Comments

on the artefacts for display at the

FREMANTLE PRISON TUNNELS, FREMANTLE, WA

for

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14 MARCH 2005

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INTRODUCTION

This document is a supplement to the report by Samantha Bolton (February 2005) to the Prison and is intended to answer additional questions raised during a on-site meeting on Thursday 24 February (9.15-10.30 am) by Sandra Murray regarding artefacts intended for display at the Fremantle Prison tunnel.

DISCUSSION

Firstly, I have had little success finding out more about metal axe heads nor metal buckets. The metal buckets should be studied for evidence of breakage and modification as seen in several buckets. I have also had no luck with the bolts and timber, although I imagine that the metal indicate type of manufacture and thus indirectly age (such as hand wrought manufacture). The size of the beams may be determined if the bolt is still set at the width of the beams.

As discussed, I think a research project on the tunnels may assist with an understanding of what the little niches were for, and on a related matter, how the tunnels were originally lit.

I include some information below about:

- Glass bottles
- Clay pipes (for FP-118)
- Enamelled wares (for context to enamel cup)
- Unidentified twisted metal items (metal artefacts 01559, 01561 and 00560)

If you need more material or references for sources please tell me.

Alistair

Glass bottles

Archaeological material are differentiated and interpreted through the identification of diagnostic attributes. In historical archaeology artefacts are commonly considered in terms of function (e.g., a clay pipe for smoking) and chronology (e.g., a clay pipe made by Thomas White and Co. between 1825 and 1870). Similarly, archaeologists rely on glass artefacts for different interpretive purposes, such as, to infer site chronology, the nature and length of site occupation, and the evidence for consumption patterns and for trade. As part of a research design archaeologists often spend a great deal of time describing and analysing the glass artefacts.

What attributes are used for determining method of manufacture, period of manufacture, and use? The key attributes are colour and evidence for manufacturing technique; however other useful attributes are evidence of information about the maker of the bottles or its original contents, and bottle shape that may also indicate its original use (for example, Dutch case gin bottles, milk bottles, and salad oil bottles all have distinctive shapes).

Most dating techniques for bottle glass are related to changes in manufacturing techniques over time. The main attributes used in glass artefacts are:

- Colour
- Evidence for manufacturing (presence/absence of certain attributes)
- Type of finish (how the bottle was sealed)
- Evidence for maker's marks (these can describe the manufacturer of the container, or the contents)

Remember that the earliest date of manufacture may not actually be the date the deposit was formed; although this is not relevant for Fremantle Prison Tunnels as the artefacts were not recorded using archaeological techniques and are thus 'out of context'. For example, there may be a "manufacturing lag" between the time a bottle was made, filled, imported to the site (probably from Europe or eastern Australia by sea), sold, and used. Even after use a bottle may be re-used for an extended period of time. In fact, you would expect conservation of items in a prison.

Using the assemblage from the Fremantle Prison described in Samantha Bolton's report as a basis, the following information may prove useful for signage. In the tables presented here greyed out areas indicate that these attributes were present at in the collection.

Parts of the bottle

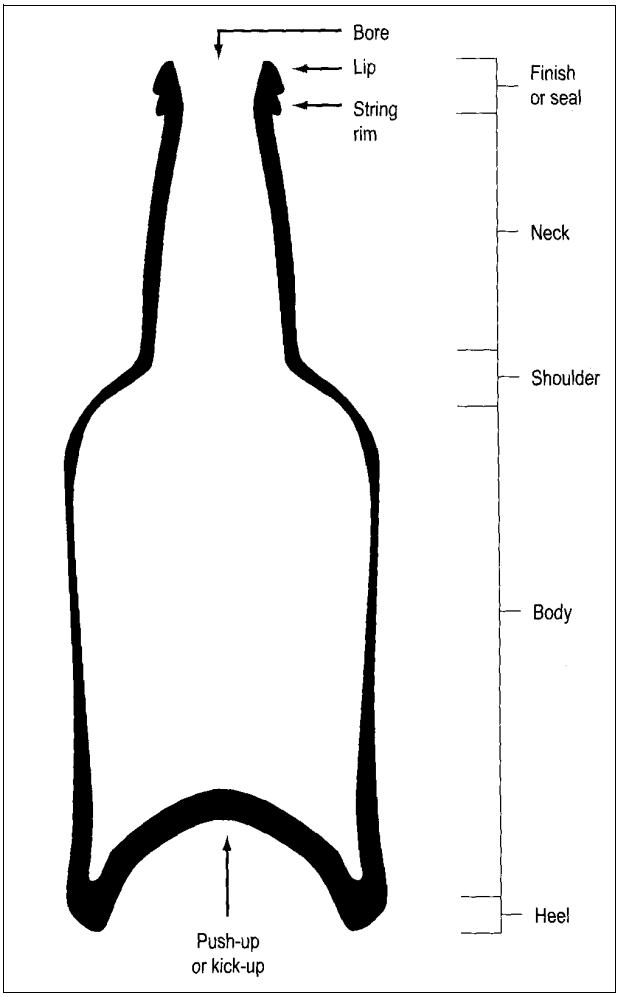


Figure 1. Parts of a bottle (from Burke and Smith 2004 Figure 6.8 p.187)

GLASS ATTRIBUTES

Colour

Olive-dark	Dark olive or black glass (1830-1870). Looks black when on the ground but the actual colour can be seen when held against a strong light; usually pre-1890 for alcohol bottles (as suggested by the Bitters bottles, FP-18, FP-19, FP-20 and FP-21).
Olive	Lighter olive colour, normally for alcohol (for example, the Brandy bottle marked '6 to a gallon'—FP-22). There are also olive bitters bottles (FP-18, FP-19, FP-20 and FP-21).
Tinted	Any glass that is clear overall, but has some colour (20 examples in collection). It may have a hint of colour that is only seen from the side, or it may be darker.
Amethyst	Specifically refers to glass that is purple in colour; c.1890-1916.
Colourless	Has absolutely no colour whatsoever; nearly always modern (20th C) as for 25 examples in the collection
Amber	Dark brown glass usually used for beer bottles (one example, FP-49); 19th century –

	modern. Used for small medicinal-type bottles or for foods (as indicated by BONOX inscriptions on FP-09 and FP-10, and possibly the screw finish for FP-90)
Blue	Cobalt blue colour, usually used for medicine bottles; 19th century – modern (post 1845)

Evidence for manufacturing technique

The attributes that may prove useful for determine manufacturing technique relate to the general trend in the 19th century to move from hand-blown bottles (asymmetrical in form), to semi-mould made bottles (with the parts of the bottle below the finish made in a mould of some form, with the closure being applied separately while molten), to—in the 20th century—bottles fully made in moulds (as indicated by seams running from the body through to the top of the finish). Those bottles with panelled sides are made in moulds of some kind, as are any with any form of embossed writing.

There are several good sources for glass bottles, although the figures used here largely derive from Burke and Smith (2004) who summarise earlier work (Boow 1991, Jones and Sullivan 1989, Jones 1979, Smith 1987, Tasker 1989).

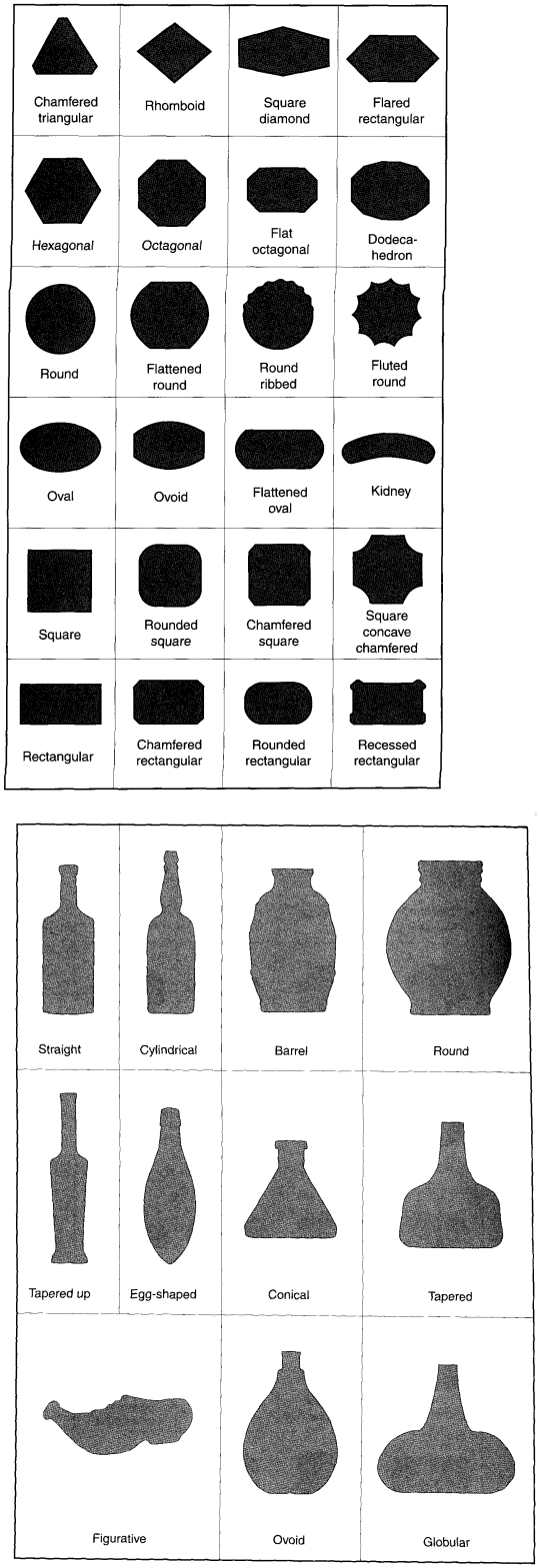
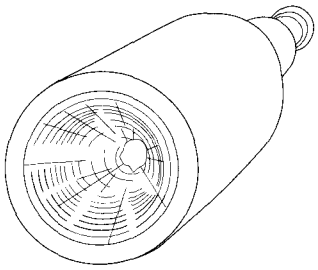
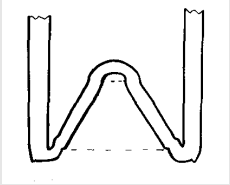
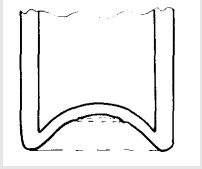
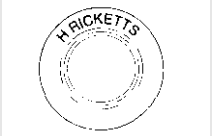
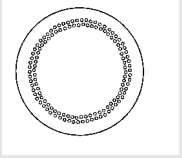


Figure 2. Shape in horizontal and vertical planes (from Burke and Smith 2004 Figure 6.9 p.189)

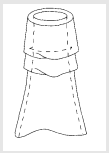
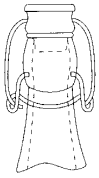
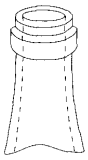
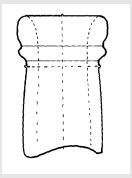
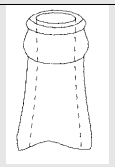
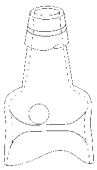
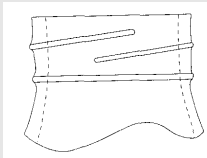
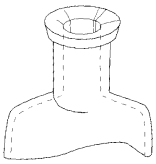
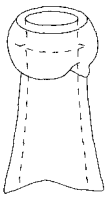
Bases

 Pontil mark	Before 1870
 Conical push up	
 Dome push up	
 Ricketts (written on base)	1820-1920
 Stippling on bottle base	1940 onwards (common on beer bottles)

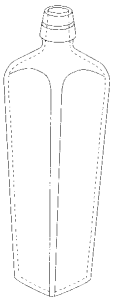
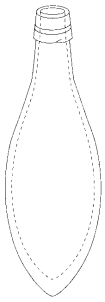
Other dateable attributes

Seals applied as a glass blob on the shoulder	More common before 1840, but found today
Embossed lettering	1821-1920s
Paper labels	Common from 1850s onwards

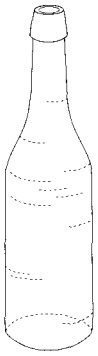
Types of finish (how the bottle was sealed)

 Single collar	 Double collar Clear glass: 1840-early 20th century	 Lightening Patented 1875 US, found on wide mouth jars from c1890	 Ring seal Until 1920 (still sone champagnes today)
 Perry-Davis	 Crown seal 1907 onwards more popular after 1920 with automated manufacturing	 Flared 1890-1920	 Blob top 1860-1920
 Codd patent seal 1873-1895	 External screw 1885-1960	 Prescription 1890-1920	 Blob top 1860-1920

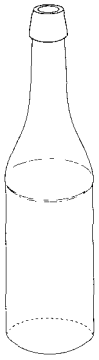
Whole bottle shapes

 Case Gin 1700s until 1930	 Torpedo or Hamilton 1809-1900

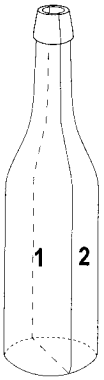
Vinegar/Oil
1870-1930



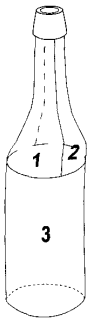
Turn or paste mould
1720-1920



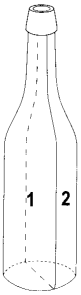
Dip mould
1760-c.1870



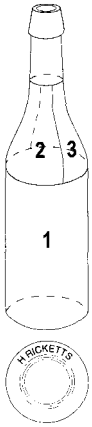
Continuous two piece mould
1903 onwards



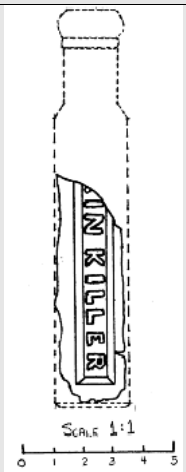
Three piece mould
1820-1840
1900-1920



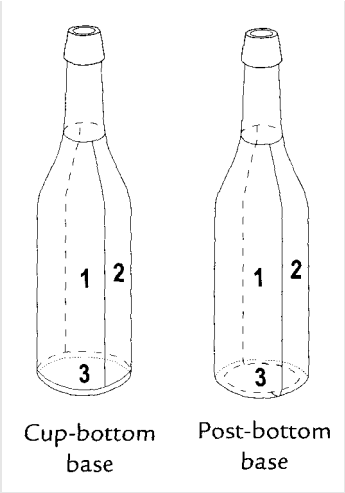
Two piece mould (full length)
c.1750-c.1900-1930



Ricketts mould
1820-1920



Perry Davis



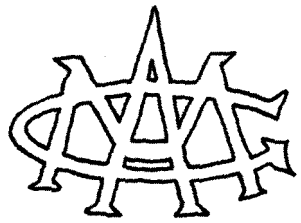
Two piece mould with separate base
1850 to present

The different types of manufacture in the assemblage were: hand blown (probably pre-1870) and machine-made. Moulds included 2 piece moulds with separate base (mainly in clear glass). Many bottles were mould made, as suggested by the Ricketts mould, panelled sides, and embossed lettering.

There were a range of finishes present; some applied separately indicating pre fully-automated production. The best way to see this is with seams: they will continue through to the top of the bottle closure in fully-automated bottle production. Other finishes were external screw finish (for food and medicine), prescription finish (for medicinal bottles), crown finish (for beers), double collar finish (normally alcohol), single collar finish and Perry Davis finish (for a specific vegetable pain killer).

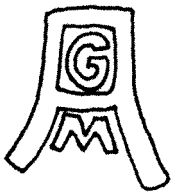
BOTTLE MAKERS

These are the main trends in AGM maker's marks for Australia, although they were not present in this group of artefacts.



a) AGM interlinked 1912-1922

b.) 1922-1933



c.) 1934-1948

Figure 3. Australian Glass Maker (AGM) inscriptions (from Burke and Smith 2004 Table A3.1 p.369-370)

References for glass artefacts

BOOW, J. 1991. *Early Australian Commercial Glass: Manufacturing Processes*, Heritage Council of NSW, Sydney.

BURKE, H. and SMITH, C. 2004. *The archaeologist's field handbook*, Allen & Unwin, Crow's Nest, N.S.W.

GRAHAM, M. 1981. *Australian Glass of the 19th and Early 20th Century*, David Ell Press, Sydney.

JONES, O. 1971. 'Glass bottle push-ups and pontil marks', *Historical Archaeology* 5 62-73.

JONES, O. R. and SULLIVAN, E. The Parks Canada Glass Glossary for the Description of Containers, Tableware, Closure and Flat Glass. Canada Parks,

MILLER, G. L. and SULLIVAN, C. 1984. 'Machine-made glass containers and the end of production for mouth-blown bottles', *Historical Archaeology* 18 (2), 84-96.

VADER, J. 1975. *Antique Bottle Collecting in Australia*, Ure Smith, Sydney.

WHITE, J. R. 1977. 'Bottle nomenclature: a glossary of landmark terminology for the archaeologist', *Historical Archaeology* 12 58-67.

Enamel cup

Enamel techniques for cooking vessels were apparently made from the mid-19th century onwards. The use of enamel coating in industrial manufacture is referred to from the nineteenth century, the enamel allowing for rust free cooking pots and pans. Robyn Stocks, an archaeologist from Sydney, informs us that enamelled ware was imported to Australia from the 1880s or the early 1900s from the UK & USA, and that there is little information about:

- end dates of importation
- early enamel colours and shapes
- local manufacture
- importation

There is longevity of forms and continued use, both of which make dating artefacts difficult. Part of the absence of information is that general references to collectable household metal wares often do not mention enamelled wares.

Robyn suggests that it may be possible to determine the period of manufacture from the weld:

- "Fire or Pug or butt weld like thumb print, doesn't tend to rust, weld may be slightly sunken.
- Scarf weld for harder steel from the end of the 18th century, raised join.
- Gas or butt weld of iron and mild steel brazed with steel, brass or bronze, weld may be slightly raised.
- Cleft weld replaced butt due to improvements to steel making it less ductile.
- Electric arc welding, from beginning 20th century, use of flux rod onto metal butt join. Similar appearance to fire welding of iron but may be slightly bumpy, and may have spatter from flux (iron melts but doesn't run)." (Stocks, Robyn, electronic communication, March 2005)

References for enamelled wares

Robyn suggests several sources:

- Rachel Field 1984 *Irons in the Fire. A History of Cooking Equipment*. Marlborough: The Crowwood Press.
- See Sears Roebuck catalogue (1906)
- Peter Cuffley 1984 *Chandeliers and Billy Tea. A Catalogue of Australian Life 1880-1940*. Victoria: The Five Mile Press.

- Feldheim, Gotthelf and Company catalogue (1905) (Enamelled ware on pp. 59-62 includes a wide range of objects including plates, pots, dishes, kettles, strainers etc with white, blue & white and grey enamel.)

Clay pipes

This section describes the use of clay pipes to interpretation of archaeological sites. There was only one pipe found in the material associated with the tunnels (FP-118), which may suggest two things:

- prisoners were not smoking, or that
- broken pipes were rare, suggesting a high level of care in their use as clay pipes are fragile and break easily.

However, we cannot say anything reliable from an archaeological perspective as there was no archaeological sampling involved.

Figure 4: Clay pipe bowl associated with Fremantle Prison tunnels (FP-118). The pipe has rouletting around mouth and a pronounced heel (rarer after 1880).

Some background information may be useful. Clay pipes are valuable for dating deposits. This requires determining the pipe manufacturer or when the pipe was made on stylistic grounds. Good sources are Oswald (1975) who lists the manufacturers of clay pipes in the United Kingdom from directories and Davey (1979) for detailed information concerning Scottish manufacturers.

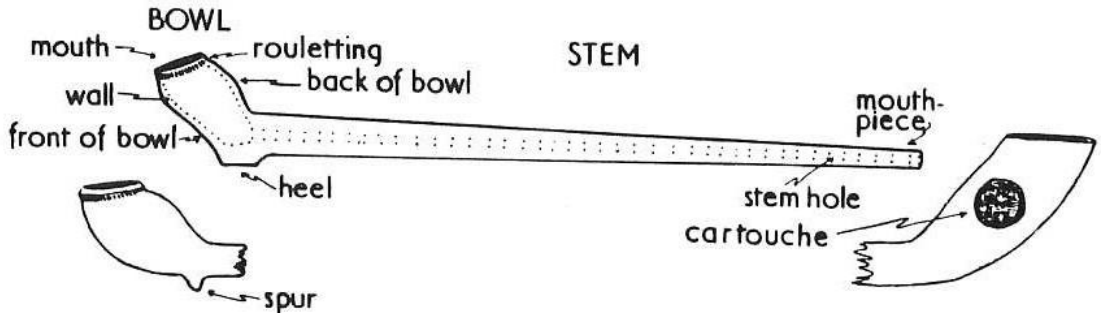


Figure 5: Clay pipes (from Orser and Fagan 1995, p.103.)

Most nineteenth century tobacco pipes were made from white clay and consisted of a stem and bowl (for pipe anatomy see Dane & Morrison 1979, pp. 4-5; Orser & Fagan 1995, p. 103). Pipes were often embossed with maker and

product names, and with decorative attributes making the determination of the manufacturer possible. Most pipes found in colonial Australia were exported from Scotland, the main nineteenth century producer of pipes.

Dating clay pipes

Changes in pipe form between the late-1500s and the early-twentieth century have been used by archaeologists to determine age. Formulaic dating based on the regression curve of regular changes in pipe stem diameter (Binford 1961; Oswald 1975) are of 'little value' after 1750 (Oswald 1975, p. 126) as for most pipes the bore size remains relatively constant. For this reason in Australian archaeological studies (Dane & Morrison 1979) bore size is not recorded. The exception are pre-1750 shipwrecks.

Consequently the primary dating method in Australia involves the comparison of manufacturer mark or decorative elements with historic directories and collections from other archaeological sites. This is not possible with the bowl fragment from Fremantle Prison. Oswald (1975: 37-41) proposes dating pipes by their general shape, although the usefulness of this approach is reduced by the many local variations in shape. Oswald's shape criteria propose that spurs such as that found on the one example from the Prison are rare after 1880.

Clay pipe makers and studies

There are generic pipe types made by several makers, one common form being Cutty varieties. Gallagher (1987a, p. 72) states these may be without a maker's name. Another feature are numbers along the stem which most commonly indicate the mould variation. Decorative elements imparted by moulds became increasingly popular after 1850. These too were common to several manufacturers.

During the nineteenth century pipes were made in the United Kingdom, Ireland, France and Holland. Pipe production centred on Glasgow and Edinburgh whose pipes were traded throughout the world. Pipes made after 1891 for the large American market were required under the McKinley Tariff Act (Gallagher 1987a, p. 73) to have the country of origin marked, not the town as was the practice previously. There is evidence however for Scottish pipes to be marked 'Scotland' by the mid-nineteenth century (Gallagher 1987a, p.73).

It seems likely that pipes made for an Australian market also changed in 1891, even though some pipes were made specifically for an Australian market, as suggested by the catalogue for W. White, Glasgow who list a 'Long Australian', 'Short Australian', 'Kangaroo', and 'Small and Large Sydney' (Gallagher 1987b, pp. 148-63).

The majority of research into clay pipe assemblages has occurred in the Americas and in Europe. As Brassey stresses 'in Australia and New Zealand…we have had to rely heavily on publications that have originated from the Northern hemisphere' (1991, p. 27). Birmingham (1971, p. 5) suggested that patterns of trade to Australia could be compared with Canada and the USA by comparing clay pipe corpora. The growing corpus of excavated material in Australia and New Zealand from the nineteenth century

requires collation and publication to facilitate comparative analysis from smaller archaeological assemblages. This would recognise the potential that clay pipes are a resource which, as Foster states regarding New Zealand, but equally applicable to Australia may 'establish narrower time spans…for historic sites' (Foster 1983, p. 94). An important reference is Dane and Morrison's (1979) description of clay-pipes from Port Arthur dated to between 1830 and 1877. Another great overview of clay pipes in Australian archaeology is provided by Gojak and Stuart (1991).

References for clay pipes

BINFORD, L. R. 1961. 'A new method of calculating dates from kaolin pipestems', *Southeastern Archaeological Conference Newsletter* 9 (1),

BIRMINGHAM, J. 1971. 'Clay tobacco pipes', *Australian Historical Archaeology Association Newsletter* 1 (3), 4-6.

DANE, A. and MORRISON, R. 1979. *Clay pipes from Port Arthur 1830-1877: A Descriptive Account of the Clay Pipes from Maureen Byrne's 1977-78 Excavations at Port Arthur, Southeast Tasmania*, Department of Prehistory, Research School of Pacific Studies, Australian National University, Canberra.

DAVEY, P. J. and POGUE, D. J. 1979. *The Archaeology of the clay tobacco pipe*, B.A.R., Oxford.

FOSTER, D. 1983. 'Clay pipes from the Cromwell district, Central Otago', *New Zealand Archaeological Association Newsletter* 26 (2), 94-101.

FRESCO-CORBU, R. 1982. *European Pipes*, Lutterworth Press, Guidford.

GALLAGHER, D. B. 1987. 'The 1900 price list of the Pipe Makers' Society', in DAVEY, P. (ed), *The Archaeology of the Clay Tobacco Pipe: X. Scotland*, British Archaeological Research Series 178, Oxford, 142-164.

GALLAGHER, D. B. 1987. 'Nineteenth and twentieth century Edinburgh pipemakers', in DAVEY, P. (ed), *The Archaeology of the Clay Tobacco Pipe: X. Scotland*, British Archaeological Research Series 178, Oxford, 31-34.

GOJAK, D. and STUART, I. 1999. 'The potential for archaeological studies of clay tobacco pipes from Australian sites', *Australian Historical Archaeology* 17 38-49.

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Metal artefacts 01559, 01561 and 00560

The artefacts pictured here seem to have been bent through use, with force related to the eyelet at one end from where the force presumably originated from. I have had several suggestions to the possible use of these items, which I include below with thanks. I prefer Paul's suggestion that they were pry bars, although further research is required.

The suggestions provided were:

1. Handles for flue vent
2. Weapons or an auger
3. Pry bars

Figure 6. Metal artefacts 01559, 01561 and 00560

Suggestion 1: Handles for flue vent

"Possibly handles associated with some sort of flue vent. I'm guessing the twist makes the shaft turn 90 degrees? The end may have been attached to some sort of flat rectangular seal. When the handle was then pulled it would pull backthrough a slot, turning through 90 degrees (and thereby blocking a similarly shaped hole behind the first one. This would have un-blocked whatever the thing was blocking, possibly allowing ventilation or change of air direction. Its a typical sort of furnace flue operating device- but then could be something totally different! This is just an educated guess. The handle certainly suggests a pulling action. Did the prison have a boiler room?"

Wayne Johnson (Sydney Cove Authority)

Suggestion 2: Weapons or an auger

"Apart from obvious chains and files, many of the other ubiquitous steel items could be weapons or like (or may have been cadged for that purpose). They all seem too ephemeral to be stone cutting devices, though a twist could indicate an auger or drill."

Martin Carney (AMAC Group)

Suggestion 3: Pry bars

"They look suspiciously like 'pry bars' to me – used in manual quarrying/mining by inserting under or beside large blocks to either move the block in short efforts by 'prying' (i.e., using the bar as a lever against a fulcrum; or alternatively to lift one edge of the block up or across to allow the entry of the point or blade of a more substantial hand tool (e.g., crowbar) or lifting apparatus (e.g., a rope or sling from the pulley set or block-and-tackle working off a sheerlegs or gin pole). The bending may result from use on heavy blocks, but could also have been intentional for example to save the operator from bending in heavy lifts."

Paul Rheinberger