4.04 Palisade and Pug

a. **palisading**
b. **pugging**
c. **dissemination**
d. **the German connection**
c. **the Lincolnshire connection**

a. palisading

Some of the earliest log construction in Australia, as we have seen, was of the palisade type, in which the logs were stuck vertically into the ground. This is more common in New Zealand, where Benjamin Mountfort's church at Hemingford, of 1852, was of whole logs placed vertically, checked out over a partly squared log base plate, and mortised into a top plate. Ian Lochhead traces this to the influence of an article by William Scott in the *Ecclesiologist,* which actually advocated something rather different - two layers of split logs with insulation in between. This article in turn was inspired by the remains of the Saxon church at Greenstead, Essex.[1] William Strutt's house near New Plymouth, of 1856, was framed in squared timber and infilled with vertical tree fern trunks of quite a large diameter. Strutt speaks of 'a rough place built of fern tree stems, with framework of wood and canvas roof',[2] and his illustration of it conveys a little more detail.[3] The same construction may well be implied in William Deans's description of his house at Port Nicholson in 1840 as being 'built of wood and large pieces of fern.'[4]

There is little evidence of full logs, as distinct from saplings, being used vertically as a load-bearing wall in Australia, but an exception to the rule is a house built by David Smyth in 1866-7 on what became his 'Monta Flora' property in the District of Owen, South Australia. Here there is no framing and the walls are of vertical trunks, seemingly about 230 mm in diameter, partly squared off and jointed with clay, just as in the local palisade and pug tradition.[5] Palisading was usually of something lighter than complete logs. William Thornley described a palisade house of split half logs of stringybark at New Norfolk, Tasmania, in 1817,[6] will a little later his neighbour, Moss, had

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[1] Ian Lochhead, 'The Early Works of Benjamin Woolfield Mountfort 1850-1865' (MA, University of Auckland, 1975), pp 39-41.

[2] Heather Onslow, 'William Strutt (1825-1915)', in Joan Kerr [ed], *The Dictionary of Australian Artists* (Melbourne 1993), p 767.

[3] William Strutt, 'A Settler's Hut', reproduced in H M Simpson, *The Women of New Zealand* (1940), and in turn in John Hale [ed], *Settlers* (London 1950), facing p 289.

[4] William Deans, quoted in Hale, *Settlers,* p 319.

[5] John Dallwitz & Susan Marsden, *Heritage of the Lower North* [South Australian Department of Environment and Planning] (no place, 1983), pp 18-19.

[6] William Thornley [ed J S Mills], *The Adventures of an Emigrant in Van Diemen's Land* (Adelaide 1973 [1840s]), p 22.

something described as a log hut.[7] In 1842 for James Fenton's dwelling at West Devon, on the Forth River, Tasmania, was of 'green saplings placed upright, secured at bottom by a trench in the ground, and on top by a wall plate of the same material'.[8]   The first authenticated palisade structures known to me in South Australia are two sketched by Edward Snell on the Yorke Peninsula in 1850, the police station, and a shepherd's hut near Lake Sunday (which he described as 'the most miserable hut I ever saw'), both of which are presumably long gone.[9] Both appear to have been of thin trunks, but would barely qualify as logs.

b. pugging

In any form of palisade construction it can be expected that in a habitable building the gaps between the logs or poles will be chinked or pugged to weatherproof them. But it often goes beyond this, so that the mud becomes a substantial element of the construction.   The use of vertical timbers plastered over with mud is most common in South Australia, and it perhaps represents the merging of two quite different traditions, true earthfast palisading on the one hand, and stakes within or attached to a frame on the other. 'Palisade and daub' which is common in Scotland,[10] has the stakes attached to the surface of the frame.[11] Otherwise stakes may be used within the panels of a *fachwerk* frame, which relates to *lehmwickel* - in fact it virtually is lehmwickel but with the earth and straw winding omitted - but this is not the result of the tradition being debased in colonial use, for it is found in Europe as well.

There may be no universal definition of 'pug', but J K Andrew, working in the Goulburn Valley in the late nineteenth century, was very precise: 'mud mixed carefully with short straw or grass'.[12]   Andrews was writing of this as a material for lining chimneys and chinking the gaps in the walls of log structures. Whether or not grass is used there tends to be a distinction between 'pug' as a material for packing and filling joints, 'daub' as a material for plastering a surface, and 'cob' as a primary material in mass construction. The presence of animal hair, and small quantities of lime, is more characteristic of daub.

The use of full height timber palisading, as we have seen, is a totally different tradition with no particularly German connections. It ultimately becomes much

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7   Thornley, *Emigrant in Van Diemen's Land,* p 132.
8   James Fenton, *Bush Life in Tasmania Fifty Years Ago* (Launceston, 1891), p 42.
9   Edward Snell [ed Tom Griffiths], *The Life and Adventures of Edward Snell* (North Ryde [New South Wales] 1988), pp 122-3.
10   John McCann, *Clay and Cob Buildings* (Princes Risborough [Buckinghamshire] 2004 [1983]), p 13.
11   Bruce Walker, 'Earth Building in Scotland', in John Hurd & Ben Gourley [eds], *Terra Britannica* (London 2000), p 22, illustrates an example in Ross-shire in which the gable is clad in this way, and the vertical members are simply nailed to the face of the frame.
12   J K Andrews memoir, c 1950, reproduced in Anne Tyson, Australian Architecture B, Melbourne University 1997.

more common, but it perhaps evolved anew out of the *fachwerk* version, for it is particularly common in Germanised areas. On the other hand it could be simply an intuitive and primitive response to the materials available, and there is some evidence that it arose independently among non-German settlers. The two origins are not mutually exclusive. Generally this construction is known in South Australia as 'pine and pug'[13] (or 'pug and pine'), but even in that state the timber is not always pine, and elsewhere pine is the exception. Dennis Jeans has called it palisade-daub,[14] but given that 'pug' is the normal term there seems no reason to change it, hence I prefer 'palisade and pug'. Another British type which has not been specifically identified in Australia is'cab and dab', which has horizontal timbers within the frame. On a stone plinth about 600 mm high

> is placed a strong sill of timber; to which is superadded uprights of quartering, two feet apart, into which are inserted rounds of rough wood, like ladder-work, at six or seven inches one above the other, to the height required: the spaces between the rounds are well filled with a mixture of mire and long straw, previously well trodden together, provincially called *cab-dab*; the whole is then plastered with good mortar, and rough casted. These kinds of buildings are used where stones are scarce, or where cheapness is the leading object.[15]

'Police Station on Yorke's Peninsula'; 'Shepherd's hut near Lake Sunday'; 'Currency Creek Lake from Mr Vercoe's house', all by Edward Snell, 1850: Edward Snell [ed Tom Griffiths], *The Life and Adventures of Edward Snell* (Angus & Robertson, North Ryde [New South Wales] 1988), pp 122, 123, 183.

Exactly when full height palisade and pug came into use is not clear because early buildings are not described with sufficient precision. The fact that the first Congregational church in Adelaide was described as 'constructed of pines and reeds'[16] is suggestive. Likewise Henning and Frenden's public house at Glenelg was of 'pines, thatched with reeds'.[17] Gawler's thatch-roofed government house was of 'native pine' from what was later known as Nailsworth.[18] What is clear is that the construction was well established on the York Peninsula by 1850, when Edward Snell's sketches show three quite diverse buildings of this sort.[19]

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[13]   For example D W Berry & S H Gilbert, *Pioneer Building Techniques in South Australia* (Adelaide 1981), p 16, discuss two examples of what they call 'pine and pug' at Mount Remarkable, one dating from 1859.

[14]   Dennis Jeans, 'The Building Industry: Materials and Styles', in Judy Birmingham, Ian Jack & Dennis Jeans, *Industrial Archaeology in Australia: Rural Industry* (Richmond, Victoria, 1983), p 101

[15]   A Crocker & Son, 'On Cottages', in *Communications to the Board of Agriculture on Subjects Relative to the Husbandry and Internal Improvement of the Country*, vol I (2nd edition, Board of Agriculture, London 1804 [1797]), p 114.

[16]   J W Bull, *Early Experiences of Life in South Australia* (2nd ed, London 1884), p 41.

[17]   Bull, *Life in South Australia,* p 136.

[18]   Bull, *Life in South Australia,* p 131.

[19]   Edward Snell [ed Tom Griffiths], *The Life and Adventures of Edward Snell* (Angus & Robertson, North Ryde [New South Wales] 1988), pp 122, 123, 183.

c. dissemination

In 1866-7 a Lurtheran mission was established at Lake Killalpannina on the lower Cooper, with buildings of palisade and pug,[20] perhaps related less to the earlier palisade and pug buildings and more to the distinct German tradfition of palisade construction, sometimes within a fachwerk framem but sometimes not.

Like other South Australian building traditions palisade and pug reached the Northern Territory (an environment for which it would seem ill adapted), and was used at Port Darwin. Daly refers to the 'log' buildings at the settlement in 1870,[21] but also mentions the 'poles' of which her family's 'log hut' was built, and to the upright logs of another dwelling.[22] All this is consistent with pole palisading of the South Australian type. She speaks of 'the spaces between the poles .. plugged with "paper" bark', though the need for pugging was not acute in the Darwin climate, and it was usually omitted. J G Knight, writing in 1880, describes the typical palisade structure (though like Daly he refers to it as 'log') which does not appear to be pugged:

> The new settler can readily make for himself a comfortable log hut by using upright poles about 6 in. [150 mm] diameter, 2 ft. [600 mm] in the ground, and 10 ft. [3 m] above, and covered with bark.[23]

One such building at Darwin was the first telegraph station, presumably of about 1872,[24] and others included the police station and a number of houses.[25] According to Peter Forrest most of the buildings in Goyder's camp were of this construction,[26] and it is seen in a contemporary illustration of one of the buildings on the overland line.[27] There are surviving examples at Stirling Station near Barrow Creek; Angus Downs station; Mount Riddoch, about 200 km north-east of Alice Springs; in the area of Arltunga; and at Andado in the Simpson Desert near the South Australian border.[28]

This construction appears also in Victoria, in the buildings of German immigrants in Melbourne, and in the rural areas settled by Germans from South Australia. One example of the former is the barn of the Schultz farm

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[20]   Information froim Howard Pearce, 2007.

[21]   Harriet Daly, *Digging, Squatting, and Pioneering Life in the Northern Territory of South Australia* (London 1887), pp 44, 46, 48.

[22]   Daly, *Digging, Squatting, and Pioneering,* pp 50, 86.

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

[24]   Illustrated in Kevin Livingston, 'The Port Darwin Line', in Val Dixon [ed], *Looking Back: the Northern Territory in 1888* (Casuarina [Northern Territory] 1988), p 36, from the collection of the Northern Territory Historical Society.

[25]   Photographs 9740 & B9735, Mortlock Library, reproduced in Arch Grant, *Palmerston to Darwin* (Dee Why [New South Wales] 1990), pp 25, 15.

[26]   Peter Forrest, verbally 1992.

[27]   E & R Jensen, *Colonial Architecture in South Australia* (Adelaide 1980), p 544.

[28]   Peter Forrest, verbally 1992.

'Ivy Bank' at Wollert, near Melbourne, probably of the early 1850s.[29] Homestead buildings of this construction survive at Kinimatka and Woorak West, both in the Shire of Lowan.[30] It is probably best to discount an early description published in Victoria of what is said to be 'wattle and dab', but is in fact a palisade: 'formed by sinking in the ground rows of young straight wattles, fixed side by side, and afterwards daubed over with strong mud'.[31] From the absence of any reference to a frame this sounds physically impracticable, and it is probably the result of some misunderstanding.

In the Riverina of New South Wales palisade and pug was once again associated with Germans, and it seems not with the Catholic Rhinelanders who reached Albury in 1851 (and built *inter alia* in pisé), but with the Lutherans from South Australia and Victoria who arrived in 1866-70. One group led by Pastor J G Klemke travelled from Ebenezer in South Australia to Blanchetown, then followed the Murray as far as Albury, reconnoitred the surrounding countryside, and finally settled on Walla Walla station.[32] Buxton describes and illustrates a palisade and pug house surviving on G Klemke's property in which vertical pine saplings are daubed on either side with mud in the usual fashion. With increasing prosperity the whitewashed pug walls would be clad externally in weatherboard, and wallpapered internally. The pug ceilings - which remain tantalisingly unexplained - would later be covered in calico, then with pine matchboard.[33] Dennis Jeans illustrates an example at Lockhart.[34]

In Tasmania palisade and pug is found at the settlement of Bismark, near Hobart, now called Collinsvale. The village was developed in the 1870s, and a surviving cottage has been found to show German characteristics, now concealed by later cladding and roofing materials. It is of *fachwerk,* using large members, up to 600 mm square, crudely framed but using mortices and other traditional jointing types, with a mud-filled wall, a shingle roof, and a ceiling of short boards carried between joists and resting on cleats. The walling consists of vertical stakes running vertically from a groove at the base to drilled holes at the top, and covered in mud and straw which is brought to a smooth face and plastered.[35]   An example in Western Australia, which appears to have consisted of vertical round poles set in the ground, and daubed over, was an orphanage building at the New Norcia mission, possibly of 1860.[36]

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[29]   Henrike Franz, 'German Involvement in Victorian Heritage Places' (Melbourne 1998), p 47.

[30]   Photographs supplied to the National Trust by Robert Kewley in 1985.

[31]   'Rusticus' [W S Chauncy], *How to Settle in Victoria* (Melbourne 1855), p 20.

[32]   G L Buxton, *The Riverina 1861-1891* (Melbourne 1967), pp 197-8.

[33]   Buxton, *The Riverina,* facing p 197.

[34]   Dennis Jeans, 'The Building Industry', p 101.

[35]   *Mercury* [Hobart], 25 May 1995, p 5; plus verbal information from Sarah Waight, Heritage Officer, Glenorchy City Council, June 1995.

[36]   Battye Library 74609P, reproduced in David Hutchison, *A Town like No Other* (South Fremantle [Western Australia] 1995), p 62.

Palisade construction has been widespread in other parts of the world, and in Newfoundland it is found both in the form of the 'tilt' in which vertical logs are set directly into the ground, and the 'full studded' building, in which the logs are roughly squared and rest upon a sill or ground plate. Although there is no reason to suggest a connection, the same variation is found in Australia. The full studded building of Newfoundland, however, was generally clad in clapboard (our weatherboard).[37] In Australia many palisade-type constructions also seem to have been faced externally from the outset, but typically with saplings nailed horizontally as the key for a mud plaster. E & D Baglin illustrate a hut of this sort at Trunkey Creek near Bathurst.[38]

d. the German connection

A distinction has been drawn above between the true palisade and the use of stakes supported by a structural frame   The latter includes the use of daubed stakes in external *fachwerk* walls (as opposed to true *lehmwickel*) and appears to be fairly common, and is known in German as *Lehmspundwand* [loamy clay palisade wall]. Like lehmwickel it was the subject of revived interest in Germany after the Great War. It is also found in traditional buildings in the Germanised area of Czechoslovakia,[39] and it is also found in German settlers' houses in Wisconsin in the United States.[40]

The wall of the Friedrichstadt barn at Hahndorf has panels filled with what is again incorrectly referred to as 'wattle and daub', but is described as 'vertical stakes slotted into holes in the timber rails and plates and wrapped around with straw and then plastered with a mud slurry.'[41] This could be *lehmwickel* or it could be an application of straw and mud to the stakes after they were placed in position. Lothar Brasse rather similarly refers to 'wattle and daub' construction but describes pointed vertical stakes set into the frame with their points in auger holes in the upper member and a groove in the lower one: straw or other pliable material is woven between them and both sides plastered with a mixture of clay and chopped straw.[42]

The barn at the Polst homestead, Light Pass, has a *fachwerk* frame with vertical stakes set in it and apparently no indication of mud rolls or wattling,[43]

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37   Shane O'Dea, 'The Tilt: Vertical-Log Construction in Newfoundland', in Camille Wells [ed], *Perspectives in Vernacular Architecture, I* (Columbia, Missouri, 1987), p 55.

38   E & D Baglin, *Australian Chimneys and Cookhouses* (Sydney 1979), p 43.

39   For example, house no 19, Becov, illustrated in Václav Mencl, *Lidova Architektura v Ceskoslovensku* [Prague 1980], p 182, fig 450.

40   The Zimmel house barn, built after 1849 by either Francis Grimmer or S F Zimmel, and the Langolf house barn, built in the 1850s by either Frederick Kliese or Gotlieb Vinde (a Saxon). William Tishler & C S Witmer, 'The Housebarns of East-Central Wisconsin', in Camille Wells [ed], *Perspectives in Vernacular Architecture, II* (Columbia [Missouri] 1986), pp 108-9.

41   Gordon Young et al, *Hahndorf* [2 vols, Adelaide 1981], I, p 196.

42   Lothar Brasse, 'The German Contribution', *Historic Environment,* VI, 2 & 3 (1988), p 46.

43   Gordon Young et al, *The Barossa Survey* (2 vols, Adelaide 1973), I, p 117.

and so does a barn at Neudorf, near Lobethal.[44] But in view of examples like those at Moculta, discussed above, one must wonder these are not of true lehmwickel construction which investigators have failed to recognise.   In Victoria 'Kilfera' near Harkaway is believed to have been built in about 1856 by the German settlers William Wiese and John M Fritzlaff, and has been described as having walls of 'a wooden frame and battens supporting mud infill'.

Apart from Buick's cottage the oldest South Australian example to survive into recent times is a German one, the typical thatched-roof farmhouse of the Mattiske family near Rosedale, District of Light, thought to be no later than 1854. It suggests its *fachwerk* connections only by the close spacing of the squared posts, at about 900 mm intervals.   Between these are set round poles, of perhaps 80-100 mm diameter, daubed over to flush up with the face of the posts.[45]   Much the same construction is found in a German farm group at Zeigler's Corner, Neale's Flat, apparently dating from the 1870s,[46] and, it appears in other locations photographed but not identified.[47]   By 1885 palisade construction was found in the far north of the colony at Innamincka, where the Police Department leased from the local station manager a cottage built of vertical box tree logs, with the gaps filled with pug.[48]

e. the Lincolnshire connection

The tradition of vertical rods, canes or laths attached to the face of a frame originates in Lincolnshire, where it has been referred to as 'mud and stud' - an unhelpful name, as the slender vertical rods are not studs, and in fact function more like vertical lathing to key the daub or plaster coating. Innocent called it 'stud and mud' but wrongly equated it with wattle and daub.[49] Mercer calls it 'mud and stud', and though vague about the details,[50] refers to examples from the seventeenth century.[51] Hurd even claims examples of the fifteenth and sixteenth centuries, but does not identify them. Not only is the technique confined to the one county, but all surviving examples come from a single district, East Lindsey.[52] In 1799 Arthur Young recommended the technique,

44   Young, *Lobethal,* p 123. See also G Young & P Perkins, *Pioneer Buildings of the Onkaparinga Bowl* [Adelaide 1984], p 23, and Gordon Young, 'Early German Settlements in South Australia', *Australian Journal of Historical Archaeology,* III [October 1985], p 51.

45   John Dallwitz & Susan Marsden, *Heritage of the Lower North* [South Australian Department of Environment and Planning] (no place, 1983), pp 30-31: also p 196, where the period is said to be 1837-54.

46   Dallwitz & Marsden, *Heritage of the Lower North,* pp 170-1, 174.

47   Photographs of South Australia in Michael Cannon, *Life in the Country* (West Melbourne 1973), p 107.

48   H M Tolcher, *Innamincka* (Innamincka [South Australia] 1990), p 10.

49   C F Innocent, *The Development of English Building Construction* (Cambridge 1916), p 133.

50   Emil Mercer, *English Vernacular Houses* (London 1975), pp 24, 125.

51   Mercer, *English Vernacular Houses,* p 104.

52   John Hurd, 'The East Midlands', in John Hurd & Ben Gourley [eds], *Terra Britannica* (London 2000), p 17.

though noting the cost of the nails required.[53] In fact the somewhat dubious aspect of all this is that the prodigal use of nails before the nineteenth century is almost inconceivable, and it does not appear that any writer in fact identifies a dated early example which is clearly built in this manner. In other words one must wonder whether the earlier examples really are 'mud and stud' as currently described (and also whether Young actually used that term).

Subject to these qualifications the construction, as described by Hurd, consists of posts or studs resting on padstones at about one metre intervals and connected with a top plate. Below there is said to be a slender mid-rail (though an illustration appears to show at least two horizontal rails), but there is no base plate, and instead a stone or brick plinth is built between the studs. Riven ash laths are said to be fixed to the face of the timber frame (though the same illustration shows rods in the round rather than split timber) with 30-50 mm spaces between them. They are nailed to the top plate, and presumably to the rail or rails, but they simply overlap the plinth at the bottom. When they are pugged or daubed the whole exterior face is a continuous surface concealing the frame, unlike the half timbered effect of wattle and daub set within a frame.[54]

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53   Arthur Young, *General View of Agriculture in the County of Lincolnshire* (1799), cited in
         Hurd, 'The East Midlands', p 14.
54   Hurd, 'The East Midlands', p 17.