THE LITERATE VERNACULAR

The manufactured ephemera of the Australian landscape

Abstract

Earliest settlement in colonial Australia relied on structures built from imported building materials, prefabricated buildings and structures based on European vernacular building traditions.

Rural and regional areas demonstrate through a number of building types the evolution of a vernacular that illustrates real colonial ingenuity and an often idiosyncratic interpretation that was informed by traditional British and European vernacular techniques. Many of these techniques can rightly be defined as a vernacular tradition peculiar to Australia.

Three important historic periods are associated with this analysis of an Australian colonial vernacular.

Initial pastoral development (1830 – 1850)

During the late 18th century and up to the 1850s there was a gradual outwards pastoral expansion from Sydney. This was a time of engineering and architectural sophistication in Europe, but in Australia the themes of isolation, hardship, vast areas, limited transport and a dependency on expensive imported industrial building materials characterised the development of particular vernacular responses.

Discovery of gold and subsequent development of regional districts (1850 – 1880)

Changes to the character of settlement associated with the influx of immigrants who came searching for gold in the 1850s resulted in a large number of vernacular structures being erected. The use of written publications directed at assisting settlers had an enormous impact on the development of an idiosyncratic vernacular that incorporated industrial building materials with traditional vernacular building.

The Depression (1890 – 1930s)

The Depression of the 1920s saw a return to a dependency on traditional building methods as well as creative solutions drawing on found materials. This is viewed as a continuation of an eclectic Australian vernacular tradition.

Exceptions to this evolution of European traditions are found in structures built by refugee groups escaping persecution. The migration of cultural groups tended to result in a replication of their traditional building practices with less eclecticism.

These buildings are a fast disappearing ephemera in the landscape, with crumbling ruins evocative reminders of a vernacular that was manufactured and informed by tradition, industry and the written word.

The geographical area of this analysis is confined to south-eastern Australia due to the historic pattern of settlement.

Deborah Kemp and Louise Honman

Melbourne, Australia

30 November 2009

Introduction

The types of buildings found in rural areas in Australia have been influenced by the written word as much as a craft tradition brought to the colonies by immigrants. Furthermore, the nature of early rural built environments was heavily influenced by the land tenure regulations and the severe limitations of labour and materials in a sparsely populated country.

In this paper we offer a view of a vernacular architecture that is in contrast to the carefully nurtured building traditions of Europe. Australia is a land of immigrants where people from all corners of the globe have settled and built homes. However, the building traditions of these many cultural groups were frustrated in the early years of settlement by the social and economic circumstances in which they found themselves. Adaptation to accommodate these constraints was the key to success. As in any thesis there are exceptions and we also offer a particular case study of German and northern Italian immigrants, whose building traditions were transplanted to Australia intact. The overwhelming majority of settlers, though, were of English, Scottish or Irish descent.

The Southern hemisphere

From the perspective of the 19th century settler Australia was the Antipodes; the upside down land; the land of oddities; where north is south; where swans are black and not white; a land of contrasts where the birds are brighter than the vegetation; where the bark falls from trees and not the leaves; where June is winter and Christmas is hot; where communication with the northern hemisphere took six months. When you left for this country you knew you would probably never see your home and family again and communication would be difficult.

Original inhabitants

The original inhabitants of Australia, its Aboriginal population, consisted of a number of culturally and linguistically diverse groups scattered over the mainland and Tasmania. Estimates of population have varied. In 1930, Radcliffe-Brown[1] estimated that 300,000 Aboriginal people lived in Australia at the time of settlement. More recently in 1983 however, Butlin[2] suggested there had been at least a million people in the south-east of the country alone. What we do know is that occupation was low density with people thinly spread across the country. Life was dependent on water, a scarce resource in Australia.

For many years it was argued that Aboriginal people were nomadic and did not construct shelters or make settlements as recognised by Europeans. This has been a political argument, particularly during the late 20th century when it became the basis for refusal of Land Rights for Aboriginal communities. Australian land was deemed *Terra nullius* [3] when it was first claimed by the British, meaning it was considered legally uninhabited and therefore European settlement was lawful. Infact, Aboriginal cultural practices did provide for settlement, based on nomadic principles and dictated by climate and geography. For example, in one part of Western Victoria, in the area between Mt Eccles and the sea, a system of channels, ponds, weirs and traps is associated with the remains of circular stone

[1] Sage website, http://jos.sagepub.com/cgi/pdf_extract/21/1/112, accessed 13/4/10

[2] ibid

[3] Terra Nullius is a legal concept based on the premise that when the first Europeans arrived in Australia, the land was owned by no one and therefore open to settlement. The concept has since been judged not to be legally valid. There are two common definitions for terra nullius - a narrow definition is 'a territory that is not inhabited' in other words, there are no people and there are no owners. The second definition, the extended one, refers to a territory where the occupants do not exercise sovereignty over the land and therefore are not held to have property rights.

huts.[4] These huts can occur singly but are generally found in clusters of between two and sixteen huts. The material used in the stone huts indicates they are of Aboriginal design, while the spatial relationship between the huts and the fish traps indicates they are part of the same cultural complex. Australian Aboriginal cultures are adept in using the natural environment around them to aid survival. Bark, for instance, was instrumental as a lightweight shelter whose value was colloquially recognised by Europeans in the term *mia mia.* The natural environment is thus extremely important for Aboriginal people, and woven into cultural practices and spiritual beliefs. The practice of rock art within an natural shelters such as caves demonstrate a holistic approach to life where culture and survival are seamlessly intertwined.l

Colonial conditions

Australian colonial architecture is a migrant architecture rooted in European traditions. The influence of colonial governance, the history of settlement and types of settlers are readily identified in 18th and 19th century architecture and vernacular buildings. . Historically, Australia was a penal colony treated as an outpost of the Empire. The architecture and settlement patterns associated with this period were rudimentary and military in character. However, as the colony grew and agricultural interests became more powerful, architecture became a civilising vehicle assisting in the establishment of societal and colonial propriety. British architects, engineers and draftsmen drew on traditional British sources including pattern books[5] and colonial settlement reflected these traditional sentiments.

Australian identity

It was not until the late 19th and early 20th centuries, with the federation of the British colonies and the creation of an Australian federal government, that we can identify stirrings of an Australian response to this unique country. Initially this was quite self-conscious and was expressed in the form of emblems pasted onto architecture, including parrots cast in iron lace work, festoons of decorative plaster work based on indigenous plants, timber carvings of Aboriginal figures emblazoned across fire surrounds and other similar pastiches. The elemental nature of the country and its climate was one of the last specifics to be addressed in this slowly awakening exploration of nationhood and identity, yet it is the most fundamental area for architects and designers to grapple with.

The derivative nature of Colonial vernacular architecture

The development of an Australian vernacular coincided with the Industrial Revolution. For European countries this phenomenon contributed to an economic growth that was coupled with social change. One of the cultural consequences was a move away from traditional materials and building techniques to meet new demands. This is in striking contrast to colonial settlement where settlers looked back to traditional building practices and vernacular designs as a solution to the harsh conditions and inherent limitations of colonial life.

This was an acquired vernacular influenced by recognised and learnt traditions, economic conditions, the natural environment, lack of manufactured building materials, and limited transport. The only vernacular practice that was influenced by Aboriginal cultural building technologies was in the use of bark. Unlike Europe where there are identifiable regional characteristics, in Australia similar techniques emerged in different places.

The result was in part derivative, in part a reaction to environmental conditions and it often manifested in an eclectic built response. It is with these buildings that one can find

[4] National Heritage List, Budj Bim National Heritage Landscape, Listed place 10567

[5] Pattern books such as those published by J C Loudon including The Encyclopaedia of Cottage Farm and Villa Architecture, 1834

the nascent stirrings of a truer and elemental response to this *unusual place*. They represent but a brief flowering of cultural building practices but nevertheless an important aspect of colonial building that has been neglected.

Vernacular buildings in Australia are defined by constraints that have varied during the 200 years of European settlement. These include limited access to manufactured building materials (as well as the high cost of these materials), limited building skills, limited transport links and forms of transport, and most importantly, limited freehold land.

The development of an Australian rural vernacular architecture

This paper illustrates a number of vernacular building types from periods related to pastoral expansion. The time frame for this is narrow, a mere 200 years. During this period, rapid social and physical changes occurred accompanied by a number of determinant events. Examples are drawn from rural buildings in south eastern Australia because it is in these areas that vernacular techniques provided the means for settlement, in the form of the first houses and rural industrial buildings. It is also where the most interesting and diverse expressions occur.

We put forward the hypothesis that it was the influence of the written word as much as transplanted traditions and learnt technique that has influenced rural vernacular building in Australia. The presence of instructional and reflective publications during the later half of the nineteenth century meant the written account had a significant influence, particularly when settlers came from urban backgrounds and had little direct experience of rural life.

However, the extent of the influence of literate sources was largely determined by land tenure. Land tenure was critical in dictating how and where settlement could occur. Where tenure was uncertain, built examples had a limited expression and publications had less influence. But where land tenure, increased numbers of settlers and a huge diversity of published advice coincided, an array of variations and derivations of vernacular building can be identified.

The range of building techniques include:

- Timber – slabs
- Cob/hybrid earth
- Pisé
- Wattle and Daub
- Log construction

Land tenure

Land tenure has been an important factor in the development of a vernacular building tradition in Australia. The way in which land was allocated and the conditions of allocation have determined the way land is used and the types of buildings that have developed.

Squatters[6] 1830 – 1850s/60s

As a penal colony there was no real settlement intention for Australia. It was to be a place of exile under total and authoritarian British colonial rule. The early years of the colony were characterised by the development of small places of imprisonment in New South Wales and Tasmania. Farming areas were established but they were to provide food for the

[6] In the 19th century, a squatter was a person who occupied a large tract of Crown Land in order to graze livestock. At first, this was done illegally, and later under license.

penal colonies and were not initially considered an economic venture. However, this changed with the growth of pastoral enterprises and particularly those linked with the export of wool. The recognition of boundaries that were ever expanding, albeit illegally, was forced upon the unwilling British government. These boundaries had initially been defined for a limited pastoral industry, but this did not stop pastoralists greedy for more land and 'free land'. The response by government was to grant leases but not freehold. Publications on how to build were of little use because most sources were largely concerned with the establishment of farms and buildings and were aimed at British farming practices with an implicit capital expenditure. This uncertainty of leasehold meant that the first pastoral structures were very primitive, built in the cheapest manner possible, and were similar in construction.

Vernacular structures from this period are a result of economic uncertainty, as well as more obvious constraints including the availability of materials and the limitations of the workforce (availability, skills and the high cost of labour). It was at this time that much construction was carried out using the contract labour of travelling sawyers and splitters, resulting in a great similarity of building over a wide geographic area.

Gold and immigration

The discovery of gold led to a huge increase in immigration. The population of the colony of Victoria increased from 80,0000 to 540,000 over a period of 10 years from 1851 to 1861.[7] Gold prospectors and miners came from many different parts of the world, including California, China and Europe. For the first time during white settlement there was a greater cultural diversity as many who came for gold stayed. These new settlers often had few farming skills or building crafts to assist them and failure was common during this period of rural settlement.

Once the initial gold rushes were over (1852 – 1860) the large number of miners that remained in these areas pressed the government for land to buy. This was met with displeasure from the squatter class who were becoming well established on their pastoral properties and were highly protective of their leasehold land. The political influence of the squatters meant that it took approximately 10 years and a succession of Land Acts before freehold land became more readily available. However, the conditions of Land Selection[8] were onerous and what little capital the settler had was not for building but for farming. This meant that many looked to vernacular building traditions for their housing and farm buildings.

Settlement through the Land Selection Acts was supported by many publications and immigrant manuals, including British, American, and colonial agricultural periodicals, newspapers and farmers' Gazettes. Content in these publications was often sourced from other overseas publications, and in particular a number had a significant American content. Many manuals were aimed at a number of colonies such as those in South Africa and New Zealand and were generic and not specifically aimed at Australian conditions.

Depression years – 1890s – 1920s

During the Depression years of the 1890s - 1920s a number of government initiatives were established with the intent of assisting the unemployed and destitute on to small allotments where they could look after themselves and their families. The ideal of the yeoman farmer was the incentive – only at this time there was considerable government

[7] SBS Gold, Immigration and Population, http://www.sbs.com.au/gold/story.php?storyid=49 , accessed 13/4/2010

[8] Land Selection is a term associated with the Land Acts of the 1860s – 1870s. Land was selected by a prospective owner but if he could not pay the freehold price he had to fulfil a number of conditions over a number of years to acquire the freehold land. Failure was common and poverty and hardship were rife as the acts did not allow for the selection of sufficient land, nor was there any allowance for the variability of climate and the subsequent failures of crops during dry years.

intervention and assistance in establishing certain types of agriculture. Settlements on French Island in Western Port Bay (Victoria) were established to provide a living for unemployed families. The Closer Settlement Schemes provided land for farming and many of the large pastoral holdings were broken up and subdivided. Farming industries were established with Government support and direction with Government publications promoting certain types of agriculture and industry, and appropriate buildings.

The influence of publications

The range of publications available to settlers was extensive, and ranged from academic encyclopaedias and architectural books, to populist local newspapers. An examination of the types of publications that were available over 200 years clearly illustrates a response to the needs and circumstances of the settlers. The largest and most diverse range of written material appeared during the 1860s – 1900. Many of these were initially overseas publications. As freehold settlement developed more were published locally, although content was often guided by overseas contributions.

The quality of the advice varied greatly as to appropriateness and usefulness. However, it is evident that many vernacular buildings were informed by publications aimed at the settler. The publications taught them techniques which were passed on, acquired and altered to suit circumstances until a fluid interpretation of some traditional European practices emerged. Many of these structures were adapted to accommodate the geography, climate and the newly available manufactured building materials.

Encyclopaedias

The earliest publications were generally encyclopaedias or similar highly technical accounts. These were for the educated person and while encyclopaedias such as Denis Diderot's *Encyclopèdie* were found in the Colonies relatively few people owned copies. Their direct influence is not easily found, but as references for other publications they provided a source of information. This was a process of gradual dissemination and provision of insights, rather than a directing of specific traditions. For example, Tomlinson's[9] *Cyclopaedia* was widely read in the colonies but many of the entries had been sourced from other earlier encyclopaedia such as Abraham Rees'[10] *Cyclopeadia*.Later, a number of Encyclopaedias became available that were aimed at the colonies and provided advice to assist building. The most direct influence encyclopaeadic sources had on vernacular building was in the use of pisé. The principles of pisé construction were recorded in a number of encyclopaedias and were gradually disseminated, with whole sections reprinted in rural newspapers. The technique was picked up in a number of regions and while not common is well represented.

Pattern books

A range of architectural pattern books could be found in the Colonies. They were written for the middle classes, to enable them to emulate the stylish buildings of the wealthy on a smaller scale, tended to be used in a more urban environment.

However, an excellent *rural* example can be found at the Beechworth goldfields, where a miner's house demonstrates a remarkable adaptation of a canvas tent using a pattern book design. The tent was at some point clad with timber slabs and a few years later a rudimentary timber frame building was added to this primitive hut, with the design sourced from a Calvert Vaux pattern book.[11] The timber slab section and pattern book derived addition still survive relatively intact.

---

[9] Charles Tomlinson [ed]Cyclopaedia of Useful Arts and Manufactures, London,1853

[10] A.Rees,The Cyclopaedia, or Universal dictionary of arts, sciences And literature, London, 1819 – 1820

[11] Calvert Vaux Villas and cottages, 1857

Immigrant manuals

Immigrant manuals were designed to give specific guidance to those emigrating to the colonies. They were greatly varied in the type of advice they gave, some being specific to the point of supplying a shopping list explaining how many nails you would need to bring with you, and the tools that would be required. Others described in great detail how to fell and split timber. The manuals were also varied in the usefulness of their content, for example, instructions for making concrete were of limited use as lime was expensive and rarely available.

Agricultural journals

Colonial agricultural journals aimed at the settler on the land were of the most assistance in providing specific information about types of buildings suited to various farm purposes. They provided advice on a number of different building techniques, including earth construction. British journals often did not make the connection between conditions 'at home' and in the Colonies, and forgot the severe limitations on materials and skilled labour. American journals were often more useful, and there are a number of direct influences that can be identified.

Many British agricultural journals were tied to the agricultural improvement movement occurring in Britain. While these provided examples, Australian conditions were so different that many of the recommendations were not taken up despite endorsement by the Government of the day. For example the Albert Purchas model farm design[12] promoted building a courtyard farmstead - a principle well accepted in Britain but too expensive for the general settler. There were a number of local sources for the prospective settler including W S Chauncy writing as 'Rusticus', in *How to Settle in Victoria*[13] In this excerpt Rusticus describes a cob building:

> *The MUD HUT is made with well-tempered clay, mixed with chopped straw, worked in with a small quantity of water, and then laid on the wall, by hand, in small quantities at a time, so that the work may set quite hard in each course before the succeeding layer is placed upon it. The surface of the wall is then smoothed off with a spade or trowel … A good coating of lime and sand when the former can be procured, vastly increases the durability of these structures, which otherwise require a verandah, or other means of protection from the effects of rain. In many cases, by giving a sufficient projection to the eaves, this difficulty may be overcome.*[14]

The *Town and Country Journal* and British and American journals such R.S. Burn's *Colonist's and Emigrants Handbook of the Mechanical Arts,*[15] described to varying degrees techniques for an unskilled labourer to learn basic building and farming techniques. The common theme was that bush materials that were readily available should be used, while common building skills that were described included splitting and sawing timber, brick making, lime burning, earthworks and fencing.

The Australasian Farmer[16] was written because the staff at the Australasian newspaper felt that a manual would be helpful given the different conditions and requirements of the southern hemisphere. Recommendations included the prioritising of fencing and establishing a water supply, followed by housing and outbuildings that would depend on local conditions and the type of enterprise.[17] It added as an admonition:

---

12 Farmers' Journal and Gardeners' Chronicle, Melbourne, 26 July 1862, p 393

[13] W.Chauncey How to Settle in Victoria (Melbourne 1855), p 20.

[14] Ibid, p20

[15] R.S.Burn,Colonist's and Emigrants Handbook of the Mechanical Arts, Edinburgh, 1814

[16] The Australasian, The Australasian Farmer, Melbourne

[17] The Australasian, The Australasian Farmer, Melbourne, p 12

> *It is to be regretted that many settlers are led by the mildness of the climate to an injurious degree of carelessness in regard to buildings. Poor character of homestead.…gives an unattractive appearance to settled districts and a financial loss…The poor erections put up to serve the new settler are often retained.*[18]

However, well into the 20th century these types of rudimentary structures were still being used and no attempt had been made to construct the 'traditional British farmyard'

Newspapers and periodicals

Many small regional newspapers in Australia gave quite specific advice but still published whole articles lifted from other journals – particularly those that were American and British. Mechanic's Institutes in rural towns operated as a library and trade school, and provided a much needed source for a number of these publications. However, much information was pertinent if basic in its intentions.

Vernacular building types

This section looks at a number of the more common types of vernacular buildings in south eastern Australia classified by the materials used. It is a small range of the types found in rural Australia and is not a complete survey of vernacular techniques used. Examples are drawn from those where a written source has been identified.

Bark

Bark as a building material is not unknown outside Australia, however the tradition of Aboriginal shelters made of bark has established the material as a quintessentially Australian building material. In colonial vernacular buildings it was commonly used as a roofing material. Bark was removed from a tree in rough lengths of 1.5m – 1.8m and laid on the roof in rough sheets, fastened with lashings of greenhide and secured with spars transversally. These were known as 'jockeys and riders.' Daryl Tonkin in *Jackson's Track* [19] described using stringy bark for construction purposes:

> *The best way to get bark off was to use a special barking bar which was about four feet long and had a flattened end like a blade about three inches wide and curved to go around the log. You could get any amount of bark off you wanted in as much as thirty foot lengths.* [20]

The book also described an aboriginal practice that required firing the bark, "to strengthen it and straighten it before you used it." Tonkin said that he "used to spend a lot of time and energy pulling the bark over a fire and then laying it out and rolling it flat", and describes this as, "the blackfella way". As bark is considered an indigenous building response, the published material for this method reflects on the process, rather than offering advice in the form of an instruction manual.

Timber slabs

Australian timber is a particularly hard and dense wood and is difficult to work, however it splits freely and came to be well regarded as a building material. The early axes used by colonists were not of much use. It was not until axes able to cope with these hard woods and the supply of cheap manufactured nails (Ewbank Patent Pressed Nail) that timber was worked in any sophisticated manner. Its fissile qualities, however, lent it to the production of slabs and the development of a generic vernacular that was ubiquitous and found in many regions.

---

[18] The Australasian, *The Australasian Farmer,* Melbourne, p 12

[19] D Tonkin and C Landon, *Jackson's Track,* Viking, Ringwood, 1999,pp 60 - 61

[20] D Tonkin and C Landon, *Jackson's Track,* pp 60 - 61

Horizontal slab construction is not peculiar to Australia. Examples are found in Denmark[21], and at Fort Vancouver in Canada, where the construction ofone of the Hudson's Bay Company's buildings was described in 1839:

> *…posts are raised at convenient intervals, with grooves in the facing sides. In these grooves planks are inserted horizontally, and the walls are complete. Rafters raised on plates, in the usual way, and covered with boards, form the roof.*[22]

Miles Lewis describes an English precedent for horizontal slab construction, a type of timber partition that featured in *Notes and Queries*[23]:

> *…of oak, very roughly made; nearly alike on both sides, formed of boards 10 in. wide, fixed in vertical grooves in stout uprights, which are 6 in. wide, with chamfered edges, having triangular, or sometimes leaf-shaped chamfer stops about 7 in. from the bottom, the whole fixed by means of mortices in a horizontal beam resting on the floor, and above in a horizontal beam chamfered over the spaces between the uprights, with short returns to meet the chamfered edges of the upright.*[24]

These early colonial slab structures were rudimentary but still required some traditional carpentry skills such as mortice and tenon joints, dove tails and trenails. Nails were expensive and scarce and traditional carpentry practices were integral to their construction.

The widespread use of this vernacular technique was noted by A. Harris in 1847, when he wrote that the timber slab building type was almost universal. He explained that the building tradition was spread by travelling artisans and that the Squatters tended to rely on travelling sawyers and workers to construct their huts:

> *'Sawyers are unavoidably a wandering race in new countries… The whole bush…was then thronged…with men who get their living by various kinds of bush work; some felling and squaring whole trees with the squaring axe…*[25]

Harris also described the typical construction of a squatters hut

> *Like all bush houses it was only one story high, and, …had a verandah in front of about six feet deep. The first step … was digging post-holes, of about two feet deep, …in which were placed posts ten feet high, squatted*[26] *on the four sides with axe, excepting the two feet let into the ground, where the whole strength of the timber was left. Along the ground… were laid ground-plates, of about the same size, and squatted on the sides facing each other, and having a groove of about an inch and a half wide and two inches deep mortised into the flat sides their whole length. Into these grooves were fitted the two ends of the eight –feet slabs we had split with the maul and wedges. The roof was made much in the usual way, only, being for some time to come to continue covered with bark... The flooring-boards, … were six inches wide and one thick; timber being used so green, and the heat being so great, boards of any greater width turn up at the edges, so as in time to look like a row of spouts. The rooms were all joisted at the top , and on the joists was spread a floor of bark, so as to form, over the whole top of the house, the settler's usual first rude granary. Squares of a couple of feet each way were left open in the wall in various places for windows; at present, however, they were only fitted with shutters. The chimneys were large, like those of old farm-houses, and, for security, had a little wall of rough stone and mortar run up inside about three feet; and in the middle of the fire-place was a large flag-stone, of a sort capable of resisting the fire, which constituted the hearth and baking place.*

---

[21] Illustration of a horizontal slab building resting on a stone plinth/foundation. m Benzon, *Gammelt dansk bindings – værk,* Denmark, 1983, p 33

[22] M Lewis, *Victorian Primitive,* Carlton, 1977, p 31

[23] Notes and Queries, 9th Series, III, p268, quoted Innocent, Development of English Building Construction, p116

[24] M Lewis, *Victorian Primitive,* Carlton, 1977, p 26

[25] A Harris *Settlers and Convicts p 87*

[26] squared

The slabs could be plastered all over to make them weatherproof and this tended to occur in New South Wales.[27] To get a surface ready to take the plaster the slabs were chipped with an axe and then plastered with a mixture of alluvial soil, cow dung and chopped grass.[28]The cracks in the slabs could also be filled with clay and mud. After 1850 when nails were cheaper a strip could be nailed over the gaps.

Later slab examples (1850s – 1880s) saw a greater reliance on nails and the use of materials such as iron for roofing. Instead of the slabs being inserted into a grooved section in the bottom and top plates, the planks were slotted between nailed battens and secured with nails. Later refinements also included sawn boards instead of split slabs.

Log

Rough hewn log houses were mainly used as lock ups on the gold fields. The logs were notched into one another at corners and sometimes the joint was reinforced by a peg. The interstices were filled up with clay. The timber log lockups were said to have come from America and the technique arrived there from northern European countries. However, this technique is also described in a number of American journals and was used in various regions including the Goulburn Valley in Victoria. These log buildings are of particular note for being used as houses as well as farm buildings. Most of the identified examples do not have floors (timber floors on bearers and joists), although one Goulburn Valley log building does have a timber floor and appears to follow the construction techniques described in R.S. Burn's *Colonist's and Emigrant's Handbook of the Mechanical Arts*[29]. Other journals also describe and promote this particular building technique of log construction and it was recommended for use in the tobacco industry for the construction of drying kilns.

Howell, in *The Agricultural Gazette of New South Wales*[30] describes building a log barn for a tobacco-drying kiln. It was cited as being suitable where large lengths of timber were not available.

> *The log size could vary between 1.5 – 2.0m. The logs were flattened on their sides with the adze or broad axe, the ends were then bevelled and these logs were dropped into grooves in the upright columns of logs. The columns could be constructed from two inner and outer pieces of timber approximately 250 x 75 mm and these were bolted together with sufficient space between them to slot the ends of the panel pieces. It was recommended that the gaps be chinked with clay or mortar .*

Howell described this as 'the old fashioned chink barn of Virginia and Carolinas.'

Earth - cob and pisé

Pisé was one of the most widely published building techniques using earth during the 19th century. The types of publications varied from encyclopaedias through to regional newspapers and although it was not widely used in Australia it was promoted as being useful in rural areas. Accounts of pisé were published in the 1870s in the *Town and Country Journal,* a widely read journal in rural areas. A number of buildings were constructed in the Riverina region of southern New South Wales, which had the right soil conditions, little millable timber and limited transport for manufactured building materials.

British settlers used pisé as a building technique more than other ethnic groups and despite other earth building traditions that were commonly utilised in Europe. There were many

[27] M Lewis, Victorian Primitive, Carlton, 1977, p 26

[28] M Lewis, Victorian Primitive, Carlton, 1977, p 26

[29] R.S. Burn, *Colonist's and Emigrant's Handbook of the Mechanical Arts*[29], Edinburgh, 1814

[30] A M Howell, ' The Culture of Tobacco,' Agricultural Gazette of New South Wales, Sydney, 1898, p 784

English publications describing and recommending pisé construction as being economical, durable and easily erected and this possibly explains its popularity amongst the British.

According to Miles Lewis many settlers understood the principles of pise. It was used from the 1840s in towns but as soon as stone and brick became available pisé was abandoned.

> *Most of the old erections were built in that most dirty and contemptible of all colonial inventions, pisè [sic] or rammed earth. There never was in the city more than one good house of such material, and that must have cost as much to make it what it is , and to preserve it, as would have paid for more desirable materials. However 'de mortuis nil nisi bonum.' The practice is now extinct here, never (it is to be hoped) to be revived.*[31]

However, it continued to be employed well into the late 19th century in rural areas.

Pisé requires specific material for its construction to be successful. A gravelly loam is critical to its successful construction and this is placed between formwork and rammed in layers. This is unlike cob which is a clay pug that is piled up in layers to make a wall and pared back after each successive layer.

In some instances adaptations were made to the pisé technique. Lime could be added to the mix to make it more durable, while the addition of scraps or wire provided a primitive reinforcement. In one example in the Riverina, barbed wire was used between each layer of rammed earth. Reinforcement was formalised in 1860 when Charles Mayes in *Victorian Government Prize Essays, 1860*[32] refers to various forms of pisé. He argued that pisé could be used as a substitute for brick or stonework to make comfortable but cheap housing, and considered the method suitable for cottages, houses, homesteads, country inns and outbuildings.

Mayes had patented an 'improved pisé' method in 1854. He had designed moulds of plain or galvanised sheet iron containing a core. This left a flattened tube or slit running vertically through the wall. The vertical tubes were to make the pisé less likely to crack and easier to dry and more weatherproof as well as for ventilation.[33] This mould could not only be used with the more traditional materials of loam and gravel but could also accommodate a mixture of burnt clay or waste bricks with sand and clay which apparently required thorough ramming, a cob pisé of clay, mud mixed with chopped straw, or shavings which had been tempered within the formwork. Mayes also refers to a concrete pisé, a mixture of sand, gravel and common lime.

The *Agricultural Gazette of New South Wales* supported the use of Mayes' method. It was considered a suitable building material for its economy, durability, ease of construction and its thermal capacities. That it was adapted is without question. Miles Lewis describes a 'debased form' of pisé that became popular amongst selectors. He describes one example as being basically timber framed with the posts taking most of the load and an earth infill panel of pisé. The formwork had been nailed horizontally flush across the faces of the post.[34]

Pisé, despite its appropriateness for Australian conditions, never became truly popular during the 19th and 20th centuries.Today in the 21st century it is increasingly common in modern architecture as its economy, durability and thermal capacities become recognised once again.

---

[31] M Lewis, *Victorian Primitive,* Carlton, 1977, p 55

[32] Charles Mayes, ' Manufactures for the Economical Development of the Resources of the Colony',*Victorian Government Prize Essay 1860,* Melbourne, 1860

[33] M Lewis, *Victorian Primitive,* Carlton, 1977, p 56

[34] M Lewis, *Victorian Primitive,* Carlton, 1977, p 58

Timber and Earth

Wattle and daub building techniques were known to the Romans in the ancient world. Typically vertical rods of hazel were place into prepared holes or grooves in the horizontal framing and thinner rods were woven in and out horizontally to form a basketwork. Both sides of the basket work were daubed with a mixture of clay, water and straw and sometimes with cow dung.

Traditional wattle and daub as described above has been identified in Australia as a building technique utilised during the earliest period of settlement. No nails were used in the construction as the ends of the wattles were placed in holes in the frame. By the late 1850s and in particular the 1860s, during the Land Selection era, crude derivations of the technique were being practised.

While examples of roughly woven wattles nailed to larger timber pieces with a rough render have been identified, it is the tradition of cruder earth and timber construction which became common throughout the colonies. This technique did not use wattles, instead larger pieces of timber were nailed horizontally 1 – 3cm apart on both sides of a timber frame and filled with earth, stone, or mixtures. This type of construction has been termed 'pole and pug' by Miles Lewis and he traces its development from the earlier wattle and daub. It is his opinion that this 'mud packed timber construction is a specific Australian development.

Wattle and daub and similar techniques were featured in many publications as an appropriate building style for the colonies. R.J. Mann in *Mann's Emigrant's Guide to Australia*[35] describes wattle and daub as the most 'usual style' consisting of strong uprights of wood driven into the ground and long narrow sticks woven across these 'like twigs of a wicker basket.' Moist clay and earth was well mixed up with chopped hay or straw and this was plastered over the wall and finished off with a trowel. Mann does not state whether this is done on both sides.[36]

'W S Chauncy, writing as "Rusticus" in *How to Settle in Victoria*[37], mentioned wattle and daub as a cheap form of construction along with other methods, while Howell[38] recommended 'wattle and dab' (*sic*) as a suitable form of construction for a tobacco kiln. However, his description that included the building of a timber frame and applying a 'dab' would perhaps be more suited to pole and pug as there is no description of weaving of wattles and then applying the daub.

Frederick Channon, writing in the *Town and Country Journal, in 1881,* also described 'Wattle and Dab Walls', and recommended the method as it was warm in winter and cool in summer. Channon formalised the development of pole and pug in this article, providing a description of the techniques and noting another variation of wattle and dab where rubble is used to fill up interstices:

> *A frame and roof was first built and then upright pieces of timber were nailed to wall plates at intervals of 900mm – 1200mm. Then 'wattles' were cut to uniform lengths and nailed horizontally to the uprights - both inside and outside - leaving a space of 100mm – 130mm between them. A stiff clay batter was 'cobbed' (thrown) from both sides of the wall at the same time, this was commenced at ground level and worked upwards. Rubble could be used here and there to fill up the interstices.*[39]

---

[35] R J Mann, *Mann's Emigrant's Guide to Australia,* London, 1849

[36] R J Mann, *Mann's Emigrant's Guide to Australia,* London, 1849, p 23

[37] W.S.Chauncy, "Rusticus", *How to Settle in Victoria,or Instructions on the Purchase and Occupations of the Land, with Observations on Gardening and Farming*, Melbourne, 1855

[38] A M Howell, ' The Culture of Tobacco,' Agricultural Gazette of New South Wales, Sydney, 1898, p 784

[39] Frederick Channon, *Town and Country Journal*, Sydney, 22 October 1881

German and Swiss Italian traditions

British building techniques in Australia were often variations on the original versions, adapted to suitlocal conditions and materials. By contrast there are some small settlements where buildings demonstrate that very little change has occurred. This tends to be the case where immigrants have had tightly controlled societies, such as religious affiliations. Often the reason for many to emigrate was the fear of persecution in their homeland. In Australia such emigrants were free to live in whichever way they chose, and they often adopted traditional ways of life. Emigrant Germans tended to retain their cultural practices with a veracity that is less common in other cultural groups. For instance in Australia traditional thatching, carpentry and *Hufendorf* village plans can be identified in areas settled by German migrants. [40]

The German vernacular technique of 'Lehmwickel' has survived largely intact, most likely because the culture that used it came with the technique to Australia. Lehmwickel is a vernacular technique associated with German half timbered (*Fachwerk*) buildings, where it wasemployed in the construction of walls and ceilings. The technique uses a mixture of earth and straw which is wrapped around timber stakes, leaving a timber point at each end. The wrapped stakes are placed alongside each other within a wall or ceiling. When used in wall construction both faces are commonly 'plastered' although in some examples internal walls and ceilings are left exposed.

In the 1850s a German settlement in the west of Victoria clearly illustrates the complete translocation of this building technique in its traditional form. Miles Lewis identified this settlement and noted:

> *Here you find traditional European half timbering (Fachwerk) – an external squared timber frame with timber bracing with earth infill. Lehmwickel has been used in the ceilings and in the walls. The stakes are split timber clad in an earth and straw mix. They were then placed either horizontally (ceilings) or vertically in panels and the pointed ends were placed in holes prepared for them.*

Another example of rural building practices transplanted unaltered to Australia is the Swiss Italian settlement at Yandoit, Victoria. Swiss Italian immigrants came to Victoria in response to economic hardships and political instability in Switzerland, and the lure of gold on the central Victorian goldfields in the 1850s. Farm buildings in Yandoit are of stone and are placed in groupings that resemble European farm complexes. The traditional design for outbuildings was adhered to, with the finished structure catering for animals below and people above. The buildings display skilled use of local sandstone in random coursed rubble. The laying technique is unusual and aesthetically adept and illustrates vernacular construction by Swiss Italians.[41]

Economic depression

The economic depression of the 1890s forced a return to the harsh conditions experienced in the early years of settlement. Cities and rural areas alike suffered poverty and hardship. The Government of the day sought to alleviate hardship by continuing policies that encouraged people to make a living from the land, a return to support for the yeoman farmer, who was self sufficient and therefore less of a drain on welfare organisations. State sponsored agriculture was also promoted to give support to industries such as chicory, fruit drying and tobacco.

---

[40] Miles Lewis, *Lehmwickel and the German Diaspora,* Proceedings of the Third International Congress on Construction History, Cottbus, May 2009, p 951

[41] Victorian Heritage Database Elvezia Complex, Limestone Hills Road, Yandoit H2065 http://vhd.heritage.vic.gov.au/vhd/heritagevic#detail_places;12296 accessed 11/4/2010

French Island

French Island in the 1890s had a number of small settlements formed by the Victorian Government and leased to Melbourne families suffering from the 1890 depression. Like many other small settlements as a result of Land Acts, the miserly portions of land were unable to sustain farmers and they often lacked the real farm knowledge required to succeed. Importation of materials to French Island was difficult and expensive therefore it provides a microcosm of vernacular building using local materials and recycled manufactured materials such as roofing iron. Chicory Kilns on the island represent a range of earth based techniques including cob with brick lining, pisé and adobe. Stone rubble and concrete were also used, and pole and pug was common in a return to earlier techniques. The kilns were often thatched with rushes indigenous to the area.

In 1861 *The Farmers' Journal and Gardeners' Chronicle* [42] gave instructions for the cultivation of chicory and a description of a 'simple' kiln. All that was basically required was a hot plate with a roof over it. If labour and materials were available the kiln could be built in a shed.

Fruit drying

The development of irrigated blocks for growing fruit and vines was another initiative aimed at the small settler. In 1893 the *Agricultural Gazette of New South Wales*[43] was praising the introduction of evaporation and drying kilns for fruits and raisins. The fruit drying kiln relied on a furnace and heated flues to dry the fruit. The Gazette proposed using cob as the main construction material.

Cob walling was most likely chosen in this case because of its ease and cheapness of construction and for the thermal properties of earth construction. As a technique it doesn't require a lot of skill and although it is considered to be less durable, the verandah of the kiln would have provided protection. Moreover the cob ceiling would absorb some of the moisture from the fruit drying process. The absorptive qualities of earth-based ceilings were also utilised in the construction of stables. The heated air from a kiln was distributed through 200mm wrought iron pipes, telescoped into each other in 1.2m lengths and laid 600mm below the floor level. The roof and verandah were made from galvanised iron in an amalgam of traditional and manufactured materials and techniques.

Conclusion

Land tenure and materials

This paper has put forward the hypothesis that vernacular building traditions in Australia have been the result not only of structural practices brought from the homelands of immigrants , but that timber and earth building traditions have evolved into an array of variations through the specific conditions encountered in Australia. Economic, transport and material limitations necessitated ingenious departures from custom. However, precarious land tenure arrangements meant that rural buildings remained primitive long after material limitations were not so acute. Different forms of land tenure continued well into the twentieth century with Government schemes for closer settlement and agricultural enterprise. Freehold land was hard won, and the construction of carefully crafted buildings was generally a luxury not many could afford.

The emergence of countless variations on traditional earth- and timber-based building forms in Australia was helped along by the availability of manufactured materials such as nails and corrugated iron that tended to make the process of construction easier. The

[42] *The Farmers' Journal and Gardeners' Chronicle,* Melbourne, 28 September 1861, p 1204

[43] *Agricultural Gazette of New South Wales,* 1893, Sydney, p 36

search for pure vernacular building techniques in Australia is, consequently, a largely a futile one.

Publications

European settlement in Australia corresponded with a more widespread and accessible media dedicated to instructing and reflecting on approaches to conditions in the Antipodes. The popular press in Britain and America published articles to assist the immigrant in all aspects of rural life, and this was rapidly taken up by the newly emerging Australian media who saw the need for information about specific Australian conditions.

There representation of Australia in writing destined for consumption in Britain also had a potential impact on vernacular building in the colonies. The re-creation of a cultural homeland was a pervasive theme and could have inhibited a more appropriate response to such a diverse climate and geographical place. Colonial vernacular building, like many of its European counterparts was not only viewed as a pragmatic solution, it was also absorbed into the popular culture of the time. Many 19th century paintings and sketches - both amateur and professional, have representations of vernacular buildings. This representation expresses an idealised vision of colonial life and of the civilising effects of traditional building.

The future for vernacular buildings

Pervasive colonial cultural attitudes to land use, whether it be for settlement or agricultural purposes, has dominated European approaches not only to Aboriginal Land Rights but also to agricultural practices. From the 19th century to the present day a number of regional and rural areas in Australia are marked by the failure to fully appreciate conditions . A hostile climate, poor soils, and frequent drought has taken its toll. The rural landscape is littered with the ephemeral structures of early settlers, despite their efforts to connect traditional building techniques with climate responsiveness, as demonstrated by the promotion of earth building as an appropriate technique for keeping indoor spaces cool.

Today the development of appropriate policies for land use, acknowledgement of Aboriginal Land Rights and a respect for the nature of place are only just beginning. Settlement is still resource hungry. But in some places a renaissance of vernacular techniques is emerging that appreciates the environmentally sustainable nature of these earlier building methods. It is increasingly common to see pisé, consolidated earth, solid log, and mud brick in modern construction, representing a continuation of some of the romantic ideals of settlement in the Antipodes.

Deborah Kemp and Louise Honman

Melbourne, Australia

24 May 2010

BIBLIOGRAPHY

Books

M Lewis, Victorian Primitive, Carlton, 1977

J C Loudon, *The Encyclopaedia of Cottage Farm and Villa Architecture*, 1834

Charles Tomlinson (ed) *Cyclopaedia of Useful Art and Manufacture*, London, 1853

A.Rees, *The Cyclopaedia or Universal Dictionary of Arts, Science and Literature*, London, 1819 -1820

Calvert Vaux *Villas and cottages*, 1857

Farmers' Journal and Gardeners' Chronicle, Melbourne, 26 July 1862,

R.S,Burn, *Colonist's and Emigrants Handbook of the Mechanical Arts,* Edinburgh, 1814

D Tonkin and C Landon, *Jackson's Track,* Viking, Ringwood, 1999

Benzon, *Gammelt dansk bindings – værk,* Denmark, 1983

A.M. Howell, ' The Culture of Tobacco,' Agricultural Gazette of New South Wales, Sydney, 1898

Charles Mayes, ' Manufactures for the Economical Development of the Resources of the Colony',Victorian Government Prize Essay, Melbourne, 1860

R J Mann, *Mann's Emigrant's Guide to Australia,* London, 1849

W.S.Chauncy, "Rusticus", *How to Settle in Victoria,or Instructions on the Purchase and Occupations of the Land, with Observations on Gardening and Farming*, Melbourne, 1855

Periodicals

The Farmers' Journal and Gardeners' Chronicle, Melbourne, 28 September 1861

Agricultural Gazette of New South Wales, 1893, Sydney

The Australasian, The Australasian Farmer, Melbourne

Frederick Channon, Town and Country Journal, Sydney, 22 October 188

Papers – published

Miles Lewis, *Lehmwickel and the German Diaspora,* Proceedings of the Third International Congress on Construction History, Cottbus, May 2009

Websites

Sage, http://jos.sagepub.com/cgi/pdf_extract/21/1/112, accessed 13/4/10 Australian Heritage Database, accessed 10/4/10

SBS Gold, Immigration and Population, http://www.sbs.com.au/gold/story.php?storyid=49, accessed 13/4/2010

Victorian Heritage Database Elvezia Complex, Limestone Hills Road, Yandoit H206http://vhd.heritage.vic.gov.au/vhd/heritagevic#detail_places;12296 accessed 11/4/2010