4.0 Thomas Ball Pottery

4.1 Overview of the Ceramics

4.1.1 Research Questions

The aim of this section is to address the list of research questions below as well as provide detailed analysis of Thomas Ball’s Pottery. We are not writing a separate section as a response to the research design due to budgetary and timing constraints. The following issues identified in the research questions (Section 1.4) are addressed in various sections of Chapter 4.

This phase of occupation may contain archaeological evidence that will relate to the following questions:

ii What type of early clay products were being produced beside bricks? Did these include clay roofing tiles, general household ceramics and other items?

iii What is the evidence for how these clay products were moulded, fired, and dried?

iv An area of interest is the manufacture of early lead-glazed ceramics in the Brickfields. Recent archaeological work and analysis at the Pitt & Campbell Streets site and in Parramatta has shown that this material was definitely being manufactured in the Brickfields. How does the archaeological information from this site expand on this new understanding?

An additional set of research questions were identified at the completion of the excavation program (Section 1.4).

Questions relating to local manufacture of pottery in the Brickfields were briefly mentioned in Question iv (above). Due to the extensive material found associated with local pottery manufacturing this question needs to be considerably expanded to further our understanding of this early pottery.

- What is the nature and range of the pottery manufactured by Thomas Ball at his pottery at the base of Brickfield Hill? Is it a mixture of utilitarian and finer table and teaware as indicated from the wasters found at Pitt and Campbell Streets?
- What does the pottery tell us about Ball’s training, skills, materials, techniques and understanding of pottery manufacturing techniques and technology? In effect, how did he manufacture pottery and other products in the Brickfields?
- Analysis of evidence of manufacturing flaws, notably problems when firing the kiln, stacking, glazing and such.

These questions assisted with our approach to the redesign of the catalogue between Stages 1 and 2. These questions underlie our approach to the cataloguing and following analysis.

4.1.2 Pottery Taphonomy and Cataloguing

Describing and quantifying the pottery and other artefacts made within Thomas Ball’s Pottery is not an easy task. We are dealing with the material that was thrown away - it was never used for the purpose for which it was designed or manufactured. Initially it was made and placed in the kiln to be fired. Somewhere during the process the firing failed and the vessel was thrown into the waster heap and eventually put into the waster pits, most probably after the cessation of the Pottery in c.1823 or slightly later. After the whole or part of the kiln firing failed, the ruined pottery was broken up and probably stored in waster heaps to be reused as saggars or setters or other similar
kiln furniture. It may have been broken up to be used as ‘grog’ in the manufacture of more clay for further pottery making or used in the domed roof of the wood-fired kiln which was reformed each time the kiln was fired. Occasionally it would then be disposed of and/or reused again as a saggard. Therefore we rarely have near complete vessels or even many sherds that we would say belonged to the one vessel.

Because of this, our typical cataloguing process had to be reinvented for this project. At the beginning of the process we did not have a lot of confidence in the use of minimum vessel (item) counts, so used Estimated Vessel Equivalent (EVE) counts with the focus of counting on rims or diagnostic elements, such as decoration and vessel shape. In the end the EVE count is probably close to a minimum vessel count. Within each context we began by sorting the pottery into glaze colour, thickness, rims, bases and body sherds, then onto vessel shape, differences/flaws etc. (Figure 4.1, Figure 4.2). With decorated pottery we were able to find many more conjoins between sherds than with single coloured sherds (Figure 4.3).

Once all the pottery was catalogued we realised it had to be re-examined in some detail because the sheer size of the corpus meant that two vessels in the same type could be 3000 catalogue numbers apart. We may initially have only have had the base of an object. Finding the upper body later shifted how we could understand other vessels of this same type. The focus of the original sorting was on the rims and bases. Many body sherds were bulk bagged and while they may belong to known bases or rims we have not been able to make these connections at this time. This would require an additional one or two phases of review and more extensive sorting. The original sorting and counting is called Stage 1 cataloguing.
As there were doubts about the reliability of these original data we wanted to re-catalogue the whole of the Thomas Ball corpus but this was impossible within the timeframe of a consultancy project or its budget. What we did was re-catalogue 25 per cent of the boxes, making sure we addressed all contexts and number of boxes with each context. This has been called Stage 2 cataloguing. We were able to ignore many of the boxes which were full of body sherds, few of which were diagnostic. In addition all identified decorated sherds or vessels were re-catalogued. This focus on decorated pottery increased our understanding of this material substantially following the initial cataloguing. Many more vessel types and shapes were identified because of the consistency of particular forms used for decoration. A decoration type series was established during the Stage 1 cataloguing and amended and developed during the Stage 2 cataloguing (Appendix 4.2).

What became clear quite quickly in the re-cataloguing process (Stage 2) was that it was an essential part of the analysis if we were to consolidate our understanding of Thomas Ball’s corpus. Like many archaeologists before us we found that the sheer quantity of material meant that we have to interrogate it by using different approaches. We had to focus in on categories of analysis to even begin to strengthen some understanding of the nature of this material.

1 The majority of the Stage 1 cataloguing was undertaken by Jenny Winnett with assistance from Sue Hearne and student volunteers and additional cataloguing of Stage 1 by Rowan Ward. Dr Bernadette McCall was responsible for most of the Stage 2 re-cataloguing of the 25 per cent of the main corpus while Mary Casey was responsible for the re-cataloguing of all the handpainted pottery, with assistance from Robert Maxwell. Both Bernadette and Mary Casey undertook the re-cataloguing of the incised pottery.

2 It is likely that re-examination of bags of body sherds will allow for resorting which may assist further analysis.

3 This will be discussed in more detail below.

Figure 4.2: Further sorting of sherds into vessel groups. Sue Hearn is working with a student volunteer. Jenny Winnett, 2 November 2009.
One of the most useful aspects of our existing cataloguing system is the type series we started developing in the 1990s and published in 1999. The type series was consolidated as part of a review in 2008 by Rowan Ward, based on the work we had undertaken on other early sites between 1999 and 2008. We have now tested this enlarged type series as part of the 710-722 George Street cataloguing. In addition to the vessel-shape type series we had to develop a ‘decorative type series’ so as to consistently catalogue the numerous decorated vessels we found. Prior to excavation at the Thomas Ball pottery we had found only a few decorated vessels, including a few handpainted examples from the city block to the east, which we believe were waster pottery from Ball’s site used for drainage, and the occasional incised or roulette sherds from sites in Parramatta or tiny fragments from other early sites. We found a few examples of decorated vessels from excavations on early sites in Parramatta (Section 4.7.2). Generally, the locally-made pottery found on sites in Parramatta was in better condition and we started to find a number of near intact vessels and full profiles, as with the Parramatta Children’s Court site. We began to identify more shapes than we had on sites in the Sydney CBD. But little of this earlier work or finds prepared us to understand the sheer quantity and variety of vessels and decoration that were being manufactured in early Sydney by convict potter Thomas Ball.

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4 Casey 1999.
5 Ward 2008.
As part of this process we designed a specific ‘locally-made pottery’ form on our Access comparative database (Figure 4.4). We redesigned it incrementally based on different stages in the cataloguing. The initial design was retooled once it was decided we needed to re-catalogue at least 25 per cent of boxes (Stage 2). Brian Robson (who has worked on our database for more than 10 years) and Mary Casey spent some time refining our entry form. We had started direct entry of the catalogue quite early in the Stage 1 cataloguing because the data we were collecting became too complicated to keep writing it down on paper. This in turn had consequences for auditing the data. Normally the specialists use the paper catalogue to audit the accuracy of the database dataset but this was not possible as there was no paper copy. Therefore, we had to do this through various queries once we started to examine the data and amend inconsistencies. The accuracy of the Stage 1 cataloguing was also checked as part of the re-cataloguing (Stage 2) process.

A decorative type series was established which mostly consisted of a table with descriptions and photographs of the various decorations (Appendix 4.2). Decorations consisted of handpainted, incised, and coggled or rouletted designs. While some elements of each of these different types of decoration had previously been found, the sheer scale of the variety of decoration could not be conceived from our known examples.

The count for the pottery in this chapter of the report excludes pottery used as kiln furniture, possibly as saggars or setters. Typically, we have catalogued them in the same way but for the purposes of this section of the report it was easier to exclude all ‘kiln furniture’ from pottery wasters. The counts for these are in Appendix 4.1: Table 6. They are also discussed in Section 4.9 below.
4.1.3 Archaeological Contexts containing Locally-Made Pottery

Most of the locally-made pottery was found in waster pits (Area A, Figure 4.5) or as backfills (Area B, Figure 4.6) of shallow erosion gullies in the lower part of the site (Appendix 4.1: Table 1). A total of 36,474 sherds were found in Area A, representing 72.83 per cent of all locally-made sherds found on the site (Appendix 4.1: Table 2). See Section 3 for discussion of these pits and Vol. 2: Section 8, Trench Reports, Areas A and B.

There were three waster pits in Area A. 70 per cent of the material from these pits was of locally-made sherds (pits 7651, 7649 and 7660, Figure 4.5). These sherds are presumed to have been dumped around 1823 when Thomas Ball lost possession of this land to Thomas Buxton (Buckton) and the pottery ceased production. A few sherds of imported pottery suggest a deposition date in the early 1830s. One of the fills (7646 in pit 7651) contained a slightly worn 1827 George IV penny which supports an end date in the late 1820s/early 1830s. The dumps of pottery wasters were only a short distance from each other. It is likely that the kiln was also nearby. It may have been on the adjacent property to the east, immediately outside the study area. As discussed above, these pits are thought to have been backfilled with sherds from waster heaps surrounding the kiln. The new owners of the land, who wished to put it to a different use, would have sought to clean up the site and the easiest way to do this was backfill shallow pits or gullies on the site. Generally we consider that rather than dig new holes they used existing depressions or gullies to bury the wasters as none of the waster pits were very deep.

Another feature in Area A containing locally-made pottery was the backfilling of a clay extraction pit (7436). This contained very sticky clay which was difficult to excavate by machine or hand. A number of context numbers were given to the fill of this feature in order that any differences within test pits and any contamination below rooms of the Woolpack Inn might be more accurately recorded. These contexts are 7326, 7385, 7390, 7399, 7400, 7430, 7437, and 7449.

In Area B the main feature was a shallow gully (7489) filled with pottery sherds. The sherds were not mixed with wet clay as they were in Area A (Figure 4.6). Within the gully the sherds were in a sandy matrix and had been notably broken up. Waster material in a sandy matrix would have drained well. For this reason it may have been deliberately used in the previous location of the gully. This dump was later built over and was found immediately beneath the earthen floor of a timber structure at no. 718 George Street. The occupation deposit (7395) associated with this structure was contaminated by the waster dump below. As a result, 176 sherds belonging to the gully material 7489 were originally excavated as 7395. This was basically loose material coming off the top of the main waster fill.

Only 17 sherds of locally-made pottery were found in Area C (Appendix 4.1: Table 2). This was less than many of the non-pottery related features in Areas A and B. Many features or deposits with no chronological relationship to the operation of the Pottery contained quantities of locally-made pottery sherds (Appendix 4.1, Table 1). Most of the sherds were found in Area A, which is considered to be the western half of the Pottery property. Subsequent development of the site necessarily disturbed many of the deposits associated with the pottery, and so it is unsurprising that many sherds were found in features associated with later structures. Some deposits, such as underfloor deposits, accumulated around unconsolidated sherds sitting in or on the strata below. Therefore the locally-made pottery formed a ‘background noise’ to all of the archaeological features excavated on the site.

The implication of this is that nearly all of the locally-made pottery found on the site is probably associated with the Thomas Ball Pottery. Contextual information suggests that these sherds were the by-products of the operation of his Pottery rather than fragments of ceramic used as part of the domestic day-to-day activities of nineteenth-century residents. While it is possible that a few
sherds came from another local potter this could only be a small part of the overall corpus found at the site and no specific instances have so far been identified.

4.1.4 Dating the Backfilling of the Waster Pits
In the ceramics report Rowan Ward identified a number of imported sherds found within the waster pits (the fills of Pit 2:7647 and Pit 3:7660, Vol. 2, Section 9.1).

- Clay extraction pit (7391):
  - Just one item was recovered in fill 7399 that was not of local manufacture: a rim sherd from a green shell-edged pearlware plate, dating between c.1780 and c.1840 (#73594) (Ceramics Report, Section 9.1).
- Pit 7647 contained three fills and 11 imported ceramics:
- Fill 7645 had 15 sherds from 10 items, with terminus ante quem dates (dates from which the type of vessel was made) ranging between 1780 and 1834 (Ceramics Report, Section 9.1, Table 2.2).
- Fill 7648 contained one imported item (9 sherds). The handpainted pearlware plate was made in the United Kingdom and had a broad date range of c.1780 to c.1870 (#74093).
- There is some suggestion of backfilling after 1830 of this waster pit or that it was not properly sealed until after this date and later ceramics infiltrated the fills.

- **Pit 7660**
  - Fill 7662 was the only one of the five fills to feature any imported ceramics. It contained five imported ceramics consisting of 9 sherds. The beginning dates for manufacture for these five ceramics ranged between 1790, 1800 and 1830. The presence of a brown-transfer print sherd dates the deposit to post-1830. Fill 7662 was underneath other fills suggesting there was limited opportunity for disturbance by other features but this area was quite cut up by modern footings.
  - There is some suggestion of backfilling after 1830 of this waster pit or that it was not sealed until after this date.

- **Pit 7651**
  - In the upper fill (context 7646) was an 1827 George IV penny, slightly worn. This also supports a slightly later backfilling of the Area A waster pits, perhaps c.1830 rather than c.1823. But this was the back yard area and was possibly not sealed by later structures until c.1830 and later ceramics may have entered into the fill of this pit.

### 4.2 The Pottery

Three main types of pottery were manufactured at Thomas Ball’s Pottery: lead-glazed, slipped and self-slipped (Appendix 4.1: Table 3). Only a few items of slipped (12) or self-slipped (46) were found. By far the majority of items being made at the Pottery were lead-glazed ceramics (2625). These are typically fine earthenware but occasionally they were coarse earthenware and some were even stoneware (Appendix 4.1: Tables 3, 4). Fine earthenware was recorded in 93.8 per cent of all vessels found, a total of 95 per cent of the sherds. The majority of lead-glazed vessels were identified as being made from fine earthenware (Appendix 4.1: Table 5).

#### 4.2.1 Fabrics

A total of 93.8 per cent of all vessels were in fine earthenware with the remaining in coarse earthenware (156) and stoneware (11) (Appendix 4.1: Table 4). The stoneware figure is not very accurate as there has been very little re-cataloguing of this material and it requires more attention to reach an accurate EVE count. A total of 561 sherds of ‘faux stoneware’ were identified. It is noted that the ‘faux stoneware’ is stoneware as defined by the degree of vitrification.7

#### 4.2.1.1 Earthenware

Earthenware pottery has a relatively porous body, greater than 5 per cent, which needs to be covered by a glaze to make it waterproof. The fine earthenware is represented by small holes in the fabric and is well mixed. Coarse earthenware is less well mixed and has larger inclusions.

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7 Section 9.2: Scientific Analysis of Thomas Ball’s Pottery - Nicholas Pitt.
4.2.1.2 Stoneware
A hard, strong vitrified ware, with a grey to pinky buff colouring (Figure 4.41). Stoneware found overseas on archaeological sites was fired above 1200C. The difference between stoneware and earthenware is the degree of porosity or the level of vitrification.8

4.2.1.3 Fabric Colour
The fabric colours are based on the original clay used to make the pottery and the degree of firing. The identification of fabric colours was based on preliminary Munsell colour charts but not every sherd was examined in relation to the Munsell chart. Twelve different colour ranges were identified but were generally determined to be based on three clays: a fine white clay, a pale brown clay and a red clay (Appendix 4.1: Table 9). These gave the variation in the colour range which is then further added to by firing temperature and duration of firing.

Hyacinth de Bougainville, during a visit to Sydney in 1828, identified that a potter, probably John Moreton, was using two types of clay, a grey clay and a red clay.9 The grey clay mentioned by Bougainville may be the fine white clay used at the site rather than a grey clay. The scientific analysis information below supports the presence of two clays, white and red, but no analysis was undertaken of the buff fabrics which possibly came from pale brown clay. Admittedly though, the range of firing, overfiring, and uneven firing in the wasters is testimony that a visual inspection is inadequate for properly concluding how many clays were used to manufacture the pottery.

4.2.1.4 Scientific Analysis10

How many clays?
The limited scientific analysis (11 sherds) allowed the following conclusions to be drawn concerning the clay and fabric of the ceramics from the Thomas Ball Pottery. It is noted that there was no analysis of the buff-coloured clays. Firstly, the clay used for the sampled ceramics appears to have been from at least two prepared clay sources. One of these sources was used for red fabrics, which were relatively high in iron oxide (conc. Fe₂O₃ > 3.5% (w/w%)), the other was used for white and buff fabrics and was relatively low in iron oxide (conc. Fe₂O₃ < 2.0% (w/w%)). Chemical analysis showed that all clays used were non-calcareous (low in calcium). The compositional results were consistent with the clay being sourced from around Sydney. Further sampling and more precise chemical analysis, using a different analytical technique, would be required to allow more definite, statistically sound statements to be made about the number of clay sources which were used.

Vitrification analysis of the fabrics suggested that pale yellow glazed ware and mulberry ware were fired at lower temperatures than the ‘faux stoneware’ (as these other wares had lower levels of vitrification).

Differences between the clays
The wares which had multiple samples analysed for level of vitrification, namely pale yellow glazed ware and faux stoneware, shared consistent levels of vitrification within the ware (Section 9.2, Table 5). This suggests that all samples of a particular ware were fired under similar conditions (temperature, kiln atmosphere, firing time etc). However, as vitrification levels vary between wares, this implies that at least for pale yellow glazed ware and faux stoneware (which shared similar chemical compositions for their fabrics), firing conditions must have varied between the different ware types. Given that other variables such as firing time or clay composition are held constant, vitrification levels generally increase with firing temperature.11 The higher vitrification

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8 Frank & Janet Hamer 1986: 305.
9 Riviere 1999: 80.
10 This section is taken from Nick Pitt’s scientific report, Section 9.2.
11 Maniatis & Tite 1981.
levels of the faux stoneware suggest that it was fired at a higher temperature than the pale yellow ware.

**Vitrification**

‘Faux stoneware’ samples demonstrated a similar level of vitrification to other English stoneware, and deserve to be considered a type of stoneware. Fine pores associated with pinholing and incipient bloating were seen using electron microscopy in all samples except mulberry ware. These fine pores were probably due to properties inherent in the clay, although other causes would have been possible.

**Organic Inclusions**

Organic inclusions of plant fibres and pollen were found in four of the six analysed samples of pale yellow glazed ceramics. There are at least three possible reasons for their presence in the ceramics. The organic inclusions may have been accidentally incorporated in the clay as it was being prepared by the potter, they may have already been in the clay-bed or they may have been deliberately added as temper material. Of these possible reasons, Nick Pitt considered the first to be more likely.

### Glazes and Colours

Lead glazed means that the vessel was decorated with glazes made from lead. Slipped means that a thin watery clay slip was used to finish the vessel before firing. The slip was either made from the same clay of the vessel (self-slipped) or made from a different coloured clay to that of the vessel (slipped). A fired glaze forms a glassy surface which is fused to the pottery body. It also provides a decorative finish to the vessel. The majority of the ceramic corpus (97.8%) was lead glazed on either the interior or exterior with a small group being self-slipped (1.7%) or slipped (0.4%). The lead-glazed vessels probably also had a slip between the glaze and the clay fabric of the vessel as it assisted with the firing process in helping the glaze adhere to the fabric. A range of colours were used in the glazes. The most common interior glazes were: yellow (535 vessels), pale yellow (362), mulberry (350), brown (328 vessels, 22,215 sherds), and pale brown (289). Many of the vessels had no exterior glaze (estimated 2187 vessels, 43,329 sherds). Where they had exterior glaze the commonest were yellow brown (126), pale yellow (59), pale brown (45), mulberry (43) and yellow (33) (Appendix 4.1: Tables 3, 4, 5, 12).

#### Scientific Analysis

All glazes were lead based as expected, with many of the sampled glazes also containing quantities of tin oxide (SnO₂). The presence of tin in nineteenth-century earthenware glazes was not expected but further research has shown that it has been observed in other nineteenth-century earthenware glazes (and late eighteenth-century porcelain glazes from South Carolina). Tin was used as an opacifier in glazes (to make them opaque), including the glazes of delftware pottery. The concentration of tin oxide in Thomas Ball pottery was lower (0.5 to 2% (by weight)) than was typical in tin-glaze pottery (which was 4% to 11% by weight).

The stoneware vessels were lead-glazed except some of the exterior surfaces where the finish resembled a thin salt-glaze. The chemical microanalysis showed that it was not a salt-glaze as such, as it was too low in sodium. Rather it was a completely vitrified region, rich in potassium, probably originating from the vapours of a wood-fired kiln.

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13 Takes from Section 9.7, Nick Pitt.
14 For further discussion see Section 9.2, pp 19-20).
15 Tite et al 2008: 69; Tite 2009: 2075.
Analysis shows that the dark red mulberry ware was not being darkened using manganese as was often the case for many eighteenth and nineteenth-century black-glazed ceramics. Instead it appears to be coloured by iron, which is concentrated in the top region of the glaze. This iron may be concentrated in the fine, dark spots visible near the top of the mulberry glaze SEM image shown in Section 9.2: Figure 18 (Volume 2).

Conclusions were also able to be made about how the glazing materials were applied to the ceramics. Comparative analysis of the glaze and body compositional data showed that all the glaze materials appear to have been applied directly to the ceramic vessels as raw lead compounds, or as lead compounds mixed with a clay slurry, rather than lead mixed with quartz (such as in the form of ground flint). Mixing and heating lead compounds with quartz to produce ‘fritted glazes’ before application to ceramics was becoming common in the early nineteenth century and was a safer method for the potter.

Electron microscope images of the glaze-body interface suggested that glazing material may have been applied to unfired ceramics, rather than to vessels which had already been fired once (‘biscuit fired’).

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16 Couper 1847: 439, 442; South 1993: 85-86.
17 Fritting is the process where part of a glaze recipe, typically a lead compound, such as litharge (an ore of lead (II) oxide) and a form of silica (usually as quartz in the form of ground flint or sand), are heated together to melting point. They then will form an insoluble compound, called a frit, which can be ground and used for glazing. A principal advantage of fritted glazes is that the lead they contain is insoluble, while lead (II) oxide is water soluble. Using an insoluble lead compound for glazing lessens the risk to the potter of experiencing lead poisoning. For further information on fritting see Hamer & Hamer 1986: 145.
4.2.3 Vessel Shapes and Quality
The identification of vessel shapes was based on the updated 2008 type series (with some minor changes) which we also reviewed as part of this process. This amended type series was itself heavily influenced by concepts of the Medieval Pottery Research Group (MPRG) established by British scholars.18 The main shapes are (Appendix 4.1: Tables 8 to 22; Appendix 4.4: Vessel Type Series):

   - Size of sherds or uncertainty of form means that some vessels were identified as possible pan/basin/bowl (113) or pan/bowl (112) or pan/deep bowl (1) or pan/crock (1). These are utilitarian vessels with a range of household uses, typically identified as food preparation although those with thinner bodies were possibly used for serving as well.
   - Probable pans constitute approximately 22.5 per cent of the lead-glazed corpus.
   - Diameters of these vessels range between 140mm to 420mm with the majority being 280mm (43), 300mm (39), 320mm (68), 340mm (50), 360mm (31) and 400mm (29). The majority of these are large robust vessels.
   - Thickness of the bases where they were definitely attributed to pans was between 5 to 8 mm.
   - Typically pans are glazed on the interior and slipped on the exterior. The main colours for pans were: brown (58), pale brown (58), red brown (48), mulberry (58) and yellow (61).
   - A number of pans were decorated: handpainted (46), incised (16), incised and handpainted (8), rouletted (3) and also in marble or agate ware (1).
   - A number of pans with thinner walls were found at the Pottery (Figure 4.7). The thickness of the bodies ranged from 5 to 10mm while the more robust pan bodies were 8 to 18mm. The thicker bodied pans are more typical of those found on other archaeological sites in Sydney and Parramatta.
   - The majority of pans are utilitarian (305), while some are medium (59) and one was fine or faux annular ware.

![Figure 4.7: Two pans which are finer than typically found, 7662/#87663 and 7646/#85031. Russell Workman, 15/4/2010, scale 10cm.](image)

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2. **Bowls** (356): curved open vessel in a range of sizes, mix of utilitarian, medium and finer forms, (Appendix 4.1: Table 8; Figure 4.8). Also with a range of rim shapes (Appendix 4.4).

- These can be quite small fine vessels (such as tea slop or sugar bowls, often with some decoration) or larger bowls probably used for food preparation (Type 7.2.1 to 17.2.6). Forty-five bowls are considered to be fine.
- The dimensions of the finer vessels range from a rim diameter of 100mm to 180mm, base diameter between 60mm to 90mm, base thickness of 2-3.5mm and 4-8mm, and body thickness between 2-3mm, 3-4mm, 4-5mm, and 5-6mm.
- The more robust vessels have rim diameters of 200 to 400mm with body thickness ranging between 5 to 11mm. The quality of the bowls ranged from medium (151) to utilitarian (157).
- Bowls have also been included in the number of crossover forms indicating some uncertainty in the identification of shapes and the fragmentary nature of this corpus: cup/bowl (6), bowl/dish (3), dish/bowl (16), jar/bowl (7), note pan/basin/bowl (113), pan/bowl (112) and pan/deep bowl (1) were identified above, also poe/bowl (38). These reflect the presence of sherds with a number of characteristics not specific to bowls.
- Vessels were identified with different decorations: handpainted (59), incised (7), incised and handpainted (3), rouletted (3) and also marbled or agate ware (7). The finer bowls are typically hemispherical in profile which places them in the eighteenth-century tradition of the form.  

![Figure 4.8: Bowls or basins as they are also termed are Type 17 in the Casey & Lowe type series.](image)

- Front row: 17.2.7 7460/86310(2), 17.6.6 7662/87375(1), 17.2.6 7662/87346(1), 17.1.2 7645/85913(1); Mid row: 17.1.8 7662/87389(1), 17.6.7 7663/86905(1), 17.1.3 7460/86511; Back row: 17.6.8 7662/87878(1), 17.1.9 7646/85071(1), 17.2.6 7460/86415(2). Russell Workman, 3/3/2011, scale 10cm.

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Rickard 2006.
3. **Dishes** (361): these are vessels deeper than a plate, depth being more than 1/3 ratio of a vessel’s diameter. A dish was defined by the Medieval Pottery Research Group as being different from a bowl based on its depth, and they are shallower, and are also an open vessel. The rim diameter is typically greater than the base and the height is between 1/3 and 1/7 of its rim diameter. This contrasts with bowls (Type 17) which are typically deeper, with the height being 1/3 of more of the rim diameter. (Appendices 4.1 for tables and Appendix 4.4 for type series drawings).

- These have a range of rim/body finishes, from straight to different everted angles, from shallow to sharp. The Type for many of these vessels is 4.1 to 4.7. Items catalogued as Types 9.3 and 9.5 (plates) have been re-categorised as dishes as they are deeper than plates.
- The rim diameters of the dishes are mostly 220 or 240mm. Many of these are handpainted (247) and are of medium quality.
- The body of the dishes is usually 4 to 5mm or 5 to 8mm thick.
- 56.9 per cent of the handpainted vessels were dishes. Where uncertainty about some vessels being a dish they were identified as dish/bowl (10) and dish/plate (17).
- Dishes are interpreted as being tableware or serving dishes, particularly the decorated types. Typically they are glazed on the inside and slipped on the exterior. Many of them are glazed with yellow (198) or pale yellow (88) while a few have green speckled decoration (4). The hand-painted dishes have a wide variety of decoration on the rim and base. Decoration sometimes extends over the everted rim or occasionally it is located just below the rim or the everted rim (Appendix 4.2).
- Other decorations included: handpainted (247), incised (4), incised and handpainted (25), rouletted (4) and also marble or agate ware (1) (Table 15).
- Some dishes were finer (10) while most were of medium quality (332) and a few were considered to be utilitarian (13).
4. **Crock**s (138): these are large hollow vessels, with or without lug handles, some with ledges for lids to sit on (Figure 4.10). They often have a flaring profile or can be quite straight. They are typically used for the storage of foodstuffs. Type 14 has lug handles while Type 15 has no lug handles. Some have a broad rim to aid lifting. A crock-shaped vessel is typically quite robust and becomes heavy when full. A lifting aid can be necessary. We do acknowledge that the presence or absence of lug handle is not definitive proof that a particular vessel did not have a lug handle, only that we do not have examples with handles.

- These are utilitarian vessels\(^{20}\) with rim diameters between 180 and 480mm. With the most frequent ranging between 240 to 420mm.
- Some vessels were called crock/pot (23).
- Many had lug handles (104), Type 14, while others (31) had no lug handles (Type 15) or were not found with the evidence for such handles.
- The lug handles are a narrow piece of clay attached to the sides of the crock, typically quite close to the rim (Type 14.2, 14.3, 14.5, 14.6) or in one case lower down the body (Type 14.4). Only evidence for three Type 14 crocks had been found on Casey & Lowe sites prior to Thomas Ball’s Pottery.
- All the crocks were lead glazed. The main colours were: brown (33), red brown (29), mulberry (31), and pale brown (13).
- All crocks were utilitarian.
- Some of the lids discussed below were made for these crocks.

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**Figure 4.10:** Handled crock. These are Type 14 in the Type Series. Left: front row: 14.6, 7646/85069(1), 14.3.1, 7646/85011(1); middle row: 14.3.2, 7646/85068(3); back row: 14.5, 7645/#85572(3). On the right is the near complete profile of a handled crock 7646/85010. Russell Workman, scale 10cm.

5. **Jars (116):** A jar has a wide neck opening with a short neck or rim that has a pronounced indentation/constriction at the neck, creating a distinct shoulder. The body is either straight sided or tapered towards the flat base, with the base diameter usually smaller than the maximum diameter of the jar. The height is variable, from squat to tall, and the overall diameter also varies considerably. Sometimes the jar has an internal lip below the interior rim edge, where a lid would rest. Most examples are defined by the rim and only in a few cases by the base.

- Jars come in four sizes: small (3), medium (12), large (36) and very large (62) (Table 8).
- They are 4.41 per cent of the EVE count for vessel shapes (Table 8).
- The majority of the very large jar types have an internal ledge for resting a lid on.
- Crossover shapes are: jar/bowl (7), jar/crock (5), jar/pot (1) and jug/jar (7).
- Four jar sherds are incised, one medium jar is incised and another handpainted, one very large jar is rouletted but the remaining jars are not decorated.
- The majority of jars were considered to be either of medium (9) or utilitarian (107) quality (Table 20).
- The various sized jars come in a range of colours: brown (10 large, 9 very large), mulberry (11 large, 25 very large) and red brown (11 very large), with the remaining colours having between one and six occurrences per shape (Appendix 4.1: Table 16).

6. **Lids (65):** The majority of lids are produced by throwing a pan-shaped vessel and turning it upside down (Types 11.1, 11.6, 11.7, 11.10), (Figure 4.19). Most of these types, where the profile is complete, have an everted rim. One lid has a rim designed to sit on the ledged lip of a jar or crock (Type 11.4).

- Type 11.4 is the most common of the lid shapes found at the site (22). This type has a ledged-shaped rim (Appendix 4.1: Table 9; Appendix 4.4).
- Incomplete lids are frequently defined by having a glazed exterior and a slipped interior which is typically the opposite of a pan which has internal glazing and slipped exterior.
- A number of lids are decorated: handpainted (6), incised (5), incised and handpainted (3) and marble or agate ware (1) (Table 15). These are often quite fine vessels.
- Lids were a mix of utilitarian (44), medium (15) or fine (5) quality but in the case of utilitarian forms the lid may not have matched the colour of the crock or jar for which it was purchased (Table 20).
- Lids come in a range of colours (Table 16).

7. **Plate (52):** This description is used to describe shallow dishes or flatwares. Characteristics include a height of less than 1/5 the rim diameter and an everted upper part of the wall (MPRG: 5.4). This category has been adjusted since the 2008 report. It previously included shapes that are now defined as dishes rather than plates, notably 9.3 and 9.5.

- All plates are lead-glazed and are typically associated with tablewares, for serving or consuming food.
- The majority of shape types are Type 9.2 (37) which is an angle-sided plate (Table 9). The original vessel identifying this type does not have a base and it is possible that further research may locate the base and it may be found to be a dish. Type 9.4 is the closest to a modern plate and is typically found in imported wares rather than locally made vessels.
- Only three plates were decorated (Table 15).
The identified ‘quality’ for plates is likely to be inaccurate because of the original limitations of the cataloguing.

Plates were glazed in mulberry (10), yellow (12) and pale yellow (16) colours (Table 16).

Where rim diameters are known they were 210mm (1) and 220mm (2).

8. Chamber Pot or Poe (28): These are an ovoid shape with a flat or rolled rim, Type 16 (Figure 4.11).

- The chamber pots are mostly decorated on the exterior and lead glazed on the interior and exterior.
- There are a number of poe/bowls (38) identified in the Thomas Ball corpus. This is because a range of bowls and poes have a very similar thickened rim (Type 16.6). The decisions concerning type (is it a bowl or a chamber pot?) were influenced by the location and type of the glaze.
- A number of the poes have a thick glossy interior glaze in a different colour to the exterior. Counts for this characteristic are only partial.
- The shapes found here are common to archaeological sites in Parramatta. There were only two new poe types: 16.11 and 16.12 with a rolled rim (Table 9; Appendix 4.4).

![Figure 4.11: Yellow chamber pot (left), 7474/89613. This is now on display in the new development. It is a very typical shape which imitates that found in contemporary British creamware. On the right is a mulberry ware chamber pot (7662/88066) with incised decoration. The interior glaze on this chamber pot is a different colour (a greeny brown). Russell Workman, scale 10cm.](image-url)
9. **Other shapes**: There are a range of other shapes but many have quite small counts: candle stick (5), colander/drainer (2), cup (7), jug (10), jug/jar (7), mug (5), mug/cup (2), saucer (10) and teapot (5), (Figure 4.12, Figure 4.13 ). The candle stick from Ball’s site is different to that found on a few other sites in Sydney and Parramatta. The mugs have more evidence of the overall shape of the form than found elsewhere. One of the saucers (7645/85499) is exactly the same as a ‘faux annular’ ware saucer found at Pitt & Campbell Streets (5215/37124).

![Figure 4.12: A range of different shapes were identified that had not been found previously: a black-glazed candlestick (7662/88501), a mug (7662/88083), a dish or saucer (7460/86643) used as a saggar with later glazes and breakage marks. Russell Workman, 8/3/2010, scale 10cm.](image1)

![Figure 4.13: Three children’s tea dolls set toys, lid, bowl and other vessel, made by Thomas Ball. Front left: 17.9 7662/89903; front right: 17.9 7648/89251 and back: 11.14 7460/86770. Russell Workman, 8/3/2010, scale 10cm.](image2)

### 4.2.4 Decoration

Seven different types of decoration or combinations for decoration were identified on 602 EVE count vessels (Appendix 4.1: Table 13). Handpainted decoration was the most common and 59 different designs were identified (Appendix 4.2: Decorative Type Series) on 433 (EVE) vessels, 72 per cent of all decorated vessels (Table 30). There were 12 different incised and rouletted decorative types on 131 vessels as well as a marbled decorative style (14) and green speckling (17) (Appendix 4.1: Table 31). The Decorative Type Series is based on the identification of different or distinct patterns but many similar elements are repeated within these patterns.
4.2.4.1 Handpainted Patterns

The patterns have been developed from some quite basic geometric or decorative techniques and are often painted in brown or green slips and typically on a yellow background (Figure 4.14, Figure 4.15). It is helpful to read this section while looking at Appendix 4.2 which illustrates the Decorative Type Series (Appendix 4.2; Appendix 4.1: Table 30):

- **Lines:** straight lines, wavy lines, curved lines, intersecting lines, two bands of intertwining lines forming a cable, either monochrome or bi-chrome in colour or wide bands. These were located in a mixture of positions: horizontally around the rim but occasionally vertically or on the base of the vessel.
- **Semi-circles:** bands of semi-circles, often close to being wavy lines but quite distinct. An occasionally double band of semi-circles.
- **Dots:** single dots, rows of dots, or dots inside and/or outside semi-circles; dots to make a circular flower motif.
- **Asterisk:** single or multiple asterisks or stars.
- **Dashes:** series of dashes or short curved lines.
- **Plant and insect motifs:** mostly abstract or simplified attempts to represent plants or insects.
- **Simplified attempt at an arrow (HP47):** May be an attempt to paint a broad arrow.

The most frequent handpainted decoration type is HP20 (37 EVE) which has a row of green semi-circles with dots above and below. HP3 has 33 examples with bichrome cable (entwined band of green and brown wavy lines). HP5 (33) is a single brown wavy line. HP8 (28) is a bichrome insect or bud. HP12 (19) is a wavy green line while HP14 (17) is a row of three connected dashes. HP 24 (17) is a line of brown dots separated by circular dot motif (abstract flower). HP25 (26) is a row of thick raised brown dots. Some of these decorative types are quite festive and may have been produced to sell at Christmas or for other festive occasions (Figure 4.16). This is suggested for HP20, HP23,
Figure 4.15: Bichrome floral or insect motif consisting of a central irregularly ovoid shape with dashes or petals, of contrasting colour radiating out from it in a single direction. Petals are in groups of two, four or six. These shapes were mostly dishes with fragments of a bowl at the top. Decoration was on the rim as well as the base of the dish. Russell Workman, 10cm scale.

Figure 4.16: HP20, a green wavy line with red brown dots, above and below, around the rim of pale yellow dishes. Row 1: 7460/#86118(3), #86103(3), #86111(2); Row 2: 7460/#86109(2), #86108(4), #86115(6); Row 3: 7460/#86120, #86107(3), #86113(7), #86114(5). Russell Workman, 25/11/2010, Scale 10cm.
HP24 and possibly HP27 because of the contrast between the green and reddish brown colours. Handpainted decorated vessels were found in seven contexts in the four main waster pits from the site (Appendix 4.1: Table 32).

Many of these simple painted decorations were probably applied using a slip cup. This is most obvious in the case of the raised drops found in a number of patterns. An example of a slip cup is illustrated in Carpentier and Rickard 2001: 126-127. This is discussed further in Section 4.5.

4.2.4.2 Incised and/or Rouletted (impressed) Patterns

There are 12 different ‘incised’ decorative patterns. Most have been made with a five-pronged tool placed against the leather-hard vessel while it rotated on a lathe or wheel to form a band of reeded or rilled lines (Figure 4.35, Figure 4.36). Different incised patterns are often used in combination up and down the body of the vessel (Appendix 4.2):

- Horizontal wavy lines of different spans: ID1, ID4 and ID7. Occasionally two of these differently spanned wavy lines are used on the same vessel. This indicates that at least in these cases the use of different lengths is a design decision and is not simply arbitrary. These are typically around the rim of a dish or bowl or pan or just below the shoulder of a lid. When used on a yellow vessel it is often highlighted with a band of green slip. Examples of intersecting bands of wavy lines (ID10) or a vertical bend of wavy lines (ID11) are occasionally found. These are also used down the bodies of mugs.

- Horizontal straight lines (ID2): these are termed either reeded or rilled and were typically of five lines. This pattern was found on rims and bodies, often emphasising the shape of the vessel. It was usually highlighted with a band of green slip. It is possible these were formed by a rouletting tool as suggested by Rickard but this is not certain (Figure 4.35, Figure 4.36).

- Three separate rouletted or coggled bands were identified. A circular tool with raised shapes was used to impress a pattern into the body of the vessel (Figure 4.17). The three identified bands are a mixture of different shapes:
  - ID3: impressed band of triangles and rectangles, some examples with green slip on yellow glazed vessel (Figure 4.37).
  - ID8: impressed band of triangles and circles.
  - ID9: impressed band of rectangles with circles (Figure 4.38).

- Incised series of vertical lines: identified as ‘faux shell edge’ (ID5 & HP6). Only one example so far found.

- Series of vertical incised or rouletted lines: probably made with a wide circular tool impressed into the vessel while it was turned on the wheel, ID6.

- ID12 is an unusual decoration with body panels created by incised horizontal and vertical lines with horizontal wavy incised lines within the panel. Only one known example.

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**Figure 4.17: Rouletting wheel used at the Lue Pottery, Lue, near Mudgee, NSW.**

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21 Rickard 2006: 34.
4.2.4.3 Moulded and Sprigged Patterns

- Sprigged: this is made by pressing a thin piece of clay into a shallow mould and producing a raised pattern (Figure 4.18). The finished product was glazed yellow with green highlights around the edge. Three sherds of this were found during cleaning in Area A (7644) above Pit 2. The sprig was attached to a clear-glazed brown vessel. Only five sherds have been found which suggests this type of decoration was not common.

- Most of the knobs or finials found had a raised impression probably produced by moulds in four sizes, with approximate diameters of 17mm, 22mm, 33mm, and 37mm. They appear to be flower forms but the quality of the knobs (knops) are of different degrees of production suggesting that some moulds were used more frequently and no longer produced a well-modelled knob. The knobs are similar to generic flower decorations found on British teapots decorated in slip wares but without the moulded leaves.22

The use of sprigged decoration was not uncommon in a range of British pottery traditions, such as commemorative jugs and stoneware jugs, but it was also used during the early manufacture of factory-made slipware.23

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22 Rickard 2006: 78-80; two of these are dated to about 1785.
23 Rickard 2006: 16 (figures), 24.
4.2.4.4 Marble or Agate Ware

This is not a ‘decoration’ but a mixture of two clays, pale red (orange) and white, mixed together to form the appearance of ‘marble’ when glazed (Figure 4.20, Figure 4.28). The glaze is mostly a ‘clear’ lead glaze to reveal the mixed colours of the fabric. Only 14 vessels identified as ‘marbled’ were found on site, in Areas A and B (Appendix 4.1: Table 13). It is noted that these were not identified in Stage 1 cataloguing but only during Stage 2. There are likely to be more marbled wares found in Stage 3 cataloguing.

In Britain this type of ware was introduced during the beginnings of the influence of decorative stones such as marble, agate and porphyry. In 1724 there was a patent for ‘an new art or method of staining, vein ing, spotting, clouding, damasking, or otherwise imitating the various kinds of marble, porphyry, and other rich stones, and tortoiseshell, on wood, stone, and earthenware’.24 The development of imitations of marble or agate or tortoiseshell slips was part of the beginnings of factory-made slipware which Wedgwood was already manufacturing some years prior to 1759.25 This is discussed further in Sections 4.6.1 and 4.6.2.

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24 Quoted in Rickard 2006: 19, pp. 18-30 for discussion of related techniques and slip designs and finishes.
4.2.4.5 Green Speckling
This involves the use of a deliberate pale green glaze with darker green ‘specks’ in the glaze (Figure 4.21). There were 17 examples of this style of decoration. Whether it was deliberate or accidental is hard to determine but its presence on 17 vessels in a number of contexts does support that it was a definite decorative technique. There is one example of a clear glaze with green specking (Appendix 4.1: Table 31). It is likely this type of decoration can be interpreted within the same tradition as marble or agate ware, perhaps as an imitation of green porphyry.26 This was a development from traditional slipware decoration where colours were intermingled and sometimes combed to create an imitation of marble (Figure 4.31). This is discussed further in Section 4.6.2. It is acknowledged that the green speckling found at this site is a poor quality imitation of these British techniques. It was an early style of slip decoration and fits in with the late eighteenth-century date range of Ball’s work as a potter in Britain.

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26 Rickard 2006; Rickard and others typically describe porphyry imitation in slip as ‘speckled’ 2006: 7, Fig. 13.
4.3 Tablewares, Serving and Teawares

In this section the finer wares are reviewed with the Utilitarian wares being discussed in Section 4.4. Identification of the quality of wares was made within the gross categories of 'fine', medium and utilitarian, with some rarer techniques specifically identified. Medium (809 or 30%) and Fine (74 or 2.8%) are typically associated with one of the food categories and well as children’s toys (Appendix 4.1: Tables 18, 19, 20, 26, 27, 28, 29, 34, 36, 37, 38, 46). Table 18 lists the different fabric thicknesses which were the main means to identify quality. Colour of glaze and vessel form were also used.

4.3.1 Functional Analysis

During cataloguing our normal practice is to identify the functional categories with which certain vessel shapes are typically associated. We use a tripartite system of General Function: i.e. food, household, personal, recreation etc, which places the artefact within a recognisable system of intended functions likely to be found within a ‘residential’ or ‘domestic’ occupation. The second step is a Specific Function which breaks the pottery into a range of functions within the General Function group. Such as with Food (GF), an item could be used for preparation, storage, tableware, serving and teaware or any grouping of these items such as tea/tableware or serve/tableware (Appendix 4.1: Table 23, 26). The Specific Function is further subdivided into individual shapes (Appendix 4.1: Table 24, 27). This process assists archaeologists in understanding the nature of the material they are cataloguing. To do this we need to understand these categories according to vessel shapes. Casey & Lowe have been working on this process for 22 years and the Thomas Ball Pottery site is a model of how it all comes together and how we need to tweak it in the face of substantial quantities of material.

The lead-glazed pottery has mostly been identified as falling within the food category, 1789 or 68 per cent of the EVE count (Appendix 4.1: Tables 23, 25), with a few personal items that had the same rim profile (mostly poes or chamber pots (28) or poe/bowls (38)). The five household items were candlesticks of the same shape. It is acknowledged that many of the items not yet identified

27 Casey 2004. Intended means what the manufacture designed the vessel for and perhaps the original intention behind the use of the purchaser.
will either fall into the food category once they have been re-catalogued in Stage 3 or remain unidentified due to insufficient lack of evidence. The recreation items were toys (5), probably pieces from a dolls or children’s tea set. The yard item was a garden pot.

### Food

The main categories into which food vessels were grouped are (Appendix 4.1: Tables 18 to 27):

- **Beverage** (5) mostly mugs or mug/cups but not ones typically identified as being used for ‘tea’, such as a tea cup with a saucer.
- **Containers** (81) more specific categories could not be identified with certainty but some could be identified as specific shapes, such as bowl (52), jar (1) and jar/crock (5).
- **Preparation** (571) food preparation is by far the largest category, being 21.7 per cent of all EVE counts but only 3.45 per cent of sherds (1705). Most of the identified vessels were pans (285, 10.86 per cent of forms) or pan/basin/bowl (113) or pan/bowl (112) with a few dishes (9) as well as two colander/drainers.
- **Preparation/Serve** (168) is another substantial category. This includes vessels that may have been used in either category, as neither of them could be excluded. This group mainly consists of bowls (52), dishes (44) and pans (70).
- **Preparation/Store** (212) mostly consists of crocks (137), crock/pot (20), and various sized jars (40), jug/jars (7) and lids (5). While it is likely that crocks were more typically used for storage vessels it is also possible that had they reached a residence they may have been used for cooking. Cooking vessels are rarely found, one good example is a cooking pot from Cumberland/Gloucester Street site.
- **Preparation/Tableware** (24) includes mainly dishes (15) and bowls (7) as well as a jug and a saucer as well as a probable jug handle.
- **Serving** vessels (15) are typically paired with tableware/serve or preparation/serve. Among the specific serving items area dish/bowl (10), jug (3) bowl (1) and a plate (Table 25).
- **Storage** vessels (93) are mainly various sized jars, medium (12) and very large (62), and lids (19), possibly for jars.
- **Tablewares** (165) include bowls (100), dish/plates (17) and plates (45). These are a mixture of medium quality bowls (77), some fine bowls (11) as well as medium (11) and utilitarian plates (34).
- **Tableware/Serve** (404) is a large combined group being mostly bowls (78) and dishes (295) as well as a few pans (7), plates (10), cups (6) and lids (7). Quite a few of the bowls are fine (21) and medium (45) quality wares. Many of the dishes in this group were decorated. The presence of decoration on vessels is considered likely to mean that it was for display purposes. Dishes were the mostly commonly decorated shape. It is possible that dishes were used to eat soup and ‘wet’ stews for people at a table. The use of the serving category is to acknowledge that they could also be used for serving food at the table, such as being used as a vessel to transport food to the table for communal serving.
- **Tableware/Tea** (28) also a mixture of vessels which may have been used at the table for a meal or as part of a tea set. These forms are typically remains of finer or medium quality bowls (13) or lids (4) that may have been used on sugar bowls or similar, as well as cups and saucers of various quality as well as jugs (2), possibly milk jugs.
- **Tea wares** (11) were infrequent, and included a cup (1), saucers (5) and parts of teapots (5). Four of the teapots were categorised as utilitarian.

#### 4.3.2 Quality

The majority of the food-related vessels were of utilitarian or medium quality. In the Stage 1 cataloguing program many vessels were identified as ‘utilitarian’ which were re-catalogued in Stage 2 as ‘medium’. This suggests that the current counts for utilitarian are likely to be inaccurate. Items identified as ‘medium’ or ‘fine’ should be correct where they were reviewed as part of the re-
cataloguing stage but there is likely to be some increase in numbers. This increase should be fairly limited as nearly 100 per cent of the handpainted material was reviewed in Stage 1 and most of this was fine or medium quality.

A utilitarian vessel is typically a thicker bodied, more robust form (Appendix 4.1: Table 18). They are found in a range of colours, even including yellow, which is often found on ‘medium’ quality vessels. Utilitarian vessels include pans (309), pan/basin/bowl (113), pan/bowl (104), bowls (160), poes (chamber pots) (25), poe/bowl (23), crocks (139), lids (61), and jars of various sizes (105) (Appendix 4.1: Table 19). Many of the same vessels occur in ‘medium’ (6-10mm thickness and often decorated) but this category is dominated by dishes (336) (Tables 20, 28). Many medium quality vessels were decorated, usually yellow glazed and handpainted, or handpainted and incised, or simply incised. Some pans (59) are included in the medium group as there were some thinner-bodied pans as well as decorated ones (Appendix 4.1: Tables 15, 19, 20). There were approximately the same number of ‘medium’ quality bowls (159) identified as utilitarian ones (160). The finer vessels are often thin-walled (2-6mm) and yellow glazed and decorated. These were often of faux annular ware or more correctly ‘imitation dipped ware’ as it is now being termed. Most of the finer (74) vessels were bowls (46) and dishes (10) as well as a few cups (3) and saucers (3).

The use of ‘faux stoneware’ during Stage 1 cataloguing was based on a visual inspection which was confirmed by Nick Pitt’s honours research (Section 9.2). The quality of the fabric and the use of decoration place it in the medium quality range while the vessel forms would suggest they were utilitarian. It is acknowledged that this description is not actually ‘quality’ based but it is quite a distinct ware and decoration and quality boundaries at Thomas Ball’s potter are quite mutable.

Medium and Fine
This group consisted of (Appendix 4.1: Tables 27, 45, 46):

- **Bowls** – tableware (77 medium and 11 fine), tableware/serve (21 fine and 45 medium).
- **Cups** - tableware/serve (2 fine and 2 medium).
- **Dishes** – preparation/serve (36), preparation/tableware (12), tableware/serve (273 medium and 10 fine) and faux annular ware or ‘imitation dipped ware’ (3 fine).
- **Dish/plate** – tableware (15).
- **Mugs** - beverage (3 medium) or mug/cups (2 medium).
- **Pans** – preparation/serve (35) a thinner group of pans not typically found on other sites, tableware/serve (9).
- **Saucers** – tea (3 fine and 2 medium); tableware/tea (3 medium).
- **Poes or chamber pots** – personal/food (12 medium and 2 fine).

The most common shapes among the medium and fine vessels were bowls (810), dishes (283), pans (48), lids (10) and cups (3) and saucers (9). The majority of finewares are tea bowls or tableware bowls with a few dishes creeping into this category.

### 4.3.3 Decoration
Not all of the decorated vessels are tablewares, serving vessels or teawares. Quite a few utilitarian vessels are decorated with incised patterns (Table 34). The utilitarian decorated vessels will be discussed below (Section 4.4.4). The majority of the handpainted vessels are fine (51 EVE or 8.5%) or medium quality items (368 EVE or 61%) (Appendix 4.1: Table 34). The commonest decorated forms in medium and fine wares are (Appendix 4.1: Tables 45, 46, 47, 48):

- **Dishes** – (283 or 62%) handpainted decoration was found on 249 vessels with only 20 being incised and handpainted. The majority of dishes were made for tableware/serve. The form of the dish was a relatively rare shape prior to excavation at this site, being the most found from any Casey & Lowe site.
- **Bowls** – (81 or 17.7%) were the next most commonly decorated food shape. Most of these (63 or 13.8%) were handpainted with a few being speckled (8) and marbled (6). A number of these bowls were quite small and fine, notably the faux annular wares and other thin walled bowls.
- **Pans** – (48 or 10.5%) were pan forms which were mainly handpainted (42) with a few incised (1) also incised mixed with painting (3) or rouletting (1).
- **Lids** – (10) while a relatively small in number the ones in the tea/serve, tableware/tea or tableware/serve category were often the fine faux annular ware and were lids for fine bowls. The decoration was typically a mixture of incised band of lines on a yellow glaze with a green slip highlighting the band.

Handpainted dishes were typically decorated around the rim and often with a central decoration on the base of the dish. Good examples of dishes illustrated in Appendix 4.2 are: HP1, HP2, HP7, HP8, HP11, HP20, HP24, HP31, and HP38.

### 4.4 Utilitarian Ware

Utilitarian vessels (1780) come in a range of vessel shapes and functions with many coloured glazes and fabrics. It is acknowledged that many of the items identified as Utilitarian are likely to be re-identified into medium if we go to Stage 3 cataloguing. This is why there are occasional anomalies such as utilitarian tablewares which should presumably be medium rather than utilitarian. These are thicker bodied, more robust vessels (usually thicker than 10mm) which dominated the pottery corpus found at this site.

Approximately 66 per cent of identified quality categories at the end of Stage 2 cataloguing were utilitarian (Appendix 4.1: Table 18). These types of vessels are often found on pre-1850 archaeological sites in Sydney and Parramatta: i.e. Parramatta Justice Precinct, cnr George & Charles Streets, Parramatta, cnr Pitt & Campbell Streets, Haymarket and the bakehouse at the Conservatorium of Music site.

#### 4.4.1 Fabrics

The colours of the fabrics, as discussed above in Section 4.2.1, relates to the colour of the original clay. Variations within the colour of the fired fabric or clay will relate to firing conditions. As we are analysing pottery wasters it is known that all of the pottery was thrown out as it was considered to be of a quality too poor to sell as it had suffered damage during firing or manufacturing. Therefore the colour of the fabric in many cases is not the intended colour (mostly due to over firing or underfiring) but also because of other conditions that may arise within the kiln, i.e. uneven firing or explosions. Many sherds still give us some idea of the original (or intended) colour of the fabric. In the case of the utilitarian pottery the commonest colour was pale red or pale orange (1152 or 67%) with darker versions of red (59) or dark red (77) followed by white or cream (347 or 20%) (Appendix 4.1: Table 42). The grey fabrics are often overfired. The dominance of the pale red or pale orange fabric is surprising and was not necessarily expected based on our experience at other sites.

#### 4.4.2 Glaze Colours

Utilitarian vessels typically have a single glaze but will on occasion have a differently coloured interior glaze. Twenty-seven examples of different coloured glaze were identified: dark red/mulberry (337 or 19.9%), brown (297 or 17.5%), red brown (240 or 14.2%), pale brown (210 or 12.4%), yellow (180 or 10.6%), black (79 or 4.7%), olive (71 or 4.2%) or pale yellow (65 or 3.8%) (Appendix 4.1, Table 41). While most of these colours were already known from other sites the dark red/mulberry coloured vessel on a red fabric was not known to Casey & Lowe which is surprising as these were the major single colour found on utilitarian vessels (Table 41). The dark red/mulberry glaze is mostly found on pale red (268), red (29) or dark red (11) fabrics (Appendix
4.1: Table 43). This indicates that Thomas Ball deliberately used this dark glaze on darker coloured fabric vessels. The majority of yellow vessels had a white (115) or cream (27) fabric but were occasionally found on pale red (23). Pale red fabrics also had brown (231), pale brown (149), and red brown (208) glazes. Pale yellow glazes were mostly found on a cream (40) or white (14) coloured fabric - only 10 vessels had a yellow glaze on a pale red fabric.

4.4.3 Functional Analysis

Utilitarian vessels come in a range of General Functions. Food is the dominant category with 1080 vessels (Appendix 4.1: Table 38). Many were unidentified (641) at the end of Stage 2 cataloguing but it is anticipated that many would be re-categorised into food function as part of Stage 3. There are a number of household vessels (6) as well as personal (25), personal/food (23). 641 vessels are currently within the unidentified category.

Food

An examination of major food Specific functions identifies the following groups (Appendix 4.1: Table 38 to 40).

- **Beverage** (2) – mugs.
- **Containers** (71 or 4%) – more specific categories identified within the Utilitarian group were: bowl (50), jar (1), jar/crock (5), and lids (3).
- **Preparation** (537 or 30%) – the main shapes were pan (273 or 15.3%), pan/basin/bowl (113), pan/bowl (104) and bowl (36).
- **Preparation/Server** (84 or 4.7%) – with mostly bowls (42), pans (35) and a few dishes (7).
- **Preparation/Store** (201 or 11.3%) – is another crossover category with mostly crocks (13), jars (34) and crock/pot (20).
- **Storage** (91 or 5%) – is mostly jars (71) and lids (20) probably made to go with the jars or the crocks.
- **Tablewares** (46 or 2.5%) – these forms are plates (32) and bowls (11). Again it is possible these would be re-catalogued as medium quality.
- **Tableware/Server** (16) – are a mixture of bowls (7), dishes (3), plate (2) and cups (2).
- **Tea** (4) – four teapots were identified by spouts. It is likely that a few knobs were identified which may have come from teapot lids but there was insufficient evidence to catalogue them as teapots. It is noted that none of the finer knobs had a steam hole as found on what is probably a Thomas Ball teapot knob from the Parramatta Children’s Court site.28

What is clear from this work is that sometimes the separation of vessels into separate functional categories can become a complex interpretive process. The categories we use as part of our analysis for general archaeological sites (many of which are residential in nature) are designed to help us interpret common research questions. A pottery manufacturing site which is making types of pottery not normally found at residential sites requires different categories. It is acknowledged that some of these vessels could as easily be placed in the category of preparation/store/serve. In some cases the reduction down to preparation/serve has been made where they were decorated. This is considered to indicate an intention to display the item rather than have it retained purely for functional use in a kitchen.

Personal

- **Hygiene** (25 or 1.4%) – are all chamber pots or poes. A number of these had a different coloured interior glaze with a high gloss finish.

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28 Casey & Lowe 2006, Section 4, 92, Fig. 4.4, middle, front row. It is a moulded knob with a central steam hole in creamy yellow glaze with some evidence of green decoration on the lid.
Personal/Food
- Hygiene/preparation (23 or 13%) relates specifically to a vessel type which is the same as the poes but they are decorated on the inside which is not expected with a chamber pot which is more typically decorated on the exterior.

Unidentified
- Containers (76 or 4.2%) – are mostly lids (27) for storage vessels.

4.4.4 Decoration
There were 602 decorated vessels but only 87 were utilitarian (Appendix 4.1: Table 34, 36, 37). The most frequent decorative techniques were incised (47 or 7.8%), rouletted (15 or 2.5%), handpainted (11 or 1.8%), incised and painted (6), marbled (4) and speckling (3). The majority of the decorated vessels were handpainted pans (5), incised pans (16), poes (12), bowls (5) and poe/bowl (4), and incised and painted pans (4). Rouletting was found on pan/bowls (3), pans (2), crock (1), poe (10), poe/bowl (1) and jar/bowls (2) and a jar (1). Marbled fabric was found on a pan (1), pan/bowl (1), and a plate (1).

The most frequent decoration styles are: (Appendix 4.1: Table 44; Appendix 4.2)
- ID1 (24) – a combed band of incised horizontal wavy lines – medium wave.
- ID2 (15) – combed or rilled band of horizontal straight lines, with typically five incised lines in the band. These can be below the interior or exterior rim or around the exterior body.
- ID3 (10) – Narrow coggled band consisting of repeated tiny impressed triangles and rectangles.
- ID7 (3) – Combed band of sharp wavy lines. The sharp wave typically has a near vertical return.
- ID6 (3) – Wide band of vertical incised or rouletted lines, may be coggled rather than incised or rouletted. Mostly found on large preparation or storage vessels.

4.4.5 Mulberry Ware
A total of 350 or 13.3 per cent of vessels were decorated with an interior dark red or mulberry-coloured glaze (Appendix 4.1: Table 12). Only 43 or 1.6 per cent of vessels had an exterior glaze in dark red or mulberry. A full range of food preparation, storage and beverage shapes were found in this colour as well as chamber pots or poes (7) and part of a teapot (Table 17). Of the 350 vessels a total of 337 were utilitarian (Table 41). This was the largest single coloured glaze in the utilitarian category. This glaze was found on a number of different fabrics (mostly pale red (268) or red (29), but also dark red (11), orange (10) and pinky brown (9)) (Table 43). This suggests that this glaze was developed to more easily cover reddish fabrics.

While the majority of mulberry ware is undecorated, 36 EVE or 210 sherds were decorated. Most of these (25) were decorated with incised lines and the remaining 11 had rouletted decoration (Appendix 4.2).
4.5 Decorative Techniques

This section discusses the techniques used to apply the individual decorative elements of the wider patterns in the Decorative Type Series (Appendix 4.2). They are arranged according to decorative motifs such as dots and lines, which themselves are combined to form the different decorative types. Firstly, the possible colouring materials used for decorations will be discussed, and then the method of application of colouring material will be considered.

It also should be noted that these comments are based on visual inspection of the handpainted pottery of Thomas Ball combined with broader knowledge of pottery techniques current in the early nineteenth century. No technical or scientific examination of the decorated pottery from the site has been undertaken.

4.5.1 Possible colouring material

The handpainted pottery from 710-722 George Street appears to be based upon three main colours (red brown, brown and green). The brown and green colours can occur in slightly different variants. The possible sources of these colours are discussed below.

Red brown

Red brown decorative motifs occur on numerous decoration types (red brown dots occur on HP 13, 20, 21, 23, 24, 25, 27, 28, 29, 30, 31, 33.2, 39, 46, 50 and 58; red brown lines occur on HP 8 and 46). The colour of the motifs is typically around ‘reddish yellow’ (7.5YR 6/8) or ‘yellowish red’ (5YR 5/8) on a pale yellow (5Y 8/4 or 2.5Y 8/4) glaze. Red brown decorations are visibly raised from the surface of the vessel (for instance the dots on 7645/#85315 are 0.3mm above the surrounding glaze surface) and at least one example shows evidence of a dot falling off a vessel before glazing and

Figure 4.22: Range of incised vessels, mostly with a mulberry-glazed vessels with ID1 decoration on the right of the photo. Front row: 7662/#88132(1), 7662/#88111(4), 7662/#88104(2); middle row: 7662/#88101(1), 7662/#88106(11); Back row: 7663/#87043, 7645/#85912(3), 7662/#88103(2). Russell Workman, scale 10cm.

This section was written by Nick Pitt in discussion with Mary Casey.
firing (7645/#85315, Figure 4.23). The example shown in Figure 4.23 also features a dot from which the glaze has partly worn, revealing what appears to be a halo of clay fabric of a similar red brown colour. For these reasons, it seems likely that red brown decorations were produced by applying a red brown clay slip to ceramic vessels made with a white-firing clay fabric, once these vessels were dry. How this slip may have been applied to the vessels is discussed below.

Brown decorations occur as both dots (on HP 16, 20, 23, 24, 25, 35, 36, 41 and 44) and lines (on HP 1, 2, 3, 4, 5, 7, 8, 10, 11, 13, 14, 15, 16, 17, 18, 19, 26, 29, 27, 29, 35, 37, 38, 41, 42, 43, 44, 45, 46, 47, 48 and 49) in the decorations of vessels from 710-722 George Street. Brown decorations should be seen as a distinct colour from red brown decorations, as demonstrated by a few sherds on which brown and red brown co-exist, one of which is shown in Figure 4.24. The colour of the brown decorations ranges from ‘dusky red’ (10R 3/3) to ‘dark brown’ (7.5YR 3/4).

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30 A slip is a homogenous mixture of clay and water which may or may not have additional components added to it, in order to modify its properties. Slips can be used for coating ceramic vessels to give a smooth finish, for manufacturing moulded vessels using a technique called slip-casting, and for decorating vessels, as appears to have been the case here. See “Slip” in Hamer & Hamer 2004: 332-333.
Brown decorations can also appear to be raised from the surface of the vessel, although generally this is much less pronounced than for red brown motifs, with some brown decorations appearing at roughly the same level as the surrounding glaze. Some brown decorations also have a metallic sheen or lustre. Figure 4.25 shows an example of brown dots which are both raised from the general glaze surface and showing a metallic sheen.

Since brown decorations can be raised from the surface of vessels, it appears that they were again produced by applying some colouring material such as a slip to the surface before firing (and probably before applying the glazing material). Although the exact nature of this colouring material cannot be known without technical analysis (such as SEM-EDS performed for other groups of pottery from this site\textsuperscript{31}) some reasonable suggestions can be made on the likely colouring material. Firstly, it is very likely that the brown-coloured material was being applied as a slip with an additional colorant. Adding a colouring material is a practice known to be used for other slip decorated ware manufacturers.\textsuperscript{32} Furthermore, the colouring material which was used was probably an iron oxide compound added to the clay. Iron oxide added to a glaze under a neutral kiln atmosphere\textsuperscript{33} gives brown colours.\textsuperscript{34}

Green
Green decorations occur both as lines (HP 1, 2, 3, 4, 6, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 27, 28, 29, 30, 31, 32, 33.1, 33.2, 34, 35, 36, 37, 38, 39, 40, 42, 43, 45, 46, 47, 49, 50, 51, 52, 55 and 56) and dots (HP 22, 24, 25, 26, 29, 31, 40, 48, 53, 58 and 59). In some instances green decorations can appear raised from the general surface of the vessel, especially when thickly applied. This can be seen in the examples shown in Figure 4.24 and in Figure 4.27. However in most cases the green decoration appears quite thin and not raised above the level of the glaze, as is seen in the example shown in Figure 4.23. Green decorations also show a tendency to run in the glaze, as can be seen in the example shown in Figure 4.26. The exact shade of green observed in the decoration varies between vessels, sometimes appearing quite green-brown, but the colour never varies on the same sherd.

\textsuperscript{31} See volume 2, section 9.2, “Scientific Analysis of Thomas Ball Pottery”.
\textsuperscript{33} A neutral kiln atmosphere means that the gases in the kiln favour neither of two major groups of chemical reaction – oxidation reactions or reduction reactions. Which of these two groups of reactions occur during firing will determine what forms many chemical compounds are present, and thereby determine the colour of the pottery produced.
\textsuperscript{34} Hamer & Hamer 2004: 188.
Figure 4.26: Decorated rim fragments HP33.1 (7460/#86186), showing a motif based on green lines which demonstrates the tendency of green decorations to run in the glaze. Russell Workman, 10cm scale.

Again, as the green decoration can appear raised, it seems likely that it applied as a slip with additional colouring material. The additional colouring material was probably a form of copper or a copper compound, as other sources of green colour in glazes, namely chromium and iron fired in a reducing atmosphere (a ‘celadon’ glaze) result in greyish greens. The form of copper used as the colorant was likely to have been either copper metal filings, or black copper (II) oxide (CuO), as both will result in speckled glazes, compared to red copper (I) oxide (Cu₂O) or copper carbonate (CuCO₃). If copper was the colorant for the green decoration, it may also account for several other features that these decorations display. Copper oxide dissolves readily in molten glazes, leading to colour bleeding, as observed in the green decoration. Copper in glazes also requires an oxidising kiln atmosphere to produce a green colour. In a reducing atmosphere it would produce a reddish brown. Therefore where green decorations appear more brown it may be because of a less oxidising kiln atmosphere and some atmospheric reduction.

4.5.2 Possible decoration application techniques
For reasons explained in the discussion above, the colouring material used to decorate vessels from Thomas Ball’s Pottery appear to have applied as a coloured slip. The decorations show two main decorative components for any decoration type (dots and lines). How a clay slip may have been applied to produce dots and lines is discussed below.

Dots

38 Hamer & Hamer 2004: 81-82.
Dots occur on numerous decoration types from 710-722 George Street (HP 13, 16, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33.2, 35, 36, 39, 46, 48, 49, 50, 58, 59), and in three main colours, namely red brown, brown and green. Dots appear to range in diameter between 3mm and 8mm. The colouring matter appears to have been applied using a nail head. This conclusion is based upon the presence of a dimple in the centre of many dots. This dimple is particularly visible in red brown dots. According to Lynne Sussman, such a dimple is characteristic of applying slip decoration using a nail head. The nail head would have been dipped in the slip and then used to apply the slip to the vessel surface. Figure 4.27 shows a particularly clear example of a dot with a visible dimple in its centre.

![Figure 4.27: Rim sherd with decoration type HP24 (7460/#86142, interior), showing pronounced dimple in the centre of dot decorations. Russell Workman, 1cm scale divisions.](image)

Although Sussman also refers to the use of nails hammered into a board being used to make a repeating pattern of dots, such as floral motifs similar to HP24, it seems unlikely that this technique was used by Thomas Ball at his Pottery on George Street. This is because the relative positions of the dots in each floral motif are slightly different, even when motifs on the same vessel are compared. Also there were different numbers of dots on various vessels, suggesting the pattern was not produced by a device that provided for repeating of a decoration.

**Lines**

A variety of lines appear in decoration types from 710-722 George Street, namely short lines which comprise part of a more complex decorative motif (HP 2, 4, 7, 8, 10, 11, 14, 15, 16, 19, 30, 33.1, 33.2, 34, 37, 38, 46, 47, 49, 51 and 52), continuous wavy or semi-circular lines (HP 1, 3, 5, 12, 13, 15, 16, 17, 18, 20, 21, 22, 23, 26, 27, 28, 29, 31, 32, 35, 36, 40, 41, 42, 43, 44, 45, 50, 54, 56 and 57) and continuous straight lines (HP 6) which form a band around a vessel. As discussed above, many examples of the decorations (including lines) appear raised above the surface of the vessel they are on. This suggests that the line decorations were applied by slip-trailing, which can produce such a result. It should be noted that applying decorative lines and bands by brushing does not produce raised lines and it also only appears to have become more common after c.1880.

Slip-trailing, such as that which appears to have been used for these ceramics, was performed using a slip-bottle or blowing-pot. According to descriptions from slightly later in the nineteenth century,

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40 Sussman 1997: 10, 15 (fig 15 & 16); also Rickard 2006: 94 referring to trials by Anthony Butera.
this consisted of a container with a larger opening and a spout, resembling a tea-pot. The potter filled the container with slip and then blocked off the larger hole with clay. One or sometimes several quill pipes were passed through the clay plug. When the potter blew air through the ‘spout’ of the container, the slip was forced out of the quill.

As the decorated vessels from Thomas Ball’s Pottery do not appear to have sets of exactly parallel lines, each line appears to have been applied individually, implying that only a single quill at any one time was being used for the slip-bottle. Slip-trailing is a versatile technique and would be capable of producing all the line based motifs seen on vessels from 710-722 George Street, including continuous straight lines, wavy lines and floral motifs. Although slip-trailing was often used with a lathe for decorating the exterior of vessels, there seems to be no reason why a similar effect could not be achieved through rotating vessels more slowly on a potter’s wheel. Indeed, this seems the most effective means of achieving the horizontal bands and wavy lines on the interior rim of many dishes from the site.

4.6 Imitation of and Influences from Contemporary British Ceramics

4.6.1 Marble or Agate Ware

This is not a ‘decoration’ but a mixture of two coloured clays to form the appearance of ‘marble’ when glazed (Figure 4.28).

Marble wares comprised of different coloured clays are typically called ‘agateware’ to differentiate them from pottery which has been decorated using different coloured slips to produce a marbled surface finish. There are two broad categories of agateware – ‘thrown agateware’ made by wheel throwing, and ‘laid agateware’, also known as ‘press molded agate’, which is made by moulding vessels with a prepared sheet of marbled clay. As the marbled/agateware from the Pottery of Thomas Ball at 710-722 George Street were wheel thrown, the remainder of this discussion will be restricted to thrown agateware.
The earliest recorded thrown agateware produced in England appears to have been made in the late seventeenth century by the London potter John Dwight. Production of agateware in England on a commercial scale did begin until around the 1730s, when potters were manufacturing thrown agateware in the Staffordshire potteries. Production in Staffordshire continued until the 1770s. These Staffordshire examples were twice-fired, lead-glazed earthenware. A thicker type of thrown agateware was produced in the late eighteenth century in Staffordshire and used for plates, dishes and bowls. Although thrown agateware production in Staffordshire is said to have ceased by the end of the eighteenth century, it did continue to be produced in other areas of England throughout the nineteenth century.

At least two contemporary potters have described methods for producing thrown agateware. The first stage in producing agateware is to build up a stack of slabs of different coloured clays. The coloured clays selected should be compatible with one another in terms of shrinking rates, firing temperatures, and other physical properties. Once the slab has been formed, it needs to be ‘wedged’ or kneaded, although care needs to be taken while kneading, to ensure that different coloured clays do not become blended together, blurring the agate pattern. After wedging, the clay is thrown no differently to usual, except that care needs to be taken so that the clay is not overworked and the layers remain distinct. After throwing, the exterior and interior surfaces of the vessel need to be scraped or turned to remove a muddy layer on the surfaces and reveal the marbled fabric. Once the marbled fabric is revealed, the vessel is complete and can be fired, or it can be treated with other common place techniques, such as attaching handles or glazing.

The marbled ware found on site was not identified in Stage 1 cataloguing but was recognised early in Stage 2. As far as we can determine no other known examples of locally-made marbled or agate ware have been identified. It is possible to interpret the use of ‘agate’ as an attempt to imitate a marbled finish such as will be discussed below in the section on factory-made slipware (Figure 4.33, Figure 4.34; Section 4.6). A total of 14 vessels in marbled clay were found during Stage 2 cataloguing (Appendix 4.1: Table 13). These were bowls (7), dishes (2), and the lids of a pan, pan/bowl and unidentified (Appendix 4.1: Table 15). All were either utilitarian (4) or medium (10) quality vessels (Table 34). Eight of the marble vessels came from 7460 in Area B and six from Area A, three each from contexts 7645 and 7464. Because they were not recognised in Stage 1 cataloguing the small count is not accurate but it is likely that as we have catalogued 25 per cent that this type of fabric, which is also a deliberate decoration, was a very small proportion, perhaps 0.2 per cent of the overall decorative corpus (Appendix 4.1: Table 14). While it is possible the count for this fabric may triple when we catalogue the remaining 75 per cent in Stage 3, it is not likely to be more common than 1 per cent of the decorative corpus.

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51 Erickson & Hunter 2003: 87-89.
52 Erickson & Hunter 2003: 90-91; Also Rickard 2006: 20.
59 Erickson & Hunter 2003: 89.
61 Hewitt [c.2000].
4.6.2 Imitation Factory-made Slipware\textsuperscript{64}

4.6.2.1 Background
The use of the terminology ‘faux annular ware’ in relation to some locally-made pottery arose from the assumption that it was considered to be a copy of annular ware and was first suggested in Casey 1999. This was the first identification of locally-made pottery imitating British contemporary pottery. Our understanding of this decorative style has developed since this time in relation to trying to tie down the derivation and nature of the use of a band of incised or rouletted lines (typically 5), more usually called reeding or rilling, which in all overseas examples is considered to be produced by engine turning on a lathe and frequently found on Mocha ware or slipware as a secondary level of decoration. It is noted that the green slipped or glazed reeded rims were produced by 1792.\textsuperscript{65}

Factory-made slipware is incorrectly also called banded or annular ware and in the late nineteenth century was called ‘dipped’ ware. In modern terminology it is frequently called Mocha ware which is a particular decoration on factory-made slipware using a specific technique with the appearance of a ‘delicate tree-like’ or dendritic markings rather than a different ware (Figure 4.29). These types of Mocha marking are considered to have originated from the imitation of decorative elements found in a moss agate or mocha stone.\textsuperscript{66}

The mechanized techniques of slipware were developed from the 1764 onwards when Wedgwood began to experiment with a horizontal mounted engine lathe to decorate English creamware and redware pottery. The decorations used on this type of pottery are different to those used to decorate factory-made slipware but the technology used was similar.\textsuperscript{67} The use of the lathe allowed a potter to decorate pottery in a precise and repeatable way by placing the pot on a lathe and turning it and applying decoration, such as a band of rilled or reeded lines or a coggled or rouletted impression around the rim. Later on the lathe was developed to cut out decoration in the leather-hard clay, often through a coloured slip to provide a contrasting decoration. While the lathe could be used in two ways the one relevant to this discussion was the decoration of a leather-hard pot mounted on the engine-turned lathe and a shallow pattern of repeat decoration rouletted or incised into the rim of the vessel.\textsuperscript{68}

![Range of mocha ware tree-like patterns, Stoke-on-Trent Museum. Mary Casey 2005.](image)

\textsuperscript{64} This section researched and written by Mary Casey and based on research in Lynnette Sussman (1997), Jonathan Rickard (2006), and J. Hawkins (1999), as well as some other references. This style of decoration was previously called Faux Annular Ware but we are now calling it Imitation Factory-Made Slipware.

\textsuperscript{65} Rickard 2006: 12, 13.

\textsuperscript{66} Sussman 1997: 26; Rickard 2006: 46.


\textsuperscript{68} Carpentier and Rickard 2001: 116; Rickard 2006; Sussman 1997: 4-5.
Factory-made slipware, also called industrial slipware\(^{69}\), used many of the decorative techniques of seventeenth and eighteenth-century slipware made in small country potteries in Britain (Figure 4.29, Figure 4.33). In a traditional country pottery, the potter applied slip decoration to change the colour of the vessel from the red or orange colour of the local clay. The slip was also applied as a coloured slip decoration. Slip is made from watery clay. Many slipware vessels were decorated with animal scenes as well as simple decorative techniques of lines, wavy lines and dots as well as marbled finishes. Those illustrated in

Figure 4.30, Figure 4.31 and Figure 4.32 represent a range of simpler styles produced on mostly utilitarian vessel shapes including: pans, plates or dishes, mugs, cups, tankards and jugs.

![Figure 4.30](image)

**Figure 4.30:** Dish or plate with an orange fabric covered with a dark brown coloured slip. Simple trailed decoration of lines, zig-zags and dots. Design probably applied by a slip cup with three quills which allowed three lines to be trailed simultaneously. Probably Midlands or north of England, second half of 18th century. Diam. 305mm. Stoke on Trent Museums webpage, Slipware Collection, Accession number 1951 P3.

The traditional slipware was a coarse or unrefined earthenware while all factory-made slipware was made in refined earthenware, basically the same fabric as contemporary tablewares: creamware, pearlware and whiteware. Traditional slipware was very much in the tradition of country potteries and their focus on producing utilitarian pottery for rural and domestic life which were not for use at the table. While factory-made slipware was produced in a refined fabric it was also the cheapest decorative pottery available during the early nineteenth century and was not intended for tableware.\(^{70}\) Other influences on factory-made slipware came from attractive stones such as agate, marble and porphyry. Potters produced marble-like finishes which presumably sought to represent the more expensive finishes used in decorative arts and furniture in the finish or glazes of pottery, presumably intending to convey the impression that the vessels were more valuable than they were (Figure 4.34).\(^{71}\) Also see Section 4.6.1 for discussions on agate ware or marbled clay found at the site.


\(^{70}\) Rickard 2006: 15.

\(^{71}\) Sussman 1997: 1; Rickard 2006: 15.
Figure 4.31: Late seventeenth to early eighteenth-century slipware excavated on the Sadler Pottery Site, Burslem. Probably manufactured by Richard Parrot. A combed marbled slip decorated vessel is on the lower right shelf. Stoke-on-Trent Museum, Mary Casey 2005.

Factory-made slipware was mostly focused on hollow vessels while traditional slipware involved decoration of many open vessels as well as hollow vessels (Figure 4.31, Figure 4.32, Figure 4.33). The use of wheels or lathes in the decoration of factory-made slipware led to a shifting focus of where decoration and how decoration was placed on the vessel. On hollow vessels, new designs were introduced with strong elements of horizontal decoration on the vessel: the rim, the shoulder and the foot. This rose out a new way of looking at the vessel in relation to using a lathe to turn it for decoration. We begin to see reeded decoration round the rim as well as other coggled bands.\textsuperscript{72}

The same is seen with Ball’s finer hemispherical bowls which were decorated on the exterior although the open vessels had horizontal rim decoration (Figure 4.35, Figure 4.36). Once the design shifted to open vessels the new fields of horizontal design no longer worked and more traditional approaches to decoration continued, such as decoration in slip bands or lines and dots around the rim with more detailed or decorative decoration in the centre of the flat vessel.

\textsuperscript{72} Sussman 1997: 4.
Figure 4.32: Slipware probably from William Burns Pot Works, Burslem. Stoke-on-Trent Museum, Mary Casey.

Figure 4.33: Range of factory-made or industrial slipware, Stoke-on-Trent Museum. Most are late eighteenth and early and mid-nineteenth-century examples; all are probably British. Mary Casey.
4.6.3 Direct Decorative Influences from Factory-made Slipware

4.6.3.1 Reeding or rilling with green highlighting

The use of reeding or rilling as a secondary decoration on factory-made slipware was typically found in association with creamware (1790-1820) and pearlware (1780-1840) vessels and rarely found on whitewares (1830 to present). Rouletted bands also had a similar date range and use. Among the decorative rim treatments used were: plain rouletted, green or other colour stained rouletted, plain rilled, green or other colour stained rilled. The presence of a rim decoration, a second decoration other than the main slip decoration, is thought to only have occurred during the earlier period (1790-1840s) as it was more expensive to produce two types of decoration and therefore these stopped being added to keep the price of these vessels down.73

Unlike the British factory-made slipware, the use of reeding or rilling and rouletting was the main decoration by itself other than being highlighted with green slip (Figure 4.34). In the case of the imitation factory-made slipwares produced by Thomas Ball the reeding and green slip is always the main decoration on the pale yellow or cream glazed vessels, mostly cups, bowls and lids, and saucers. The use of green-slipped engine-turned rilling was typically a decorative technique used at the top and base, or occasionally the shoulder, of a jug or mug or pepper pot in Mocha, Slipped or Dipped wares.74 We have seen no examples of this decoration used by itself other than what is most likely to be locally-made pottery, presumably by Thomas Ball.75

75 Although it is noted that we are currently cataloguing some from 15 Macquarie Street, Parramatta which is very fine and we hesitate to attribute it to Thomas Ball at this time.
Figure 4.35: Variety of reeded lines (ID2) highlighted with green slip (HP6) which is similar to factory-made slipware on creamware. Remains of four lids are in the left column (front to back): 7662/#88461(1), 7663/#86827(1), 7645/#85354(1), 7645/#85258(1). In the middle column: 7460/#86383(2), 7645/#85256(2) - frags of a cup, 7662/#88460 - partial lid; right column: 7663/#86825(1) - bowl, 7645/#85499 - base, 7650/#89274 – base. Russell Workman, 3/2/2011, scale 10cm.

Figure 4.36: Range of thicker vessels, all dishes. Bottom row (LtoR): 7663/#86824(5), 7646/#85221; 2nd row: 7662/#88464(5); 3rd row: 7662/#88463(5); Back row: 7645/#85266(3), 7646/#85267(3). Russell Workman, 3/2/2011, scale 10cm.
More Factory-Made Slipware Influences
Following on from the discussion of reeded decoration frequently found on factory-made slipware above there are other similarities in the decorative techniques used on the utilitarian styles that are worth investigating. There are other elements of slipware that Thomas Ball may have borrowed and modified. One of the main problems in applying this hypothesis easily to our vessels is that the greater majority of the handpainted vessels were open dishes rather than the tall and closed vessels typically manufactured for slipware. It is therefore more likely that the incised and rouletted decoration is the key to the relationship with factory-made slipware.

Other decorative elements of factory-made slipware found on Thomas Ball pottery other than the use of reeding with green slip highlighting are (see Appendix 4.1: Table 30, 31 for EVE counts within each decorative type):

- Rouletted bands around rims with green slip (Rickard 2006:32-33, 35, 36, 91, 93), (Figure 4.37, Figure 4.38).
- Use of wavy or zig-zag line decoration (Rickard 2006:36, 53, 68; 89, fig. 124; 91, 92, 93); (Appendix 4.2: HP12, HP13, HP15, ID1 & HP6).
- Bands of dots (Rickard 2006:71, 77). (Appendix 4.2: HP24, HP25, HP58?).
- Simple flower motifs constructed from a circle of dots with a central dot in the middle (Rickard 2006:94, figs 131, 132; 71, Fig. 103). (Appendix 4.2: HP24).
- Use of sprigged decoration (Rickard 2006:9, fig. 14; 29, fig. 39; 82, Fig. 116). (Appendix 4.2: sprig).
- Simplified or abstract plant, bud or insect motifs (Rickard 2006:72-73). (Appendix 4.2: HP4, HP8, HP14, HP30, HP33.1, HP33.2, HP34, HP37, HP46.
- Moulded tea pot knobs with rouletted bands on the shoulder which is similar to some of the finer incised wares (Rickard 2006:78-79, Fig. 101).

![Figure 4.37: Rouletted decoration (ID3) highlighted with green slip. Narrow coggled band consisting of repeating tiny impressed triangles and rectangles. These dish sherds came from pit 2, 7645/#85343. Russell Workman, 10cm scale.](image1)

![Figure 4.38: Rouletted decoration (ID9) highlighted with green slip (HP6), narrow coggled band of rectangles with circles in the middle. These two sherds from a dish came from Pit 3, 7662/#88113. Russell Workman, 1cm scale divisions.](image2)
Figure 4.39: HP24 with the simple flower motif made of dots is occasionally found on factory-slipware. Russell Workman, scale 10cm.

Figure 4.40: Earthenware slipware bowl decorated with cable motif, cats eyes and a simple flower motif. From Slesin 1997. Another example of this motif is in Rickard 2006: 94, Figs 131, 132.
4.6.4 Stoneware

Quantities of sherds (561) identified as ‘faux stoneware’, which following scientific analysis was confirmed to be lead-glazed stoneware, were found at the site (Appendix 4.1: Tables 4, 11, 19, 20, 26, 34, 49, 50; Fig. 4.1). To date, the Stage 2 re-cataloguing of the stoneware has not been completed. The sorting of these sherds is quite difficult as they fracture in a linear manner and joins are not obvious, nor are differences between vessels easily discernible. This means that the Stage 1 vessel counts are generally unreliable and the decorative analysis is also inadequate. The small number of sherds (561) indicates that this material is a small part of the overall corpus and may be evidence of Ball experimenting to see if he could produce stoneware. Nearly all, 92 per cent, of the stoneware came from Waster Pit 2, Area A, from the upper fill of the pit. Most of this was olive coloured (490 sherds) with some mulberry coloured sherds coming from Pit 3 (29). The small quantity of sherds may indicate that the pottery was experimental in an attempt to produce a better quality fabric, perhaps more resistant to shock.

The stoneware is basically the same clay as used in the earthenware but is fired to a higher temperature. In other cases items called stoneware may be little more than overfired vessels. In other cases some vessels were definitely intended to be stoneware as they have quite a different appearance and shape to the earthenware vessels. To date we identified 11 (EVE) vessels but preliminary resorting makes it clear that there are likely to be more vessels. Vessel shapes identified to date are: dishes (2), jugs (3), jug/jar (4), and poe/bowl (1); two strap handles probably for jugs have also been found. General function identified for the stoneware vessels are: food (9), personal/food (3), and storage (2). Identified decoration includes some painting and use of incised bands (Figure 4.41).

An interesting element of some of these sherds is that they are glazed on the interior which is completely unnecessary for stoneware as the fabric is impervious to liquids which is why it became so associated with containers for liquids of all kinds.

Figure 4.41: Decorated stoneware, (HP57) 7645/#89815.
4.7 Thomas Ball’s pottery on Other Sites\textsuperscript{76}

4.7.1 Ball Pottery on Sites in the Rocks and Sydney CBD

Although it can be difficult to identify likely examples of Thomas Ball’s ceramics from other sites without visual inspection of the artefacts, the 2008 honours thesis of Carly White\textsuperscript{77} affords an opportunity to indirectly compare decorated lead-glazed ceramics from 710-722 George Street with those from four other sites. White’s thesis considered ‘colonial earthenware’ from trench A of Cumberland/Gloucester Streets Site 1994 excavation, Lilyvale, First Government House and the Harrington Street Well.\textsuperscript{78} White visually inspected at least some of these assemblages.\textsuperscript{79}

Although much of White’s analysis was based on glaze position (i.e. interior, exterior or both) and colour, she also formed a decoration type list, which was accompanied by photos of examples of 14 of the 19 types observed.\textsuperscript{80} This allows a comparison to be made with the decoration types observed at Thomas Ball’s Pottery. This is outlined in Table 5.1. For Decoration Series found at Thomas Ball’s Pottery see Volume 4: Appendix 4.2.

The comparison in Table 5.1 shows that out of the 11 incised decoration types, four were likely to correspond with decoration observed at the Pottery of Thomas Ball, while all handpainted designs had likely parallels with Thomas Ball ceramics. However, further analysis by White showed that her decoration types did not occur evenly across the sites she considered. Rather, all the incised pottery which had parallels from Thomas Ball’s Pottery, was found on the Lilyvale site.\textsuperscript{81} Also, most of the handpainted pottery was found at the Lilyvale site, with only one fragment of White’s type 14 (HP12) found at First Government House, and one fragment of White’s type 16 (HP6) found in the assemblage of trench A, Cumberland/Gloucester Streets site.\textsuperscript{82} Although the total numbers of sherds counted were very low (no more than one or two of any one type), the concentration of Thomas Ball parallels at the Lilyvale site does suggest that Thomas Ball’s pottery may not have been used in the same quantities at all sites.

<table>
<thead>
<tr>
<th>White Type No.\textsuperscript{83}</th>
<th>White Type description</th>
<th>White photo reference</th>
<th>Likely Thomas Ball comparison type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incised decoration types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 1</td>
<td>Single application of six narrowly spaced horizontal lines beneath rim (exterior) and one extra line beneath where edge of tool rested.</td>
<td>p 81; LV18730</td>
<td>ID2</td>
</tr>
<tr>
<td>Type 2</td>
<td>Multiple applications of multiple horizontal lines on body (exterior). Even spacing indicates use of tool.</td>
<td>p 81; LV18763</td>
<td>ID2</td>
</tr>
<tr>
<td>Type 3</td>
<td>Single application of six widely spaced horizontal lines on body (exterior). Uneven spacing suggests lines were added individually.</td>
<td>p 81; LV18456</td>
<td>does not resemble closely any Ball types</td>
</tr>
<tr>
<td>Type 8</td>
<td>Single line parallel to rim (interior).</td>
<td>p 82; LV17948</td>
<td>none</td>
</tr>
<tr>
<td>Type 9</td>
<td>Single application of two lines in waves on body (exterior).</td>
<td>p 82; LV18064</td>
<td>ID1 or ID7</td>
</tr>
<tr>
<td>Type 10</td>
<td>Single application of three lines in waves on body (exterior).</td>
<td>p 82; LV18064</td>
<td>ID1 or ID7</td>
</tr>
<tr>
<td>Type 15</td>
<td>Single line parallel to rim (interior).</td>
<td>p 84; CUGL 24989</td>
<td>none</td>
</tr>
</tbody>
</table>

\textsuperscript{76} This section was researched and written by Nick Pitt.
\textsuperscript{77} White 2008.
\textsuperscript{78} White 2008: 38-39.
\textsuperscript{79} White 2008: 37-38.
\textsuperscript{80} White 2008: 45-55, 55-56, 81-85..
\textsuperscript{81} White 2008: 57, fig 5.14.
\textsuperscript{82} White 2008: 57, fig 5.14.
\textsuperscript{83} Note that White did not use ‘type 7’ and that ‘type 4’ was a moulded decoration displaying in relief a leaf similar to that of a grape vine (White 2008:55).
To summarise, White’s 2008 thesis allows decorated Sydney manufactured earthenware from the Lilyvale, Cumberland/Gloucester Streets, Harrington Street Well and First Government House sites to be compared to those found at the Pottery of Thomas Ball at 710-722 George St, Haymarket. From this comparison, a handful of probable examples of Thomas Ball’s pottery are able to be identified, mostly from the Lilyvale site.

Apart from White’s thesis, further information on the artefacts from the Lilyvale, First Government House and Cumberland/Gloucester Streets sites is available from the EAMC Archaeology Database. Although the descriptions of lead-glazed ceramics from these sites are of varying levels of detail, some descriptions are detailed enough to suggest that certain artefacts may be examples of Thomas Ball’s pottery, as found at 710-722 George Street. From the Lilyvale site, out of 182 catalogue entries (443 fragments) for lead-glazed ceramics, two have descriptions suggestive of decorative patterns seen at 710-722 George St.

The lead-glazed ceramics from Lilyvale are also relevant to those interested in locally manufactured-pottery because they include a chamber pot fragment marked “J. LEAK”. However, the ceramic description field for Lilyvale does not describe the decorated examples found by White, raising the possibility that further decorated examples of locally-made ceramics were found at Lilyvale but not catalogued as such.

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84 Note that the example illustrated by White also shows specks of green glaze on a yellow background. This makes the vessel somewhat similar to examples from 710-722 George Street, Haymarket, although in this specific case, the speckling occurs with a lower frequency to that illustrated for HP9, in appendix 4.2 of this report.

85 La Trobe University and Industry Partners 2006; see also the database manual, Crook & Murray 2006.

86 These were ceramics with the following codes in the “decor” field: BlackLeadGlz, BrownLead, GreenLead, LeadGlaze, OrngeLead, RedLead, YellowLeadGlz.

87 One cup (LV14169) is described as Yellow Lead Glaze, with green line & brown dots. A jar (LV11722) is described as Red Lead [Glaze] with an orange body & incised exterior.

88 LV11805. Jonathan Leak was another prominent early Sydney potter.

89 White 2008: 81-85 (Appendix A). Also see summary in table 1, above.
From First Government House, catalogued ceramics from the 1990-1991 Young Street and Raphael Place (YRP) excavations there were seven catalogue entries (and seven fragments) which had descriptions which were suggestive of decorative patterns of Thomas Ball’s pottery,90 out of a total of 148 catalogue entries (and 231 fragments) of lead-glazed ceramics from the site.91 There were no detailed descriptions in the catalogue of lead-glazed ceramics from the 1983-87 excavations at First Government House to allow decorated ceramics potentially made by Thomas Ball to be identified. However, the database does include a photograph of the bowl sherd identified by White as having a wavy green line on its rim suggesting that it was made by Thomas Ball.92

Out of the EAMC data, the Cumberland/Gloucester Streets site catalogue provides the greatest likelihood of identifying any Thomas Ball parallels, as the EAMC archaeology database includes images of all ceramic types,93 and is supported by a specialist artefact report.94 These images of ceramic types show four examples of hand-painted decoration, which strongly resemble those associated with Thomas Ball found at 710-722 George Street.95 Another rouletted type was photographed, showing a pattern similar to that categorised as ID3 at 710-722 George Street.96 A further photographed sherd showed a combination of incised lines and green highlighting below the rim, similar to the combination of HP6 & ID2 found at 710-722 George Street and 2008 excavations at Cunningham Lane.97 However, the particular gloss of the glaze on this photographed example is higher than that typically seen in Thomas Ball’s pottery, making it uncertain whether this example was made by him or not.

The type series from the Cumberland/Gloucester Streets site also allows some rudimentary analysis to be made of the wider artefact catalogue, showing the relative frequency of decorated types, compared to other lead-glazed ceramics (Table 5.2).

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Type description</th>
<th>Number of catalogue entries</th>
<th>Total of Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Glazed ware 3</td>
<td>white fabric, yellow int &amp; ext glaze, traces of Green</td>
<td>56</td>
<td>70</td>
</tr>
<tr>
<td>Lead Glazed ware 8</td>
<td>white fabric, brown terracotta slip dots, lead glaze overall</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lead Glazed ware 10</td>
<td>white fabric, wavy Green line below rim</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lead Glazed ware 16</td>
<td>brown fabric, brown int and ext glaze with Green cross</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total for Lead Glazed Ware (including other types, not listed individually)</strong></td>
<td></td>
<td><strong>1018</strong></td>
<td><strong>2524</strong></td>
</tr>
<tr>
<td>Red Glazed ware 4</td>
<td>pink fabric, int red glaze, rouletted Zl rim border</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total for Red Glazed Ware (including other types, not listed individually)</strong></td>
<td></td>
<td><strong>32</strong></td>
<td><strong>50</strong></td>
</tr>
<tr>
<td>HP Earthenware Green 1</td>
<td>combed lines at rim, green glaze over</td>
<td>27</td>
<td>33</td>
</tr>
</tbody>
</table>

Table 5.2: Table showing the types from the Cumberland/Gloucester Streets site which resemble decorated ceramics from the Pottery of Thomas Ball.

90 YRP0111, YRP0199, YRP0236, YRP5915, YRP5985, YRP6026, YRP6201.
91 These were ceramics with the code, “Lead glazed coarse earthenware” in the “Type Series” field.
92 FGH10126.
93 Crook & Murray 2006: 9. It should be noted that Wilson (1999), who oversaw the cataloguing of the Cumberland/Gloucester Streets site ceramics, used the concept of “type” differently to the standard practice of Casey & Lowe. Wilson uses type as a means of categorising ceramics by fabric and then by surface finish (1999: 210-211). The way the term is employed by Casey & Lowe almost always refers to the physical shape of a ceramic vessel.
95 These types are: Lead Glazed Ware 3 (CUGL25256), Lead Glazed Ware 8 (CUGL62114), Lead Glazed Ware 10 (CUGL62115) and Lead Glazed Ware 16 (CUGL63887).
96 Red Glazed Ware 4 (CUGL63874). Note that other rouletted types, described as “ear-of-wheat”, found at the Cumberland/Gloucester Street site were clearly not the same as any from Thomas Ball’s Pottery.
97 HP Earthenware Green 1 (CUGL63135). For photos of examples from 710-722 George Street, see Appendix 4.2 of this report; for an example from Cunningham Lane see Figure 4.42.
Apart from the decorated wares, other lead-glazed ceramics from the Cumberland/Gloucester Street site also resemble pottery associated with Thomas Ball. One photographed knob is almost identical to those knobs found at 710-722 George Street.  

In addition to the sites discussed so far, there is sporadic evidence that Thomas Ball’s pottery has been found on other archaeological sites around Sydney. Occasionally this information occurs in completed excavation reports. For example, the ceramics artefact report for the School of Arts, Pitt Street site included a description of ‘coarse earthenware’. This material included ‘a few pieces of decorated ware including two pieces of cream ground with green wavy lines and dots’, as well as some pieces showing signs of ‘rudimentary rouletting’.  

Another site where decorated lead-glazed ceramics similar to Thomas Ball’s products have been found is during the 2004 Cunningham Lane excavations, immediately northeast of the 710-722 George Street site (Figure 4.42).  

Figure 4.42 shows one decorated ceramic from the Cunningham Lane site with incised lines below its rim and green glaze highlighting, which strongly resembles the combination of ID2 & HP6 observed on lead-glazed ceramics from 710-722 George Street.  

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98 Lead Glazed Ware 13 (CUGL63839). Note that other sherds in this type are not knobs, but rim, body and base fragments.  
99 Thorp 1990: §4.2 [p 14]. Wilson 1999: 219 also notes that some marked lead-glazed ceramics from the Cumberland/Gloucester Streets site had the same fabric and glaze pattern as pottery from the School of Arts, Pitt Street site.  
100 Thorp 1990: §4.2 [p 14]. The complete description of the ‘coarse earthenware’ analysed by Thorp is: The body is coarse earthenware, occasionally poorly fired and generally thick walled although this sample includes a few finer pieces. It is produced on a wheel. It is often unglazed but many pieces are lead glazed in a variety of brown, red/brown, ochre, cream and buff, green and green/yellow colours. The most distinctive pieces incorporate a simple form of decoration, often bands or splatters of colour. The sample includes a few pieces of decorated ware including two pieces of cream ground with green wavy lines and dots and, the most distinctive and fine, a cream ground with brown and green stripes. A few pieces show some form of rudimentary rouletting.  
101 Personal communication with R. Stocks, June 2011.
4.7.2 Ball pottery on Casey & Lowe Sites
Decorated lead-glazed ceramics have also been found at several other sites excavated by Casey & Lowe. At the Conservatorium site, numerous lead-glazed ceramics were found, mostly in contexts associated with the early nineteenth-century bakehouse (c.1801-1815), which pre-dated the construction of the Government Stables and its courtyard, c. 1818-1820, underneath what is now Verbruggen Hall. Among a minimum item count (MIC) of 113 lead-glazed ceramic vessels from the whole site, there were three examples which were handpainted in patterns very similar or identical to Thomas Ball. Interestingly, all these patterns were either interweaving brown and green wavy lines (Figure 4.43), identical to HP3 from 710-722 George Street, or a green wavy line, suggesting some attempt at maintaining a matching set.

Also in the contexts associated with the bakehouse were four vessels (MIC) of what was termed in the catalogue and report at the time, ‘annular creamware’. Although at the time it was unclear whether these examples were locally made, knowledge of Thomas Ball’s pottery and lead-glazed ceramics from other sites makes it seem possible that three of these vessels were made by Thomas Ball. These three vessels consisted of a bowl, a saucer and a cup and each had incised lines, highlighted with green glaze below the rim (Figure 4.44), much like the decoration pattern, ID2 & HP6, observed at 710-722 George Street, and other parallels at the Cumberland/Gloucester Streets and Cunningham Lane sites already discussed here. The fourth vessel, a bowl, which had been identified as ‘annular creamware’, is unlikely to have been made by Thomas Ball, as its decoration, of thick, brown and cream bands above the base on the exterior surface is unlike anything found at 710-722 George Street. Moreover, the slightly indented cream bands indicate that it was made using a lathe, a technique not noticed on material from Thomas Ball’s Pottery although he was clearly influenced by this technique.
Other sites excavated by Casey & Lowe, where decorated parallels to Thomas Ball’s pottery have been found include the old DMR site on Campbell Street, Sydney, Parramatta Children’s Court, Pitt & Campbell Streets, Sydney and the Parramatta Justice Precinct (Figure 4.45, Figure 4.46, Figure 4.47).

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111 Image originally reproduced in Casey & Lowe 2002, §5.2.4.2 (ch. 5, p 126), photo 5.5.
112 Casey 1999: 22-23.
113 Example of incised and handpainted: [3156/#21594, 3688/#21595, 3712/#21598] (one vessel across multiple contexts). See Casey & Lowe 2006a, §8.1.7.2 (vol 2, section 8.1, p 45).
114 Example of incised and handpainted (ID2 & HP6): 5215 /#37124; example of handpainted (HP37): 5239/#37208.
115 Examples of incised and handpainted: 6529/#55888, 6336/#38966; example of handpainted: 6331/#55888.
The following table contains a summary of the type of decorated lead-glazed ceramics found at various sites (Table 4.3).

<table>
<thead>
<tr>
<th>Site</th>
<th>Handpainted?</th>
<th>Rouleting?</th>
<th>Incised?</th>
<th>Incised &amp; Handpainted?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lilyvale</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Government House; Young Street and Raphael Place 1990-1991</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Government House 1983-1987</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumberland/Gloucester Streets</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>School of Arts, Pitt Street</td>
<td>Y</td>
<td>Y(?)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cunningham Lane</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conservatorium</td>
<td>Y</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>DMR site</td>
<td>Y(116)</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Parramatta Children’s Court</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitt &amp; Campbell Streets</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Parramatta Justice Precinct</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3: Summary table of what sites contain decorated lead-glazed ceramics similar to those associated with Thomas Ball found at 710-722 George St, Haymarket.

116 Note that one handpainted saucer from the DMR site, shown on the left of plate 4 of Casey 1999, features a pattern not seen at 710-722 George Street, Haymarket.
4.8 Kiln & Manufacturing Techniques

Although no in situ evidence for Thomas Ball’s kiln was found during excavations, the site did retain structural and other debris relating to the production and firing of pottery and other artefacts between c.1801-1823. These items, dumped during the lifetime of the Pottery and after it was abandoned, were found redeposited in pits, hollows and gullies of Areas A and B, and occasionally in other disturbed locations (Vol. 2, Section 9; Section 4.1.3). The field drawing made by the surveyor Hallen in c.1831 of the study area and surrounding properties shows a circular structure with narrow extension just to the southeast of Area A (Figure 3.26 centre right). Its shape and location in the Brickfields strongly indicates that it was a kiln, perhaps used by Ball, with a single flue and stoke hole on the northeast side. 117

Figure 4.48: Sorting of kiln structure and furniture artefacts from Area A, context 7460. Front: lead glaze and slag on various clay items and setter fragments. Middle: briquetage. Back: bricks. Russell Workman.

117 Preliminary cataloguing and analysis of pottery and kiln furniture from this site was undertaken by Jenny Winnett and Nick Pitt, extensively reviewed by Mary Casey, Bernadette McCall and Robyn Stocks. Kiln structure artefacts were catalogued by Robyn Stocks. Possible kiln sketch in Field Books, Survey of the City of Sydney, A. Hallen, SR Reel 2628 (2/5195), Item 347, p5.
4.8.1 Structural Evidence for Thomas Ball’s Kiln

The structural evidence for at least one of Thomas Ball’s kilns was found mainly within backfilled pits and drainage gullies in Area A (fills 7649, 7647, 7651, 7660) and in the western part of Area B (fill 7460), with a far smaller amount from features in Area C (Appendix 4.1: Tables 55, 56, Figure 4.48). The debris indicates an updraught clamp or Scotch kiln with a reusable or permanent low sandstock brick curtain wall mortared and rendered with clay. The kiln may have had a temporary clay or briquetage domed superstructure with a small opening at the top. The kiln is likely to have been sunken partly into the ground with at least one brick flue in which wood was burnt as fuel, stoked from a pit at one or both ends. The chamber floor may have had a central platform and could have been sandy or paved in a combination of sandstock bricks and celled or perforated kiln bricks, both of which were found at the site. Continual use and rebuilding of the kiln is indicated by used bricks with heat-deteriorated, heavily vitrified and slag-coated surfaces. The inclusion of fragments of previously fired objects within the upper walling also testifies to this. The kiln was probably similar to one of several small kilns excavated in Britain and America dating from the seventeenth to early nineteenth-century and may have features in common with a c.1830-1852 brick kiln found nearby in Albion Street, Surry Hills (Section 4.8.2).118

The burning of wood created an atmosphere in the chamber that caused physical changes in the clays and glazes of the pottery, kiln furniture and structure (Sections 4.2.1, 4.2.2). Physical evidence for wood at the site included charcoal fragments and plant microfossils (Volume 2, Section 9.6). The dominant pollen species in modified topsoils in Areas B and C (7472, 7386) was casuarina (Allocasuarina/Casuarina) indicating that the ‘1788’ vegetation on the southern slope of Brickfield Hill was an Allocasuarina-Eucalyptus forest/woodland with a predominant grassy understorey (with Old Man Banksia (Banksia serrata)) on drier sites and a fern understorey on damp sites. It is highly likely that the wood burnt in Ball’s kiln was locally sourced. Early land clearance on Brickfield Hill meant that much of the material may have been gathered from the area around Cockle Bay where swamp oak (Causuarina glauca) was growing until the 1820s.

The sandstock bricks were made of poorly mixed and crushed pink and white clays with numerous ironstone and organic inclusions. The bricks had been hand-moulded in a wooden stock frame and had no frog (‘flat’ type) on the stock face. Physical changes caused by exposure to heat observed on individual brick surfaces and mortar/render helped identify how the bricks were laid (both stretcher and header fashion) in the lower kiln wall or flue (Figure 4.49). One brick fragment had a ‘XX’ tally mark at one end (7460/95195, Figure 4.50). These bricks were typical of those made at Brickfield Hill in the first decades of the colony, 1788-c.1830. Other denser red-grey sandstock bricks found in Area B were specially cut to create key and bevelled-edge bricks that would have been used to build one or more corbelled flues (7460/95208, 95212-13; Figure 4.50). These can be compared to specially-made key-bricks and tiles found at the sixteenth to mid eighteenth-century pottery kilns in England.119

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118 For early brickmaking in Sydney see Birmingham 1983; Gemmell 1986; Pavlou 1976; Ringer 2008; Stocks 2008, 2009b; and Varman 1993. Primary sources are: Collins 1798, 1802; Tench 1789, 1793; and Worgan 1788. For Britain: see Dobson 1850.

119 Dwight’s Fulham Pottery, London - see Green 1999: 179, Fig. 145. Donyatt, Somerset, Site 13, Area N, Kiln 2 see Coleman-Smith 2002: 158-160, Fig. 24, Nos. 35/2, 35/9.
Figure 4.49: Flat sandstock bricks from kiln structure showing (from top to bottom) gradual to extreme heat changes and deterioration of clay, vitrification and build-up of slag and splashed lead glaze. Left-right, top row: 7663/95165, 7650/95080, 7460/95203, 7662/95086, 95167. Second row: 7460/95220, 95219. Third row left and bottom: views of 7460/95222; right: 7662/95094. Russell Workman, 10cm scale.
Figure 4.50: Shaped and marked bricks from the kiln structure found in context 7460. Top row left: corbel or keystone brick (95298). Top right and Middle row left: bricks with bevelled side edges and partly darkened dense clay fabric (95208). Middle row right: brick fragment with incised ‘XX’ tally mark (95195). Bottom: dense brown clay bricks fragments (95212). Russell Workman, 10cm scale.
Other specialised materials used to construct the kiln included ‘kiln bricks’ with square hollow cells that were used in kiln chamber floors to distribute heat from the flues (Figure 4.52, Figure 4.53). The bricks were laid cell-side down directly above the fire enabling the heat to travel more effectively upwards, a process often further aided by piercing small holes through the bottom of the cells. The single example of a kiln brick with simple, non-pierced cells (7648/95068 Type S) was made of well-crushed and mixed buff clay that was quite different to that available locally. This brick was probably imported from Britain. Although worn, it was barely affected by heat and may have been used only briefly in the kiln. The more common type was represented by five kiln bricks with five nail-pierced holes per cell (7662/95097 Type 5S). It was made from a coarser and probably local mix of pink to red clays, sometimes with rounded hard lumps, and crushed ironstone nodules. The 5S type had been used in the kiln during several firings, becoming badly deteriorated and fragmented with exposed surfaces thickly coated with lead glaze and slag. For the final firings these kiln brick fragments were laid at odd angles, even upside-down in a different way to their original function. There were no examples of wider and thinner ‘kiln tiles’ at the site which were commonly used in other potteries in Britain and in drying floors of grain and malt kilns in Britain and Australia.
A range of comparable kiln tiles and bricks, some with nail-pierced holes, were used in a number of sixteenth to mid eighteenth-century pottery kilns in England.\textsuperscript{120}

Buff-coloured clay was used as mortar and render/lining on the bricks. It was finer but otherwise similar to that used to create the layered upper wall (briquetage). This clay turned orange-red to dark grey in the hot kiln (Figure 4.51). The bricks and the sandstock roof tiles that were reused as kiln furniture or perhaps shelves had been made in another part of Brickfield Hill. They may have been sold as seconds, broken and discarded on heaps by the manufacturers or retrieved from dismantled earlier local structures. They represent cheap, readily available building materials that were part of a long-term recycling strategy conducted by the early colonists. The roof tiles are not thought to have been made after c.1810 and appear only to have been reused by Ball as stacking furniture (setters) or perhaps fragmentary briquetage inclusions rather than larger structural or roofing elements (Section 4.9.7).\textsuperscript{121}

The temporary upper walling (briquetage) of the kiln was made by hand-applying layers of partly pugged clay which contained small to large fragments of plant matter, sandstones, ironstones, pre-fired broken bricks, tiles and pottery. Each layer of clay was reapplied after the previous layer had dried with some showing careful finger-smoothing. The pottery sherds were mainly used to line the inner surface, presumably to take advantage of their thermal properties and to provide strength. The largest fragment of briquetage found in Area A was slightly curved and 8-10mm thick. It consisted of at least nine layers (7460/95223, Figure 4.54). Pressure and heat during firing caused dislodged glaze and vitrified slag to travel through the layers to the outer surface. Some of this was already present on the inclusions used in the mixture. The clay and inclusions were affected by the heat, becoming harder and turning various shades of orange, red or even black. The curved shape of the briquetage indicates that the kiln was circular or oval and/or had a domed upper walling. This material can be compared to similar fragments found during excavations of kilns in Britain and America, notably the sixteenth to mid eighteenth-century pottery kilns at Donyatt, England.\textsuperscript{122}

\textsuperscript{120} A kiln floor tile found in an early leaseholder storage cellar (3960/26319) at the PCC Site Parramatta was identical to one recently identified by Robyn Stocks reused in the south wall of the c.1810-1822 Dairy Cottage at Parramatta Park. Both tiles were made of similar coarse clays and had 4 pierced holes in the cells (4S type), see Stocks 2006: 14, 38; Casey & Lowe 2011: Section 3.2. For British tile types see Belford & Ross 2004: 215-225; Crew 2002, 2004. Donyatt, Somerset kiln bricks and tiles in Coleman-Smith 2002: 158-160, Fig. 24.

\textsuperscript{121} Roof tiles were manufactured at Brickfield Hill from 1788-c.1810 and approximately one third were broken during firing. See Stocks 2008, 2009b; and Varman 1993. Primary sources are: Collins 1798, 1802; Tench 1789, 1793; and Worgan 1788. For Britain: see Dobson 1850.

\textsuperscript{122} Donyatt Site 13, Area N, Kiln 2 in Coleman-Smith 2002: 158-160, Fig. 25: 35/11-12. Use of pottery wasters in briquetage see Pearce 2007: 159. USA: see ‘clay plugging’ at the 1770-72 porcelain factory in Philadelphia see Hood: Fig. 61.
Figure 4.52: Range of broken kiln bricks with squarish cells and perforations from contexts 7460, 7645, 7648 7662 7663. Russell Workman, 10cm scale.

Figure 4.53: Kiln brick types. Left: S type with plain cells (7648/95068). Right: 5S type with 5 holes in cells made by a nail (7662/95097). Franz Reidel amended by Sandra Kuiters.
Figure 4.54: Large kiln walling or briquetage fragment (7460/95223). Left top-bottom: curved profiles of three sides showing construction layers, pot inclusions and gaps filled with glaze and slag. Right top: exterior with finger-smoothed layers; bottom: interior with pot body sherds used to line interior. Russell Workman, 10cm scale.
4.8.2 Comparative Kiln Structures

The kiln and pottery waster debris from Ball’s Pottery was used to fill clay extraction pits and other cuts relating to brickfield and pottery-making activities. It was also used as fill in the water-worn gullies at the southeast and western parts of the site (cuts 7660, 7647/7649/7651; and gully 7489). This was done to clear and level the allotments for redevelopment as well as to raise the level of George Street. The cuts and pits that were slightly back from the road and to the south-east would probably have been closer to the location of Ball’s kiln. The upper walling of the kiln would have been reconstructed after each firing and it is possible that the whole structure was also rebuilt or relocated several times during the lifetime of the Pottery. The field drawing by Hallen in c.1831 of a circular kiln to the south of the site with one flue and stokehole on the northeast side was perhaps built by Ball. It may be the only representation of a kiln at Brickfield Hill in the historical records (Figure 3.26 centre right).

Evidence for possible older kilns may include a circular, oval or rectangular sunken area with one or more flues and fireboxes, and possible burnt soils and deposits. The sub oval cut 7660 in Area A, disturbed to the north and south, was superficially similar in shape and size to a sunken kiln but the base and sides had no evidence for an in-situ structure or burning. It was most likely used as a pond for softening and manipulating (pugging) clay prior to throwing (Section 3, Figure 3.19).

Excavation of the c.1830-1852 rectangular clamp or Scotch brick kiln at 20 Albion Street, Surry Hills (Figure 4.55) showed that natural clay not far below the flues and soils below the surface outside the kiln walls were not changed by the heat. Although used to fire sandstock bricks, this is the only pre-1850s kiln to be excavated in Sydney. With part of the lower curtain walling and most of the six parallel flues and stokeholes in situ this kiln has provided interesting evidence for local construction techniques and firing methods. The unfired or green bricks had been stacked directly above the flues onto a hard-packed sand floor which became burnt dark red by the heat of the wood fuel. Curiously, the sandstock bricks with shallow rectangular frogs being made and used to build the flues and lower walls of the Albion Street kiln were also used to construct the cesspit (7658) at the rear of the Woolpack Inn in Area A of the site (Section 3, Figure 3.37).

No kiln earlier than or contemporary with that of Thomas Ball’s Pottery has been excavated in Australia, although several sites scattered across Brickfield Hill, Sydney have revealed areas of brickfield activity such as clay extractions, pugging and cartage. In 2008, pottery and clay pipes from the nearby 1821-1838 pottery and clay pipe kiln(s) of Jonathan Leak located off Elizabeth Street, between Goulburn and Wentworth Streets, were retrieved but have not yet been analysed.

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123 Albion Street kiln - see Stocks 2010 ‘Kiln structural Report, 20 Albion Street, Surry Hills’ in App. 3 ‘Brickmaking techniques’ in Casey & Lowe, in prep, Archaeological Investigation 19-41 Reservoir Street, Surry Hills; also Casey & Lowe 1995b.

Figure 4.55: Sub-rectangular base and flues of clamp or Scotch kiln at 20 Albion Street, Surry Hills, drawn by Franz Reidel 1996.
Figure 4.56: Clamp kiln with temporary walls from R. Ringer 2008: 18.

Figure 4.57: Scotch kiln with reusable walls from R. Varman 1993: Fig. 97, from “The Kiln”, Lionel Lindsay etching, Art in Australia, September 1925.
We know from contemporary sources the brick and tile kilns at Brickfield Hill, Sydney were of clamp or more permanent Scotch updraught construction (Figure 4.56, Figure 4.57). In New South Wales and Victoria this practice continued until the 1860s by which time simple downdraught kilns were also in use. Most of the early eyewitness accounts only describe the work being done at the brick and tile kilns and do not discuss structural elements in detail. Little is known about the form of early kilns built in Sydney to fire pottery although it is likely that they conformed to those built and operated by potters in Britain, some of whom like Thomas Ball came to Sydney as convicts. However this may not have always been possible, as there were several restrictions on construction and operation in Sydney. These included the lack of skilled labour, animal power, mechanical equipment and raw materials, including coal for fuel. As a result, structures may have more closely resembled those of the previous century, or been an adaptation using a mix of technologies. Any developments in pottery-making, whether machinery or stylistic since Ball’s departure from England in 1799, would have to be learnt from new personnel, goods or reference material that came to Sydney. The organisation of brick and pottery yards based on medieval models was documented by various practitioners in Britain during the nineteenth century. These plans, profiles and yard layouts may be relevant to the spatial organisation of Ball’s Pottery (Figure 4.63). Depictions of Fowlers Pottery in Camperdown, Sydney in 1865 and James King’s Irrawang Pottery in the Hunter Valley in c.1836 are also valuable sources of information (Figure 4.58). Irrawang Pottery operated intermittently from 1833-1856 and was partly excavated in the 1960s and 70s.\footnote{sydney brick, pottery and pipe kilns described by Collins 1798, 1802 (1975); Tench 1789, 1793; and Worgan 1788 (1978, 2010). Technological development and excavation of Australian kilns see Casey 1999; Casey & Lowe 1995b, 2009; Ford 1995; Gemmell 1986; Lawson 1971; Lewis 2011: Chapter 6.02; Pavlou 1976; Ringer 2008: 17-20; Stocks 2006, 2008, 2009b; Varman 1993: 8-11, 40, Figs. 18, 20-21, 97-98. Also Irrawang and Fowlers works: Bickford 1971; Birmingham 1983; Kelloway 2008. New Zealand see Clough 1989. British kilns and development: see Dobson 1850: Vol. 1, 60-62, 74-79, 104-105; Belford, P. & R.A. Ross 2004; Coleman-Smith 2002; Copeland 2009; Crew 2002, 2004; Dawson & Kent 1999; Green 1999; Killock, Brown & Jarrett 2003; McGarva 2000; Pearce 2007; Tyler et al1999; Tyler et al 2005; Tyler, Betts & Stephenson 2008. Ireland: see Wilkins & Bunce 2007. USA: see Guerke 1987: 28-34; Hood 2007; Wingfield, Richmond & McKelway 2010. Spatial analysis of excavated pottery works in Greece: see Shaw et al 2001. Britain: brick and tile manufacture and yard layouts see Dobson 1850.}

Figure 4.58: James King’s Irrawang Pottery, Hunter Valley. Advertisement showing layout in c.1836, with clay-pugging mill to left, bottle kiln centre right. From Birmingham 1983: 81.
Numerous circular, oval and rectangular pottery kilns from this period and earlier have been investigated in Britain, Europe and America. In Britain the closest parallels to Ball’s kiln would probably be those run by small businesses in rural villages rather than large enterprises in bigger towns. Roadside pottery clamp kilns were common in the narrow valleys of Donyatt village, Somerset in the late sixteenth to early nineteenth centuries. They were continually rebuilt and some may have been used to fire clay pipes. During excavations a variety of small circular or sub-circular kiln bases with one or more flues or fireboxes were revealed, having been rebuilt and reshaped through time by individual potters (Figure 4.59).

Figure 4.59: Circular clamp pottery kiln with central plinth and opposed firemouths. Sixteenth century with early eighteenth-century reuse from Donyatt Site 13, Cutting N, Kiln 2, plan and conjectural perspective reconstruction, from Coleman-Smith 2002: 220, Fig. 9.

A variety of oval and rectangular kilns were used to fire salt-glazed, tin-glazed and lead-glazed pottery during the seventeenth to eighteenth centuries. Their internal platforms, flues, fireboxes and stokeholes were fitted to suit the landscape, firing and technological requirements and the potter’s individual needs (Figure 4.60). However, such variation is not as pronounced in four late eighteenth to early nineteenth-century small clamp and bottle kiln bases built of brick and stone excavated in Massachusetts and Connecticut (Figure 4.61). The limited resources of the potters in eastern America may provide good parallels with those experienced in the first decades of settlement in Sydney.\(^\text{126}\)

Updraught pottery bottle kilns had an outer shell or ‘hovel’ that tapered to an upper chimney for better heat control and were fuelled predominantly by coal fed via fireboxes at the base of the inner kiln (Figure 4.62). They were commonly used to fire pottery in Britain from the 1750s until the

\(^{126}\)Comparative plans and kiln development see Green 1999: Figure 23. The four USA kilns used to fire red earthenware were excavated by Old Sturbridge Village (organisation) - see Blakely 1989. For Hervey Brooks bottle kiln excavation see Worrell 1980 "To Burning a Kiln of Ware" The Way Hervey Brooks Did It’ at http://www.osv.org/explore_learn/document_viewer.php?DocID=1052.
c.1900 when the mechanised improved versions were superseded by more efficient and hotter downdraught and continuous kilns. Examples of bottle pottery kilns have been excavated in Britain and America and several continue to be built and fired. It is possible that Thomas Ball also used a bottle kiln to fire his pottery but there is no evidence for this.\textsuperscript{127}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{kilns}
\caption{Comparative plans of various salt-glaze and other kilns excavated in Britain, Germany and USA. From Green 1999, Figure 23. Note: f = firebox, s = stokepit, sg = salt-glaze, tg = tin-glaze, and lg = lead-glaze kilns.}
\end{figure}

\textsuperscript{127} Dawson & Kent 2008: 202-203; Francis 2000: Fig 20; Copeland 2009.
Figure 4.61: New England, USA late eighteenth and early nineteenth-century excavated brick and stone kiln bases. Note top left was a bottle oven. Drawn by Old Sturbridge Village (www.osv.org).²²⁸

Figure 4.62: Cross-section of a typical bottle oven with central kiln inside hovel, from Francis 2000: Fig. 20.

Figure 4.63: Scotch kilns for brick and tiles with walls of same thickness top to bottom. Top left: Plan of walls and flues or firing chambers with dark shading being firebrick lining, unshaded are temporary piers. Top right: profile through structure. Middle: profiles showing structure and flue openings. Bottom: brickyard layout showing functional areas from rear to front. A: clay extraction cut; B: clay heaps; C: clay-puddling mill; D: working floors before firing; E: drying sheds; F: kiln; G: working floors after firing; Left: water pond. From Dobson 1850 Vol. 1, p.75, 76, 77 and 60).
4.8.3 Tools and Equipment

When Ball’s Pottery closed in 1823 most intact or usable tools and equipment would have been carried off site, recycled or sold rather than abandoned at the site. Pot-forming and decorating tools may have consisted of organic materials, broken pottery or roof tiles which have either not survived in the archaeological record or are difficult to distinguish from other worn fragments. The only definite tool found at the site was a large hand-held clay smoother/pounder from the middle fill of a pit filled with ceramic wasters and kiln debris in Area A (7648/89252, Figure 4.64). The tool would have been useful in preparing clay, smoothing-out harder lumps or perhaps even burnishing surfaces of large pots. Measuring 81mm high the sub-spherical lump of cream clay with orange swirls and inclusions was patted roughly into shape and held in the right hand of an adult leaving deep finger and thumb impressions (and prints) around the side. The lower circular working surface, 107mm in diameter, had become smooth with a curved edge, the fine striations indicating both circular and linear motion. The greater wear or scarring evident along what was the bottom edge when held in the hand may have been the result of gentle pounding. At 846 grams this object could also have functioned as a weight. A number of similar clay tools but smaller in size has been recently found at Jonathan Leak’s 1821-1838 pottery in the Haymarket. 129

![Figure 4.64: Clay smoother/pounder with finger and thumb impressions on side, flat circular base with striations and scarring from wear (7648/89252). Russell Workman, 10cm scale.](image)

Several types of vessels and kiln bricks appear to have been perforated using different-sized hand-forged nails. Some of the kiln furniture was cut by wire or possibly a large knife; the spurs partly shaped using a cylindrical wooden dowel. There was no evidence for metal hardware from the kiln structure or shovels and wheelbarrows that may have been used to stoke the fire and clear away debris. The surface of a number of vessels showed evidence of tools used to make them prior to being decorated (Figure 4.65, Figure 4.66). These features included facets trimmed by a knife or other firm object; string or wire marks from where the pot had been cut from the wheel; knife or palette marks on the base edges where the pot had been levered-up from the wheel; and three sets of short parallel marks from a drying tripod stand on the base of a large bowl (7646/85022). 130

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129 Leak tools yet to be fully analysed - pers. comm. Graham Wilson December 2009. For range of tools used to make pottery in Britain see Copeland 2009: 72.

Figure 4.65: Knife or palette marks on base when lifted off wheel (7663/86915). Russell Workman, 10cm scale.

Figure 4.66: Exterior base of Type 17.6.2 large bowl with spattered splitting yellow glaze and base marks string and wheel marks, and tripod marks from probable drying stand (7646/85022). Russell Workman, 10cm scale.
4.8.4 Kiln Stacking and Firing

Once the vessels and other objects had been made and had dried, leather-hard glaze was applied to the desired surfaces. The objects were then ready to be stacked in the chamber of the kiln. Our understanding of how Thomas Ball stacked and fired his kiln(s) over time has been gained by analysing the kiln debris and structures found on the site in conjunction with the available historical records. Interpretation has also been informed by archaeological investigations of contemporary and earlier pottery, pipe and brick making sites in Sydney, Britain, Europe and America.\(^{131}\)

Stacking of the kiln chamber was a time-consuming task whereby a stable internal structure had to be built using the items to be fired. These items were contained, separated or supported by a variety of kiln furniture (Section 4.9). Care had to be taken not to smudge any glaze and to allow for adequate and even heat and oxygen distribution in the chamber. Heat filtered up through gaps or holes in the chamber floor from burning wood fuel that had been placed in one or more flues sunk below the ground surface (Sections 4.8.1, 4.8.2). The burning of wood created an atmosphere in the chamber that caused physical changes in the colour and texture of the clays and glazes of the vessels, kiln furniture and structure (Sections 4.2.1, 4.2.2).

The pottery discarded by Ball showed a wide range of clay and glaze colours, with many faults being evident from all stages of manufacture (Appendix 4.3). Poor or uneven clay mixing, throwing and glazing placed considerable stresses on the vessels when they were fired in a kiln where the heat was not able to be fully controlled and at times oxygen was (unintentionally?) restricted or reduced. Such technical difficulties were typical of wood-fired clamp or Scotch kilns where proximity to the centre of the kiln or the heat from the flue openings in the floor determined how well the pot was fired and its final colour. This variation could be extreme and unidirectional with one side of a vessel having an entirely different colour or glaze vitrification to the other. These effects were also evident in the kiln furniture, such as the darkening of the clay and glaze (Figure 4.79) and distinct silhouettes of vessels or saggers placed on flat tile setters (Figure 4.95).

Evaluation of kiln stacking and firing evidence can be problematic when considering that pottery broken during firing could have been reused as kiln furniture (Section 4.9.6). This dual function left a variety of visible and invisible marks and residues on the pottery (listed as manufacturing faults) whose origin had to be disentangled during cataloguing and analysis. The manufacturing faults and kiln disasters which resulted in numerous pot wasters and broken kiln furniture has allowed a glimpse into the stacking patterns of different types of vessels (Kiln Furniture Type Series Appendix 4.5). Compilation of the stacking data is ongoing using evidence from the positions of bobs and other furniture on the pottery, the direction of glaze flow such as dripping and pooling, heat or atmosphere-induced surface changes, and instances of blowouts, encrustation or vessel breakage and collapses (Figure 4.67 to Figure 4.72, Figure 4.84, Figure 4.93, Figure 4.96, Figure 4.97).

Ball appears to have used placing rings and spurs to separate and support most of the finer glazed earthenware vessels in saggers or base setters with the assistance of different bob types and other setters (Figure 4.68 (right), Figure 4.83) There is evidence that saucers and plates were stacked above each other base-down and separated by widely-spaced small bobs next to and on the rim. Some of these vessels had cracked and collapsed onto each other in the kiln (Figure 4.67). In earlier

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\(^{131}\)Australian references see Section 4.8.1-2. Britain: Pearce 2007: 156-162; Copeland 2009. Bobs and other kiln furniture still adhering to pot wasters and firing reserve marks from early eighteenth-century Polesworth, North Staffordshire in Barker 1998. Stacking and firing evidence in London at Dwight’s Fulham Pottery in Green 1999; and at the Doulton Pothouse, Lambeth in Tyler et al 2005; Warwickshire in Melton & Scott 1999: 119-121, Figure 19; Cupar, Fife Scotland in Martin & Martin 1996; various tin-glazed kilns in Tyler, Betts & Stephenson 2008: Fig. 86. Ireland in Francis 2001: 80-81. A spectacular collapsed saggara causing 34 tin-glazed dishes and supporting pins to fuse together inside a c.1640-60 kiln was recovered from the ‘Zuidergracht’ Canal in Delft, Netherlands, see the Delft Museum, Netherlands Nro. C.10-2005. USA: kiln furniture used to make porcelain in 1770-72 at Philadelphia see Hood 2007; and for manufacturing faults see Hunter & Ray 2007.
and contemporary kilns in Britain plates and dishes were commonly stacked in saggars using horizontal bar or pin supports. Investigation into this possibility using Type 12.6 bobs is ongoing (Section 4.9.4.2). There was less evidence concerning fine cups and mugs due to their limited numbers but they were probably also fired in saggars or base setters. Larger olive-green, red-brown or mulberry-glazed bowls, crocks and other open vessel types were open-stacked, rim-down (Figure 4.68 left). They were supported and separated by different types of bobs beside and on the rim (Figure 4.70). Glaze that pooled on the rim caused bobs to adhere and was often transferred to adjacent stacked vessels (Figure 4.68).  

Setters of clay, pottery and roof tile acted as firm horizontal (base or lid) and vertical separators for stacked pottery and saggars in the kiln (Sections 4.9.5, 4.9.6). Thick clay setters were not common but like the roof tiles they often had impressed marks from pottery rims or kiln furniture spurs or rims. They also bore reserve marks made by differential heating or reduction of the clay surface during firing (Figure 4.78, Figure 4.87, Figure 4.95). The original shapes and sizes of all the setters were difficult to determine due to secondary fragmentation in the kiln and post-deposition. However, it is clear that several were roughly reshaped into circles, ovals or rectangles (Figure 4.90, Figure 4.96). Where higher, thicker or angled kiln setters were required all furniture could be double-stacked (Figure 4.69, Figure 4.97). Similarly, some of the bobs were pressed together to create unique multiple supports or those of double height (Kiln Furniture Type Series Appendix 4.5; Figure 4.85). All of the kiln furniture with the exception of the rectangular spurs (Type 12.4) can be directly compared to that used by earlier and contemporary potters in Britain and America. These objects are discussed individually below (Section 4.9).

The small recreational objects made by Ball appear to have been fired in the same kiln(s) as the pottery due to their similar surface discolouration and occasional dripped lead glaze adhering to fragments of other clay items (Section 4.10). The marbles were probably placed together in small groups as some were perfectly fired while others had numerous heat-related faults. They may have been in saggars, on setters or tucked in odd spaces between the stacked pots. However, the severe discolouration, uneven firing, dripped glaze and fragments of adhering pottery, kiln furniture or other marbles on a number of the examples indicates that they were fired in very exposed or open-stack locations (Section 4.10.2; Figure 4.101 to Figure 4.103).

In Britain tobacco pipes were customarily fired in saggars, carefully placed concentrically and/or bowl-down depending on the size of the saggar. Occasionally they were placed on a hand-formed clay stand. The fired-clay of the reed pipes was highly varied in colour with a number having uneven clear or scattered thin salt-like ‘glaze’ and/or drops of light brown lead glaze on the upper stem surface. Several of the discarded fragments also had overfired distorted stem ends (Section 4.10.1, Figure 4.98 to Figure 4.100). These firing features and faults suggest that Ball placed the pipes in shallow saggars or setters where the stem ends were slightly more exposed to the heat or reduced atmosphere. Although comparative information regarding firing of clay whistles has not been found in the literature, the example in the shape of a bird was probably well protected within a saggar. The buff clay had no dripped glaze and was only slightly discoloured towards the top of the bird where it may have been exposed above the saggar (Section 4.10.3, Figure 4.105).

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132 Discussion of stacking and firing with range of saggars & other kiln furniture see Barker 1998; Copeland 2009; Hood 2007; Martin & Martin 1996; Pearce 2007: 156-162; with historical pictures Tyler, Betts & Stephenson 2008. Bars/props/pegs/pins set into clay bobs or squeezes to stack plates or bowls see Barker 1998; Tyler et al 1999: Fig. 11; Tyler et al 2005: Figs. 49-50; ‘pegs’ and historical pictures in Tyler, Scott & Stephenson 2008; ‘annular’ in Martin & Martin 1996. Ireland: Francis 2001: 81, Figs 25ix-x.

Figure 4.67: Stacking of finer yellow-glazed saucers/plates with scarring on bases, rims missing (7645/85442 on 85441). Russell Workman, 10cm scale.

Figure 4.68: (left): Two red-brown glazed rim sherds adhering with glaze scar (7646/85245); (right): circular glaze pooled from kiln furniture placing ring or narrow vessel rim (7645/85434). Russell Workman, 10cm scale.

Figure 4.69: Double stacked pot body and base fragments (7664/87073). Russell Workman, 10cm scale.
Figure 4.70: Views of Type 12.7.28 bobs on rim of pot Type 1.5 (7645/85664). Russell Workman, 10cm scale.

Figure 4.71: Selection of pot and setter fragments with various bobs, encrusting and pooled glaze (7645/85879, 89853-89862). Russell Workman, 10cm scale.

Figure 4.72: Pot base setter fragment adhering to Type 12.7.2 bob (7645/85879). Russell Workman, 10cm scale.
4.9 Kiln Furniture Types

The kiln furniture was analysed to discover how the range of items were used to stack different vessels and items in the kiln (Section 4.8.4) as well as to more fully understand production and firing processes at Thomas Ball’s Pottery (Appendix 4.1: Table 55-63). The range of clay items made by Ball and used as kiln furniture are described in the following sections and, with the exception of the setters, are incorporated into a numbered Kiln Furniture Type Series (Appendix 4.5). Of the specially-made types the thick large cylindrical saggars and the finer carefully cut spurs and placing rings were pre-fired and designed to be reused. In contrast, the damp, pliable and poorly-mixed clay bobs were placed directly onto or below parts of individual vessels during stacking. Bob shapes ranged from amorphous lumps or pinches of clay to rolls and cut bars. During kiln firing the bobs became distorted into unique irregular forms which were brittle and less able to be reused. Being hand-moulded the finer earthenware bobs often had fingerprints (Figure 4.73, Figure 4.74) which may in the future also aid in identifying the individual potters or assistants which at present can only be discerned by specific similarities of manufacture. Finally, thick flattish clay slabs or handy fragments of discarded pottery and second-hand roof tiles were used as convenient horizontal setters, small shelves or narrow vertical spacers.

Figure 4.73: Left: Fingerprints on coarse earthenware Type 12.7.7 bob (7645/95314); Right: on thin fine earthenware bob Type 12.81 (7662/95460). Russell Workman, 10cm scale.

Figure 4.74: Fingerprints on flattened fine earthenware bob Type 12.8.9 (7662/95444). Russell Workman, 10cm scale.
4.9.1  Saggars Type 12.2

Saggars are typically large cylindrical vessels in which finer wares are placed during kiln firing. They can be vertically stacked and whether upright or inverted provide protection and regulate ventilation when kiln temperatures may be uneven. The relatively few saggars identified in the assemblage from the site were plain cylindrical straight-sided vessels with a low flat-topped rim and a flat base (Appendix 4.5). Thomas Ball does not seem to have used saggars with cut-out or pierced walls for better ventilation (oxidisation) during stacking or those with slots to fit handled vessels as used by contemporary potters in Britain and America (Figure 4.76).134

Ball only used saggars of local non-refractory coarse or occasionally fine earthenware with ironstone inclusions. This made it difficult to discern saggar sherds from those of other large thick vessels found in the debris, especially when the latter were reused as pot sets (Figure 4.75, Section 4.9.6). Although no complete example of a saggar has been found at the site rim, body and base sherds from at least 42 vessels were identified, with 36 from Area A, pit 7660 (fills 7662, 7663) (Appendix 4.1: Table 55).135

The saggars were made in a limited size range with those able to be measured having rim diameters of 280-380mm and a body height up to 146mm (Appendix 4.1: Table 57). Many saggars have encrusted clay and spattered glaze or slag which is thickest on the interior base. The variety of dripped glaze colours, from pale yellow to green, red, brown and mulberry suggests that saggars contained a wide range of vessels in the kiln and were used for several firings. The encrusting of small clay fragments in the base, similar to that found with pottery bases reused as setters (Figure 4.91, Figure 4.92), appears to have been intended to prevent adhesion of vessels or kiln furniture by allowing the glaze to pool in the hollows. Ball was presumably attempting to follow other potters in Britain and America who commonly employed flint chips or coarsely-ground quartz for the same purpose (Figure 4.76).136

Although only 25 per cent of the varied types of pottery wasters from the site have been fully reviewed (Section 4.1.2), some information about Ball’s use of saggars during kiln firing can already be gained. Saggars and better-shaped base setters appear to have been largely reserved for firing of finer glazed wares. These items were stacked with the aid of pre-fired furniture such as placing rings and spurs, whereas many coarse ware vessels were open-stacked. Use of saggars may have begun to decline after the first kiln firing, when a variety of large broken vessels became available that could do the task just as well (Section 4.9.6.3). This economizing strategy was one of many commonly used by potters and made even more sense for Ball, as his financial difficulties are known to have increased. Time, materials, labour and firing space could be saved if broken saggars were not remade but merely replaced by unsellable large vessels. However, the continually changing combination of saggar and open-stacking within the kiln chamber would be a challenging and probably time-consuming task. It required many different types of kiln furniture, especially the highly flexible bobs which often had evidence of last-minute pot-shifting. In addition, the delicate

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134 Copeland 2009: 111-139; Melton & Scott 1999: 123-124; Pearce 2007: 156. Saggars with pierced walls in the Stoke-on-Trent Museum and Art Gallery 2005 exhibition, visited by Mary Casey; see also Barker 1998; Christophers & Haselgrove 1973: Fig. 7; Green 1999: Appendix 2; Melton & Scott 1999: 119-120, Figs. 18-19; Martin & Martin 1996; Tyler et al 2005: Fig. 51; Tyler, Betts & Stephenson 2008; Wade Martins 1983: 20, Fig. 32, Plate VII. Discussion of saggar functions and sizes in Ireland see Francis 2001: 80-81; and for 1770-72 porcelain manufacture in Philadelphia USA in Hood 2007.

135 Refractory clay saggar making and placement in British kilns in Copeland 2009. Fireclay saggars for smelting metal from ore during the later part of the nineteenth century were found immediately to the north of the site beside Cunningham Lane by Austral Archaeology, report by Hickson forthcoming. The total number of saggars within the assemblage has yet to be finalised due to ongoing analysis.

136 Flint chips or ground quartz were frequently used on interior of saggar bases to prevent vessel adhesion during glaze firing. See Barker 1998: 321; Hood 2007: Fig. 55, 60, 62, 63. Ground flint for stoneware production - see Green 1999: 145-146.
balancing of different-sized and shaped vessels for each setup would be more prone to collapse than when using mostly saggars which had sturdy rims and sides for high stacking.

Figure 4.75: Selection of saggar sherds showing internal encrusting, glaze and slag from firing (7662/88564). Russell Workman, 10cm scale.

Figure 4.76: Kiln furniture from the mid-eighteenth-century pottery at Town Road Hanley, North Staffordshire. Left-right: clay bob, two different ‘ring stilts’, pierced saggar with salt-glazed bobs on flint chips or ground quartz, salt-glazed ‘crown stilts’. Mary Casey, Stoke-on-Trent Museum and Art Gallery 2005 exhibition.
Figure 4.77: Range of placing rings (upper) and rectangular spurs (lower two rows) from the site. Russell Workman, 10cm scale.

Figure 4.78: Placing ring (7460/88367) on tile/setter (7645/95030) demonstrating how two impressions were probably made by a points from a similar ring during firing. Russell Workman, 10cm scale.
4.9.2 Spurs Rectangular Type 12.3

Thomas Ball manufactured two subtypes of reusable fired kiln furniture in the shape of small sub-rectangular ‘spurs’ to balance and separate finer vessels during firing (Appendix 4.5, Figure 4.77 lower rows). Spurs were made from a flattened fine earthenware slab which had a cylindrical wooden dowel pressed along the central length, creating a channel. The slab was then cut by wire and/or knife into rectangular or square shapes. The basic form, Type 12.3.1, was modified by angled cuts midway along the side ridges to create four points, Type 12.3.2. Type 12.3.1 tended to be smaller but more numerous than Type 12.3.2 (Appendix 4.1 Table 58). The clay used to make the spurs was identical to that of the placing rings and finer glazed vessels. The spurs were occasionally self-slipped (7645/88571). The Munsell colour range of the clay was white, cream, or buff 10YR 8/1-3 ‘white’ to ‘very pale brown’ or 7.5YR8/4 ‘pink’; pale red 5YR 6/6-8 to red 10R5-6/6 ‘red’; and a possibly reduced N5/ ‘grey’.

All 16 examples were dumped into Area A, pit 7647 (fill 7645) along with the more numerous placing rings (Appendix 4.1: Table 55). Although Subtype 12.3.1 tended to be smaller than Subtype 12.3.2 (Appendix 4.1 Table 58), almost all appear to have been used to fire vessels with at least one of the same yellow, light brown, green and red-brown or mulberry glazes (Section 4.2.2). Subtype 12.3.2 was more successful than Subtype 12.3.1 in supporting glazed vessels without adhering to them (Figure 4.79). The surfaces of most spurs were coated in a thin ‘glaze’ from the wood-fuelled atmosphere in the kiln (Sections 4.2.1, 4.2.2) and thicker lead glaze that dripped or flowed down from the supported vessel, pooling at points of contact and on the base of the spur. Several spurs had been fired in a reducing atmosphere or repeatedly enough to turn the fabric grey and darken the dripped glaze (Figure 4.79).

Figure 4.79: Spurs Type 12.3.1 with dripped/pooled glaze and ridges broken off from adhering vessels (left-right: 7645/88575, 88576). Russell Workman, 10cm scale.

Figure 4.80: Range of sizes and colours of Spur Type 12.3.1 (left-right: 7645/88574, 88573, 88572, 88578, 88579(2)). Russell Workman, 10cm scale.
The manufacture and use of rectangular spurs, rather than triangular forms, appears to be unique to Thomas Ball and their limited numbers and distribution suggests that they may have been an experiment, perhaps only used for a single firing. Spurs probably functioned in a similar way and may have been more efficient for Ball to produce than trivets, tripod or triangular stilts, spurs or ‘cockspurs’ common at earlier and contemporary potteries in Britain and America.\footnote{Britain: Barker 1998: especially Figs. 30, 42-44, and plate stacking in Copeland 2009; historical discussion of stacking, firing and furniture including ‘trivets’ Tyler, Betts & Stephenson 2008. Ireland: Francis 2001: 81, Fig. 25viii. USA: Cockspur or rooster claw ‘bobs’ made in the eighteenth century by John Hinds in Holland Massachusetts see www.osv.org and https://picasaweb.google.com/covenanteer/HindsSite5057765852514747682.}

4.9.2.1 Spurs Rectangular 2-Ridged or Pointed Type 12.3.1
This spur subtype is the basic model characterised by a concave upper surface with narrow long ridges or spurs at the top of vertical sides or ends (depending on the individual item) and a flat base (Figure 4.79, Figure 4.80). Ranging in size from 15 x 9mm to 27 x 21mm these spurs were generally smaller than Type 12.3.2 but had a similar variety of fabric colour which was occasionally affected by reduction of oxygen in the kiln and/or successive firings (Appendix 4.1: Table 58).

4.9.2.2 Spurs Rectangular 4-Pointed Type 12.3.2
This spur subtype was less numerous and a modification of Subtype 12.3.1. The top of the long side ridges were cut at an angle to create a point at each corner that effectively reduced the size of the contact area with the supported vessel (Figure 4.81). These spurs are generally squarer, larger and more robust than 12.3.1 spurs and may have held slightly larger vessels. They ranged in size from 27 x 23mm to 33 x 30mm (Appendix 4.1: Table 58).

Figure 4.81: Upper and lower views of Spurs Type 12.3.2 showing clay colour and dripped/pooled glaze from upper vessel (left-right: 7645/88582, 88583, 88584). Russell Workman, 10cm scale.
4.9.3 Placing Rings Type 12.4

Reusable circular pre-fired fine earthenware placing rings were able to balance and separate finer vessels, particularly when they were stacked inside each other during firing (Appendix 4.5; Figure 4.77, Figure 4.78). They could be used as a stable individual support for wide open vessels such as plates and dishes. Although no complete example was found the size and form of some 242 rings of different diameter and height could be discerned in the assemblage (Appendix 4.1: Table 59). Almost all were made on the wheel using the same fine earthenware clay and in a similar manner to straight-sided vessels and cut horizontally by a wire or string when still wet (Figure 4.82). Small plain undiagnostic ring fragments were assigned to the generic Type 12.4; those with short thorn-like points or spurs stuck onto one (upper) rim (or edge) using wet clay to Type 12.4.2 (Figure 4.83, Figure 4.84). Although the furniture type series includes Type 12.4.1 there was no conclusive evidence at the site for any rings without points or other features.

The clay fired to the same colour as the spurs and fine earthenware pottery, with 14 being poorly mixed or marbled red and white. The Munsell colour range of the clay was white, cream or buff 10YR 8/1-3 ‘white’ to ‘very pale brown’ or 7.5YR8/4 'pink'; pale red 5YR 6/6-8 to 7/6 'reddish yellow' or 2.5YR 6/8 'light red'; orange 7.5YR8/6-5YR5/3 'reddish yellow-reddish brown'; red 10R5/6 'red; and a possibly reduced 'N5/ 'grey'. The surfaces of most rings were coated in a thin ‘glaze’ from the wood-fuelled atmosphere in the kiln (Sections 4.2.1, 4.2.2). Patches of thicker lead glaze also dripped or flowed down from the supported vessel, pooling at points of contact and on the base of the rings. The glaze colours were similar to those on the spurs and the pottery. They ranged from cream to orange, yellow brown, brown, red brown, dark brown, dark red or mulberry, olive yellow and olive green. The placing rings with points or spurs (Type 12.4.2) were identical to ‘ring props’ or ‘ring stilts’ used by various potters in England from the 1480s, but there was no evidence for other types such as single or double-edged ‘crown rings stilts’ made by contemporary British potters (Figure 4.76). Instead reused pottery base setters may have functioned in this way (Section 4.9.6.3).138

4.9.3.1 Placing Rings Type 12.4.1

Simple circular placing rings were made on the wheel and cut horizontally by a wire or string when still wet. No spurs or other features were added or cut before firing. This type, found at several excavated potteries in Britain, has not been identified in the assemblage. The circular scar on the interior base of a fine yellow-glazed vessel (7645/85434) may have been formed by adhesion to a ring of this type or the base of Type 12.4.2 or perhaps a narrow vessel rim with a diameter of 39mm (Figure 4.68).139

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138 Britain: history of and use of ‘ring props’ in Pearce 2007: 158; various ‘ring stilts’ in Barker 1998. ‘Ring stilts’ of various types from Town Road, Hanley in North Staffordshire thought to have been made at Humphrey Palmer’s Church Works in the 1760s-70s were on display at the Stoke-on-Trent Museum and Art Gallery 2005 exhibition. USA: see Hood 2007: Fig. 60.

139 Britain: plain ‘rings’ made and used in the sixteenth century at Fulmodeston - see Wade-Martins 1983: 20, Fig. 32, Plate VII; also range of ‘cylinders’ and ‘rings’ in Tyler et al 2005: Fig. 48. USA: ‘cylinders’ used in 1770-72 porcelain kiln in Philadelphia see Hood 2007: 44, Figs. 57, 59.
4.9.3.2 Placing Rings Type 12.4.2

These circular placing rings were mostly made on the wheel and cut horizontally by a wire or string when still wet. Before they were fired a small number of short thorn-like points or spurs were stuck onto one (upper) rim (or edge) using wet clay (Figure 4.77, Figure 4.83). The points lessened the contact area with the glazed vessel and allowed heated air to flow through. Made in a range of sizes their base diameter measured from 40-110mm, body height from 4-31mm, and thickness from 3-16mm (Appendix 4.1: Table 59).\(^{140}\)

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\(^{140}\) Identical ‘rings’ used in Britain from the 1480s; see Pearce 2007: 142, 158, Fig. 83.
Figure 4.83: Range of placing rings type 12.4.2 showing shape and manufacture and usage details. Top (left-right): Ring interiors irregular slumped (7460/88368); unused or unglazed after biscuit firing(?) (7662/88676); narrow angled (7662/88706); layered or marbled clay (7646/95495). Middle and bottom: exterior and horizontal interior views. Russell Workman, 10cm scale.
Figure 4.84: Placing ring type 12.4.2 features, fabric and glazes. Top (left-right): Applied clay spur with red-brown ‘glaze’ from burning wood in kiln, dripped glaze and adhering fine earthenware fragment from vessel being fired above (7646/85248, 7662/88669). Middle and bottom: pooled glaze down exterior and on base (7645/88598) and (7662/88706, 7646/95495). Russell Workman, 10cm scale.
4.9.4 Bobs
The term ‘bob’ refers to unfired clay kiln furniture hand-made into various shapes and used to stack pottery in the kiln. Thomas Ball usually made bobs from poorly mixed and crushed local clays or occasionally from readily available scraps of fine, marbled or coarse earthenware left-over from pottery manufacture. The Munsell colour range was: white 10YR 8/1-3 ‘white’ to ‘very pale brown’; white 7.5YR/4 ‘pink’; pale red 5YR 6/6-8 to 7/6 ‘reddish yellow’ or 2.5YR 6/8 ‘light red’; 7.5YR8/6-5YR5/3 ‘reddish yellow-reddish brown’; red 10R5/6 ‘red’.

Clay bobs were the most numerous type of kiln furniture used by Ball. Some 1,919 bobs were found amongst concentrations of dumped kiln debris. They were mainly found in pits in Area A (fills 7660, 7647 and 7651) and in Area B (fill 7460) (Appendix 4.1: Tables 55, 61). As different types or subtypes were found in greater concentration in some contexts, further analysis may be able to identify separate kiln firings. The term ‘bob’ appears to best fit this type of informal kiln furniture and with some variation is used in the literature about earlier and contemporary pottery production in Britain and America.141

Bobs were sorted first by their manufactured shape and then typed according to how they were used in the kiln. Their use was evidenced by one or a combination of vessel impressions, adhering fragments of pot and other furniture, surface finger and heat distortion, discolouration and glaze splashes. During cataloguing each bob was assigned a shape type number (12.6, 12.7, 12.8 or 12.9) which prefixed another number that identified how the bob was used in a common sequence from 0 to 70 (Appendix 4.5: Types 12.6 to 12.9). There were also several examples of multiple bobs (given an M suffix to the subtype), denoting instances where different bob shapes were squished together or stacked to form a more desirable or larger kiln support (Figure 4.85). It is clear from the data that the more carefully-made and standardized types of bobs, the bars and rolls, were the most numerous in the assemblage and used for the greatest variety of tasks (Appendix 4.1: Table 60).

4.9.4.1 Bobs Amorphous Type 12.5
This type of clay bob was characterised by its amorphous-shaped lump of coarse earthenware or clay that had been quickly placed in the kiln during stacking without any prior shaping and minimal finger manipulation (Appendix 4.5). These bobs were mainly found in pits in Area A (fills 7662, 7663) and Area B (fill 7460) (Appendix 4.1: Tables 60, 61). Although of varied size there were few subtypes among the 210 examples with most being used as simple supports or for sealing gaps between vessels. Aside from undiagnostic fragments, the most common subtype only had evidence of being used on one flat surface (12.5.1). The next common types had been used on a flat surface/base to support vessels across one end or along one side (12.5.6, 12.5.10) or to separate the edges and rims of plates or other fine wares. They were differentiated from Type 12.8 ‘pinches’ by their lumpiness and general lack of evidence for finger-manipulation. It was often difficult to distinguish worn amorphous bobs or those with no evidence of use from simple lumps of clay dropped during pot manufacture or kiln construction (briquetage). However, they were much denser and had far less sand and other inclusions than worn sandstock brick and tile fragments.142

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142 Equivalent to Melton & Scott 1999: ‘props’ Fig. 20.201-208 and possibly bobs Fig. 19.196-197. See also clay ‘pads’, ‘cones’ and ‘cylinders’ and ‘squeezed lumps’ used for various applications in Barker 1998; Green 1999: Appendix 2; and clay ‘prop’ or ‘support’ in Pearce 2007: 142-43, Fig. 85.
4.9.4.2 Bobs Bars Type 12.6

This type comprised rectangular, cuboid, or sub-cuboid bars cut from hand-flattened slabs of clay. At least one cut edge must be evident. The bars were of variable thickness and made from fine to coarse earthenware as well as poorly mixed or layered clay. The position on the slab where the bar was cut dictated whether it was rectangular or more triangular in plan, and whether it had vertical or irregular (original slab) edges. The original clay slabs were also used as thick clay setters, lids or possible small shelves (Section 4.9.5). Bars needed to be prepared prior to kiln stacking to be available for hurried positioning, repositioning and combining with other bobs. Most of the 636 bobs were found in pits in Area B (fill 7460) and Area A (fills 7662, 7663 and 7645) (Appendix 4.1: Tables 60, 61; Appendix 4.5). Although approximately 23 per cent had only one flattened surface or were undiagnostic fragments, the most common subtypes were formed when the bars were inserted between rims rather than bases of vessels (12.6.6, 12.6.2, 12.6.23 and 12.6.26).

Bar bobs can be compared to kiln furniture of earlier and contemporary British and American potters and may have been used in conjunction with other bob types to more firmly set vessels in place. ‘Bars’ or ‘pins’ in Britain commonly supported flatware, such as plates and shallow dishes, placed in neat horizontal stacks within saggars during glost firing. They were secured to the inner walls by holes or amorphous clay bobs or ‘squeezes’. Further analysis of the bar bobs used by Ball needs to be done to confirm whether this practice was followed.143

Figure 4.85: Multiple bobs (left): angled stacking type 12.6.6M 7460/95242; (right): vertical stacking type 12.6.50M 7460/95264. Russell Workman, 10cm scale.

4.9.4.3 Bobs Rolls Type 12.7

The most numerous bob type, some 867 items, were rolls of clay of various lengths and diameters with a circular or oval section. The smaller examples of this type were made of fine and coarse earthenware. The rolls could be roughly shaped or tightly and carefully formed either from lumps, pinches or cut pieces (bars?) of clay. Several had been pinched-off one end of larger rolls. As the rolls varied so greatly in size the maximum diameter of the item (where not distorted by vessel pressure) was measured in order to evaluate possible subtypes and differences in stacking use. This measure resulted in the subdivision of the type into two rough sizes: small to medium rolls with diameters from 0-20mm and large rolls with diameters greater than 20mm.

143 Bars/props/pegs/pins with rectangular or triangular section, some set into ‘squeezes’ of clay for stacked plate or bowl firing in Britain: see Barker 1998: especially Figs. 29, 37, 39; Tyler et al 1999: Fig. 11; Tyler et al 2005: Figs. 49-50; ‘annular’ in Martin & Martin 1996. USA: see Hood 2007: Fig. 59. Ireland: Francis 2001: 81, Figs 25ix-x.
Although these bobs were quickly rolled by hand, many groups of small rolls that were found in the same context were quite regular in form. This indicates that they were made in a methodical manner to conform to a pre-conceived type and were used to support/separate several vessels of the similar size. Some 867 of these bobs were found, mostly in pits in Area A (fills 7645 and 7662, 7663) and Area B (fill 7460) (Appendix 4.1: Tables 60, 61; Appendix 4.5). The most commonly used subtypes had been shaped by being placed between rims or bases of vessels (12.7.6, 12.7.2, 12.7.23, 12.7.4 and 12.7.26). Many of the smallest rolls were systematically made to be quickly inserted between rims leaving a tail or small protruding handle at one or both ends (Figure 4.86).

Studies of kiln furniture made by earlier and contemporary potters in Britain and America rarely mention deliberately rolled clay bobs, sometimes called ‘sausages’ or ‘snakes’. The closest parallels to Ball appear to have been made in London at the c.1812-c.1926 Doulton stoneware pothouse in Lambeth and Dwight’s eighteenth and nineteenth-century kilns in Fulham, as well as during the early eighteenth century at Polesworth, north Warwickshire.  

Figure 4.86: Selection of 77 Type 12.7.23 bobs of fairly regular form used to separate two vessels, with impression across the centre of both sides, some with broken ends (7460/95288). Russell Workman, 10cm scale.

144 Tyler et al 2005: Fig.49.; ‘snakes’ in Green 1999: Appendix 2, 188, Fig. 152, 194-95, Fig. 157. Polesworth ‘sausages’ in Melton & Scott 1999: Fig. 19. See also roll sections used to adhere bars in Francis 2001: 81, Fig. 25x.
4.9.4.4 Bobs Pinches Type 12.8
These bobs were made from finger-pinched or pulled-off lumps of fine to coarse earthenware or occasionally poorly mixed and crushed clay. They usually had irregular small shapes that were completely finger-manipulated and covered in fingerprints. Occasionally they were pinched off the ends of other formed bob types or difficult to discern from bob rolls. Most of these 182 bobs were found in pits in Area A (fills 7662, 7663; and 7645), and Area B (fill 7460) (Appendix 4.1: Tables 60, 61; Appendix 4.5). Aside from undiagnostic fragments, the most common subtypes were those used for simple support scenarios such as being inserted between rims and occasionally between the bases of two vessels (12.8.6, 12.8.10 and 12.8.1, then 12.8.21 and 12.8.26).

4.9.4.5 Bobs Flat Type 12.9
This type of bob was made by flattening both faces of a lump of clay by hand before use and included otherwise undiagnostic flat bob fragments. They were made of either fine to coarse earthenware or poorly mixed and crushed clay (Appendix 4.1: Tables 60, 61; Appendix 4.5). These bobs were differentiated from amorphous bobs (12.5) which were flattened only during use, bar bobs (12.6) which were cut, and clay setters which were generally thicker, larger and made of coarser clays (Section 4.9.5). Some 21 of the 24 mostly broken examples had two flattened surfaces probably from being used to separate two vessel bases (12.9.2). They appear to be similar to small short ‘pillars’ or shaped ‘pads’ of clay used in earlier and contemporary British kilns.145

4.9.5 Clay Setters
Clay setters were made of coarse earthenware or poorly mixed clays hand-flattened to a variety of different thicknesses with slightly irregular edges. They were usually thicker than flat bobs (Type 12.9) but there is not enough evidence to know if they were formed into rectangular or other shapes. Clay setters were the least-commonly found type of hand-formed kiln furniture at the site (Appendix 4.1: Tables 55, 62). Fragments from four large slabs (Figure 4.87) were found in pits in Areas A (fills 7645 and 7662) and B (fill 7460) but a number of other smaller worn flat pieces of clay may also be of this type. Clay setters were similar to some of the kiln briquetage and could have been used in the chamber floor. They were also the right thickness and texture to be the slabs from which bob bars (Type 12.6) were cut. Several large thick setter fragments had surface impressions and discolouration that occurred after they were placed horizontally in the kiln as furniture or shelves. The small impressions were made by vessels, spurs or placement rings similar to those observed on the surface of some reused pre-fired tile setters (Section 4.9.7). Clay setters can be compared to kiln furniture used as ‘setters’, ‘shelves’, ‘bats’ and ‘lids’ at various earlier and contemporary potteries in Britain and America.146

146 Britain: ‘setters’, ‘bats’ ‘lids’ and ‘shelves’ see Green 1999: Appendix 2; Melton & Scott 1999: Fig. 18; Tyler et al 2005: Figs 38, 40-41, 44-47. Also clay ‘prop’ or ‘support’ in Pearce 2007: 142-43, Fig. 85. USA: ‘saggar disks’ see Hood 2007: 44, Fig. 58.
4.9.6 Pottery Setters

A range of suitable ceramic vessel base rim and body sherds that had broken during manufacture were reused as setters during kiln firing. They were found in Areas A and B amongst dumped kiln debris in Areas A and B. The largest setters as well as those with flat bases were placed horizontally in the chamber to stack and protect pottery in a similar way to saggars. The smaller or curved sherds were used as vertical separators (Appendix 4.1: Tables 55, 62). All these items were made of local non-refractory clays and where possible their original vessel type has been recorded. Pot wasters were commonly used as kiln furniture by earlier and contemporary potters in Britain and America.¹⁴⁷

During analysis it was often difficult to discern reused ceramics from vessels broken when they were initially fired in the kiln and it should be noted that the numbers recorded here reflect only the 25 per cent of the assemblage that has been reviewed. Their reuse as setters was identified by a number of features added by the potter to prepare the surface of the pot for reuse and manufacturing faults which occurred during refiring. Most diagnostic were the small and often evenly scattered clay fragments or encrustation featured mainly on the interior bases. Also noted were surfaces which had been finger-smereared with wet clay. It was concluded during analysis that the clay was used by Ball as an alternative to flint chips or ground quartz commonly used by potters in Britain and America (and difficult to obtain in Sydney) to prevent vessels adhering to the base during glost firing (Figure 4.76).¹⁴⁸ Other indicators included refired broken edges, different-coloured glaze or pot/furniture adhesions, and burnt or distorted surfaces.

4.9.6.1 Rim Setters

Some 58 rim sherds have been identified as setters used vertically and horizontally to separate and support pottery and other items in the kiln (Appendix 4.1: Table 62). Almost all were from thick-walled large utilitarian vessels such as pans, jars and crocks (Types 1, 14, 15, and 17), with clay-smeared and partly encrusted surfaces as well as refired edges (Figure 4.88, Figure 4.89).

¹⁴⁷ Britain: North Staffordshire in Barker 1998. USA: John Hinds site at Holland, Massachusetts HSKFO2a & 2b, HSKFO3a & 3b shown at: https://picasaweb.google.com/covenanteer/HindsSite5074800677571434370; /HindsSite507480069045636274; /HindsSite5074800724816074658; /HindsSite5074800754880845746.
¹⁴⁸ Hood 2007: Fig. 55.
4.9.6.2 Body Setters
At least 23 curved sherds from broken vessels of all sizes but of an unknown original shape were reused as horizontal and vertical setters. Like the base setters they were characterised by the presence of encrustation, edge refiring and different splashed and pooled glazes, but these items had more consistent surface clay smearing. Some appear to have been deliberately shaped or modified (Figure 4.90).

4.9.6.3 Base Setters
Broken or unsellable bases of large utilitarian vessels such as pans, bowls and crocks were commonly reused as base setters during kiln firing, with 252 being recognised at this stage in the assemblage (Appendix 4.1: Table 62). Due to the lack of rims and other diagnostic features only two pan shape types were able to be identified (Types 1.9.2 and 1.4.2) from contexts 7646 and 7460 (Appendix 4.4: Vessel Type Series). Placed horizontally in the chamber, some of the base sherds had low or symmetrically-broken sides that enabled them to be inverted and reused on the opposite face, or as lids (Figure 4.92). Occasionally the irregular broken edges of the sides were utilised for specific support (Figure 4.93) similar to some pedestal or crown ring stilts made by eighteenth-century British potters (see Section 4.9.3).

The bases were often encrusted on the interior with small quite evenly scattered fragments of clay as well as smeared clay on the sides prior to reuse. Exploded clay, pot and pooled glaze similar to that seen inside saggars adhered mostly to the upper surface of the base; the underside, closest to the fire, was often blackened. The edges of the broken vessel sides were commonly covered with glaze forced out from the surface or dripped from other vessels.

4.9.6.4 Lid Setters
Flat lids with a central knob or hole (shape type 11.7) were a useful but rare setters type in the kiln. The single example found in the assemblage had a missing knob and edge nibbling/shaping. When used as a setter or perhaps a saggar lid, the lower face was encrusted with small clay fragments and splashed glaze, and the upper face had been subject to fierce burning (7663/87005, Figure 4.94). Examples of possible lid setters or saggar lids with central hole have also been found in Britain.150

150 Lid fragments with splashes of glaze on convex underside from early eighteenth-century Polesworth, Warwickshire in Melton & Scott 1999: 121, Figure 19.185.
Figure 4.88: Clay-smeared rim setter fragment 7460/86475. Russell Workman, 10cm scale.

Figure 4.89: Clay-smeared rim setter fragments 7460/86476. Russell Workman, 10cm scale.

Figure 4.90: Clay-smeared triangular body setter now fragmented 7490/89625. Russell Workman, 10cm scale.
Figure 4.91: Evenly encrusted base setter fragments, left 7646/85026 and right 7646/85006. Russell Workman, 10cm scale.

Figure 4.92: Base setter fragments. Left: bob fragments on interior. Right: encrusted exterior 7663/86997. Russell Workman, 10cm scale.

Figure 4.93: Base setters showing dripped glaze over breaks and adhering pot fragment. Left to right: 7460/86796, 86643. Russell Workman, 10cm scale.
4.9.7 Sandstock Tile Setters/Shelves

Low-fired sandstock roof tiles made in Sydney from 1788-c.1810 were reused at Thomas Ball’s pottery as kiln setters and possibly shelves (Appendix 4.1: Tables 55, 63; Figure 4.95 to Figure 4.97). The poorly crushed and mixed pink and white clays often had a folded appearance in profile, as well as red ironstones, sand and inclusions of vegetable matter. The clay source for the tiles was different from that used to make bricks but both were fired in the same kilns at Brickfield Hill. The tiles were made to roof early government buildings and other important structures in the colony. However, they were difficult to fire successfully and eventually proved insufficiently robust for long-term use. The tiles reused by Ball were typical of those made in kilns close to his pottery at Brickfield Hill rather than the thicker types made by slop-moulding at Parramatta from c.1790. Most were thin and rectangular with some fragments retaining a single lug (or nib) or two square peg or nail holes for attachment to roof battens (Figure 4.96). Rarer were small slightly curved fragments of half-cylindrical ridge tiles. The lack of sheared-off lugs and weathered surfaces indicates that the tiles may not have been used on roofs of previous structures or at Ball’s Pottery and were probably purchased or retrieved by Ball as cheap seconds or discarded fragments along with the bricks used in the kiln structure directly from the Brickfield Hill yards. There is no evidence for any of the tiles being used in the lower brick wall of the kiln but the smaller fragments may be amongst the aggregate in the upper clay lining.\(^{151}\)

Thomas Ball may have utilised the larger flat rectangular tiles as horizontal surfaces, lids or thin shelves in other parts of the Pottery, such as drying sheds or yards, but their primary purpose appears to have been as setters or shelves in the kiln. Evidence for the stacking is seen on the surfaces where the position of the pot is shown in reserve within a darkened background, or splashed lead glaze; or as curved or sharp impressions sometimes with adhering pot or furniture fragments (Figure 4.95). Smaller broken tiles may also have been placed vertically in order to separate saggars or pots in the kiln. Impressions of narrow tiles or pot sherds steadied by soft clay bobs during stacking have been identified on several bob subtypes (Appendix 4.5).\(^{152}\)

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\(^{151}\) Discussion of brick and tile manufacture at Sydney and Parramatta see Stocks 2008, 2009b; and Varman 1993. Primary sources are: Collins 1798, 1802; Tench 1789, 1793; and Worgan 1788. Britain: see Dobson 1850.

\(^{152}\) Similar reserve marks on flat setters from Britain in Green 1999: Appendix 2; Tyler et al 2005: Figs. 44-47.
Tiles (along with saggars and suitable pottery sherds) were used as setters in successive kiln firings. Being pre-fired and covered in sand they were well-suited and more robust than the thicker hand-flattened clay setters made at the pottery (Section 4.9.5). Many of the tiles became (further) broken in the kiln making it difficult to ascertain their shape and size when being reused as furniture. Several appear to have been deliberately snapped or cut across the width to form smaller rectangular or oval shapes. Occasionally the tiles were double-stacked for extra height or width and glaze had pooled in the gaps (Figure 4.97). Roof and floor tiles were commonly used as kiln furniture by earlier and contemporary potters in Britain and America.153

Figure 4.95: Tile setters with stacking evidence on the surface; (left): reserve silhouette of vessel (7662/95098); (right): impression and remnants of placing ring or vessel rim (7662/95104). Russell Workman, 10cm scale.

Figure 4.96: Selection of Peg 1 and Single Lug 1 type tile setter fragments or shelves showing burnt encrustation and pooled glaze (context 7662). Russell Workman, 10cm scale.

153 Britain: North Staffordshire in Barker 1998; Tyler, Betts & Stephenson 2008: Figs. 26, 83-85 (85 has marbled clay).
4.10 Other Products of the Pottery: Pipes, Marbles and Whistle

The excavation of the waster pits and other redeposited material from Thomas Ball’s Pottery has enabled other recreational items to be attributed to this manufacturer. These were hand-carved earthenware reed pipes and hand-rolled clay marbles which have been found previously on other excavations in Sydney and Parramatta. In addition, a previously unknown form, an earthenware whistle moulded in the form of a bird, can now be tentatively included in Ball’s repertoire (Appendix 4.1: Table 64).

4.10.1 Pipes

Evidence for eight broken carved facetted pipes were found at the site mostly from redeposited pot waster and structural kiln debris in Area A (Appendix 4.1: Table 64; Figure 4.98 to Figure 4.100). At least seven appear to have been broken during manufacture or discarded before being used. One was almost complete with a chipped bowl rim (7645/7728). Two very small fragments of a pipe bowl that was smoked or burnt on the interior were found in a Woolpack underfloor deposit (7324), perhaps disturbed from an underlying context.

The pipes were thick-walled with a short stem for a reed or other organic mouthpiece and made from fine buff to coarser orange clay with tiny red inclusions. The prepared clay was initially rolled around a fairly thick cylindrical rod that formed the bore; the bowl end was slightly bent and hollowed out by finger-turning and narrowly pierced to reconnect the bore hole. When leather-hard the pipe was hand-carved into octagonal facets that ran along its length from the flat rim of the long forward-sloping bowl to a thick conical spur, and then along the short stem with a trimmed flat end. During kiln firing the clay changed to mottled orange or light grey and was darker towards the underside. When overfired the clay turned dark brown-grey and the shape was distorted. The pipes and the marbles were fired in the same kiln as the lead glazed pottery with five examples having drops of yellow-cream (7461, 7645), red-brown (7645, 7648) or orange-clear (7645) glaze on the upper surfaces. There were no obvious examples of adhering clay items as seen with the marbles (Section 4.8.4). The pipes were remarkably uniform, indicating that they were carved by a single skilled person, and perhaps the result of one firing. They measured 76mm in length, with a bowl height and diameter of 36 x 25mm. The spur was roughly 6mm in height, the short stem was 14-18 mm in diameter, the bore hole 6mm.

154 For find locations in Sydney and Parramatta and discussion of these types of pipes and marbles see Stocks 2008, 2009a. Other types of white clay pipes that may also have been made by Ball were also found at the PJP site (with a thick conical stem); and immediately to the northeast at 2-6a and 12 Cunningham Street Surry Hills (large effigial or face bowl with dark brown clay eyes) by Austral Archaeology, report by Hickson forthcoming.
The morphology of the pipes is unusual and Thomas Ball appears to have been influenced by both British and American traditional styles. Curiously, the closest parallels are pipes made by seventeenth-century and later pipemakers in the frontier Chesapeake Bay region of the eastern states of North America; partly because they were robustly made using clays of similar texture and tools for a clientele that had little access to imported goods. Pipes made by these European settlers in America, using a similar limited set of tools to Thomas Ball, based their forms on red clay Indigenous examples and it is probable that Ball or someone in his employ had seen one of these in Sydney or overseas. Carved facetted clay pipes have been rarely found at excavated sites in Sydney and Parramatta, indicating that they were only made briefly or were perhaps unpopular. Ball may have made them along with the marbles as an experiment, or to gain new customers when imported supplies were limited.

The only contemporary Sydney pipemaker known to have made pipes in large numbers was William Cluer. He began making moulded ball clay pipes in 1802 and after he died in 1821 his business was run by his wife Mary Morgan until 1846. A large proportion of the pipes marked by William Cluer or his firm found at local sites, including 710-722 George Street, show that they were made using worn moulds. They had been smoked for as long as possible and were only discarded when irreparably broken and badly torrefied (stained). This consistent pattern of pipe overuse seen at various sites in Sydney and Parramatta points to a time of pipe shortages which Ball may have attempted to capitalise on. Alternatively, his hand-made pipes may have been produced in the couple of years before Cluer began production with imported moulds.155

![Carved facetted pipes from Area A (context 7645) showing range of fired clay colours and surface glaze drops. Front row: 97728(1), 97729(2). Back row: 97732(1), 97731(1), 97730(2). Russell Workman, 10cm scale.]

155 USA reed pipes in Luckenbach and Kiser 2006: Fig. 22; the facetted pipes by ‘The Carver’ c.1640 from Virginia, Fig. 4 curved stem pipes by Emmanuel Drue c.1660 from Maryland; see also Association for the Preservation of Virginia Antiquities 1997, 1998; Virtual Phips, The Archaeology of the Phips Homestead, Woolwich, Maine (ca. 1639 to 1676) at [http://w3.salemstate.edu/~ebaker/Phipsweb/phipsindex.html](http://w3.salemstate.edu/~ebaker/Phipsweb/phipsindex.html). General pipe information and facetted style see Ayto 1994; Bradley 2000; Humphrey 1969:30, Fig. 42; Oswald 1975; Reckner & Dallal 2000:58. Early Australian pipemakers in Gojak and Stuart 1999.
Figure 4.99: Carved facetted pipes Area A (context 7645), reverse of above. Front row: 97729(2), 97728(1). Back row: 97730(2), 97731(1), 97732(1) interior possibly grey from firing rather than use. Russell Workman, 10cm scale.

Figure 4.100: (left): carved facetted pipes detail of stem showing carving marks and darker red stem end from greater heat in kiln (7461/97843, 7648/97745); (right): Exterior of bowl fragment showing unmixed clays (7324/96444). Russell Workman, 10mm scale divisions.

4.10.2 Marbles
Some 57 hand-rolled clay marbles were found at the site, with four fired to a high enough temperature to be the equivalent of stoneware (Sections 4.2.1, 4.2.2; Appendix 4.1: Tables 64, 65; Figure 4.101 to Figure 4.104). Although they were discovered in contexts of many periods, including underfloor deposits of the Woolpack and House 710 in Area C, it is clear from their inclusion within the redeposited waster and kiln debris in Area A (7645, 7646) that they were made by Thomas Ball. They ranged in size from 13 to 27mm in diameter with the most common being 17mm. The darkened ‘stoneware’ examples were the largest being 18-27mm in diameter.
The marbles were made from a range of buff to red clays with small ironstone inclusions. Many were highly asymmetric or ovoid and marked with fingerprints. Several had drops of clear, orange, olive green, brown and red-brown lead glaze or adhering earthenware fragments indicating they had been fired in the same kiln as the pottery and pipes. The marbles with significant manufacturing faults and lack of surface battering wear are unlikely to have been used in games. However, due to lack of supply in the colony those with some faults appear to have been sold as seconds as similar marbles with drops of glaze and filed-off adhesions have been identified from at least one Parramatta site. It is also possible that these marbles may have actually aided kiln stacking rather than just being positioned where possible in-between vessels and other items.

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Figure 4.101: Hand-rolled white, buff to red clay marbles from Area A, made by Thomas Ball. Front row: 7323/96047, 96058, 96067, 96214. Middle row: 7324: 96525, 96616, 96623. Back row: 7331/96758, 9730/96677, 7349/97670. Russell Workman, 10cm scale.

Figure 4.102: Hand-rolled buff to orange clay marbles from Area A waster pit fill 7645 with splashed lead glaze and adhering pot fragments from kiln firing, made by Thomas Ball. Bottom row: 97737, 97736, 97736, 97738, 97742. Middle row: 97734, 97735, 97736, 97739. Back row: 97741, 97733, 97740. Russell Workman, 10cm scale.

156 Marbles with glaze found at PJP site - see Stocks 2008, 2009a. See also Baumann 1970; Opie 1997; Randall 1971.
Figure 4.103: Hand-rolled white, buff to orange clay marbles from Area B with splashed lead glaze and adhering clay fragments from kiln firing, made by Thomas Ball. Front row: Area B House 716 cleaning 7457/97827, 97831, 97830, 97828, 97829, 97832. Middle row: 7457/97823, 97824, 97825, 97826. Back row: topsoil 7472/97844, fill east of House 718 7490/97853, 97854. Russell Workman, 10cm scale.

Figure 4.104: Clay, stoneware (stw), porcelain and limestone marbles from Area A Woolpack Room 3 underfloor deposit (7335). Hand-rolled clay and stoneware types were made by Thomas Ball. Front row: ‘Stw alley (glazed)’ 96968, ‘Clay m made paint’ 96969, ‘Clay m made’ 97016, ‘Clay m made paint’ 97030, ‘Clay h made’ 97082; Middle row: ‘Stw alley (glazed)’ 96964, Limestone ‘Stonie’ 96966, Porcelain ‘China alley linear’ 96967, ‘Clay m made paint’ 96965, ‘Stw alley (glazed)’ 96964; Back row: ‘Clay m made paint’ 96850, ‘Clay m made’ 96886, ‘Clay h made’ 96911. Russell Workman, 10cm scale. Key: h=hand; m=machine.
4.10.3 Bird Whistle

A small whistle moulded into the shape of a sitting pigeon with head facing forward and wings folded was found in the fill of a drain constructed in c.1880-1902 after the demolition of the Woolpack Hotel in Area A (7657/97752). The whistle measured at least 62mm in length, was 24mm wide and 33mm in height. Made of unglazed buff fine earthenware with common tiny red ironstone or clay inclusions it had a worn beak and broken tail (Figure 4.105). Slight light-grey discolouration of the clay on the upper part of the bird occurred during firing.

Although a unique object, the whistle has been tentatively attributed to Thomas Ball due to the similarity of the clay and manufacturing techniques, such as trimming and firing, as used to make the pipes, marbles and some of the pottery (Appendix 4.1: Table 64). Its depositional context is slightly problematic but it is possible that the bird was discarded many years before it became incorporated into the drain fill along with sandstone rubble. The slightly worn or much-handled appearance of the whistle suggests its use as a toy or musical instrument by children or adults over a long period of time.\(^\text{157}\)

The eyes, beak and feather detail formed in a 2-piece mould were not evenly rendered or sharp, and the upper and lower seams had been roughly trimmed. A rectangular object or moulding stick had been pushed vertically into the underside of the belly creating oval-edged hole when removed. Subsequently a cylindrical object had pierced through the lower back of the bird into the side of the lower hollow, and then a narrow rectangular hole was made horizontally from the end of the tail into the top side of the upper hole. The head had been fired to a slightly darker grey and was later stained by iron in the soil.

The mouthpiece was the tail, the air directed into the lower hollow with the sound adjusted via the holes similar to an ocarina. Although unlikely it is possible that a small amount of water was used if the hollow was stoppered at the bottom. Bird whistles have been made for thousands of years in the Middle East, Mediterranean, China and the Americas, and are well represented in Britain and Europe from the Medieval and later periods. The most similar in form to the whistle at the site were those of a pigeon or pheasant made at the time of the American Civil War in the 1860s.\(^\text{158}\)

\(^{157}\) Stone-lined drain trench context 7657, see Section 3.5.2.2 in this Volume.

Figure 4.105: Views of moulded clay bird whistle (7657/97752). Russell Workman, 1cm scale.