

3.07 Stones

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This section is not a geological survey of Australia, but rather an attempt to find which stones were used or preferred at which dates and which locations. Especially interesting are those which were exported from one place to another, because the cost and effort involved reflect a serious preference.

a. early history

In 1629 survivors from the shipwreck of the *Batavia* built two huts or forts on West Wallabi Island in the Houtman Abrolhos, 400 km north of Fremantle, and the remains of these are the oldest *in situ* European buildings in the country. They were designed principally to defend the occupants of Wallabi Island, led by Wiebbe Hayes, from the rival party led by the murderous Jeronimus Cornelisz, but would also have been used as shelters. One is in the form of a long rectangle with rounded corners and a division across the centre. The other is a smaller structure in the form of a shorter rectangle with a doorway, and is better formed, with sharper corners. The walls of both are built of slabs of laminar limestone laid dry, about 0.6 to 0.8 m high, and they must have been roofed, probably with spars and sailcloth.¹ The oldest European stone structure of any architectural pretension is one that arrived fortuitously on the same ship, the *Batavia*. It is an entrance portal prefabricated in 1628 of stone quarried in Lower Saxony and despatched for use in the Dutch East Indies. Along with a substantial part of the ship itself, has now been recovered from the seabed and reconstructed at Fremantle.²

There is not necessarily any distinction to be made between the Aboriginal stonework and the most primitive constructions of the Europeans, such as those at White Hills, Central Australia. European miners had travelled hundreds of kilometres to reach this site, by foot, camel or bicycle, but it is possible that they built only the more pretentious

¹ Philippe Godard, *The First and Last Voyage of the Batavia* (Perth 1993), pp 220-1.

² Ian Molyneux, *Looking around Perth* (East Fremantle [Western Australia] 1981), p 5; illustrated in Godard, *The Batavia*, pp 164, 166, 168, 170, 174.

rectangular buildings, of which the ruins also survive. Aborigines living on the fringe of the settlement, or occupying it during its later phase as a mission, may have been responsible for the more Neolithic-looking remains. Most of the stone circles were probably only the lower part of some sort of brush hut (whether of Aboriginal or of European construction), or were built around the bases of European tents to protect or weigh down the edges. The question must arise, however, if these relatively modern remains are so equivocal, how confident can we be of our interpretation of sites like Lake Condah - or indeed of much earlier Palaeolithic and Neolithic sites in other parts of the world?

Dry stone walling is fairly widespread, especially in western Victoria and in South Australia, but of marginal relevance to the building industry proper, and usually more or less undocumented and undatable. The earliest documented dry walling was built in 1856 on various parts of the Manifolds' Purrumbete run in western Victoria, most of it at a cost of three shillings a rod [4.95 m], and mainly as stock fences along the run boundaries.³ Travelling through the area in 1857 James Bonwick 'saw a stone wall miles in length four or five feet [1.2 - 1.5 m] high and two [0.6 m] broad'.⁴ There is a single length of sixty-five kilometres along the ridge of Camel's Hump Range and Brown Hills Range, South Australia, apparently built after 1864-67 when the first freehold grants were made in the hundreds of Anne and Ayers, initiated by one of the settlers, Scott or Browne, and continued by others according to the nature of the stone available on the spot.⁵ By the late 1870s squatters were having rabbit-proof walls, more substantial than the earlier ones, built to control the recent rabbit infestations. The ground was excavated to bedrock, and the wall built off this, so that rabbits could not get under. The biggest rabbit-proof fence, on the western edge of the Stony Rises, was over 1.8 m high and 0.9 metres thick at the base.⁶

Squatters were generally not disposed to build solid houses before they had freehold tenure, a fact which immediately dissipates many myths based upon the assumption that homesteads were built at the same date that the relevant squatting licences were taken out. However, where stone was the most readily available and convenient material, especially in the form of floaters or boulders, it might well be used. Thus Lady Jane Franklin commented in 1837 that one Green, to the north of Melbourne, had a new house built of stones 'picked up nearby', and containing a room 10.5 metres long.⁷ In western Victoria the Manifold brothers were building a stone house at 'Purrumbete' by 1848.⁸ Some substantial farm buildings of 1849 to 1852 survive, but they are of squared honeycomb

³ W G Manifold, *The Wished-For-Land* (Camperdown [Victoria] 1986), p 133.

⁴ James Bonwick, *Western Victoria, its Geography, Geology and Social Condition* (Geelong [Victoria] 1858), p 31.

⁵ John Dallwitz & Susan Marsden, *Heritage of the Lower North* (no place [Adelaide] 1983), cover picture and inside caption.

⁶ Manifold, *The Wished-For-Land*, p 133. The Pomborneit parish plan of 1863 shows the extensive dry wall separating the Manifold and Roadknight holdings: Marshall, Raelene, & Jim Holdsworth.

⁷ Mabel Brookes, *Riders of Time* (South Melbourne 1967), p 161.

⁸ George Goodman, *The Church in Victoria during the Episcopate of the Right Reverend Charles Perry* (London 1892), p 87.

bluestone from the surface, rather than fully dressed stone from quarries.⁹ More exceptionally Orr's 'Stratford Lodge' at Metcalfe is a rubble granite building claimed to date from about 1848. In Western Australia field stones finished in mud plaster and lime wash were used from 1850 at the New Norcia Mission.

b. local freestones

That there are distinctive building traditions characteristic of the areas where particular stones are found, is more or less self-evident. The conventional sandstones are predictable, and are used in both vernacular and formal buildings, as are a few limestones, granites and other types. At Sydney a sandstone quarry was opened on the eastern side of Bennelong Point within a few weeks of landing.¹⁰ Governor Phillip reported in May 1788 that there were three sorts of stone, a freestone 'which appears equal in goodness to that of Portland', an indifferent sandstone or 'ironstone', and another stone which contained a high proportion of iron.¹¹ He further stated in July that 'the stone is good, but [we] do not find either limestone or chalk'.¹² By 1803-5 the *Sydney Gazette* could report that a number of stone structures had been built,¹³ and by 1821 6% of Sydney buildings were of stone.¹⁴ The most prominent Sydney quarries were to be those at Pyrmont, producing a stone which was described as being of medium structure and comparable to some of the well-known Scottish freestones, and the Hawkesbury sandstone deposits in the neighbourhood of the city were also extensively worked.¹⁵ By the 1820s the government was quarrying stone at Goat Island for the construction of the Government House extensions and the Darlinghurst Gaol.¹⁶

Towards 1820, it appears, paving stone was sent from Sydney to Batavia [Jakarta],¹⁷ and as will appear below, Sydney stone was later exported in quantity to Victoria and other

⁹ The self-dated stables of 1849 and woolshed of 1852 at Mount Hesse, western Victoria: John Curtis, 'Eight Homesteads of the Winchelsea District' (BArch research essay, University of Melbourne, 1969), p 7.8.

¹⁰ [Francis Fowke, attrib], 'Sketch and Description of the settlement at Sydney Cove, &c', 16 April 1788, reproduced in Tim McCormick et al, *First Views of Australia 1788-1825* (Chippendale, NSW, 1987), p 37.

¹¹ Arthur Phillip, *The Voyage of Governor Phillip to Botany Bay* (London 1789), p 145. See also Phillip to Under-Secretary Nepean, 15 May 1788, *Historical Records of New South Wales*, vol 1/2, p 128, cited in Helen Proudfoot, 'Fixing the Settlement', in Graeme Aplin [ed], *A Difficult Infant: Sydney before Macquarie* (Kensington [New South Wales] 1988), p 61.

¹² Governor Phillip to Lord Sydney, 9 July 1788, in F M Bladen [ed] *Historical Records of New South Wales*, II, part II (Sydney 1893), p 147.

¹³ *Sydney Gazette*, unspecified, quoted in Ian Evans, *The Australian Home* (Sydney 1983), p 35.

¹⁴ John Oxley, 'A Return of Buildings in the Town of Sydney in the Year 1821', Bigge Appendix, Bonwick Transcripts, Mitchell Library, box 25 p 5654, quoted in Peter Bridges, *Foundations of Identity* (Sydney 1995), p 147.

¹⁵ Robert Haddon, 'Australian Planning and Construction, in G A T Middleton [ed], *Modern Buildings* (6 vols, London, no date [c 1910]), V, p 188.

¹⁶ Dimity Dornan & Denis Cryle, *The Petrie Family: Building Colonial Brisbane* (St Lucia [Queensland] 1992), p 19

¹⁷ Margaret Steven, 'Eastern Trade', in James Broadbent [ed], *India, China, Australia: Trade and Society 1788-1850* (Sydney 2003), p 52

colonies. More remarkably, it reached California, where it was used in 1851 to build the Jenny Lind Theatre, which was subsequently converted to become San Francisco's City Hall.¹⁸ Sydney stone continued to be exported into the twentieth century, and will be further discussed in the context of the intercolonial trade.

There were other quarries in the hinterland, including Marulan, which provided the sandstone for the portico at Camden Park from 1832.¹⁹ In about 1834 Marulan limestone was used in the entrance hall, stair hall and upstairs chimneypieces at 'Tarmons', Darlinghurst.²⁰ Three of the less important chimneypieces supplied for the Lyndhurst bedrooms in 1835 were not of marble but of 'stone',²¹ in fact the Marulan limestone, and at least one survives.²² Next, Marulan sandstone chimneypieces were installed in the main hall and the dining room of Government House, Sydney, of 1836-43.²³ There was also a limestone 'beautifully grained, like dark marble, suitable for chimney-pieces and ornamental slabs' at Cadell's property 'Ben Bullen' on the Turon.²⁴ Sandstone from Ravenswood was used for a warehouse at West Maitland,²⁵ of which only the ground floor remains today, and for St Mary's Church, West Maitland.²⁶

In Queensland as early as 1828 Charles Frazer reported the existence of freestone eighteen kilometres upstream from Brisbane 'of excellent quality, granular, and when cut it is quite soft, but on exposure becomes as hard as granite.'²⁷ This was doubtless the Ipswich stone which, together with that from nearby Woogaroo (Goodna), was the staple until the 1840s.²⁸ Woogaroo continued to be exploited in subsequent decades, providing some of the stone for Parliament House in 1865,²⁹ and for the Supreme Court building in about 1878.³⁰ The contractor Joshua Jeays established his own quarry there. In the town

¹⁸ Harold Kirker, *California's Architectural Frontier* (Salt Lake City, 1986 [1960]), p 71 & pl 17. the reference is simply to 'a yellow sandstone imported from Australia', but there can be little doubt as to its identity. Peter Barrett, 'Building through the Golden Gate: Architectural Influences from Trans-Pacific Trade and Migration between Australia and California 1849-1914' (MPD, Melbourne University, 2001), p 36, refers to it as Sydney sandstone, apparently on the basis of the *California Architect and Building Review*, II, 11 (November 1881), p 117, and Alec Bagot, *Coppin the Great: Father of Australian Theatre* (London 1965), p 279. Bagot also says that the bricks for the building were shipped from Sydney.

¹⁹ R T Baker, *Building and Ornamental Stones of Australia* (Sydney 1915), p 113.

²⁰ Barrie Dyster, *Servant and Master* (Kensington [New South Wales] 1989), p 134.

²¹ Dyster, *Servant and Master*, p 107.

²² Joan Kerr, "'So Elegant an Edifice": the Building of Lindesay', in Dinah Dysart & Joan Kerr [eds], *Lindesay: a Biography of the House* (Sydney 1984), p 22.

²³ Robert Griffin & Ann Toy, *Government House Sydney* (Sydney 2000), pp 18, 22.

²⁴ Samuel Mossman & Thomas Banister, *Australia Visited and Revisited* (London 1853), p 247.

²⁵ Baker, *Building and Ornamental Stones*, p 126.

²⁶ Baker, *Building and Ornamental Stones*, p 128.

²⁷ Charles Frazer, 'Journal of a residence on the Rivers Brisbane and Logan, 20 June - 6 September 1828', NSW Archives Office, Colonial Secretary, letters received re Moreton Bay, 4/1917, quoted in Ian Evans et al, *The Queensland House: History and Conservation* (Mullumbimby [New South Wales] 2001), p 18.

²⁸ Dornan, *Petrie Family*, p 83.

²⁹ Dornan, *Petrie Family*, p 147.

³⁰ Dornan, *Petrie Family*, p 153.

itself the Roma Street quarry was opened in convict times and worked until about 1850.³¹ During the 1850s John Petrie bought a quarry site at Albion, and in the 1860s this supplied further stone for Parliament House, after Jeays failed and the Petries took over the contract.³² It was again used for the General Post Office of 1871-9, together with stone from Murphy's Creek,³³ and the same two stones were used in the Customs House in 1886-9.³⁴ Murphy's Creek stone alone was used for the Supreme Court³⁵ and (with Oamaru dressings) for the National Bank of Queensland building of 1881-5.³⁶

The Albion quarry continued until the end of the century, but the government bought the Highfield quarry near Toowoomba to supply its own building projects. It was used, together with 'Pearson's brown stone' in the first wing of the Public Offices ('Treasury') building in 1885.³⁷ The Helidon stone, obtained a little over a hundred kilometres from the city,³⁸ is said to have been used in 1887 for Andrea Stombuco's house 'Sans Souci' (now 'Palma Rosa'), at Hamilton.³⁹ This seems doubtful, but it was later used in the Treasury and, in the form of rubbed ashlar, in Brisbane Railway Station. Another stone, Yan Gan, was used in the Lands Office.⁴⁰ The range of suitable building sandstones within reach of Brisbane was considerable, and a select committee of Parliament, which reported in 1888 on quarries in the southern district of the colony, mentioned those around Brisbane at Moggill, Grandchester, Gatton, Grantham, Helidon, Murphy's Creek, Highfields and Mount Stuart, in addition to others around Logan Village and Beaudesert.⁴¹ However - at least after the 1880s - for climatic and transport reasons stone was not much used in Queensland for other than major public buildings.

Tasmania had a succession of sandstone quarries at Kangaroo point, Point Ventenat, Bruni Island and elsewhere, and the products were used fairly extensively in local buildings as well as exported (as will be discussed below). As early as 1850 a hearthstone was included in a consignment of building materials and portable houses exported from Hobart to California on the *Elizabeth Starbuck*.⁴²

South Australia generally lacked good freestone, though it had marble in quantity, and plenty of stone suitable for rubble work. In 1845 Robert Sanders's store in King William Street, Adelaide, was provided with a 'unique Italian front of wrought freestone', designed

³¹ Dornan, *Petrie Family*, p 152.

³² Dornan, *Petrie Family*, p 148. See also the map, p 165, on which the site of the Petrie quarry is occupied by St Columban's, south of the Sandgate Road.

³³ Dornan, *Petrie Family*, p 149, where 'firestone' presumably means freestone.

³⁴ Dornan, *Petrie Family*, p 165.

³⁵ Dornan, *Petrie Family*, p 153.

³⁶ Australian Heritage Commission, *The Heritage of Australia* (Melbourne 1981), p 4/16.

³⁷ Dornan, *Petrie Family*, p 163.

³⁸ Haddon, 'Australian Planning and Construction', p 188.

³⁹ Ray Sumner, *More Historic Homes of Brisbane* (Brisbane 1982), p 63; Dornan, *Petrie Family*, p 167. However the *Courier-Mail* report described it as built of 'stone from Petrie's Quarry throughout', which suggests Albion, as Dornan makes no reference to the Petries owning a quarry at Helidon.

⁴⁰ Haddon, 'Australian Planning and Construction', p 188.

⁴¹ *Australasian Builder & Contractor's News*, 24 November 1888, p 462.

⁴² *Hobart Town Courier*, 9 February 1850, as advised by Peter Barrett.

by the architect W D James.⁴³ This seems likely to have been a local stone, possibly from Hallett & Duff's freestone quarry, which was in operation by 1840.⁴⁴ There were other local stones good enough for local purposes, as at the Burra Mine Quarry, the stone from which was recommended in 1878 for use in the Bank of Australasia branch at Kooringa.⁴⁵ In the twentieth century Murray Bridge and Waikerie sandstones were marketed much further afield by Standard Quarries.⁴⁶ A facing of pinkish-grey sandstone from the Adelaide Hills was used on the end wing of the Cheltenham Racecourse administration building in 1956.⁴⁷

Victoria was also endowed with a rich variety of sandstones, few of which were of any use. In 1858 the Government offered a prize for the discovery of a stone suitable for use in the new Parliament House, but all it produced was a sandstone from Bacchus Marsh which had been in intermittent local use since 1845. A commercial operation, the Victoria Quarries, was now begun by the Matson Brothers, and the stone was used in some major buildings, including the Treasury, Spring Street, where it has caused problems ever since. It was not necessary to use it for Parliament House because the Darley stone was discovered in the nick of time, and the east or Library frontage was executed in this. The new discovery doomed the Bacchus Marsh quarry to closure, as Matson wrote

after an outlay of some thousands other [stone] was found on Govt. land in consequence of which we are informed it will in future be taken from thence & when the Treasury is completed, as we cannot compete with the Govt. our quarries must be closed, the private demand for stone being inadequate to their support.⁴⁸

Unfortunately the Darley stone, which was obtained not far from Bacchus Marsh, was of a similar type and developed the same defects. In 1868 some local use was made of Mount Sturgeon stone for flagging,⁴⁹ but it was not until the Heatherlie quarries were opened at the other end of the Grampians that a stone suitable for the Houses of Parliament became available.

The interesting part of this story, however, is the development of more or less scientific testing methods which occurred in association with the original competition, and with

⁴³ *South Australian Observer*, 4 May 1845, quoted in E & R Jensen, *Colonial Architecture in South Australia* (Adelaide 1980), p 66.

⁴⁴ *South Australian Register*, 28 November 1840, quoted in Jensen, *Colonial Architecture in South Australia*, p 14.

⁴⁵ G & W Sarat Dunstan, 'Specification for the Several Works required in the Erection of Banking Premises for the Bank of Australasia, Kooringa' (Aberdeen [South Australia] 1878), p 1. The advice was followed by the Melbourne architects: Reed & Barnes, 'Specification of Work to be done and Materials to be used in the Erection of Banking Premises at "Kooringa S.A." for the Bank of Australasia' (Melbourne 1878), p 4.

⁴⁶ F W Ware & W L Richardson [eds], *Ramsay's Architectural and Engineering Catalogue* (Melbourne 1949), §5/2; *Ramsay's Catalogue* [1955], §5/2.

⁴⁷ *Cross-Section*, no 43 (1 May 1956), p 1.

⁴⁸ Matson papers, quoted in Manifold, *The Wished-For-Land*, p 126.

⁴⁹ J H Stanton [ed James Affleck], 'Kolor' [Stanton Diary] (Minjah [Victoria]): Stanton to Reed & Barnes, 19 September 1868 & 16 November 1868; diary entry 8 December 1868.

efforts to maintain quality control in the quarried stone. This will be discussed below. A reasonably durable stone appeared in Victoria only with opening up of the Mount Difficult quarry in the 1880s, producing the 'Stawell stone' which is used on the west front of Parliament House, and in the twentieth century was sold by Standard Quarries.⁵⁰ The Western Australian Donnybrook stone was used for the Commonwealth Government Offices in Mounts Bay Road, Perth, but supplies abruptly ran out and the builder could find no stone to match it, so he ended up importing Sydney stone and bleaching it to reduce variations in colour.⁵¹

c. local limestones

Limestone came in more varied forms than any other. Coral - if that can be called limestone - was used for rubble construction in those places where it was available. On Norfolk Island calcarenite, a limestone made up of small grains resembling sand, was used, but it was of much better quality when quarried below seawater, and this necessitated much arduous work for the convict labourers and led to some deaths by drowning. A limestone quarry was opened in Hobart in 1816, and the stone had been discovered in other locations as well, but it was used mainly for lime burning rather than masonry.⁵² In Western Australia the Cottesloe shell limestone was used in the Perth area, and a superior quality stone was quarried on Rottnest Island.⁵³

Adelaide had a higher proportion of stone buildings than any of the other colonial capitals. Here, as Robert Gouger reported:

more than half the town ... being upon a bed of limestone, the proprietors of that portion, by simply removing the earth to a depth of about two feet [0.6 m], find not only stone wherewith to build, but limestone whereof to burn their lime. Thus, there is a great facility for building, and that in a very substantial way.⁵⁴

Also in Adelaide, and elsewhere in South Australia, much ordinary building is done in the local 'bluestone', a slate or shale. It was laid as random or coursed rubble, or as ashlar with various forms of brick or other dressing as will be discussed below, as indeed is the local limestone. The South Australian tradition of stone building was reinforced by the shortage of timber in many areas of the colony.

This tradition was inherited by the Northern Territory, where timber was widely available, but where, nevertheless, stone was the readiest material for buildings of architectural pretension. This seems to explain the somewhat surprising use of stone in a tropical

⁵⁰ W L Richardson, *Ramsay's Architectural and Engineering Specifications [Volume 1]* (Melbourne, no date [1934]), p 54; *Ramsay's Catalogue* [1949], §5/2; [1955], §5/2.

⁵¹ *Cross-Section*, no 7730 (1 September 195?): CHECK REFERENCE.

⁵² *Hobart Town Gazette*, I, 3 (15 June 1816), p 2.

⁵³ Haddon, 'Australian Planning and Construction', p 189.

⁵⁴ Robert Gouger, *South Australia in 1837; in a Series of Letters, with a Postscript as to 1838* (London 1838), pp 69-71.

climate, for the Government Residency at Darwin in 1871,⁵⁵ for a number of Overland Telegraph stations at about this time,⁵⁶ and later for the various public buildings in Darwin designed by the architect J G Knight. By 1880 the problem of white ant had proved so intractable that it was government policy to build only in stone (which at Darwin means sandstone), with 'concrete floors faced with Portland cement', or in corrugated iron on a cypress pine frame.⁵⁷ In Western Australia similar combinations of limestone with brick dressings are found for example in Fremantle, where George Seddon has acutely observed that the practice becomes normal after the railway connection in 1886. Before that time bricks were too expensive to obtain, and quoins were normally in limestone, though in larger and better dressed pieces than the body work.⁵⁸

In Victoria the Waurn Ponds limestone and Barrabool Hills sandstone were used extensively in their own areas, but also used together in major buildings, the Barrabool for wall facing and the Waurn Ponds for dressings. This was the combination in St Paul's Cathedral, the Melbourne Technical College, and Ormond College, Melbourne.⁵⁹ In the 1930s Standard Quarries were marketing a sandstone of unspecified (but local) origin, as 'Riplstone'.⁶⁰ At Point Nepean the local limestone was so extensively used as to institute a local school of building, but of too poor a quality to be exported elsewhere.

Limestone offers special opportunities because it is soft when quarried and easily sawn, but hardens under exposure. In south-eastern South Australia and south-western Victoria - from Robe to Port Fairy - there was a little school of limestone construction in the 1840s and 1850s, in which the sawn slabs were laid on edge as two leaves, with a rubble filling in between, not unlike the traditional Norman use of Caen limestone. This can be seen at 'Woodbine', Port Fairy, and in a primitive form at 'Cameron's place', the Coorong, South Australia (where the quoins and chimneys are slabs on edge, but the rest mainly rubble).⁶¹ Chimney flues are sometimes formed within the wall thickness, chimneystacks are generally set in flush with the external wall face, and there is a distinctive form of fireplace in which the flue carries down as a sort of trough in the fireback, closing on an angle about half way down. In 1857-8 the architect A Crouch of Mount Gambier is said to have made the first use of Mount Gambier polyzoal limestone,⁶² which is so soft,

⁵⁵ Harriet Daly, *Digging, Squatting and Pioneering Life in the Northern Territory of South Australia* (London 1887), pp 109 ff.

⁵⁶ Powell's Creek, Tennant Creek, Barrow Creek, Alice Springs and Charlotte Waters: J G Knight, *The Northern Territory of South Australia* (Adelaide 1880), pp 34, 35, 36, 39, 42, quoting Ernest Giles in the *South Australian Register*.

⁵⁷ Knight, *The Northern Territory*, p 26. See also *Australasian Builder & Contractor's News*, 8 October 1887, p 358.

⁵⁸ Professor George Seddon, personal observation, 1997.

⁵⁹ Haddon, 'Australian Planning and Construction', p 188.

⁶⁰ Richardson, *Ramsay's Specifications*, p 54.

⁶¹ Danvers Architects, *Heritage of the South-East* (Adelaide 1984), p 16/17, and rear section sv Meningie.

⁶² In the Sisters of Mercy Convent of 1857 and the National School of 1858. Danvers, op cit, p 115, quoting L Hill, *Mount Gambier: the City around a Lake* (Leabrook [South Australia] 1972), p 146. THIS SEEMS TO BE WRONG - CHECK HILL.

uniform and regularly sawn as to be more like a factitious material than a genuine stone in character.

In 1880 an attempt was made to promote this stone, which was claimed to be identical with 'the celebrated Oamaru stone' of New Zealand, and to have stood for nearly twenty years in many houses at Port McDonnell. Inexhaustible supplies were to be found over a large area, but the principal quarry was to be found at the Hanging Rocks, in the Mount Gambier district, apparently the property of John Frew. Specimens from this source had been brought to Adelaide by one Pitman, of Freeman Street, and it was calculated that it could be delivered to Melbourne for between 2 s 6 d and 3 s 0 d a cubic foot, as compared with 4 s 3 d for Oamaru stone.⁶³ Nothing particular seems to have come of this initiative, but the trade was actively promoted again in the 1920s by the Mt Gambier Limestone Quarrying & Building Co Pty Ltd. The blocks were cut in standard sizes of 4.5 x 12 x 24 inches [115 x 300 x 600 mm], suitable for cavity walls, and sent by rail to the Adelaide and Melbourne markets. Almost any larger size could be cut if required.⁶⁴ In the same year H D Annear was to use the Mount Gambier stone for the front of his infelicitous mansion 'Delgany', at Portsea, Victoria, together with local limestone from the demolished house for the rear portions.⁶⁵ Another stone, which could be sawn like Mount Gambier stone but was said to be 30% harder, was discovered at Finnis and a quarry opened there in 1956. It came in both white and pink.⁶⁶

d. basalt & granite

The basalt of Melbourne and Western Victoria, known locally as 'bluestone', though unrelated to the South Australian stone of that name, is a very hard material which cannot easily be carved. It was extensively used in plinths and base courses, often, but not always, rock faced. But because it was gloomy in appearance and difficult to treat ornamentally, and also because it did not show the ornament to advantage when there was any, it was not much used in the body work of public buildings other than gaols and churches. Despite its apparent homogeneity it actually varies considerably in quality. There were quarries all around the western and northern parts of Melbourne, the Yarra River being effectively the edge of the lava flow, and the Footscray bluestone was amongst the most widely used for prominent works, such as St Patrick's Cathedral. Other quarries were used for less important stone buildings, road metal and other purposes.

⁶³ *Australian Engineering and Building News*, 1 March 1880, p 208.

⁶⁴ *Australian Home Builder*, 15 April 1925, pp 26-8, 30-31. The quarrying is described in R L Jack, *The Building Stones of South Australia* [Geological Survey of South Australia, bulletin no 19] (Adelaide 1925), pp 38-40. Jack mentions the same standard sawn size, but not the Mt Gambier company: instead he illustrates (as his frontispiece) Mackay's Quarry and Roofs and Ceilings' Quarry, sections 140 and 134 respectively, Hundred of Blanche.

⁶⁵ Harriet Edquist, *Harold Desbrowe-Annear: a Life in Architecture* (Melbourne 2004), pp 176-7.

⁶⁶ *Cross-Section*, no 43 (1 May 1956), p 1.

Towards the end of the century most high grade stone was got at Malmsbury, though it was not as hard as that obtained at Lethbridge.⁶⁷ The Malmsbury stone was used in the plinth of the E S & A Bank in Collins Street, of 1883-7.⁶⁸ In 1891 the architect W S Law specified walling in fine axed 'Coburg or Williamstown bluestone free from air holes, honeycomb or other defects', but Malmsbury stone steps and flagging.⁶⁹ The Malmsbury stone would be taken to Melbourne by rail, and on occasion exported by sea to the other colonies. By the mid-twentieth century, however, Standard Quarries dealt in basalt only from Footscray.⁷⁰ Basalt is also found in New South Wales at Kiama, Dundas, Orange, Sterling (near Inverell) and elsewhere,⁷¹ though it was imported from Melbourne for major Sydney buildings. It is also found in other places, such as northern Tasmania, and Toowoomba in Queensland.⁷² In Launceston the bluestone from Cataract Hill was used - apparently for the first time - in the basement level of the Cornwall Assurance Company office of 1864-5.⁷³

At the Moreton Bay settlement in 1826 Charles Frazer described a 'remarkably formed Porphyritic [*sic?*] Body, the Base of a light pink, with white spots. It is remarkably hard, and breaks into square blocks.'⁷⁴ This was perhaps the porphyry used for Adelaide House, Ann Street, in 1853.⁷⁵ There was also a material described as 'purple hardstone' from the Lutwyche quarries, which the Government Architect, J J Clark, proposed to use for the base of the Government Printery extension, after 1884, but it proved impossible to get 'the current colour'.⁷⁶ By 1887 the Brisbane Municipal Council had bought the Spring Hill porphyry quarry, which it let out to a private contractor.⁷⁷ Subsequently Queensland had the Enoggera and Greymare granites, the former especially containing pyrites, and therefore liable to iron staining. In the 1920s a new granite was extracted on the property of Dr A H Marks at Camp Mountain, and was used for the basement levels of the Brisbane Town Hall. It was examined by Professor H C Richards, who concluded that it was of the highest quality and bore favourable comparison with the world's best grey granites.⁷⁸

⁶⁷ Haddon, 'Australian Planning and Construction', p 188. See also *Australasian Builder & Contractor's News*, 9 July 1887, p 140. The stone was selected for the stair treads of the Metropolitan Gas Co building: Reed, Henderson & Smart, 'Specification of Work to be done ... New Premises for the Metropolitan Gas Coy.' (Melbourne 1890), p 8.

⁶⁸ Robyn Riddett, 'A Building "Worthy of the City"', in U M de Jong [ed], *W W Wardell: the Architect and his Era* (Geelong [Victoria] 2000), p 114.

⁶⁹ W S Law, 'Specifications of Residence Drummond St. Carlton for Mrs. L. Abrahams' (Melbourne 1891), pp 3-4.

⁷⁰ *Ramsay's Catalogue* [1949], §5/2; [1955], §15/2.

⁷¹ Baker, *Building and Ornamental Stones*, pp 61-3.

⁷² Meg Cook, *Sandstone and Cedar* (Toowoomba [Queensland] 1983), p 78.

⁷³ *Illustrated Melbourne Post*, 25 January 1865, p 12.

⁷⁴ Frazer, 'Journal of a residence', quoted in Evans, *The Queensland House*, p 18.

⁷⁵ Dornan, *The Petrie Family*, p 118.

⁷⁶ Dornan, *The Petrie Family* p 162, quoting John Petrie to the Works Department, 9 June 1886, QSA General Correspondence, WOR/A 284.

⁷⁷ Dornan, *The Petrie Family*, p 163.

⁷⁸ H C Richards, 'Report on the Camp Mountain "Granite" as a Building Stone' (Brisbane 1923), pp 1-2.

Victoria had small deposits of granite in the vicinity of Melbourne, which were used for building purposes in the first decades of settlement. Many country areas, especially around Wangaratta produced more or less usable granite, but the only high quality material was at first that of the Harcourt quarries, which was extensively used for patent axed work, plinths and polished columns, though it contained black spots which are difficult to avoid in cutting a block of any size. The grandest specimens were the six great columns in the public hall of the Melbourne Stock Exchange, each of which was 0.6 metres in diameter and took thirty horses to transport to Melbourne.⁷⁹ By the 1930s other good granites had been found, and Standard Quarries were selling Casterton grey, Harcourt grey, and Wangaratta pink and buff granites.⁸⁰ Twenty years later it was Casterton red rather than grey, and Dromana green had been added. This new granite made a rather anachronistic appearance as the facing of the State Savings Bank Centre at the corner of Swanston Street and Post Office Place, Melbourne, in 1961.⁸¹

New South Wales grey granite was used in areas like Young and Braidwood, but most prominent examples of granite are ornaments or facings to city buildings,⁸² such as the Moruya and Montague Island granite columns of the General Post Office⁸³ and the Moruya granite columns of the Customs House, Sydney.⁸⁴ Gabo Island, off the border with Victoria, produced a hard red granite or syenite which was used in some important buildings, but it too was mainly confined to detailed elements, such as the portico columns of the Treasury, Sydney.⁸⁵ South Australia had a reddish granite from Murray Bridge, used in the base of the Savings Bank, Adelaide,⁸⁶ and later a Murray Valley black granite.⁸⁷ Granites were obtained in a number of areas of Western Australia, and the Kanowna stone, a sort of decomposed granite, was used in the Kalgoorlie public buildings, and in the Coolgardie district generally.⁸⁸

Generally, however, granite has been used only to a limited extent for structural walling. It is slightly surprising to find a reference to its use in the 1850s for walling in the form of parallel slabs on edge, as in the limestone construction discussed below. At 'Ercildoune', Victoria, Andrew Learmonth urged his brother Tom

that all stones be laid on their broadest surface - with your [?laminated] granite masons like to lay stones on edge and fill up the walls with anything - this is very much the case with the wall you had built in 1854 which looked so well but is [faulty] ...⁸⁹

⁷⁹ D M Cash, *The Gothic Bank of Collins Street* (Melbourne 1989), p 20, citing the *Australasian Insurance and Banking Record*, 17 July 1891, p 503.

⁸⁰ Richardson, *Ramsay's Specifications*, p 54; *Ramsay's Catalogue* [1955], §5/2.

⁸¹ *Cross-Section*, no 108 (1 October 1961), p 1.

⁸² Baker, *Building and Ornamental Stones*, pp 47-9.

⁸³ Baker, *Building and Ornamental Stones*, pp 36, 38.

⁸⁴ Baker, *Building and Ornamental Stones*, p 37.

⁸⁵ Baker, *Building and Ornamental Stones*, p 33.

⁸⁶ Baker, *Building and Ornamental Stones*, pp 32, 23-5.

⁸⁷ *Ramsay's Catalogue* [1949], § 5/2; [1955], §5/2.

⁸⁸ Haddon, 'Australian Planning and Construction', p 189.

⁸⁹ Andrew Learmonth to Tom Learmonth, 8 April 1859, Learmonth papers, State Library of Victoria, quoted by Hanut Dodd, *Australian Architecture B*, University of Melbourne, 1995.

e. local slate

Both marble and slate were found in South Australia in 1836 by Johannes Menge, the South Australian Company's mineralogist,⁹⁰ and the slate on Kangaroo Island was reported to be suitable for export.⁹¹ By 1839 C B Newenham was operating the Green Hill Slate and Flag Quarry near Adelaide.⁹² By June 1840 slates from Willunga were being exported to Sydney,⁹³ but it was presumably the same local slate as was used on the Legislative Chamber in Adelaide in 1833, which had to be replaced within months.⁹⁴ Indeed in 1846 Willunga slate was reported to be so fragile as a roofing material that 'you might as safely tread on a skylight'.⁹⁵ It was thought, however, that it might improve with depth, and in any case would be good for flagging and slabs. By the 1880s it was regarded as 'possessing many good qualities' for such purposes.⁹⁶ It was quarried into the twentieth century, and will be referred to again below.

A much better slate for uses such as flagging, steps and mantelpieces - though not for roofing - was thought to be the Mintaro slate from Thomas Priest's quarry, opened in about 1860,⁹⁷ and in the 1880s it was used to pave all the corridors and wet areas of Parliament House, Adelaide.⁹⁸ Mintaro slate though excellent, was very hard, and the cost of working it for a time prevented much being exported to the neighbouring colonies, but in 1890 it was specified in the National Mutual Life Association headquarters, Melbourne, designed by the Adelaide architects Wright, Reed & Beaver. It was here used in half and three quarter inch [13 & 19 mm] thicknesses for the flooring and shelving of strongrooms; in 1½ inch [38 mm] thickness for flooring the top floor 'earth space'; and in two inch [50 mm] thickness for external door sills, gallery flooring, stair landings, and basement flooring.⁹⁹ By the turn of the century this slate was in wide demand in Australia generally for lavatory and other slabs, kerbing and paving.¹⁰⁰

⁹⁰ Douglas Pike, *Paradise of Dissent* (Melbourne 1967 [1957]), p 208.

⁹¹ Henry Capper, *South Australia. Extracts from the Official Despatches of Colonel Light, &c* (London 1837), p 31

⁹² Jensen, *Colonial Architecture in South Australia*, p 13.

⁹³ *South Australian Register*, 6 June 1840, cited in Jensen, *Colonial Architecture in South Australia*, p 33.

⁹⁴ *South Australian Register*, 10 May, 10 October & 28 October 1843, cited in Jensen, *Colonial Architecture in South Australia*, p 64.

⁹⁵ *Builder*, IV 161 (7 March 1846), p 110.

⁹⁶ *Australasian Builder & Contractor's News*, 9 July 1887, p 138.

⁹⁷ Elizabeth Warburton, *Martindale Hall* (Adelaide 1979), p 97. See also Baker, *Building and Ornamental Stones*, pp 91--2.

⁹⁸ *Australasian Builder & Contractor's News*, 3 December 1887, p 489.

⁹⁹ Wright, Reed & Beaver, 'Specification for Erection of Premises for the National Mutual Life Association of Australasia. Corner of Collins & Queen Streets Melbourne' (Melbourne 1990), pp 6, 10, 12, 13.

¹⁰⁰ Haddon, 'Australian Planning and Construction', p 189.

Slate had been discovered in Van Diemen's Land by 1816,¹⁰¹ but it was probably of poor quality, for nothing more is heard until much later. By the 1880s a great deal of Melbourne money was being invested in a slate quarry on the Tamar, about thirty kilometres from Launceston, but the first products were not of a high quality, and the success of the venture was thought to depend upon the stone improving with depth¹⁰² - a favourite mantra with struggling quarrymen, just as with miners. The lack of any further reports suggests that this improvement did not manifest itself. Slate was also found at Gundagai, New South Wales, but an attempt to exploit it, by Hugh Wilson of Redfern, proved a failure.¹⁰³

In Victoria the greatest amount of slate was produced by the Castlemaine quarries of Wilson, Corben & Co, though this material does not have a pronounced cleavage, and should arguably be described as a stone rather than slate.¹⁰⁴ A most unusual pair of stone buildings at Barkers Creek near Castlemaine have (or had) roofs covered in rectangles of slate about 14 to 16 millimetres thick and up to 1.4 by 1.26 metres in area.¹⁰⁵ These are doubtless a by-product of the local slate quarries, but they are typologically closer to the 'stone slates' of laminated limestone used in parts of England than they are to slate roofing. In 1888 the Festiniog Slate Company Limited (named after the famous quarries in Wales) was formed to exploit the Kara Kara quarries at Percydale near Avoca, hitherto owned and worked by Spence & Co. It was claimed to produce blocks 5.4 metres and more in length, as well as roofing slate equal to the best Welsh.¹⁰⁶ If little more is heard of it, this may be more attributable to the depression of the 1890s than to any defect in the product.

Enamelled slate, which was used extensively, will be discussed below. Plain polished slate was often used for higher grade bathroom fittings such as cisterns and lavatory basin tops. Ordinary grey slate was commonest, but other types were used, as at the Commercial Bank of Australia headquarters, Melbourne, of 1890-3. The building was priced on the basis of either Castlemaine or Percydale (Kara Kara) slate - two Victorian types - for certain bath tops and bathroom skirtings.¹⁰⁷

¹⁰¹ *Hobart Town Gazette*, I, 3 (15 June 1816), p 2.

¹⁰² *Australasian Builder & Contractor's News*, 11 June 1887, p 79.

¹⁰³ *Australasian Builder & Contractor's News*, 9 July 1887, p 138.

¹⁰⁴ *Australasian Builder & Contractor's News*, 9 July 1887, p 138.

¹⁰⁵ The property is 'Timber Hills'. Blakely Road, Barkers Creek, and the buildings have not been dated, though indications suggest about 1870. One building contains two rooms and is probably a dwelling, while the other is a single room, possibly a store. Both have been damaged by fire, and at the time of inspection in 2004 the store was totally gutted and unroofed.

¹⁰⁶ Street & Co Limited, *Prospectus of the Festiniog Slate Company, Limited* (Melbourne, no date [1888]), copy held by Ken Bethell.

¹⁰⁷ G W Blackburn, 'The Commercial Bank of Australia Limited New Premises, &c' [bill of quantities] (Melbourne 1890), p 22. The Kara Kara slate quarries of W B Spence were at Percydale: *Australasian Builder & Contractor's News*, 31 August 1889, p 196. However, at the Centennial Exhibition there were distinct exhibits from W B Spence & Co of the Kara Kara Slate Quarries, and from the Percydale Company, with an address in Melbourne: Centennial International Exhibition, Melbourne, 1888-1889, *Official Record* (Melbourne 1890), p 633.

f. local marble

George Clewett of Pitt Street, Sydney, was credited with being 'the first to introduce into the Australian drawing-room (and that at a considerable cost) the ornamental luxury of marble chimney-pieces, the product of the colony',¹⁰⁸ and Major Mitchell reported in 1838 that a quarry of crystalline variegated marble had been opened near the Wondilly and a few miles from Towrang, in consequence of which most houses in Sydney now had marble chimneypieces, tables &c.¹⁰⁹ This must have been the marble which had been recently discovered at Marulan, two hundred kilometres southwest of Sydney, the limestone from which has already been mentioned. In 1835 Clewett supplied eight chimneypieces for Lyndhurst Hall, three of which were Australian, one in the dining room being 'An Australian Ceyenna [Siena] chimney piece with columns mouldings and carved blockings' (though it would be difficult to identify Marulan with Siena marble).¹¹⁰ Marulan marble was also used at 'Barcom Glen' near Darlinghurst (demolished)¹¹¹ and in 1835 for mantelpieces at Camden House, Camden.¹¹² By 1851 marble had been discovered at Maria Island, Van Diemen's Land, and was shown at the International Exhibition, London.¹¹³

Marble was to be found at a number of locations in South Australia, and by 1858 large quantities were being shipped to the South Australian Company's wharf in Melbourne.¹¹⁴ The most important source was the Carrara Quarry at Kapunda, which supplied the exterior facing for Parliament House.¹¹⁵ The Kapunda Marble and Building Company successfully tendered for the building at £102,000, and carried out the foundations and the granite basement, after which a dispute arose between them and the architect about the method of measuring, with the result that the government terminated the contract. The new contractors were Shaw & Co, who still used the Kapunda quarries, but experienced great difficulty in getting blocks large enough for the pilasters. At the 'Villa Alba' in the Melbourne suburb of Kew, Kapunda marble was used in about 1884-5 for the hall floor, the bath, and the pantry shelves.¹¹⁶

In Victoria the Orbost marble was said to be 'very beautiful', but it was not readily accessible. In the contract for the Melbourne Public Library (c 1909-13) it had been intended to use it if possible, but because of the large quantity required it was thought prudent to specify only 'Australian' marble. The contractors, naturally, proposed to use

¹⁰⁸ *Sydney Herald*, 20 April 1837, in Dyster, *Servant and Master*, p 107.

¹⁰⁹ *Mitchell's Expedition into Australia* (1838), II, p 318, quoted in Baker, *Building and Ornamental Stones*, p 12.

¹¹⁰ Dyster, *Servant and Master*, p 107.

¹¹¹ Baker, *Building and Ornamental Stones*, p 13.

¹¹² Baker, *Building and Ornamental Stones*, p 84.

¹¹³ Baker, *Building and Ornamental Stones*, p 13.

¹¹⁴ *South Australian Register*, 25 November 1858, quoted in Jensen, *Colonial Architecture in South Australia*, p 14 .

¹¹⁵ *Australasian Builder & Contractor's News*, 24 November 1888, p 462; 1 June 1889, p 508. See also Jack, *Building Stones of South Australia*, pp 48-9.

¹¹⁶ *Table Talk*, 26 June 1885, p 4.

cheaper interstate marble, which caused an outcry,¹¹⁷ and ultimately the local material was used. Queensland types included a rather strident black and white marble from Ulam, near Gladstone, which was used in the dining room at Tattersall's Club, Brisbane, in 1939.¹¹⁸

g. imported flagging and slate

Hearths were commonly of sandstone, and might be imported, depending upon the stone locally available in the colony concerned. In Victoria a specification of the 1850s calls for hearths of 'approved freestone',¹¹⁹ which implies importation, and that more probably from Britain than from the neighbouring colonies. At 'Pontville', Doncaster, a house of the 1840s, has been found three hearths of some sort of hard limestone which must have been imported to the site with considerable difficulty at a time when there were no proper roads.

Another aspect of the British connection is the familiarity of the settlers with standard British stones, so that quantities of York, Arbroath and Caithness flagging were imported to Australia before it was found that local quarries could supply paving of a similar character.¹²⁰ The York stone was obtained from carboniferous beds in various parts of Yorkshire, and was known for its size, hardness and toughness. Brown, Rusby & Booth of Sheffield were the main producers, and received an honourable mention at the Great Exhibition.¹²¹ In 1842 flagstones, probably of this material, were imported for paving the Anglican church at Fremantle.¹²² In 1855 the Royal Engineers used York stone in the south wing of the Fremantle Gaol,¹²³ just as they had used it as the standard paving in the galleries of their barracks in the West Indies in the 1820s.¹²⁴ York stone was also used in the trafficked areas in G Block of the Victoria Barracks, Melbourne, in 1857,¹²⁵ and in 1858 the council of Emerald Hill, near Melbourne, imported ten thousand square feet [930 m²] of it for footpaths.¹²⁶ The same stone, or something very like it, appears in buildings by the Victorian Public works Department, as in the portico of the Kilmore Court House, of 1863.

¹¹⁷ *Building*, 13 March 1911, p 19.

¹¹⁸ *Building*, 23 December 1939, pp 22-3.

¹¹⁹ Russell, Watts & Pritchard, 'Specification for ... dwelling Houses... at Elwood ... Joseph Docker', 13 December 1854, Docker Papers, Manuscripts Collection, State Library of Victoria, p 4.

¹²⁰ Charles Mayes, *The Australian Builders' Price-Book* (Melbourne 1862), p 30.

¹²¹ London, Great Exhibition, 1851, *Reports by Juries*, p 535.

¹²² A Burton [ed], *Wollaston's Picton Journal* (Nedlands [Western Australia] 1975), pp 180, 184.

¹²³ R McK Campbell, *The Fremantle Prison* (Fremantle [Western Australia] no date [1975]), p 26: Henderson's report refers to the 'corridor and the centre of lower association room flagged with [-]shire paving ...', but there is no doubt that it is Yorkshire.

¹²⁴ John Weil, 'Colonial Connections: Royal Engineers and Building Technology Transfer in the Nineteenth Century', *Construction History*, XII (1996), p 12. See also Don Roderick, 'The Origin of the Elevated Queensland House' (PhD, University of Queensland 2004), p 49, quoting Smyth, 'On the Construction of Barracks in Tropical Climates, *Royal Engineers Corps' Professional Papers 1844*, pp 235-6 (from the Royal Engineers Museum, Kent).

¹²⁵ Allom Lovell & Associates Pty Ltd, *Victoria Barracks Melbourne* (Melbourne 1992), p 77.

¹²⁶ Susan Priestley, *South Melbourne: a History* (Melbourne 1995), p 88.

Flagging from Aberdeen is supposed to have been imported for a Melbourne shop in 1851,¹²⁷ and the Melbourne City Council used Caithness stone for street paving in 1858¹²⁸ and called tenders for Arbroath flagging in 1859.¹²⁹ A red sandstone flagging thought to be that of Caithness or Arbroath, is found at half a dozen Victorian houses or terraces of the 1850s and 1860s.¹³⁰ Nothing is known in Arbroath today of a red stone, but both the Carmyllie and Caithness stones belong to the Devonshire or Old Red Sandstones, and it seems that red stone was extracted in the area in the nineteenth century. The Caithness flags were extracted from the old red sandstone or Devonian series, particularly at J Sinclair's Forse-Rockhill Quarries, six kilometres to the west of Thurso,¹³¹ and they were regarded as excellent in quality.¹³² At Angus, east of Arbroath, a large quarrying industry in the Lower Sandstone had developed by the late seventeenth century, but it expanded greatly in the nineteenth century with the introduction of cutting, planing and sawing machines.¹³³ At the Great Exhibition W F L Carnegie of Kinblethmont, Arbroath, showed flagstones from the Leysmill quarries; from Lord Panmure's quarries at Carmyllie; Baxter's Balgaries Quarries; Watson Carnegy's Balmashanner Quarries, and Pierson's Gaynd Quarries, together with other stone including the 'old red sandstone shales'. All of the flagging was said to be 'known as the Arbroath pavement',¹³⁴ and it must correspond with the material referred to in Australia as Arbroath stone. In 1854 a railway was opened between Carmyllie and Arbroath, and by 1859 it was carrying 150 tonnes of stone a day. Most modern references to stones from these locations refer to green, grey, greyish blue and similar hues, and the flagging now quarried at Carmyllie is reported to be green.¹³⁵

There were proposals to import slate houses during the gold rushes,¹³⁶ and it seems that some arrived. Similarly slate slabs were used for the complete structure, walls and roof, of a court house at Umzinto in Natal, South Africa, though this appears to have been of local slate.¹³⁷ Other small quantities of slate slabs came from Britain, probably for uses such as urinals and billiards tables. In 1853 slates were imported for use in the fireproof flooring

¹²⁷ Alexander Sutherland et al, *Victoria and its Metropolis* (2 vols, Melbourne 1888), II, p 709.

¹²⁸ R Smyth & S Rawsden, 'Building Stone', *Victorian Parliamentary Papers* [Legislative Assembly], 1858, p 436, quoted in RBA Architects, *Royal Terrace, 50-68 Nicholson Street, Fitzroy, Conservation Management Plan* (draft, Melbourne 2003), p 22.

¹²⁹ *Australian Builder*, 19 February 1859, p 52. For Arbroath stone see Wyatt Papworth [ed], *The Dictionary of Architecture* (London 1853-92), sv Forfarshire Stone.

¹³⁰ Front paths, Royal Terrace, Nicholson Street, Fitzroy, and Bay View Terrace, Grattan Street, Carlton; verandah paving, Falconer Terrace, Napier Street, Fitzroy, and Mills Cottage, Gipps St, Port Fairy; exterior paving, Point Cook homestead, Point Cook; kitchen wing, Villa Alba, Kew.

¹³¹ London, Great Exhibition, 1851, *Catalogue*, I, p 114.

¹³² London, Great Exhibition, *Reports by the Juries on the Subjects in the Thirty Classes into which the Exhibition was divided*, (London 1852), p 114.

¹³³ Stone Roofing Association web site, <http://stoneroof.ukhome.net/devon.html>, consulted 28 May 2004.

¹³⁴ London, Great Exhibition, 1851, *Reports by the Juries*, I, p 115.

¹³⁵ Stone Roofing Association web site, consulted 28 May 2004.

¹³⁶ *Argus*, 14 December 1853.

¹³⁷ Brian Kearney, *Architecture in Natal* (Cape Town 1973), p 760, ref *Davis' Natal Almanac* (1855-65).

system of the Sydney Mint, as will be discussed below, and throughout the century slate was frequently used for damp-proof courses in brick and stone walls.

The great majority of imported roofing slates were of the blue Welsh type, principally from Bangor, where the Penrhyn and Dinorwic quarries were regarded as the best.¹³⁸ Slate was also produced by the Oakely Slate Quarries Co at Festinog. Other Welsh slates were those of Portmadoc, where there were said to be some excellent, but also some very inferior quarries. Green slates came from Westmorland, Cumberland, and Whitland Abbey in Pembrokeshire, and the Westmorland slates, which were of irregular size, were laid in courses diminishing in depth towards the ridge.¹³⁹ In general there was an elaborate sequence of about twelve standard slate sizes, from a single, 12 x 8 ins [399 x 200], through duchesses, 24 X 12 [600 x 300] to queens, 36 x 24 [900 x 600], which can be found in any standard text. The larger sizes were of necessity thicker.¹⁴⁰ They were commonly fixed with composition nails cast from an alloy of copper and tin in the ratio 7:4, which were stiff and tough, with a yellow brassy appearance.¹⁴¹ Williams's patent slate roofing had a ridge formed with a slate on one side finishing at the top edge in a cylindrical roll, which formed into a continuous ridge moulding. A visually similar effect was created with in Ashton & Green's Slate Roll Ribbing, which had a timber roll grooved to take receive the topmost slates on either side of the ridge. Both types came in either Portmadoc or Bangor slate.¹⁴²

It is not clear when imported roofing slates reached the older colonies, but they must have been fairly readily available by the 1830s. In February 1840 3,300 Welsh roofing slates reached Adelaide on the *John*, for the roof of the Quaker meeting house,¹⁴³ though slate was soon being extracted locally. In Melbourne slate was used in 1840 on the Bank of Australasia and the Customs House.¹⁴⁴ A local specification of 1854 calls for Bangor roof slates, each fixed with two composition nails, and rendered on the underside with Roman cement.¹⁴⁵ Bangor purple countess slates were specified for a roof in 1890, 'laid to a 4" lap and double nailed with compo nails to 3 x 1¹/₂ [76 x 38 mm] battens',¹⁴⁶ and Bangor also produced a pink slate, which was specified for a Melbourne house in 1891.¹⁴⁷ The Penrhyn slate was shown at the Sydney and Melbourne exhibitions of 1879 and 1880 by the London agents, Previte & Greig.¹⁴⁸ Greave's Portmadoc slate probably reached

¹³⁸ *Australasian Builder & Contractor's News*, 11 June 1887, p 79.

¹³⁹ J T Rea, *How to Estimate: being the Analysis of Builders' Prices* (London 1904 [1902]), p 185.

¹⁴⁰ See, for example, Rea, *How to Estimate*, p 181.

¹⁴¹ London, Great Exhibition, 1851, *Reports by Juries*, p 186.

¹⁴² Ashton & Green Limited, *Ashton & Green, Limited, Slate, Tile, Brick, Cement, Marble, and Iron Manufacturers and Merchants* (London 1887). pp 6-7.

¹⁴³ [Herbert Stock & Jenny Stock], 'Religious Society of Friends ... Application for Inclusion of the Adelaide Meeting House ...' (Adelaide 2006), p 3.

¹⁴⁴ *Port Phillip Patriot*, 25 May 1840; Garryowen [Edmund Finn], *The Chronicles of Early Melbourne 1835 to 1852* (2 vols, Melbourne 1888), I, p 46.

¹⁴⁵ Russell, Watts & Pritchard, 'Specification for ... Dwelling houses ... at Elwood .. for Joseph Docker', 17 December 1854, Docker papers, Manuscripts Collection, State Library of Victoria, p 16.

¹⁴⁶ 'Wright, Reed & Beaver, 'Specification for National Mutual Life', p 27.

¹⁴⁷ Law, 'Specifications for Mrs. L. Abrahams', p 25.

¹⁴⁸ Sydney Exhibition 1879, *Catalogue of British Section*, p 51; Melbourne International Exhibition, 1880, *Official Catalogue of the Exhibits* (2 vols, Melbourne 1880), II, p 320.

Australia rather later than the Bangor types, but by the 1880s it could be reported that shipments received at Sydney and Melbourne had proved very reliable.¹⁴⁹ A patent system of slating developed by one Blaikie of Auckland, New Zealand,¹⁵⁰ was reported to be well-known, but its nature is regrettably a mystery.

Late in the nineteenth century two or three colours might be deliberately mixed for decorative effect, usually of American types, though green slate from Cumberland is not unknown. A warning issued by the *Australasian Builder & Contractor's News* in 1887 that 'The American and Italian slates which come to the colonies should be avoided at any cost' went unheeded. The American slates were said to be brittle and to change colour, while the Italian slates, which had come to Melbourne, were commonly cross-grained, and would snap across the middle after fixing, in addition to which the top layers would rot away and the colour change to whitish.¹⁵¹ Vermont green slate from the United States was used to roof the Australian Property & Investment Co building, Melbourne,¹⁵² and on the Presbyterian church in the suburb of Hawksburn,¹⁵³ both in 1889. Towards the turn of the century the Vermont slate became increasingly popular,¹⁵⁴ and was used, for example, to roof the Bairnsdale Court House, Victoria, of 1892-4,¹⁵⁵ and J H Moir's building in Perth of 1896-7.¹⁵⁶

h. imported stone

The importation of freestone was somewhat unusual, but at the Victoria Industrial Society Exhibition of 1858 Henry Apperley showed sculptures, and Samuel Longley a 'Gothic time piece', both carved in Caen stone¹⁵⁷ - the stone from Normandy which had been extensively used in England itself since the Norman Conquest. R G Thomas's Stow Memorial Church, Adelaide (now the Pilgrim Church), of 1865-7, likewise has quatrefoils of Bath limestone and porch capitals of Caen stone.¹⁵⁸ In 1859 Bath stone was being advertised in Melbourne in blocks of thirteen to fourteen cubic feet [0.37 - 0.40 cubic metres],¹⁵⁹ and Bath stone was later used in the Auckland High Court, New Zealand.¹⁶⁰ Lion limestone from the United Kingdom was used in the 1936-9 wing of Parliament House, Adelaide.¹⁶¹

¹⁴⁹ *Australasian Builder & Contractor's News*, 11 June 1887, p 79.

¹⁵⁰ *Australasian Builder & Contractor's News*, 6 April 1889, p 334.

¹⁵¹ *Australasian Builder & Contractor's News*, 11 June 1887, p 69.

¹⁵² *Australasian Builder & Contractor's News*, 20 April 1889, p 379.

¹⁵³ *Australasian Builder & Contractor's News*, 21 December 1889, p 590.

¹⁵⁴ Robert Haddon, 'Australian Planning and Construction', in G A T Middleton [ed], *Modern Buildings* (6 vols, London, no date [c 1910]), V, p 192.

¹⁵⁵ *Bairnsdale Advertiser*, 26 April 1894.

¹⁵⁶ *West Australian*, 28 July 1897, quoted by Ingrid van Bremen, 'The New Architecture of the Gold Boom' (PhD, University of Western Australia, 1990), p 124.

¹⁵⁷ Victoria Industrial Society, *Catalogue of the Eighth Annual Exhibition* (Melbourne 1858), pp 35, 45.

¹⁵⁸ Susan Marsden et al [eds], *Heritage of the City of Adelaide* (Adelaide 1990), pp 158-9.

¹⁵⁹ *** Reference to be checked.

¹⁶⁰ Information from John Hoysted, 1991.

¹⁶¹ David Young, 'An Introduction to Natural Building Stones: a Walk along North Terrace, Adelaide' (typescript report, 1981), p 1.

In 1854 a Melbourne firm offered for auction two granite building fronts which had arrived from Hong Kong. Each was about thirty feet [9 m] wide and thirty-three feet [10 m] high, of white granite, elegantly designed, elaborately carved and highly polished, under the direct supervision of a European architect. They were said to be 'in the most chaste and perfect taste' and suitable either for public establishments or private houses. Sixty-five tonnes of granite slabs were offered for sale at the same time.¹⁶² Not much granite seems to have arrived over the next two decades, but Peterhead red granite was used in the upper façade of the Union Bank, Melbourne, in 1878.¹⁶³ In 1889 it was reported that the giant blocks of granite used in the Australia Hotel, Sydney, including base blocks weighing ten tonnes each, were supplied by Macdonald, Field & Co of Aberdeen, and the same firm had supplied the polished shafts of red Peterhead granite of a similar weight.¹⁶⁴ Aberdeen granite columns were used in the arcaded gallery of the residential entrance to the E, S & A Bank in Melbourne, of 1883-7.¹⁶⁵ Polished red Aberdeen granite colonettes, supplied by the North of Scotland Granite Company of Peterhead, were used in J H Moir's building, Perth, in 1896-7,¹⁶⁶ and in J Q Bruce's Citizens Life Assurance Co building (later Electra House), King William Street, Adelaide, in 1901.¹⁶⁷

Marble was imported extensively for small works like chimneypieces, monuments and altars, mainly from Italy. In the drawing room at Elizabeth Farm, Parramatta, is a grey marble chimneypiece to which Elizabeth Macarthur referred in 1832 as having been brought out 'several years since', whilst two further chimneypieces, in the dining room and a bedroom, were brought from Europe by her son James in 1831.¹⁶⁸ In 1833 the *Agnes* brought 'two packages of marble slabs' to Sydney as part of a cargo from China.¹⁶⁹ These were probably the blue clouded marble paving tiles, about 300 mm square, obtained north-west of Canton and exported not only to Sydney but to India and South America.¹⁷⁰ In New Zealand the first marble chimneypiece was reported to be one imported in about 1850 for a house in Wellington,¹⁷¹ but by 1851 Charlotte Godley was also able to report a small black marble chimneypiece at Mrs Brittan's house near Christchurch.¹⁷² By 1855 Oswald Bloxsome's house in Sydney had a drawing room mantelpiece of Italian marble.¹⁷³ Occasionally imported marble was used for

¹⁶² *Argus*, 15 July 1854.

¹⁶³ H M Franklyn, *A Glance at Australia in 1880* (Melbourne 1881), p 320.

¹⁶⁴ *Australasian Builder & Contractor's News*, 18 June 1887, p 90; 26 October 1889, p 397.

¹⁶⁵ *Australasian Builder & Contractor's News*, 20 April 1889, p 379.

¹⁶⁶ Ingrid van Bremen, 'The New Architecture of the Gold Boom' (PhD, University of Western Australia, 1990), p 119, quoting the *West Australian*, 28 April 1896.

¹⁶⁷ Information from Paul Stark, 1991.

¹⁶⁸ James Broadbent, *Elizabeth Farm, Parramatta: a History and Guide* (Parramatta [New South Wales] 1984), p 3.

¹⁶⁹ *Sydney Gazette*, 15 January 1833, reproduced in Steven, 'Eastern Trade', p 58.

¹⁷⁰ Broadbent, *India, China, Australia*, p 192, n 13, quoting J R Morrison.

¹⁷¹ Charlotte Godley [ed John Godley], *Letters from New Zealand by Charlotte Godley 1850-1853* (Christchurch 1951), p 44.

¹⁷² Godley, *Letters from New Zealand*, p 288 s.

¹⁷³ *Argus*, 3 March 1855, p 3.

conventional architectural purposes. At 'Como' in Melbourne, even the kitchen has a black and white marble floor, which dates from before 1864 and must necessarily have been imported.

Sieneese marble, so often imitated in scagliola, marbleising and wallpaper, was used in its genuine form in Lloyd Tayler's Bank of South Australia Building, Adelaide.¹⁷⁴ Cipollino marble was used in the ground floor cladding of Red Cross House, Adelaide;¹⁷⁵ Carrara marble and green Italian granite in the cladding of the Prudential Building, with arebascato and rosa alpina marble interior panelling;¹⁷⁶ and travertine cladding and rosa alpina panelling in the A M P Building of 1934-6.¹⁷⁷ C H James's Empire Building in Collins Street, Melbourne, had a 'noble' staircase made of Sicilian marble, except for the balustrade of the best rough royal, all 'specially imported'.¹⁷⁸ Not far away the same stone was used not only for the staircase, but for a bath top, lavatory top and skirting in the best bathroom of the Commercial Bank.¹⁷⁹ Red Spanish marble shafts were used in the façade, and French marble in the dado of the hall, at the Melbourne Stock Exchange of 1889-91.¹⁸⁰

In Sydney one Monsieur T Geruzet, presumably an importer, submitted a 'fine sample of polished Pyrenees marble' for the inspection of the New South Wales Institute of Architects in 1888.¹⁸¹ Adams's Marble Bar, built in 1893 to the design of Varney Parkes, was a particularly lush and publicly accessible marble interior, and since the demolition of the hotel in 1969 it has been reconstructed within the Hilton Hotel. Another form of marble, 'Teurab Marble Mosaic tiles', was available in Melbourne from Barnett Brothers in 1889,¹⁸² but no example has yet been identified.

In 1859 the Victorian Government was proposing to import Italian marble for the Parliamentary Library. The stonemasons objected to this, and gained considerable public support, during which it was even alleged that there was a conspiracy between the architect, J G Knight, the responsible minister, Gavan Duffy, and the Pope.¹⁸³ Knight subsequently suggested the use of the admittedly coarse, but perfectly sound Adelaide marble, in the hope that this would be more acceptable:

as no semi-political demonstration has ever been made against the importation of thousands of tons of stones which have been brought over from Van Diemen's Land (though the getting of freestone from a penal colony would seem to be almost as infectious a thing as importing Catholicised marble) ...

¹⁷⁴ Information from Paul Stark, 1991.

¹⁷⁵ Young, 'Introduction to Natural Building Stones', p 3.

¹⁷⁶ Young, 'Introduction to Natural Building Stones', p 3.

¹⁷⁷ Young, 'Introduction to Natural Building Stones', p 3.

¹⁷⁸ Alexander Sutherland [ed], *Victoria and its Metropolis* (2 vols, Melbourne 1888), II, p 585.

¹⁷⁹ G W Blackburn, 'The Commercial Bank of Australia Limited New Premises, &c' [bill of quantities] (Melbourne 1890), pp 42, 23.

¹⁸⁰ Cash, *The Gothic Bank*, citing the *Australasian Insurance and Banking Record*, 17 July 1891, p 503.

¹⁸¹ *Australasian Builder & Contractor's News*, 10 November 1888, p 431.

¹⁸² *Australasian Builder & Contractor's News*, 7 September 1889, p 278.

¹⁸³ *Australian Builder*, 8 January 1859, pp 3, 6, 9; 26 February 1859, p 58.

In the final event, however, and to the relief of Victorian patriots, a suitable freestone was discovered locally.

i. the intercolonial trade

As between the Australasian colonies the trade in Oamaru stone was undoubtedly the most significant. This was a limestone of a very sound and consistent quality which became a major item of export from New Zealand. There were about ten quarries around Oamaru, only one of which, Parkside, is operating today.¹⁸⁴ A finer quality white limestone was got from the Mount Somers quarries, inland from Ashburton on the South Island, and from the same area a pink limestone, which was often used in conjunction with the white.¹⁸⁵ Presumably these were the white and pink 'Pacific Portland' stones from New Zealand reported to be used for the façade of the Empire Building in Melbourne in 1888.¹⁸⁶

Oamaru stone was used in Adelaide by the 1870s,¹⁸⁷ and later in St Peter's Cathedral and in the Norwood house of the contractor J Jude.¹⁸⁸ However in 1887 there was a somewhat triumphant report that, whereas Oamaru stone had previously been imported, the new Bank of New South Wales at the corner of North Terrace and King William Street was being faced with Finnis Creek freestone on a base of Victor Harbor granite,¹⁸⁹ both local materials (the freestone being from near Strathalbyn).

In Melbourne some of the first Oamaru stone was used for the Bank of Australasia, Collins Street, in 1874, and came specifically from Round Hill.¹⁹⁰ Oamaru stone was used also for the façade of the Union Bank in 1878,¹⁹¹ the interior of Wilson Hall, Melbourne University, of 1879-82,¹⁹² the dressings at Ormond College in 1880,¹⁹³ and (combined with Pymont sandstone) the façade of Record Chambers, Collins Street, of

¹⁸⁴ These were Totara Tree; OK (now Round Hill); Gay's (later Parkside), Clark's at Teschemakers; Bingham's at Teschemakers; Campbells at Fortification Rd, Totara; Brown's at Alma; Weston, Anderson, at Cave Valley; and other quarries at Ote Kaiche and Aramoia Creek. The Totara Tree and OK quarries produced the hardest stone, but they were bought out and closed down by John Gay in 1922. Information from Alan Sim of Auckland, 2005..

¹⁸⁵ Haddon, 'Australian Planning and Construction', p 189. Haddon refers to Mount 'Somlis', but this can only be Mount Somers.

¹⁸⁶ Sutherland, *Victoria and its Metropolis*, II, p 585.

¹⁸⁷ Information from Paul Stark, 1991.

¹⁸⁸ *Australasian Builder & Contractor's News*, 9 July 1887, p 140.

¹⁸⁹ *Australasian Builder & Contractor's News*, 18 June 1887, p 100.

¹⁹⁰ Reed & Barnes, 'The New Bank of Australasia' [ms tender notice and miscellaneous pages copied from specification] (Melbourne 1874), p 20.

¹⁹¹ Franklyn, *A Glance at Australia*, p 319.

¹⁹² University of Melbourne, *Proceedings on Laying the Memorial Stone of the Wilson Hall of the University of Melbourne by the Honourable Sir Samuel Wilson, Knt., M.L.C.* (Melbourne 1879), pp 2, 9-10.

¹⁹³ *Argus*, 13 November 1879, p 6.

1887-8.¹⁹⁴ The specification for the National Mutual Life Association building in 1890 called for 'approved New Zealand stone' in the vestibule ceiling, but specified capitals and moulded shaft bases in 'Omaroo' or Mt Somers freestone.¹⁹⁵ Oamaru stone was listed as a standard item in Mayes's pricebook of 1883.¹⁹⁶

In Sydney Oamaru stone was used for the interior of St Mary's Roman Catholic Cathedral,¹⁹⁷ and the façade of an office building for A J Adams in Phillip Street, of 1887,¹⁹⁸ and it was almost certainly the 'white and light stone from New Zealand' which J H Hunt unsuccessfully proposed for the vaulting of Christ Church Anglican Cathedral, Newcastle, in 1882.¹⁹⁹ In Brisbane the stone was used for the columns and carved work of the National Bank of Queensland building, by F D G Stanley in 1881-5,²⁰⁰ at the house 'Cumbaqueepa' and at 'The Mansions' in George Street, both by the emigré Melbourne architect G H M Addison, and for the spire of the Albert Street Wesleyan Church in 1889.²⁰¹

Conversely, Sydney sandstone was exported in small quantities first to New Zealand,²⁰² and then to Melbourne during the later 1830s and the 1840s, for special purposes such as steps, lintels and porticoes, though there is insufficient evidence to distinguish it from Tasmanian imports over the same period. Within New South Wales itself - though virtually a separate colony - Boydtown imported Pymont stone not only for the sills and lintels of the Seahorse Hotel in 1843, but for the complete structure of the tapering square lighthouse tower built in 1846.²⁰³ In 1879-82 a 'hard durable stone from Sydney' was used for the exterior of Wilson Hall, Melbourne University.²⁰⁴ One would assume that this was Pymont stone, but for the fact that in 1883 the façade of the Tangye Bros warehouse in Collins Street was said to be the first use of the material in Melbourne.²⁰⁵

¹⁹⁴ *Australasian Builder & Contractor's News*, 15 October 1887, p 366.

¹⁹⁵ 'Wright, Reed & Beaver, 'Specification for National Mutual Life' p 14.

¹⁹⁶ Charles Mayes, *The Australian Builders' Price-Book* (4th ed, Melbourne 1883), p 29.

¹⁹⁷ Robert Haddon, 'Australian Planning and Construction', in G A T Middleton [ed], *Modern Buildings* (6 vols, London, no date [c 1910]), V, p 189.

¹⁹⁸ *Australasian Builder & Contractor's News*, 4 June 1887, p 58.

¹⁹⁹ Peter Reynolds & Joy Hughes, 'Private Practice: Works 1869-1904', in Peter Reynolds, Lesley Muir & Joy Hughes [eds], *John Horbury Hunt: Radical Architect 1838-1904* (no place [Sydney], 2002), pp 75-6.

²⁰⁰ Australian Heritage Commission, *The Heritage of Australia* (no place [Melbourne 1981], p 4/16.

²⁰¹ *Australasian Builder & Contractor's News*, 7 December 1889, p 535.

²⁰² The dressings for the stone store at Kerikeri, which were shaped on site in 1832. Mary Cooper, & Noni Boyd, *Historic Buildings of Northland and Auckland* (Wellington 1989), p 11; Peter Shaw, *New Zealand Architecture* (Auckland 1991), p 11 & illustration p 18.

²⁰³ H P Wellings, *Benjamin Boyd in Australia (1842-1849)*(Bega [New South Wales], no date), pp 12, 23-4.

²⁰⁴ *Proceedings, Wilson Hall*, p 9.

²⁰⁵ *Argus*, 15 December 1883, p 11.

This was followed immediately by the façade of the E S & A Bank headquarters in the same street.²⁰⁶ Here William Wardell had been awarded the commission despite ignoring the conditions of the competition, as reported in the *British Architect*:

Stone being costly, it was necessary that its use should be economical to the greatest extent; terra cotta, or some such material, being substituted for the general framework, and intermediate surfaces being plated with mosaic or tilework, so as to produce an artistic effect at moderate expenditure.²⁰⁷

The bank was followed by the façades of Record Chambers, as mentioned above, the Melbourne Stock Exchange,²⁰⁸ and the National Mutual Life Association in 1890.²⁰⁹ Sydney sandstone continued to be marketed in Melbourne in the twentieth century.²¹⁰

In Adelaide white Sydney sandstone was used in the superstructure of the Savings Bank, Adelaide,²¹¹ the Bank of Adelaide,²¹² and the Jervois Wing of the Public Library, in 1879-84; the Mitchell Building of the University of Adelaide, 1879-81; the Art Gallery of South Australia, 1900 & 1936; and the string courses of Bonython Hall, 1933.²¹³ Unspecified Sydney sandstones were used in both the Savings Bank²¹⁴ and the Bank of Adelaide headquarters in Adelaide, of 1879, where the body was of brown stone and the dressings of 'white'.²¹⁵ As in Melbourne, Sydney stone continued to be marketed in Adelaide through much of the twentieth century.²¹⁶

In the twentieth century the Hawkesbury and Bondi sandstones were exported. Hawkesbury stone was used in 1930-31 for the mullions and tracery of St Paul's Anglican Church at Tai Tapu, New Zealand, together with (and more surprisingly) a base of Victorian granite. The architect was Cecil Wood, but the choice of Australian stones was because the church was a memorial to the Australian born Lady Jessie Cooper.²¹⁷ Bondi sandstone was used at Goldsbrough House, Adelaide, of 1935,²¹⁸ and Bowral granite was also used in the plinth.²¹⁹ 'Saunders' Sydney Stone', advertised in 1934, was probably

²⁰⁶ *Australasian Builder & Contractor's News*, 15 October 1887, p 336. According to Cash, the stone was from Robert Saunders's Purgatory Quarry: Cash, *The Gothic Bank*, p 10, quoting Wardell to Verdon, 17 December 1883; Wardell to Goss & Masson, 17 December 1883.

²⁰⁷ *British Architect*, 9 January 1880, quoted in Michael Darby, *John Pollard Seddon* (London 1983), p 99.

²⁰⁸ Cash, *The Gothic Bank*, citing the *Australasian Insurance and Banking Record*, 17 July 1891, p 503.

²⁰⁹ 'Wright, Reed & Beaver, 'Specification for National Mutual Life', p 9.

²¹⁰ *Ramsay's Catalogue* [1949], § 5/2; [1955], §5/2.

²¹¹ Baker, *Building and Ornamental Stones*, p 35.

²¹² Baker, *Building and Ornamental Stones*, p 114.

²¹³ Young, 'Introduction to Natural Building Stones', pp 1-2.

²¹⁴ Baker, *Building and Ornamental Stones*, pp 35, 114

²¹⁵ *Australian Engineering and Building News*, 1 October 1879, p 130,

²¹⁶ *Ramsay's Catalogue* [1949], § 5/2.

²¹⁷ Matthew Crooks, 'St Paul's Anglican Church, Tai Tapu, 1930-31', in Ian Lochhead [ed], *Arts and Crafts churches of Canterbury* [exhibition catalogue] (Christchurch [New Zealand] 1996), p 10. The granite was reportedly from Cooper's family property, 'Glenara', though perhaps the nearby Gellibrand's Hill quarry is a more likely source.

²¹⁸ Marsden, *Heritage of Adelaide*, p 110.

²¹⁹ Young, 'Introduction to Natural Building Stones', p 3.

the traditional Pyrmont type, though named for the supplier, Robert Saunders of Sydney.²²⁰ New South Wales marbles were also exported, that from Borenore being used in the chamber of the Melbourne City Council.²²¹

The South Australian Willunga slate, already mentioned, was exported as flags and slabs even after its poor reputation as a roofing material caught up with it. Later it reappeared as an apparently satisfactory roofing material. In 1858 James McMeikan & Co of Melbourne were stocking South Australian slate,²²² and as Charles Mayes said, 'an inferior slate is imported here from Willunga, South Australia'.²²³ By 1925, when there were three companies quarrying the material, it was said that the flagstones had acquired a bad reputation for scaling. Flagging was now produced only by selecting from the thick layers of uncleaved slate which were found sporadically, whilst the predominant thin-bedded slate was used exclusively for roofing.²²⁴ The Mintaro Flagstone Quarry was floated as a public company in 1889, with a capital of £10,000.²²⁵ By 1914 the Mintaro Slate and Flagstone Co, as it had become, was exporting slate extensively to Melbourne and was planning to open a branch in Sydney.²²⁶

We have seen that a Hobart Town hearthstone was exported to California in 1850, and during the 1850s Tasmanian stones were imported to Victoria not only for hearths and flagging but, more rarely, for the facing of prominent buildings. The Victorian Colonial Architect specified, for the erection of three iron houses in 1854, 'Hearth stones of 3 inch Hobart Town Stone rubbed on the face', and a 'landing the size of Verandah to be formed of 3 inch Hobart Town Stone rubbed on the face and edged'.²²⁷ The first of the major buildings was Melbourne University, which used stone from Pitfield's quarry at Kangaroo Point²²⁸ (now the Hobart suburb of Bellerive): Louisa Meredith saw it when on a visit from Tasmania to Melbourne, and remarked 'verily they have need of gold mines in Victoria'.²²⁹

Other stones exported from Tasmania were a 'New Kangaroo Point Stone' and the Point Ventenat stone, from Bruni Island.²³⁰ In 1867 J E Calder reported that there was little

²²⁰ Richardson, *Ramsay's Specifications*, p 54.

²²¹ Baker, *Building and Ornamental Stones*, p 79.

²²² Victoria Industrial Society, *Catalogue of the Eighth Annual Exhibition* (Melbourne 1858), p 11.

²²³ Mayes, *Australian Builders' Price-Book* (1862), p 30.

²²⁴ The current quarries were the Australian Slate Quarry Limited, being the former Bangor Quarry, in section 256, Hundred of Willunga, acquired by John Dunstan in 1917, and Martin's Quarry and St Bastin's Quarry, both in section 1008. Jack, *Building Stones of South Australia*, pp 22-6. Jack refers to an article on the Willunga slate by John Dunstan, in *Architecture*, 20 August 1919.

²²⁵ *Australasian Builder & Contractor's News*, 23 March 1889, p 273.

²²⁶ Jack, *Building Stones of South Australia*, p 33, reprinted from a report by the Government Geologist in 1914.

²²⁷ Victoria, Colonial Architect, 'Specification of Work Required in erecting Iron Houses in Richmond Paddock' (Melbourne 1854), no page.

²²⁸ *Australian Builder*, 13 (29 May 1856), p 105: in this report the location of the quarry is erroneously given as Westernport Bay.

²²⁹ L A Meredith, *Over the Straits: a Visit to Victoria* (London 1861), p 94.

²³⁰ Miles Lewis, 'Tradition and Innovation in Victorian Building 1801-1865' (3 vols, PhD, University of Melbourne 1972), II, pp 267-8, 288;

activity in the export of Tasmanian flagging or building stones,²³¹ but in 1872 an unspecified 'white stone from Tasmania' was used in the façade of Farmer's Store in Sydney.²³² It was probably the fine white sandstone of the Prossers Bay quarry which, Louisa Meredith observed in 1879, had been used for the Town Hall (in part), the Post Office (in part) and the new Law Courts in Melbourne.²³³ Spring Bay stone from Hobart, which is seemingly the same thing, was used for the principal's house at Trinity College, completed in 1872,²³⁴ and was one of three stones considered in 1874 for the new Bank of Australasia in Collins Street.²³⁵ It was listed by Mayes in 1883 as a standard export to Melbourne.²³⁶ In 1889-91 a white Tasmanian limestone was used for the capitals in the public hall of the Melbourne Stock Exchange.²³⁷

Farmer's Store, Sydney, of 1873, designed by J H Hunt, was sort of epitome of Australian building stone, for apart from the Tasmanian stone already mentioned, it used Sydney sandstone, Goulburn white and grey granite, white granite from Ballarat, and Victorian bluestone.²³⁸ In fact it used both Ballarat and Melbourne bluestones, the former for the footings and the latter for the pedestals in the façade,²³⁹ for Melbourne exported its basalt fairly extensively. In 1879 the Sydney City Council first passed, and then rescinded, a resolution requiring Melbourne bluestone to be used for street paving, as it was regarded as the best material available.²⁴⁰ The Sydney General Post Office, at least in the 1887 extension, had Melbourne bluestone paving in the colonnade.²⁴¹

However, in 1888 Sydney's humiliation seemed to have ended, for Loveridge & Hudson opened a trachyte quarry at Bowral, producing as material 'far preferable to Melbourne bluestone'.²⁴² A specimen was described as being free from honeycomb and vents, and able to take a polish equal to any Scottish or Australian granite.²⁴³ In 1889 the New South Wales Railways decided to use bluestone rather than sandstone as ballast on their tracks, but were able to obtain this from Kiama and Newcastle rather than Melbourne.²⁴⁴ Somehow, however, Melbourne bluestone kept on coming, and in 1888-9 a complete entrance porch of the material was added to the Congregational Church at Petersham, New South Wales, to the design of John B Spencer.²⁴⁵

²³¹ J E Calder, *Tasmanian Industries* (Hobart 1869), p 58.

²³² Emery Balint, *Record of Commercial Buildings Constructed in the Victorian Era in N.S.W.* (Sydney 1987), p 234.

²³³ Vivienne Rae-Ellis, *Louisa Anne Meredith: a Tigress in Exile* (Hobart 1990 [1979]), p 195.

²³⁴ *Argus*, 14 June 1878, p 7.

²³⁵ Reed & Barnes, 'The New Bank of Australasia' [ms tender notice and miscellaneous pages copied from specification] (Melbourne 1874), p 20.

²³⁶ Mayes, *Australian Builders' Price-Book* (1883), p 29.

²³⁷ Cash, *The Gothic Bank*, citing the *Australasian Insurance and Banking Record*, 17 July 1891, p 503.

²³⁸ Balint, *Record of Commercial Buildings*, p 234.

²³⁹ Franklyn, *A Glance at Australia in 1880*, p 247.

²⁴⁰ *Argus*, 24 December 1879, p 5.

²⁴¹ Lucas, Stapleton & Partners Pty Ltd, *General Post Office, Sydney* (Sydney 1991).

²⁴² *Australasian Builder & Contractor's News*, 24 November 1888, p 462; 6 April 1889, p 318.

²⁴³ *Australasian Builder & Contractor's News*, 17 December 1888, p 553.

²⁴⁴ *Australasian Builder & Contractor's News*, 21 December 1889, p 589.

²⁴⁵ *Australasian Builder & Contractor's News*, 31 August 1889, p 209.

Purported Footscray (Melbourne) bluestone was used in the Colonial Mutual Life Assurance Building, Launceston (complete in 1887), not only for the base, but to form patterns in the gable, in alternation with Ross stone.²⁴⁶ In South Australia there one or two cottages of basalt at Port Wakefield,²⁴⁷ and 'a substantial base of Melbourne bluestone was used in the Australian Widows' Fund Assurance Company building in Grenfell Street, Adelaide, of 1887.²⁴⁸ Twelve thousand tonnes of bluestone pitches were used to pave the pig yards at the Pooraka stock market (designed by the Melbourne architect C A D'Ebro in 1913).²⁴⁹ Some Harcourt granite was also imported to Adelaide, where it is reported to have been used in part of the cladding of Chalmers later Scots) Church,²⁵⁰ presumably an addition to the original building of 1850-1; in the consulting rooms at 206-7 North Terrace (later the John Martin building) of 1901; and in the ground floor of Bagot's building.²⁵¹

In 1896, remarkably enough, a deputation of masons to the Premier of Western Australia, Sir John Forrest, asserted that nearly all the stone used for ornamental work on buildings in the colony was imported from Melbourne, and argued that there should be a protective duty levied upon such imports, so as to foster the development of local resources. The situation seems remarkable, given Victoria's relative paucity of building stones, but it is true that bluestone was still extensively exported, and by now Stawell freestone was available. Most architects in the west at this time were Victorian emigrés, and tended to specify the materials to which they had been accustomed when in Melbourne. An interesting example is J H Moir's building at the corner of St George's Terrace and Barrack Street, of 1896-7. It was at first going to be dressed in Oamaru stone, but as built the dressings were in cement, while the base of the building was 'of massive wrought and Moulded Malmsbury [Victoria] bluestone'.²⁵² It is presumably this material, though reported as 'Malmesbury', which forms the plinth of the Te Aro branch of the National Bank in Wellington, New Zealand, of 1917.²⁵³

Ornamental stones were naturally the most transportable, notably the marbles. Borenore marble from New South Wales was used in the Melbourne City Council chambers,²⁵⁴ Caloola marble in the Queen Victoria statue, St Kilda Road.²⁵⁵ In the twentieth century Angaston marble from South Australia was exported to Melbourne and Perth for

²⁴⁶ *Australasian Builder & Contractor's News*, 3 December 1887, p 480. Although there had been quarries at Footscray, by this date the superior stone brought by rail from Malmsbury was sawn there, and this is probably what was meant.

²⁴⁷ Information from Peter Bell and Peter Donovan, 1991.

²⁴⁸ *Australasian Builder & Contractor's News*, 2 July 1887, p 140.

²⁴⁹ Donovan & Associates, *City of Salisbury Heritage Survey* (draft, February 1991), pp 76-8.

²⁵⁰ Young, 'Introduction to Natural Building Stones', p 3.

²⁵¹ Young, 'Introduction to Natural Building Stones', p 4.

²⁵² Ingrid van Bremen, 'The New Architecture of the Gold Boom (PhD, University of Western Australia, 1990), p 119, quoting the *West Australian*, 28 April 1896.

²⁵³ Oroya Day et al, *Historic Buildings of Wellington* (Wellington 1986), p 39.

²⁵⁴ Baker, *Building and Ornamental Stones of Australia*, p 70.

²⁵⁵ Baker, *Building and Ornamental Stones of Australia*, p 77.

monumental work and stone slabs, and a large quantity was sent to London for use in the interior of Australia House.²⁵⁶

²⁵⁶ R L Jack, *The Building Stones of South Australia* [Geological Survey of South Australia, bulletin no 19] (Adelaide 1925), p 52.