LANCASTER IMPRINTS 23

ARCHAEOLOGY AT THE WATERFRONT

1: INVESTIGATING LIVERPOOL'S HISTORIC DOCKS

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Front cover: *Excavations of the Mersey Railway Company's Pumping and Ventilation Station, at Mann Island*
Rear Cover: *Excavations at the new Museum of Liverpool site, Mann Island (top right); Excavations of the Countryside Neptune site, Mann Island (top and bottom left)*

LANCASTER IMPRINTS

Lancaster Imprints is the publication series of Oxford Archaeology North. The series covers work on major excavations and surveys of all periods undertaken by the organisation and associated bodies.

Contents

Other Liverpool Industries

In addition to the pottery, there is evidence from the Countryside Neptune and LLC extension sites for two other important Liverpool industries: clay tobacco pipe manufacture and sugar refining. The first relied, like the finer pottery manufacture, on imported clays coming into the port, whilst the other depended on imports of sugar and molasses from the West Indies (Sheridan 2000).

Clay tobacco-pipe industry

David A Higgins

The excavations produced a very large clay tobacco-pipe assemblage, some 41,700 fragments, dating, for the most part, to the end of the eighteenth century. Most of it (*c* 40,800 fragments) came from the Countryside Neptune site and the Mann Island elements of the LLC extension, with much smaller amounts (897 fragments) from the Pier Head and Central Docks section of the LLC extension. It comprises primarily production waste, dumped from local workshops, the names of which could be identified by the presence of distinctive stem stamps. First appearing during the second half of the eighteenth century (Higgins 2008, 132), these stamps comprise a long, single-line mark containing the maker's name and place of work (in this case Liverpool) in relief lettering.

The largest dumps, from the Countryside Neptune site and the Mann Island section of the LLC

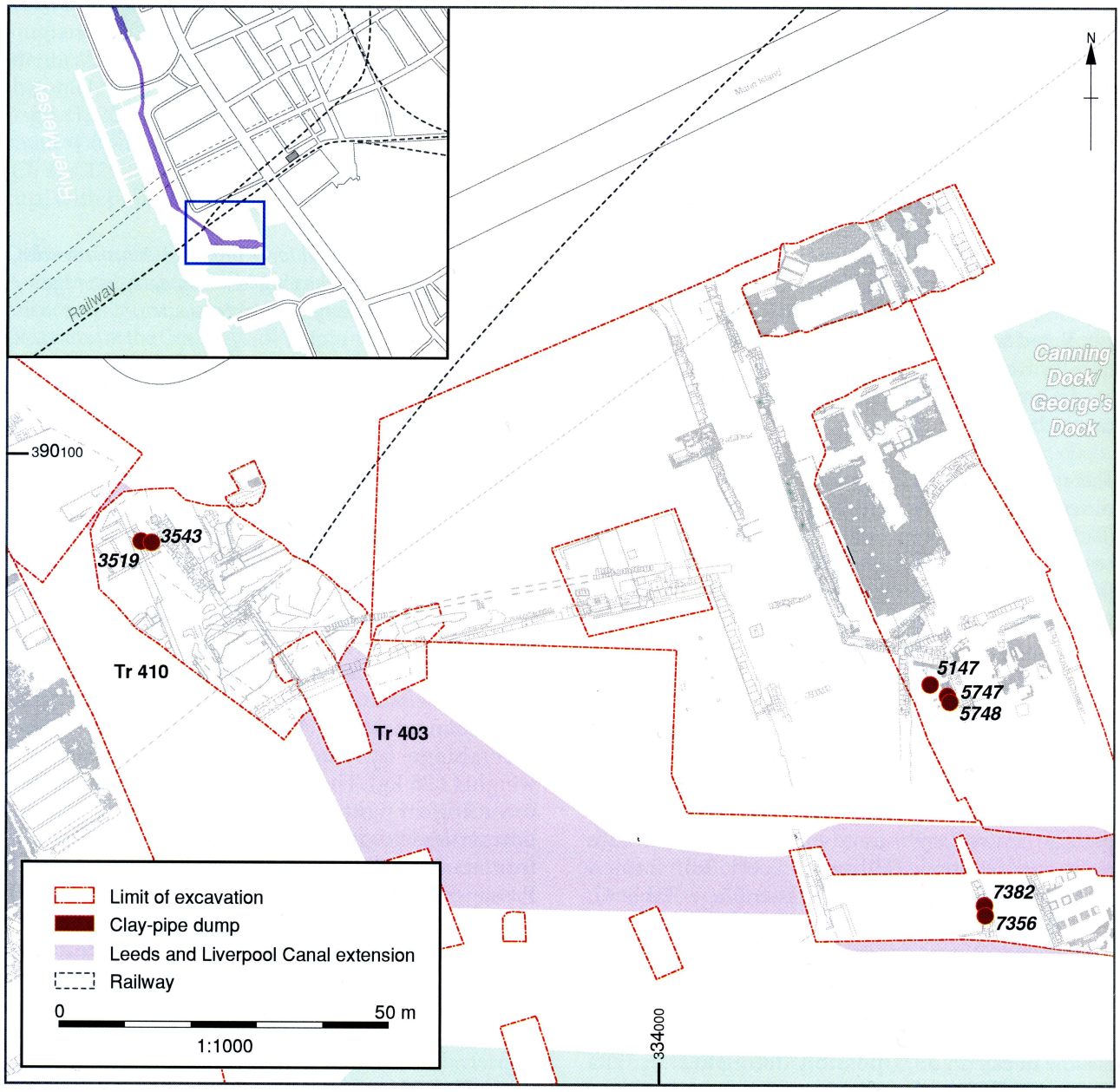

Figure 74: The locations of the clay tobacco-pipe kiln dumps (© Crown copyright 2014 Ordnance Survey 100005569)

extension, were subject to detailed analysis, the results of which will appear in a separate volume concentrating on the finds from the docks (Philpott in prep). The methodologies adopted for this study and the rationale behind them are found within the project archive (Higgins 2011a; 2011b; 2012). These dumps are the first from the city to have been studied in detail, providing an important step in defining the range of pipes produced, and some insight into the dynamics of, and interaction between, individual workshops.

The dumps from reclamation associated with the construction of Manchester Basin

Five tobacco-pipe kiln dumps (***7382***, ***7356***, ***5147***, ***5748***, and ***5747***; Fig 74) were recovered from reclamation deposits, which were associated with the creation of Manchester Basin in the last decades of the eighteenth century (*Ch 3, p 78*). Two of the dumps (***7382*** and ***7356***) fell within the Mann Island section of the LLC extension, producing 5830 fragments, along with very large quantities of other production debris. One of them (***7382***) produced only stamps belonging to William Morgan, but the other (***7356***) included those of both William Morgan and Thomas Hayes, two prominent makers at the end of the eighteenth century (Higgins 2012). The dumps had many mould types in common, suggesting that they were not only related, but also contemporary. The remaining three dumps (***5147***, ***5747***, and ***5748***) were recovered from the Countryside Neptune excavations, and all derived from William Morgan's workshop. The vast majority of the material (33,500 fragments, out of a total of 33,708) were derived from dump ***5747***, however.

The kiln dumps of late eighteenth-century date come from a period when Liverpool had an internationally important pipe-making industry, and was rapidly eclipsing Chester both as a port and a pipe-production centre (Higgins 2008, 138). While the stems of this period changed little in form and are, therefore, difficult to date, the bowl forms, maker's marks, and decorated pieces, all provide reliable evidence, suggesting that the land reclamation containing this material did not take place until after *c* 1780 (*Ch 3, p 78*).

Kiln dump ***7382***

The assemblage (640 bowl fragments, 1527 stems, and 102 mouthpiece fragments) included 41 marked stem fragments, representing at least 20 different pipes. As the name stamps are exclusively those of W Morgan (Pl 184), the entire group has been attributed to his factory. There are, however, two documented pipe-makers of this name, who worked between 1767 and 1822 (*eg* Gore 1767; 1823), but the context suggests that this group dates from the 1780s, and can thus be attributed to the earlier of them, William (I). This dating is reinforced by the fact that many of the mould types are duplicated in the second kiln group (***7356***; *p 199*), which also produced the marks of Thomas Hayes (II), who was working from *c* 1780-1800 (Gore 1787; 1790; 1796; 1800).

In total, 14 mould types were identified (Types A-I, K-O), but there may well have been more, as some

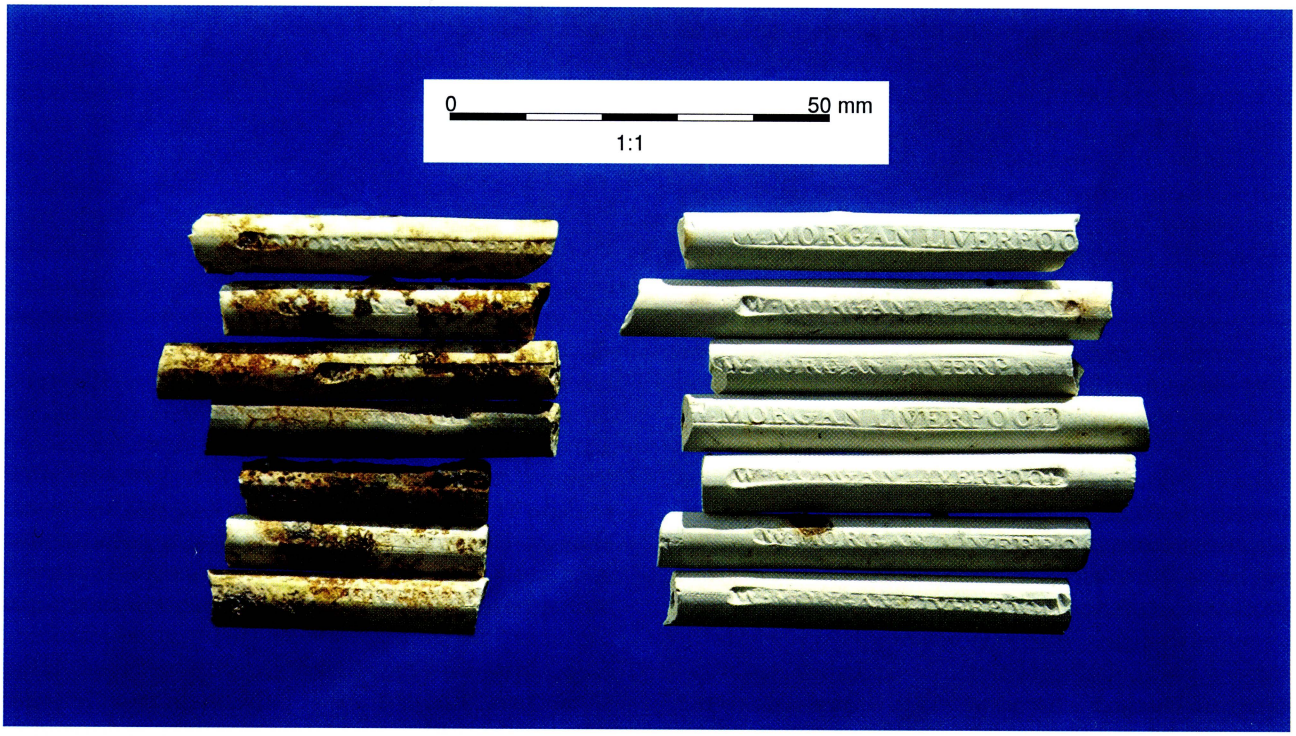

Plate 184: Stamped-stem fragments of W Morgan of the 1780s, before cleaning with EDTA, and after

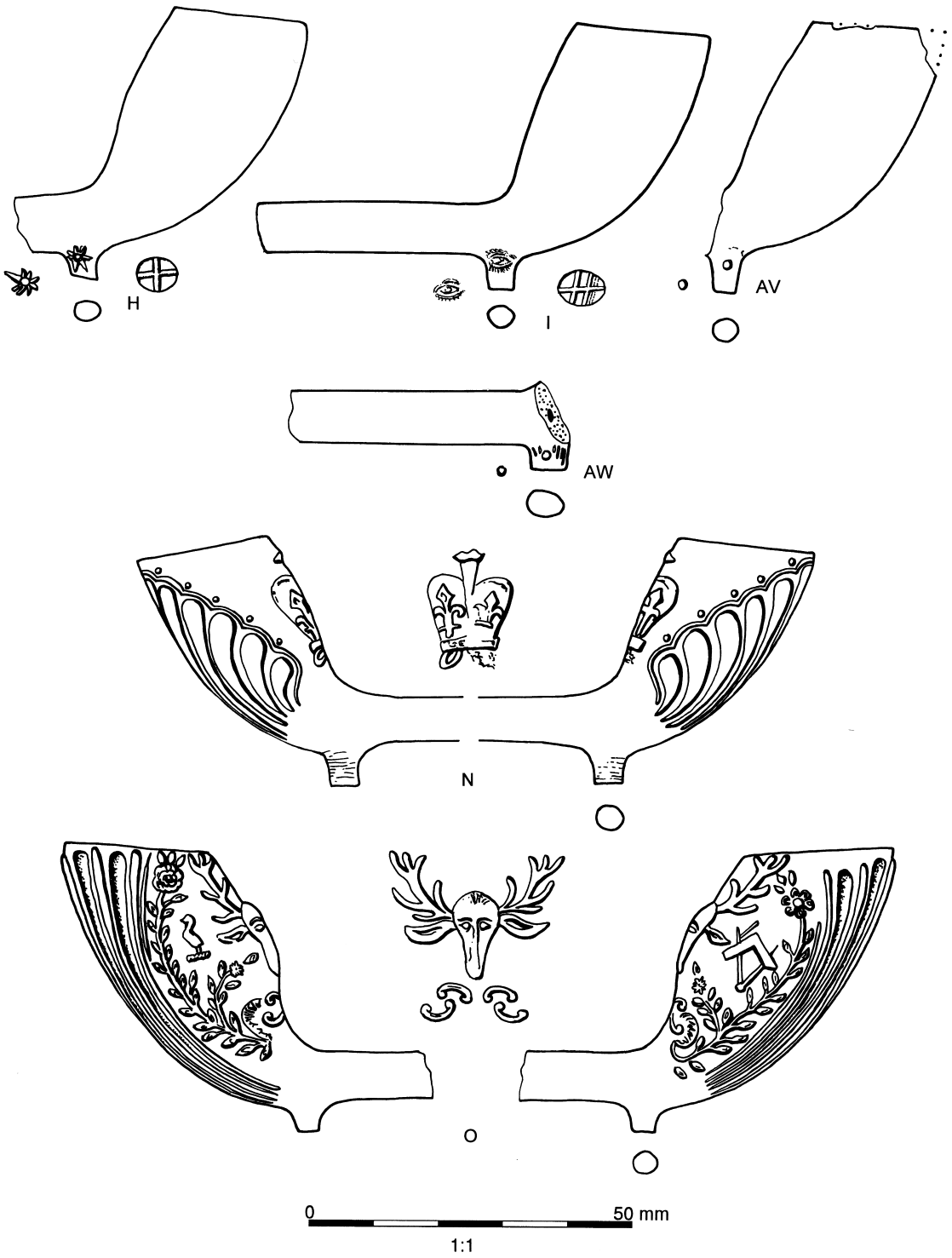

Figure 75: Clay tobacco-pipe bowls produced by William Morgan in the 1780s

fragments were too small for detailed identification. Evidence from another of the dumps (**5747**; *p 201*) confirms that all of them were produced by Morgan's workshop, but also adds at least three, and possibly as many as seven, more (Types AQ-AW).

Most of Morgan's forms (19 of the 21 defined) are plain, with three of them (A-C) being heel-less export types. These were not used in England until the middle of the nineteenth century (*cf* Atkinson and Oswald 1969) and thus the fact that this dump is of substantially earlier date makes it clear that Liverpool makers were producing for the specific requirements of the export trade, and not just for home markets. Ships from Liverpool were heavily involved in the slave trade, and the much larger export-style pipes (forms A and B) were almost certainly produced as trade goods to be used in bartering for slaves, as well

as for sale in the Caribbean and North American markets (Higgins 1995).

The other plain forms represent a range of sizes and styles that would have been intended for both the home and the export markets. Several have internal bowl crosses and four have relief-moulded marks on the sides of the heel: a star (Type H); an 'all-seeing eye' motif, drawn from Masonic iconography (Type I); a single dot on each side of the heel (Types AV and AW; Fig 75). Two of the mould types are highly decorated, one with scalloped decoration and a crown facing the smoker (Type N), and the other with a range of motifs, including a Liver Bird on the left-hand side of the bowl, a square and compasses on the right-hand side, and a stag's head facing the smoker (Type O). The fluted decoration is particularly distinctive on this type, comprising alternating concave and convex flutes, a style particularly associated with the Liverpool area, and only used towards the end of the eighteenth century (*pers obs*). The bowl form itself is also typical of the time and place, being characterised by a very slender base to a large, relatively thin-walled bowl, with the rim dipping slightly back towards the smoker.

The presence of nine glazed mouthpieces shows that William Morgan (I) was producing glazed tips, and provides the earliest firm evidence for this practice from the Liverpool area. The colour of the glaze varies, but the majority are pale green or yellowish/light brown. It is not certain whether all the pipes had glazed tips or whether it was confined to certain types, as most of the pipes in the dump are likely to have been discarded after their initial firing, and the glazed tips were most probably applied as a secondary process. Indeed, it would not be surprising if this, at the time, innovative, finishing technique was reserved for the better-quality and/or more-expensive types.

Kiln dump ***7356***

Although somewhat larger than ***7382*** (684 bowl fragments, 2669 stem, and 208 mouthpieces), the two dumps are clearly related, as nine of the 15 mould-types present in ***7382*** are duplicated in this group. Whilst apparently contemporary, it is unusual in producing stem marks from two different makers, with 13 stamped fragments attributable to William Morgan (I), and 62 to Thomas Hayes (II). Analysis suggests that around three-quarters of the identifiable pipes are attributable to Hayes, and further, that nine of the mould types which appear in both dumps can be attributed to Morgan, whilst the new types can probably all be attributed to Hayes.

Thomas Hayes (II) is only recorded in trade directories from 1787-1800 (*eg* Gore 1787; 1790; 1796; 1800), although it is likely that he was running the nearby Strand Street factory from *c* 1780. It is, therefore, almost certain that this dump can be dated to the last two decades of the eighteenth century. If the group represents, as seems likely, an early phase of Hayes' production, then a date of *c* 1780-90 can be suggested, which matches that of dump ***7382*** (*p 197*). As documentary evidence suggests that there was probably a family connection between Hayes and Morgan (*p 206*), it seems reasonable to suggest a partnership of sorts, which would explain why their waste was dumped together.

As the maker's marks are often poorly impressed or broken, it is very hard to separate individual die types, but there seem to be minima of four types for Hayes and two for Morgan. The number of different dies represented must therefore imply that these were significant manufactories, with several different workers producing pipes.

There are 17 mould types unique to this dump, all of which have been attributed to the workshop of Thomas Hayes (II) (Types P-AF). They reflect a similar range of products to those of William Morgan, with two decorated and 17 (probably) plain forms. The two decorated forms (Types P and Q; Fig 76) are very similar to each other, and also to one, produced by Morgan, that includes the use of alternate concave and convex flutes (Type O; Fig 75). The bowl forms produced by Hayes are, however, generally less slender at the base, and the rim angle sometimes dips away from, rather than towards, the smoker (Fig 77). This style is probably slightly later than that used by Morgan, although they were obviously in contemporary production. The plain forms are also similar to Morgan's, including an export style (Type R; Fig 76), as well as a range of other forms, both large and small. The main difference between the two producers lies not so much in the range, but in emphasis, with Hayes apparently producing a larger number of smaller forms, but fewer export types.

Several of the pipes attributed to Hayes have internal bowl crosses, and five have moulded marks; two are stars (Types W and X), two others are probably intended as an 'all-seeing eye' (Types Z and AA), and one (Type AB) appears to be the initials TH, for Thomas Hayes. The use of moulded initials is very rare in the North West (*pers obs*), and, in addition, the initials appear on the heel in an unusual upright orientation. The mould-maker appears to have had trouble engraving the letters, with the H apparently cut twice in different orientations, leaving a grid-like mark, which is possibly superimposed on a T underneath. One of the few parallels in the North West is a fluted bowl of *c* 1770-90 in the Grosvenor

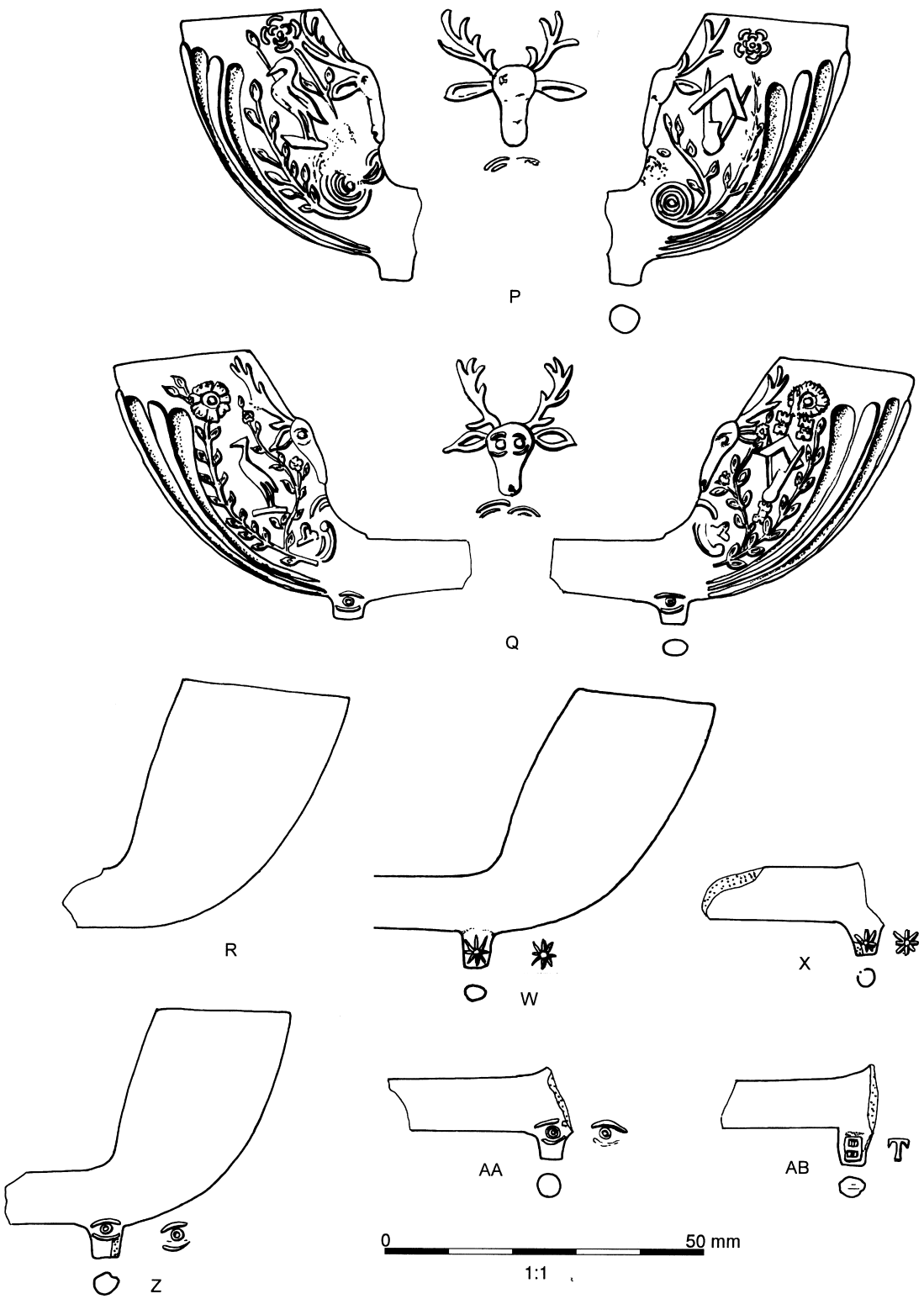

Figure 76: Clay tobacco-pipe bowls produced by Thomas Hayes

Museum, Chester (GVS 84-5), with the upright initials IH on the spur, most likely for John Hall of Chester, working *c* 1750-1818 (Rutter and Davey 1980, 241). One of the star designs is only represented by a broken-off spur, but it can be matched with a complete example from excavations in Poole, Dorset, which retains its T Hayes stem stamp (*pers obs*).

One of the mould types is of particular interest, in that it occurs in two distinct forms, albeit clearly from the same mould, which has distinctive flaws on the sides of the heel. One version is much taller than the other (Types Ya and Yb), and it is clear that the mould has been modified by cutting down its rim, thereby producing a shorter bowl with a more compact appearance.

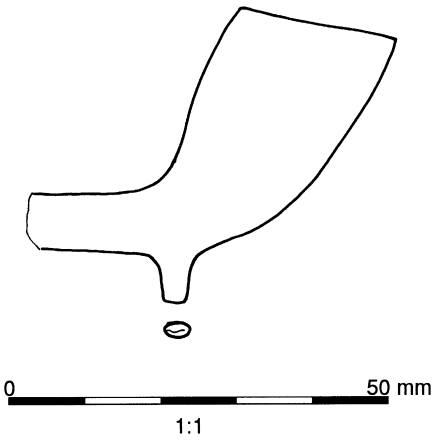

Figure 77: Clay tobacco-pipe bowl produced by Thomas Hayes in the 1780s

There is, again, evidence for glazed tips, with ten mouthpieces and 53 stems having glaze on them. The colour was mainly a vivid dark green or a range of browns. During the nineteenth century, a 'tipping muffle' was used to glaze stems (Peacey 1996, 183), but a piece of kiln debris (a roughly triangular-sectioned, applied clay strip, with glaze runs and broken stems adhering) from this dump suggests that an earlier method, whereby the tips were glazed in the main kiln rather than in a separate tipping muffle, had been used by Hayes. This is probably the earliest evidence from the entire country for how the pipes were tipped, and represents a technique somewhat different from that which became the norm (*pers obs*).

There were, in addition, tens of thousands of fragments of kiln debris, clearly showing that both Morgan and Hayes appear to have been using developed muffle kilns of the type that had become fairly standard by the end of the eighteenth century (Peacey 1996). Some pieces of the slag/stem laminate include stamped stems, confirming that the waste did indeed come from the factories of Morgan and Hayes.

Kiln dump ***5147***
The small group comprising dump ***5147*** contained 29 bowls. None had been smoked, and many of the stems are over-fired or encrusted with clay or slag from having been used in muffle construction. Other fragments of kiln debris were present, so that it is clear that this is kiln waste.

Again, the material can be attributed to William Morgan (I), with nine of the stems stamped with a single-line maker's mark, reading 'W. MORGAN LIVERPOOL', and at least two different dies are represented. Although none of the seven cut mouthpieces is glazed, there are three stem fragments with yellowish-green glaze on them, showing that some of the pipes had glazed tips. The bowls are rather fragmentary, but eight different mould types can be identified, all matched by those in dump ***7382*** (*p 197*), implying that this is another contemporary deposit.

Kiln dump ***5748***
Dump ***5748*** was found close to dump ***5747*** (*see below*). It contained 179 pieces of clay tobacco pipe, with 31 unsmoked bowls, and three fragments of kiln-waste. The material can, again, be attributed to William Morgan (I), as all of the identifiable examples can be matched with those in dump ***7382*** (*p 197*). There are 22 plain bowl fragments, including two with moulded marks (one with stars and one with 'all-seeing eyes'; Types H and I; Fig 75; *p 199*), and nine mould-decorated fragments (eight of type N and one of type O).

Kiln dump ***5747***
Dump ***5747*** is by far the most important of those encountered, being the largest from Liverpool yet to be studied. In total, it is estimated that it comprised some 33,500 pipe fragments (*c* 6800 bowl fragments, 25,700 stem, and 1000 mouthpieces), as well as more than 1000 fragments from kiln supplements used during the firing process. Again associated with William Morgan (I), it dates from the 1780s, and was deposited during land reclamation associated with the construction of the Manchester Basin (*Ch 3, p 78*).

It is well-known that pipe makers at this period would have produced a range of different pipe styles for different markets, including the export trade (Jackson and Price 1974, 84), and the large size of this group probably ensures that a full range of products has been identified. It produced multiple examples of 14 (Types A-O) of the 15 mould types seen in dump ***7382***, confirming their identification as Morgan products. The only form not represented was Type J, which suggests that this stray spur was from a pipe produced elsewhere, or that it was intrusive. As well as the 14 bowl forms, there are at least three, and possibly as many as seven, more of Morgan's types in this dump (Types AQ-AW), bringing the total number of forms recognised to between 17 and 21, at least three of which were specifically for export (*p 199*). Three of the new mould types are represented by multiple examples (Types AQ-AS), but the four others (Types AT-AW) are only represented by one or two examples each, and thus cannot be attributed with complete confidence. As they do not appear to have been smoked, however, and as two of them seem to be wasters, there is a strong case for their having been made by Morgan. All seven had plain bowls, four having internal bowl crosses (Types AR-AU), and two having moulded dot marks on the spur sides (Types AV-AW).

The group produced about 550 marked stem fragments (representing *c* 230 complete marks) of at least two different stamp types, all of which can be attributed

Plate 185: Examples of ring wads, applied strips, and rolls

to William Morgan (Pl 184), demonstrating that this is a large and uncontaminated group. The estimated number of complete marks is much smaller than the number of pipes indicated by the presence of 1000 mouthpieces, possibly suggesting that only 20-25% of the pipes produced at the factory were stamped.

Several of the stems and / or mouthpieces were glazed (*c* 190 fragments), in order to prevent the dry clay of the pipe sticking to the smoker's lips. This was still a relatively new introduction in the 1780s, with the earliest recorded use in this country coming from Staveley Hall in Derbyshire, where examples occur in a house-clearance group dating from the second quarter of the eighteenth century (*pers obs*). The Staveley group is, however, unusually early, and comes from a high-status household. In contrast, the Morgan factory was clearly producing an everyday range of pipes, typical of Liverpool products of the period, which suggests that it was common practice in Liverpool by this date, and making this the earliest firm evidence for any widespread use of the technique. The glazes used ranged in colour from dark green, through pale limes and yellows, to dark browns.

Kiln dump **5747** did not produce any evidence for the nature of the kiln itself, or any of the furniture that would have been used within it. There was, however, a good sample of supplements, including 'ring wads', 'applied strips', and 'rolls', (Pl 185), which were used to bed the kiln furniture and support the pipes during firing within the kiln. All of the historical accounts and illustrations of the firing process show pipes stacked in the kiln with the bowl downwards, and the ends of the stems resting on a central mushroom support (Peacey 1996; Fig 78).

There were also copious amounts of 'slag / stem laminate', which illustrate the commonly seen use of previously fired pipe stems to provide the framework for a layer of clay, ash, and horse manure, that was used to seal the top of the muffle chamber during firing (*op cit*, 168-71). The mixture

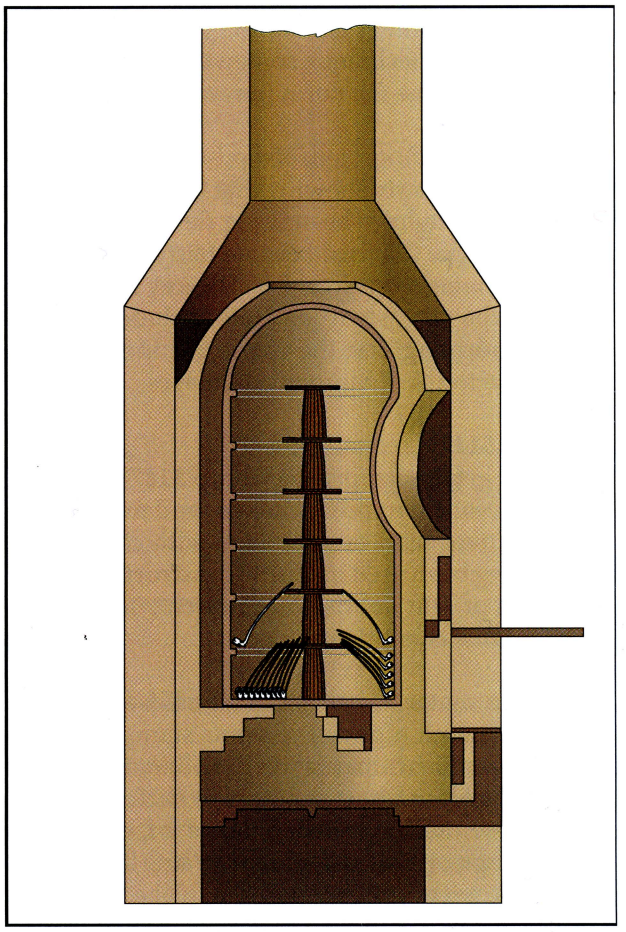

Figure 78: Section through a clay-pipe kiln

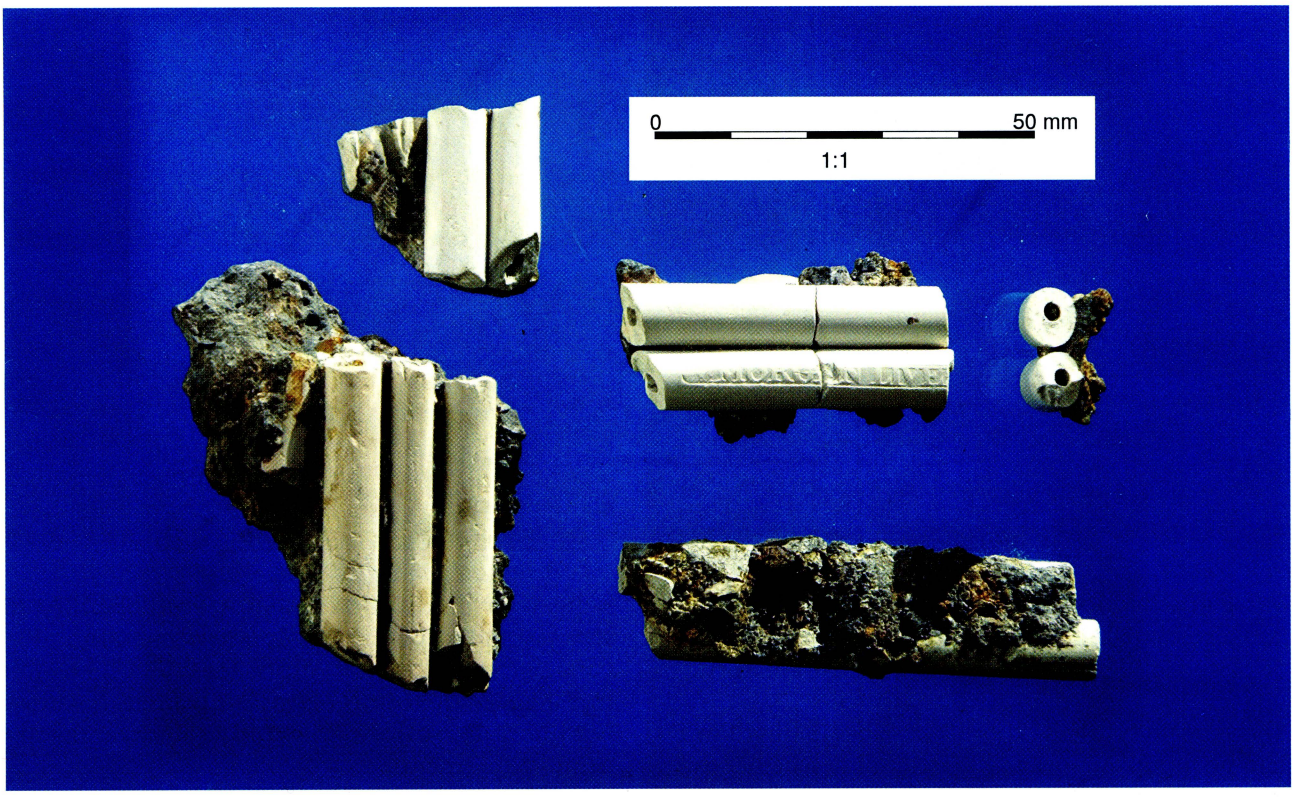

Plate 186: Slag/stem laminate from the W Morgan kiln dump, ***5747****, of the 1780s, including a stem with part of a 'W.MORGAN LIVERPOOL' stamp surviving*

became slaggy during the firing and fused to the pipe-stem framework. Many of the waste stems from ***5747*** have slaggy deposits adhering, and there are several chunks containing multiple stems, showing that this technique was being used by Morgan in the 1780s (Pl 186), probably some 40 years earlier than the earliest previously recorded use (*op cit*, 171).

Hayes' later dumps from between Chester Basin and the Manchester Dock

The Pier Head excavations on the LLC extension produced another 866 pipe fragments, ranging in date from the mid-eighteenth to the mid-nineteenth century. This included material from two small, late eighteenth-century dumps (***3519*** and ***3543***; Fig 74), derived from the Thomas Hayes (II) workshop, both dating to *c* 1795.

Kiln dump ***3519***

Dump ***3519*** was found within reclamation deposits in Tr 410, west of river wall ***3544*** (*Ch 3, p 78*), which were probably laid down in *c* 1795. It comprised a small group of seven bowls, 62 stems, and 12 mouthpieces. As all of the bowls are unsmoked, and one has a piece of clay sheet from the kiln adhering to its rim, these have been identified as kiln waste. The bowls are all plain, and several have trimmed heels, a finishing technique that went out of use around 1800 (*pers obs*).

Three stem stamps were noted (from three different pipes), all of which appear to be marks used by Thomas Hayes (II), who was working *c* 1780-1800 (*p 197*). Four mould types are represented (Types AH, AL, AM, and AP), the first three duplicating types in dump ***3543*** (*see below*); the fourth is a spur bowl. As the stem marks also duplicate those from ***3543***, the two deposits are clearly very closely related. The 12 mouthpieces are all unglazed, with simple cut ends, although there was a stem fragment with splashes of yellowish-brown glaze.

Kiln dump ***3543***

Dump ***3543*** lay very close to ***3519***, and is probably contemporary. It produced 125 bowl fragments, 531 stems, and 50 mouthpieces. Again, all of the 20 marked stem fragments can be attributed to Thomas Hayes (II), being inscribed with a long, single-line stamp. At least two different die types are represented, one of which is also seen in dump ***3519*** (*see above*). The second is unique amongst the dies, in having a numeral, in this case '2', added to the end of the die, so that it reads 'T.HAYES.*LIVERPOOL*.2'.

Neither the stamp types, nor the mould types, correspond to those seen in the earlier Hayes' workshop material from Mann Island (dump ***7356***; *p 199*), which was dated to the 1780s, perhaps suggesting that the pipes in ***3543*** might be later. Indeed, some of the decorated pipes would normally

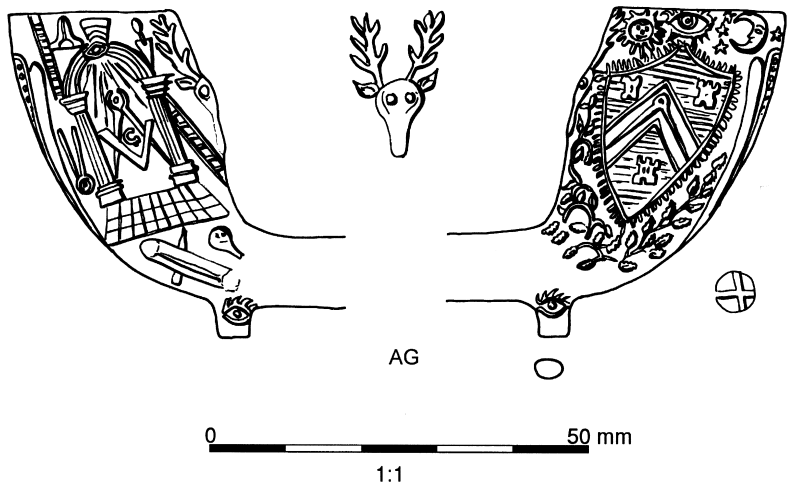

Figure 79: Decorated clay tobacco-pipe bowl produced by Thomas Hayes in c 1795

be regarded as nineteenth-century types and, as Hayes had died by 1803 (Gore 1803), this allows the group to be placed at the very end of the eighteenth century.

There are no spurless export-style pipes in this dump, but the group is too small to determine whether this reflects a change in fashion, or a particular production batch. A few of the bowls, all from a single mould type (Type AG), are highly decorated, their sides covered with a wide range of Masonic motifs (Fig 79). Similar pipes from dump ***7382*** bore depictions of the Liver Bird and stags' heads (*p 199*), but this new design has a rather more upright bowl style, and it would appear that the earlier designs had fallen out of use. The fluted decoration and stags' heads are still present, however, but the other decorative motifs have been expanded to cover almost all the bowl's surface.

The majority of the forms from this group are plain, appearing in a range of sizes and styles (Types AH-AM). There are also two forms with simple leaf-decorated seams (Types AN-AO), a type of decoration that became very widely used from the early nineteenth century onwards (*pers obs*). Only one of the 50 mouthpieces is glazed (a translucent pale lime green/yellow), but there are stem fragments with traces of a similar colour glaze. This low incidence suggests either that glaze was rarely used at this point, or that this dump comprised waste from the actual firing process, rather than any secondary tipping process.

There is also a small amount of a range of waste characteristic of that from a developed muffle kiln (Peacey 1996, fig 94). The fuel used was clearly coal, as small fragments survive, as do large quantities of ash and cinder.

Other pipes

In addition to the well-defined kiln dumps, numerous other fragments of clay tobacco pipe were recovered, offering a rare opportunity to study some of Liverpool's post-medieval trading connections. Most date from the mid-eighteenth to the late nineteenth or early twentieth century, but there are also a few residual seventeenth-century fragments.

A spur bowl with Masonic decoration, dated to *c* 1770-1810, came from cellar floor ***5708*** (*Ch 3, p 87*). Although Masonic motifs were commonly used in the Liverpool area (*p 199*), this example is in a Yorkshire style (White 2004, 567), and is thus presumably imported. Other imports include a late seventeenth-century bowl manufactured in London (Fig 80), and a stem of Dutch origin. Pipes from the Netherlands are generally very rare in the UK and, when they do occur, they are most frequently encountered in ports, where they probably reflect casual loss by sailors, rather than trade (Higgins 2009, 43).

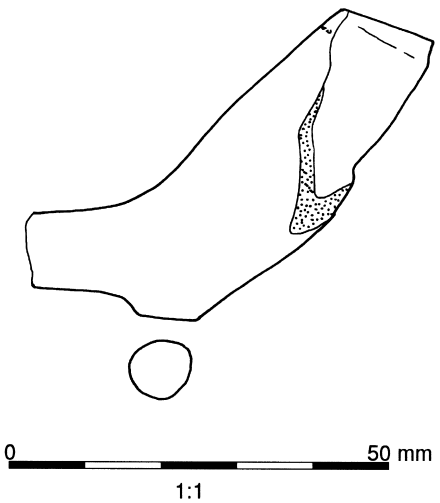

Figure 80: Late seventeenth-century clay tobacco-pipe bowl, manufactured in London

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Figure 81: Elaborately decorated eighteenth-century clay tobacco-pipe stem

Fragments from the Countryside Neptune site included 39 that were marked with the maker's name. Other notable examples include an elaborately decorated eighteenth-century stem (Fig 81) from **5122**, backfill overlying a cobbled area of the quayside at Nova Scotia (*Ch 3, p 80*). Its tendril border and decorated stem twist are characteristic of pipes produced in Chester in *c* 1720-80 (Rutter and Davey 1980). Similar pipes with ornately decorated stems were also produced in Rainford (Dagnall 1987) and production might be expected in Liverpool as well, where the pipe makers would have been in direct competition with those from Chester, especially for overseas orders.

The group also includes a range of distinctive decorated pipes produced in the Liverpool area, all of which employ particular motifs, such as a stag's head facing the smoker, Masonic emblems, the Liver Bird, and flower/foliage motifs. They include a particularly unusual example from a demolition layer, which has a stag's head facing the smoker, and flutes on the opposing side. The right-hand side of the bowl is largely missing, but has traces of Masonic decoration, but, unusually, the left-hand side depicts the Glasgow Arms (a bird sitting on a tree with a bell and fish; Fig 82). It dates from *c* 1780-1810, is the earliest known example of the Glasgow Arms being used to decorate a pipe, and it seems likely that this is a Liverpool product, intended for export. The design is shown in various early twentieth-century trade catalogues (*cf* Jung 2003, 390) and has been seen on late nineteenth-century pipes, but never before on anything earlier than *c* 1860 (*pers obs*).

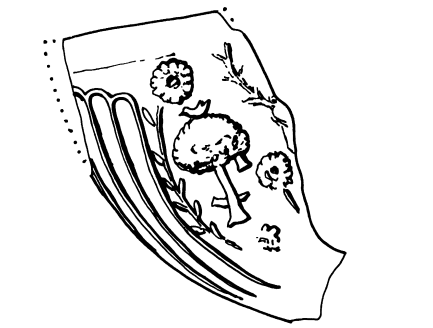

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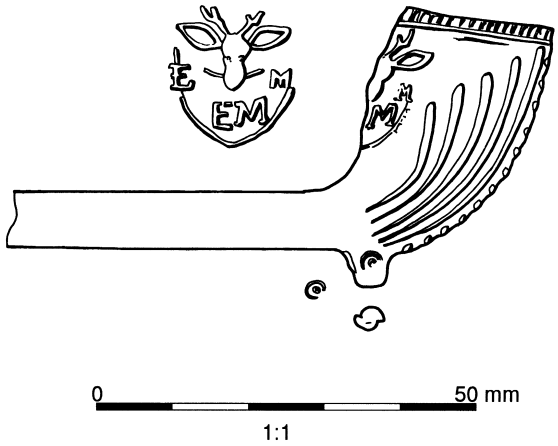
Figure 82: Clay tobacco-pipe bowl decorated with the Glasgow Arms

There are also some slightly later pipes (*c* 1820-50), which are typically decorated with a panel containing a variety of motifs above fluted decoration and, sometimes, a shield, with the maker's initials, facing the smoker. An example, marked EM in a shield (Fig 83), can be attributed to Elizabeth Morgan (working 1816-39; Gore 1816; 1839). There are not many late nineteenth- to early twentieth-century pipes, but a few provide evidence for the kinds that were being used in the waterfront areas at that time. They include examples marked with pattern names, such as 'LONDON' or 'DUBLIN PIPE' (Fig 84), as well as makers' marks from firms in other areas. These include McDougall's of Glasgow, which was in operation from 1846 to 1967 (Anon 1987, 356), and



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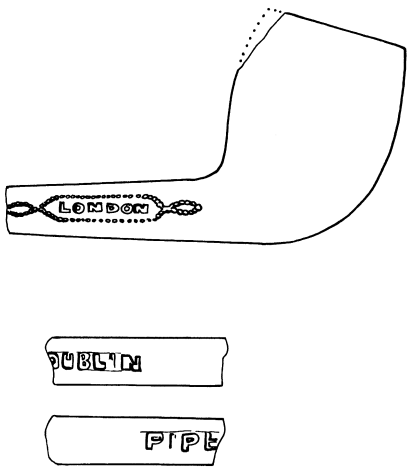
1:1

Figure 83: Decorated clay tobacco-pipe bowl, marked 'EM'



0 50 mm
1:1

Figure 84: Clay tobacco-pipe bowl, marked 'LONDON', and a stem marked 'DUBLIN PIPE'

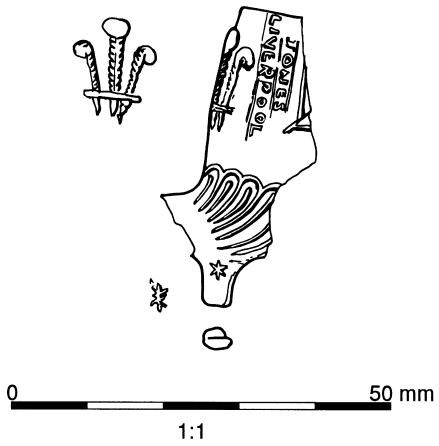


Figure 85: Clay tobacco-pipe bowl marked with 'JONES/ LIVERPOOL'

Southorn's of Broseley, both of whom had agents in Liverpool during the second half of the nineteenth century, and were shipping their products out of the port (*eg* Gore 1874; 1882; 1892). These came from a fairly large assemblage (five bowls, 132 stems, and 14 mouthpiece fragments), from the backfill (***5116***) of the cellar (***5114***) of a late eighteenth-century warehouse (*Ch 3, p 83*). The lack of bowl fragments, and the extensive burning, suggests that they were from a domestic deposit, rather than being kiln waste, with the most likely date of deposition being the 1850s.

Another bowl, with enclosed flutes at the base, the Prince of Wales feathers facing the smoker, and a small star on each side of the spur, is marked 'JONES/ LIVERPOOL' in relief on the right-hand side (Fig 85). The lettering is in an unusual location, being upright, and running from top to bottom of the bowl. It has no known parallels, but was made by either John Jones (father), or John George (son), of Liverpool, who only worked on their own from *c* 1835-57 (*eg* Gore 1835; 1857).

Discussion

Despite its pre-eminence as a maritime port, and the concomitant access to world-wide export markets, the eighteenth- and nineteenth-century pipe producers of Liverpool, who would have serviced those markets, are not well-known, even though, by the 1830s, Lancashire (which then included Liverpool) contained no less than 17.4% of all English pipe makers (Higgins 2008, 138). More than 350 pipe makers have been documented as working in the city, and pipes bearing Liverpool marks or designs are well-known from Canada to the Caribbean, and from Africa to Australasia. Despite this, there has been almost no publication of pipes or of kiln waste from the city, which presently makes it almost impossible for researchers to identify and date Liverpool pipes.

The assemblage was dominated by production and kiln waste dumped by two related manufacturers, who clearly worked closely together in the last quarter of the eighteenth century, perhaps sharing workers and/or premises, as well has having possible familial links (*see below*). Analysis has allowed their products to be much better understood, with their form, decoration, and, importantly, the maker's stamps and dies fully recorded, and dated with some precision.

Stem stamps identified the two manufacturers as William Morgan (I) and Thomas Hayes (II). William, the son of a tailor, was born in Liverpool in 1743 (LVRO 283 SMW/1/4). It is not clear when he began to make pipes, but, from 1767 onwards, when he was 23 or 24 years old, he appeared regularly in the early trade directories (*eg* Gore 1767). He could have set up his business before this, but it is unlikely that he would have been working independently before his 21st birthday in 1764. He moved between several different addresses during his career: in 1796 he was in Gradwell Street (Gore 1796), with a second manufactory in Parliament Street. This is the only reference to William having a Parliament Street address, but, between 1816 and 1839, later members of the family are recorded as having a pipe warehouse and/or manufactory there (Gore 1816; 1821; 1823; 1825; 1827; 1832; 1834; 1835; 1837; 1839), presumably on the site established by him. William Morgan died in 1804, aged 61, and was described in the burial register as a pipe maker (LVRO 283 NIC/1/8). Evidence suggests that he might have retired around 1800, as a directory entry for 1803 lists a 'William Morgan Junior' in Gradwell Street (Gore 1803), presumably indicating that a son of the same name had taken over the business.

There is less documentary background for the career of Thomas Hayes (II). He is only recorded in directories in the period 1787-1800 (Gore 1787; 1790; 1796; 1800), but it is likely that he was running the nearby Strand Street factory from 1780, when he married Lydia (née Banner), the widow of pipemaker Johnathan Hutchinson, who had previously occupied the site (LVRO 283 PET, 3 October 1780; Gore 1777). Interestingly, the parish registers of St Nicholas (LVRO 283 NIC/1/6), recording the death of William Morgan's daughter Kitty in 1794, note the maiden name of his wife as Mary Hayes. This raises the possibility that she came from the prominent Hayes family of pipe makers, and so could have been a close relative of Thomas Hayes, which would explain the close collaboration between the two men.

The range of forms seen in the waste dumps also shows that they were producing pipes in a number of styles, including spurless export pipes (probably with short stems), plain and decorated pipes with large bowls (probably with long stems), and plain pipes with

smaller bowls (medium-length stems). There was also some evidence for the rapid evolution of bowl forms and decorative styles, with Morgan's decorated forms looking slightly outdated in comparison to those used by Hayes, which, in turn, could be seen to evolve between dumps dating from the 1780s and *c* 1795. Although his visit to the Liverpool pipe factories in the 1750s is somewhat earlier in date, the Swedish industrial spy, John Julius Angerstein, records a similarly wide range of products, noting that 'pipes sold for 9 pence to 30 pence per gross' (Berg and Berg 2001, 311), showing that the best pipes were selling for more than three times the cost of the cheapest.

Documentary research has allowed the production periods to be defined quite closely, and analysis of the kiln debris (Higgins in prep) has established that both manufacturers were using developed muffle kilns to produce their wares, of the type that had become fairly standard by the end of the eighteenth century (Peacey 1996). There were, however, idiosyncrasies, and it seems that mouthpieces were glazed within the main kiln, rather than in a separate 'tipping muffle', as was the case in the nineteenth century.

The assemblages also give some indication of the scale of late eighteenth-century production. Evidence shows that William Morgan was using at least 17-21 different moulds during the 1780s, and Thomas Hayes produced at least 17 pipe types during the 1780s and ten during the 1790s. Assuming that each maker had all their mould types in simultaneous use (*ie*, with some 10-20 moulding benches being used in any given factory), then the workshops would have been capable of producing at a scale comparable with the enormous numbers of pipes known to have been shipped from the city at that time. For example, the shipping records for 1770 show that some 5535 gross (797,040 pipes) were exported in that year alone (Higgins 2008, 138).

The sugar-refining industry

Sugar refining has been associated with Liverpool since the seventeenth century, when the first sugar house was set up by Richard Cleaveland and Daniel Danvers (Brown 1993, 16), and by 1756 there was a pottery factory (the Mould Works, near the Infirmary) making, among other things, sugar moulds and drips and, significantly, selling them 'on the same terms as for Prescot, Sutton and other places' (Smith 1970, 5), which were also undoubtedly supplying Liverpool's sugar-refining needs. By 1773, there were eight sugar houses in the town (Brown 1993, 16), which probably would have had a huge and increasing requirement for the moulds and syrup jars used in refining. Furthermore, in the period 1785-1810, the sugar trade through Liverpool increased by 277% (Hyde 1971, 26), leading to a concomitant need for moulds and refining jars.

Plate 187: The rim of a syrup jar

Sugar wares (sugar-loaf moulds and syrup-collecting jars) comprise a significant element of the pottery assemblage (1098 fragments; 20.5% by fragment count and 29.88% by weight; Table 4) and several deposits were identified which contained considerable amounts. At the Countryside Neptune site, these included two dumps from eighteenth-century land-reclamation deposits to the east of river wall ***7638*** (*Ch 3, p 62*). One of these dumps contained 309 fragments, whilst the other produced 138 fragments. In addition, during excavation on the Mann Island section of the LLC extension, vessel fragments were particularly concentrated in two late eighteenth-century reclamation layers west of slip wall ***7325*** (*Ch 3, p 64*); the earlier layer contained 72 fragments, whilst the later contained 42 fragments. Another concentration (78 fragments) was present in the early nineteenth-century pottery dump located to the north of river wall ***3801*** (*Ch 4, p 127*).

There are large numbers of rim fragments from relatively large-diameter sugar-loaf moulds (Pl 187), and variations in the rim profiles make it clear that there are numerous moulds present. Several of the fragments appear to have rows of small holes running across them, which does not seem to be a normal feature, and might point to a more specialised use, or a specific manufacturer, or could, perhaps, have served to bear supporting bands used round some moulds (J Speakman *pers comm*). In addition, the assemblage contains the basal apertures from several moulds (Pl 188), and glazed rim fragments from a number of syrup jars, as well as three small pinched feet in a fabric similar to the loaf moulds, which could also derive from syrup jars.

These vessels almost certainly originate from the local sugar-refining industry, and were made in Liverpool, or perhaps Prescot, where it has been established that sugar wares were also produced during the early eighteenth century (McNeil 1989), in fabrics

Plate 188: The perforated base of a sugar-loaf mould

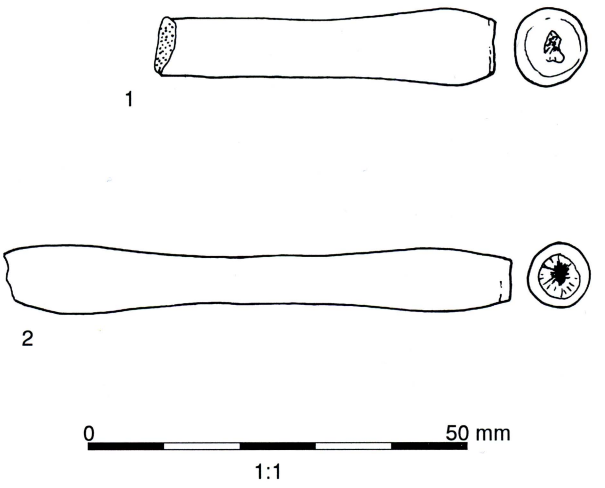


Figure 86: Pipe-clay hair curlers

effectively identical to those from these excavations. Interestingly, syrup-collecting jars at Prescot are described as over-fired to vitrification, and a high proportion of fragments in the Mann Island / Pier Head assemblage have been similarly over-fired, with large inclusions, and they are frequently blistered. There is no doubt that sugar wares were also made in Liverpool, and it has been suggested that, as several potters had interests in both production centres, a split was made between finewares, which relied on imported clays brought to Liverpool by sea, and so were most economically made in Liverpool, and coarsewares, which used clays from the coal-measures, made in Prescot, where they were locally abundant (Davey 1991).

Other Materials

Pipe-clay hair curlers

David A Higgins

Two pipe-clay hair curlers were recovered from the Pier Head section of the LLC extension (Fig 86). Both have probably been shaped by rolling the clay over some type of former, but the first is more neatly finished, with the end formed with a single cut, leaving just a small central dimple from rolling (Fig 86.1). The second is less neatly finished and the end has just been allowed to form a conical hollow where the clay has run off the end of the former (Fig 86.2). There seems to be a line near one end that presumably marks the edge of the former and the position where the end should have been trimmed (the other end is chipped off).

Both examples are of slender eighteenth-century forms, and may well date from late in the century, since one was associated with pipe stems attributed to Thomas Hayes II, who was working *c* 1780-1800 (*p 197*). These curlers were almost certainly manufactured as a sideline by the local pipe-makers.

Ceramic building material

During the excavations on Mann Island, a representative sample of 128 bricks was retained from a range of contexts. Of these, 122 were from the Countryside Neptune site, with some deriving from the floors of the numerous cellars, while others came from the foundations and walls of buildings on Nova Scotia and north of Canning Dock. They all appear to be of late eighteenth- or early nineteenth-century date, and comprise examples of slop-moulded and, possibly, pallet-moulded bricks (Ryan 1996, 92), by unknown makers. The majority are handmade, and most of these, and also the machine-made bricks, fit into the range of 220-240 x 105-115 x 60-90 mm, reflecting the thicker standard that prevailed in the north of England at the time (Brunskill 1997, 38). The remaining 16 bricks, all of which appear to be of late eighteenth-century date, came from the Mann Island section of the LLC extension and are again by unknown makers. They were from a number of contexts representing the foundations, walls, and surfaces associated with a mid-nineteenth-century warehouse (**7339**; *Ch 4, p 197*).

Metalwork

In total, 450 fragments of metalwork were recovered during the combined programmes of excavation. This assemblage is composed of copper-alloy objects, ironwork, and a small quantity of lead.

Copper-alloy objects

Coins and tokens

Some 19 copper-alloy coins were recovered, with 17 coming from the Countryside Neptune site, the