

2.01 Bark

Aboriginal use of bark

V-huts

the European bark tradition

emergence of the bark roof

the technology of bark

the canonical bark roof

sources and analogies

roof variations

the spread of bark building

later usage

Bark was used in the nineteenth century both for roofing and for wall cladding. It is not used in many other parts of the world and, where it is, the differing properties of the species used often result in quite different forms. Thus in Zhejiang Province of China the bark is not flattened out, but split into semi-cylindrical pieces which are laid with their natural curvature alternately facing upwards and downwards, like Cordoba tiles.¹ Eric Sloane reports the same form in North America,² and this is most unlikely to be the result of any cultural connection - rather, it must reflect the availability of species with similar properties. There were other cultures which used bark in building, in Scandinavia, North and South America, China and Africa.³ It was obtained from the elm, yellow birch, chestnut, oak, pine, black ash or hemlock, most of which seemed to have produced a lighter sheet than the Australian trees, particularly the birch bark, which was obtained in sheets about 900 mm square and sewn together with spruce root into 3 to 4¹/₂ metre rolls.⁴

Birch bark is a much lighter material than the barks used for building in Australia, and in Scandinavia it is traditionally to make slipper-like shoes, small boxes, cups, baskets, mats and other minor items. It was also used to clad conical huts framed with poles, rather like teepees, then for the flat roofs of the earliest log structures, and then for pitched roofs when they were introduced in the fourteenth century. In these roofs the bark was not the finished surface, for in western influenced areas planks were laid down the slope of the roof, and elsewhere turf was often laid over the bark, especially in prestigious buildings of the seventeenth century.⁵ The use of birch bark as an underlay for sod roofing was then brought to North America by Swedish settlers in the Delaware from 1638.⁶

1 R G Knapp, *China's Vernacular Architecture* (Honolulu 1987) - no page - check original notes.

2 Eric Sloane, *An Age of Barns* (extracted edition, no place 1976 [1967]), no page.

3 John Fitchen, *Building Construction before Mechanisation* (Cambridge [Massachusetts] 1986), p 216, citing G P Murdock, *Our Primitive Contemporaries* (New York 1934), pp 297-8; M H Lee, 'The Ancient House of the San Diegueno Indians', *Art and Archaeology*, 25 (February 1928), pp 100-105, 108; O G Ricketson, 'American Nail-less Houses in the Maya Bush', *Art and Archaeology*, 24 (July-August 1927), pp 27-36.

4 Peter Nabokov & Robert Easton, *Native American Architecture* (New York 1989), pp 22-3.

5 Kirsti Kovanen, 'Birch-Bark Traditions', *International Conference on Vernacular Architecture* (Bangkok 1997), passim.

6 K E Roe, *Corncribs* (Ames [Iowa] 1988), p 13.

Aboriginal use of bark

In Australia bark construction is one of the few forms which might seriously be thought to have derived from the Aborigines, who had developed the techniques of stripping and curing bark, and who used it for dwellings, canoes and other purposes. We have quoted Watkin Tench's disparaging account of the oven-shaped bark huts encountered by the British settlers at Sydney,⁷ though an illustration published in Arthur Phillip's *Voyage*,⁸ shows more tent-like rectangular structures with sheets of bark in an inverted V section. According to Phillip huts were built of a single piece of bark 'about eleven feet [3.3 m] in length, and from four to six feet [1.2 - 1.8 m] in breadth, being, when stripped from the tree, bent in the middle and set up as children put up a card.'⁹ Augustus Earle illustrated low conical structures which were little more than windbreaks, only about half the surface of the cone being clad.¹⁰

There were more substantial or permanent structures elsewhere. Matthew Flinders described 2.4 m diameter circular huts at Shoal Bay with vertical walls and an indirect entranceway to break the weather. They were formed on a grid of strong vine tendrils bound with wiry grass and clad in paperbark, and had an inner coating of soot testifying to a period of ongoing occupation. One double hut was big enough to accommodate ten or fifteen people.¹¹ Some of the more substantial bark-clad dwellings in the Brisbane area were of saplings curved into a domical shape, and clad with what James Backhouse described as tea-tree bark. He illustrates one, of a rather regular cocoon-like form, whereas Owen Stanley depicted rather cruder structures in the same locality.¹²

Such evidence as there is suggests that the Aborigines were indeed important in showing the settlers how to strip bark and which species to use. However, the Aborigines lacked the technology to cut bark on a large scale until the European tomahawk became available, and it is reported that the Ganai of Gippsland had used only thatch on their shelters, and turned to bark upon the arrival of the tomahawk.¹³ In the case of good timber trees like stringybark, the settlers could hardly have avoided recognising the quality of the bark sooner

7 Watkin Tench, *A Narrative of the Expedition to Botany Bay* (London 1779), reprinted in L F Fitzhardinge [ed], *Sydney's First Four Years* (Sydney 1979 [1961]), pp 47-8.

8 Arthur Phillip, *The Voyage of Governor Phillip to Botany Bay* (London 1789).

9 Governor Phillip to Under Secretary Nepean, 15 May 1788, *Historical Records of New South Wales*, vol 1/2, p 388, quoted in Helen Proudfoot, 'Fixing the Settlement', in Graeme Aplin [ed], *A Difficult Infant: Sydney Before Macquarie* (Kensington [NSW] 1988), p 58.

10 Reproduced in Irving, p 34.

11 Isabel McBryde, *Aboriginal Prehistory in New England* (Sydney 1974), p 9, quoted in Irving, p 34.

12 James Backhouse, *Narrative of a Visit to the Australian Colonies* (1843), pp 354-7, quoted in J G Steel, *Brisbane Town in Convict Days 1824-1842* (St Lucia [Queensland] 1975), p 228 & illustration fig 91; painting by Owen Stanley, 1848 (held in the Mitchell Library), reproduced in Steel, fig 92.

13 Coral Dow, 'Tea Tree and Reeds', *Gippsland Heritage Journal*, 21 (March 1997), p 3, quoting A W Howitt, *The Native Tribes of South-East Australia* (London 1904), p 738, & R B Smyth, *The Aborigines of Victoria* (Melbourne 1878), I, p 142.

or later, and the way in which they built with it was certainly not based upon Aboriginal precedents.

An early indication of direct transference from the Aboriginal to the European culture of the idea of using bark occurs in James Atkinson's *Agriculture and Grazing in New South Wales* of 1826. He describes a typical European settler's excursion into the interior, and the camp at which 'the black Natives strip some bark off the nearest trees that will suit the purpose, and construct a hut sufficiently large to shelter the whole party'. His illustrations show the stripping of the bark and the building of the hut, which is little more than a lean-to windbreak, very much in the Aboriginal tradition. Yet elsewhere in the same book he gives reasonably detailed directions on the construction of a more permanent bark hut.¹⁴

If Atkinson's account is a generalised one, Dawson provides a more precise account of the Aboriginal contribution in 1826. 'As soon as we had raised the frames of some of our intended habitations,' he reported, 'we were sadly at a loss for bark to close the sides and cover the roofs.'¹⁵ Seeing their plight, a local Aboriginal brought a dozen of his fellow tribesmen to assist. They,

having received each a small hatchet, set to work in good earnest, and brought such a quantity of bark in two or three days as would have taken our party a month to procure. Before a white man can strip the bark beyond his own height, he is obliged to cut down the tree; but a native can go up the smooth and branchless stems of the tallest trees, to any height, by cutting notches in the surface large enough to place the great toe in, upon which he supports himself, while he strips the bark quite round the tree, in lengths from three to six feet. These form the temporary sides and coverings for huts of the best description.

Dawson also watched the blacks stripping bark by standing on a forked stick some three metres from the ground, and performing the task 'in less than half the time that a white man could have done it upon *terra firma*.'

At the Ogilvies' Terniex station on the Manilla, the four huts built in the 1830s were 'covered with large strips of bark stripped by blacks',¹⁶ and it was Aborigines who in 1839 stripped the bark used for the huts of G J Macdonald, Land Commissioner at what was to become Armidale, New South Wales.¹⁷ A less satisfactory transaction between the races occurred when 'Cocky' Rogers, superintendent of 'Grantham' station in what is now Queensland, simply helped himself to four hundred sheets of bark from Aboriginal humpies, with which to roof his store sheds and huts:¹⁸ other such incidents, doubtless, have eluded the historical record.

14 James Atkinson, *An Account of the State of Agriculture and Grazing in New South Wales* (London 1826), p 137 and preceding plates.

15 Robert Dawson, *The Present State of Australia* [London 1830], pp 19-20.

16 George Farwell, *Squatter's Castle* (Melbourne 1973), p 99.

17 R B Walker, *Old New England* (Sydney 1966), pp 15, 29.

18 Steel, *Brisbane Town in Convict Days*, p 299.

V-huts

The method of building permanent bark structures, and roofs in particular, demands the most careful consideration. Despite the ready availability of bark and the example of the Aborigines, it seems that more than a quarter of a century passed before the European settlers began to use it as a building material, for Robert Irving has acutely observed that there is no reference to European bark construction in Australia until 1815.¹⁹ It is then that Governor Macquarie writes in praise of William Cox's work in building a road over the Blue Mountains 'with only such temporary covering as a bark hut could afford from the inclemency of the weather'.²⁰ This does not mean the Cox necessarily built any such structures, for the evidence suggests that he did not,²¹ but it does tell us that the idea of a bark hut was by now a familiar one.

Macquarie's description does not suggest anything more than an ad hoc structure, possibly resembling the hut which Alexander Harris built for himself in the 1820s: 'a few sheets of ... bark ... leaned together, top and top, tent like, with one end stopped by another sheet.'²² Harris also mentions other such 'tent huts' at later dates.²³ These would have closely resembled the Aboriginal bark buildings described by Arthur Phillip, and many others seem to have been much the same. In January 1839 Robert Muir, Colin Campbell and John Campbell slept in a bark gunyah on arrival at their squatting run, 'Glenmore', New England.²⁴ As late as 1858 the Spencer family, at 'Mount Abundance' on the Darling Downs lived for six months in two V-shaped bark humpies about 1.8 metres high at the peak, and about 4 by 2 metres in plan.²⁵ In Western Australia, although the Aborigines used paperbark for hut construction,²⁶ European settlers adopted it, and J R Wollaston refers to 'V-huts', which may have been of bark. One had been built by himself and his son William at Dardanup, and two he came across in 1851 at Stanton Spring, on the Perth-Albany Road.²⁷ Janet Millet later wrote more explicitly of European V-huts, some of which were thatched and others covered with strips of paperbark.²⁸

-
- 19 Robert Irving, 'The First Australian Architecture' (MArch, University of New South Wales, 1975) p 158.
- 20 Lachlan Macquarie [per J T Campbell], 'Government and General Orders', *Sydney Gazette*, 10 June 1815, quoted in George Mackaness [ed], *Fourteen Journeys over the Blue Mountains of New South Wales* (Sydney 1966), p 66.
- 21 Cox himself lived in a caravan with a sleeping berth, and his depot buildings were substantial for reasons of security. The first of them was 'a good log hut', and Cox himself refers to 'the weather-board part of the roof' of another. Mackaness, *Fourteen Journeys*, p 62; H C Antill, 'Journey of an Excursion over the Blue Mountains of New South Wales', in *ibid*, pp 76-7; William Cox, 'Journal kept by Mr. W Cox on making a Road across the Blue Mountains, &c', in *ibid*, pp 42-3.
- 22 [Alexander Harris], *Settlers and Convicts* (Melbourne 1953 [1847]), p 30.
- 23 Harris, *Settlers and Convicts*, pp 159, 182.
- 24 Walker, *Old New England*, p 24.
- 25 Eve Pownall, *Mary of Maranoa* (2nd ed, Melbourne 1959 [1959]), p 125, ref Mary McManus, 'Reminiscences of the Maranoa District'.
- 26 H W Bunbury, *Early Days ... Western Australia* (1930), pp 72-6, quoted in A C Staples, *They Made Their Destiny* (Harvey [Western Australia] 1979), p 13.
- 27 J R Wollaston [ed C A Burton & P U Henn], *Wollaston's Albany Journals (1848-1856)* (Perth 1954), pp 239, 134.
- 28 [Janet] Millet, *An Australian Parsonage* (London 1872), pp 44-5.

the European bark tradition

Meanwhile, what sound like more substantial bark structures had developed by 1820, though we do not know what form they took. The Frenchman R P Lesson commented on the bark huts at Emu Plains which had been used, he believed, to shelter the convict workmen when the land was cleared in 1819, and were still standing at the time of his visit in 1824.²⁹ Indeed Captain W J Dumaresq saw them in 1827, as 'the filthy bark huts or barracks of the men'.³⁰ Meanwhile, by 1822, there was a substantial hut on the Blue Mountains road, which Elizabeth Hawkins referred to as having been built by the men employed in mending the roads, but which may indeed have been built during the construction. Hers is, in any case, the first detailed description of a bark building in Australia.³¹

Some stakes of trees are stuck in the ground, the outside bark from the trees is tied together, and to these with narrow strips of what is called stringy bark; being tough, it answers the purpose of cord, and the roof is done in the same manner. There was a kind of chimney but neither window nor door, but a space left to enter.

In 1823 Lieutenant Percy Simpson, establishing the convict settlement at Wellington Valley, was told that he must decide whether to build the convict huts from the bark of trees or from sods.³² He chose the former, and twelve years later James Backhouse noted that houses in the area were generally of vertical slabs or 'of large sheets of Gum-tree bark, fastened to a frame work of poles; the roof being also of this material'.³³

emergence of the bark roof

The first illustration of bark roofing seems to date from 1820, in a view of the mill at Parramatta owned by Samuel Marsden, in which the skillions, which are later additions to the miller's house, have what are apparently bark roofs.³⁴ Even this does not clearly show the standard bark roofing method as subsequently understood. At 'Glendon' in the Hunter Valley, Robert and Helenus Scott occupied a bark and sapling structure in 1823-4, and an illustration by one or other of the brothers, 'Glendon, August 1823', shows an open-fronted

29 R P Lesson [translated O & W P Havard], 'Journey Across the Blue Mountains, 1824', *Journal and Proceedings of the Royal Australian Historical Society*, XXIV, part IV, quoted in Mackaness, *Fourteen Journeys*, p 148.

30 [W J Dumaresq], 'A Ride to Bathurst, 1827', *Australian*, 17 March 1827, et seq, quoted in Mackaness, *Fourteen Journeys*, p 174.

31 Elizabeth Hawkins, 'Journey from Sydney to Bathurst in 1822', in Mackaness, *Fourteen Journeys*, p 109.

32 Colonial Secretary to Lieutenant Percy Simpson, 1 January 1823 'Instructions for the Settlement at Wellington Valley', New South Wales Government Despatches, Mitchell Library, A 1297-13, quoted in *** Michael Pearson, Notebook on Earth Buildings, p 20.

33 James Backhouse, *A Narrative of a Visit to the Australian Colonies* (London 1847), quoted in Mackaness, *Fourteen Journeys*, p 207.

34 Joseph Lycett, 'Mill, near Parramatta, New South Wales, the property of the Revd. St. Marsden', watercolour, 1820, in Tim McCormick et al, *First Views of Australia 1788-1825* (Chippendale, NSW, 1987), p 263.

bark skillion which may be the kitchen. However, the upper surface of the roof is invisible, so it is impossible to tell whether the bark was weighed down.

The first written description of a bark roof, as used on the Hawkesbury in the early 1820s, makes no reference to a system of weighing down the sheets. This is in Tucker's *Adventures of Ralph Rashleigh*.³⁵

... the roof covered with forest box or stringy-bark, which was stripped from the living trees in sheets of about six feet long and from two to four feet wide, laid upon rafters composed of small sapling poles just as they came from being cut in the bush. The sheets of bark, having holes pierced through each in pairs, were then tied on the rafters with cords twisted of the inner rind of the kurrajong tree.

Robert Dawson, first agent of the Australian Agricultural Company at Port Stephens in 1825-8, described as the typical accommodation of assigned convicts in both temporary and more permanent huts, the former consisting of a 'frame-work of poles tied together with narrow strips of young bark', and the latter of split logs with a bark roof.³⁶ By this time Peter Cunningham was able refer to the bark roof as a standard type.³⁷

the technology of bark

In the Riverina Andrew Crombie described the process followed in about 1860 by an Aboriginal getting the bark in further detail:³⁸

After selecting a box tree, straight, and in sappy condition, he would chop a ring around it thus ///// then again crossing XXXXX making the ring in criss cross fashion. This line, though chopped by eye only, would often be as precisely accurate as though marked with chalk line. Then, taking two forked sticks, and resting them against the trunk of the tree, he would place a stick in the forks, and using this as a movable platform upon which he would stand, he would repeat this ring, making it six or seven feet higher up. Finally he would chop a straight line from top to bottom ring, and the result was that a clean sheet of bark, say, six feet by seven feet would, after a little levering with a tomahawk handle, slip safely to ground, and the boy be provided with half the material required for a good weatherproof, winter gunyah.

As late as 1880 J G Knight spoke of it as normal in the Northern Territory that bark for roofing was 'cut and brought in by the blacks'.³⁹

Atkinson regarded stringybark as the best type for roofing,⁴⁰ and later box was used as well.⁴¹ Alexander Harris used black butt.⁴² The stringybark had the additional advantage

35 James Tucker, *The Adventures of Ralph Rashleigh*, quoted in Philip Cox & J M Freeland, *Rude Timber Buildings of Australia* (London 1969), p 44.

36 Dawson, *Present State of Australia*, pp 431-2.

37 Peter Cunningham, *Two Years in New South Wales* (2 vols, London 1827), II, p 161.

38 Andrew Crombie, quoted in Peter Freeman, *The Homestead: a Riverina Anthology* (Melbourne 1982), p 17, and in turn in Irving, p 35.

39 J G Knight, *The Northern Territory of South Australia* (Adelaide 1880), p 27.

that it could be used - as the name implies - to make ropes or cords, which were also commonly used in bark roof construction. The bark of the kurrajong, a rarer tree in New South Wales, has been referred to in the description from *Ralph Rashleigh*, above. It could be beaten and twisted into ropes, which Atkinson claimed to be almost as strong as Manilla coir.⁴³ Harriet Daly referred to the use of ironbark at Palmerston [Darwin] in about 1870,⁴⁴ but this seems scarcely credible if the species was that known by the name today.

Descriptions of European bark harvesting show some differences from Aboriginal practice, as well as divergences amongst themselves, especially over the manner of seasoning the bark, if at all. Lady Jane Franklin described how at Mundy and Smyth's Pyalong station, in Victoria, sheets as much as 4.2 metres long were used for roofing:⁴⁵

The bark is from the box or swamp gum ... They cut the sheet of bark they want with a tomahawk or axe and then with a mallet, hammer over the whole surface, which loosens, and disengage it from the trunk. They then place the pieces of bark upright as if forming a hut and light a fire under it to singe or heat them, which removes the curves and flattens them. This barking operation can only be done in the spring.

But Lady Franklin's description does not seem to be generally applicable, for the large size of the sheets is not confirmed by other accounts, and Niel Black, for example, needed two lengths to reach the ridge of his roof.⁴⁶ The singeing process is not generally confirmed either, though W T Pyke's *Bush Tales* describes charring the sheets as a standard procedure.⁴⁷ At Darwin in the 1870s the bark sheets were simply wetted and laid out with stones on them to weigh them down.⁴⁸ Similarly in Queensland in 1892 Tom and Constance Ellis managed to get sheets as large as 3.6 by 1.8 metres, from what she rather surprisingly describes as 'pine trees', and they were simply piled flat with weights on top until thoroughly dry.⁴⁹ in the Goulburn Valley of Victoria, in the late nineteenth and earlier twentieth century.⁵⁰

The bark for roofs was regularly taken from large box trees, and as carefully laid upon the ground, logs were placed across to make and keep it flat until 'seasoned'.

The European mode of constructing bark roofs was perhaps not standardised in the first decade or so of their use. In the novel *Ralph Rashleigh*, written in about 1845, a house

40 Atkinson, *State of Agriculture*, pp 15-16.

41 **** Griffith, *The Present State and Prospects of the Port Phillip District*, p 55.

42 [Alexander Harris], *Settlers and Convicts* (Melbourne 1953 [1847]), p 30.

43 Atkinson, *Agriculture and Grazing in New South Wales*, pp 16, 17.

44 Harriet Daly, *Digging, Squatting, and Pioneering Life in the Northern Territory of South Australia* (London 1887), pp 50-51.

45 M Brooks, *Riders of Time* (Melbourne 1967), p 70. For Mundy see R V Billis & A S Kenyon, *Pastoral Pioneers of Port Phillip* (Melbourne 1932), p 101.

46 **** Kiddle, *Men of Yesterday*, p 55, quoting Niel Black's journal.

47 W T Pyke [ed], *Bush Tales*, quoted in Bob Raftopoulos, *S.T. Gill's Illustrated Australia 1818-1880* (Brisbane 1987), p 40.

48 Daly, *Digging, Squatting, and Pioneering Life*, p 50.

49 C J Ellis, *I Seek Adventure* (Sydney 1981), p 54.

50 J K Andrews, 'History of Merrijig' (manuscript, Merrijig [Victoria] 1954), p 61.

'composed of the then unvarying materials of Australian architecture in the interior' is described. The whole roof structure was joined with wooden pins, as nails were too expensive for the humbler settlers. The rafters were round poles, and the roof sheeting was bark of the box or stringybark. The sheets were 1.8 metres long by 0.6 to 1.2 wide, with holes pierced at the corners. Through these holes were passed cords 'twisted of the inner rind of the kurrajong tree' to tie the sheets down.⁵¹ The critical point is that there is at this stage no mention of an overlying frame to weigh the roof down, as was to become the norm soon after this.

the canonical bark roof

One of the first illustrations to show clearly the canonical method of roofing is a sketch by Abraham Lincoln of a barn, on the farm which Lincoln occupied in the Illawarra Valley for four years from 1840. His description of it is confusing: he states that it is 'roofed with "box" bark, tied to battens inside with green hide thongs, with guys laid on top'. Whether he could be referring to the poles as 'guys' is unclear, but this, he claimed, was 'the usual way of roofing buildings in bark.'⁵² It may not have been until this time that the system was developed of weighing the bark down with longitudinal sleeper poles hung from saddle poles. A hut built in 1842 for James Fenton at West Devon on the Forth River in northern Tasmania, by a former bark stripper, Bill Lakin, had a roof 'covered with sheets of bark, weighted with spars to keep them from warping',⁵³ but this does not tell us how the spars were supported. Similarly Jane Franklin talks of longitudinal poles on the roofs at Pyalong Station, already referred to, without explaining how they are supported: 'On a framework of sticks are laid sheets of box bark, some as large as fourteen feet [4.2 m] in length overlapping one another and lying like great sheets of lead kept down by poles laid lengthways ...'⁵⁴

Robert Russell's sketch of whalers' huts at Refuge Cove (also in the Port Phillip District) in 1843 appears to show the developed system with a grid of raking and longitudinal poles, but is not clear enough for us to be certain of the details.⁵⁵ From the same year, however, we have an unequivocal illustration of a number of bark roofs at Perrott & Garde's 'Cathkin' station in the District, sketched by Henry Godfrey,⁵⁶ while there is an even clearer example of a bark hipped roof in Charles Norton's sketch of the homestead at Birch's 'Seven Hills' run in 1844, and it was probably built in the late 1830s.⁵⁷ The fundamental principle was

51 [?James Tucker], *Ralph Rashleigh* (Sydney 1962 [1929, written c 1845]), p 136, quoted in D I Stone & D S Garden, *Settlers and Squatters* (Sydney 1978), p 9.

52 Mark Hitchcock, 'Illawarra Homesteads' (BArch, University of New South Wales, 1980), p 28.

53 James Fenton, *Bush Life in Tasmania Fifty Years Ago* (Launceston, 1891), p 42, quoted by J R Carroll, *Harpoons to Harvest* (Warrnambool [Victoria] 1989), p 47.

54 Brooks, *Riders of Time*, p 70.

55 Robert Russell, sketch of whalers' huts, Refuge Cove, Wilsons Promontory, Mitchell Library, reproduced in Jane Lennon, *Our Inheritance* (Melbourne 1992), p 21.

56 Henry Godfrey Sketchbook, La Trobe Library, reproduced in Michael Cannon & Ian Macfarlane [eds], *Historical Records of Victoria*, VI (Melbourne 1991), p 247.

57 Charles Norton, 'Mr Birch's Old Hut', 1844, SLV, reproduced in Michael Cannon & Ian Macfarlane [eds], *Historical Records of Victoria*, VI (Melbourne 1991), p 28. Another good illustration is E W Jeffreys's sepia wash drawing of Campbell's 'Ghin Ghin' station at the

perhaps clearly enunciated for the first time in 1848, by H W Haygarth: that the bark should be 'fastened to the roof by means of a wooden frame, so constructed as to press some part of every sheet, and thus to keep down the whole.'⁵⁸ In the same year Bishop Perry's wife commented upon very picturesque effect of roofs in Gippsland, in which the bark was 'prevented from blowing off by four long poles placed, two horizontally and two perpendicularly, on each side of the roof.'⁵⁹ In South Australia, where bark was less used, Ben Boyce lived in a sod hut with a bark roof for six months in 1839-40,⁶⁰ and the surviving Michelmore house near Meadows, built in the 1840s, has a bark roof.⁶¹

A sketch of a settler's hut on the north shore at Sydney, in 1849, clearly shows the evolved system as applied to a hipped bark roof, and with the timbers connected with pegs.⁶² The use of poles on bark roofing is explained in most detail by Alfred Joyce:⁶³

For common work, such as cow-sheds, stables and cart-sheds the roofing material was nearly always bark. It was never nailed except in one place, in the middle, on account of its great shrinkage, but was fastened to the ridge pole with strips of hide. This same green hide was of universal use as the general cordage, dray ropes of four plaits, hurdle ties, etc. To keep the bark firmly on the roof, logs were laid on it, suspended from saddle poles, and all fastened together with strong wooden pegs. Stringy bark and green hide served a variety of purposes. Very few nails were used, greenhide and pegs being the usual fastening.

The shrinkage of the bark, which meant that it would tear itself apart if nailed, could be dealt with in various ways, including Joyce's greenhide ties, but the warping was more of a problem. This called for a system of weighing down the whole roof area without making fixings through the bark - in effect a framework to be draped across the roof ridge and maintained in place by its own weight. The saddle poles to which Joyce refers, are pairs of poles running down the full slope of the roof and crossing each other at the ridge, where they are lashed together. In his method, which is the standard one in eastern Australia, and attested by countless illustrations, it is not the saddle poles themselves which lie on the bark surface, but heavier timbers running lengthwise at intervals down the slope: the saddle poles are simply lashed on top and prevent the longitudinal timbers from sliding down the roof.

sources and analogies

-
- Goulburn, with five bark roofed buildings. But although the run was established in 1838 the illustration is later, and there is nothing to establish the dates of the structures. Reproduced in Michael Cannon & Ian Macfarlane [eds], *Historical Records of Victoria*, V (Melbourne 1988), facing p 300.
- 58 H W Haygarth, *Recollections of Bush Life in Australia* (London 1848), p 16.
- 59 **** Goodman, *The Church in Victoria*, p 74.
- 60 Colin Kerr, *'An Exe lent Coliney'* (Adelaide 1978), p 140.
- 61 Information from Paul Stark, 1991.
- 62 'Settler's Australian hut, North Shore, Sydney, N.S. Wales, 1849', Rex Nan Kivell Collection, National Library of Australia, Canberra, reproduced in Peter Freeman, *The Homestead: a Riverina Anthology* (Melbourne 1982), p 22.
- 63 Alfred Joyce [ed G F James], *A Homestead History* (Melbourne 1949 [1942]), pp 80-81.

The fully evolved bark hut goes well beyond any known aboriginal forms, and is analogous in some details to various European traditions of thatching. It *seems* to be one of the most successful of colonial innovations. However, most of the bark roofs built by the Red Indians were similar to the extent that they had at least some sort of overlay of saplings, and especially of raking poles.⁶⁴ The prehistoric source of the construction seems to have been in the roofs of the Canadian Athapaskans, who built conical huts covered in various materials. When the covering was of hides or bark the sheets were not sewn together (as in some later Indian roofs) but held down with additional poles tied onto the outside.⁶⁵ In the north-east of what is now the United States, the Indians used sapling and bark structures for conical tipis, domical wigwams, and rectangular gabled houses.⁶⁶ Most notable were the Iriquois Indians, who built long houses 3 to 9 metres wide, and up to 40 metres long, from flattened slabs of dried bark from the elm and other trees. These buildings were of a size far greater than any Australian Aboriginal structure and had an arched roof form quite unlike any Australian European building, and there is no question of there being any significant connection. With some other Red Indian building types the issue is less clear-cut. Later Indian buildings were often larger and more complex, and some of the bark roofs had an overlying timber grid in both directions, as in the Australian roof.⁶⁷ This is not necessarily a truly indigenous Indian form, for all the evidence well and truly post-dates European contact in North America: indeed the most clear-cut illustrations of those that resemble the Australian form⁶⁸ post-date its appearance in Australia itself. Nonetheless, there is sufficient other evidence to suggest that such roofs were in use in America in the eighteenth century, well before their appearance in Australia.⁶⁹

Whether these American roofs might have had any influence in Australia is quite another question. There is, after all, not much evidence that the form was adopted by Europeans in

64 For example, a Chippewa house at Leech Lake, Minnesota, and a Chippewa conical wigwam east of St Paul, Minnesota; Peter Nabokov & Robert Easton, *Native American Architecture* (New York 1989), pp 60, 63. Nabokov and Easton, pp 82-3, give a reconstruction of an Iriquois longhouse with longitudinal poles laid on the barrel vaulted bark roof: however, this is inconsistent with the contemporary account of J-F Lafitau, who clearly refers to the members as being similar to those of the frame below - that is, arched transversely, exactly like a nineteenth century bark house built by Passamaquoddy Indians, illustrated on the same page.

65 S C Jett & V E Spencer, *Navajo Architecture* (Tucson [Arizona] 1981), p 54.

66 Nabokov & Easton, *Native American Architecture*, pp 22-3.

67 For example a Potawatomi house in Kansas: Nabokov & Easton, *Native American Architecture*, p 62, and, seemingly, a house visible in the background of a (mostly thatched) Caddo village, in about 1870.

68 Summer house of the Sauk and Fox, United States, photographed c 1885, from the Smithsonian Institution, National Anthropological Archives (W S Prettyman). Reproduced in Nabokov & Easton, *Native American Architecture*, pp 22-3.

69 A Creek Indian log cabin of the late eighteenth century, from the Smithsonian Institution, National Anthropological Archives (W S Prettyman). Reproduced in Nabokov & Easton, *Native American Architecture*, p 46. Here the raking members are shown below rather than above the longitudinal ones, but it is clear that picture is inaccurate from the fact that the raking members are discontinuous as they approach the ridge - there is therefore nothing to form the crossed tops at the ridge, nor any apparent means of preventing the superstructure from sliding off. It seems reasonable to infer that the structure is in fact like that of the later photographs. Similarly, an illustration of the Cherokee town of Toqua, based upon the observations of Louis-Philippe, Duc d'Orléans, in 1799, shows a log roof of a form which is patently impracticable and is unsupported by any other documentary reference, but which has the combination of raking and longitudinal members on top (neither set shown consistently above or below the other). It seems highly probable that the roofing material was bark. *Ibid*, pp 104-5.

North America itself, though bark was used in the Cordoba tile fashion which has been mentioned above, and there are other examples, like the 1.2 metre 'shingles' of hemlock bark used on a trapper's hut in 1869.⁷⁰ Donald Hutslar quotes a promising precedent for the Australian system in roofing used in the 'Fire-Lands' of north-central Ohio in about 1808-12:⁷¹

These early settlers generally erected the ordinary log cabin, but others of a wandering character built bark huts, which were made by driving a post at each of the four corners and one higher between each of the two end corners, in the middle, to support the roof. Layers of bark were wound around the side of the posts, each upper layer lapping the one beneath to shed rain. The roof was barked over, strips being bent across from one eave over the ridge pole to the other and secured by poles on them.

The construction of the walls is somewhat equivocal, but the critical words are the last ones, for they could refer to a grid of timber such as is used on the Australian bark roof. However, the evidence is against this, for there are a number of descriptions of roofs in Ohio which were covered not in bark, but in what might best be termed palings, in which poles are placed on top in the longitudinal direction only. There is every reason to suppose that this was the same in the bark roof as described.⁷² Later accounts name these members 'weight poles'.⁷³

The only European precedents are different traditions of thatching used raking poles and longitudinal poles, though not the two types together. Pairs of raking poles, known as *Stangen* or *Gerten*, had been used in Serbia and Russia to weigh down thatched roofs. In North Germany and elsewhere much shorter poles, extending little more than a metre down each slope and known as *Dachreiter* or *Wartrae*, were used to weight the thatch only at the ridge, which was where it was most liable to be lifted off by wind.⁷⁴ Similar members are found on a number of Canadian (European) thatched roofs,⁷⁵ particularly in Charlevoix County, Quebec, as distinct from Yamaska and St Maurice counties, where the topmost thatch was lashed to the ridge pole.⁷⁶

English thatched roofs provide some precedent for the use of longitudinal members in the 'ledger' which are only light rods, one or two of which are placed near the ridge and the eave line, and are not carried by saddle poles but sewn straight through the thatch to the

70 E N Woodcock [ed A R Harding], *Fifty Years a Hunter and Trapper* (Columbus [Ohio] 1913), pp 141-2, quoted in D A Hutslar, *Log Construction in the Ohio Country, 1750-1850* (Athens [Ohio] 1992 [1986]), p 118.

71 C B Squier, quoted in Henry Howe, *Historical Collections of Ohio* (Cincinnati [Ohio] 1847), p 51, and in turn in Hutslar, *Log Construction*, pp 73-4.

72 T L Harris, W L Howells, and especially C M Walker, quoted in Hutslar, *Log Construction*, pp 77, 79, 106.

73 Hutslar, *Log Construction*, pp 115, 118.

74 **** Innocent, *Development of English Building Construction*, pp 210, 216.

75 M E Weaver, 'Notes on Thatch and Sod Roofing', *APT Bulletin*, VIII, 1 (1976), p 70; A J H Richardson, 'A further note on French-Canadian roof-cover and timber walls', *ibid*, illustrations pp 63-5.

76 Eric Arthur & Dudley Witney, *The Barn* (New York 1988 [1972]), p 132.

rafters, or held by pegs or broaches stuck through the thatch.⁷⁷ Members in *both* directions seem to have been combined on one of the early thatched roofs in Sydney, but this was in the form of something rather like a ladder, running along the face of the roof next to the ridge, and is not relevant to the coherent system of members which later appeared in the Australian bark roof.⁷⁸ In a relatively late account of Gippsland bark building, E S Sorenson describes a stringybark roof held down with greenhide and weighted with poles. These are pegged together, and are called 'riders' and 'jockeys'.⁷⁹ Not only is it rare to find any term applied to these members, but the term 'riders', presumably for the sloping poles, is reminiscent of the German *Dachreiter* [literally roof rider, though more conventionally applied to a king post]. the use of European terminology is not necessarily proof of European origin, for elsewhere there were bark roofs which, rather than having only one component - the ledger or the rider - had both, combined in the same way as in the canonical Australian bark roof. One somewhat arcane location of this form is Kamkatchka, where thatched roofs had laid over them a grid of ledgers and riders, with the latter on top just as in Australia.⁸⁰

There is a precedent for a combination of raking and longitudinal timbers nearer to hand than this, in roofs in Sumatra thatched with *atap*, a type of palm leaf. Settlers *en route* for Australia may well have encountered the Sumatran roofs, or they might at any time have seen the illustration first published by William Marsden in 1810-11.⁸¹ This hypothesis, though intrinsically far-fetched, is greatly assisted by the fact that there is no reference to European bark construction in Australia until 1815 - that is, after the publication of Marsden's print. New Zealand also had bark roofs,⁸² but the form of construction is unclear, and a connection at this date is probably less likely than one with Java.

roof variations

In a hipped roof it is not possible to have raking members running down from the ridge on the end slope, except possibly one at the very centre as in Norton's painting of 'Seven Hills'. Therefore the transverse members are supported at the corners by those on the long sides. A number of examples are found in the photographs of Hill End and Gulgong commissioned by B O Holtermann from Beaufoy Merlin and Charles Bayliss in 1872.⁸³ An occasional variant construction, used with hipped roofs, is to dispense entirely with supports extending

77 Innocent, *op cit*, p 198.

78 Watercolour by Edward Dayes, 'Brickfield Hill and village on the High Road to Parramatta', 1796; also an engraving from it by J Heath entitled 'The Brickfield-hill or High road to Parramatta. August 11, 1796' (the latter published in Collins, *Account of the English Colony*), in McCormick, *First Views of Australia*, pp 80-1.

79 E S Sorenson, *Life in the Australian Backblocks* (London 1911), p 24.

80 John Webber, 'A View of the Town and Harbour of St Peter and St Paul in Kamschatka, on the Siberian Coast', c 1782. Mitchell Library, Sydney, Z DL Dxxf.41.

81 William Marsden, *The History of Sumatra* (Kuala Lumpur 1975, reprint of 3rd ed, 2 vols, London 1811 [1783]), p 57 and plate XIX, 'A Village House in Sumatra'. The book was first published in 1783, but the plate is labelled 'Published by W. Marsden. 1810.' and so must have appeared for the first time in this 1811 edition.

82 Peter Shaw, *New Zealand Architecture* (Auckland 1991), p 16.

83 Keast Burke, *Gold and Silver: an Album of Hill End and Gulgong Photographs from the Holtermann Collection* (Melbourne 1973), pls 41, 49, 61, 81, 89, 105.

from the ridge and instead to link the longitudinal members around the roof in plan to form a rectangle, which cannot slide down. This is fairly unusual, but is seen in an early cottage at Penola, South Australia.⁸⁴ Fenton and Walker illustrate a somewhat similar form in Scotland - a thatched hip roof at Lochaber, Argyllshire, with a whole series of ledgers running continuously around it.⁸⁵ These would of course have been supported through the thatch in the conventional way, so that the resemblance is fairly superficial.

Some Australian bark roofs replace the raking timber members with ropes or wires slung over the ridge to connect the longitudinal poles on opposite faces. The use of rope in this way probably came first, and the Holtermann photographs include two such examples at Gulgong.⁸⁶ The cladding of such a roof in Queensland in 1892 is described in detail by Constance Ellis:

He ... backed the dray against the house, put a rope round one sheet of bark, put a couple of saplings from the dray to the roof for runners, hauled the sheet up till it rested on the saplings. Then he climbed on to the rafters, rope in hand. I mounted the dray, he hauled the rope, I guided the bark, and with much pulling and hauling, one sheet was in place. When that was fixed, the same process put the other beside it. ...

It was just after sundown when the last sheet was in place. Then Tom got two long and fairly heavy saplings. He fixed a rope near each end of one, lifted it on to the roof, put a narrow sheet over the joining at the ridge, then while I hung on to the ends of the rope, he slid the tied sapling over, then tied the ends to another long sapling - thus making a weight that would keep the bark flat at each end of the ridge.

With the job complete Constance was able to spend the latter part of the evening giving birth to her second son.⁸⁷

The growing availability and cheapness of galvanised wire was probably the factor that led to its replacing rope in many examples, and this seems to have been common by 1887 when builders were advised:⁸⁸

get a spar the length of the house and about 6 inches through, lay it upon the bark about 3 feet from the top, lay a similar spar on the opposite side of the ridge, and tie these two together every 6 feet or so, by strands of wire; the wire being pliable will bend over the ridge, and so keep the sheet of bark that does duty for a ridge-cap always nicely curved. Now place another pair of similar spars about 1 foot from the eaves and suspend it from the ones above, and your roof is fixed and firm; it will keep out wind and rain, heat and cold.

84 Sharam's Cottage, Wilson's Lane, Penola, c 1865-70. Photo SAA [?South Australian Archives] ref B 26749, reproduced in Danvers Architects, *Heritage of the South East* (Adelaide 1984), p 80/81.

85 Alexander Fenton & Bruce Walker, *The Rural Architecture of Scotland* (Edinburgh 1981), p 55.

86 Burke, *Gold and Silver*, pls 83, 84.

87 Ellis, *I Seek Adventure*, p 55.

88 P Fletcher [ed], *Hints to Immigrants* (London 1887), p 19, quoted in Bell, *Timber and Iron*, pp 107-8.

The use of bark for attic floors was probably much more common than surviving records suggest. The earliest extant example is probably that in the stables at 'The Hermitage', Barnawartha, Victoria, which are believed to date from about the time of the house, probably the 1850s. The joists are tree trunks and appear to be original, and large bark sheets rest upon them. In Gippsland are some large [1.9 x 2.6 m] and remarkably well preserved sheets forming a loft floor in the stables at 'Strathfieldsaye', the date of which is not known.

the spread of bark building

The bark roof, notwithstanding the example at Meadows and some others in South Australia, was overwhelmingly a phenomenon of the eastern seaboard colonies of Victoria and New South Wales, and then of Queensland. In Queensland bark construction was possibly less ubiquitous than in areas like Hill End, but there were many examples. An illustration of a hut at the Cape River diggings in 1868 shows a neat building with a boarded door, a bark chimney, and with the roof over-frame pegged together.⁸⁹ A house at Roma, in the same year, had neat weatherboarded walls, but a complete bark roof.⁹⁰ Bark was used to build the first Church of England at Stanthorpe, opened in 1872.⁹¹ Also at Stanthorpe, the Presbyterian church was a most impressive bark building, so tall as to require two lengths of bark to make of the side walls, and a little more than three to make up the gable end.⁹²

In Western Australia bark was used more sporadically, as at Roebourne where the medical officer Charles Mayhew (and his notoriously aggressive wife) occupied a bark hut briefly in 1869.⁹³ As at Roebourne, bark was often used not merely for the roof but for the cladding of a whole building. One of the earliest descriptions of the construction of an Australian bark hut is that by James Atkinson in 1826:⁹⁴

this is effected by setting up corner posts of saplings, surmounted by plates, and the frame of a roof of small poles. Some large sheets of the bark of the box or stringy-bark are then procured; some are set on their ends to form the sides, and others laid up and down on the top to form the roof, with one or two long pieces lengthways to form the ridge, securing the whole by tying it with strips of the inner bark of the stringy bark; a space is left for a door, and a square hole cut for a window, and pieces provided to close these apertures at night; some long pieces are then built into the form of a chimney at one end, and sods placed inside to prevent their catching fire. Care is taken to give the different sheets sufficient overlap to allow for their shrinking,

89 Geoffrey Bolton, *A Thousand Miles Away* (Canberra 1971), facing p 145.

90 John Oxley Library no 5444, reproduced in Ian Evans, *The Australian Home* (Sydney 1983), p 37.

91 John Oxley Library no 20152.

92 John Oxley Library no 20215.

93 Susan Hunt, *Spinifex and Hessian* (Nedlands [WA] 1986), p 54, quoting Colonial Secretary's Office, 1869, no 76.

94 Atkinson, *Agriculture and Grazing in New South Wales*, pp 29-30.

and also to give the eaves sufficient projection to carry the rain water from the walls; a trench is dug round to carry off the wet ...

At Port Essington in Northern Australia, bark was used experimentally for walling in the 1840s, after it was found that the conventional timber structures were eaten by white ants.⁹⁵ Even at Palmerston [Darwin] in 1870, there was at least one bark roof, covering the long shed used as stables,⁹⁶ and by 1872 bark huts were numerous.⁹⁷ In 1880 J G Knight referred to bark as the normal material for roofing in the Territory, though he estimated its life at only two to three years.⁹⁸

Bark huts were also occasionally built at the Ballarat goldfield,⁹⁹ but at Airey's Inlet there survived until recent times and in very good condition an example which seemed to date from at least 1862, and perhaps earlier. It was destroyed in the bushfires of 1983, but had been documented and restored before that time. The building measured about 4.5 metres by 9, with a simple gable roof, and was framed in undressed round timber consisting of 150 mm diameter posts, 1.5 metres high, and spaced about 2 metres apart, and connected by 100 mm diameter girts at the 0.3, 0.9 and 1.5 metre heights. Rafters were about 80 mm in diameter and at one metre spacing, with a 40 mm diameter collar tie, and spanning across them in the lengthwise direction of the building were 60 mm purlins at one metre centres. The bark cladding was in pieces 1.5 metres high, 15 to 20 millimetres thick, and commonly 60 to 90 centimetres broad with a maximum of 1.4 metres.¹⁰⁰ The remarkable feature was that the roof riders were not suspended in the conventional way from raking members passing over the ridge, but were fixed straight through the rafters with coach bolts. According to the theory of the matter this should have caused the sheets to damage themselves in shrinking, and this may well have been the case, for the roof had long since been covered over in corrugated iron.

Fortunately, there is a good description of the erection of such a hut as it was done in Gippsland in the 1860s:¹⁰¹

The timber on the Gipp's Land hills is free splitting. The kind mostly used for splitting purposes is the stringy bark, so called from the facility with which it can be stripped or pulled into strings, and the fibres of which can be twisted into ropes for houses. The method of barking the tree is to ring it at the butt, and again eight or

95 Peter Spillett, *Forsaken Settlement* (Melbourne 1972), p 150.

96 Daly, *Digging, Squatting, and Pioneering Life*, p 48.

97 Daly, *Digging, Squatting, and Pioneering Life*, p 145.

98 Knight, *The Northern Territory of South Australia*, p 27.

99 Carnegie, loc cit.

100 The house was on the Noble family property, off the main road at the base of the valley, and is supposed to have been occupied by Thomas Butson Pearce, whose memorial near the lighthouse states that he died in 1862 at the age of 53. A reasonably accurate replica has since been built on the site. I have had no opportunity to authenticate what may be an even older bark hut at 'Naringal' near Wallinduc, alleged to have been built by William Rowe in 1841: *Age* (Melbourne), 4 May 1977.

101 C D Ferguson [ed F T Wallace], *The Experiences of a Forty-Niner during Thirty Four Years Residence in California and Australia* (Cleveland [Ohio] 1888), pp 469-70. It is a mistake to regard the use of round timbers as a purely colonial trait.

nine feet above, then split it down from one girdle to the other, get the fingers in and start it from the wood. When once started, it will readily peel around the body of the tree, and come off one whole sheet, eight feet long and from three to six feet wide. Take a long-handled shovel and strip off the round outside bark, and it will resemble a side of sole leather. Two men can strip from forty to sixty sheets in a day, so it did not take long to strip enough bark to cover a house, sides, roof and all. The young stringy bark trees make the best of poles, and one can cut them twenty-five or thirty feet long, as straight as a candle, and, if desired, not more than three inches in diameter. Two men can go into the bush and strip the bark, cut the poles and put up a house inside of a week, and a good tidy-looking one too, and such a one as many thousands who are worth their thousands of pounds have lived in for years.

later usage

The methods used by selectors in the Kyabram area in the seventies seem to have been largely unchanged. In this case the bark came from the box tree, and was kept flat with logs until it had dried out, then laid on a roof structure consisting of 9 centimetre diameter saplings as rafters, with smaller saplings tied transversely, to which the bark was tied with bullock hide. The uppermost sheets of bark were curved over to form the ridge.¹⁰² A surviving hut and nearby stables at Anglesea, with the roofs sheeted over but some of the bark walling visible even from the outside, date probably from the eighties. A large bark barn at Flynn in Gippsland first reported to me by Gary Gilmour, was probably built by the 1870s, and was converted to an abattoir in the 1888. It is probably the largest surviving bark building in the world, though it is now entirely encased in weatherboard and iron on the outside.¹⁰³ In the vicinity of Hill End and Gulgong one can still today find the remnants of bark roofs or, more commonly, the framework which carried them. At 'Carrabah' in the Taroom area of Queensland, there survives beneath an iron roof some of the bark which was collected in the 1870s, as noted at the time in the diary of Rigby, the joint owner.

Remarkably enough, a bark roof was used in metropolitan Sydney as late as 1876, when George and Charles Hoskins, later to be founders of Australia's steel industry, built their first works at Ultimo.¹⁰⁴ Bark was used in New South Wales right into the twentieth century, and an illustration survives of small pieces designed to be used like shingles, at Oxley, near Balranald.¹⁰⁵ As late as 1913, as Don Watson points out, the Queensland Government was publishing advice on how to strip bark and build a bark hut, as well as how to split slabs, rails and shingles, and to build a slab hut.¹⁰⁶ The tradition of building was now probably more alive in the more remote parts of Queensland than it was in any other locality.

102 W H Bossence, *Kyabram* (Melbourne 1963), p 44.

103 Miles Lewis, *West and South Gippsland: Best Old or Renovated Farm Building* ([Melbourne] 1985), p 2.

104 Robert Irving & John Kinstler, *Fine Houses of Sydney* (Sydney 1982), p 75.

105 Arthur Feldtmann, *The Balranald Story* (Balranald [New South Wales] 1976), p 13.

106 Donald Watson, *The Queensland House* [typescript report] (Brisbane 1981), p 4.5.