4.02 Pole and Pug

a. European and American precedents
b. lath and pug
c. the mining connection
d. dissemination

a. European and American precedents

The term 'pole and pug' is used here for the form of construction which is sometimes wrongly called wattle and daub, but which has no commonly accepted name of its own, either in Australia or overseas. This is a construction in which the main earthfast posts have nailed to either side of them straight saplings, or poles, at fairly close intervals. In the space between is packed a soft mud mixture, which could perfectly well be called cob, but for the fact that 'pug' tends to be the more general term for mud which is integrated into a timber structure. It should be noted that this pug has little or no structural function, and that it is not a plaster or daub, but a packing.

There are overseas analogies for this sort of construction, but it is doubtful whether there are overseas sources. In Normandy there is a version called *andouillage* in which only slender vertical members are used, set within the panels formed by the main posts of the structure. G-H Rivière illustrates an example at Grecey (Manches) in which the main posts are about 130 mm square. The intermediate verticals are flat slats about 80 mm wide, spaced at about 280 mm and clad on either side with quite irregular saplings, or in fact little more than twigs - close to the components of wattle and daub in proportion, but with no interweaving. This creates an armature or lattice which is filled with earth and plastered on each face to finish flush with the main posts, about 180 mm thick in total.[1]

Such construction is found in the United States in two quite different contexts. One is that of Ukrainian settlers, who undoubtedly brought the technique from their homeland, and from Galicia in particular, but another seems to be a spontaneous local development. A Ukrainian settler of the early twentieth century recalled his family house in Boryskivtsi, 'built by digging poles into the ground. Between the poles we constructed a grill-like framework and filled it with earth.' Another said:

> Our homes were made with poles set up in the ground and fastened smaller poles to the upright posts and the cracks were filled or plastered with mud mixed with hay or straw. They were finished with mud alone so it would be smoother.

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[1] Georges-Henri Rivière, 'La Maison Rurale des Pays Normands', in *Chantier 1425* (reports of a survey of vernacular architecture, early 1940s, held in the library of the Musée des Arts et Traditions Populaires), p 20.

Construction of this sort characterises a 930 square kilometre area of western North Dakota in which nearly forty such structures have been found.[2] Christopher Martin describes the horizontal members as laths, but it is clear from an illustration that they are saplings in the round (though there are later variants using sawn lathing). The posts were of cedar, about 150 mm in diameter and 0.9 to 1.2 m apart, the horizontals were of willow, and the filling was a mixture of earth, dung and straw, locally known as 'gumbo'. Sometimes small rocks were placed in the bottom, to resist erosion.

In Boyd County, Nebraska, buildings by what are described as 'German-Russian-Americans' used much the same system, with willow uprights, willow poles, and a packing of mud and straw.[3] Other examples of this construction have also been identified amongst Ukrainian buildings in Saskatchewan, Canada, though log construction is more common.[4] The same form of building is found amongst the Papago Indians, near the Mexican border. The buildings are flat-roofed and the posts, which are relatively lightweight and closely spaced, have been selected with natural forks to hold the roof beams. In some cases the poles run horizontally, exactly in accordance with the method already discussed, but in others about four poles run horizontally, and the close-set poles are vertical.[5]

It can by no means be inferred that this is an indigenous tradition, for the Indians in the region had been in contact with Europeans since 1540, and it is worth bearing in mind how much more difficult such a building technique would have been before nails were available. A very similar horizontal pole and pug technique has been found in the Great Basin area of Nevada, where the buildings are known as 'mud', pole' or 'Indian' houses, and certainly there is no Ukrainian component. However Blanton Owen sees them as having been a spontaneous local development rather than something derived from the Indians.[6] Whether or not this is the case, this does seem to be a form of construction which any settler might invent for himself, as a matter of common sense, and it must in any case be a fairly modern one, given that it is more or less dependent upon nails.

b. lath and pug

In Australia, too, this construction may have evolved spontaneously, or have been influenced by Aboriginal practices, given that it is prominent in South Australia, where the Aborigines used saplings and mud for building.[7] However the indications

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2 Christopher Martin, 'Skeleton of Settlement: Ukrainian Folk Building in Western North Dakota', in Thomas Carter & B L Herman [eds], *Perspectives in Vernacular Architecture, III* (Columbia [Missouri] 1989), p 86 ff.

3 David Murphy, 'Building in Clay on the Central Plains', in Carter & Herman, *Perspectives in Vernacular Architecture, III* , p 81.

4 Martin, 'Skeleton of Settlement', p 89.

5 Peter Nabokov & Robert Easton, *Native American Architecture* (New York 1989), pp 344-5.

6 Blanton Owen, 'The Great Basin "Mud" House: Preliminary Findings' (abstract), in Thomas Carter & B L Herman [eds], *Perspectives in Vernacular Architecture, III* (Columbia [Missouri] 1989), pp 245-6.

7 A P Elkin, *The Australian Aborigines* (Sydney 1979), p 50, cited in Irving, *History and Design*, p 34.

are that this was not the case, because split laths rather than round poles were used in the earliest versions.

This is probably derived from British practice. In 1805 William Atkinson advocated the use of timber posts of about four inches [100 mm] diameter at fifteen inch [780 mm] spacing, clad on both faces with plastering laths. The outside was to be plastered in clayey mud mixed with chopped straw, and the inside with mud or with lime and hemp.[8] According to McCann, 'mud an stud' buildings, which he equates with timber and laths, were built in many parts of England, but the majority of survivors are in Lincolnshire.[9] He seems to be conflating two different things, the widespread tradition of horizontal lathing, which is particularly common in Essex, and the inappositely named 'mud and stud' using vertical rods or split pieces, known only in Lincolnshire (as discussed above). In the early twentieth century, according to Ketteridge and Mays, practice in Essex was to use split ash poles as laths, and a coating of clay reinforced with straw and chaff.[10]

Peter Cunningham, writing of New South Wales, refers to construction of split timber and plaster, as distinct from wattle and daub,[11] and when Philip Oakden bought the King's Meadows' farm outside Launceston in 1834 there was an 'old lath and plaster' house on the site.[12] The first 'Government House' at Adelaide was described as 'constructed of mud, put between laths, supported by uprights of native wood, and ... covered thickly with thatch'.[13] In Wellington, New Zealand, Petre's house was built 'in imitation of Essex farm houses' of lath and plaster, coated in roughcast.[14] In Canterbury Charlotte Godley referred to 'cob' houses consisting of a 'frame of poles filled with clay', but she makes no mention of lathing.[15]

Where suitable materials were available twigs or poles would be used in place of split laths. A crudely built cottage in the Adelaide Hills, using round poles or twigs, was allegedly built in the 1840s, and survived into the twentieth century.[16] But there are other possible sources for the use of round poles. There was for example a related system in Somerset, where the gables of cob buildings were made with round poles nailed upright, split sticks nailed across these, and a coating of daub or rough mortar over the whole - a method known as 'split and dab'.[17] In New Zealand, an example has been found in a blacksmith's shop at Weld's Hill Station.[18] Salmond gives a

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8 William Atkinson, *Views of Picturesque Cottages with Plans, &c* (London 1805), pp 13-14.

9 John McCann, *Clay and Cob Buildings* (Princes Risborough [Buckinghamshire] 2004 [1983]), p 13.

10 Christopher Ketteridge & Spike Mays, *Five Miles from Bunkum* (London 1972), p 33.

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

12 Anne Bailey & Robin Bailey, *An Early Tasmanian Story: with the Oakdens, Cowies, Parramores, Tullochs and Hoggs* (Toorak [Victoria] 2004), p 23.

13 Robert Gouger, *South Australia in 1837; in a Series of Letters: with a Postscript as to 1838* (London 1838), p 68.

14 Charlotte Godley [ed John Godley], *Letters from New Zealand by Charlotte Godley 1850-1853* (Christchurch 1951), p 74.

15 Godley] *Letters from New Zealand*, p 159.

16 Photograph in the State Library of South Australia, reproduced in John Archer, *Building a Nation* (Sydney 1987), p 44.

17 Innocent, *Development of English Building Construction*, p 138.

18 M L D Allen, 'A Renaissance of Earth as a Building Material in New Zealand' (MArch, University of Auckland, 1991), p 57.

drawing of this type and misleadingly (perhaps under the influence of McCann) calls it 'mud and stud' construction.[19] However a house which he takes as an example, from Robin Hood Bay, Marlborough, appears to be different in principle, for the horizontals are not large saplings but slender twigs and canes, not nearly strong enough to have served as the armature for the clay infill, and obviously added to provide a bond for the daub or plaster finish.[20]

c. the mining connection

Packing with stone or other materials is a distinct tradition. In a house built in South Australia in 1851 by a German carpenter (who was generally following local rather than German practice), '1 inch wide slats would be nailed onto the beams [*sic*] and the space between these and the outer wall would be filled with earth, small stones and even wood shavings.'[21] Another example at Onkaparinga is of studwork solidly filled with rubble and finished in lath and plaster, and is also distinctive for being built of earthfast studs, with no ground plate.[22] Similar construction was used prior to 1880 at Moonta and Kadina:[23]

> The favourite building materials of the miners were pines and battens, cut from the adjoining scrub, formed into a framework, and filled in with mud and stones, all of which were to be found close at hand.

At Sandy Creek, Victoria (near the hybrid mud building which has been discussed above), there stands a stable built basically of vertical timber posts of a smaller diameter than is normal in mud construction, to each side of which have been nailed horizontally 5 centimetre saplings at 10 or 12 centimetre spacing; the gaps have been packed with smallish stones and even brickbats to make the whole wall solid.[24]

There is reason to believe that this technique of packing stones into a frame arose in mining areas. Moonta and Kadina are copper mining areas, Sandy Creek is a gold mining area.. A similar method is traditionally used for shoring mining works in the north of England, and in fact a tunnel wall of this sort has been recorded in South Australia at Wallaroo.[25] But it is also true that such rubble-filled buildings come close to French precedents, for around Paris, it was reported:

> The framed timber structure being completed, strong oak batten laths from 2 to 3 inches wide are nailed to the quarters horizontally, at 4, 6 or 8 inches apart, according to the character of the work, and the spaces between are loosely built up with rough stone rubble. A strong mortar is then laid on both sides at the

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19 Jeremy Salmond, *Old New Zealand Houses 1800-1940* (Auckland 1986), p 36.

20 Salmond, *Old New Zealand Houses,* p 35. A house at Mahiri Station, p 4, is a more convincing example.

21 G Listemann, *Meine Auswanderung nach Sued-Australien und Rueckkehr zum Vaterlande; ein Wort zur Warnung und Belehrung fuer alle Auswanderunglustige* (Berlin 1851), translated and quoted by Lothar Brasse, 'The German Contribution', *Historic Environment,* VI, 2 & 3 (1988), p 48.

22 Gordon Young [ed], *Onkaparinga Heritage* (?Adelaide 1988), p 184.

23 H M Franklyn, *A Glance at Australia in 1880* (Melbourne 1881), p 93.

24 Warwick Hatton at al, 'Maldon' (5 vols, BArch University of Melbourne, 1964), p 106.

25 Oswald Pryor, *Australia's Little Cornwall* (Adelaide 1969 [1962]), facing p 48.

> same time, and pressed completely through from opposite sides, so that the mortar meets and entirely embeds the stone rubble by filling up all the hollows, and with so much body on the surface as to completely cover up and embed the timber and laths.[26]

Pierre Chabat's *Dictionnaire* illustrates something of the sort, except that the blocks of rubble are so large and square that they would have to be built into place before the laths were laid across the surface, rather than after.[27]

Regardless of its possible mining origins, the stone packed frame was to spread more widely in Australia. A writer in the *Sydney Morning Herald* in 1870 instructed:

> Make a frame of stout saplings driven into the ground, or (which is better) raised upon a rough stone foundation. Nail stout laths on either side of the saplings. Fill the spaces between the laths with rubble, gravel, or any hard substances which will lie close. To make the work solid throw in, as it goes in, a cement of moist clay and loam. If a little lime is mixed therewith it will be all the better. The wall thus made will be a very solid one, and may be finished off with plaster.[28]

The way in which clay or loam is used in this description suggests an approach towards the earth-filled frame of standard pole and pug construction.

In a butcher's cool store at Porcupine Flat, Victoria, believed to date from about 1864 (and destroyed in the 1970s by fire and erosion), the timber structure was similar to that at Sandy Creek, about eight kilometres distant, but the infill was of mud rather than stone.[29] The same method, and sometimes a variant using split or sawn laths instead of round saplings for the horizontals, was in very extensive use from the 1860s in the Hill End and Gulgong mining districts of New South Wales. Not only are many such buildings recorded in the famous Holtermann photographs,[30] but a substantial number can still be found today in Hill End itself and in the vicinity of Wattle Flat, Hargrave, Mudgee and Gulgong.

All the places named are gold mining areas, which again tends to support a mining origin, but one possible case occurred prior to the gold rushes in Victoria. Charles and Marian Ryan's 'Killeen' homestead at Longwood, near Euroa, built in 1849,[31] was described by Marian as being of 'pisa' with walls two feet [600 mm] thick:

> To make pisa there is first a lattice work of wood, two feet in depth; the interior is filled with clay or earth and chopped straw and is rammed down very hard, then cemented all over outside, at least I suppose it is a sort of cement.[32]

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26 C B Allen, *Rudimentary Treatise on Cottage Building* (2nd ed, London 1854 [?c 1845]), p 37.

27 Pierre Chabat, *Dictionnaire des Termes Employés dans la Construction* (2 vols, Paris 1875 & 1878), I, p 952.

28 *Sydney Morning Herald*, 8 April 1870, p 5.

29 The only recently surviving portion of 'Wendy' Brown's Foresters' Arms Hotel and butchery, which was taken to be of the same date at the original buildings.

30 Keast Burke, *Gold and Silver* (Melbourne 1973), passim.

31 For the acquisition of the run see George Mackaness [ed], *The Correspondence of John Cotton* (3 vols, Dubbo [NSW] 1978 [original date unspecified]), III, p 43.

32 Maie Casey, *An Australian Story 1837 - 1907* (Melbourne 1962), p 89.

Despite the reference to ramming, it is hard to accept that a structure of clay, and containing chopped straw, is pisé in any meaningful sense. It is even harder to imagine the solid shutters or *banches* of pisé construction could be described as 'a lattice work of wood'.

The earliest description of the building of such a structure is that of the American A B Peirce in about 1872 or 1873. He used split poles, and he may also have been the first to mis-describe this construction as wattle and daub. His three-roomed house at Hill End was:

> ... constructed in the regulation style, without sills, by simply driving saplings into the ground at regular intervals, on either side of which were fastened the wattles or split limbs, forming horizontal half-rounds, the space between them being filled in solid with a mixture of earth, water, and grass.[33]

Near Gulgong there is one building which has, as it were, translated this system of construction from the level of low technology to that of medium technology, though it still appears to be of nineteenth century date. The framing is in sawn scantling rather than round timbers; on each face of the frame is nailed wire netting rather than saplings; the infill is still of mud, but the final rendering coat over the wall surface is of cement rather than the traditional mud and/or lime.

d. dissemination

Just like the stone packed frame, pole and pug spreads far beyond the mining areas in which it originated,[34] and while it should be distinguished from wattle and daub, I would not seek to deny a connection between the two. At French Island a survey of the surviving structures was conducted in 1981 by Colin Munro of the Department of Architecture at Melbourne University, together with the writer and a group of architectural students. It has suggested some degree of continuity between Gairdners' farmhouse, the wattle and daub structure discussed above, and the various pole and pug structures which later proliferated on the island. Other buildings, perhaps of related construction, were built on the south part of the island in the late 1860s and 1870s. Then in the 1890s a benign government allowed the casualties of the economic depression to establish themselves on the island, with a minimum of direct financial aid, in settlements with names like 'Perseverance' and 'Energy'.

The new settlers landed of necessity at the only jetty, near the Gairdners' cottage, and proceeded north as best they could out of the farmland and into the untracked scrub. On the poor soil of the island they attempted to grow chicory, but for the most part were forced within a few years to abandon an unequal struggle. There was no ready means of transporting building materials from the mainland, even had they been able to afford to do so, and just as John and William Gairdner on the same island had

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33 A B Peirce [ed A T Leatherbee], *Knocking About* (New Haven [Connecticut] 1924), p 128.

34 An example on the Perthville to Evans road, near Bathurst, New South Wales, originally had a shingle roof, and appears to be relatively early (whereas the other end of the building has solid walls, possibly pisé, and a roof of Redcliffe iron suggesting a ate nineteenth or early twentieth century date): inspected 2002.

resorted forty or fifty years earlier to wattle and daub, so the chicory planters, almost without exception, built frames of round timber and filled them with mud packed between saplings. It is possible that they simply misinterpreted the construction they saw at the Gairdners' earlier building, and at least probable that it was what drew their attention to the slender saplings available for building purposes.

These interesting buildings have decayed at a fearful rate in recent years, but examples can still be found at the 'Energy' settlement. The size and spacing of the uprights varies upwards from 80 millimetres diameter and 600 millimetres apart, and the horizontal saplings are about 20 millimetres in diameter and spaced perhaps 100 millimetres apart. At 'Roseneath', a now demolished house at Tankerton in the south-west, split laths are used in place of saplings, but this is now thought to have been later than the other examples.[35] At 'Bondsville' (formerly 'Sproxton'), a house towards the south-east of the island which has now almost collapsed, the surface has not been rendered smooth over the saplings but, as it were, weather-struck on a slope upward from the outer edge of one sapling to the inner edge of the next, producing an overlapping effect rather like weatherboard in appearance. This same weather struck form has also been found on a much earlier mainland building with strong German antecedents, 'Friedensruh' at [Waldau Court] Doncaster, near Melbourne, dating from 1853.[36]

The tradition continues well into the twentieth century with what are called simply 'pug' buildings, in which the horizontals are split laths rather than round poles. Photographs show the construction of such buildings at Alectown, New South Wales, as late as 1914. A later example of conventional pole and pug construction in Victoria, a small creamery building at 'Glenburnie', Devon Meadows, which dates from the 1920s, should probably be seen as related to the buildings on French Island, for it is not near to any mining area or to any other node of such construction.[37] In South Australia the same manner of building is found in a miner's house to the north-west of Echunga which probably dates from the depression years of the 1930s.[38]

These forms of construction may, at places like Maldon or Hill End, have developed from the miner's system of saplings and stones, which has been discussed; they may at French Island be a primitive descendant of the wattle and daub already used in the area, or a spontaneous response to the local conditions and available materials; they may have been of some yet to be identified German origin; or they may have other direct European origins.

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35 For the general history of the island see Nimmo, op cit: in inspecting individual buildings I have been guided by a local resident, Mr Chris Chandler.

36 National Trust file no 1460.

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

38 Paul Stark, *Meadows Heritage* (Meadows [South Australia] 1983), p 143. The modern photo appears to show it totally concealed by later work, but the construction is visible in an older illustration from J Whimpress, *Echunga 1839-1939* (Adelaide 1975), p 53.