

Slate, slate, everywhere slate: the cultural landscapes of the Willunga slate quarries, South Australia

SUSAN PIDDOCK

The slate industry was central to the economy of the nineteenth and early twentieth-century town of Willunga, South Australia and today evidence of the slate industry and the uses of slate abound around the township. As part of the Adelaide Hills Face Zone Cultural Heritage Project the history and archaeology of the slate industry and the uses of slate were recorded. While sites such as the Delabole quarry and village are listed on the South Australian Register of State Heritage Items little attention has been focused on the preservation and interpretation of these sites as a part of a wider cultural landscape rather than as individual sites. As this article will demonstrate the relict landscapes of the quarries need to be seen as part of a wider cultural landscape that encompasses industrial and social landscapes, which can in turn be used as the basis for public interpretation. The interest of the general public is essential to the survival of such sites.

INTRODUCTION

South Australia was home to two areas of slate quarrying, Mintaro in the north of the state close to Burra and Willunga to the south of the capital city, Adelaide (Fig. 1). Both areas were discovered and quarried from the mid-nineteenth century until today. The focus of this article is the landscape of the Willunga slate quarries (Fig. 2), and it will be argued that this landscape is composed of several layers and all need to be included in any interpretations of the cultural landscape. I use the word layers to differentiate connected features on the landscape that can be seen as complete in themselves. In this way an archaeological site and its immediate surrounds can be seen as a layer and can be interpreted together without looking beyond to the wider landscape at a regional level for example.

These layers can also be schemes of interpretation which we use to explain or explore a site for ourselves as archaeologists or for the general public. In this article interpretative layers are used to explore the world of the Willunga slate quarries.

There is an increasing tourist interest in the slate industry which has led to the opening of a Slate Museum in Willunga and publication of a Slate Trail pamphlet by the National Trust (Willunga Branch) in 2006. In this paper other options will be considered that bring history and archaeology together to explore the story of the slate industry.

The recording and interpretation of the Willunga slate industry and the local uses of slate was undertaken by the Hills Face Zone Cultural Heritage Project (HFZCHP) between 2002 and 2005. The Adelaide Hills Face Zone is an area 90 km long which extends from Sellicks Hill, south of Adelaide, to Gawler in the north along the western face of the Mount Lofty Ranges and forms a backdrop to the city of Adelaide. The

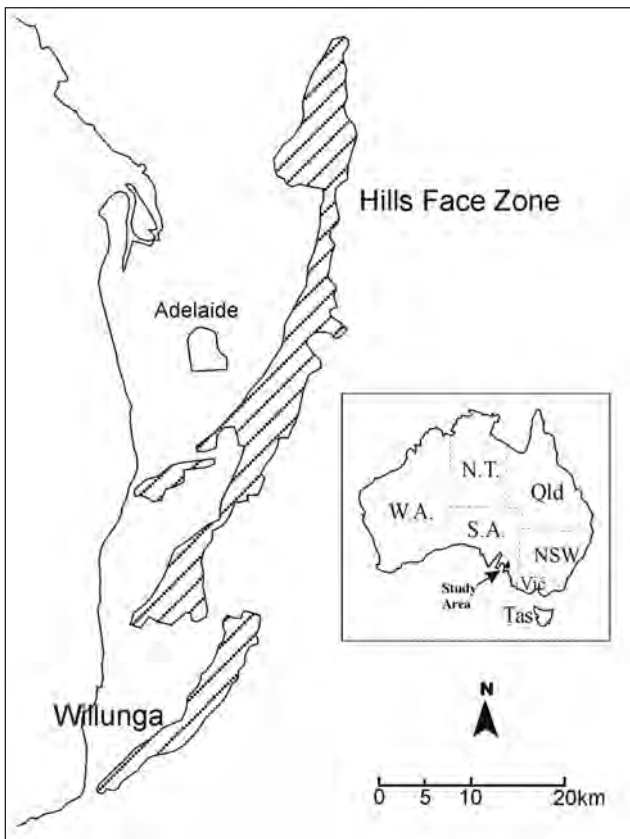


Fig. 1: Hills Face Zone shown in relation to the Adelaide city centre. Drawn by Robert Keane, Flinders University

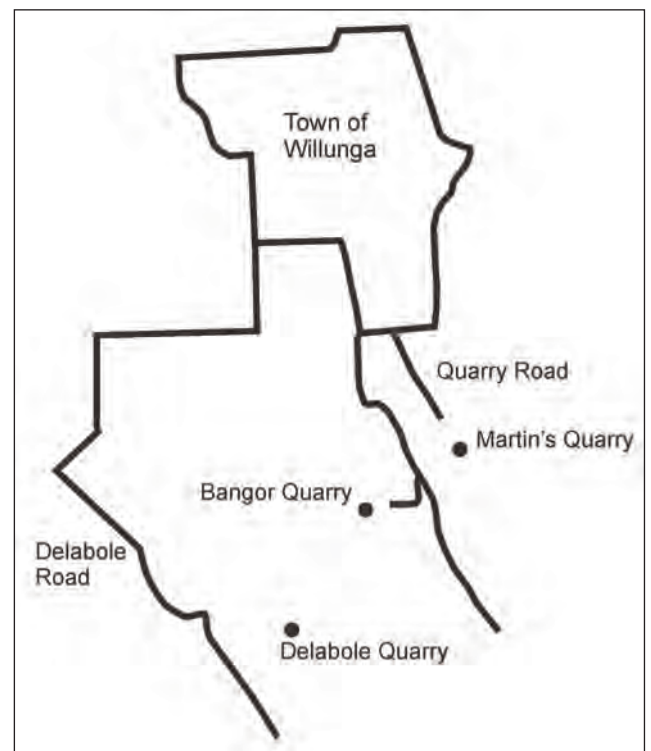


Fig. 2: Map of Willunga showing the location of the Willunga Slate Quarries. Not to scale, redrawn by Tony Lowe based on author's plan

Zone is between 5 and 10 km wide (Fig. 1). It was created to protect part of the Adelaide Hills from urban development and intensive agricultural and horticultural activity under the 1962 Metropolitan Development Plan. Today it forms a major component of the Metropolitan Open Space System (Smith et al. 2006:ix–x).

The aims of this Australian Research Council (ARC) Linkage Project were to:

- Document Indigenous and European cultural impacts on the landscape of the Adelaide Hills Face Zone.
- Understand the ways in which the processes of colonisation shaped today's landscape.
- Identify and document sites of cultural heritage significance.
- Recommend selected sites as cultural tourism destinations.

To accomplish these aims the project conducted heritage surveys across the Hills Face Zone recording all cultural impacts on the landscape using a GPS unit and camera. This data was then entered into the Adelaide Hills Face Heritage GIS Database 2005 in order to analyse their spatial distribution and to assess their significance. This was supported by detailed historical research and the application of landscape archaeological theory based on the work of Willey (1953), Anschuetz, Wilshusen & Scheick (2001) and Jacques (1995) (for a full discussion see Smith et al. 2006:ix–xiv).

As the chief investigators and designers of this project come from an Indigenous archaeology background (the author came on board later) the theoretical basis of this project draws on landscape theory more normally associated with anthropological studies than with historical archaeology.

The project methodology was influenced by the settlement ecology method as defined by Anschuetz, Wilshusen and Scheick in their article 'An Archaeology of Landscapes: Perspectives and Directions' (2001:177). The settlement ecology approach acknowledges that 'landscapes are the products of people's interactions with their environments' (Anschuetz et al. 2001:177). The culture and traditions of the group being considered act as filters that inform how groups structure and organize their use and occupation of places (Anschuetz et al. 2001:177). In the case of the Hills Face Zone, the group being considered are the European settlers, who bought with them to South Australia their own cultural 'baggage' that included industrial and domestic building technologies, social mores, agricultural and horticultural practices, and culturally determined settlement patterns (Smith et al. 2006:xi). This 'baggage' was to directly impact on their use and modification of the landscape as identified by the project and over time aspects of landscape learning came into play that saw the original settlement and land use patterns change over time. Landscape learning is a process by which people gain a knowledge of natural resources and fill the gaps in their knowledge of this new environment (after Rockman 1999:12). The European colonisers of the Hills Face Zone gradually adapted their knowledge to suit the new environment and this adaptation, or in some cases a lack of experience, was to be the key to the successful economic transformation of the natural environment to the largely culturally constructed landscape of the nineteenth century.

The application of this settlement ecology method to the data collected allowed us to interpret the cultural uses of the natural resources essential for the economic development of the colony and to understand some of the human impacts on the environment.

This study also drew on the work of G. R. Willey who sought to go beyond a study of single sites to look at regional settlement patterns (Willey 1953; Smith et al. 2006:xi).

Willey and others argued that 'settlement patterns not only reflect the natural environment ... they also are shaped directly by cultural needs' (Anschuetz et al. 2001:168). In the Adelaide Hills Face Zone settlement patterns were often focused on the natural resources available whether mineral or water sources.

This article, however, is not about landscape theory *per se*, but rather the term landscape is used as an artificial construct, a way to link individual features and sites scattered across the physical landscape into a layer. This then allows us to create a meaningful story for interpretive purposes. However landscape theory as indicated above informed the original research design and conclusions of the project as a whole and this paper is a development of these theories.

As part of Hills Face Zone Cultural Heritage Project the slate quarries of Willunga were visited and recorded. These quarries included Bangor, Martin's and Delabole (Fig. 2). The first two are active commercial quarries today supplying flagging and slate for garden features, while Delabole is quarried privately. An essential part of this project was community involvement which included discussions with local history expert Martin Dunstan, whose family owned the Bangor Quarry, and Gerald Martin, whose family previously owned Martin's Quarry, and who also showed us sites in the town of Willunga and surrounding areas. In addition, letters were sent to residents in the Hills Face Zone asking whether they had historical remains on their properties and whether they would be interested in an investigator visiting them. This led us to several home visits in the Willunga district where a range of features using slate as their primary material were identified, these included for example drains, water tanks and fences. It is likely that this is only a small sample of what could be found as the home owners we visited were those with an interest in the history of their properties or heritage in general. The HFZCHP teams were then able to identify and record not just the heritage of the slate quarries but identified a wider landscape reflecting both the importance of slate to the community and the uses of slate in the local economy.

In Australia there is a strong tradition of the study of industrial sites from the perspective of historical archaeology, industries studied include the Blue Tier tin-field in Tasmania, the oil-shale communities of New South Wales, copper fields in North Queensland, the gold fields of Victoria and the Northern Territory and the coke works of Wollongong to name a few (Jackman 1997; Jack 1997; Kerr 1997; Lawrence 1997; Holmes 1989; Rogers 1988). The study of the Blue Tier tin-field is particularly interesting in relation to the cultural baggage discussed above, as some of the earlier miners came from Cornwall and brought with them knowledge of the geological structure of Cornish tin lodes which could not be directly transferred to the tin deposits in the Tiers and which lessened the economic value of these deposits (Jackman 1997:51). The oil-shale communities of Joadja, New South Wales reflects most closely the circumstances of the slate quarries of Willunga. Houses were provided for the workers near their workplace, there was a strong religious community of migrants from Scotland and importantly many of the sites are now on private property and have been preserved (Jack 1997:38–90). However tourism is not a major factor here, unlike at Willunga which is adjacent to a major winery area. Unfortunately the author has not been able to locate any articles or reports on the archaeology of slate quarries for comparative purposes.¹

A BRIEF HISTORY OF THE WILLUNGA SLATE QUARRIES

The town of Willunga, located on the exact boundary of the Hills Face Zone 43 km from Adelaide, was first surveyed in

1839 as part of a wider survey of the regions south of the new town of Adelaide. Sections 258 and 286, Hundred of Willunga, were surveyed by P. L. Snell Chauncy for the owner Edward Moore and subdivided to form town allotments. The adjoining blocks of sections 700 and 703, owned by the South Australian Company, were also quickly subdivided into blocks (Linn 1991:35). The town, in an agricultural district, became the administrative centre of the area and a stopping place on the road journey from Adelaide to the South Coast.

Slate was first discovered in the Willunga hills by Edward Loud in March 1840. Whilst out shooting quail Loud identified an outcrop of slate on the western side of a ravine. This was to become Loud's Quarry, and by 26 June 1840 12 families were employed at the quarry (Linn 1991:42). *The South Australian Register* reported on 6 June 1840 that slates from the quarry were sold for £10 10s a thousand in Adelaide. *The South Australian Register* also reported that the quarry was believed to be limitless, and the writer believed that slate would quickly replace timber shingles as the primary roofing material as well as providing a valuable article for export to neighbouring colonies. This was a prophetic statement as the Willunga quarries exported over 150,000 roofing slates by 1841 by ship to Port Adelaide, Melbourne and Sydney from Port Willunga, a little over 11 km from the quarries across the Willunga Basin (Linn 1991:43; Dept. of Mines n.d.:28). The quarry was managed by Loud's neighbour, Sampson Daw, a Cornishman familiar with slate working.

Delabole Quarry

Three months after Loud's discovery Sampson Daw found slate on his own property, approximately 1.6 km northeast of Loud's Quarry. These quarries and the ones discussed below were to derive their slate from the same reef which was approximately four miles (6.43 km) long and 3000 feet (914.4 m) deep. This reef is located in the Willunga Front Hills which extend in a westerly direction from about two miles south of Willunga (Dept of Mines n.d.).

Daw opened a quarry called Delabole after the Delabole Slate Quarry in Cornwall (Dept of Mines n.d.:25). Loud's Quarry closed soon after the opening of the Delabole Quarry as the latter's slate was superior (O'Malley 1996:7). Although Sampson Daw appears to have owned Section 753, next to the quarry, the quarry itself was on Section 1150 which was waste land. Under the *Waste Lands Act* (a part of the *South Australian Foundation Act* 1836) a person could purchase such land but it remained a royalty section and 1/15th of the minerals were due to the Crown (Vaudrey 1990). Daw and Thomas Polkinghorne appeared to have permission to remove the slate and ultimately purchased Section 1150 for £303 in 1847.

The Polkinghorne and Daw partnership was dissolved in 1852 and Section 1150 was conveyed to Daw, who sold it to J. Allen on 9 December 1861 (General Registry Office Book 179/303). The land was then sold to the South Australian Delabole Slate Co. Ltd on 30 August 1865. On 28 May 1866 the Delabole Slate Company had its first half-yearly meeting, and the Chairman Hon. T. English indicated that two of the quarry faces were in working order whereas the third and upper quarry required further outlay to open it up (*The Observer*, 26 May 1866).

In 1872, John Allen repurchased the quarries from the Delabole Slate Company which may have found them not as profitable as hoped (GRO Book 288/55; Department of Mines n.d.: 28; *The South Australian Register*, 30 November 1927). While the Delabole Quarry was the main supplier of roofing slate in Australia from 1840 to 1893, the growing popularity of galvanised iron and other roofing materials in the later

nineteenth century saw interest in slate fall. The Delabole Quarry suffered a slow decline in its workings until Allen sold the land to G. Ware purely for grazing in 1903 (Dept of Mines n.d.:30; South Australian Register of State Heritage Items).

Martin and Bastian's Quarry

This quarry was located near Glenunga Creek in the Beltana Gully and was opened by James Gregory and Co. in September 1842. The competition provided by imported slate from Cornwall and Wales and by other quarries was too great and the company was unable to pay its rent to the South Australian Government and surrendered its lease only 19 months after it was taken up (Linn 1991:42). In 1846 Thomas Williams and Thomas Polkinghorne, a former member of James Gregory and Co., took up this lease and the quarry on Section 1008 was later known as Martin's Quarry after Thomas Martin a later owner of the land (B55737 viewable at <http://www.catalog.slsa.sa.gov.au/screens/opacmenu.html>).

Thomas Martin was born in Cornwall in 1825 and immigrated to South Australia in 1847. He purchased the land on which the quarry was located sometime before 1863 (Mines n.d.:30; Dunstan 1977:100). Initially a worker in the slate quarries he went on to own the quarries which were worked under the tribute system (Payton 1987:54). Under the Cornish tribute system, which had spread to America and Australia, individual sections of a mine or quarry were contracted out to individuals or groups of miners. They were paid varying prices for the quarried slate or ore by the owner of the mine or quarry (Payton 1984:90–91).

Tribute on the first quarry face was taken by Messrs Kernick, Cobbledick and Male in the early 1850s and tribute on a second quarry face (called the middle quarry) was taken by a Mr Jacobs in 1863. Jacobs had recently arrived from America and was familiar with slate quarries (*The Register*, 30 November 1927). A further quarry face was opened up a short distance from Martin's Quarry by Sampson Bastian. Martin initially held a share in this quarry but later sold it. Martin and Bastian's Quarry, as it was known, was worked until 1912 by Thomas Martin Jr after the death of his father in 1900 (*The Register*, 30 November 1927).

Bangor Quarry

This quarry was initially opened in 1842 by Thomas Williams, although it is not clear whether he owned the land or leased it. Certainly in 1856 the quarry was being leased by Messrs Kernick, Male and Cobbledick. Experienced Cornish stone dressers, they had been working a quarry owned by the Martin family, but with its collapse, they entered a rental contract on the Bangor Quarry for £125, with the option of purchasing it for £1000 (*The Register*, 30 November 1927). After the first 21-year lease expired, they took out a further seven-year lease. Due to illness Mr Male withdrew from the partnership, and Kernick and Cobbledick sold the lease to G. Sara and his son, William; who were slate merchants and builders by profession (Dunstan 2004). The Saras then sold it to another unspecified company who worked the quarry for three years before it was abandoned because of a decrease in the demand for slate (*The Register*, 30 November 1927). A year or two later it was reopened by Harry Richards, who sold the quarry in 1912 to an unidentified Sydney company which subsequently went into liquidation (Dunstan 2004).

On 8 October 1917 John Dunstan, a Sydney architect, and William Noller, a builder and contractor, successfully tendered for the Bangor Quarry. In 1920 John Dunstan formed a company called Australian Slate Quarries Limited to operate the quarry. The Bangor Quarry had been worked to a stand-

still and six months were required to clear the debris. The quarry went on to supply between 500,000 and 2,000,000 slates per year (Heritage SA file).

In 1921 Australian Slate Quarries Ltd purchased Martin and Bastian's Quarry for £1050, effectively removing all local competition for the slate market. These quarries, encompassing 25 acres (10.125 hectares), were located on the northern boundary of the Bangor Quarry. The equipment from these quarries was brought to Bangor and put to use.

The First World War (1914–1918) affected the availability of galvanised iron and slate was the ideal replacement. However from the late 1920s, the availability of terracotta tiles for roofing saw a renewed decline and by the 1940s the quarry was producing only walling and paving stone (Heritage SA file). Between 1917 and 1944 Bangor Quarry produced 12,250,000 roofing slates, making it the largest producer of roofing slate in Australia (Dunstan 2004). Today the Willunga–Bangor Slate Quarry is still worked commercially as is Martin's Quarry.

INTERPRETATIVE LAYER 1: AN INDUSTRIAL LANDSCAPE

To understand the process of quarrying and to identify what possible features might remain at a quarry site, such as those at Willunga, we can access nineteenth-century accounts such as the one written by John Jenkin in 1888 which describes the working of the Delabole Slate Quarry, Cornwall. Using Jenkins's account we can reconstruct the slate working process at Delabole, Willunga for example.

The first stage in the process was the clearing of the overburden until the good slate was reached. Slate by its



Fig. 3: Quarry face at Delabole. Photograph by author 2003

nature forms sheets called lamiae and at the Willunga slate quarries these sheets run vertical or at right angles to the ground (Fig. 3). It was the job of the rockman to place blasting powder in the correct places (usually the joins between sheets) so that the largest blocks possible were freed without breaking them into small pieces by overcharging the powder. This required knowledge of the grain of the slate and the 'cutting away of the beds' (Jenkins 1888:18). *The South Australian Register* (18 July 1868) reported that at Delabole, South Australia, these initial blocks were up to several inches thick and 90 feet (27.43 m) in extent. Once the slate was loosened a hillman climbed on the plateau to insert a wedge between the layers and split the slate apart. This similarly required a high level of skill. The block had to be split into the proper size and thickness required by the slate dressers. The art was to determine the proper number of slates a block would produce. An incorrect decision would lead to pieces of slate that were too thick or too thin, liable to breaking or of inferior quality (Jenkin 1888:19–20). The blocks were loaded on to a trolley and taken down from the quarry faces to the working area by tramline. Cables stretched across the gully with attached pulleys and chains allowing the quarried slate to be moved (Dunstan 2004). The slate dresser would then cut the slate to a series of sizes either manually or using a machine. Manually the slates were cut using a notched gauge and an iron frame to mark out the sizes of slates to be cut from a block. The slate from the Delabole quarry was then transported by horse dray to Port Willunga for shipping (Dept of Mines Report n.d.:28). What traces then can we find of these activities in the landscape?

The Archaeological Landscapes of Delabole, Martin's and Bangor Quarries

The landscape of the Delabole Quarry today clearly reflects the modification of the landscape produced by the nineteenth-century quarrying process. The quarry lies between two steep hill faces that were both modified by the quarrying process. The quarry itself consists of three faces cut into the hillside (Fig. 4). The removal of the slate created a plateau in front of the lower quarry face. The opposite hillside shows evidence of benching which is highly visible when viewed from some distance. It is likely that this benching was done to carry the tramline up to the higher quarry faces. The tramline was laid in 1866 (*The Observer*, 26 May 1866), however the tracks have been removed possibly for re-sale and there are no historic photographs of Delabole to indicate the exact path of the tramline.

A further part of the modification of the landscape was the creation of a water management scheme to provide the quarry with a steady supply of water. The water management scheme began above the quarry with the creation of a small dam reservoir to collect water from the hillside. This was associated with a slate-lined and covered channel and slate sluice gates that fed water into the reservoir or allowed water to flow directly down into the creek in a slate channel to the quarries. The water was controlled by sluice gates, although they have been removed in recent times. Near the upper quarry face is a pool that might have been artificially created, a slate drain near the middle quarry face and a slate cairn over a well on the plateau near the lower quarry face suggests the water was managed down past all the quarry faces (Fig. 5). The drain may have been excavated lower underground in this area or the well may access a natural water course. The stream is evident below the plateau where it runs along the valley floor as a creek. It seems likely that the water was managed to supply the needs of the quarry workers for domestic purposes and possibly to alter the water flow through the quarry itself, although this is speculation.



Fig. 4: The three quarry faces at Delabole cut into the hillside. Photograph by author 2003

While there is slate debris covering the floor of the plateau adjacent to the quarry face and on the opposite hillside, there is no evidence of any structures associated with the preparation of the slate before it was shipped. It is possible that the slate was prepared in the open. There may have been some kind of temporary structure to protect the blasting powder. The slate debris came from the process of cutting the slate into workable material and from broken or imperfect slate created in the blasting process. This slate had little economic value but as will be discussed later was used by Willunga residents to build a range of structures.

Slate waste was used to support the dirt track that led out of the quarry up the adjoining steep hillside to the Delabole Road where it was transported to Port Willunga. Slate was laid in a similar manner to that used for dry stone walling to create a 'bridge' where the hillside falls sharply away allowing wagons to travel from the plateau onto the side of the adjoining hill and up past the foreman's house and chapel to the main road (Fig. 5). Slate was used in a similar way at Martin and Bastian's Quarry to form a retaining wall.

There is little evidence of the quarrying activities at Martin and Bastian's Quarry apart from the quarrying process itself as

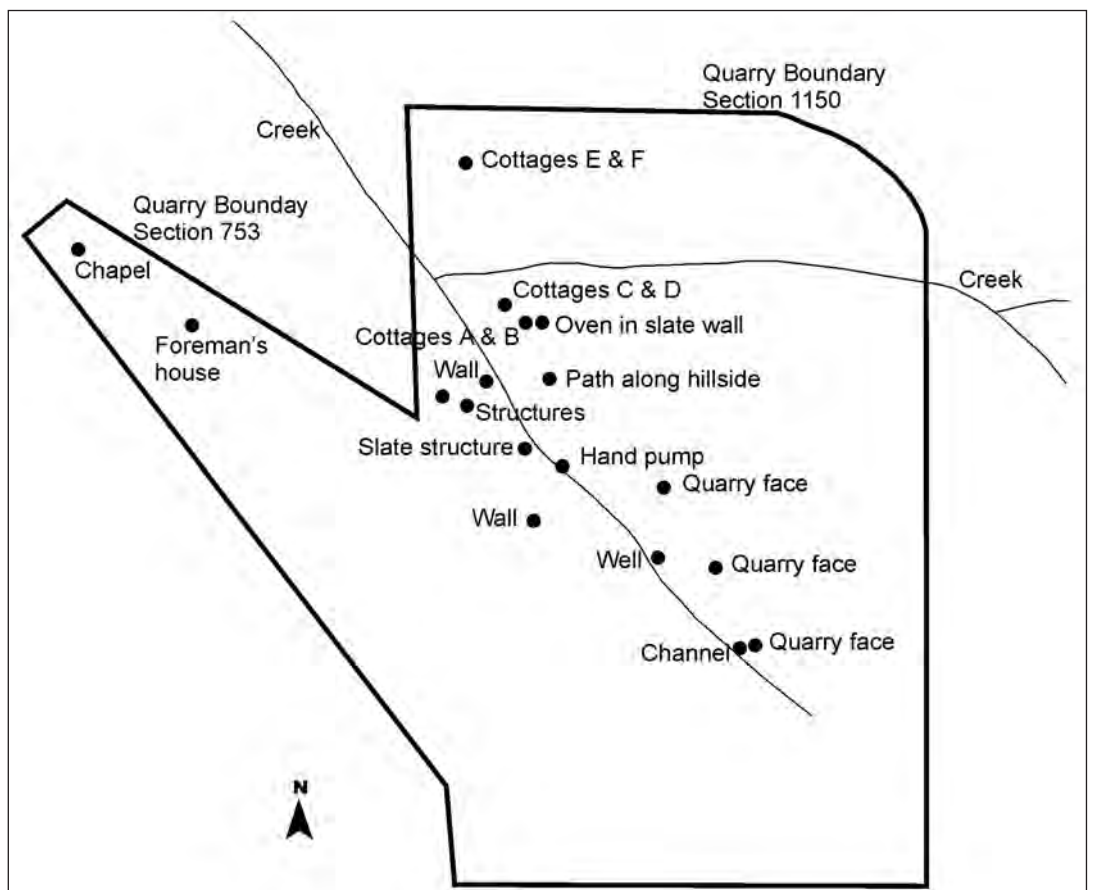


Fig. 5: Plan of archaeological features at Delabole showing their relative positions to each other. Not to scale, redrawn by Tony Lowe based on author's plan

indicated by marks on the slate of the quarry face. A historical photograph held by the State Library of South Australia (B55737 viewable at <http://www.catalog.slsa.sa.gov.au/screens/opacmenu.html>) dating to 1908 shows a tramway, crane and nearby stone building at the quarry. As indicated above the owners of Bangor were to buy these quarries and they probably removed the portable equipment including the tramway for reuse or sale. There is no evidence of the building which may have been an office. A cement slab and fixtures suggest the working shed, where the slate was processed, was to the south of the quarry faces. The area in front of Martin's Quarry faces is now covered by a large modern shed and evidence might have been covered or destroyed when it was erected. Near the quarry faces is a creek and as at Delabole there is evidence of a water management scheme composed of slate drains and an iron pipe slightly above the Bastian's Quarry faces.

At the Bangor Quarry there is more evidence of a working quarry with several buildings remaining which date to both the nineteenth and twentieth centuries. Unlike the other Willunga slate quarries there is quite an extensive photographic record (held by the State Library of South Australia) that allows one to understand the landscape of the quarry and the placement of equipment. The quarry face of the Bangor Quarry was originally 150 feet in height and was cut substantially into the hillside with many large plateaus created by the cutting and the blasting of the slate (B56203, viewable at above site). The quarry face ran in a NW–SE direction and was accessed by a road winding around several hillsides. Below the road the hillside substantially drops away to a creek with a second access road winding around the hillside below the quarry allowing access to the waste slate which was deposited over the edge of the plateau.

The area in front of the quarry face was used as a slate working area and a tramline ran from the quarry face to the edge of the working area and branched through the slate mill designed by John Dunstan and erected in 1922 (M. Dunstan 2005 pers. comm.). The slate mill (140 ft long by 45 ft wide; 42.67 by 13.71 m) was erected to house the new plant which included a 100 hp multi-tubular boiler, five dressing machines, a saw bench, feed pump and feed water heater. Steam cranes were located on the hill top some 60 feet (18.28 m) above the quarry face and down in front of the quarry face and can be seen in photographs from the early twentieth century. The crane was a five-ton steam derrick semi-portable crane with a 70 feet (21.33 m) jib that suspended over the quarry face (Dunstan 2004; B55886 viewable at above site).

Today a large part of the quarry face has been filled in and the upper part is worked for slate. Next to the quarry face is a slate-lined well probably put in place when the quarry face was filled in. The slate mill partially survives with the walls facing down the hillside missing. The machinery shop which comprised one end of the mill is gone but the chimney for the boiler is still intact. The walls of the slate mill were created by layering slate with brick used for the window surrounds, and slate was also used for interior walling and to create louvers below the roof. A drawing supplied by Martin Dunstan shows that slate dressing machines were placed in a line on the side of the mill facing downhill with apertures next to each machine allowing waste slate to be thrown out readily (PRG280/1/35/323, viewable at above site). The tramway ran through the centre of the building before curving round at the end of the mill to face the edge of the plateau allowing slate waste from the slate saw operations to be removed. The mill was capable of turning out 2,000,000 roofing slates per annum (Dept of Mines Report n.d.:32).

A slate-walled water tank remains in the mill, and the present owner of the quarry found one of the original trolleys

used to carry slate along the tramline abandoned above the quarry face. The trolley comprises three wooden beams in a wooden frame with four wheels below. Photographic evidence suggests that the trolley was pushed along by several men rather than a horse being used to pull it.

Below the quarry, where the creek flows, there is some evidence of the management of the water flow with a slate drain present. A slate 'bridge' at the bottom of the slate dump allowed vehicles to cross the creek to where useable slate could be found. Only ten per cent of the Bangor Quarry's slate was suitable for roofing slate which was the main product of the quarry in the twentieth century (Dunstan 2005 pers. comm.) and the waste was available for other uses. One such use of the waste slate was the construction of a powder magazine. This structure was some distance from the Bangor Quarry faces across a gully on an adjoining hillside. The distance was a safety precaution. Like the slate mill, the powder magazine was constructed of slate with walls created using the book-leaf style. The thickness of the walls was probably intended to keep the explosive powder dry and reasonably cool.

The oldest building at Bangor is the pay office which is located above the road leading into the quarry itself. Constructed of slate, with a slate chimney, it directly abuts the hillside. It is likely that it was constructed sometime between 1856 and 1880, when it can be seen in photographs held by the State Library of South Australia. As Messrs Kernick and Cobbedick had a 21-year lease with the option to purchase, it would have been reasonable for them to spend time building a substantial structure as people would be working at the quarry for long periods, and especially as slate for the walls was readily available.

The nature of the slate quarrying process which could be done in the open air and the resale value of the equipment has led to few archaeological features surviving in the landscape. As can be seen at the three Willunga slate quarries discussed the features remaining are those which were associated with the physical modification of the landscape itself, i.e. water management systems, waste slate, the quarry faces themselves, benching and the construction of walls and bridges using slate. Only at Bangor do we find the physical evidence of buildings such as the mill and powder magazine. But as indicated above the landscape of the Willunga quarries is not limited to the industrial landscape layer, it is possible to identify a social landscape at Delabole and in the township of Willunga itself; as a social landscape composed of the world of the quarry workers and owners which forms another interpretive layer itself.

INTERPRETATIVE LAYER 2: A SOCIAL LANDSCAPE

The social landscape of the Willunga slate quarries is comprised of the homes of the quarry workers and owners. A distinctive part of this landscape is the village of Delabole which comprises a series of cottages, a foreman's house and a chapel. The six workman's cottages were erected in 1866 and are located on the hillsides opposite the road leading down to the Delabole quarry faces (*The Observer*, 26 May 1866). Each building is formed by two semi-detached cottages of two rooms each. Two buildings are located on the hillside adjoining the quarry plateau and a third building is on an adjoining hillside across a gully (Fig. 5). They are only accessible by going across the quarry plateau and walking across the steep hillside above the creek.

The first building accessed from the quarry plateau is composed of Cottages A and B (illustrations of the cottages



Fig. 6: Fireplace in Cottage A, Delabole. Photograph by author 2003

discussed below can be found in Piddock and O'Malley (2006). Cottage A has a floor area of 38 sq m (8.1 m by 4.7 m) and Cottage B an area of 36.3 sq m (7.9 m x 4.6 m). The two cottages are separated by a double-faced fireplace which forms the centre of the building. The fireplace is some 2 m in width, and projects 80 cm into the rooms (Fig. 6). The fireplace in Cottage A has a slate mantel supported by slate blocks and is backed with slate (O'Malley 1996:26, 28).

The cottage walls were built on a foundation of slate but were constructed using the *pisè-de-terre* technique where a wooden framework is used to create the walls with the earth being progressively rammed down into the framework. The cottage walls were most likely made from the earth excavated to create the level site on which the cottages sit, and pieces of rock and slate are included in the pise mix. While Pauline O'Malley in 1996 was able to identify the doorways into the cottages and the window placements, by 2004 these were no longer evident. The doorways opened onto the kitchens with their fireplaces. The other room in each cottage is only accessible from inside the cottage itself.

Cottages C and D, to the north of Cottages A and B and slightly lower down on the hillside, are arranged in the same way with similar floor areas (37.6 and 39 sq m respectively) and a central fireplace (O'Malley 1996:29). Slate shelving remains intact inside Cottage D and render is still visible on the walls.

The third building, Cottages E and F, is located on the adjoining hill slope (Fig. 5). When O'Malley visited in 1996 the window and front door apertures still survived. They had slate lintels and the doorway was 1.7 m high. By 2004 significant weathering had occurred, and only the bottom halves of the doorway and walls remained. The cottages had slate foundations and were laid out in the same way as the other cottages. Both cottages were 36 sq m respectively (O'Malley 1996:31).

Cottage E has a slightly different fireplace. Here the timber mantle is made of a tree trunk resting on slate supports. O'Malley noted that the only worked part of the tree trunk faced into the room. The fireplace in Cottage F also has a timber mantel. In this case the tree trunk has been cut in half and the cut side laid on top of the slate supports (O'Malley 1996:31).

Directly in front of Cottages A and B, across a level area, is a slate wall running in a southeast direction for 3.4 m which then turns west for 1.1 m, before turning southeast again for 0.65 m (O'Malley 1996:28). The wall acts as a retaining wall and has a small rectangular cavity which may have been used as an oven (Martin Dunstan 2004 pers. comm.). In front of Cottages C and D is a similar levelled area and a L-shaped slate retaining wall 2.2 m in length. A wall (1.2 m long) also

runs in front of Cottages E and F (O'Malley 1996:30, 31). Arum Lilies and a dog-rose bush near the cottages suggests some attempts to beautify the area and gardens may have been planted on the level areas near some of the cottages.

While *The Observer* only mentions six cottages there may have been other structures, also possibly cottages built later. On the slope below the foreman's house, which was on the opposite hillside from the cottages discussed above, there is part of a *pisè-de-terre* wall lower down the hillside and closer to the creek. There is also a slate wall nearby that may have been associated with this structure.

The foreman's house like the cottages suffered significant deterioration since 1996 when O'Malley recorded it. It originally consisted of an L-shaped room and a second square room. Larger than the cottages at 70.98 sq m, the L-shaped room was divided in two by a double-faced fireplace. The different heights of the mantels indicates the different uses of each fireplace, the western fireplace mantel was 35 cm higher than the eastern one. The doorway was placed on the northwest side of the building, with the kitchen on the left side and the entrance to the bedroom or office on the right side, a short passage gave access to a large rectangular living room (O'Malley 1996:32). The kitchen area had a slate floor. In front of the building slate flagging had been laid, with a slate retaining wall supporting the flagging on the lower slope (O'Malley 1996:32). Pieces of slate laid vertically are also evident near the house. These were used as fences to protect the gardens from rabbits that were once common (Martin Dunstan 2004 pers. comm.). The house was located next to the track into the quarry so no one could enter or leave without the foreman's knowledge. But the building given most prominence was the chapel.

The chapel was located 500 m from the quarry towards the brow of the hill. Its position allowed a view over the village and quarry and across adjoining hills and valleys. When the quarry was in operation the hillsides were denuded of trees, today brush has blocked the view. The chapel was built in 1866 by the quarry workers and was Methodist by denomination, with its lay preacher, William Herring, living in the village (Payton 1987:55).

The chapel is built of slate and a slate retaining wall creates a level area in front of the chapel. The original roof has gone but was likely to have been of slate as well. The substantial nature of the chapel indicates the level of importance placed on religion by those working in the quarry. The chapel represented an investment of money and labour not given to the cottages of the village residents. The land for the chapel was transferred by Sampson Daw to a group of men prominent in the Willunga Wesleyan Methodist community in 1867 (O'Malley 1996:22). Services were held in the chapel and a Sunday school was provided for the children of Delabole. It appears likely that the village was abandoned in 1890 before the closure of the quarry in 1903 and that its residents then moved to Willunga (Dunstan 1998:5).

The village of Delabole provides us with an opportunity to explore the economic and social lives of its residents in public interpretations. Studies such as the one undertaken by Susan Lawrence go beyond the descriptions of the industrial heritage to look at the actual life of the workers and their families (Lawrence 1997:63–64; 2000) offering possibilities for the interpretation of the Delabole landscape even if direct comparison can not be made. It may be possible to draw comparisons from nineteenth-century accounts such as Jenkins (1888) which describe a life where accidents were an ever present danger and life was dominated by work in the quarry.

The village was a community that lived, worked and worshipped together. We know a few of the residents, they include James Jacobs (Martin Dunstan's maternal great-

grandfather), an experienced slate worker. He had travelled from Cornwall to Pennsylvania in America and finally to Willunga in 1864. He and his family moved into the village in 1866 after he found work at the quarry. Jacobs was to stay for ten years receiving five shillings a day as pay. Another resident was William Kean, a slate splitter at the quarry around 1867. His grandson remembers that he lived in No. 2 cottage; however we do not know which one this was. Another resident was William Reed with his wife Eliza (Dunstan 2004). In 1868 about 100 people were accommodated in the village (*The South Australian Register*, 18 July 1868). It is likely that many of these people were children as Joseph and Susan Sibley had 14 children, William and Louisa Herring had 12 children, and James and Sarah Ann Jacobs had 13 children, and although not all may have survived they were still large families (O'Malley 1996:14). Two marriages are known to have occurred in the chapel both in 1873. On 25 May Elizabeth Jane Reed, daughter of William and Eliza Reed who lived in Delabole, married Charles Mansfield, and on 31 July Elizabeth Augusta Toll married James Oliver Sibly. At the time James Sibly's father, Joseph was manager of the Delabole Quarry, and while they lived in Willunga itself the quarry was central to their lives as workers (Dunstan 2004 unpaginated).

One way of interpreting this landscape of the cottages placed so close to the quarry and some distance from the town of Willunga is to see it as a replication of the familiar landscape of Cornwall here in South Australia. As discussed elsewhere it is possible to draw parallels between the placement of the cottages so close to the quarry with the placement of worker's houses in Delabole in Cornwall (Pidcock and O'Malley 2006:373–377). In Delabole, Cornwall in 1841 Thomas Rickard Avery, a quarry owner, built cottages for his workmen on the edge of the quarry, and the villages of Medrose and Pengelly (now collectively called Delabole) grew up as workers built their own accommodation close to their work place (Lorigan 2007:150–153 and Plate 4). Here at Delabole, South Australia, the quarry owners built the cottages and foreman's house adjacent to the quarry faces.

The presence of a Methodist chapel above the cottages strongly echoes Delabole, Cornwall. Methodism came to Delabole (Cornwall) in 1747–1748 and without the presence of a Church of England church found a ready foothold and

several chapels were built including a Bible Christian chapel, a United Free Methodist chapel and the original Methodist chapel (Lorigan 2007:129–138). Lorigan indicates that every aspect of the lives of the Methodist congregations was influenced by Wesley's teaching. Leisure activities were organised and revolved around the chapel and included teas, concerts, lectures and visits to the seaside (Lorigan 2007:132). It is likely that the chapel played a central role in the lives of the Delabole cottagers, and further Methodist chapels were built in the town of Willunga itself including the primitive Methodist chapel, the Wesleyan and Bible Christian chapels (O'Malley 1996:20; Dunstan 1977:55–57). Jenkin (1888:38) indicates that, 'a good many very good local preachers are to be found among the quarrymen belonging to each denomination who preach in the chapels'. This tradition was continued in Delabole by William Herring who lived in the village and was a Wesleyan class leader and lay preacher (Payton 1987:55).

This argument for the re-creation of a familiar landscape is supported by the level of immigration of Cornish people to South Australia; where 'Little Cornwalls' were created at Burra and the copper triangle of Moonta, Kadina and Wallaroo in the north of the state, in the district of Mount Barker and Callington in the Adelaide Hills and in Willunga (Payton 1984:34, 37–38, 70–73). John Jenkin in 1888 noted 'about thirty years ago a small colony emigrated to Australia and they are still working slate quarries near Adelaide, and are doing well' (Jenkin 1888:39). *The Register* of 18 July 1868 reported that the 'highly intelligent' foreman at Delabole, via Willunga, had 20 years experience in the slate industry and before coming to Australia had been employed at Delabole in Cornwall. Of those who lived in the village of Delabole, four men are known to have emigrated from Cornwall: Henry Waters, Simon Sibly, James Jacobs and William Herring (Martin Dunstan 2005 pers. comm.).

If the re-creation of a familiar landscape offers one way to explore the social landscape of the Willunga slate quarries, a comparison of the lives of the quarry workers and owners offers another approach. The Delabole cottages provide a sharp contrast to the two-storied Georgian house of Sampson Daw in the township constructed by George Sara, the leading builder in the district in the late 1850s (National Trust 2006) (Fig. 7). Daw's house and the houses of quarry owners such as



Fig. 7: Sampson Daw's House, Willunga. Photograph by author 2007

Thomas Martin and the cottages of other quarry workers in the town of Willunga, such as those of the Sibly and Arthur families which remain in the township along with the cottages of Delabole, can be used to build a picture of the community. While the life of the quarry workers was probably dominated by work, in Cornwall they worked from 7am to 5.30pm with a half-hour lunch break (Jenkin 1888:37), other activities were available with lectures, concerts and recitals being held at the Oddfellows Hall in the High Street which quarrymen and their families attended (National Trust 2006). Issues of economic and social status could be addressed by looking at these buildings along with community development as part of the interpretation of the social landscape of the slate quarries.

Another aspect of this interpretation is the importance of religion and religious freedom in South Australia. While the cottages were simple rough cottages of effectively mud and stone, the chapel was built of slate transported up the steep track from the quarry by the quarry workers and built by them voluntarily. As Pauline O'Malley (1996:22) notes the construction of the chapel was 'a display of the non-permanence of the earthly contrasting with the permanence of God'. The chapel which today cannot be seen from the quarry and village, because of regrowth of the vegetation, would have been highly visible for the village occupants, particularly as the quarrying activity appears to have denuded the hillsides of timber. Photographs taken by visitors to Delabole in the 1960s clearly show this regrowth is a very recent phenomenon.

For interpretative purposes we need to build pictures of the lives of the quarry workers who are absent from the documentary evidence both in South Australia and in Cornwall (Lorigan 2007:3). The impermanent nature of the cottages and the highly disturbed nature of the site would suggest that little in the way of material culture is likely to remain within the cottage walls. To understand their world we need to look at the structures and transformation of the landscape they left behind.

INTERPRETATIVE LAYER 3: A WIDER LANDSCAPE

The industrial and social landscapes of the Willunga slate quarries detailed above are not the only aspects of the archaeological landscape visible in Willunga. They are in fact a part of a wider landscape that needs to be included in any interpretative analysis for the general public. This wider landscape includes a range of buildings and features where slate was used as a construction material and represents to a degree another economic landscape, where slate is used in a diversity of ways to support other industries such as pastoralism.

Domestic Uses of Slate and Local Economies

Slate roofing tiles were exported from Willunga in the hundreds of thousands but its flexibility as a building material was not limited to roofs. In the Willunga township slate was used for wall construction with walls being created of layered horizontally placed pieces of slate using the book-leaf style wall construction method and echoes similar uses in the slate quarries of Wales and Cornwall. The website <http://www.penmorfa.com/Slate/Remains.htm> for example features slate arches and walls at the Rhosydd Quarry, Wales which operated in the nineteenth century which suggests a common use of slate in this way in slate producing areas. Such walls were used for a dairy and for sheds in the Willunga area. While labour intensive to construct, slate walls were probably inexpensive if the material used were remnants from the cutting of tiles and flagging, the slate waste which covered the

hillsides of the quarries. Other cottages in the town of Willunga were constructed of similar inexpensive materials such 'cob' (straw and mud with some inclusions such as stones) with slate roofs. One such cottage is Spargo's Cottage built in 1855–1856 by Robert Spargo, a quarryman from Cornwall (Lush 2002:1). The cottage remains largely unmodified from its nineteenth-century appearance and has a slate roof and slate water tank. Slate water tanks can be found throughout the area and the Adelaide Hills.

While slate windowsills, slate floors and chimneys can be found throughout the area, one of the most unique buildings in Willunga is Glantawe. Built by Martin Dunstan's grandfather John Dunstan, for his son Basil, owner of the Bangor Slate Quarry in 1925, the house was entirely constructed of slate, including the garage and fences. Large pieces of sheet slate were placed in timber frames to construct the walls, floors and ceilings with red brick used in some areas with decorative slate inclusions.

Surviving in the Willunga township are examples of box drains constructed of slate to control the flow of water from the springs in the hills above. While the construction technology of the box drains is interesting in itself, the analysis and interpretation of these features allow us to tap into wider issues that reflect the reality of water management in the town in the nineteenth century. Faye Lush in her unpublished manuscript 'Spargo's Cottage' stated that Willunga Council was constantly building drains to divert spring and flood waters to and from neighbouring properties leading to many disputes as water was diverted from one property to another. In the interpretation of these features for the public, as discussed below, the story can be directly linked to the slate quarries as one of these disputes was between Grace Spargo, widow of Robert Spargo a quarry worker, and George Sara, a slate merchant who from 1883 was lessee of Bangor Quarry. Grace sought damages from the Willunga Council after they diverted the floodwater passing over her land onto George Sara's land. Water had economic importance as Robert Spargo had used diverted spring water to feed his large vegetable and fruit garden which provided an income when he could not get quarry work (Lush 2002:1–2).

Slate gravestones at the Wesleyan church and cemetery can be linked to the families of quarry workers who worshipped at the church and to George Sara who carved some of the headstones. In the Willunga Slate Trail and Museum pamphlet practicality is shown to triumph over more sensitive feelings when a headstone with a serious mis-spelling was used as floor flagging (National Trust 2006).

Slate was not just used in domestic settings but can be associated with the sheep industry in the Willunga hills. Slate was used to create sheep shelters, sheep-shearing pens, as fence posts (two different styles of fence were identified) and to create dams to supply water for stock. This use of slate echoes the vaccary walls of the Pennies where such fences created enclosed cattle and oxen pastures (<http://www.stoneroof.org.uk/fence.html>). The most readily accessible of these features is the Martin family sheep run constructed from pieces of slate (Fig. 8). Across the road from the run is a slate fence using similar pieces of slate and a slate slab-sided shed. The Martin family home is just a little way down the road forming a small interpretative layer of its own concerning the Martin family which owned the Martin's quarry as well as running sheep in a diversification of the family's business interests. Their story can include information about social status and contrasting lives to that of the quarry workers.

The story of slate is not just limited to the slate quarries, but represents a versatile material that could be employed as a construction material. It is not clear whether the slate used was waste, a by-product of the making of flagging and roofing



Fig. 8: Slate sheep run near Martin family's former house. Photograph by Pam Smith 2005

tiles, which may have been free or purchased at small cost or material purchased at the full price. At Delabole in Cornwall the slate splitters identified three different layers in the blocks removed with one layer being used in particular for mantles and gravestones (Lorigan 2007:45). A similar process may have occurred at the Willunga slate quarries with slate layers used for different purposes. Certainly slate had an economic value beyond that of roofing and flagging for the local community where it was a widely used for diversity of purposes and to support other industries in the local vicinity.

The smaller slate features, such as gravestones and sheep runs, add to the historical picture of the past and form a wider landscape than that centred on the quarries themselves, they allow colour and texture to be added to the story of the industrial process of quarrying slate in the Willunga hills. The quarries and the social landscape of the workers' cottages and quarry owners' houses form an interlinked picture where slate was not just an export item but part of the lives of the residents of Willunga, not just the quarry workers and owners.

INTERPRETATION FOR THE PUBLIC

The preservation of past landscapes such as that identified in the Willunga district rests in the hands of local communities and in the hands of developers. The essential key to maintaining these links with the past is knowledge. It is the older members of the community with a fund of local knowledge which may or may not be recorded in some way, and it is often these people who lead the fight to preserve local heritage. As has been demonstrated in the past in South Australia, and particularly at Delabole, heritage listing in any form is not a protection against the destruction of a place and often the heritage or importance of a building or landscape is not realised until it's too late to protect it. Last minute battles between developers and local communities are often recorded in local papers with only well known sites making it into the main city newspapers. The village of Delabole is listed on the South Australian Register of State Heritage Items but has significantly suffered over the last 40 years and the buildings



Fig. 9: Delabole cottages C and D in September 1967. Photograph by Jim Killick, used with permission



Fig. 10: Photograph showing the same cottages in 2003 on the further hillside. Remains in the foreground are foreman's house. Photograph by author 2003

are rapidly disappearing. This deterioration is most evident at the foreman's cottage. In 1996 it was possible to determine the original room shapes and sizes, in 2004 there were only a few pieces of the walls still standing. This more than anything demonstrates the fragility of the past, particularly at Delabole (see Figs 9 and 10 for a dramatic contrast).

Further problems for the management and protection of sites associated with the slate quarries and the social landscape of Willunga is their location on private land and as such they cannot be readily accessed. They are in a way invisible, both in terms of being physically invisible (the cottages are not visible from the public road that runs above the site) and in the mental landscape of the general public. Without the protection afforded by museum status, inclusion as part of National Trust managed properties or something similar sites such as Delabole are particularly vulnerable. They need to be made visible as this in turn would generate understanding of their significance and therefore interest in their preservation. Because of this 'invisibility' we have to find other ways of bringing the cultural heritage and history of Willunga to a wider audience, notably by creating interest in the wider community not just among children who are most often the ones targeted for structured activities and educational programs. We need to involve their parents and visitors to an area.

A significant step towards this has been undertaken by the Willunga Branch of the National Trust with the opening of the Slate Museum in the police stables near the Courthouse Museum. This small two-roomed museum explores the working of the slate quarries and peoples the past through artefacts and stories (see <http://www.toursouthaustralia.com/willunga/index.html> for some interior pictures). In the past tours were held of the Willunga quarries and they are a good way to provide the public with access to these places. However, as indicated above many sites of interest are on private property and there is the question of public liability if anyone should injure themselves while visiting the quarries and village of Delabole. The publication of the Slate Trail brochure by the National Trust while allowing for self-guided tours faces the same issue of privacy.

One practical solution to this problem is to place interpretative signage nearby the sites on adjacent roads so that people can physically locate the places in the landscape without actually going on to properties, for example at the quarries and Delabole. These signs would need to include photographs and illustrations if they are to have any value if the sites are not accessible. This has been done in Fremantle, Western Australia in an unobtrusive way with metal columns featuring historic photographs as well as textual information placed at sites of interest such as the Fremantle Lunatic Asylum (Fig. 11). Here historic photographs showing the asylum and other buildings from the nineteenth century create a real sense of the past landscape. To have an interpretative value these signs need to include historic and modern photographs and descriptions such as of the quarrying process spread over several adjoining signs. Vertical columns such as those used in Fremantle are less intrusive than rectangular boards.

While hands-on activities are generally seen in connection with children, there is no reason why these activities cannot be aimed at adults and could include slate shaping and splitting by hand. Story evenings are another possibility with different levels aimed at children and adults and can be combined with walking tours where the stories of the town, slate quarries and people can be explored. Costumed tour guides are used to great effect at the Tower of London, England telling stories about the people who lived there, and the idea can easily be adapted to suit local circumstances. The main issue remains funding; at the moment much of the work is being done by volunteers. If the intention of the South Australian government is to develop South Australian cultural tourism it needs to support local developments through funding.

The most effective way to interpret the Willunga landscapes and its stories however may be through the World Wide Web. While this is a tried and tested option, it still has value, particularly for reaching the widest audience in Australia and overseas. Many of the sites about slate quarries overseas including www.penmorfa.com/Slate and www.jgd.org.uk/rotwsi/rotwsimenu.html are essentially static, including photograph galleries and limited information. What is needed is a dynamic site that makes use of modern

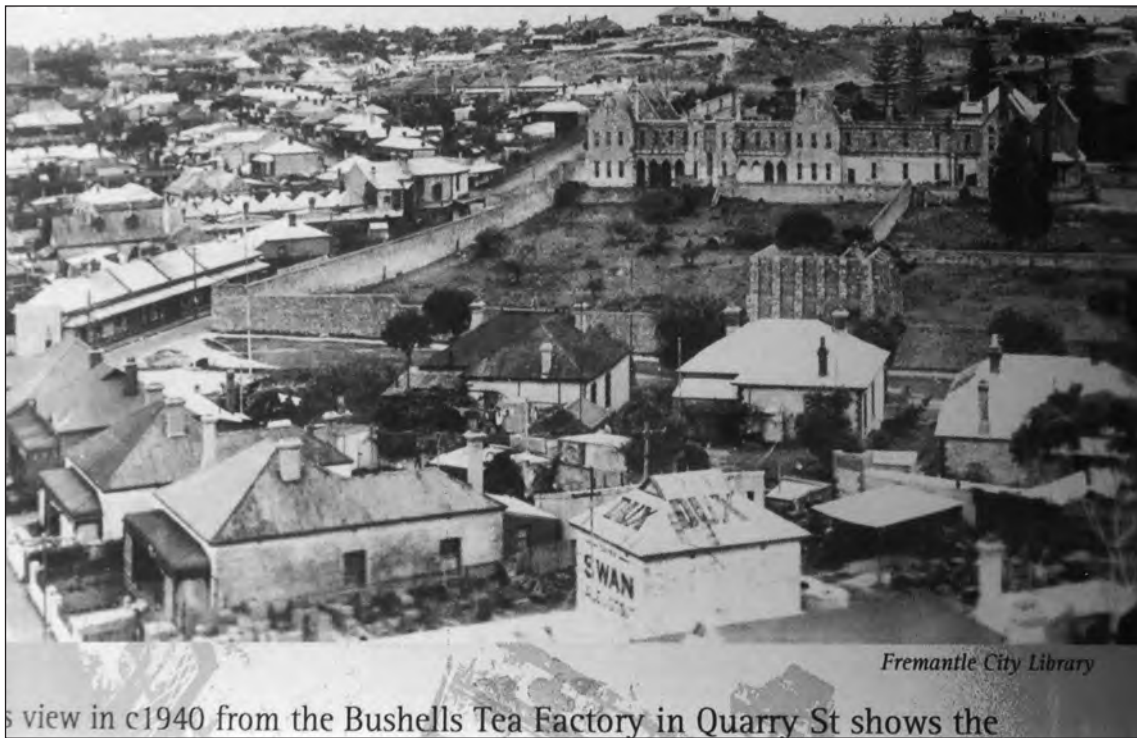


Fig. 11:
 Photographic
 reproduction on the
 sign outside of the
 Fremantle Lunatic
 Asylum, Western
 Australia.
 Photograph by
 author 2006

technological developments to make it more interactive. The use of interactive tours within a website that includes photographs or video footage of sites allows access to sites on private property that are not normally accessible to visitors following the Slate Trail.

Within a website it would be possible to use oral histories, either as voice recordings or as story links, to record memories before they disappear with the passing of those who worked in the slate quarries in the twentieth century. Video footage could also be linked in allowing the techniques of slate dressing to be recorded, for while historical documents are useful, the subtleties of actually watching someone work can make a vast difference to our understanding of the processes involved. In an age of mechanisation and computers traditional skills are rapidly being lost. These traditional skills are not just those of the nineteenth century or further back in time, but skills of our lifetime.

The wealth of historic photographs of quarries such as Bangor, and photographs of the archaeological evidence remaining on the landscape can be combined with information from documentary sources to explore the process of quarrying slate, the dangers of quarrying and how the slate was dressed. While we do not have detailed descriptions of working at the Willunga quarries, nineteenth-century pamphlets from Cornwall, as indicated above, provide extensive details about the quarrying process which can be used to interpret what we have found and know about life here (Jenkins 1888; Turner 1865).

The use of modern technology such as web sites allows us to access the widest possible audience for history and with the increasing use of the Internet by school children and adults for research purposes we have a way of generating a picture of the past that is not limited to features on the landscape that have little meaning unless we know what we are looking at. The layers highlighted above can be used to create stories on the web site. The interpretation of archaeological remains does not need to be limited to site reports and papers, but can be used effectively on the Internet.

The Willunga slate quarries provided an opportunity for

the development of the area as a cultural tourism destination. In Wales in particular former slate quarries have been developed as tourism destinations that offer opportunities to explore the quarries and watch demonstrations of slate splitting and shaping (Edwards and Coit 1996:351). The main difference between Willunga and Wales is the size of the quarries. The Welsh slate quarries were quarried to a much larger extent and tourism has become a way to partially relieve the strain of the quarry closures on the local economies (Edwards and Coit 1996:344). Edwards and Coit in their article 'Mines and Quarries: Industrial Heritage Tourism' have called these sites productive attractions which lie beyond well known economic and tourist circuits (of castles and stately homes for example) (1996: 343, 351). They also often represent large scale 'disfigurement' of the natural landscape. Willunga has several advantages over these Welsh sites. It lies close to the McLaren Vale winery area and as the quarries are relatively small scale much of the beauty of the landscape has been retained. It is also close to Adelaide being a little under an hours drive from the city centre. The main problem, however, is the fact that most of the sites such as the quarries and the Delabole Village are on private property. The organisation of open days with property owners is one possibility; another would be to extend the small courthouse slate museum into a major slate centre with more extensive photographic displays and interpretative displays. However the realities of funding in the modern world make this an unlikely option. The World Wide Web and interpretative signage and story books for adults and children are the best options for exploring the world of the quarries if they are developed by professionals experienced in writing and interpreting for the general public.

CONCLUSION

We have the opportunity to present the story of the Willunga slate industry in a number of ways to the public. As discussed above there are several layers of interpretation that can be used to give the stories coherence using the archaeology as a

foundation. Another approach would be to look at the economic history of the slate quarries which links the history of the quarries and their products to economic changes in the State and locally within the Willunga area.

While roofing slates or flagging may be the most commonly known product of the quarries, the landscape of Willunga demonstrates the diverse use of slate as a practical and readily available building product that could be used for fencing, drains and wall construction as well as rainwater tanks and gravestones. Slate sheep pens allow a link to be created between the quarries and the pastoral industry for example, while slate gravestones and slate buildings such as the dairy can be used as a basis for stories about the local community, about the skills and people within that community, the immigration process that saw migrants bring with them traditions from home.

These approaches then draw together the disparate elements of cultural heritage found at Willunga into a comprehensible story that is likely to be remembered far more readily than a list of individual items in the landscape. Although a lot of the structures have gone we have enough documentary and oral history information to build pictures of what the slate quarry working was like and these can be used in signage and web based sites to interpret and bring to life this layered landscape. Each layer can present different stories which talk about the slate industry and the process of quarrying, and bringing of skills to Australia, of the long hours in the quarry balanced by the roles played by education, entertainment and religion in the life of the workers, of the social hierarchy in Willunga as expressed by housing, and choice to live near the quarry while some quarry workers lived in town, and of the importance of water through disputes over drains. Landscape learning and the cultural 'baggage' brought by migrants to South Australia which saw the recreation of a familiar landscape in the placement of the cottages close to the Delabole Quarry and the centrality of religion to the life of the quarry workers, reflecting that of Delabole in Cornwall, which saw the building of chapels at Delabole and the town of Willunga offer further opportunities for interpretation and exploration of the lives of the quarry owners and workers that should not be ignored.

The aims of the HFZCHP were to identify and document sites of cultural heritage significance and to recommend selected sites as cultural tourism destinations. The Willunga landscapes described above were identified and documented through the project are a significant part of the cultural heritage of South Australia. These landscapes are subtle; while the quarry sites are readily identifiable, other parts of the cultural heritage are more widespread across the landscape. The use of the World Wide Web offers us opportunities to explore this heritage in an accessible way while providing privacy to those property owners where these features are found. The township of Willunga and the surrounding landscape provide a distinctive cultural tourism destination. The possibility to build on the dedicated work of the volunteers of the Willunga National Trust Branch should not be ignored, and such places are important not just too local and state economies but to the protection and preservation of the past. We should be encouraging owners to develop an understanding of the value of the features on their property, to understand the history of their area.

ENDNOTE

1. The author would welcome any communications about the archaeology of slate quarries, especially in Australia. Email: spiddock@ozemail.com.au

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