

The Architecture of Industry

Professor Miles Lewis

This paper is intended to review the architecture of industry in two senses – the architecture constructed *for* industry, and the architecture produced *by* industry. Both topics are enormous in scope, and both are relatively neglected, so that there are many aspects which need to be brought to light in historical studies of northern Tasmania.

Transport

Although transport is a marginal topic in this context, it does produce some of the most evocative and technically interesting remains, and it seems appropriate to mention the current threat to the Abt railway between Queenstown and Mount Lyell. The Abt system involves an extra toothed track at the centre, wherever the slope is steep, into which the locomotive can engage for travelling up and down hill. The current planning issue,¹ in which I am involved, is a proposal to build a luxury hotel adjacent to the Regatta Point terminal. This has been approved by the West Coast Council, and is the subject of an appeal. Not only is the case important in its own right, but it is in part analogous with recent events at Penguin.

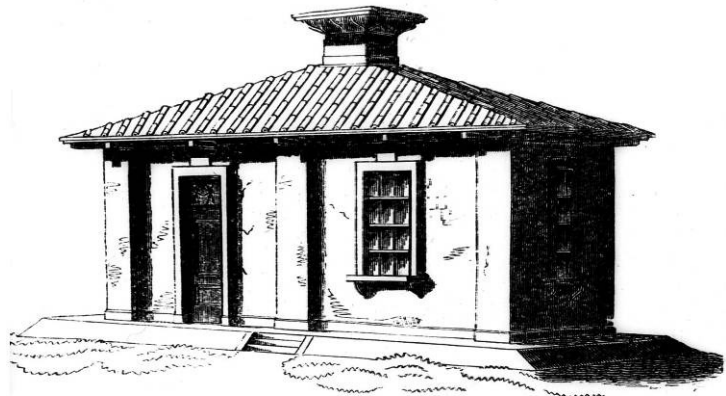


The Mount Lyell Abt railway track and the Regatta Point Railway Station.
Miles Lewis

Regatta Point is opposite the heart of the Strahan and at the centre of the main views seaward from the Esplanade, and in general planning terms the destruction of this aspect is of even more concern than the impact on the railway site. The latter includes the railway terminal with its restored track, station building, turntable, and steam crane. But the issue is not all black-and-white, because some of those elements are unauthentic – there has been some alteration in the line of the track, the turntable has been introduced in recent times (the original turntable is on the site but below ground in a different location), and the crane (though appropriate) is introduced. One lesson to be learnt here is that industrial heritage, even though its importance might be technical rather than aesthetic, needs to be treated with the same concern for authenticity as architectural or other heritage. Otherwise its prospects for preservation are reduced, as of course is its intrinsic cultural significance.

Agriculture

Just as Tasmania has more colonial architecture than anywhere else in Australia it has more and better remains of colonial agriculture. The homesteads themselves are part of this evidence, and their subsidiary buildings are even more so. A major source for these buildings is Loudon's *Encyclopaedia of Cottage Farm and Villa Architecture*, of 1833,² which seems to have been largely ignored in Tasmania so far. In relation to conventional architecture I know only of its use by James Broadbent in his analysis of the work of James Blackburn.³



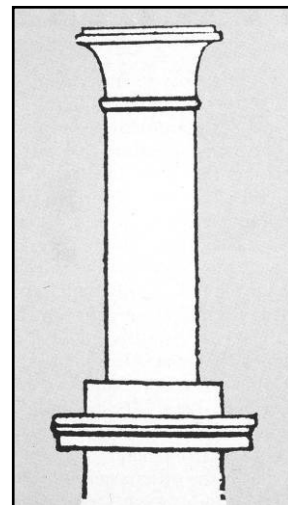
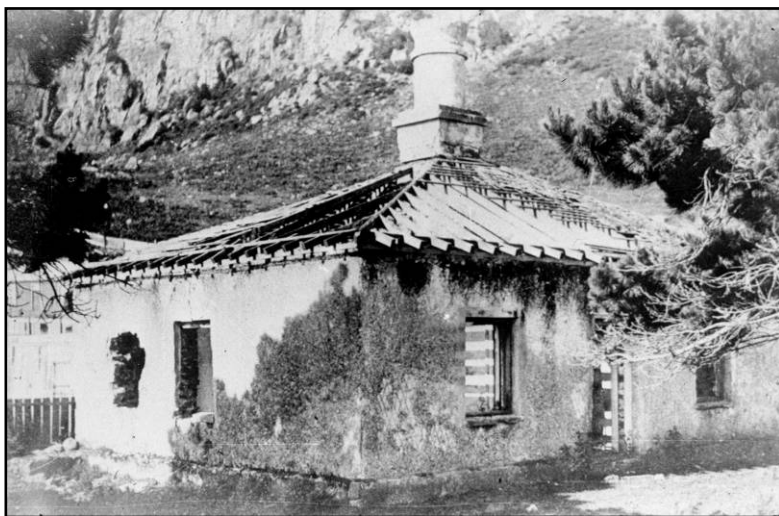
'Clairville', Western Junction, gate lodge, 1830s
'Dwelling for gardener or other servant on a gentleman's estate', c 1833, Miles Lewis;
Loudon, *Encyclopaedia of Cottage, Farm and Villa Architecture*, p 89

When one looks at the gatehouse of 'Clairville', Western Junction, it is clear that it is influenced in general terms by designs in Loudon. Even closer to this particular Loudon design was the storekeeper's cottage at 'Highfield'. Its chimney differs, but that is only because another design from Loudon was used as the source. Edward Curr, manager of the property, left behind instructions for the cottage when he went back to England in 1833, and even suggested particular chimney designs, saying 'for a simple and tasty design adopt fig. 100 Loudon's *Encyclopaedia of Architecture* or 125 page 73.'⁴

These are examples of Loudon's stylistic influence, but the *Encyclopaedia of Cottage, Farm and Villa Architecture* also has many functional devices and structures more directly relevant to agriculture. Even more so do his *Encyclopaedia of Agriculture*,⁵ and some of his other publications.⁶ I will return below to some details published by Loudon.

There were of course many publications other than Loudon, and other sources such as localised English building traditions. The barns at 'Brickendon' are closely based upon Sussex and Surrey traditions, and the steddle barn in particular has the same steddles, stained weatherboard cladding, and jerkin-head roof, and indeed even the same gable vent, as the granary at Bramley, Surrey.

The steddles themselves are a matter of great interest. The steddle is a stubby stone shaft or timber log with a projecting flat cap, like a mushroom. This was used in most European cultures and many others, and it was common throughout England (not merely Sussex and Surrey), sometimes with variant names such as *staddle* and *dottle*.⁷ Steddles were used especially for granaries, which became common as a distinct building type only in the eighteenth and nineteenth centuries. The commonest steddles were round and mushroom-shaped, but some were flat-headed or square.⁸



Storekeeper's Cottage, 'Highfield', Circular Head, Tasmania, 1833 chimney design from Loudon, Archives of Tasmania, kindly supplied by Geoff Lennox; Loudon, Cottage, Farm and Villa Architecture, p 63, fig 100.

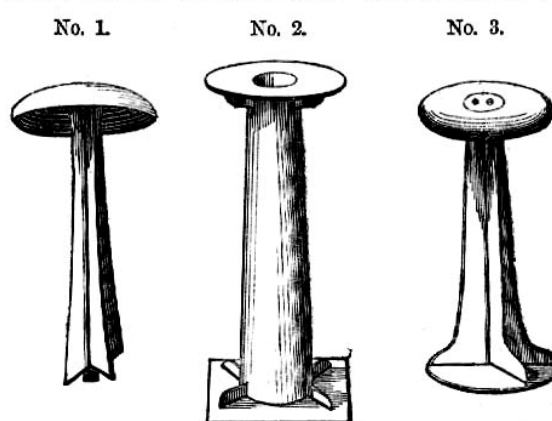


*Left: 'Brickendon', Longford, Tasmania, steedle barn, Miles Lewis;
Right: Bramley Granary, Surrey, England, Chris How*

According to the *Complete Husbandman* they were used in Hampshire and other counties where stone was plentiful:

The lower stone is about three feet high, two feet wide at the bottom, and one at the top; over this they lay another stone, of about a yard square: some make it of a round form, which is the best. This prevents not only mice and rats from jumping up, but also the dampness of the ground.⁹

IMPROVED CAST-IRON STACK-STOOLS.



Constructed for preventing vermin getting into Stacks.

Prices.—2s. 6d. to 5s. 6d. each.

Cast iron stack stools, from Charles D Young. A Short Treatise on the System of Wire Fencing, Gates, etc. as manufactured by Charles D. Young & Company (Glasgow 1850), p 73.

Sometimes iron posts were used. In Suffolk, early in the nineteenth century, it was reported that stacks of corn (if intended to be left for any time), were

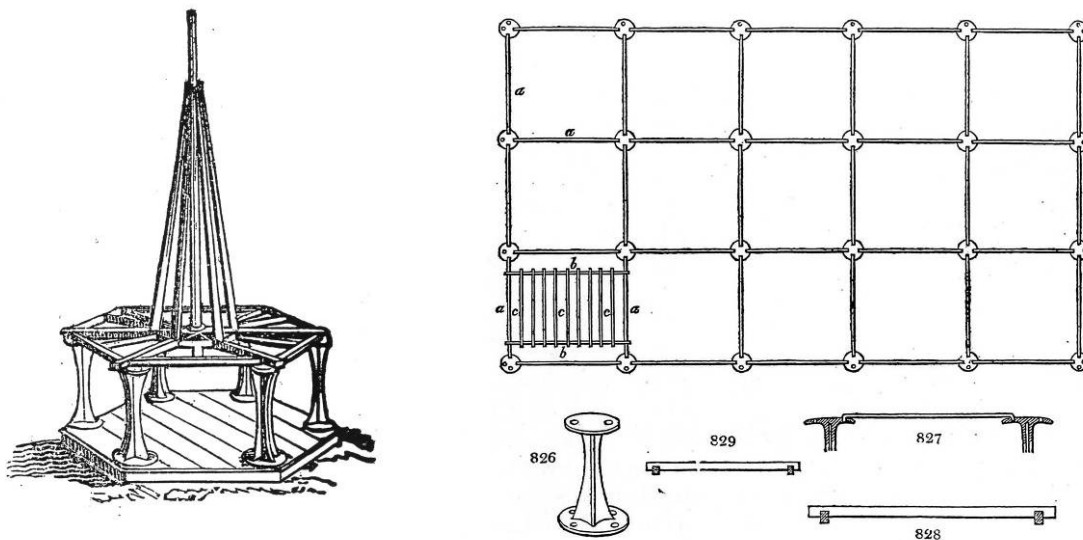
built on frames, called staddles, supported by stone or iron pillars about eighteen inches from the ground, with flat caps over the pillars to prevent the access of rats and mice.¹⁰

Loudon, in his *Encyclopædia of Agriculture*, similarly describes the usual construction of corn stands as being a timber frame supported on upright stones two feet [600 mm] high, with projecting flat caps. But sometimes they were built on iron pillars, also with flat caps in his illustration, or on continuous stone walls with copings of stone or of oak boards projecting well beyond the face.¹¹ One British manufacturer of iron steddles was Charles D Young & Co, whose Edinburgh works catalogue of 1850 illustrated three models of 'improved cast-iron stack stools'.¹² Unfortunately no branded examples of iron steddle can be identified in Australia except in the vermin-proof stores manufactured under Springall's patent, discussed below.

The *Complete Husbandman's* account of stone and other steddles was republished in the *Sydney Gazette* in 1804, but earlier local reports indicate only the use of posts without caps. By 1839, however, true steddles were being used in various ways at the agricultural establishment at Longridge, Norfolk Island. One was as a base for wheat stacks, as at Emu Plains, eight steddles being placed in a circle with one at the centre, in much the same manner as some of the rick stands discussed below. Others were arranged in a rectangle to carry maize, and yet others formed the base of a granary building.¹³ Stone steddles also had some currency in colonial Tasmania, for they were used not only at 'Brickendon', but in

an unusual square version) for the granary at 'Grantham', Bothwell, thought to date from the 1850s.¹⁴ I have little doubt that there were many others in Tasmania, and there is every prospect that they remain to be discovered – particularly the cast iron variety, which is found even in Victoria.

In a related matter, Loudon describes and illustrates recently introduced cast iron stands for stacks 'with or without hollow cones or triangles', and what he illustrates is an hexagonal iron frame carried at the corners on six iron pillars or steddles, and supporting at its centre a tall slatted cone designed to circulate air up through the centre of the stack.¹⁵ Although it is unclear in this reference, a later note in his *Encyclopædia of Cottage, Farm and Villa Architecture* shows that Loudon attributes this design to one Mitchell at Blairquhan, near Alloa, Scotland.¹⁶ In discussing ricks he says that they 'ought to be placed upon stands or saddles [sic], so as to keep them dry and safe from rats and mice',¹⁷ though in this case he does not describe their form.



Left: cast iron stand for stacks. Right: modular rick stand by Cottam & Hallen, London.
J C Loudon, *An Encyclopædia of Cottage, Farm, and Villa Architecture and Furniture*,
(London 1846 [1833]), pp 405-6.

By this time, the 1830s, the London ironfounders Cottam and Hallen manufactured rick stands in a form suitable for modular construction. Each was of cast iron, 750 mm high, and consisted of a flat disc top and bottom, with a solid stem in between. The discs contained four holes, into each of which could be fitted the bent-down end of a wrought iron rod. These rods were supplied in two metre lengths, which meant that a square grid could be created on a module which must have been about 2.1 metres, allowing for the rod and the additional diameter of the top disc. The rest of the floor structure, which need not concern us here, was created with a further series of standard wrought iron rods.¹⁸ Given that many examples of Cottam & Hallen's ornamental casting reached Tasmania, it seems highly probable that their rick stands did as well.

Charles D Young & Co, whose cast iron stack stools have been mentioned also produced an 'improved wrought-iron corn-crib stand', which was not illustrated, but was based on pillars and came in diameters from twelve to twenty-one feet [3.6 to 6.3 m].¹⁹ It might well have been something similar to Springall's patent.



*Springall's patent vermin-proof stores in Victoria: Left: 'Ripple Vale', view and substructure.
Right: 'Mount Hesse', steddle and view.
Miles Lewis.*

The Springall's patent stores are circular structures in which the steddles support concentric wrought iron rings, linked with radial rods, cartwheel-fashion. On top of this base structure the circular store itself is apparently made wholly of timber, and clad in quirked weatherboarding. The sides slope outwards, probably so that the overlapping weatherboards are in a vertical plane,²⁰ for this means that they can be curved in plan while remaining horizontal in elevation. One of these stores at 'Mt Hesse', Victoria, is built on two rings, the inner one carried on three steddles and the outer on six, and the two linked by eighteen radial rods. A larger one at 'Ripple Vale' is on three rings with two, four and eight steddles, and linked with twelve and twenty-four spokes. The base of each steddle at Mt Hesse is square and divided into four panels, one containing a crest, and the others with wording as follows:²¹

MADE
BY
GARRETT & SON

LEISTON
WORKS

SPRINGALL'S
PATENT
[?]1844

Garretts were major manufacturers of agricultural machinery, and these steddles do not feature prominently in their history. However they are referred to in an account by R A Whitehead, who says that the firm took up the manufacture of cast iron rick stands on mushroom feet, intended to deter rats, and designed by R Stringall [*sic*] of Ipswich. It is claimed that these became known as 'stringalls', then corrupted to 'steddles' or 'stathels',²² an unconvincing attempt to create an etymology for what is in fact a much older term.



Iron fencing, 'Woolmers', near Longford, reputedly c 1820.

Miles Lewis

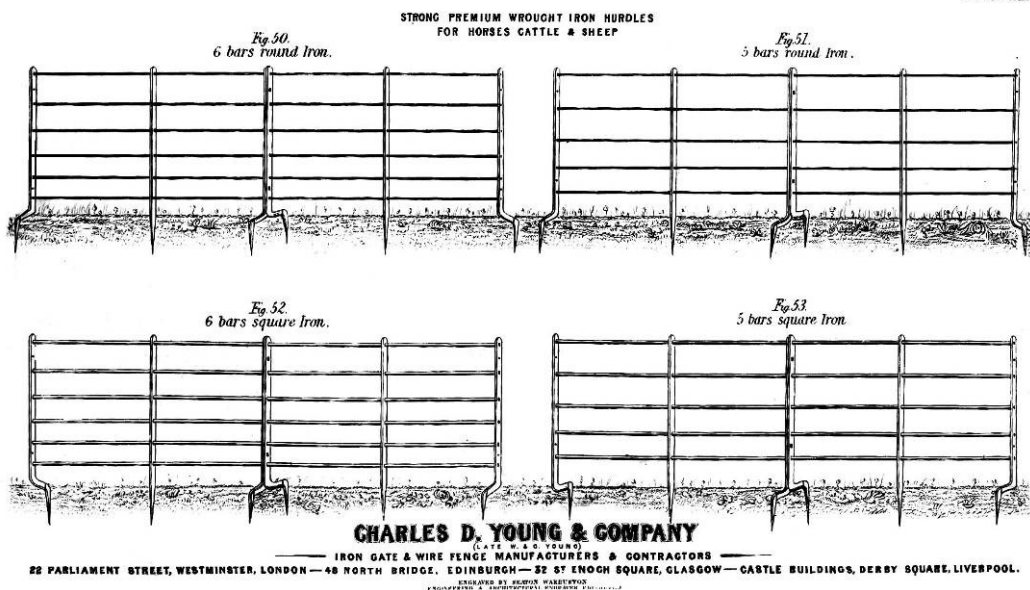
Another imported iron component was fencing, and this again remains to be researched in Tasmania. The fencing at 'Woolmers', reputed to have been made in Longford in about 1820, is of wrought iron bars which were certainly rolled in Britain rather than in Australia, and that being so it was probably exported as a fence. Many British makers produced iron fencing, either in the form of continuous systems or of hurdles (separate panels).

By the 1840s iron wire fencing was popular and, because this had to be kept in tension, the end posts were braced and generally set deeper in the ground, while the intermediate posts could be lighter; and droppers, to keep the wires spaced properly, could simply be suspended within the panels.

Manufacturing & Processing

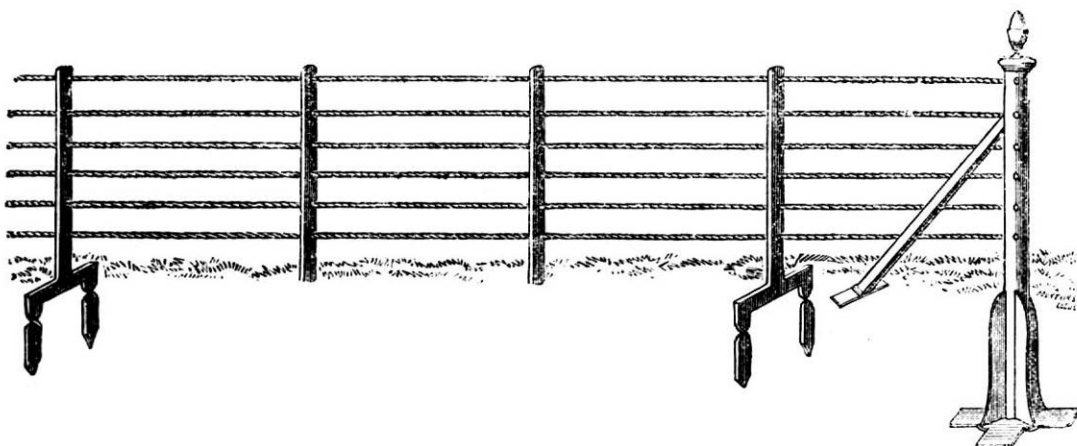
In considering iron steddles and fencing systems we have been looking at not only the appurtenances of the agricultural industry but the products of manufacturing industry. But these were of overseas origin, and in fact there is not a great deal of manufacturing in Tasmania to concern us. There is, however, one locally-made product which must be considered because its use was taken to extremes rarely seen elsewhere, and that is the wood stave pipe.

Wooden pipes have a history going back to prehistoric times, and solid trunks of elm, alder or oak with the core bored out were traditional to most parts of Europe, though there were always difficulties in joining them reliably. In the nineteenth century such pipes were bored with a power-driven shell augur.²³ One wooden pipe factory was that of the New River Company, which had its horse mills and boring yard at Dorset Stairs, northwest of Blackfriars Bridge, London, and this factory might well have supplied pipes to Australia. But pipes of this sort were also made locally, and an erratic pipeline made up of what are reported to have been bored-out ironbark logs was laid in Brisbane some time before 1839.²⁴



Strong premium wrought iron hurdles.

Charles D Young & Company, Illustrated and Descriptive Catalogue of Ornamental Cast and Wrought Iron and Wire Work manufactured by Charles D. Young & Company (Edinburgh 1850), p 21.



Wire fencing by Motley & Green, of Leeds

J Steinhardt, The Illustrated Guide to the Manufacturers, Engineers, and Merchants of England, Scotland, Ireland and Wales (London 1869), p 456

The stave pipe, made up of several pieces bound together like a barrel, eliminated the tedious process of boring, and allowed much larger diameters to be fabricated, but it had its own problems. Although it is unclear when it was invented, by 1676 pipe staves from Salem, Massachusetts, were being imported by the islands of the West Indies.²⁵ In 1806 a British patent was obtained by Eckhardt and Lyon for making pipes out of tongued and grooved wooden staves bound around by hoops, like an elongated barrel.²⁶ Nine hundred wood stave pipes, probably made on this system, were imported to Victoria from Great Britain in 1856; others were used for sewerage at the Fremantle gaol during the 1850s (though they were already leaking by 1859);²⁷ and in Adelaide stave pipes were used in 1860 to bring water from the Thorndon Park Reservoir.²⁸ In 1864 a Victorian patent was granted to B H Dods (probably of McKay, Dods & Co, plumbers) for 'an arrangement of timber, prepared or not, embedded in certain plastic cement, composed of bitumen, asphalt, silica, etc., and impervious to water and gases'.²⁹ Regrettably, it has not been established whether McKay Dods & Co proceeded to market or to manufacture these. Nor do we know whether or not anything eventuated from a patent taken out in 1889 by Robert Barbour, timber merchant, squatter and member of the New South Wales Parliament.³⁰ This was for an 'Improved wooden water-pipe or aqueduct for carrying water'.³¹



*Wood stave pipe, Sewell, Chile.
Miles Lewis*

A new patent for wooden stave pipes was taken out in Australia in 1908,³² in which the novelty appears to have consisted in the fact that the pipes were wound spirally with galvanised wire, then coated with steam heated bituminous solution, wrapped with hessian, and then recoated to give a skin 6 mm thick.

The range of pipes available was from three inches [76 mm] to fourteen feet [4.2 m] diameter. The smaller pipes, up to 600 mm diameter, were machine banded, but the larger were built up on the designated site on the 'continuous stave principle'.³³ These were marketed under the 'Pioneer' brand, advertised in 1911 by the Australian Wood Pipe Co, with works at Booth's Wharf, Balmain, Sydney, and agents in Victoria, South Australia, Queensland and Western Australia.³⁴ The 'patent non-corrosive wood pipes' which were sold in Tasmania by the local agents A E Evershed & Co of Launceston,³⁵ were presumably also of the Pioneer brand. In Tasmania they were extensively used in mining, but they were also put to urban uses. In the upgrading of the Waddamana hydroelectric power station, in about 1920, stave pipes of up to four metres diameter were designed by J H Butters to circumvent a shortage of steel pipe caused by industrial disputes on the mainland. They were designed for a pressure of 1400 kilopascals, and remained in use for more than twenty-five years.³⁶ I have also found smaller stave pipes at the Maria Island Cement Works.



*Wood stave pipe, Maria Island Cement Works, Tasmania.
Miles Lewis*

Flour mills were far more common than factories in nineteenth century Tasmania, but they are essentially the same building type in any case. The standard form of mill or factory, from the time of the industrial revolution, was a multi-storey building designed so that the machinery could be grouped conveniently to operate off a single source of power, such as a waterwheel or a steam engine. This applies as much to a flour mill as to any other factory. The buildings were originally timber framed, but within a masonry shell, but for reasons of fire the English mills tended to increasingly adopt iron framing and fireproofing systems.

But in Tasmania we are more concerned with the continuing timber tradition, generally using square chamfer-stopped columns, with crossheads on top to provide seating for the beams, and all within a brick or stone envelope. The columns generally reduced in size as they rise, corresponding with the reduction in load.



*Portarlinton Flour Mill, Turner Court, Portarlinton, Victoria, by Andrew McWilliams, 1857, showing an adzed beam, a cross-head or spreader, modern wedges, and a square chamfer-stopped column.
Miles Lewis*



*Crown Mills, 22 Cameron St, Launceston: ground, third and fourth levels, showing chamfer-stopped wooden columns reducing in size, cross-heads and beams.
Miles Lewis*

This form of construction continues into the twentieth century, and is used for warehouses and stores as well as mills. It is also used in saw-toothed roof buildings, which develop in the latter half of the nineteenth century under the influence of William Fairbairn, and which often use light beams braced with metal rods (*barrups*) in the roof framing.

Prefabrication

Prefabrication has a special significance in Tasmania's industrial history because prefabricated buildings were amongst the first manufactured products to be exported from the island. At the time of the Californian gold discoveries in 1848, Van Diemen's land was one of the scattered British outposts on the Australian and New Zealand coastlines, with no pretensions to manufacturing capability. But, before the time of the Panama Canal or even the Trans-Pacific Railway, these settlements were better placed to provide timber buildings than were the eastern states of the USA. The first house from Australia seems to have been one sent by George Smyth of Sydney in May 1849, on the barque *Volunteer*.³⁷ This might have been a poor speculation, for the crew deserted at Monterey, leaving the passengers to walk overland to San Francisco, and Smyth's house presumably stranded in Monterey.³⁸

In June 1849 one Seabrook of Hobart had nine houses 'setting up in wooden framing' for him to take to San Francisco on the *William Melville*. They were to 'form the nucleus of a small village', with the largest of them becoming a store,³⁹ though it is not clear whether or not this eventuated.⁴⁰ Meanwhile the architect James Thomson, with E Gilbert, despatched twelve wooden houses on the *Vansittart*,⁴¹ and for the next twelve months continued to send houses and building materials. Exports continued from Sydney and Hobart, and on a smaller scale from Launceston and Adelaide, and in fact the scale of the exports increased. Consignments of ten or twelve, as in June were replaced by batches of twenty, thirty or more,⁴² though of course some single buildings or small batches continued, mainly where their owner was himself travelling with them.

In November 1849 George Atkinson despatched thirty houses for California in the *Lord Hobart*. In the event the *Lord Hobart* was seized by creditors of its owner, Thomas Hovenden, and sold to Robert Tooth, but it still made the trip to San Francisco.⁴³ In all, over a hundred houses were sent from Hobart in the twelve months from June 1849.⁴⁴ At Dover, to the south of Hobart, is the site of a brick kiln and sawmill, which is only partially documented, but which is believed to have been a location where houses were manufactured for the Californian market.⁴⁵ Launceston sent fifty-eight houses in the twelve months from April 1849, as well as quantities of palings, shingles and other timber.⁴⁶ In March 1850 James Thomson of Hobart designed an elaborate hotel for the captain of the barque *Henry Harbeck* to take to San Francisco. It measured 23 x 12.8 metres in plan and was 6.3 metres high:

The ground storey contains a lofty and spacious entrance hall, on the right of which is the bar 11 x 11 [feet], and on the left the coffee room 14 x 16; from the hall you enter a corridor the whole length of the house, on one side of which are four spacious parlours, and on the other side a parlour 14 x 14, and a dining room 28 x 14: the rear of the building is occupied with domestic offices. The staircase is in the hall of a private entrance at the side, and leads to the upper floor; in front are two rooms together measuring 33 x 16, communicating by folding doors, and also by three French windows, with a covered balcony 41 x 8; a corridor extends from this suite of rooms to the back of the building, having on the right and left nine bed-rooms; eight more bed-rooms will be fitted up in the roof. A spacious verandah extends round the front and two sides of the building in addition to the upper balcony.⁴⁷

A myth has developed about a house of Tasmanian origin which stood until 1924 as the oldest known building in Monterey, and was thought to date from just before the discovery of gold. William Bushton, an Australian carpenter, and his wife Jane, are said to have set out for San Francisco in the belief that the climate would benefit their invalid daughter. After a dispute between the ship's captain and the passengers they were in fact landed at Monterey. Bushton bought land at the corner of Munras Avenue and Webster Street, and on it put up a twelve-roomed house which he had himself pre-cut in Australia and brought with him. The building, partly of one and partly of two storeys, survived in an increasingly decrepit and picturesque form until its demolition in 1924.⁴⁸

The story of the landing at Monterey seems to have been taken from that of the *Volunteer*, referred to above, and recent research by Peter Barrett has shown that Bushton was not in fact a carpenter, and that his story was more complex. He had been a partner in the Bridgewater Carrying and Commission Business, near Hobart, until was sold by Bushton & Hanson in December 1849.⁴⁹ At about this time six timber houses were advertised for sale in Hobart, each measuring 7.3 x 3.6 metres, and with a mortised frame,⁵⁰ and it is likely that the Bushtons bought these, for the description resembles that of the houses they subsequently took to California. On about 2 February 1850 the American barque *Elizabeth Starbuck* sailed for California, with passengers including Mr and Mrs Bushton and their five children, and Mr and Mrs Hanson,⁵¹ and with cargo including twenty-two wooden houses and a considerable range of building materials.⁵² The Bushtons are believed to have taken at least six houses, of which two at least were two storeyed, and finding that the market had dropped, they used at least four of these, including two of two storeys, to build their house in Monterey.⁵³ This was certainly not the first framed building in Monterey, nor even the first house from Australia, nor were the Bushtons by any means the first Australians in Monterey, for a number were living there already.

European buildings reached California only after the Australasian ones, but they are important from an Australian point of view because most of them were made of iron, and the British makers of iron buildings who cut their teeth in the Californian trade were to become major exporters of buildings to Australia after the gold discoveries. For the most part this is irrelevant to Tasmania, but it happens that Tasmania has two buildings, and the fragment of another, made in the 1850s by Edwin Maw of Liverpool, on a very distinctive structural system.

Edwin Maw is first heard of in 1850 when he sent iron buildings to California,⁵⁴ but his main business seems to have been the manufacture of railway rolling stock and equipment. He had a foundry at Liverpool on the north side of the Wallasey Pool, Seacombe.⁵⁵ The only contemporary documentation in Australia which refers to his buildings is a Melbourne newspaper advertisement which cannot be located, but an undergraduate student report in 1971 quoted it as referring to 'Mairs of Liverpool':

For Sale

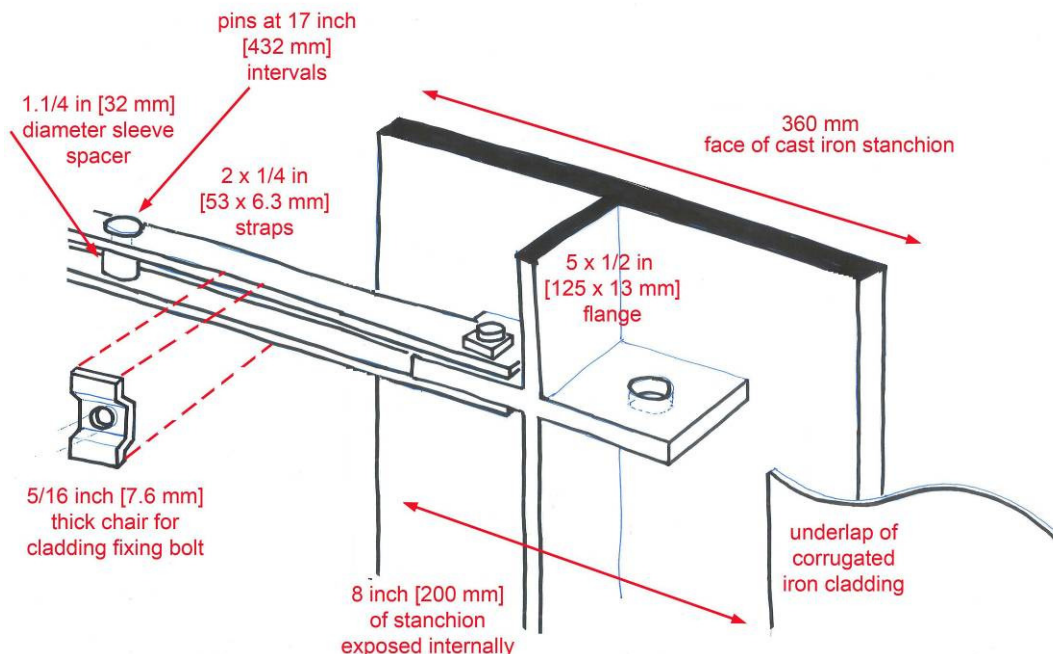
- a corrugated iron store 63'6" x 31' x 12'
- Ditto - fitted with shop front 40' x 20' x 12' connected with a two roomed house 26' x 13'6" x 12'.

All with iron standards framing and pillars. Manufactured by Mairs of Liverpool as per plans and specifications in hands of Wharton, [?Caird] & Little.⁵⁶



*The Edwin Maw building at 'Longford House', Longford: view and girt detail.
Miles Lewis*

There is, however, evidence of his buildings in later reports, and in the surviving structures themselves in Tasmania, plus one in Melbourne and three at Numbaa, New South Wales. Only two are branded, but the structural system is so distinctive that most of the others are beyond doubt. Those in Tasmania are a shed behind the Lucas Hotel, Gilbert Street, Latrobe,⁵⁷ which I have not inspected; a shed at 'Longford House', Longford; and a single corner column at 'Longford House', presumably from another Maw building.⁵⁸ The Latrobe building is three bays across, and at least four bays long, unbranded but with Maw's girts. The Longford building is of three bays, moved and braced in recent times, unbranded, but with Maw's girts. I refer to them as Maw's girts because they appear also in the former Presbyterian Church at Numbaa, New South Wales, which bears Maw's brand on at least one of the iron stanchions.



*Edwin Maw's structural system, as seen in the building at Longford.
Miles Lewis*

The distinctive external characteristic of Maw's buildings, and the basis for some of my attributions, is the division of the bays with what appear to be broad Tuscan pilasters, and which are in fact the structural cast iron columns. The buildings are clad in five inch [130 mm] corrugated galvanised iron, which is bolted to the strange chain-like girts running between the columns, an extraordinary detail which I can only surmise might have been used by Maw in his railway wagon construction. My detailed measurements are from the building at Longford, but they seem to be consistent elsewhere. The flange projecting from the back of the pilaster measures 5 x ½ in [125 x 13 mm]. There are horizontal girts at two levels, each consisting of paired flat bars, and identical chains run across the building linking the bases of opposite columns. The flats measure 2 x ¼ in [33 x 6.3 mm] and are linked with pins passing through 1.1/4 in [32 mm] diameter spacer tubes at 17 inch [432 mm] intervals. The corrugated cladding is fixed with 5/16 in [7.6 mm] diameter bolts passing through 5/16 in chairs resting between the straps.

Ironfounders seem to have been peculiarly susceptible to financial crises, and the sharp increase in the cost of iron at the time of the Crimean War might well have had an adverse effect upon Maw. Be this as it may, he found himself in financial difficulties, and on 8 June 1854 he assigned his personal estate to Thomas Truss, 'overlooker of the rolling stock of the Shrewsbury and Chester Railway', probably one of his major customers.⁵⁹ A meeting of creditors on 14 June authorised Maw to continue in operation for the benefit of creditors, and nominated trustees,⁶⁰ but the business could not have continued for long. Little more is known of Maw himself, but in the 1881 census he was described as a retired civil engineer, widowed and living with his daughter in Little Meols, near Liverpool. He died on 24 July 1888, aged 76, at Liscard, Cheshire⁶¹

Conclusion

Even such a heterogeneous survey as this can form the basis for some conclusions. The first is that Tasmania is rich in industrial heritage, especially from the colonial period, and mostly in areas like agriculture, transport and milling, rather than in manufacturing. Many opportunities remain for researching this material. I am sure that many items – such as iron steddles – remain to be discovered or to be recognised for what they are. Many British and other background sources, such as the works of Loudon, remain to be exploited. And the interpretation of these remains to the public, in reasonable technical detail rather than mere tourism clichés, would be of enormous value.

¹ The Resource Management and Planning Appeal Tribunal has subsequently ruled against the development, but not upon the heritage grounds which I advanced at the appeal and to which I refer here.

² J C Loudon, *An Encyclopædia of Cottage Farm and Villa Architecture* (London 1833).

³ James Broadbent, 'James Blackburn', in Howard Tanner [ed], *Architects of Australia* (South Melbourne 1981), pp 31-37.

⁴ Extracts from the Van Diemen's Land Company records, Tasmanian State Archives, 'Circular Head Memorandum for Dr. Hutchinson on taking charge, 11 April 1833, p 95. The two are essentially the same design, shown in detail in fig 100, p 63, and as a pair of pots on a cottage design in fig 125, p 73.

-
- ⁵ J C Loudon, *An Encyclopaedia of Agriculture, comprising the theory and practice of the valuation, transfer, laying out, improvement, and management of landed property, and the cultivation and economy of the animal and vegetable productions of agriculture, a general history of agriculture in all countries, with suggestions for its future progress, in the British Isles* (London 1826).
- ⁶ J C Loudon, *A Treatise on Forming, Improving, and Managing Country Residences* (London 1806); *Observations on Laying out Farms, in the Scotch Style, adapted to England* (London 1812); *The villa gardener : comprising the choice of a suburban villa residence, the laying out, planting and culture of the garden and grounds, and the management of the villa farm, including the dairy and poultry-yard* (London 1850). It is relevant that a copy of Loudon's *Farms in the Scotch Style*, now in the State Library of Victoria, was owned by J P Fawkner, who migrated from Van Diemen's Land to the Port Phillip District.
- ⁷ Wyatt Papworth [ed], *The Dictionary of Architecture* (London 1853-92), sv Staddel, gives that spelling as well as the terms stattel, stavel, stackstead, stackstool, standing stool, crock and patten, and describes it as a short pier of brick, stone or iron. But he does not mention the mushroom top or the question of vermin protection: rather he sees the device as a means of supporting a building above ground so that it can be removed as a tenant's fixture. Also, sv Patten, he gives the further alternative of straddle, and makes the same point that the building was raised to prevent its becoming an adjunct to the freehold. He cites a village, Crakehou in Yorkshire, in which every house and barn 'stood upon crocks.' Alec Clifton-Taylor, *The Pattern of English Building* (new ed, London 1972), p 77, refers to staddle-stones, steddle-stones, or dottles.
- ⁸ R J Brown, *Timber-Framed Buildings of England* (London 1986), pp 307-8.
- ⁹ Complete Husbandman, quoted in the Sydney Gazette, 2 December 1804, p 3.
- ¹⁰ Penny Cyclopaedia (27 vols, London 1833-43), XXIII, p 213 (sv Suffolk).
- ¹¹ Loudon, *Encyclopædia of Agriculture*, §2746, p 423.
- ¹² Charles D. Young & Company, *Illustrated and Descriptive Catalogue of Ornamental Cast and Wrought Iron and Wire Work* (Edinburgh 1850), p 73.
- ¹³ H W Lugard, 'Plans, Sections and Elevations of Buildings belonging to Agricultural Establishment Longridge', April 1839, Archives Office of Tasmania, PWD 2661 934 378/57 (from a copy held at Norfolk Island).
- ¹⁴ Frank Bolt, *Vanishing Tasmania* (Kingston [Tasmania] 1992), p 35.
- ¹⁵ Loudon, *Encyclopædia of Agriculture*, §2747, p 424.
- ¹⁶ Loudon, *Cottage, Farm and Villa Architecture*, p 405, §812.
- ¹⁷ Loudon, *Cottage, Farm and Villa Architecture*, p 405, §808.
- ¹⁸ Loudon, *Cottage, Farm and Villa Architecture*, pp 405-6, §813.
- ¹⁹ Charles D. Young & Company, *Illustrated and Descriptive Catalogue of Ornamental Cast and Wrought Iron and Wire Work* (Edinburgh 1850), p 73.
- ²⁰ It was also a European, and then a North American tradition to build corn cribs and similar stores wider at the top than the bottom, so as to reduce the opportunity for water to get in - however, this was sensible only in relation to structures designed with slots or openings for ventilation, or made in rough construction such as unchinked logs.
- ²¹ John Curtis, 'Eight Homesteads of the Winchelsea District' (history of architecture research essay, University of Melbourne, 1969), p 3.5, has the Ripple Vale brand as 'Leston Works / Pringal's Patent. Made by Garrett and Son / [crest], while at Mount Hesse it is the same but with '1844' below the crest.
- ²² R A Whitehead, *Garretts of Leiston* (London 1964), quoted in an email from Angela Plumb of the Ipswich Record Office to Simon Lloyd of the Public Heritage Unit, Victoria, 16 October 2002, forwarded to me by Lloyd. For general information see the web site, 'The Garrett Archive', <http://www.suffolkcc.gov.uk/sro/garret>.
- ²³ Robert Mallet, 'Machines for Direct Use - Engineering Tools', in Robert Mallet [ed], *The Record of the 1862 International Exhibition* (Glasgow 1862), p 294.
- ²⁴ J G Steel, *Brisbane Town in Convict Days 1824-1842* (St Lucia [Queensland] 1975), figs 58, 115.
- ²⁵ J D Phillips, *Salem in the Seventeenth Century* (Boston 1933), p 281.

-
- ²⁶ British patent of George Eckhardt & Joseph Lyon, 18 December 1806: Repertory of Arts, X, (1807), pp 425-6; see also Abraham Rees [ed], *Cyclopaedia, or Universal Dictionary of Arts, Sciences, and Literature* (London 1819), sv Pipe.
- ²⁷ References supplied by Michal Bosworth from the data base on Fremantle Gaol. BL ACC1156 C6 (Superintendent's Letterbook, 1857-1859), PD 330: Superintendent Lefroy, 12 September 1859. BL ACC1156 C23 (Comptroller General's Letterbook.), PD 1391, 15 September 1859.
- ²⁸ Ken Nelson, *Water Resources* (Melbourne 1979), p 70, quoted by James Doulgeridis, University of Melbourne 1992.
- ²⁹ Victorian patent no 718 to Benjamin Hawkins Dods, 2 June 1864.
- ³⁰ Clarence Karr, 'Robert Barbour (1827-1893)', in N B Nairn et al, *Australian Dictionary of Biography*, III (Melbourne 1969), pp 88-9.
- ³¹ *Australasian Builder & Contractor's News*, 16 March 1889, p 263.
- ³² In C E Mayes, *The Australian Builders & Contractors' Price Book* [8th ed, Sydney 1914], advertisement p 8, the pipe illustrated is marked, and in Australian Wood Pipe Co, *Catalogue No.3*, cover it is captioned Patent No 11398 30/4/08 (the last digit of the patent number is clear in the latter, not the former).
- ³³ Town and Country Journal, 19 April 1911, p 34.
- ³⁴ *Building*, 12 December 1911, p 24. The agents were Wm Adams & Co, Melbourne; F M Whitney, Adelaide; E S C A Co, Brisbane; and Harris Scarfe & Co, Perth. The company's catalogue (as quoted by Mayes) states that its pipes were first used in 1908).
- ³⁵ *Leatherwood*, I, 3 (Winter 1992), p 64.
- ³⁶ Brian Carroll, *The Engineers* (Barton [ACT] 1988), pp 113-4. For an illustration see Brian Carroll, *The Builders* (North Ryde [NSW] 1981), p 75.
- ³⁷ *Shipping Gazette and Sydney General Trade List*, 26 May 1849, p 142
- ³⁸ *Shipping Gazette and Sydney General Trade List*, 29 December 1849, p 302.
- ³⁹ *Hobart Town Courier*, 29 December 1849, p 302.
- ⁴⁰ When the *William Melville* sailed its contents included wooden houses, but there were ten rather than nine and they were in the name of G & J Salier: *Hobart Town Courier*, 7 July 1849, p 2.
- ⁴¹ *Hobart Town Courier*, 23 June 1849, p 2. Also *Hobart Colonial Times*, 22 June 1849; 6 July 1849; 6 March 1850, quoted in Barrett, 'Building through the Golden Gate', p 33.
- ⁴² One batch of forty went in the *Fair Tasmanian* in October 1849; thirty (plus two separately) in the *Lord Hobart* in November; fifteen on the *Carolina* in December; twenty plus two in the *Elizabeth Starbuck*, ten in the *Dorset*, six in the *I Don't Know* in February 1850; twelve plus ten in small lots in the *Sisters*, six in small lots in the *Augustus* and sixteen plus three in the *Timbo* in March 1850: *Hobart Town Courier*, 17 October 1849, p 2; 3 November, p 4; 12 December, p 2; 9 February 1850, p 2; 23 February, p 2; 6 March, p 2 & 13 March, p 2.
- ⁴³ *Hobart Town Courier*, 3 November 1849, p 4, as above; Bateson, *Gold Fleet*, pp 78-83; ref Supreme Court Papers, Bankruptcies Register 2, No 1958, Mitchell Library, and *Sydney Morning Herald*, 5 November, 6 November, and 19 November 1849.
- ⁴⁴ Barrett, 'Building through the Golden Gate', p 32.
- ⁴⁵ Information from a Mr Beechey, 1986.
- ⁴⁶ Launceston Examiner, 29 May 1850, p 341.
- ⁴⁷ *Hobart Town Courier*, 3 March 1850, (sic) quoted in Peter Barrett, 'Building through the Golden Gate: Architectural Influences from Trans-Pacific Trade and Migration between Australia and California 1849-1914' (Master of Planning & Design, University of Melbourne, 2001), p 33.
- ⁴⁸ *Argus*, 1 March 1923, p 9, and various unsourced newspaper cuttings and typescript notes kindly supplied by Mrs Shirley Jones.
- ⁴⁹ *Hobart Town Courier*, 12 December 1849, p 3: see also Barrett, 'Building through the Golden Gate', pp 19-20, where the references appear to be incorrect.
- ⁵⁰ *Hobart Colonial Times*, 20 November 1849, quoted in Barrett, 'Building through the Golden Gate', p 20.
- ⁵¹ *Hobart Town Courier*, 2 February 1850, p 2.

-
- ⁵² *Hobart Town Courier*, 9 February 1850, p 2.
- ⁵³ Barrett, 'Building through the Golden Gate', pp 19-21 and illustrations. The problem with this interpretation is that the houses on the *Elizabeth Starbuck* do not appear to have belonged to Bushton: twenty were despatched by Boyes & Poynter, and two by C Flegg.
- ⁵⁴ C E Peterson, 'Prefabs in the California Gold Rush, 1849', *Journal of the Society of Architectural Historians*, XIV, 4 (1965), p 322, quoting San Francisco Custom House records.
- ⁵⁵ *Liverpool Mercury*, 21 November 1851.
- ⁵⁶ Unsourced advertisement, quoted in Richard Moshel & John Witorz, 'Building Materials Imported into Victoria from the First Settlement until 1856' (BArch, University of Melbourne 1971), p 19.
- ⁵⁷ Drawn to my attention in 1995, by Dr Tim Hubbard; detailed information from Mr E J Curtis, Latrobe, 1995, and by letter of 21 April 1997.
- ⁵⁸ Inspected 2008 by courtesy of the owners, Lynton and Lisa Manley.
- ⁵⁹ *Liverpool Mercury*, 7 July 1854.
- ⁶⁰ *Morning Chronicle*, 4 September 1854.
- ⁶¹ Information from Peter Cross-Rudkin and Rob Close, 2008.