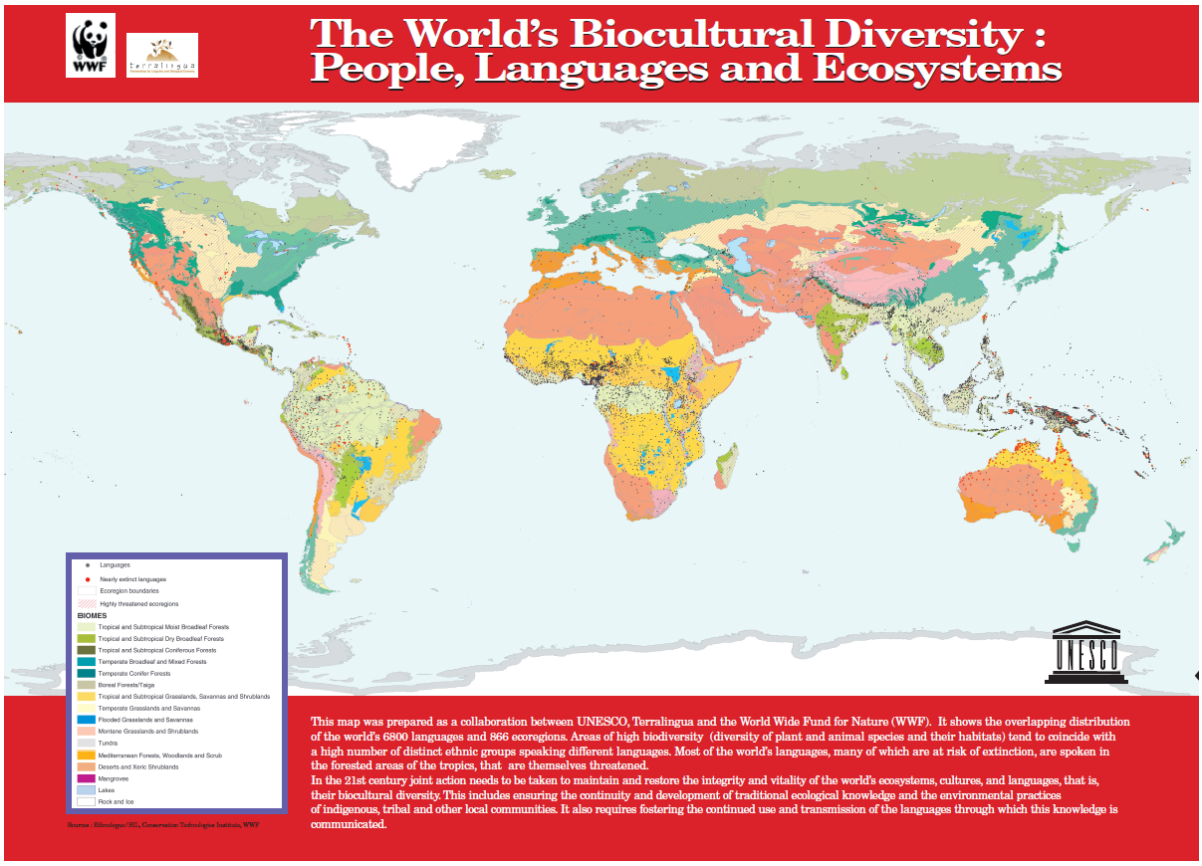
Hence, there are linkages between linguistic diversity, cultural diversity and biological diversity. Humanity's collective knowledge of biodiversity and its sustainable use and management rests on cultural diversity, which in turn rests on linguistic diversity. Conversely, conserving biodiversity often helps strengthen cultural integrity and values.[7]

The conservation of biodiversity is linked to the conservation of cultural and linguistic diversity. Various studies have shown the overlap between the world's biodiversity, cultural and linguistic diversity.

UNESCO, Terralingua and World Wide Fund for Nature (WWF) have mapped overlapping distributions of the world's 6,800 languages and 866 ecoregions (see Map 1).[8] Areas of high biodiversity tend to coincide with a high number of distinct ethnic groups speaking different languages. Most of the world's languages, many of which are at risk of extinction, are spoken in the forested areas of the tropics, which are themselves threatened.

[6] Maffi, above n 1, 30.
[7] Kathleen Courrier (ed), *Global Biodiversity Strategy* (WRI, IUCN, UNEP, 1992) 23.
[8] UNESCO, Terralingua and WWF,*The World's Biocultural Diversity: People, Languages and Ecosystems*, Terralingua: Unity in Biocultural Diversity <http://www.terralingua.org/wp-content/uploads/downloads/2011/10/poster-unesco-2011.indd_.pdf>.

Map 1



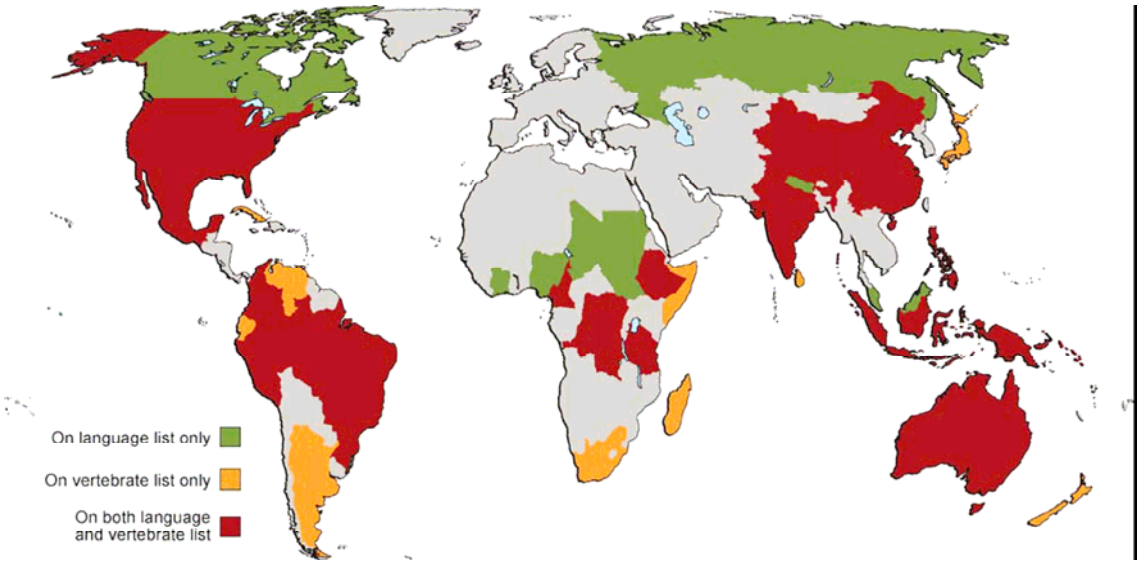
UNESCO, Terralingua and WWF also have compared endemism in language with rankings of biodiversity. Both India and Australia rank highly in total number of endemic languages as well as endemic vertebrates, bird areas and flowering plants. India has 309 and Australia 261 endemic languages, which ranks them fourth and fifth respectively in this category globally. Australia has the most endemic vertebrates in the world, 1346 in total, and India, with 373, has the seventh highest number. Australia and India have the 11th and 12th highest number of flowering plants respectively, and the ninth and 11th highest number of endemic bird areas. Both India and Australia are among the world's 17 megadiverse nations, in which two-thirds of all known life forms live.[9]

A comparison of endemism in language and higher vertebrates has been displayed graphically by Maffi, as seen in Map 2.[10] Maffi and Woodley have also mapped the

[9] *Sharing a World of Difference: the Earth's Linguistic, Cultural and Biological Diversity* (UNESCO, WWF, Terralingua, 2003) 39, Table 8.
[10] Luisa Maffi, 'Language: A Resource for Nature' (1998) 34(4) *Nature and Resources: the UNESCO Journal on the Environment and Natural Resources Research* 12-21. Original work by D Harmon,

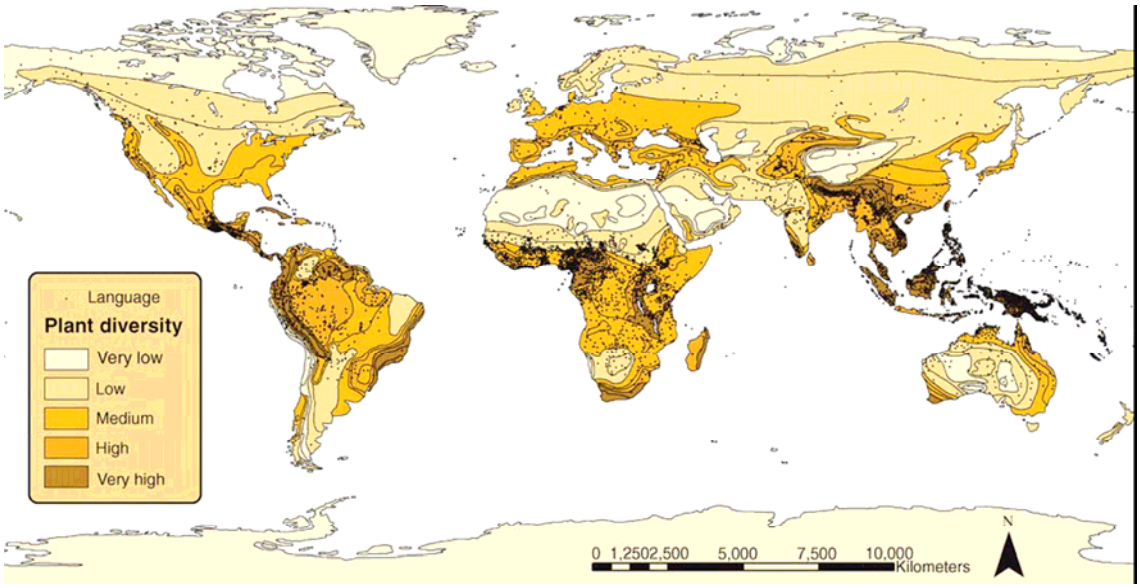
global distribution of plant diversity and languages, depicted in Map 3.[11]

Map 2



World map showing overlap of endemism in languages and higher vertebrates

Map 3



Global plant diversity and language distribution

based on D Harmon, 'Losing Species, Losing Languages: Connections Between Biological and Linguistic Diversity (1996) 15 *Southwest Journal of Linguistics* 89.

[11] Luisa Maffi and Ellen Woodley, *Biocultural Diversity Conservation: a Global Sourcebook*, (Earthscan, 2010) Plate 1 which occurs after 153, from J R Stepp et al (2004) 'Development of a GIS for Global Biocultural Diversity' (2004) 13 *Policy Matters* 267–70.

The loss of biological diversity, including genetic, species and ecosystem diversity, both stems from and invites the loss of cultural diversity. The Global Biodiversity Strategy recorded in 1992 that:

> Since 1900, experts say, about one Indian tribe has disappeared from Brazil each year. Almost one half of the world's 6000 languages may die out in the next 100 years. Of the 3000 languages expected to survive for a century, nearly half will probably not last much longer.[12]

In 1999 Posey noted:

> Human cultural diversity is threatened on an unprecedented scale. Linguists estimate that between 5,000 and 7,000 languages are spoken today on the five continents. Languages are considered one of the major indicators of cultural diversity. Yet an estimated half of the world's languages – the codifications, intellectual heritages, and frameworks for each society's unique understanding of life – will disappear within a century. Nearly 2,500 languages are in immediate danger of extinction; and an even higher number are losing their 'ecological context' that keep them as vibrant languages' (citations omitted).[13]

The Index of Linguistic Diversity quantitatively demonstrates that the world's languages, both in number and the linguistic and cultural diversity they represent, are being severely diminished. Global linguistic diversity has declined 20 per cent in the 35 years between 1970 and 2005.[14] Over the same period, the Living Planet Index (an indicator of the state of global diversity based on trends in vertebrate populations of species around the world) shows biodiversity has declined almost 30 per cent.[15]

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[12] Courrier, above n 7, 11.
[13] Posey, 'Introduction', above n 5, 3.
[14] *Index of Linguistic Diversity*, Terralingua: Unity in Biocultural Diversity <http://www.terralingua.org/linguisticdiversity/>.
[15] WWF and Zoological Society of London, 'Living Planet Index' (Indicator Factsheet 1.2.1, Biodiversity Indicators Partnership) 2. The Living Planet Index is explained in Jonathan Loh, Rhys E Green, Taylor Ricketts, John Lamourex, Martin Jenkins, Valerie Kapos and Jorgen Randers, 'The Living Plant Index: Using Species Population Time Series to Track Trends in Biodiversity' (2005) 360 *Philosophical Transactions of the Royal Society B* 289.

There is, therefore, an urgent need to conserve the world's linguistic diversity, and the distinct forms of local knowledge that indigenous and minority languages encode, as part of conserving the world's biological diversity.

The ninth of the 10 principles on conserving biodiversity enunciated in the Global Biodiversity Strategy involves the conservation of cultural diversity.[16] Article 8(j) of the *Convention on Biological Diversity*[17] recognises this need and obliges each contracting party to:

> Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote the wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices.

The loss of biocultural and linguistic diversity is well exemplified in Australia. I propose to focus on the detrimental effect early European settlement in Sydney had on linguistic and biocultural diversity.

The effects of early European settlement on language and ethnobiology

When European settlers arrived in Australia in 1788, it is thought that there were about 250 distinct Aboriginal languages. Each was as different from one another as English is different from German, French, Italian, Latin, Greek, Sanskrit and Hindi. Within these Aboriginal languages there were often dialects, so that there were probably up to 600 different ways of speaking.[18]

[16] Courrier, above n 7, 23.
[17] Opened for signature 5 June 1992, 1760 UNTS 79 (entered into force 29 December 1993). The text of the Convention is reprinted in 31 ILM (1992) 818.
[18] Bruce Moore, *Speaking our Language: the Story of Australian English* (Oxford University Press, 2008) 5-6.

Dixon et al note that:

> The native languages of Australia are highly developed instruments of culture, each possessing a wide vocabulary and an intricacy of grammatical forms. The apparent simplicity of the Aboriginal traditional hunting and gathering lifestyle is in sharp contrast to the elaborateness and complexity of their social and religious life, and to the richness of their language. These languages enable Aboriginal people to express subtleties of meaning in any aspect of their cultural lives, from complicated myths to detailed and precise information about the landscape.[19]

The Aboriginal people had detailed knowledge of their environment, including its fauna and flora upon which their survival depended. Men hunted large animals and fished, while women collected small animals and vegetable material. They had a deep knowledge of the morphological, ecological and behavioural characteristics of native animals and plants and their seasonal availability.

The arrival of Europeans, first with Captain Cook on the ship, the 'Endeavour' in 1770, and then with the First Fleet under Governor Phillip in 1788, provides an illustration of poor communication and lack of willingness by the Europeans to learn the local Aboriginal people's language and traditional ecological knowledge.

In 1770, in the Sydney-Hawkesbury area, there were only two Aboriginal languages spoken: the Sydney language and the Hawkesbury-MacDonald River language. The Sydney language was spoken in the area from the northern side of Botany Bay to the southern bank of the Hawkesbury River. The Hawkesbury-MacDonald language was spoken from the northern bank of the Hawkesbury River and Broken Bay to the headwaters of the MacDonald River.[20]

The Sydney language had at least two dialects, a coastal dialect, around Port Jackson, and an inland dialect, extending west to the Hawkesbury River. The whole

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[19] R M W Dixon et al, *Australian Aboriginal Words in English* (Oxford University Press, 2nd ed, 2006) 2.

[20] Jim Wafer and Amanda Lissarrague, *A Handbook of Aboriginal Languages of New South Wales and the Australian Capital Territory* (Muurrbay Aboriginal Language and Culture Co-operative, 2008) 140.

of the Sydney language has been referred to as *Dharug* or *Dharuk* although earlier accounts referred to the coastal dialect as *Eora* and the inland dialect as *Dharug*.

The Hawkesbury-MacDonald River language has been referred to as *Darrkinyung*.[21] It is likely that in the interface between the two languages at Hawkesbury River – Broken Bay there was a dialect of *Darrkinyung*.[22]

The first Europeans founding the colony in Sydney, therefore, met Aboriginal people who spoke the Sydney language, *Dharuk*. This language provides the most loan words into Australian English. Not surprisingly, most of the loan words describe features of the natural world, including its fauna and flora.[23]

Captain Cook, on the Endeavour entered what we now call Botany Bay but he originally named Stingray Bay on 29 April 1770. He spent eight days exploring Botany Bay, before departing on 6 May 1770 to sail up the east coast of Australia. He and his crew were forced to stay seven weeks on the Endeavour River, near Cooktown in far northern Queensland, when the ship was severely damaged on a coral reef.

Joseph Banks, the famous botanist who accompanied Captain Cook, and Daniel Solander, collected many botanical samples during their stay at Botany Bay. Benson and Eldershaw conclude that they collected at least 132 species of plants.[24] Of interest are the plants that were subsequently used by the first settlers. I will refer to many of these plants later.

Captain Cook had an abiding passion to ensure that he and his crew ate fresh vegetables on their journey around the world to avoid scurvy, a disease caused by a deficiency of vitamin C. At Botany Bay, they ate a leafy plant, *Tetragonia tetragonoides*, first called New Zealand spinach, as New Zealand was the first place that Captain Cook had collected and eaten this vegetable, but later referred to as

[21] Ibid 143.
[22] Ibid 145.
[23] Moore, above n 18, 8.
[24] Doug Benson and Georgina Eldershaw, 'Backdrop to Encounter: the 1770 Landscape of Botany Bay, the Plants Collected by Banks and Solander and Rehabilitation of Natural Vegetation at Kurnell', (2007) 10(1) *Cunninghamia* 113, 122.

Botany Bay greens or warrigal greens or warrigal cabbage, and a coastal herb, *Apium prostratum* (sea celery).[25] They also ate the berries of a small tree, *Syzygium paniculatum*.[26] Banks wrote in his journal for 8 May 1770 that:

> They [Cook and Solander] found also several trees of the Jambosa kind,[27] much in colour and shape resembling cherries; of these they ate plentifully and brought home also abundance, which we ate with much pleasure tho they had little to recommend them but a light acid.[28]

Although the crew of the Endeavour saw and interacted with the Aboriginal people from afar, they did not have any communication with them and hence did not have the opportunity to learn any of their language or their culture, including learning their traditional ecological knowledge.

It was not until the Endeavour was forced to stay at the Endeavour River in Queensland that the crew had any detailed contact with, and learnt anything from, the local Aboriginal people, the *Guugu Yimidhirr*. Banks not only collected some more plants during the stay, but he also took down a word list from the local Aboriginal people. Unbeknown to Banks, the language of the local Aboriginal people of the Endeavour River area, the *Guugu Yimidhirr*, was a distinct language from the Sydney language. Nevertheless, Banks' wordlist of the 'New Holland language' was given to Governor Phillip to use when he arrived to found the new colony in Sydney in 1788.

Amongst the words Banks had recorded was 'kangaroo', perhaps the most recognised Australian English word worldwide. On 23 June 1770, Cook records in his journal 'one of the men saw an animal something less than a grey hound, it was of a Mouse Colour, very slender made and swift of foot.'[29] The next day, Cook himself saw one of the animals that had been sighted by the crew. Cook described

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[25] Tim Low, *Bush Tucker: Australia's Wild Food Harvest* (Angus & Robertson, 1989) 133.
[26] Benson and Eldershaw, above n 24, 122.
[27] Banks was referring to the tree *Syzygium jambos*, which is widely distributed in the Indian subcontinent and bears a rose coloured fruit.
[28] Quoted in A B & J W Cribb, *Wild Food in Australia* (Fontana/Collins, revised ed, 1982) 31-32.
[29] J C Beaglehole (ed), *The Journals of Captain James Cook on His Voyage of Discovery* (Cambridge University Press, 1995) vol 1, 351 and quoted in Moore, above n 18, 1.

the animal as being 'of a light Mouse colour and the full size of a grey hound and shaped in every respect like one, with a long tail which it carried like a grey hound. In short I should have taken it for a wild dog but for its walking or running, in which it jump'd like a Hare or deer'.[30] Cook elicited from the local Aboriginal people the word *kangooroo* or *kanguru* as the name for the animal.

Cook and Banks wrongly assumed that name referred to any species of kangaroo or wallaby and it became widely used by Europeans for that purpose. However, the word was used in *Guugu Yimidhirr* to refer to a specific species of large kangaroo. When Captain Phillip P King later visited the Endeavour River in 1820 and took down a vocabulary of words, he did not record the word 'kangaroo' but instead recorded *min-ar* or *mee-nuah* for a kangaroo-like animal. It is thought that this occurred because King pointed at several species of kangaroo other than the large variety and the *Guugu Yimidhirr* people might not have connected his pronunciation 'kanga-roo' with the word 'kang-oo-ruu' or 'kangurru'.[31]

Even now it is not clear what was the particular species of kangaroo that Cook and his men saw and recorded as being 'kangaroo'. Dixon says that the *Guugu Yimidhirr* word *gangurru* refers to 'a large black or grey kangaroo, probably specifically the male *Macropus robustus*,[32] the eastern wallaroo. Male eastern wallaroos are usually dark grey to almost black in colour.[33] However, Cook's description is of an animal having a lighter mouse colour. Dawson suggests that Cook collected an eastern grey kangaroo, *Macropus giganteus*.[34] An eastern grey kangaroo has long, soft, grey-brown fur.[35]

In any event, the word 'kangaroo' was completely unknown to the *Dharuk*-speaking people of the Sydney area. Lieutenant Watkin Tench, who came with the First Fleet, states in his account of the early colony, *1788*, that the word 'kangaroo' was the generic term used by the European colonists to refer to any species of kangaroo.[36]

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[30] Beaglehole, above n 29, 351-352 and quoted in Moore, above n 18, 1-2.
[31] Dixon et al, above n 19, 58.
[32] Dixon et al, above n 19, 57.
[33] Terence J Dawson, *Kangaroos*, (CSIRO, 2nd ed, 2012) 28.
[34] Ibid 18.
[35] Ibid.
[36] Watkin Tench, *1788* (Text Publishing, 2012) 57, 237.

Tench noted that the Aborigines were unfamiliar with the name ‘kangaroo’ until it was used by the first settlers. He noted that the local Aboriginal people were confused by the first settlers pointing at wallabies and using the word ‘kangaroo’. In the *Dharuk* language, different words were used for different species of kangaroos and wallabies. For example, the eastern grey kangaroo (*Macropus giganteus*) was *badagarang*[37] or *patagaran* or *patagorang*;[38] the eastern wallaroo (*Macropus robustus*) was *wularu*;[39] and the swamp wallaby (*Wallabia bicolor)* was *bagaray*[40] or *banggarai*.[41]

It seems likely that the Aboriginal people assumed the word ‘kangaroo’ was a European word and referred to different types of large animals and the Aboriginal people used it in this context hoping that the Europeans would understand them.[42] Hence, Tench records that the local Aboriginal people referred to sheep in an enclosure and cows being unloaded from a newly arrived ship as kangaroos.[43]

The *Dharuk* language, has, however, given us loan words in English for a number of types of kangaroo-like animals. In 1798, the Deputy-Judge Advocate David Collins, who had arrived with the First Fleet, recorded in his accounts of the English Colony in New South Wales that a smaller, black kind of kangaroo was called ‘Wali-bah’ by ‘the natives of Port Jackson’.[44] This was a reference to the brush-tailed rock wallaby (*Petrogale penicillata*) which is brown with almost black legs, paws and feet and a black stripe from the eye to the back of the head. The *Dharuk* word *walabi* or *waliba* for the brush-tailed rock wallaby has given rise to the English word ‘wallaby’.

The *Dharuk* word for the eastern wallaroo (*Macropus robustus*) was *walaru* and has given rise to the word ‘wallaroo’. The red-necked pademelon (*Thylogale thetis*) is a smaller, compact-bodied, wallaby occurring in the Sydney region. The *Dharuk* word

[37] Jakelin Troy, ‘The Sydney Language’ in Nick Thieberger and William McGregor (eds), *Macquarie Aboriginal Words* (Macquarie Library, 1994) 69.
[38] Tench, above n 36, 237 and see also the note by Tim Flannery at 57.
[39] Troy, above n 37, 69.
[40] Tench, above n 36, 238.
[41] Troy, above n 37, 69.
[42] Note by Flannery in Tench, above n 36, 57.
[43] Tench, above n 36, 57 and 237. See also Dixon et al, above n 19, 58.
[44] Dixon et al, above n 19, 7.

for this species was *badimaliyan*, which was altered by folk etymology to paddy-melon or pademelon.

Two smaller marsupials were known and recorded in the Sydney region. The *potoroos* are species of rat-kangaroo, one of which occurred in the Sydney region, the long-nosed potoroo (*Potorous tridactylus*). The *Dharuk* word was *badaru*, which gave rise to the English word 'potoroo' and the genus *Potorous*.[45]

Unfortunately, another type of rat-kangaroo, the eastern bettong or Gaimard's rat-kangaroo (*Bettongia gaimardi gaimardi*), which the *Dharuk* called *bidung*[46] is now extinct in mainland Australia. The *Dharuk* name, however, lives on in the genus name *Bettongia*, covering rat-kangaroos. Watkin Tench described a nest making kangaroo-rat in his account of the early colony, including that it 'is good to eat'.[47] It is likely that this kangaroo-rat was the eastern bettong.

The *Dharuk* language has also contributed names for three other famous Australian animals: the koala, wombat and dingo.

The *Dharuk* for the koala (*Phascolarctos cinereus*) was *gula* or *gulawan*. The word *gula* was originally spelt *coola* or *koolah*. However, it was replaced by the tri-syllabic 'koala', probably because of a scribal error.[48]

The common wombat (*Vombatus ursinus*) was called *wambad* in *Dharuk*. Deputy-Judge Advocate Collins recorded an Aboriginal man describing it as 'Whom-batt'.[49] The *Dharuk* name has given rise to the English word 'wombat' and the genus *Vombatus*.

Australia's native dog, the dingo (*Canis lupus dingo*), was described by the *Dharuk* by two names, depending upon whether the dingo was domesticated or wild. Although Aborigines have been in Australia for more than 40,000, the dingo only

[45] Dixon et al, above n 19, 70 and Troy, above n 37, 69.
[46] Dixon et al, above n 19, 51.
[47] Tench, above n 36, 238.
[48] Dixon et al, above n 19, 64.
[49] Ibid 78.

arrived around 4,000 years ago. A domesticated dingo was *din-gu* or *dayn-gu*.[50] A wild dingo was referred to as a *warrigal*.[51] Europeans later used the word *warrigal* to refer to other wild things, both Aborigines and plants and animals. Hence, wild spinach (*Tetragonia tetragonoides*) was referred to as 'warrigal greens' or 'warrigal cabbage'.

The early European settlers recorded *Dharuk* names for other animals, but the names have not become loan words in English. The first settlers observed flying phalangers or wrist-winged gliders. These are arboreal mammals of different species in the genus *Petaurus* that have folds of loose skin running from their wrists to their ankles which they use to glide from tree to tree. Tench recorded 'a flying squirrel',[52] which was most likely a wrist-winged glider but of unknown species. The recorded *Dharuk* word for flying phalangers generally was *bungu*.[53] However, the *Dharuk*-speaking people appeared to have distinguished between different species of gliders. The sugar glider (*Petaurus breviceps*), for example, was called *djubi*.[54] The yellow bellied glider (*Petaurus australis*) was called *yabunaru*.[55] The *Dharuk* name for the squirrel glider (*Petaurus norfolcensis*) was not recorded.

The feathertail glider (*Acrobates pygmaeus*) is in a distinct family from the wrist-winged gliders. The feathertail glider lacks the gliding membrane, but instead uses its distinctive feathertail to glide. The *Dharuk* word for the feathertail glider was *wubin*.[56]

At least two species of possum occurred and still occur in the Sydney area, the common ringtail possum (*Pseudocheirus peregrinus*) and the common brushtail possum (*Trichosurus vulpecula*). Tench referred to possums as 'opossums'.[57] The

[50] Ibid 54.
[51] Ibid.
[52] Tench, above n 36, 239.
[53] Troy, above n 37, 69.
[54] Ibid.
[55] Jakelin Troy, *The Sydney Language* (Australian Dictionaries Project and Australian Institute of Aboriginal and Torres Strait Islander Studies, 1993) available at <http://www.williamdawes.org/docs/troy_sydney_language_publication.pdf>.
[56] Troy, above n 37, 69.
[57] Tench records that there were three kinds of opossums: above n 36, 239.

words ‘opossum’ is used in American English and was based on ‘opassom’ meaning ‘white dog’ in the Virginia Algonquin language.[58]

The generic *Dharuk* word for possum was *wali*.[59] There were also *Dharuk* words to identify particular types of possum.[60] *Guragura* referred to brown or red possums, but the species is not now known. *Barumin* referred to the grey, common brushtail possum (*Trichosurus vulpecula*).[61] The ringtail possum (*Pseudocheirus peregrinus*) was called *bugari*.[62]

The quoll is a predatory mammal with distinctive white spots on its fur, comprising a number of species in the genus *Dasyurus*. A quoll was first recorded by Banks during the forced stay on the Endeavour River in 1770. Banks recorded the *Guugu Yimidhirr* word ‘*Je-quoll*’ for the animal which he described to be ‘about the size of, and something like, a pole-cat, of a light brown, spotted with white on the back, and white under the belly’.[63] The *Guugu Yimidhirr* word is *dhigul* and refers to the northern quoll (*Dasyurus hallucatus*).[64]

Different species of quoll occurred in the Sydney area, being the spotted-tailed quoll (*Dasyurus maculatus*) and the eastern quoll (*Dasyurus viverrinus*). Today, the eastern quoll is feared to be rare or possibly extinct in NSW. The eastern quoll was called *bulungga* in the *Dharuk* language.[65] The first settlers referred to a quoll as a ‘native cat’, being a contraction of ‘native pole-cat’,[66] or sometimes as a ‘tiger cat’ because of its markings. The common name of ‘tiger cat’ was given to the spotted-tailed quoll.[67] The *Dharuk* for a tiger cat or spotted-tailed quoll was *marriyagang*.[68]

[58] Dixon et al, above n 19, 50.
[59] Troy, above n 55.
[60] Ibid.
[61] Ibid.
[62] Ibid.
[63] Dixon et al, above n 19, 71.
[64] Ibid.
[65] Troy, above n 55.
[66] Ronald Strahan, *The Mammals of Australia*, (Reed New Holland, revised ed, 1995) 52 and see Moore, above n 18, 17.
[67] Strahan, above n 66, 68.
[68] Troy, above n 37, 69.

Another predatory mammal found in the Sydney area, although much smaller than the quoll, is the brown antechinus (*Antechinus stuartii*). The *Dharuk* name was *mirrin*.[69]

Finally, there were 'bats' in the Sydney area, being Pteropodid bats, commonly known as flying foxes. One of Captain Cook's lieutenants in 1770 described an Australian flying fox at the Endeavour River as 'about as large as a one gallon keg, as black as the devil with wings and horns on its head'.[70] It is likely that this was a black flying fox (*Pteropus alecto*) found in coastal northern Australia. Tench noted in 1788, in Sydney, that he had not been able to find 'the bat of the Endeavour River'[71] but he later recorded 'an immense flight of bats driven before the wind, covered all the trees around the settlement'.[72] These were flying foxes of the genus *Pteropus*, most likely the grey-headed flying fox (*Pteropus poliocephalus*), which still occur in large camps or colonies at various places in the Sydney area.

The *Dharuk* word recorded for 'bat' was *wirambi*,[73] but it is not now known whether that word referred to bats generally or a particular species of bat. A flying fox was called *ngununy*.[74]

Not all native animals were given names by the Europeans based on *Dharuk* names. Some animals appeared sufficiently similar to animals the first settlers had knowledge of from other parts of the world that they were able to apply names derived from the names for those other animals. The emu (*Dromaius novaehollandiae*), for instance, although endemic to Australia, appeared to the first settlers to be like a cassowary and this name was used until the 1850s. However, Tench, who had served in the Americas and had travelled to South America, described it 'approaching nearer to the emu of South America',[75] although he also referred to it as a cassowary.[76] Another 1788 observation described the bird as 'the

[69] Troy, above n 59.
[70] Peggy Eby, 'The Biology and Management of Flying Foxes in NSW' (Species Management Report No 18, NPWS, 1995) 5.
[71] Tench, above n 36, 73.
[72] Ibid 234.
[73] Troy, above n 37, 69.
[74] Troy, above n 59.
[75] Tench, above n 36, 72. The emu of South America is a *Rhea*.
[76] Ibid 239-240.

Emew'.[77] The word 'emu' is from the Portuguese word 'ema' that applied to various ostrich-like birds.[78] The *Dharuk* word for emu was *murawung*.[79]

The goanna (reptiles of the genus *Varanus*) was named using an altered form of the Spanish word 'iguana', which in turn was borrowed from the Taino language of the Arawak family spoken in Puerto Rico.[80] The *Dharuk* name for goanna was *wirriga*.[81]

The bandicoot is a small, ground dwelling mammal with a long snout that digs conical holes with its forelimbs and explores the excavations with its snout. The name 'bandicoot' was derived from the Dravidian language, Telugu, in Southern India where *pandi-kokku* (pig-rat) was the name of a rat-like animal to which the Australian bandicoot bore some resemblance.[82] The long-nosed bandicoot (*Perameles nasuta*), which occurred in the Sydney area, was called *burraga* in the *Dharuk* language.[83]

The platypus was the exception; it was so extraordinary as to be without counterpart anywhere in the world. The colonists 'discovered' the platypus in 1797. Skins were sent back to Britain. George Shaw of the British Museum gave it the name in 1799 of *Platypus anatinus* with *Platypus* meaning 'flat-footed' and *anatinus* meaning 'duck-like'. In 1800, the German anatomist Johann Blumenback received a skin from Joseph Banks and published his scientific name for it as *Ornithorhynchus paradoxus*, with the genus name meaning 'duck-bill' and the species name meaning 'of paradoxical character'. When it was discovered that *Platypus* had been already used for a genus of beetles, the two scientific names were amalgamated and scientifically the animal became *Ornithorhynchus anatinus*.[84] However, the common name of 'platypus' remained. No *Dharuk* name for the platypus was recorded.

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[77] Moore, above n 18, 23.
[78] Ibid.
[79] Troy, above n 55.
[80] Dixon, above n 19, 50. See also G S Rao, *Indian Words in English* (Oxford University Press, 1954) 60.
[81] Troy, above n 55.
[82] Dixon above n 19, 51 and Moore, above n 18, 23.
[83] Troy, above n 55.
[84] Moore, above n 18, 19-20.

The early settlers also recorded *Dharuk* words for birds and fish, some of which became loan words into Australian English. For birds, loan words include 'boobook' (derived from *bug-bug*, an imitative name for the call of the boobook owl (*Ninox novaeseelandiae*),[85] 'wahkhun' (derived from *waagun*, an imitative name for the call of different species of crow and raven indigenous to Australia, including the Australian raven, *Corvus coronoides*)[86] and 'wonga wonga' (derived from *wanga-wanga*, the name for the ground feeding, grey and white pigeon, *Leucosarcia melanoleuca*).[87]

The Aboriginal people of Sydney lived well on the fish and other products of the sea and the shoreline. A major source of food was collected in the intertidal zone, particularly bivalve shellfish (such as pipis, mussels,[88] cockles[89] and oysters[90]), other mollusc shellfish (such as snails, limpets and periwinkles) and invertebrates (such as crabs[91] and worms).

Dharuk words for fish and other aquatic life that have become Australian English words include 'cobra' or 'cobbera' (derived from *gabara*, referring to a shipworm or mollusc native to mangroves, traditionally eaten by Aborigines),[92] 'tarwhine' (derived from *darrawayin*, referring to the silvery marine fish, *Rhabdosargus sarba*),[93] and 'wollamai' (derived from *walamay*, referring to the marine fish, the snapper, *Chrysophys auratus*).[94]

There were a number of other *Dharuk* words for birds, and for fish and other marine life,[95] but these have not been borrowed into Australian English.

[85] Dixon, above n 19, 81.
[86] Ibid 87 and Troy, above n 55.
[87] Dixon, above n 19, 88-89.
[88] The mussel was called *dalgal* in *Dharuk*.
[89] The Sydney cockle was called *gadyan* in *Dharuk*: Troy, above n 37, 70.
[90] The Sydney rock-oyster was called *badangi* and the mud oyster was called *daynya* in *Dharuk*: Troy, above n 37, 70 and Troy, above n 59.
[91] The crab was called *yara* in *Dharuk*.
[92] Dixon, above n 19, 91.
[93] Ibid 96.
[94] Ibid 98.
[95] Recorded in Troy, above n 37, 69-71 and Troy, above n 59.

Compared to fauna, the recorded *Dharuk* words for flora are far more limited. There may be a number of explanations for the paucity of loan words for flora.

One explanation is that, in contrast to the peculiar Australian fauna (such as the kangaroo and platypus) which had no counterpart in Europe or other colonised parts of the world, the first settlers had some reference plants in their European knowledge against which to compare certain of Australia's flora. The first settlers gave common names to native plants drawn from plants from other parts of the world, sometimes merely pointing to a similarity in appearance and sometimes reflecting mistakes about the botanical families to which they belonged.[96] In order to distinguish the Australian plant from the European plant with which it was compared, the Australian word was often preceded by a term that indicated a difference. Commonly, the adjective 'wild' or 'native' was used.[97] Sometimes an Aboriginal word connoting 'wild' was used, notably 'warrigal' or 'myall'.[98] Thus, the first settlers referred to 'wild celery' (*Apium prostratum*) and 'wild spinach' or 'warrigal greens' or 'warrigal cabbage' (*Tetragonia tetragonoides*).

A second explanation may be that the first settlers who had the authority, education and literacy to record Aboriginal words for plants, dealt more with the Aboriginal men, who hunted and fished animals, rather than the Aboriginal women who collected the plants and other vegetable matter. Hence, there was little opportunity for the Europeans to learn and record the Aboriginal words for native plants.

A third explanation may be that the first settlers were more concerned with cultivating European crops than with learning native plant foods. Agriculture was to be the means of procuring constant and abundant provisions for the first settlement.[99]

Nevertheless, the first settlers did learn some of the *Dharuk* words for the native flora and a few of these have become loan words into Australian English.

[96] Moore, above n 18, 22.
[97] Ibid 24-25.
[98] Dixon, above n 19, 77.
[99] Low, above n 25, 19.

One of the first *Dharuk* words recorded for a native plant, in 1788, was for the floral emblem of NSW, the waratah (*Telopea speciosissima*), deriving from the *Dharuk* word *warrada*. The striking, bright red flower head of the waratah was admired for its beauty but the Aboriginal people also sucked the flowers for its sweet nectar.[100]

Two other food plants were recorded in 1790. The first settlers observed the local Aboriginal people eating the small, green fruits of shrubs or small trees of the genus *Persoonia*. The fruit was called *jibung* in *Dharuk*. The plant itself became known by the same name as the fruit, 'geebung'. The name now refers to any of the species of the genus *Persoonia*.[101]

It is unfortunate that the first settlers were not more inquiring of the local Aboriginal people about the different species of *Persoonia* of which there were many in the Sydney area. Banks collected two at Botany Bay in 1770, the lance-leafed geebung (*Persoonia lanceolata*) and the broad-leafed geebung (*Persoonia levis*). Aborigines also used other species of *Persoonia* for other purposes. Turbot records that Aboriginal people of the Sydney area strengthened bark used for fishing lines by soaking it in a solution made from the bark of the laurel geebung, *Persoonia laurina*.[102]

The other native plant food recorded in 1790 was for a cycad, *Macrozamia communis*. The *Dharuk* word for this plant was *buruwan*, which became 'burrawang'. The word now refers to any of several plant species of the genera *Macrozamia* and *Cycas*.[103] The cycads produce large cones, either male or female. The female cones bear two large orange-red seeds. The seeds contain large quantities of starch, which was a valuable source of food. However, the seeds are poisonous in their raw state and need to be carefully prepared to remove their harmful properties. The Aboriginal people throughout Australia devised different methods to prepare the cycad seeds, usually involving a long and arduous process of cracking, soaking, grinding and baking the seeds. The first settlers did not learn the proper methods of preparation

[100] Dixon et al, above n 19, 118.
[101] Ibid 112.
[102] Recorded in Royal Botanic Gardens & Domain Trust <http://www.rbgsyd.nsw.gov.au/education/Resources/bush_foods/Persoonia_species>.
[103] Dixon et al, above n 19, 110.

from the Aboriginal people, notably the Aboriginal women who possessed the necessary knowledge of food preparation, and they suffered accordingly.

Banks collected specimens of *Macrozamia communis* at Botany Bay in 1770. Whilst at the Endeavour River later that year, one of Cook's crewmen ate just one or two seeds of a cycad, *Cycas media*, and was violently affected by them 'both upwards and downwards'.[104] Governor Phillip recorded that French seaman with the explorer La Perouse, who had arrived in Botany Bay shortly after the First Fleet, ate *Macrozamia* seeds but they 'occasioned violent retchings'.[105] However, over time, later colonists did learn the detailed process of food preparation from the Aboriginal people throughout Australia.[106]

Fishing was an essential means of supplying food to the Aboriginal people of the Sydney area. They made their fishing lines from the bark of trees, particularly the black kurrajong (*Brachychiton populneus*). The *Dharuk* word for a fishing line was *garrajung*. The English loan, 'kurrajong', was extended to the tree from whose bark fishing lines were generally made.[107] The fibre of the kurrajong was not only used by the *Dharuk* people for fishing lines but also for fishing nets and carrying bags.[108]

Young kurrajong plants have a yam-like, tuberous root, which was also eaten by the Aboriginal people. Dixon suggests that they cooked the roots of the young plants as food[109] but Cribb states it is not clear whether or not the roots were cooked or prepared in any way before being eaten.[110] Maiden notes that when boiled, the roots have a flavour similar to that of turnips but 'sweeter'.[111]

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[104] Low, above n 25, 84 and see also Cribb, above n 28, 84.
[105] Cribb, above n 28, 90. Surgeon George Worgan, who arrived with the First Fleet, wrote of one of the plants in the Sydney area that it 'bears a Nut, which after some preparation the Natives Eat, but one of the Convicts has been poisoned by it in its crude State'. This may also have been the seed of a Cycad': George B Worgan, *Journal of a First Fleet Surgeon (1788)* (Project Gutenberg of Australia eBook, posted 2004) available at <http://gutenberg.net.au/ebooks04/0400181.txt>.
[106] Ibid and J H Maiden, *The Useful Native Plants of Australia* (Turner and Henderson, 1889) 21, 40-41.
[107] Dixon et al, above n 19, 114.
[108] Ibid 114 and Maiden, above n 105, 633.
[109] Dixon et al, above n 19, 114.
[110] Cribb, above n 28, 138.
[111] Maiden, above n 105, 59.

These four words – waratah, geebung, burrawang and kurrajong – are the only words for flora borrowed from the *Dharuk* language into Australian English.

Nevertheless, other *Dharuk* words for plants were recorded, mostly being sources of food. A generic word for edible vegetable was *ganugan,*[112] yet no particular species of edible vegetable was identified as falling within the ambit of this word.

The fleshy tubers of terrestrial and ground-growing orchids were eaten by Aboriginal people and, following suit, by the first settlers.[113] Tench records use of the common orchid root as a food.[114] The epiphytic rock lily (*Dendrobium speciosum*) has thick leaf bases swollen with starch grains. The leaf bases were roasted and eaten by the local Aborigines.[115] Two *Dharuk* names have been recorded for the rock lily, *buruwan* as well as *wagaldarra*.[116]

The starchy rhizomes (or underground stems) of the bracken fern (*Pteridium esculentum*) were eaten both raw and roasted by the local Aboriginal people to extract its white starch.[117] The *Dharuk* word for the bracken fern rhizome was *gurgi*.[118]

The first settlers also observed local Aboriginal people eating ‘yams’. The recorded *Dharuk* word for yam is *midiny.*[119] Unfortunately, the first settlers used the word ‘yam’ indiscriminately to refer to any type of tuber or root used by Aborigines regardless of the species of plant.[120] Hence, it is impossible now to know to what plant or plants the *Dharuk* word *midiny* refers.

One type of yam that was recorded was the tuberous roots of the hairy milk vine (*Marsdenia flavescens*). Cribb records that the Aborigines of the Hawkesbury River

[112] Troy, above n 37, 71.
[113] Low, above n 25, 124-125.
[114] Tench, above n 36, 231.
[115] Cribb, above n 28, 120 and Low, n 25, 125.
[116] Troy, above n 37, 71-72 and Troy, above n 55.
[117] Maiden, above n 105, 54 and Low, above n 25, 19, 107-108. The species name ‘esculentum’ roughly means ‘edible’.
[118] Troy, above n 37, 71.
[119] Ibid.
[120] Low, above n 25, 105-106.

area used the tuberous roots as food. However, they required careful preparation to remove their toxic properties, as Captain Hunter's expedition in 1788 found out to their discomfort: 'It had much the appearance of horseradish and had a sweetish taste, and having swallowed a small quantity, it occasioned violent spasms, cramps in the bowels, and sickness at the stomach.'[121]

The first settlers recorded Aboriginal use of some fruits and followed their example. I have earlier referred to the fruits of species of *Persoonia* called geebungs. The fruit was not favoured by the settlers. Tench noted in 1788 that it was 'excessively sour'.[122] A hundred years later, Maiden noted that geebung fruits 'are mucilaginous, insipid and slightly astringent. They are largely consumed by Aboriginals, and also to some extent by small boys.'[123]

As I have previously noted, Cook collected at Botany Bay in 1770 and fed his crew the magenta fruits of the magenta cherry, magenta lilly pilly or brush cherry (*Syzygium paniculatum*). It was described to be 'of a pale crimson colour and has the taste of a sweet acid'.[124] Tench notes that 'the small purple apple mentioned by Cook' was sometimes procured by the first settlers.[125] The brush cherry was known as *daguba* in the *Dharuk* language.

The cherry like fruits of another type of lilly pilly (*Acmena smithii*) were also eaten. The roundish, purplish fruits were of poorer quality than other lilly pilly fruits.[126] Maiden records that the fruits 'are eaten by the Aboriginals, small boys and birds'.[127] The *Dharuk* name was *midjuburi*.[128]

The fruits of the native fig trees in the Sydney area were also eaten by the local Aboriginal people, as well as by the first settlers. Two species of fig were identified,

[121] Cribb, above n 28, 143.
[122] Tench, above n 36, 71.
[123] Maiden, above n 105, 51.
[124] Quoted in Benson and Eldershaw, above n 24, 116. See also Cribb, above n 28, 31-32 and Low, above n 25, 63.
[125] Tench, above n 36, 71.
[126] Cribb, above n 28, 32.
[127] Maiden, above n 105, 29.
[128] Troy, above n 55.

the Port Jackson fig (*Ficus rubiginosa*) and the sandpaper fig (*Ficus coronata*).[129] The *Dharuk* name for the Port Jackson fig was recorded, *damun*, but not for the sandpaper fig.[130] The fruits of both figs were eaten, either raw or cooked in a cake. The exceptionally rough leaves of the sandpaper fig were also used by Aborigines for the final smoothing of wooden weapons.[131]

Another fruit eaten by the first settlers was the native cherry, *Exocarpus cupressiformis*,[132] elsewhere referred to by the Victorian Aboriginal name 'Ballart' or 'Cherry Ballart'. The native cherry was viewed as illustration of 'Antipodean contrarieties', having what was considered to be a stone on the outside of the cherry.[133] In fact, the nut is seated on an enlarged, succulent pedicel.[134] The *Dharuk* name for the native cherry was *guwigan*.[135]

The Aboriginal people and the first settlers obtained a type of 'cabbage' from the growing centre or heart of certain plants. It is likely that this was an occasional food, not a mainstay. The removal of the growing centre destroys the plant. The types of plants used for this food source were not abundant and were slow growing. Regular harvesting would have been unsustainable.

One native plant from which a 'cabbage' was obtained was the cabbage tree palm, *Livistonia australis*. The *Dharuk* word for the cabbage tree palm was *daranggara*.[136] Tench records obtaining 'mountain cabbage' from the cabbage tree palm.[137] Surgeon Worgan of the First Fleet recorded that '[t]he Cabbage is at the Top [of the tree], enclosed in a Fibrous Network, and about this, large Fan-like leaves spring out' and that 'the Cabbage eats something like a Nut.'[138] The first settlers would have been familiar with the practice of eating palm hearts, as it was done elsewhere throughout

[129] Low, above n 25, 22. Surgeon Worgan recorded that '[o]f Fruit Trees we have found a small Fig': above n 105.
[130] Troy, above n 37, 71.
[131] Cribb, above n 28, 35.
[132] Low, above n 25, 46-47.
[133] Ibid 46.
[134] Maiden, above n 105, 30.
[135] Troy, above n 55.
[136] Troy, above n 37, 71.
[137] Tench, above n 36, 231.
[138] Low, above n 25, 130 and Worgan, above n 105.

the world. Maiden recorded that the Aboriginals were very fond of the growing centre or heart of the cabbage tree, which they ate in a raw or cooked state.[139]

The other growing centre used by the local Aboriginal people was of the grass tree of the genus *Xanthorrhoea*. The Aborigines used the white tender portion of the trunk, eating it raw or roasting it.[140] The *Dharuk* word for the grass tree was *gulgadya* and for the grass tree stem was *galun*. The Aborigines also soaked the nectar-laden flowers on the flowering spike to produce a sweet drink.[141] The *Dharuk* word for the grass tree seed spike was *yagali*.[142] The Aboriginals also used resin from the grass tree to attach spear points to hafts and stone axe heads to wooden handles.[143]

Scurvy, caused by a vitamin C deficiency, was rampant during the first few years of the settlement at Sydney. Tench records that 'scurvy began its usual ravages' but '[u]nfortunately the esculent vegetable productions of the country are neither plentiful nor tend very effectually to remove this disease.'[144] Various native bush plants were tried as cures. Two that became popular were the native sarsaparilla (*Smilax glyciphylla*), the leaves of which were infused in hot water to make sweet tea, and the small acid fruits of the native currant (*Leptomeria acida*).[145] Recent nutrition tests show that native currants are a modest source of vitamin C but that sweet tea was probably almost useless.[146]

Tench records use of sweet tea[147] and the belief that '[t]o its virtues the healthy state of the soldiery and convicts may be greatly attributed. It was drank universally.'[148]

The first settlers were not particularly adept at botanical identification. They often confused native sarsaparilla (*Smilax glyciphylla*) with false sarsaparilla (*Hardenbergia violacea*). Maiden records that it is 'common thing, in the spring, in

[139] Maiden, above n 105, 40 and see also Cribb, above n 28, 110.
[140] Maiden, above n 105, 67.
[141] Cribb, above n 28, 184.
[142] Troy, above n 37, 72.
[143] A B and J W Cribb, *Useful Wild Plants in Australia* (Fontana/Collins, 1982) 89.
[144] Tench, above n 36, 65-66.
[145] Surgeon Worgan wrote of a '[f]ruit which tastes exactly like the Currant when green' but noted 'these Fruits are scarce': above n 105.
[146] Low, above n 25, 22.
[147] Tench, above n 36, 231.
[148] Ibid 102.

the streets of Sydney to see persons with large bundles of the leaves [of false sarsaparilla] on their shoulders doubtless under the impression that they have the leaves of *Smilax glyciphylla*' but the virtues of the false sarsaparilla 'are purely imaginary'.[149] Ironically, the first settlers recorded the *Dharuk* word for false sarsaparilla, *waraburra*[150] but not for the true, native sarsaparilla.

The above lists of plants eaten by the first settlers, learnt from the local Aboriginal people, is very limited and certainly far less than the vast array of plants used productively by the local Aboriginal people. Conversely, the first settlers ate a number of plants as vegetables that were not eaten by the local Aboriginal people.

The wild spinach eaten by Captain Cook's crew, *Tetragonia tetragonoides*, was eaten extensively. It had in fact been cultivated as a summer spinach in England after Banks had taken seeds home in 1770.[151] Other plants resembling European vegetables were also eaten. Two varieties of sea celery (*Apium prostratum*), referred to by the first settlers as wild celery and parsley, had earlier been eaten by Captain Cook and were used by settlers cooked in soup.[152] They also ate a small, saltmarsh herb, Australian samphire (*Sarcocornia quinqueflora*), which is similar to the European samphire (*Salicornia europea*).[153] They gathered wood sorrels (*Oxalis* species), small herbs with lemony, clover-like leaves which were used as vegetables and salad leaves, similar to wood sorrels in Europe.[154] They thought the grey saltbush growing around Sydney (*Atriplex cinerea*) was the European herb called sage,[155] although it was botanically unrelated.

None of these vegetables, however, was eaten by the Aboriginal people in the Sydney area. Low suggests the reason for this non-use is that many of the plants are halophytes, plants that store salt in their tissues. The salt leaches out during boiling, producing a tender and succulent vegetable. However, traditional Aborigines had no

[149] Maiden, above n 105, 190.
[150] Troy, above n 37, 72.
[151] Low, above n 25, 20, 134.
[152] Ibid 20 and Worgan, above n 105.
[153] Low, above n 25, 20 and Worgan, above n 105.
[154] Low, above n 25, 20 and Worgan, above n 105.
[155] Low, above n 25.

cooking pots and no way to boil food. They might have avoided halophytes, as being too salty to eat raw.[156]

Notable omissions from the wordlist of *Dharuk* words are words for the different vegetation types or ecological communities that occurred in the Sydney area. Today, vegetation is classified and mapped by scientists as different vegetation communities, such as coastal heath, swamp forest or littoral rainforest. Unfortunately, there is no record of whether or how the *Dharuk*-speaking people of Sydney classified their natural environment by any vegetation or ecological criteria.[157]

The loss of linguistic, cultural and biological diversity

The first settlers, therefore, learnt only a fraction of the language and the traditional ecological knowledge of the Aboriginal people of the Sydney area, including of the plants and animals, and their attributes and characteristics. This was partly a product of the European view of Australia's impoverished and peculiar flora and fauna. Tench, for example, stated '[t]he list of esculent vegetables and wild fruits is too contemptible to deserve notice.'[158] It is partly a product of the European settlers' dim view of Aboriginal people and their culture and knowledge, and the European settlers' view of the superiority and ability of their imported animals and plants to feed the colony.

However, it is also partly a product of the rapid decline of the *Dharuk*-speaking people and their language and culture after the European invasion. A smallpox epidemic ravaged the local Aboriginal population within two years of the first settlement. Half of the Port Jackson tribe died. Dixon records that for about 50 years *Dharuk* culture continued to be passed on to young people, although it co-existed

[156] Ibid 21-22.
[157] In south east Queensland, the Gabi-gabi word for the shrub or tree *Banksia aemula* is *walum* or *walam,* which has become 'wallum', and the word also refers to the sandy coastal heathland in which the plant grows: Dixon et al, above n 19, 145.
[158] Tench, above n 36, 230-231.

with a vastly different culture of the European invaders. By the middle of the nineteenth century, however, much of the rich artistic and religious life was lost.[159]

The loss of the *Dharuk* language heralded a loss of the traditional ecological knowledge of the *Dharuk*-speaking people. Without the language with which to describe and communicate their traditional ecological knowledge, a great deal of the knowledge itself was lost.

Today, the world is the poorer for these losses, for we now have so little of the *Dharuk* people's language and ethnobiological knowledge of the plants and animals of the Sydney area. We have *Dharuk* names for only about a hundred plants and animals and of those we know only snippets of information about how the Aboriginal people used and managed them. We know nothing of the Aboriginal people's knowledge of the morphological, ecological and behavioural characteristics of the local animal and plant species or their habitats.

The loss is even more acute as a number of the animals and plants that were recorded as being known to the *Dharuk*-speaking people are now listed as rare, endangered or even extinct.[160] The *Dharuk*-speaking people's traditional ecological knowledge could well have helped us in the conservation of these animals and plants and their habitats.

[159] Dixon et al, above n 19, 22.

[160] The faunal species of the eastern bettong (*Bettongia gaimardi gaimardi*) is listed as extinct throughout mainland Australia under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). The eastern quoll (*Dasyurus viverrinus*) may be extinct in New South Wales and is listed as endangered under the *Threatened Species Conservation Act 1995* (NSW). The brush-tailed rock wallaby (*Petrogale penicillata*) is listed as vulnerable under the Commonwealth Act and endangered under the NSW Act. The koala (*Phascolarctos cinereus*), grey-headed flying fox (*Pteropus poliocephalus*) and spotted-tailed quoll (*Dasyurus maculatus maculatus*) are listed as endangered under the Commonwealth Act and vulnerable under the NSW Act. The southern brown bandicoot (eastern) (*Isoodon obesulus*) is listed as endangered under the NSW Act and the long-nosed potoroo (*Potorous tridactylus*), squirrel glider (*Petaurus norfolcensis*) and yellow-bellied glider (*Petaurus australis*) are listed as vulnerable under the NSW Act. The long-nosed bandicoot (*Perameles nasuta*) populations at North Head and inner western Sydney and the squirrel glider (*Petaurus norfolcensis*) population at Barrenjoey Peninsula are listed endangered populations under the NSW Act. The floral species of the brush cherry (*Syzygium paniculatum*) is listed as vulnerable across Australia under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and as endangered in New South Wales under the *Threatened Species Conservation Act 1995*.

The story of Sydney's first settlement and the loss of linguistic and biocultural diversity it caused, serves as a lesson which should guide us in the future. It should inspire us to conserve cultural and linguistic diversity throughout the world as an important component of conserving biological diversity.

The European first settlers in Australia can be seen to have adopted the approach of Julius Caesar when he conquered Gaul: I came, I saw, I conquered. If only, however, the first settlers had adopted a different approach: I came, I saw, I listened and I learnt from the indigenous people of Australia.

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