

### 5.03 Carpentry

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#### *a. the British tradition*

Carpentry is one of the basic trades imported to Australia from Britain, though not without some difficulty, as Governor Phillip himself noted. He found that only sixteen carpenters could be mustered out of all the ships' crews and all the convicts who reached Sydney in 1788.<sup>1</sup> Moreover, whilst stonemasonry techniques were transported to Australia virtually unaltered, the use of timber differs markedly from English practice in a number of respects. The reasons for this can be boiled down essentially to three: the hard but often fissile character of native timbers; the relatively high cost of labour (in the post-convict era); and the importation of pre-cut and prefabricated components. Local construction tended at first to be traditionally English in character - which is true even where no actual English prototype can be found, as in the eaves joist construction discussed below.

Within these parameters, Australian practices are themselves very diverse and are often quite difficult to work out. There are a number of instances of 'earthfast' construction, with the vertical members running directly into the ground, a very primitive approach in terms of British practice (in which the ground sill dates from Saxon times). In North America earthfast or *poteaux-en-terre* construction is regarded as the more primitive form, at least partly deriving from the palisade construction of the native Americans. The problem of rotting post bases caused it be generally superseded by building on a horizontal plate (itself commonly on top of a substantial stone plinth), known as *poteaux-sur-sole*.<sup>2</sup> Earthfast construction is found especially in New South Wales (? and later in some German buildings in South Australia) in response to the problem of rotting post bases. At 'Hadley Park', Castlereagh, a single storey building which is thought to be the original cottage of about 1806-11, is framed on earthfast posts of the order of 140 mm square at about 950 to 1,000 mm centres.<sup>3</sup>

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<sup>1</sup> [Arthur Phillip], *The Voyage of Governor Phillip to Botany Bay* (London 1789), p 80.

<sup>2</sup> Hugh Morrison, *Early American Architecture from the First Colonial Settlements to the National Period* (New York 1952), p 157.

<sup>3</sup> From inspection, 1997, and from Graham Edds & Associates, '*Hadley Park*' *Conservation Management Plan* (Richmond [NSW] 1996), p 54.

Alexander Harris's description of slab construction, previously mentioned, has round posts or trunks set in the ground, but above ground dressed down to a square section. Precisely the same thing is done in more conventionally carpentered houses, such as the old wing at 'Barooga', in the Riverina of New South Wales, thought to date from the late 1840s. The posts are possibly 350 mm in diameter, and set up to a metre into the ground, but above ground they are dressed down to a little over 150 mm [six inches square]. Between them ran nominally eight inch [200 mm] square ground sills, with some intermediate support from blocks of timber, but these sills have now been replaced.<sup>4</sup> Much the same occurs at 'Moranghurk' homestead, Victoria, where the round bases reduce to chamfered square posts, and the ground sill is grooved to take vertical slabs.<sup>5</sup>

Broadbent reports that 'The Cottage' at Mulgoa was framed with posts at 450 to 600 mm centres set directly into the ground.<sup>6</sup> But such buildings are certainly in the minority, and even in so primitive a construction as vertical slabs, a grooved wall plate is more normal. But to place a wall plate directly on the ground is itself a solecism in English terms, not because stumps would be expected, but because any respectable British building would tend to have a masonry plinth.

The specification for a Melbourne building of 1839 gives a good idea of standard practice (including the use of stringybark):

Provide and lay for wall plates to receive the ground floor of joists one inch stringy-bark boards [scarfed] where necessary and securely nailed. The ground joists to be eight inches by three [200x 75 mm] and to be laid 15 inches [380 mm] apart. The joists of gallery to be laid as shown in the plan, and to have a secure hold in the wall, and notched into the wall plate, which will be eight inches by three inches properly scarped and nailed. Provide and fix as the work proceeds window frames of well-seasoned stringy-bark five inches by three inches with proper stops and batten beads. Provide and fix door frames of pine five inches by three inches. Provide and lay for top wall plates stringy-bark four inches by three inches properly halved and securely nailed at the joints and angles. The wall plates to be laid four and a half inches [115 mm] from the outside of walls, and flush with the top of brick work. Lay on wall plates ceiling joists eight inches by two and a half inches [200 x 65 mm] to project 12 inches [300 mm] from the face of the wall all round the building.<sup>7</sup>

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<sup>4</sup> Inspection January 2000, and information from the owner, Mr John Jarrett. The property was taken up by George Hilar in 1847, and the building is thought to date from this time.

<sup>5</sup> A R J Billman, 'The Timber Vernacular: Building Techniques of Domestic Timber Architecture in Geelong and the Western District 1840-1870' (BArch, Deakin University, Geelong, 1992), diagram 20.

<sup>6</sup> James Broadbent, 'Aspects of Domestic Architecture in New South Wales 1788-1843' [3 vols, PhD, Australian National University 1985], I, pp 20-21, n 54.

<sup>7</sup> [Joseph Burns], 'Specification of sundry works required to erect and complete a School-house, in connection with the Presbyterian Church, Melbourne, according to the accompanying plans', in Michael Cannon [ed], *Historical Records of Victoria*, III (Melbourne 1984), p 517.

The more elaborate joints of traditional British carpentry tend to be eschewed in Australia. The tusk tenon is occasionally found,<sup>8</sup> but it is not a logical form. The American R G Hatfield explained that the joint is rarely cut so accurately that both tenon and shoulder are in effective bearing. All that is achieved, therefore, is to unnecessarily weaken the trimming beam into which the trimmer is housed.<sup>9</sup> Few of the many scarfed joints known in British practice for joining timbers end-to-end are to be found in Australia. However one classic type is that with a zig-zag profile like a lightning flash (and hence called *trait de Jupiter* in France,<sup>10</sup> and sometimes also in Britain<sup>11</sup>), and in one version of it the flash is on an angle across the timbers, and a small square opening is left at the centre, so that wedges can be driven in to lock the joint firmly.<sup>12</sup> Although this seems to be rare in Australia, it is found in the Henty barn at Muntham, Victoria, which probably dates from the 1850s.<sup>13</sup>

It is no accident that regional variations are strongest before 1900. Until there were local textbooks on building there could not be any really consistent local development - that is, the innovations and variations, of which there were many, have to be seen within the context of British practice, just as they would be if they occurred in Yorkshire. The first ostensibly local text on carpentry was the *Australian Amateur Carpenter and Builder*,<sup>14</sup> published about the turn of the century, nominally in Sydney. It is in fact nothing but a locally issued version of an English text of two decades earlier, *Every Man His Own Mechanic*,<sup>15</sup> as is indicated by the fact that it describes British and European timber species rather than Australian ones. It was divided into three sections, each separately paginated, and at least one of these 'Ornamental and Constructional Carpentry and Joinery' was also published separately in Melbourne by E W Cole.<sup>16</sup>

<sup>8</sup> For example, in trimming an upper floor opening at 'Pontville', Victoria, and the store at 'Memsie', Bridgewater, Victoria, where the timbers were still visible shortly after the collapse of the building in 2004.

<sup>9</sup> R G Hatfield, *The American House-Carpenter* (New York 1852 [1844]), pp 190-191.

<sup>10</sup> Pierre Chabat, *Dictionnaire des Termes Employés dans la Construction* (2 vols, Paris 1875 & 1878), I, p 750.

<sup>11</sup> E L Tarbuck, *The Encyclopædia of Practical Carpentry and Joinery, &c* (Leipzig, no date [c 1860]), p 150.

<sup>12</sup> John Wood, *A Series of Plans for Cottages or Habitations of the Labourer* (London 1806 [c 1781]), p 16, note c, and miscellaneous plate 2, figs 4 & 5, refers to it as an 'indented joint'. Peter Nicholson, *Mechanical Exercises; or, the Elements and Practice of Carpentry, &c* (London 1812), p 70 and plate 4, fig 4, calls it a 'single oblique tabled scarf'. Peter Nicholson, *Nicholson's New Carpenter's Guide* (London 1825), pl xli, illustrates it but describes it only as one of the methods of scarfing timber. [Peter Nicholson], *Practical Carpentry, Joinery and Cabinet-Making* (London 1839 [1826]), p 19 & plan x, fig 2, describes it as a 'scarf, with indents, and wedges, to draw the joint close'. Tarbuck, op cit, p 150, pl 21, fig 19 & pl 22 fig 42, finds all these joints objectionable on the grounds that they weaken the timber, and illustrates a version without the key (but does not recommend it) and another with the key (of which he says nothing). James Newlands, *The Carpenter and Joiner's Assistant* (Glasgow 1865), p[ 148 & pl xxix, fig 3, describes and illustrates and, like some of the other authors, has the joint strengthened with bolts running through it laterally.

<sup>13</sup> Information from Chris How, 2006.

<sup>14</sup> *The Australian Amateur Carpenter and Builder* (Sydney, no date [c 1900]).

<sup>15</sup> [Francis Young] *Every Man His Own Mechanic* [London, no date [1882]]. The preface is signed 'F.Y.', and Francis Young is named as author in the tenth edition of 1893: see item 219 of *Catalogue 118* of the Bow Windows Bookshop [Lewes, Sussex].

<sup>16</sup> *Cole's Ornamental and Constructional Carpentry and Joinery* (Melbourne, no date [c 1900]).

### ***b. the German tradition***

The German tradition of half-timbering, *fachwerkbau*, is far more homogeneous than the British, and it remains almost equally homogeneous when it manifests itself in Australia. The infill may be brick or *lehmwickel*, and the building may be on a plinth or (much more rarely) raised on stumps, but the family resemblance is very strong. Fachwerkbau is distinguished by a series of complex traditional joints, not easily described, and by a framing of squarish studs spaced typically at about 800-900 mm centres, with diagonal bracing *within* certain panel, floor to ceiling, at a relatively steep angle. Because these braces do not intersect the studs the question of which member prevails (or whether they are halved together) - so critical a diagnostic in the British tradition - does not even arise.

The German migration to Australia was part of a widespread *Auswanderung*, caused by an increase population which the land could not absorb, increases in prices, and the incapacity of farmers in some areas to maintain the payments for their land which were part of the process of de-feudalisation. The emigrants were almost entirely rural and lower middle class - small landowners, village shopkeepers and artisans. One wave of migration was stimulated more specifically by religious concerns, when King Frederick William III of Prussia first introduced and then made mandatory a prayer book which was unacceptable to many Lutherans. Pastor A L C Kavel, who adhered to old Lutheranism, led his congregation at Klemzig to migrate to South Australia in 1838. This group, and others which followed, established the best-known German settlements, which are those of the Barossa Valley.<sup>17</sup>

Migration to other parts of Australia was for more mixed reasons, and to some extent the result of active recruitment by agents of the colonial governments. Westgarthtown outside Melbourne dates from about 1850, but the buildings are stone-walled. German settlements in western Victoria, at first by way of secondary emigration from South Australia, date from the 1850s, but there continued to be a strong German influx into the Wimmera and then the Mallee district for the rest of the century. Elsewhere there are concentrations of Germans at Doncaster and other places near Melbourne, and at individual rural locations including Germantown, later Grovedale, which will be mentioned below. There is a small German settlement at what became Collinvale [CHECK], Tasmania. Towards 1860 Germans reached the Riverina of southern New South Wales, and there is a German building of the 1850s at Ashfield, Sydney, as discussed above. There were also Lutheran and Moravian mission establishments in various localities.

In Queensland there was a Gossner mission established at Nundah in 1838, and a steady stream of German immigration subsequently, followed by an expanded intake in the 1860s due to the promotional activity of J C Heussler, emigration agent for Europe from 1861. After the government established the Logan Agricultural Reserve in 1861, extended in 1863, a large group of German families from Posen, Brandenburg and Hessen-Darmstadt arrived in 1863-4 and established the village of Bethania. By the end of the century the district was said to be almost entirely

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<sup>17</sup> Gordon Young et al, *Hahndorf* (2 vols, Adelaide 1981), pp 49-50.

inhabited by Germans, and at Gramzow (now Carbrook) Christian Kruger had a fachwerk house which survives today. It was built for him at some time after 1872 by August von Senden, a native of Holstein, who may have been responsible for a number of buildings in the area.

The Kruger house was framed in grey ironbark from the property, pre-cut with the major timbers running the full length of the house, or about twelve metres long, and 180 mm square. They were marked with chiselled Roman numerals and symbols to identify each piece and the wall to which it belonged. Joints were mortised, tenoned, and secured with wooden pegs. Each wall frame was assembled and then raised on stumps, and the whole allegedly completed during one day's work by fourteen men, then infilled with brick.<sup>18</sup>

The German tradition is not confined to *fachwerk*. It extends to some forms of earth construction, to *lehmwickel*, as discussed above, and to thatching, framed barns, semi-underground cellars, and haufendorf-style village planning. Some carpentry details show distinct resemblances to those of the Dutch barns of North America, which have been examined in detail by John Fitchen, and in particular the junction of post and beam with angled braces and pegged mortice and tenon joints,<sup>19</sup> as in the Schubert house at Lobethal, South Australia.<sup>20</sup>

### *c. base wall plates*

One case is known of a house built onto a plinth, but without any base plate. It is that of a German settler at what was originally Germantown, and is now Grovedale, Victoria, which is a properly carpentered building of the 1850s. The floor joists rest directly onto the masonry, and the studs are attached to the sides of the joists, which is rather suggestive of what is termed balloon framing, as discussed below, in distinction to the platform framing of current Australian practice. Whether this derives from any German tradition I am unable to say.

The house made in Sydney in 1837, for Captain Lonsdale to take to Melbourne, is shown in the drawings as though the plates were on the ground, though as built they were substantially raised. The plates are 6 x 4 inches [100 x 150 mm] laid on the flat, and the floor joists rest on them, checked out about 50 mm at the lower corner.<sup>21</sup> Where plates were placed directly on the ground they generally have long since rotted, but in the original (about 1843) part of Mills Cottage, Port Fairy, Victoria, there are indications that the wall plates were placed on the flat and halved together at the corners, that a light brace also joined them at the corner, and that the floor joists ran in on top of the plate and between the wall studs<sup>22</sup> - again rather in the manner of balloon framing. An unusually late example in which the floor joists rest on top of

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<sup>18</sup> Maureen Lillie, 'Kruger's Farm - a German Building in Queensland', *National Trust Journal of Queensland*, 6 (1996), pp 13-15.

<sup>19</sup> John Fitchen, *The New World Dutch Barn*, (Syracuse [New York] 1968), p 112.

<sup>20</sup> Gordon Young et al, *Lobethal 'Valley of Praise'* (Adelaide 1983), p 209.

<sup>21</sup> 'Plan and Elevation of Wood House for Port Phillip' & 'Section through AB of framed House prepared for Port Phillip', in Port Phillip Establishment plans, 1846-7, location 2/8477, New South Wales Archives.

<sup>22</sup> Miles Lewis, 'The Construction of Mills Cottage' [mimeograph report, Melbourne 1986], p 21.

the plate rather than below it is Blood's cottage, Box Hill, Melbourne,<sup>23</sup> a house which, though it contains early materials, seems to have been rebuilt in the 1890s.

George Robertson's buildings at 'Warrock', Victoria, show one very distinctive characteristic. Rather than a true platform frame or a true balloon frame connection between wall and floor, the two elements are more or less independent. In Robertson's original hut, which dates from even earlier in the 1840s, the walls are fully lined on the inside face down to the plate, and the floor joists and boarding simply butt against this lining. But this is a building with a chequered history, and was long ago moved from its original site, where it may have once had an earth floor. The old shearing shed, also of the 1840s, has a brick plinth, upon which rests the base plate of the stud wall, as well as the ends of the joists. The joists are checked out slightly over the plate, but the connection is by no means integral. In the belfry building, of 1863, there is a similar arrangement, in which the end of the joist is checked over the plinth. The base plate is in principle quite independent of the joists, but the two have been linked by skew nailing.

#### *d. lightweight construction*

Innovations in the direction of lightness and standardisation are associated first with the importation of precut and prefabricated components, and then later with the use of steam powered sawmills and other machinery. The roof trusses of various buildings of the 1830s and 1840s, as discussed below, seem to fall into the first of these categories. The gold rushes of the 1850s saw massive importation of timber buildings from England and elsewhere, generally of lighter construction than would otherwise be normal. But they also saw local building become much lighter, as is graphically indicated in William Howitt's account of a stud frame resting on stumps, which looked to English eyes no more substantial than a surveyor's pegs:<sup>24</sup>

The timbers of which their skeletons are first formed are often only two inches by two and a half in thickness. I actually measured some in Collingwood, - the spars and joists about two inches by three. The floors are generally raised about a foot from the ground, and are principally supported by pegs driven into the ground, just as you see pegs driven to mark out the site of any intended building. The whole thing, before they cover it with boards, looks more like a spider's web, or a bird's cage, than anything else. You imagine you might just kick it over, as you would a basket.

This tendency towards lightweight construction and the use of the stud frame, as discussed below, was specifically attributable to the conditions of gold rush Victoria. Conservative British practices were largely re-established in the following years, but in the long term local conditions favoured the development of the lighter stud frame construction. There was, however, another type of lightweight construction which was traditional, and which was used in the 1850s for internal walls - the 'ledged

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<sup>23</sup> Allan Willingham, *Blood's Cottage, 519 Station Street, Box Hill* (North Fitzroy [Victoria] 1990), p 90.

<sup>24</sup> William Howitt, *Land, Labour, and Gold* [2 vols, London 1855], I, p 286.

partition'.<sup>25</sup> This was a single layer of tongued and grooved boarding running vertically from floor to ceiling. The only identified surviving examples in the southern parts of Australia are British prefabricated houses, but the system had been used for cottages in Britain since at least the late eighteenth century. John Wood advises that partitions should be 'of boards *one inch and a quarter* [32 mm] thick, grooved and tongued, and planed on both sides ...'.<sup>26</sup> In the United States the Housewright's Rules of Portland, Maine, in 1805, list 'Rough partition solid of plank', 'if the planks sawed from 3 to 4 inches in width shot and set edgewise ...', 'Planed partitions, on one side, battened, or matched', 'If planed on both sides', 'Plank partitions, planed on one side, battened, or matched', and 'if planed on both sides'.<sup>27</sup> Such walls had become accepted at Cape Town,<sup>28</sup> and they seem to have been used also in fitting out ships for passengers.

In the Tide Surveyor's house at Moreton Bay [Brisbane] in 1858 a minor partition was specified 'to be of 1<sup>1</sup>/<sub>8</sub>" grooved and tongued pine boards wrought to slip on floor and capped on top'.<sup>29</sup> These partitions were later to become widespread in Queensland, and were regularly associated with the single thickness lining of exposed frame external walls, as discussed below. In 1925 the Commonwealth Government Architect, J S Murdoch, said:

The supporting capacity of a 6-inch by 1-inch board, standing on its end, in position as part of a partition, is enormous. Studs would have to be put at the end of the partition, and also at the sides of each door. No other studs would be required, and studs 3 x 2 in. [75 x 50 mm] would be quite sufficient. In Melbourne, and even to some degree in Sydney, builders are horrified at these methods of construction, but in Queensland there is a full understanding of this class of building.<sup>30</sup>

In the United States it appears that 'boxed houses' were built in this way, including the external walls (sometimes with vertical battens), and often lacking even corner posts - though it is difficult to see how this could be practicable. But the general consensus seems to be that they appeared only in the late nineteenth century, later than the Australian examples, and continued to the mid-twentieth. They are mentioned in the mid-south, especially western and south-western North Carolina, East Tennessee and Appalachian Kentucky.<sup>31</sup> During the building materials shortage after World War II

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<sup>25</sup> Wyatt Papworth [ed], *The Dictionary of Architecture* (London 1853-92), sv 'Ledged Partition'.

<sup>26</sup> John Wood, *A Series of Plans for Cottages or Habitations of the Labourer* (London 1806 [?1781]), p 14.

<sup>27</sup> *Housewrights' Rules of Work for the Town of Portland* (Portland [Maine] 1805), p 15, reproduced in L F Sprague, A C Ives & E G Shettleworth [eds], *Joiners and their Price Books in Portland, Maine 1760-1819* (Augusta [Maine] 2003), p 52.

<sup>28</sup> R B Lewcock, *Early Nineteenth Century Architecture in South Africa* (Cape Town 1963), p 387.

<sup>29</sup> Don Watson, *The Queensland House* [typescript report] (Brisbane 1981), pp 5.3- 5.4.

<sup>30</sup> Australia, Parliament. Parliamentary Standing Committee on Public Works, *Establishment of Royal Australian Air Force Station (No. 2), at Richmond, New South Wales* (Melbourne 1925), evidence of J S Murdoch.

<sup>31</sup> This is derived from a query by Marvin Brown and responses by R D Jones, Bill Macintyre, Tony Vanwinkle and M A Williams on the Vernacular Architecture Forum web site, July-August 2003. The main published source appears to be M A Williams, *Homeplace: the Social Use and Meaning of the Folk Dwelling in Southwestern North Carolina* (University of Georgia Press 1971).

an attempt was made in Australia to develop 'shell construction' in which all internal walls were lightweight and were carried on the regular floor structure, without regard for the location of stumps. Full scale tests of this construction were carried out at the Commonwealth Experimental Building Station at Ryde, Sydney.<sup>32</sup> Nothing seems to have come of it, and it is not hard to envisage the acoustic and other problems which would have resulted.

### *e. cladding*

Cladding in flush boarding, as distinct from overlapping weatherboards which are better calculated to exclude water, is rare in Australia. However 'Wood Cot Park' in Gippsland, believed to date from 1854-5, is clad in roughly sawn packing case-like boards. These were clearly imported, and are marked with an 'F' in a broken diamond, though why an 'F' is unclear, as the first owner was James Neilson. Here it has been claimed that the boards were covered in oilcloth, though (as will be discussed below), the evidence suggests otherwise. The next stage of sophistication is rebated boarding, in which the downward projection of the upper board covers the upward projection of the lower one. An example of this occurs on a cottage at 14 William St, Port Fairy, Victoria, thought to date from about 1847. The boards are of hardwood, and therefore of colonial origin, most probably from northern Tasmania. They are about 20 mm thick, between 180 and 260 mm broad and about 3.5 metres long.<sup>33</sup> This simple rebated form is not nearly so prominent as the type which presents a recessed joint on the face, sometimes called 'shiplap', or what becomes 'chamferbord' in Queensland.

At this point it becomes necessary to clarify the main terms, almost none of which has a universally agreed meaning. The term 'weatherboard' is not a universal one, in the sense that in Britain it sometimes embraces a wide range of cladding types, and in the United States it tends to refer to vertical board and battening. In Australia it refers to horizontal boards overlapping in a sawtooth profile, which is almost certainly the oldest form of weatherboard, traceable to medieval Europe, and probably very much older. It originally consisted of split boards of a very irregular character, but by the nineteenth century these had been almost entirely superseded by sawn boards of uniform size. In England it seems that 'weatherboard' was at first applied primarily, but not exclusively, to this form of lapped boarding. In America this is generally called 'clapboard', a term originally used in Britain for a board suitable for cooperage of wainscot, and deriving originally from the German *Klap-holz* or *Klapper-holz* meaning barrel staves.<sup>34</sup> But this usage is not universal even in the United States, and in Virginia it was called weatherboard as in England.<sup>35</sup> Here we will use the term 'weatherboard' to mean horizontal lapped boarding, unless otherwise specified.

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<sup>32</sup> Australia, Department of Works and Housing, Directorate of Housing, *Australian Housing, Bulletin 10* (Melbourne 1946), p 173.

<sup>33</sup> Information from Marten Syme, 2004.

<sup>34</sup> H Morrison, *Early American Architecture* (New York 1952), p 30.

<sup>35</sup> Wyatt Papworth [ed], *The Dictionary of Architecture* (London 1853-92), sv 'Clapboard'. See also Morrison, *Early American Architecture*, pp 16, 30-31, 138. William Toomath, *Built in New Zealand* (Auckland 1996), p 184 n 3, claims that there is a further distinction in that overlapping boards were called clapboards if they were of the older split type, and weatherboards if they were sawn.

The term *whetherborde* is recorded in English, with the present meaning, in 1539-40,<sup>36</sup> but in the late sixteenth century it was used only for farm and other non-residential buildings. In the eighteenth century it was used for artisan accommodation, and became a regional type in the Weald of Kent, parts of Essex, Hereford and Buckinghamshire, and much of East Sussex. Originally it consisted of rough dressed boards of oak or elm, fixed with wooden pegs, and generally unpainted except in coastal areas. Later softwoods and nails came to be used,<sup>37</sup> and quirked or beaded edges in more pretentious work. Neve said in 1703 that the term meant

the nailing up of Boards against a Wall ... This Work is commonly done with Feather-edg'd-boards ... In plain work they nail the thick edge of one Board, an Inch, or an Inch and a half over the thin edge of another: But if the work is to be a little extraordinary, they set an O--G on the thick edge of every Board.<sup>38</sup>

Weatherboarding was used in Sydney in the 1790s,<sup>39</sup> but did not become common in houses until about 1800. James Grant described at this time how 'every man becomes the master of his own house, and when he can afford it, he weatherboards and paints it',<sup>40</sup> and in 1803 George Caley noted that weatherboard was the most preferred material, and would be much more used if there were a sawmill.<sup>41</sup> It is possible that it was still being imported at this stage, given the difficulty of sawing local timbers into small sizes. By 1839 weatherboard was so common that a number of government buildings in Melbourne were clad in it,<sup>42</sup> and Andrew Petrie recorded the existence of a 'Weather Boarded Verandah Cottage' amongst the government buildings at Moreton Bay [Brisbane].<sup>43</sup> In New Zealand Charlotte Godley wrote in 1850 of the churches at Wellington 'built of the universal weatherboard (the only thing that successfully stands through earthquake)',<sup>44</sup> but it would be rash to assume that this meant weatherboard in the modern Australian sense, for it might well have referred to the vertical board cladding which was common in New Zealand.

Weatherboard was so little used in rural areas that property and place names reflect the exceptional examples, as in the case of the 'Weather-boarded Hut', a military

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<sup>36</sup> *Oxford English Dictionary*, sv.

<sup>37</sup> Geoffrey Sharpe, 'Discovering Historic Facades and Cladding', *CHS Newsletter*, 53 (April 1999), p 7.

<sup>38</sup> Richard Neve [attrib], *The City and Country Purchaser, and Builder's Dictionary: or the Compleat Builder's Guide* (London 1703), p 285.

<sup>39</sup> Irving 'The First Australian Architecture', p 192, cites the Union Hotel, licensed in 1798.

<sup>40</sup> James Grant, *The Narrative of a Voyage of Discovery performed in His Majesty's Vessel the Lady Nelson* [London 1803], p 83.

<sup>41</sup> Irving, 'The First Australian Architecture', p 162, quoting George Caley to Sir Joseph Banks, 1803, *Historical Records of New South Wales*, V, p 294. For advertisements for the sale of weatherboard houses see the *Sydney Gazette*, 2 April 1803, p 4; 12 June 1803, p 1; 3 July 1803, p 4; 25 December 1803, p 1; 1 April 1804, p 3; 8 April 1803, p 1; 27 May 1804, p 4; 16 September 1804, p 4

<sup>42</sup> James Rattenbury to C J La Trobe, 'Survey of Government Buildings erected in the District of Melbourne', 14 December 1839, in Michael Cannon [ed], *Historical Records of Victoria*, III (Melbourne 1984), pp 222-226.

<sup>43</sup> Ian Evans et al, *The Queensland House: History and Conservation* (Mullumbimby [New South Wales] 2001), pp 222-226.

<sup>44</sup> Charlotte Godley [ed John Godley], *Letters from New Zealand by Charlotte Godley 1850-1853* (Christchurch 1951), p 87.

station at Springwood in the Blue Mountains in 1826, which within a few years had become an inn.<sup>45</sup> Louisa Meredith stayed at what was now the Weatherboard Inn in 1839 and commented that the material was used in many houses in the colony, but found it necessary, nevertheless, to explain that 'the walls [consisted] of thin boards lapped over one another, nailed to upright slabs or posts, and lathed and plastered within.'<sup>46</sup> In the Port Phillip District in the same year William Russell, similarly, felt obliged to elaborate on 'what they call weather boards - thin deals overlapping each other' facing the walls of his brother's hut.<sup>47</sup> It seems to have been built in about April-May 1839, when the site was chosen as the headquarters for the Clyde Company,<sup>48</sup> and the Russells regarded it as exceptionally comfortable compared with others in the Western District.<sup>49</sup> In about 1848 G D and W D Mercer built a weatherboard head station on their run to the west of Geelong, Victoria, and so distinctive was this that henceforward the run was known as 'The Weatherboard'.<sup>50</sup> However in the same year Bishop Perry and his wife were able to stay in a weatherboard building much further to the west, the Golden Fleece Hotel at Woody Yallock.<sup>51</sup> At this time H W Haygarth complained that weatherboard cottages, though common near the capital (meaning Sydney) and in the more settled parts, were 'looked on as a sort of unnecessary luxury, beyond the boundaries'.<sup>52</sup>

A complete typology of weatherboarding is beyond our scope here, but it may be said that generally boards cut or split on site are rectangular in section, whereas many of the imported pine boards were cut, either at the mill, or after the timber reached Australia, into tapered sections. The thin edge was at the top, and would be covered by the overlap of the board above, so the exposed bottom edge was the thick one. Such sections of course form a rectangle when placed in pairs with the tapers in opposing directions, and they are indeed cut in this way out of rectangular sections. Deals were sometimes described as two-, four- or six-out, according to how many boards could be cut from them. Although the site-cut boards were more often rectangular in section, this did not preclude an ornamental treatment of the exposed edge, such as the quirk or bead which often appeared on it in the 1840s and 50s, which in these circumstances was of course run by hand.<sup>53</sup> Later examples are more varied, the single beaded edge often giving way to a more feathered profile. The simple bullnose rarely appears before the 1890s, and it then continues until the mid-twentieth century.

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<sup>45</sup> J D Lang, *An Historical and Statistical Account of New South Wales* (2 vols, London 1834), II, p 134.

<sup>46</sup> [L A] Meredith, *Notes and Sketches of New South Wales* (London 1844), p 72.

<sup>47</sup> William Russell to relatives in Scotland, 28 August 1839, in P L Brown [ed], *Clyde Company Papers. II* (London 1952), p 244.

<sup>48</sup> P L Brown [ed], *The Narrative of George Russell, with Russelliana and Selected Papers* (London 1935), p 181.

<sup>49</sup> Brown, *Narrative of George Russell*, p 192.

<sup>50</sup> 'George Mercer (1772-1853), George Duncan Mercer (1815-1884), John Henry Mercer (1823-1891), and William Drummond Mercer (1796?-1871)', in A G L Shaw & C M H Clark [eds], *Australian Dictionary of Biography*, II (Melbourne 1967), p 224.

<sup>51</sup> George Goodman, *The Church in Victoria during the Episcopate of the Right Reverend Charles Perry* (London 1892), p 81.

<sup>52</sup> H W Haygarth, *Recollections of Bush Life in Australia* (London 1848), p 14.

<sup>53</sup> For example, the old wing of 'Barooga' homestead, New South Wales, thought to date from the later 1840s: inspected January 2000..

The use of vertical board and batten cladding is not common in Australia, in contrast with North America and New Zealand. In the United States, where it was favoured by A J Downing, it is generally known as weatherboard (by contrast with 'clapboard', as discussed above).<sup>↑</sup> The rarity of it tends to give rise to a presumption of overseas influence in those cases where it does occur locally, such as the original Anglican church (now church hall) at Clunes, Victoria, of 1859-60,<sup>54</sup> St Andrew's Church of England, Ormiston, Queensland, of about 1868,<sup>55</sup> and a cottage at Cleveland, Queensland.<sup>56</sup>

British 'shiplap' boarding is normally a horizontal cladding board in which the edges are rebated so that the upper one overlaps the lower with their faces in a vertical plane, and with a wide joint exposing the tongue of the lower board. Alternatively it may be like this in appearance but with a tongued and grooved rather than a rebated joint. The terms 'rustic' and 'rusticated' are frequently used, the latter by George Washington in 1775, but in this case as in many others we do not know whether it refers to boards which form deep horizontal grooves only, or to a full masonry block treatment.<sup>57</sup> P B Eassie in the 1870s was happy to refer to virtually any horizontal board cladding, including shiplap, by the name 'weatherboard'.<sup>58</sup>

There are useful definitions in a twentieth century British work by R V Boughton,<sup>59</sup> who illustrates as 'shiplap' both of the forms mentioned above, but elsewhere refers to them as 'drop-siding'. Boughton uses the term 'rustic' for a V-jointed rebated board, whereas in Australia and New Zealand<sup>60</sup> it is the term for shiplap. It is illustrated for the first time in Nangle's *Australian Building Practice* of 1900, as 'rusticated weatherboards', which the author says are made out of Kauri pine or American redwood 'the latter being much the best'.<sup>61</sup> Walter Jeffries's *Australian Building Estimator* refers to 'dressed rustic' boarding,<sup>62</sup> which is apparently the same thing, and Mayes's *Australian Builders & Contractors' Price Book* uses similar terms.<sup>63</sup>

Shiplap boarding was used in the United States in the early nineteenth century. It was also used in 1842-3 at the Newcastle Hill Station near Kingston, Jamaica. Here the board was rebated in the usual way, but the exposed recessed joint flowed forward with a curved profile.<sup>64</sup> In New Zealand Toomath identifies early examples at The Elms mission house, Tauranga, of 1846, where there is a curved base to the channel, and at St John's Church, Te Awamatu of 1854, where there are twelve inch [300 mm] boards with a tongue and groove connection and a square channel base.<sup>65</sup> Generally,

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<sup>54</sup> Richard Aitken, *Talbot and Clunes Conservation Study* (Ivanhoe [Victoria] 1986), no page.

<sup>55</sup> Oxley Library no 649, negative 20131.

<sup>56</sup> Oxley Library no 689, negative 20266.

<sup>57</sup> Toomath, *Built in New Zealand*, p 46.

<sup>58</sup> P B Eassie, *Wood and its Uses* (Gloucester 1874), p 79.

<sup>59</sup> R V Boughton, *The New Carpenter and Joiner* (3 vols, London, no date [c 1935], II, pp 170, 237. Wyatt Papworth [ed], *The Dictionary of Architecture* (London 1853-92), sv 'Rusticated Boarding', gives a definition so poorly expressed that it is impossible to tell whether it refers to shiplap, V-jointed or some other form of horizontal boarding.

<sup>60</sup> Jeremy Lowe of Wellington, letter of 6 April 1993.

<sup>61</sup> James Nangle, *Australian Building Practice* (Sydney 1900), pp 132-3.

<sup>62</sup> Walter Jeffries, *The Australian Building Estimator* (Sydney 1907), p 111.

<sup>63</sup> C E Mayes, *The Australian Builders & Contractors' Price Book* (7th ed, Sydney 1908), p 111.

<sup>64</sup> Information from Dr Robert Irving of Yale, 1996.

<sup>65</sup> Toomath, *Built in New Zealand*, p 47.

however, shiplap is rare in New Zealand before the 1870s.<sup>66</sup> In Australia shiplap boarding is sometimes found in imported buildings, such as 'Osborne House', 456 Victoria Street, North Melbourne, which was built in 1854 and is believed to have been imported from America. It possibly appears first in locally made buildings in the 1860s,<sup>67</sup> but does not seem to be common until later. It was usually in pine, which would normally be imported from Europe, and therefore it probably came already dressed.

The greatest Australian use of shiplap boarding is in Queensland, where it was originally referred to as 'chamfered board', and has since become known as 'chamferboard'. Chamfered board was being advertised in Rockhampton in 1865 in nine and twelve inch [225 and 300 mm] widths.<sup>68</sup> It was used to line the exposed frame buildings which will be discussed below, and the earliest conjunction of the two elements is probably in the Railway Traffic Manager's house, Rockhampton, of 1865. In Queensland the boards are relatively narrow, and because they are behind the framing timbers they carry no suggestion of imitating masonry.<sup>69</sup> In Victoria in 1879 G R Johnson specified 'wrot chamfered rebated boarding' in 1<sup>1</sup>/<sub>4</sub> x 11 inch [32 x 280 mm] yellow deal.<sup>70</sup>

Grooved boards linked with loose splines can sometimes present a similar appearance where the spline is of metal (for if it is of wood is not really practicable to leave it exposed). The exterior cladding of the imported house 'Lyndhurst Hall', of about 1855, is of horizontal board linked by a hoop iron strip fitting into grooves in both boards, but so arranged as to show a wide recess, like a drafted joint in masonry - that is, giving the appearance of shiplap boarding. The patented 'portable brick house' of E Smallwood of London in 1853 was similarly clad in metal-tongued yellow deal wainscoting. It is not known whether any examples reached Australia. Another imported house clad in boards joined with hoop iron is reported to have been made in an Essex attic in about 1856, shipped to Geelong, and overlanded to Ballarat by bullock wagon.<sup>71</sup> An English-made house advertised for sale in 1853 had 'inch boarding, plough and fillet over joists'<sup>72</sup> (which sounds like flooring, but that no cladding is otherwise specified), and a two storey portable house of Baltic timber, 'ex Goffredo Mameli imported to Melbourne in 1856 had 1<sup>1</sup>/<sub>2</sub> inch [38 mm] 'grooved' boards of Baltic timber,<sup>73</sup> presumably also with wooden splines. This is the *Goffredi Mameli*, which had sailed from Genoa and reached Melbourne on 29 March 1856,<sup>74</sup> and this suggests that the house may have been of Italian, or possibly Swiss manufacture

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<sup>66</sup> Jeremy Lowe, letter of 9 May 1993, cites examples at 3 Ascot St, 17 Ascot St and 202 Sydney St West, in the Wellington suburb of Thorndon, all believed to date from the 1870s.

<sup>67</sup> Such as a shopfront of the 1860s at Torquay, Tasmania: see Frank Bolt, *Vanishing Tasmania* (Kingston [Tasmania] 1992), p 133.

<sup>68</sup> *Bulletin* (Rockhampton), 8 February 1865, courtesy of Margaret Strelow.

<sup>69</sup> For Queensland chamferboard profiles see Peter Bell, *Timber and Iron* (St Lucia [Queensland] 1984), p 171.

<sup>70</sup> G R Johnson, 'Bill of Quantities Metropolitan Meat Market, Bank, Hotel, and Two Shops, &c' (Melbourne 1879), p 11

<sup>71</sup> Michael Read, 'Prefabricated Buildings and Structures' (BArch history thesis, Melbourne University 1963), p 22.

<sup>72</sup> *Argus*, 15 October 1853, p 8; 5 November 1853, p 8.

<sup>73</sup> *Argus*, 28 June 1854, p 7.

<sup>74</sup> So I am advised by Marten Syme.

A particularly interesting local example is Christ Church, Tarraville, Gippsland, built in 1855-6 with an exposed frame in the Ecclesiological / New Zealand tradition, discussed below. The framing is slotted to receive horizontal two by nine inch [50 x 225 mm] boards, grooved and with a quarter inch [6.5 mm] spline between them for weatherproofing. The interior has been subsequently lined with boarding. Thick metal-splined planking of a similar character was used by the New Zealand Arts and Crafts architect S H Seager, as at 2 Whitby Road, Christchurch, of 1898. An unusual variation occurs in a Singapore-built house of the 1850s at 17 Coventry Place, South Melbourne. The roof is clad in lapped boards, which were apparently overlaid with zinc sheeting. Some of the boards are plain, but others are ploughed for splines, and seem to have been intended as vertical wall cladding. Whilst these side grooves have not been used, boards have been joined lengthwise with splines, were required.

### *f. blocked boarding*

Boarding imitating stone blocks, with not only the horizontal joints recessed and rebated, but false vertical joints in the same form, seems to have been introduced in the United States by Peter Harrison, notably in his Redwood Library at Newport, Rhode Island, in 1748.<sup>75</sup> This seems to have been the type with joints of a V section, which is generally the earlier form. The same material was used in George Washington's 'Mount Vernon', perhaps for the recladding of 1757-8, and Benjamin Latrobe, on a later visit, referred to it as 'a wooden building, painted to represent chamfered rustic and sanded'.<sup>76</sup> Washington's colleague, Major Roger Morris, used blocked boarding with quoins at the corners, for his house in Manhattan in 1765,<sup>77</sup> and a similar treatment was used on Colonel Jeremiah Lee's house, Marblehead, Massachusetts, of 1768.<sup>78</sup> The boarding in imitation of ashlar which appeared in Canada by about 1827-8<sup>79</sup> was probably of the same type, and it seems also to be fairly common in the United States in the 1840s and 1850s.<sup>80</sup>

Five houses which resembled Lyndhurst Hall in overall form, though not necessarily in construction, were built in Jolimont Square (Wellington Place) East Melbourne in 1857-8, but may have been first imported for the late Lieutenant-Governor C J La Trobe in 1856. If so, they were possibly part of the same shipment as the house

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<sup>75</sup> Carl Bridenbaugh, *Peter Harrison: First American Architect* (Chapel Hill [North Carolina] 1949), p 50.

<sup>76</sup> Morison, *Early American Architecture*, p 360, quoting La Trobe's journal.

<sup>77</sup> Morison, *Early American Architecture*, p 560.

<sup>78</sup> Morison, *Early American Architecture*, p 560.

<sup>79</sup> The François Durette house, 18 rue Ferland, Quebec, of about 1827-8, and the contemporary Louis Joseph Papineau house, Montreal: A J Richardson, 'Guide to the Buildings in the Old City of Quebec', *APT Bulletin*, II, 3 & 4 (1970), pp 46-7.

<sup>80</sup> A de C McArdle, *Carpenter Gothic: Nineteenth-Century Ornamental Architecture of New England* (New York 1978), pp 41 & 85, illustrates two examples, the John J Brown house at Portland, Maine, by the architect Henry Rowe in 1845, and the Henry Mason Brooks house at Salem, Massachusetts, of 1851. Both are two-storeyed, Gothic, and apparently derived from design IIA of A J Downing's *Cottage Residences*. The Brown house is a variant of the Downing design and the Brooks house a literal copy. However, Downing's house was meant to be of stone, and had no real stress on the quoins, whereas the Brooks house has pilasters at the corners and the Brooks house has expressed quoins.

which arrived on the *Goffredi Mameli* (referred to above) and if they were of Swiss manufacture, this would be consistent with La Trobe's strong Swiss connections. These houses have been long demolished, but photographs of one<sup>81</sup> show it to have both the standard expression of horizontal grooves, and somewhat less pronounced vertical grooves staggered like bonded masonry blocks.

The masonry treatment of the Jolimont houses is still of the early form, in which both the horizontal joints of the boards and the mock vertical joints appear to be of V-section. This crude treatment of shiplap with vertical joints to simulate masonry does not persist in Australia, for it is replaced with a more sophisticated board in which the block is accurately cut out against a uniformly flat background. The vertical joint is no longer the tongue of the lower board, for that is now totally concealed. This blocked boarding probably appears in about 1870,<sup>82</sup> but seems to be far more common in the 1880s and on into the twentieth century. It was regularly used on the facades of single-storey cottages, while the other walls are clad in ordinary weatherboard.

A further development was to project the supposed quoins of the building more boldly, which was sometimes done on block fronted buildings in Australia,<sup>83</sup> whereas in New Zealand block facing is not used, and quoining is done on regular 'rusticated' or shiplap façades. Despite this a very picturesque Australian example, which has both a blocked board front and expressed quoins, has New Zealand connections. This is 'Te Aro Villa', now 'Garthowen' in Launceston, which was built in the 1880s.<sup>84</sup>

### *g. flooring*

Much early timber flooring in Australia was simply butt-jointed, as in a specification of 1839: 'Provide and lay well-seasoned one inch stringy-bark boards for floor, shot on the edge [ie with the arris planed off], the joints well broke and securely nailed to the joists'.<sup>85</sup> Grooved and feathered (or ploughed and feathered) boarding<sup>86</sup> was obviously far superior in maintaining an even floor surface, especially where the timber was inadequately seasoned. Before the days of planing machines and moulding mills it was easier for a carpenter to groove both edges of a board, and then to connect them with a loose fillet, feather, or spline, rather than having to form a tongue on the board itself. Writing in the late eighteenth century, John Wood recommended what he called 'grooved and tongued' flooring for cottages, but this

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<sup>81</sup> David Saunders [ed], *Historic Buildings of Victoria* (Brisbane 1966), p 102; Maie Casey et al, *Early Melbourne Architecture 1840 to 1888* (Melbourne 1953), p 128

<sup>82</sup> A row of two storey block-fronted houses at 44-8 Macarthur Place North, Carlton, Victoria, must have been built prior to 1872, when the provisions of the *Melbourne Building Act* were extended to Carlton. A cottage at 120 Princes Street, Kew, Melbourne, dated originally from the 1850s, but seems on the evidence to have been refaced in blocked boards in 1875.

<sup>83</sup> 85 Palmerston Crescent, South Melbourne: illustrated in Casey, *Early Melbourne Architecture*, p 144.

<sup>84</sup> Malcolm Fraser et al, *The Heritage of Australia* (South Melbourne 1981), p 7/122.

<sup>85</sup> [Joseph Burns], 'Specification of sundry works required to erect and complete a School-house, in connection with the Presbyterian Church, Melbourne, according to the accompanying plans', in Michael Cannon [ed], *Historical Records of Victoria*, III (Melbourne 1984), p 517.

<sup>86</sup> For the terms see W J Christie, *A Practical Treatise on the Joints Made and Used by Builders* (London 1882), pp 167, 171.

actually means splined: 'That is, on both edges of the board, exactly in the middle, is made a groove about three quarters of an inch deep, then a thin piece of wood, of an inch and a half broad, is put into the groove of one board, and the other is drove up to close joint on it ...'<sup>87</sup>

In mid-nineteenth century England floorboards might be, in increasing order of expense, square splayed, ploughed and tongued, rabbetted and filleted, feather tongued, or tongued with hoop iron.<sup>88</sup> In the United States, at least, butted boards might have small timber fillets or 'sand boards', checked into the joists but not nailed, and designed to catch the sand which, it appears, was commonly used to clean the floor surface.<sup>89</sup> In eighteenth century Virginia flooring might be tongued and grooved, splined, shiplapped, or simply butted,<sup>90</sup> and in some examples dowels or pegs linked the boards at spacings between 150 and 450 mm.<sup>91</sup> In Britain similar fillets were commonly checked into the underside of the floorboards themselves. The term 'Scotch-tongued and grooved', used of the flooring of a Melbourne building of 1855,<sup>92</sup> has yet to be explained.

Wood splined boarding is found in the floor of 'Woodlands', Tullamarine, Victoria, an imported house by Peter Thompson of London, put up in 1843, and at 'The Heights', Geelong, a German-made house of 1854. Lyndhurst Hall has floorboards (as well as cladding) joined in the same way, but with tongues of hoop iron, and the same was done in the Sydney Mint of about 1854,<sup>93</sup> and in the former Colonial Store, Adelaide, of 1867.<sup>94</sup> Metal splines have also been found in some of the floors of the Kew Lunatic Asylum, Melbourne, of the 1870s, and in a wing of 'Barooga' homestead, New South Wales, believed to date from the 1890s. The original rationale for splined flooring had long passed, because some time before 1833 (Loudon reports it as a recent development) one Milne, an engineer of Hutchesontown, Glasgow, had invented a planing machine which would reduce a board up to six metres long to a uniform thickness, 'planed perfectly smooth on one side, and grooved on one edge and tongued on the other, in one minute.'<sup>95</sup> Of course, that is not to say that such machines were available everywhere. Nearly half a century later, in 1878, P B Eassie gives a price for 'Matching, Rebating or Grooving for hoop iron', and illustrates splines of various types.<sup>96</sup>

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<sup>87</sup> John Wood, *A Series of Plans for Cottages or Habitations of the Labourer* (London 1806 [?1781]), p 13.

<sup>88</sup> Tarbuck, *Builder's Practical Director*, p 222.

<sup>89</sup> H O Tustin, 'Sand-Board Usage under floor of an early house in Tuckeston, New Jersey', *APT Bulletin*, V, 1 (1973), pp 102-3.

<sup>90</sup> P E Buchanan, 'The Eighteenth-Century Frame Houses of Tidewater Virginia', in C E Peterson [ed] *Building Early America* (Radnor [Pennsylvania] 1976), p 71.

<sup>91</sup> The former at the Bishop White house, Philadelphia, and the latter at the Nelson house, Yorkton, Virginia: H C Miller, 'The Education of Historical Architects, &c', *APT Bulletin*, XXVII, 1-2 (1996), p 33.

<sup>92</sup> Andrew Lemon, *Box Hill* (Melbourne 1978), p 18.

<sup>93</sup> Inspected, 1999.

<sup>94</sup> Information from Bruce Harry, 1991.

<sup>95</sup> J C Loudon, *An Encyclopædia of Cottage, Farm, and Villa Architecture and Furniture* (London 1846 [1833]), p 1013, § 2090.

<sup>96</sup> P B Eassie, *Wood and its Uses* (Gloucester 1874), pp 9, 23.

At about the middle of the century J L Tarbuck illustrated what would later be called 'secret nailing'. The boarding is tongued and grooved, but unevenly, so that the lower part of the grooved side projects past the upper part, and the reverse is done on the tongued side so as to match it. This means that a nail can be driven through the lower part of the grooved side, and concealed when the next board is placed, so in the finished floor the each board is nailed but no nail head is exposed.<sup>97</sup> By 1891, if not earlier, this was being done in Melbourne and the term 'secret nailing' was used.<sup>98</sup> In 1887 the 'Pavodilos' system, of flooring was introduced to Australia as an alternative to tonguing and grooving, designed to create a sounder joint and to facilitate blind or secret nailing. The edge profile of the boards was a sort of zig-zag which presented a broad shoulder through which a nail could be driven, such that the head would be concealed by the adjoining board. This flooring was advocated especially where fancy woods were used, and Hudson Brothers had obtained the patent rights for New South Wales.<sup>99</sup>

In Australia, as in Britain, upper floor spans where the joists had to be deep and narrow, and were therefore liable to twist, required herringbone strutting - that is, light struts angled between the joists in a criss-cross manner. Thus a specification of 1854 called for 'herring bone strutting deal 2 1/2" by 2 properly [ ? ] at the ends with [?hardwood] 3 x 2 and well wedged up with dry oak wedges.<sup>100</sup> In 1862 the Melbourne architect Thomas Hale patented an alternative system in which perforated cast iron plates were put between the joists.<sup>101</sup> This system, in conjunction with Hale's device for reinforcing the beams, was tested in September 1862 by the engineer A K Smith, and performed very creditably.<sup>102</sup> The fact that no more is heard of the system is doubtless a reflection of the practicalities. To be effective the dimensions of the plate must match the depth of the joist, and the interval between joists. In any given floor a slight variation in these dimensions, especially the horizontal interval, will make the plates almost useless. As between buildings, differences in these dimensions might give rise to a demand for plates in a huge range of standard sizes.

Suspended or sprung floors for dancing made only a tentative appearance before 1900. The Chaffey homestead, 'Rio Vista', at Mildura, has one in the basement ballroom, and it has been claimed that when it was built in 1891 there were only two others in Victoria.<sup>103</sup> Another is found in the 1901 extensions of 'Purrumbete' near Camperdown, where cylindrical iron shafts carry solid rubber pads, and the bearers rest upon these.

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<sup>97</sup> [J L Tarbuck], *The Builder's Practical Director* (Leipzig [c 1858]), p 222. Wyatt Papworth [ed], *The Dictionary of Architecture* (London 1853-92), sv 'Tongue', mentions the practice of double grooving boards to receive a slip either of wood or of hoop iron.

<sup>98</sup> W S Law, 'Specifications of Residence Drummond St. Carlton for Mrs. L. Abrahams' (Melbourne 1891), p 13.

<sup>99</sup> *Australasian Builder & Contractors' News*, 26 November 1887, p 473. See also Hasluck, *Cassell's Carpentry and Joinery*, p 91; Henry Adams, *Cassell's Building Construction* (London, no date), p 91.

<sup>100</sup> PRESUMABLY Russell, Watts & Pritchard, 'Specification for ... dwelling houses .. at Elwood ... for Joseph Docker', 13 December 1854 (Docker Papers, Manuscripts Collection, SLV), p 8.

<sup>101</sup> Thomas Hale, Victorian patent no 560, 24 July 1862.

<sup>102</sup> *Argus*, 13 September 1865, p 5.

<sup>103</sup> The claim is made in display material at the property.

*h. training*

In 1901 a teacher's certificate in slöjd [anglicé *sloyd*] woodwork was introduced in Victoria and the first twenty teachers were trained by John Byatt. Slöjd is Swedish for 'skilful', and the system had been initiated by the Finnish-born teacher Uno Cygnæus, on the principles of Pestalozzi and Froebel, then developed in Sweden, which is where Byatt studied it. In doing so, Byatt was only pursuing a fad already established in Britain. Sloyd had been introduced into the woodwork classes of the City and Guilds Institute and the School Board of London at the instigation of George Ricks, and in 1892 S Barter, an instructor in these courses, had published a textbook referred to as 'the English Sloyd'.<sup>104</sup>

In August 1901 Byatt organised an exhibition of sloyd work which attracted four thousand visitors. He did not propose to introduce the Swedish form of economic training in Australia, but rather 'the general development of the boy's natural facilities'. By August 1912 the Education Department had forty-two sloyd centres in operation and another twenty planned. The teaching included the drawing of plans, the study of timber types, working techniques, and the construction of models. However all this was mainly at the primary school level, and therefore of only marginal relevance to carpentry as a trade.<sup>105</sup> There appears to have been some teaching of sloyd at secondary level, but it was far less prominent.<sup>106</sup>

The first local building textbooks were those of Nangle<sup>107</sup> and Haddon,<sup>108</sup> of 1900 and 1908 respectively, and both described the stud frame. Nangle especially was involved in technical education, and this was to become the arena in which influential teachers and even national authorities on carpentry could now emerge. One of these was Alex Smith, instructor in carpentry at the Melbourne Working Men's College (later Melbourne Technical College, then the Royal Melbourne Institute of Technology). Smith's publications included *The Australian Home Craftsman* of 1929, *The Steel Square in Australian Roofing* of 1932 (and in many subsequent editions), *Carpentry for All* of 1938,<sup>109</sup> *Steel Square Roofing* of 1947<sup>110</sup> and subsequently, and *The Australian Home Carpenter Illustrated*, of the 1950s.<sup>111</sup> Smith's importance does not depend upon his priority in the matter of the steel square, but upon the fact that through his publications he was able to emerge as a national authority on carpentry, as after him, to a lesser extent, was Clifford Lloyd, lecturer at Swinburne Technical School in Melbourne, who is mentioned below.

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<sup>104</sup> S Barter, *Woodwork (the English Sloyd)* (London 1892).

<sup>105</sup> L J Blake [ed], *Vision and Realisation* (3 vols, Melbourne 1973), I, pp 1097-8.

<sup>106</sup> Blake, *Vision and Realisation*, I, pp 446, 461.

<sup>107</sup> James Nangle, *Australian Building Practice* [Sydney 1900].

<sup>108</sup> Robert Haddon, *Australian Architecture* [Melbourne, no date (1908)].

<sup>109</sup> Alex Smith, *Carpentry for All* (Melbourne 1938), published by the *Australian Home Beautiful*.

<sup>110</sup> Alex Smith, *Steel Square Roofing. Theory and Practice* (Melbourne 1947 [2nd ed 1956]).

<sup>111</sup> Alex Smith [ed W D Shum], *The Australian Home Carpenter Illustrated* (Sydney, no date [1950s]).