

Writing Slates and Schooling

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Although slate writing equipment is a common feature of archaeological assemblages from historical sites in Australia, archaeologists have paid these items relatively little attention. The main period of production spanned the period 1770–1900. Thereafter, there were calls to remove slates from the schoolroom because they were regarded as unhygienic. Archaeological evidence indicates, however, that slates persisted in use well into the twentieth century. This paper examines the role of writing slates and pencils in colonial Victoria, their function in education, and their presence beyond the turn of the century. Slates remained in use due to their economy and convenience, the lack of supplies of cheap paper, and the persistence of older models of classroom teaching.

INTRODUCTION

Writing slates and slate pencils were a commonplace item of everyday life in colonial Australia. Fragments are found in large numbers in both urban and rural domestic contexts and provide, along with ink bottles, a key archaeological indicator of literacy and numeracy. Historians and collectors have studied ink pens and graphite (lead) pencils in great detail (e.g. Finlay 1990; Nickell 2000; Petroski 1990; Whalley 1975). Archaeologists, however, rarely venture more about slates than that they show children were practising schoolwork and their parents were preparing shopping lists (e.g. Karskens 1999:162; Lawrence 2000:127). This paper explores the function and significance of slate writing equipment in colonial Victoria, and its persistence into the twentieth century. Evidence from a number of archaeological sites in Victoria reveals that slates were a frequent feature of nineteenth-century deposits. By the turn of the century, there were calls to remove them from classrooms on grounds of hygiene. However, evidence from Henry's Mill, a forest sawmill and settlement in south-west Victoria, indicates that slates continued in use in both domestic and school contexts.

The first part of this paper explores the origins, form and manufacture of slate writing equipment. Although the main period of production spanned the period c.1770–1900, there is evidence that slate products were in use well before and after these dates. It then traces the archaeological occurrence of slates in nineteenth-century Victoria, their role in elementary schooling, and concerns about school hygiene. Archaeological evidence suggests that slates continued in use for many years thereafter. The reasons lie in the economy and convenience of slates, the paucity of cheap paper as an alternative writing medium, and the persistence of nineteenth-century modes of teaching and learning into the first part of the twentieth century.

WRITING SLATES AND PENCILS

Slate is a fine-grained argillaceous [clayey] rock with frequent mica and quartz inclusions, which splits or cleaves readily into thin slabs. Cleavage planes are usually independent of the original bedding and are formed by intense pressure at great depth. Slate occurs in various colours, principally blue, green, purple, grey and black, with the darker slates caused mainly by carbon-based inclusions. Major deposits of slate occur in Wales, Scotland, England, France, southern Germany and the north-eastern United States. In Australia, slate has been quarried in New South Wales around Goulburn and in Tasmania near Launceston (David 1950:376–8). In South

Australia, a substantial slate tile industry developed in the Willunga district from the 1840s (Dunstan, M. 1977; Linn 1991).

Slate has been used in Wales since at least the Roman era, for roofing, flooring and paving. It was popular as a building material because it is weatherproof, durable and easy to work (Lindsay 1974:17–18). Writing slates have also been in use for centuries. In the late fourteenth century, Geoffrey Chaucer wrote in his *Treatise on the Astrolabe* 'Than tok I alle the signes ... and wroot so many signes, degrees, and minutes in my slate' (Chaucer 1894–97 (II): 45). Leonard Digges advised astronomers in his *Pantometria* of the late sixteenth century that 'ye must search Angles of position agayne, and marke them in the table or Slate' (Digges 1591 (I):28). Abraham Cowley's sacred poem of 1651–4, *Davideis*, refers to 'Letters ... painfully engrav'd in thin-wrought Plates, Some cut in wood, some lightlier trac'd on Slates' (Cowley 1969 (II): 716–18). Archaeologically, several slate pencils were recovered from the wreck of the *Batavia*, which was wrecked off the West Australian coast in 1629 (Green 1989:167). Navigators at sea could use slates for calculations of position.

The main era of writing slates, however, appears to begin in the later eighteenth century, when developments in sea and land transport permitted the gradual expansion of slate quarrying in Wales and the growth of a substantial slate workshop industry. Prior to this, most slate pencils came from Europe and were known as 'Dutch Pencils' (Finlay 1990:58; Lindsay 1974:49). Touring Wales in 1778, Thomas Pennant reported that 136 000 writing slates were exported from Port Penrhyn in that year alone (Pennant 1810 (III):87). By 1880 there were five manufacturers of writing slates in the city of Bangor.

Both roofing and writing slates were split by hand. The splitter took a block about three inches thick and tapped a chisel with a mallet against the edge of the block. A crack formed in the direction of cleavage, and slight leverage with the chisel separated the slate from the block. The usual thickness of roofing slate was about $\frac{1}{6}$ to $\frac{1}{4}$ inch (4 to 6.5 mm; Cullen 1990:28; Isherwood 1982:30–4). A writing slate, however, was made from a finer variety of material and was about 2.5 mm thick. Thereafter roofing slates were trimmed to size, often in a hand-operated guillotine. Writing slates, however, required further finishing processes, with sawing, grinding and polishing done with machinery. In addition, holes were sometimes drilled to permit several slates to be bound as a 'book', while parallel lines were also etched in the surface to guide the hand in writing.

Slate pencils were formed by cutting and turning sticks of soft slate, especially from deposits where cross-cleavage

occurred. The cylindrical form of slate pencils was achieved by forcing a length of slate of square section through a series of reducing tubes. The parallel flat facets identified on many slate pencil stubs appear to be a remnant of this production process. A hand-operated machine for this purpose was devised by a Cumbrian, Mr J. Brockbank, in 1811. He was able to produce about 1200 pencils a day, and his success encouraged him to install a water-powered version of his machine (Finlay 1990:58). Slate pencils could also be made by pressing moistened slate powder until it was firm enough to be made into pencils.

The squeak of slate pencils across slate boards made a noise that few care to recall. Nevertheless, slates provided an effective means of committing letters, words and numbers to a surface in temporary form. Pressing the softer slate pencil across the harder surface of the writing slate meant the latter acted as a file, shearing off and catching in its tiny recesses some of the slate pencil, leaving a near-white mark on a dark grey background. Chalk could also be used to mark writing slates.

Slate pencils were available in several forms by the later nineteenth century. Unadorned, pointed grey pencils were typically 5 1/2 inches in length, and came in boxes of a dozen or 100 at a time (e.g. Anthony Hordern and Sons 1897:311). Alternatively, pencils also came with the lower half wrapped in paper printed with geometric designs. Slate pencils could also be encased in cedar wood like lead pencils, with a length of seven inches (e.g. Montgomery Ward 1895:115). Wood-cased slate pencils sometimes featured a small swab of fibres at the end of the pencil for use as an eraser, while metal holders or ferrules were available to allow the pencil to be used and worn down to a short stub (e.g. Iacono 1999:27). Slate pencils could also be impressed with the name of the manufacturer. Two such examples marked 'A.W. Faber' were recovered from the Hyde Park Barracks in Sydney, dating them to the period 1839–1898 (Crook and Murray in prep).

Writing slates were made in several different sizes and formats. Standard sizes included 5 x 7, 6 x 9, 7 x 11 and 8 x 12 inches. The surface could be ruled with lines, divided into squares or left blank. A wooden frame, wire binding, felt strip or ribbon secured the edge of the slate and helped protect fingers from splinters. Wire-bound slates had perforated edges, whereas those fitted into a slotted, mitred wooden frame had bevelled edges (Ellis 2001:76–7). Smaller pocket slates were also available by the later nineteenth century, measuring 3 x 5 inches. There were also slates for music and for use in kindergartens. Slate 'books' consisted of two, three or four boards drilled and bound together with cloth covers. Alternatively, book slates were also made out of thick paper and painted black to look like slate. Gentlemen's pocket books were also popular, beginning in the seventeenth century. Leather pocket books, often stamped with the owner's name, contained one or more thin sheets of slate and an iron-cased slate pencil in a slender pocket provided for the purpose (Finlay 1990:179).

Slate pencil sharpeners were also available, made of chilled iron with a copper finish. The sharpener featured a corrugated groove in which the end of the pencil could be reduced to a tapered point. Pencils could also be made from soapstone, or with a pure aluminium point attached to an enamelled handle, for use with writing slates (Montgomery Ward 1895:115). 'Porcelain slates' were advertised by Lassetter's in 1911. These were used with a lead pencil and cleaned with a damp sponge. American pupils in the later nineteenth century sometimes used glass slates for art instruction (Basbanes 2001:164; Korzenik 1985:194–6). Slate pencils were also widely used by carpenters, masons and other tradesmen for marking a variety of surfaces other than slate.

An important reason for the enduring popularity of writing slates and pencils was their economy and durability. In the mid 1850s in Victoria, Commissioners of the National Board provided schools with writing slates to sell at 1d. each and slate pencils at 4d. per 100 (Blake 1973 (I): 62). More than half a century later, Anthony Hordern and Sons advertised slate pencils in boxes of 100 for 4 1/2d., and 5 x 7 inch writing slates for 2d. (Anthony Hordern and Sons 1911:201). Larger slates, 8 x 12 inches, cost 3 1/2d. each. In contrast, basic graphite (lead) pencils cost 4d. per dozen by the turn of the century, nearly eight times as much as slate pencils. The cost of paper was extra. Lead pencils had become a major industry by the mid-nineteenth century, especially in Germany, and by 1912 world production had reached two billion (Petroski 1990:205). It is uncertain which kind of pencil lasted longer in use, but in the school, home and office, slate pencils offered a substantially cheaper alternative.

Paper in Australia, especially writing quality paper, was a valuable commodity throughout this period, one to be used with care. Large quantities could not be provided to schools for pupils to practice their work, with the result that slates were used instead. Paper was first manufactured mechanically in Australia at a mill near Sydney in 1818, but the enterprise soon collapsed. It was not until the 1860s that substantial commercial production began again. In Sydney, a mill came into operation on the Georges River near Liverpool in 1867, while in Melbourne a mill on the south bank of the Yarra River below Princes Bridge began in May 1868 (Linge 1979:197, 425; Sinclair 1990:11–17). Another paper mill was established at Geelong in the late 1870s. Mills used linen and cotton rags, recycled paper and imported pulp to produce paper, including newspaper sheets and strong brown wrapping paper. Throughout the nineteenth century, however, a great variety and quantity of printing and writing paper continued to be imported into the Australian colonies.

Expansion of the industry to meet local demand required wood pulp. The technology of transforming trees into paper was first developed in Germany in the 1840s and transferred to the United States in the 1860s. The Pagenstecher brothers imported machinery to Massachusetts in 1867 that shredded logs to pulp by forcing their ends against a revolving water-cooled grinding stone. Rag fibre was initially added to give extra strength. The price of newsprint paper quickly fell, from 25 cents per pound in the early 1860s to less than two cents in 1897 (Hunter 1957:380). Wood as a raw material dramatically transformed the paper and newspaper industries in the U.S., and provided a material that conserved the supply of rags for the making of fine papers.

In Australia, the installation of rotary presses by the major metropolitan newspapers in the 1860s and 1870s meant they had to use imported newsprint to maintain production. By 1914, 100 000 tons of paper were imported into the Commonwealth, at a cost of £1 million per year (Shakespeare 1918; Trivett 1914:341). Ten years later, annual costs had risen to more than £5 million (Education Department 1924). The war years brought interruptions to imported paper supplies, and added urgency to the search for local sources. Eucalypts were the obvious answer, and during the 1920s and 1930s the Council for Scientific and Industrial Research began testing species and techniques to convert eucalypt logs into wood pulp. It was not until 1936, however, that paper began to be produced on a commercial scale at Burnie in Tasmania, in 1940 at Maryvale, Victoria, and at Millicent in South Australia in 1941. The Second World War again disrupted the supply of imported paper, enabling the new mills to sell everything they could produce, regardless of its quality (Dargavel 1995:41–2; Moulds 1991:72–5; Watson and Cohen 1969). As wartime

restrictions eased in the late 1940s and 1950s, paper became much more widely available, and slates began to disappear from the classroom.

ARCHAEOLOGY OF WRITING SLATES

Writing slates and pencils are archaeologically commonplace for several reasons. They were manufactured on a relatively large scale, were sold very cheaply and they were used widely in domestic and educational contexts. Slate pencils also broke easily, and their narrow profile meant that fragments often fell beneath the floor. They were typically discarded once worn beyond a useable length, and are very stable upon entering the archaeological record.

Adrienne Ellis has described the archaeology of childhood in Victoria by analysing the frequency of child-specific artefacts recovered from a number of terrestrial and maritime sites (Ellis 2001). Her analysis reveals that slate pencils were a frequent component of excavated assemblages from the nineteenth century. Table 1 presents a summary of slate artefacts recovered from both urban sites (300 Queen Street, Cohen Place, 118 Franklin Street) and rural sites (Corinella, Dolly's Creek, Viewbank) in Victoria, as well as two shipwrecks (Figure 1). In addition, recent investigation at Casselden Place in Melbourne during 2002 yielded 369 slate pencil fragments and four pieces of writing slate (Godden Mackay Logan 2004).

There have been very few schools formally excavated by archaeologists in Victoria. However, re-development in 2002 of the College of Surgeons site in Spring Street, Melbourne, revealed the remains of the National Model and Training School (Clark and Associates 2003). The school opened in 1854 as both a training establishment for teachers and a model school for the colony. It continued to provide education to pupils until it was demolished in the early 1930s. Most artefacts were recovered during excavation of a thick fill deposit relating to this demolition. Analysis identified 182 slate pencil fragments and 72 fragments of writing slate. These were recovered from contexts distributed across the site.

Apart from the College of Surgeons site, evidence for slate writing equipment derives mostly from domestic contexts. Classroom practice of the period normally involved school monitors distributing writing slates at the start of each lesson and collecting them again at the end for storage in a cupboard. Pencils, however, were small enough to be slipped into a pocket and taken home. Many of the pencil fragments recovered archaeologically may have derived from this practice. This may also explain the apparent paucity of writing slates identified at domestic sites in Victoria. Alternatively, the discrepancy may relate to the difficulty in distinguishing fragments of writing slate from slate roofing tiles. Nevertheless, it is clear that slate writing equipment was lost or discarded in substantial quantities within Victorian domestic contexts in the nineteenth century.

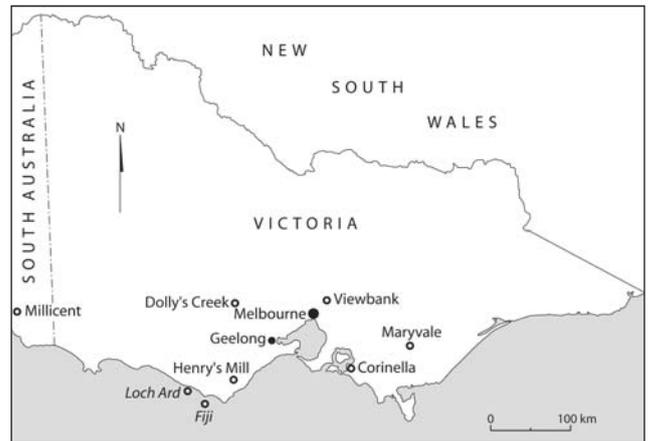


Fig. 1: Map of Victoria showing location of sites mentioned in text.

SCHOOLING AND SLATES

Elementary schooling in Victoria in the mid-nineteenth century consisted of a mix of private denominational and publicly funded common schools. Poorly qualified teachers instructed irregular numbers of pupils, often with very limited supplies of classroom equipment. James Bonwick recorded that tent schools on the goldfields had only a few books, 'but at such an extravagant price that the parents would not buy them ... even the common little slates were half-a-crown [2s. 6d.] apiece' (Bonwick c1862:33). School attendance was often disrupted by family moves to new goldfields. In 1862, 'ragged' schools were founded in Melbourne for urban children whose parents could not afford the fees, and these had enrolled over 1000 children by the end of the decade (Kociumbas 1997:104). There were fewer educational opportunities in rural areas, with teachers, and the funding to employ them, hard to come by.

Political and economic changes over this period leant greater urgency to improving literacy and numeracy of working people. New technologies, increasing British capital and urbanisation required a more educated, better skilled workforce. Universal education also served to counter the 'threat' of trade unionism and international socialism heard more and more in the factory, shearing shed and street. School activities were to teach greater discipline and submission to authority. State education was thus overhauled in all Australian colonies in the 1870s and 1880s, gradually introducing compulsory, full-time attendance (Kociumbas 1997:119).

In Victoria, the *Education Act* of 1872 meant that schooling was to be free, secular and compulsory, with children attending between the ages of six and 15. Minimum attendance was 120 days a year, increased to 160 days by 1890. Teachers in the nineteenth century were on a fixed

Table 1: Slate writing equipment recorded at Victorian archaeological sites (source: Ellis 2001:31–46).

	Occupation dates	Slate pencils		Writing slates	
		fragments	MNI	fragments	MNI
300 Queen St	1849-c.1860	2	2		
Cohen Place	c.1854-1923	91	67	3	2
118 Franklin St	c.1872-1900	17	12		
Corinella	c.1872-1920s	5	5		
Dolly's Creek	c.1857-1888	11	11	15	5
Viewbank	c.1844-1875	21	16		
Loch Ard	1878	3	3		
Fiji	1891	6	3		

salary which increased according to how many pupils passed examination. This 'payment by results' system was dismantled in 1906 (Blake 1973 (I):322). Nevertheless, a formal and restrictive teaching syllabus remained, setting out what was to be taught on a month by month basis. There was a heavy emphasis on repetition and rote learning in the classroom of this era. Words and letters had to be copied, laboriously and exactly, over and over. History and geography consisted largely of the memorization of dates, capes and bays. The daily routine focused on the three Rs, with severe discipline crushing individual initiative and expression. Every child was regarded as capable of learning the work if only he tried hard enough. Pupils would normally spend six to eight years in primary school, without ever having the opportunity to compose an original expression (Blake 1973 (I):295).

Slates were generally only used by school children in the most junior grades. Arthur Orlebar reported in 1862 that 'Slate Writing has become ... an almost universal preliminary to paper writing' (Orlebar 1862:5). Teachers introduced pupils to slate writing at the same time as they began to read, thus learning to shape the letters as they grasped their sounds and meaning. Alternating broad and narrow lines scored across the slate helped guide the hands of young pupils learning to copy and shape their letters from models on the blackboard. The lines matched blackboards ruled for writing instruction into copybooks, where the body of each letter was formed between the narrow lines and the top and tail of letters extended above and below. The reverse side of slate boards was typically used for arithmetic, as well as for drawing. Blake notes that even by 1870 such an approach to handwriting was regarded as 'old-fashioned' (Blake 1973 (I):110). It was also argued that poor writing standards often derived from the bad example set by teachers and monitors. By Class III, however, school children in Victoria had normally passed beyond the need for slates in shaping letters and used ink and copybooks instead. Writing slates continued to be used for arithmetic exercises (Blake 1973 (I): 292; Dean 1890–91:96; Horn 1989 6–7).

Prior to the advent of school desks with built-in table tops, slates had to be balanced awkwardly across the knees and cradled with one arm. The narrow profile of slate pencils, however, meant they were a poor mechanism for allowing pupils, at six and seven years of age, to learn to write. While lead pencils were generally $\frac{1}{4}$ inch (6.5 mm) thick, slate pencils were often narrower, about 4.5–5 mm thick. With less developed motor skills, young children were less able to maintain the necessary control over a slate pencil, while grasping the board with the other hand, and form letters with the degree of care usually demanded by handwriting systems of this period. Small fingers were also more likely to drop slate pencils and lose them through cracks in the floor. To avoid this, a small hole could be drilled through the wooden frame and the pencil attached with a length of string.

By the late nineteenth century, writing slates and slate pencils were beginning to be regarded as unhygienic and pressure mounted to remove them from the classroom. As pupils so often neglected to bring a cloth with which to clean their slates, the easiest method was to spit on the surface and wipe it with a sleeve. Parents objected because clothes wore out more quickly. Some slates became so greasy it was impossible to mark them, so they had to be taken home and scrubbed. The practice of a school monitor collecting school slates at the end of the day and redistributing them the next meant that any infection on the slate surface was soon spread around. Pupils also put slate pencils into their mouths. In 1909, a School Medical Officer in Bournemouth succeeded in cultivating the diphtheria bacillus from the slate pencils belonging to a class (Slate Trade Gazette 1909).

Attempts to remove slates from schools and improve

hygiene were part of the wider public health movement of the era. Building on the germ theory of disease developed by Pasteur, Koch and others in the 1860s and 1870s, health authorities began to improve water supply, street drainage, rubbish collection and sewage systems. Most of these measures began to be implemented in Australian cities by the later nineteenth century (Dingle and Rasmussen 1991; Dunstan, D. 1984:121–51; Wong 1999). Government schools functioned as part of the state, and genuine efforts were made to reform sanitary measures in education. Regular inspections and adequate cleaning of classrooms, along with appropriate lighting, ventilation and heating, and fly-proofing of the toilets, were all recommended to improve health standards in schools. The use of a common drinking cup and school towel ceased, recognised as potent sources of infection. The cleaning of slates by spitting on them and wiping with a sleeve was no longer allowed, at least in theory. Talks on health, correct posture, public behaviour and, for older children, the parts of the body, were all recommended.

Apart from the potential for infection, however, there was also recognition that slates could be beneficial. Some authorities were concerned about the effect of prolonged exposure to paper on children's eyesight. It was believed that continuous use of indistinct lead pencil marks on a bright white background would weaken and harm the eyes. Slate writing was thus regarded as more benign.

Historians have suggested that the use of slates in schools was in decline by the 1890s (e.g. Barcan 1988:158). By the turn of the century in England, the Board of Education was also discouraging the use of writing slates in school on grounds of hygiene (Lindsay 1974:258). However, slates appear in retail catalogues until the beginning of the First World War, and Paul Wielandy recorded that wood-cased slate pencils were still available in the United States in the early 1930s (Wielandy 1933:91). Archaeological evidence from Henry's Mill also indicates that writing slates and pencils continued to be used well into the twentieth century. The following section describes the slate writing equipment recovered from the mill, and the context within which slates persisted in use during this period.

HENRY'S MILL

Henry's Mill was established in 1904, deep in the Otway Ranges of south-west Victoria. The isolation of the site meant that around 100 people lived permanently on site. The settlement featured small timber huts for single men and wooden houses for married men and their families, along with a store, boarding house and post office. A school opened in 1909, nestled close among the family houses, to cater for the growing number of children at the mill. The schoolroom was 26 feet long and 13 feet wide (8 m x 4 m), adequate for the initial enrolment of 16 pupils, but much too small for the 38 children crammed in by 1923. In 1927 the mill was destroyed by fire and the site was gradually abandoned (Davies 2001; 2002; in press).

Houses at the mill were leased to a succession of short-term working tenants over a period of more than 20 years. Debris from each house thus represents the conflation of multiple episodes of occupation. The remains of three houses at the mill were excavated in 1998, each within a 5 m x 5 m trench, to a maximum depth of 20 cm. The main structural features identified were fireplaces and oven settings. A large amount of domestic material was recovered. This included at least 30 slate pencils, one graphite pencil core, fragments of four writing slates and two glass ink bottles (Table 2). Slate pencil fragments varied in length from 17 mm to 62 mm, with individual pencils identified by a worn point at one end. Two

Table 2: Slate writing equipment recovered from Henry's Mill (Davies 2001:89–90).

	House A		House B		Dump C		House E	
	<i>fragments</i>	<i>MNI</i>	<i>fragments</i>	<i>MNI</i>	<i>fragments</i>	<i>MNI</i>	<i>fragments</i>	<i>MNI</i>
Slate pencil	35	17	14	11			3	2
Lead pencil	1	1						
Writing slate	6	2	4	1	1	1		
Ink bottle	2	2						

examples from House A showed evidence of wear at both ends, suggesting reuse after one end was broken or became blunt through use. One example was brown in colour, where all the others were grey.

Evidence for slate writing equipment was widely distributed across the site. Much of the material from House A came from deposits that securely post-date 1913, reinforcing the persistence of slates during this period (Davies 2001: 50–2). The presence of two ink bottles in House A also implies the use of dip pens and paper, and at least some literary activity. One slate from House A and one from Dump C had parallel lines etched on both obverse and reverse surfaces (Figure 2).

The largest proportion of toy fragments was recovered from House B, consisting mostly of marbles and fragments of tea sets and dolls' heads. This weakens the correlation between slates, toys and children, and suggests that parents may have used slates for their own writing needs as well. The recovery of slates from domestic contexts at Henry's Mill also suggests that these items were being brought home from school, a distance of only a few metres in some cases. Despite the presence of slates and the isolation of the site, however, there is no evidence for home schooling at the mill. Given the relatively small scale of excavation, a significant quantity of slate material was recovered from the site, especially in the period of their supposed decline. It is possible that the use of slates lingered on in remote rural areas, when they had already been replaced in metropolitan contexts.

Writing slates and pencils thus continued in use well into the twentieth century, despite calls to remove them as unhygienic. This relates to the economy of slates, the availability of paper, and the persistence of older teaching methods. Advertisements in the catalogue of Anthony Hordern

and Sons for 1911 indicate that the cost of slate writing equipment was only a little higher than it had been half a century earlier. Slates were thus a cheap option for use in the home, school and office. Writing slates could also be used again and again, unlike paper, which was essentially restricted to a single use.

CONCLUSION

It was widely argued from the late nineteenth century that slate writing equipment was unhygienic. Children sucking on the ends and spitting on the boards, and having these circulate around the classroom, was held, probably correctly, to promote the spread of infection. On the other hand, writing slates were at least non-absorbent and thus readily cleaned and disinfected, and their use continued into the 1920s and 1930s. Slate pencils persisted because they were considerably cheaper than lead pencils, and writing slates were highly durable. Frequent losses of small slate pencils, evident in their frequent archaeological recovery from sites like Henry's Mill, were compensated for by their ready availability and economy of purchase. Slates also had the advantage over paper and ink of being erasable and reusable.

Although new subjects, such as nature study and domestic science, were introduced into the curriculum soon after 1900, the older emphases on discipline and rote learning remained a firm fixture in the classroom. Slates were also an entrenched feature of classroom furniture and traditional teaching methods. Pupils inscribed their exercises on a slate, had the work checked by the teacher, and then rubbed it off for the next lesson. Portable and durable, slates were popular for so long because they were convenient, especially in teaching the youngest pupils the rudiments of language and arithmetic. Slates also endured because large quantities of paper were not readily available for use in Australian classrooms. The mass production of paper from eucalypt pulp which began in the 1940s thus had a significant impact on schooling. It allowed paper to be used on a much larger scale than ever before, and contributed to the replacement of slates. In spite of this, slates disappeared only slowly from the Australian classroom in the years following the Second World War. They were still used, for example, in some Queensland schools at the beginning of the 1960s. Elsewhere they continued in use beyond even this. In India, for example, writing slates and pencils were still being manufactured and sold in the 1990s (Fulekar and Khan 1995).

The education received by children in rural districts of Australia was often limited by the demands of household chores and distance, as well as by boredom and teaching methods of the day. Illness and frequent family moves also undermined the effectiveness of elementary education. Rote learning was common, and pupils rarely had the opportunity to engage critically with the learning process. The youngest pupils struggled to manipulate slate writing equipment with the dexterity often required by handwriting systems of the period. Many left school with only the most basic skills in

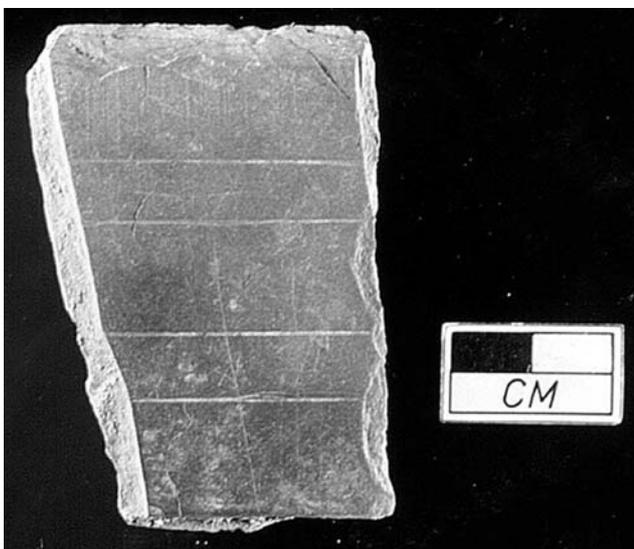


Fig. 2: Fragment of writing slate from House A, Henry's Mill (photo A. Ellis).

literacy and numeracy. Nevertheless, slates provided a medium of expression when few practical classroom alternatives were available. Their archaeological visibility opens a small window on education practices in Australia of the era.

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BIBLIOGRAPHY

- BARCAN, A. 1988. *Two Centuries of Education in New South Wales*, UNSW Press, Kensington, NSW.
- BASBANES, N. 2001. *Patience and Fortitude*, Harper-Collins, New York.
- BLAKE, L.J. 1973. *Vision and Realisation: A Centenary History of State Education in Victoria*, 3 volumes, Education Department of Victoria, Melbourne.
- BONWICK, J. c1862. *Rides Out and About: Rambles of an Australian School Inspector*, The Religious Tract Society, London.
- CHAUCER, G. 1894–1897. *The Complete Works of Geoffrey Chaucer*, W. W. Skeat (ed.), Clarendon Press, Oxford.
- CLARK, V. and ASSOCIATES 2003. Archaeological Investigations at the Royal Australasian College of Surgeons: The Site of the former 'National Model and Training School' Melbourne, report prepared for Atkinson Project Management and The Royal Australasian College of Surgeons, Essendon, Vic.
- COWLEY, A. 1969. *The Complete Works in Verse and Prose*, A. B. Grosart (ed), 2 volumes, Georg Olms Verlagsbuchhandlung, Hildesheim.
- CROOK, P. and T. MURRAY in prep *The Historical Archaeology of the Hyde Park Barracks*, Sydney, Historic Houses Trust of NSW, Sydney.
- CULLEN, M. 1990. *Slate Roofing in Canada*, Environment Canada, Ottawa.
- DANIELS, J. 1989. *Early Schooling in Victoria 1900–1920*, Pioneer Settlement Press, Swan Hill, Vic.
- DARGAVEL, J. 1995. *Fashioning Australia's Forests*, Oxford University Press, Melbourne.
- DAVID, T.W. EDGEWORTH 1950. *The Geology of the Commonwealth of Australia*, 3 volumes, Edward Arnold and Co, London.
- DAVIES, P. 2001. Isolation and Integration: The Archaeology and History of an Otways Forest Community, PhD thesis, La Trobe University, Melbourne.
- DAVIES, P. 2002. "A Little World Apart...": Domestic Consumption at a Victorian Forest Sawmill', *Australasian Historical Archaeology* 20:58–66.
- DAVIES, P. in press 'Space and Structure at an Australian Timber Camp', *Historical Archaeology* 39 (4):51–64.
- DEAN, A. 1890–91. Report of Alfred Dean, Shepparton District, Report of the *Minister of Public Instruction*, Government Printer, Melbourne.
- DIGGES, L. 1591. *A geometrical Practical Treatize Named Pantometria, divided into three Bookes, Longimetra, Planimetra, and Stereometria ...*, Abell Jeffes, London.
- DINGLE, T. and C. RASMUSSEN 1991. *Vital Connections: Melbourne and its Board of Works 1891–1991*, McPhee Gribble, Ringwood, Vic.
- DUNSTAN, D. 1984. *Governing the Metropolis: Politics, Technology and Social Change in A Victorian City, Melbourne 1850–1891*, Melbourne University Press, Melbourne.
- DUNSTAN, M. 1977. *Willunga Town and District, 1837–1975*, 4 volumes, Lynton Publications, Blackwood, SA.
- EDUCATION DEPARTMENT 1924. *Victorian Education Gazette and Teachers' Aid* 20 May 1924.
- ELLIS, A. 2001. Toy Stories: Interpreting Childhood from the Victorian Archaeological Record, BA (Hons) thesis, La Trobe University, Melbourne.
- FINLAY, M. 1990. *Western Writing Implements in the Age of the Quill Pen*, Plains Books, Carlisle, Cumbria.
- FULEKAR, M.H. and M.M. ALAM KHAN 1995. 'Occupational exposure to dust in slate pencil manufacture', *The Annals of Occupational Hygiene* 39 (1):107–14.
- GODDEN MACKAY LOGAN, LA TROBE UNIVERSITY and AUSTRAL ARCHAEOLOGY 2004. *Casselden Place (50 Lonsdale Street, Melbourne) Archaeological Excavations Archive Report*, report prepared for ISPT and Heritage Victoria (December 2004), artefact catalogue.
- GREEN, J. 1989. *The loss of the Verenigde Oostindische Compagnie retourship BATAVIA, Western Australia (1629)*, BAR International Series 489.
- ANTHONY HORDERN AND SONS 1897. General Catalogue, Anthony Hordern and Sons, Sydney.
- HORN, P. 1989. *The Victorian and Edwardian Schoolchild*, Alan Sutton, Gloucester.
- HUNTER, D. 1957. *Papermaking: The History and Technique of an Ancient Craft*, 2nd edition, Alfred A. Knopf, New York.
- IACONO, N. 1999. Miscellaneous Artefacts Report, *The Cumberland/Gloucester Streets Site, The Rocks Archaeological Investigation Report*, Godden Mackay Heritage Consultants, Redfern, NSW, vol.4, part II, pp. 11–118.
- ISHERWOOD, G. 1982. *Cwmorthin Slate Quarry*, Merioneth Field Study Press, Kings, Dolgellau.
- KARSKENS, G. 1999. *Inside the Rocks: The Archaeology of a Neighbourhood*, Hale & Iremonger, Sydney.
- KOCIUMBAS, J. 1997. *Australian Childhood: A History*, Allen & Unwin, St Leonards, NSW.
- KORZENIK, D. 1985. *Drawn to Art: A Nineteenth-Century American Dream*, University Press of New England, Hanover and London.
- LASSETTER 1911. Lassetter's Commercial Review No.26, partial facsimile reprinted as *Australia in the Good Old Days*, Ure Smith, Sydney.
- LAWRENCE, S. 2000. *Dolly's Creek: An Archaeology of a Victorian Goldfields Community*, Melbourne University Press, Melbourne.
- LINDSAY, J. 1974. *A History of the North Wales Slate Industry*, David and Charles, Newton Abbot, Devon.
- LINGE, G.J.R. 1979. *Industrial Awakening: A Geography of Australian Manufacturing 1788 to 1890*, Australian National University Press, Canberra.
- LINN, R. 1991. *Cradle of Adversity: A history of the Willunga District*, Historical Consultants, Blackwood, SA.

- MONTGOMERY WARD & CO 1895. *Catalogue and Buyers' Guide*, No. 57 Spring and Summer, facsimile edition 1969, Dover Publications Inc, New York.
- MOULDS, F.R. 1991. *The Dynamic Forest*, Lynedoch Publications, Melbourne.
- NICKELL, J. 2000. *Pen, ink and evidence: a study of writing and writing materials for the penman, collector and document detective*, Oak Knoll Press, New Castle, Delaware.
- ORLEBAR, A.B. 1862. *Models for Slate Writing in Elementary Schools, With Suggestions for their Use*, F.F. Bailliere, Melbourne.
- PENNANT, T. 1810. *Tours in Wales*, 3 volumes, printed for Wilkie and Robinson, etc., London.
- PETROSKI, H. 1990. *The Pencil: A History of Design and Circumstance*, Alfred A Knopf, New York.
- SHAKESPEARE, T.M. 1918. 'Paper-Making in Australia', *The Birregurra Times* 9 July 1918.
- SINCLAIR, E.K. 1990. *The Spreading Tree: A History of APM and AMCOR 1844–1989*, Allen & Unwin, Sydney.
- SLATE TRADE GAZETTE 1909 cited www.ilechicymru.info/slatesinschools.english.htm, accessed 15 December 2004.
- TRIVETT, J.B. 1914. *The Official Year Book of New South Wales*, Government of New South Wales, Sydney.
- WATSON, A.J. and W.E. COHEN 1969. 'Pulping of Eucalypts – An Historical Survey', *Appita* 22 (4): xvii–xxx.
- WHALLEY, J.I. 1975. *Writing implements and Accessories: From the Roman Stylus to the Typewriter*, Gale Research Company, Detroit.
- WIELANDY, P.J. 1933. *The Romance of an Industry: A Retrospective Review of the Book and Stationery Business*, Blackwell, Wielandy, St. Louis.
- WONG, A. 1999. 'Colonial Sanitation, Urban Planning and Social Reform in Sydney, New South Wales 1788–1857', *Australasian Historical Archaeology* 17:58–69.