

The Lime-Burning Industry in Victoria: An Occupance Approach

JANE HARRINGTON

This paper reviews the concept of occupance and applies it to a discussion of the lime-burning industry of Victoria as an approach which seeks to address and analyse functional, political, spatial and economic networks. Associated industries, activities, commercial and transport networks are investigated, together with the potential to utilise a range of archaeological site types and locations.

The research and fieldwork undertaken in the process of identifying and recording the archaeological evidence for the lime-burning industry in Victoria has reinforced the paradigm that it is appropriate to view sites, not as isolates, but as components which reflect the interaction between people and their physical and cultural environments, this interaction being grounded in the relationship between a site and all other related sites in a larger system. The archaeological reflection of the systems 'landscape' is contained not only in the relics and artefacts found in the immediate environs of the site but also in the historical and archaeological evidence for those other components which contribute to the system as an operational totality. As a consequence the empirical evidence available from archaeological sites can be interpreted in a wider context, creating a link not only between disparate geographic locations but also between different types of archaeological sites such as land based and maritime sites.

Disciplines such as geography and economics have long been interested in the flow of goods, resources and information and have developed models for analysing regional economies, development and commodity movement.¹ These approaches can be similarly applied in archaeological investigation, and gain particular relevancy within historical archaeology as a consequence of the capacity to apply qualitative and quantitative analysis to both documentary and physical data. The following discussion is predicated on the application of one such approach to the investigation of lime burning in Victoria: the concept of 'occupance'. Occupance has been applied traditionally in geography and has been identified as having useful application in relating particular sites and industries to a total cultural and regional landscape. An occupance is defined as the association of material forms, techniques, organisational units and attitudes by which people occupy a given area. It expands to encompass a wider definition than that just provided by industry as it embraces not only immediate elements of production but also the more

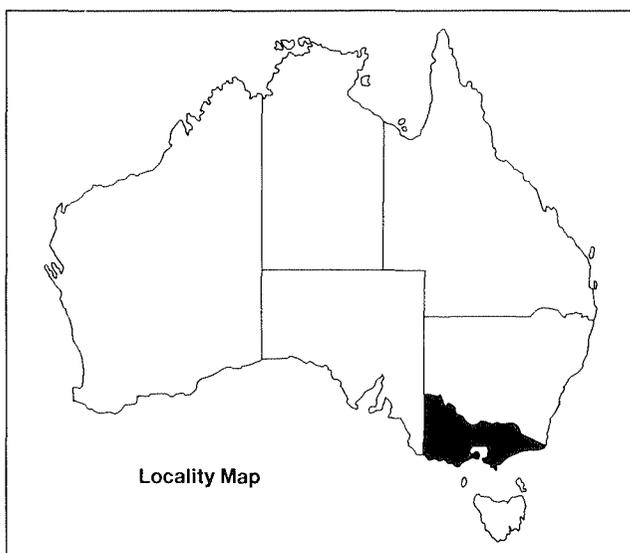
global landscape and larger material complex of associated industries and activities, commercial networks and transport systems.² Sites are therefore able to be considered within a web of functional, hierarchical and political, as well as spatial and economic relationships.

An occupance and its various elements contain sites which are accessible for the purpose of empirical archaeological investigation. In the study at hand this directs attention, in the first instance, to the impressive structural remains of lime kilns, and in the second instance to a range of what may be considered ancillary sites, such as roads, tramways, quarries, residences, cemeteries and graves, jetties and shipwrecks. At the same time there is a need to address the functional relationships that exist between the occupance and its more extensive cultural landscape. For example, where the location and development of an industry — such as lime burning — is dependent on resource availability and the capacity to realistically extract, process and transport the resource and/or its end-product, locational decisions are influenced by costs and returns within a broader economic system. Hence location will be related to the transportation and extraction technology that was available at the time. It is also important to be cognisant that such systems are dynamic and open to changes occurring in other parts of the system, such as economic and technological advancements; as a result a given occupance can be addressed within the context of development and change and, in certain circumstances, its own replacement over time.³

One of the methodological advantages of such an approach is to move away from the treatment of archaeological sites as basic units, or self-loci, of relatively concentrated activity and to treat them as one part of a functionally differentiated continuum of activity which extends irregularly across a given region. Incumbent in this is the recognition that 'every human activity has its own characteristic spatial scale....different human behavioural patterns can be proposed on the basis of site-environment relationships at varying scales'.⁴

The growth and operation of the lime-burning industry in Victoria, as with most extractive and commodity producing industries, cannot be addressed in isolation from the operation of economic, political, technological and social networks. In the case of lime burning this web of interaction not only encompassed other parts of colonial Victoria but extended to a 'world' environment embracing New South Wales, Tasmania and even Great Britain.

Lime-burning activities in Victoria can be dated to the 1830s — concentrated particularly around Mornington Peninsula and Geelong (Fig. 1, 2). By 1841 Geelong lime had become an export product, having found a viable market place in Launceston. The vigour of the lime industry — and the ancillary role that lime boats played in communications — was highlighted in an 1844 diary entry by Governor La Trobe in which he notes that he was able to maintain communication with 'headquarters' while holidaying at Queenscliff by taking advantage of the constant traffic of lime boats.⁵ The importance and size of the lime trade had gained public recognition during this period, exemplified in the report



appearing in the *Argus* on 16 February 1849 that a special lime wharf was being built on the Yarra to provide better accommodation for the lime vessels which at that stage numbered around 25. In the 1860s George McCrae indicated there were over forty vessels involved in the trade.⁶ As there was no alternative land route to Melbourne these small schooners and ketches were an indispensable link between the Heads area and Melbourne during the 1850s and 1860s. During these years the lime-burning business was booming, riding on the building expansion driven by the discovery of gold in Victoria and the influx of both people and finance.

While most early lime burning was undertaken by local, single owner-operators, by the 1850s the majority of lime production was in the hands of larger business partnerships and enterprises. Operators were subject to broader market influences and constraints including competitive production costs and differentials in quality of product. In such an environment the constraints and expenses of transport, in particular, proved to be of paramount importance. The reality of available transport technology dictated that most early lime-burning sites were located on the coast as shipping was the only available or cost effective means of transporting lime to the major markets in Melbourne. In 1858 the statistical register listed 47 kilns in Victoria, over half of which were in Geelong or on the Mornington Peninsula, with the majority of the remainder located in coastal regions. With the expansion of the railway system, however, the inland limestone resources became viable business propositions and by the 1860s several regions were supplying lime and transporting it to Melbourne via railway, notably Coimadai (near Bacchus Marsh), Sale and Hamilton. By 1868 the formation of partnerships and businesses had reduced the number of actual lime burners recorded in the Victorian Directory to 24.⁷

The economic impetus of the colonial lime trade was a market scarcity in which the demand for lime, predominantly for use in construction, could not be met by local lime producers. As a result a considerable amount of lime and cement was imported from overseas, at an expense almost three times as much as the local product. This cost, combined with complaints of staleness by builders and contractors led to the formation in 1860 of the Melbourne Lime Company which aimed to supply lime and cement solely for its shareholders, all of whom were members of the Victorian Builders and Contractors Association. By 1874 this had been consumed into a new builders co-operative, the Melbourne Builders Lime and Cement Company, which included among its members David Mitchell, who founded the Lilydale lime quarries in 1878 and the Victorian Portland Cement Company, both of which are still operating today. A number of prominent lime burners (including Blair and Campbell at Limeburners Point, Geelong) maintained their independence and effectively operated in competition with the larger co-operative.⁸

As the operation of coastal lime-burning kilns was economically tied to shipping it is not surprising to find that there was a close connection between lime burners, lime merchants and ship owners; burners and merchants in particular recognised the viability of maintaining and operating their own ships as company vessels. Historically at least 18 vessels have been identified that either operated as lime carriers or had been in some way involved in the lime trade in Victoria: these include the *Childe Harold*, *Adieu*, *Barbara*, *Joanna*, *Result*, *Victoria*, and *Harriet*.⁹ A number of these vessels have been identified as coming to grief, and although the circumstances were no doubt lamentable the 'silver lining' is found today in the potential for archaeological investigation.¹⁰ *Harriet*, for example, was wrecked at Duck Ponds (Limeburners Lagoon) in Corio Bay. *Childe Harold*, carrying a cargo of lime ran ashore at Point Gellibrand in Williamstown in 1841. Both *Adieu* and *Barbara* were wrecked in the channels just off Rye on the Mornington Peninsula. The *Result* went down in the Coles

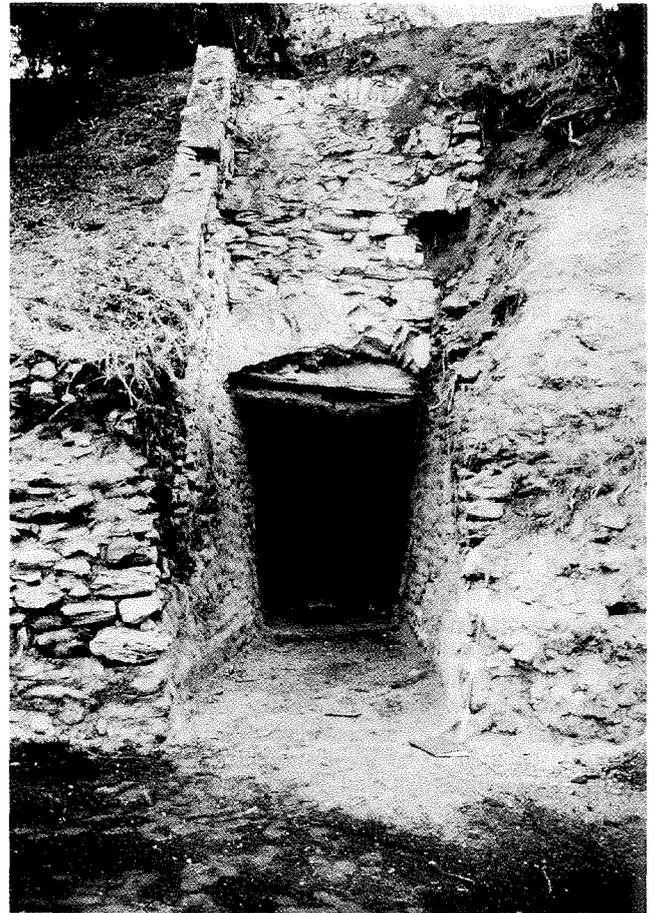


Fig. 1: Duffy's lime kiln, Portsea, Mornington Peninsula (Author 1995).



Fig. 2: Limestone road running in front of kilns, Limeburner's Point, Geelong (Author 1995).

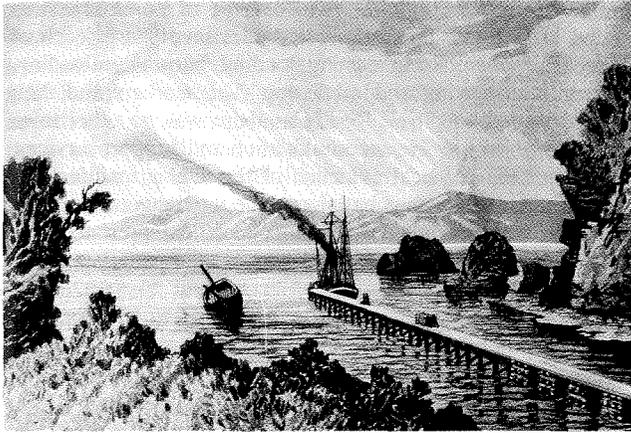


Fig. 3: 'Loading Lime, Waratah Bay', *Australasian Sketcher* 3 July 1879. Ship at the end of the jetty is the steamer *Rosedale*, wrecked at Lakes Entrance in 1878. The wreck on the left is *Alcandre* which broke up in 1877.

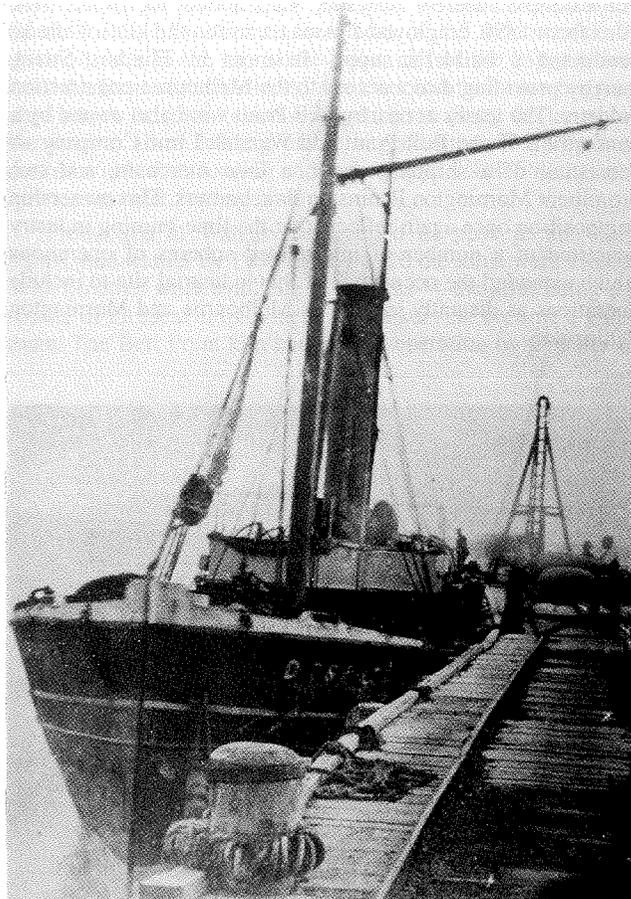


Fig. 4: Loading bags of lime onto *Despatch* at Walkerville. *Despatch* struck the pier and was beached at Lakes Entrance in 1911 (n.d., Foster Museum).

Channel off Swan Island in 1916, at which time the vessel was owned by the Melbourne Builders Lime and Cement Company. In terms of the interrelationship of burning, marketing and shipping it is interesting to note that the *Result* was originally owned by George Baker, a Melbourne lime merchant who for some time also maintained an active involvement with lime burning on the Mornington Peninsula.¹¹

The *Joanna*, a wooden two-masted schooner, built in 1856 and wrecked the following year, is of particular interest as the shipwreck site has been located and inspected. An inspection was undertaken by the (then) Victoria Archaeology Survey, Maritime Archaeology Unit, in 1985 and again on two separate

fieldwork occasions in 1990.¹² The wreck lies on the West bank of the West Channel of Port Phillip and stands one to three metres above the seabed, lying on a sandy bottom. The overall length of the site is 12 metres, and the depth varies between four to six metres depending on the tide. The bulk of the site consists of a clearly identifiable cargo of lime; bags of lime have rolled over and settled on top of the port side of the ship. The site is known to also contain artefacts pertaining to the passengers and crew, with recovered items including a child's school slate, buttons, blue and white porcelain, cooking utensils, furniture parts and shoes. The high concentration of personal effects provide a rare insight into the domestic sphere, which is so often reduced to invisibility in industrial contexts, and may indicate that the owner's or skipper's family lived on board. The remains of the *Joanna* are considered to be of particularly high historical and archaeological significance due to the good condition of both the hull and the cargo, and to the extensive associated cultural material.

Shipwrecks and lime take on a special association in that lime is inherently dangerous due to its volatile chemical nature. The addition of water to lime, the process which creates hydrated lime and is generally referred to as 'slaking', triggers a reaction which starts slowly but generates enough heat to raise the temperature to a point where the reaction will proceed at an alacritous rate. This heat can be sufficient, under certain conditions, to precipitate the ignition of wood or other combustible material. Consequently the accidental slaking of stored shipboard lime can have disastrous repercussions, a fate epitomised by the sinking of the *Victoria*, a lime boat owned by John Cain, a prominent Rye lime burner, which burnt out totally in 1890 while moored at Napier Wharf in Footscray due to a fire in the lime cargo.

The importance of the shipping industry, and the story of lime-boat disasters, is particularly well illustrated by the history of shipping lime from the site of Walkerville, Waratah Bay. The Waratah Bay lime deposits were discovered in 1875 and six kilns were built and operational at the site by 1878. Another single kiln was set up at Bell Point, about one kilometre south of the Walkerville kilns. The first load of lime produced at the Waratah Bay kilns was loaded onto *Blackboy* only to combust, thereby causing the destruction of all the lime: fortunately the ship was saved. Other vessels were not so lucky and both fire and storms have claimed victims with several of the small coastal ships that called for lime at Walkerville being wrecked in storms in and around the bay. The etching (Fig. 3), titled 'Loading Lime, Waratah Bay' is taken from the *Australasian Sketcher* July 1879 and shows the steamer *Rosedale*. The wreck to the left is *Alcandre* which broke up in 1877 — *Rosedale* itself was lost at Lakes Entrance in 1878 so this picture was published 'posthumously'.¹³ The SS *Despatch* (Fig. 4) also participated in regular runs between Lakes Entrance and Melbourne. The *Despatch* was a 237 ton steamer, built in 1869 specifically for the Melbourne, Portarlington and Geelong trade. By 1890 *Despatch* was being utilised in the Bairnsdale to Melbourne run, a route which had previously been the domain of schooners and ketches. The round trip from Queens Wharf to Bairnsdale, then back via Waratah Bay to load lime and on to Melbourne reportedly took five days.¹⁴ Unfortunately *Despatch* struck the pier at Lakes Entrance in 1911 and contemporary reports indicate that the ship was beached inside the entrance.

The *Gazelle*, *Rubicon*, *Orbost* and *Beagle* were also used for shipping lime during the early years of the Walkerville kilns. *Gazelle* and *Rubicon* were both owned by the Hon. William Froggett Walker (at one time Minister of Customs) who had taken over the lime-burning leases for the Waratah Bay kilns in 1884.¹⁵ In October 1887 *Rubicon*, a 64 ton wooden schooner, ran ashore one night in a gale and broke up, despite the dropping of two anchors; at the time it was carrying

an almost full shipload of lime. The *Rubicon* shipwreck site lies on the shore of rocky headland, two metres east of the now North Walkerville boat ramp. An inspection by the Maritime Archaeology Unit in 1989 revealed that the two anchor chains are still visible, running out for approximately 100 metres. The site also includes a large area of lime deposits studded with small copper-alloy fastenings and a small section of hull sheathing. The statement of cultural significance of the *Rubicon* shipwreck site acknowledges that it is an important example of a component of the lime trade and an integral part of the total industry infrastructure.

The lesson not having been learnt, the ketch *Centurion* (built in 1907) was bought by one of the later owners of the kilns, Andrew McCrae, to ship lime from Walkerville. A surprising purchase as it was well known in the market place as a leaky vessel — hardly suitable for transporting lime — and in July 1913 on a trip out of Walkerville wet lime caused a fire to break out on board. *Centurion* was beached at Newhaven, Phillip Island, and burnt out. A 1989 search by the Maritime Archaeology Unit only located a few small pieces of timber; a local informant reported that the Port of Melbourne Authority had swept the remains with a wire some ten or more years prior to the inspection.

The Walkerville and Bell Point kiln sites retain a significance — and a history — that goes beyond a catalogue of shipping disasters. Both sites were unsettled prior to the discovery of limestone deposits, both were located on isolated parts of the coast, and both were developed and populated in the singular context of the operation of lime burning (Fig. 5, 6). While the single kiln at Bell Point was supported by a commensurably minimal workforce, the multiple kiln site of Walkerville was effectively developed as a company town. A significant number of individuals were employed in the

operation of the six kilns; a work force of some size was needed to facilitate the various activities involved in each of quarrying, fuel gathering, carting, loading, burning, unloading, bagging, transporting and marketing. The workers and their families settled and lived locally as there was no other town close enough to provide accommodation and support services. As a result the physical evidence of the site is manifest not only in industrial remains but also in the remnants of domestic structures and associated features such as the presence of a small cemetery (Fig. 9).

The reliance on shipping for transport of goods both in and out — and the economic realities of transport availability and cost — is reflected in the fact that the kilns were established with part ownership by a shipping company, Bright Bros, and that for most of their period of operation the kilns were run by companies that were partly owned by a shipping agent, shipping company or an independent sea captain. The composition of these partnerships also reflected the above mentioned tendency for groups with varying expertise and interests (marketing, shipping and burning) to amalgamate. For example Andrew McCrae, who leased the Walkerville kilns from 1890, employed a manager to run the kilns while he conducted a builder's supply business in Flinders Street, thereby providing direct access to the Melbourne construction industry. The leases at nearby Bell Point were also owned by a consortium — the Bell Point and Waratah Lime Company — consisting of a shipping agent, a lime merchant, and two prominent Mornington Peninsula lime burners. This ownership composition once again reflects that the lime-burning industry consisted of a number of interrelated spheres of operations which extended the occupancy of this industrial site to include operations as distantly located as Melbourne and Mornington Peninsula.



Fig. 5: Remains of jetty, Bell Point (Author 1995).



Fig. 6: Walkerville kilns showing remote location of the site. The two remaining jetty pylons can be seen on the beach in the centre, left of the substantial remains of kiln No. 5 which has subsequently undergone renovation works (McClelland 1985).

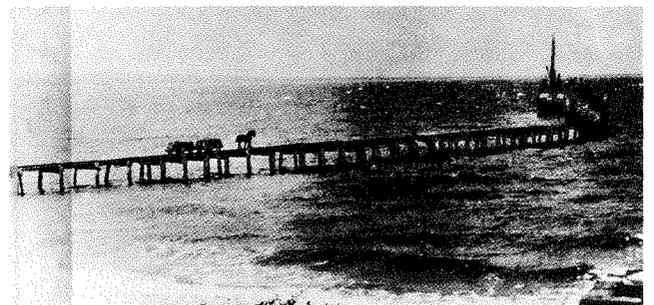


Fig. 7: Wyrallah at end of Walkerville jetty, note curve in the structure. A horse drawn tram-trolley is transporting bags of lime for loading (n.d. Landy Collection).

The decision to build kilns at Waratah Bay was made with the recognition that the construction of a loading facility was of primary importance. In the first instance all supplies, livestock and building materials needed for the construction and operation of the kilns site had to be ferried between the ship and the beach, and all goods had to be brought in and out by ship. Waratah Bay had been identified as early as 1854 as the site of a good, safe anchorage. Two main problems were encountered however in plans to construct a jetty: the first was a lack of suitable timber to use as piles, the second the difficulty of driving the piles into the solid rock beds which ran immediately offshore. The timber problem was resolved by hauling logs by bullock team from the Ten Mile district, a distance of nearly 10 kilometres. The Ten Mile timber was considered superior to coastal timber and better able to withstand long immersion in sea water.¹⁶ The final construction of the jetty was designed to circumvent the rock outcrops by incorporating several distinct curves in the 300 metre long jetty (Fig. 7).

Local transport needs were met by the construction of a series of narrow gauge tramlines on which horse drawn trucks were hauled to facilitate the transport of timber from Bluff Creek for fuel (a distance in excess of 1.5 kilometres), of quarried rock to the top of the kilns, and of the bagged lime from the front of each kiln. All six kilns had their own bagging shed which faced onto iron rails which ran along the length of the jetty to allow loading of the bagged lime. The jetty was double width at its loading end and equipped with bollards and howsers to cater for larger ships.

Production at Walkerville reached its peak in the early 1890s, had waned by 1900 and by 1926 the kilns were closed. With no other work available in the area — the kilns being the source of all local employment — Walkerville became a ghost town. The Bell Point kiln had ceased operation by October of

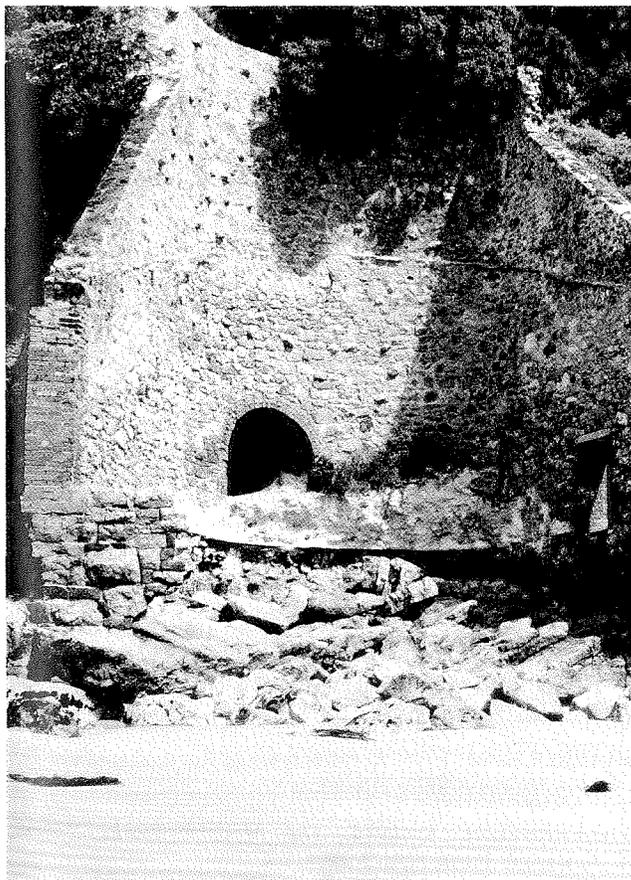


Fig. 8: Kiln No. 5 at Walkerville, prior to renovation works. The front working area has subsided. Note vaulted entrance to draw hole, door leading to kiln No. 6 (on left) and roof line in retaining walls (McClellan 1985).

1914.¹⁷ In both cases the causes of closure included a decrease in demand for lime and increase in transport costs.

The effect of the expansion of the railway system in Victoria cannot be overstated in terms of the changing fortunes of those involved in lime burning. It opened up new regions, making previously non-viable resources exploitable, and therefore creating increased market competition. On a cost basis it was unarguably less expensive and more efficient to transport goods by rail in preference to sea. On the larger scale the railways were to have a huge economic effect on the fortunes of ship owners in terms of breaking the monopoly of certain trade routes and providing a more cost effective means of transport. The result was a steep rise in shipping costs and an extra financial burden on those coastal lime-burning industries which were reliant on shipping for the transport of their lime. A steep increase in transport costs was a major contributory factor to the decline of the coastal lime burners. As the railway never got any closer to Walkerville than Foster, 35 kilometres of almost impassable bush away, using railway transport was never an option for the Waratah Bay kilns.

Ultimately the demise of lime burning as a viable industry was related to both international and local developments in technology and industry. Portland cement had come into large scale use in the United Kingdom during the 1850s and ultimately replaced lime mortar as the predominate construction material. The later half of the nineteenth century was a period of great increase in inventions and patents, both in Britain and the Australian colonies. Concrete became accepted as something more than a low grade mass material and, together with cement, became a preferred building product. Local manufacture of cement had commenced in Victoria: the Australian Portland Cement Co. at Fyansford, Geelong, was formed in 1889 and by 1911 they were supplying the majority of Victoria's cement needs, slowly eroding the market for lime-based products.¹⁸

The site of Walkerville today is dominated by the impressive remains of the six brick and stone kilns, all of which are in varying states of deterioration (Fig. 7, 8).¹⁹ On the beach, immediately south of the kilns, can be seen evidence of timber supports associated with the buildings erected adjacent to the kilns as workshops and stables. The last of the early residences fell victim some number of years ago to a local fire-bug vendetta but brickwork and footings associated with these structures remain on the slopes behind the kilns. A brick fireplace has been incorporated into the retaining wall running alongside the road leading to the carpark. All that is left of the jetty are two pylons, standing on the beach — all the below water remains have been removed in response to local concerns that they created a shipping and recreational hazard.



Fig. 9: Headstones (burials date to 1899 and 1907), Walkerville cemetery (Author 1995).

There is limited evidence of the tramway system: scattered iron bars, bolts and remnants of the superstructure can be seen. The tramway embankment running between the quarry and the kilns is still visible although there is little physical evidence of the tramlines. A local resident retains two iron wheels from one of the side-tipping horse drawn trucks and has reported that there is still some evidence of tramlines and wooden sleepers in the vicinity of the timber camp at Bluff Creek.

On a larger scale however the application of the occupation approach allows these features a place in the much broader commercial and geographical spheres within which Walkerville operated. There is the potential to pursue an archaeological investigation which seeks to relate local elements to a broad range of networked sites locations — including Bell Point, the Mornington Peninsula, and Melbourne — and to site types, such as other lime-burning kilns, shipwrecks, railways, warehouses, commercial structures and docks.

CONCLUSION

An occupation approach, which seeks to contextualise a site in terms of a larger material, economic, technological and social structure, illustrates the complexity involved with reconstructing the network of associations in industrial operations. At the same time the successful application of such an approach can serve to enhance the interpretation of a single archaeological site. Our understanding of an industrial site, such as the Walkerville lime kilns, is impoverished without recourse to an investigation of the colonial economic environment, of the available transport systems, and without recourse to a statewide approach to the material remains of the lime-burning industry — including those that are available through both historical and maritime archaeological approaches. By embracing more than the immediate elements of lime production the operations at Walkerville can be read as part of an extended cultural landscape which allows the investigator, through the combination of historical and empirical evidence, to gain and communicate a heightened appreciation of a significant past lifestyle and industrial operation.

ACKNOWLEDGMENTS

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NOTES

- 1 Riordan & Adams 1985. See also Modderman (1988) for a discussion of the relationship between archaeology and geography.
- 2 Jeans 1981. Equally applicable is the concept of 'world spheres' as proposed by Wallerstein (1974, 1980) and applied in Hardesty (1988), in the discussion of transportation, communications, demographic and economic networks associated with mining communities.
- 3 Jeans 1981.
- 4 Adams 1988:21–22.
- 5 Blake 1975:14.
- 6 McClennan, J. 1986:5.
- 7 McClennan, J. 1986:30.
- 8 See McClennan for a good summary of the obviously 'fiery' state of the market during this period.
- 9 Foster 1987; details pertaining to individual shipwrecks can be found in the files maintained by the Maritime Heritage Unit, Heritage Victoria.
- 10 A number of international vessels whose cargo manifests included lime shipments are also known to have been wrecked off the Victorian coast. These include the *Falls of Halladale*, out of Glasgow, which ran aground at Curdies Inlet near Petersborough.
- 11 The site of Baker's lime kiln is marked by a plaque, near the Sorrento foreshore.
- 12 Now the Maritime Heritage Unit, Heritage Victoria.
- 13 McClennan, J. 1986:5.
- 14 Bull 1964.
- 15 Walkerville was originally named Waratah but underwent a name change in the early 1890s in recognition of William Froggett Walker who had operated the kilns for a number of years post-1884.
- 16 Fleming 1975:1.
- 17 Fleming 1975: 7.
- 18 Lewis 1988:4.
- 19 The kiln designated as No. 5 has been partly reconstructed by the Department of Conservation and Natural Resources.

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