

## The Jacksonville 'Blue China' Shipwreck (Site BA02): Clay Tobacco Pipes

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A rescue excavation conducted by Odyssey Marine Exploration in 2005 on the deep-sea Jacksonville 'Blue China' shipwreck (Site BA02) recorded 63 intact and fragmentary clay tobacco pipes of two major types. This New York based East Coast schooner was apparently transporting a minor consignment of pipes to a Southern port when it was lost in the mid-19th century, possibly September 1854.

Visual analysis of a sample of 16 tobacco pipes recovered, featuring a ribbed bowl (Type 1) and the letters 'TD' embossed on an otherwise undecorated bowl (Type 2), combined with a study of mid-19th century clay pipe production across Europe and America, has not identified specific manufacturing origins. While some of the examples are most characteristic of English and German manufacture, Scottish and American provenances cannot be excluded. The Site BA02 cargo of tobacco pipes is the first discovered on the wreck of a schooner off America and is one of the larger pipe assemblages found at sea off the USA. The wreck's relatively well-established date helps secure the chronology of these common styles of an important artifact within both American and European archaeological contexts.

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### 1. Introduction

Amongst a primary cargo of British ceramics and American glass bottles, window panes and other glassware, the Jacksonville 'Blue China' shipwreck discovered by Odyssey Marine Exploration at a depth of 370m, 70 nautical miles off Jacksonville, Florida, contained a comparatively small consignment of clay tobacco pipes, 63 examples of which were recorded across the site. The assemblage is clearly cargo and was scattered across the wreck in a wide zone extending from the northernmost flank in Area E, through Areas B, F and G (Fig. 1).

Two main clusters occur to the north. Area B contains 39 pipes (33 within the confined limits of Area B1, 3.0 x 2.2m), which are associated with deposits of dark glass liquor/spirits bottles (Fig. 2). An additional 11 pipes were present in Area E: six in Area E3 to the southwest of storage keg K7 and another six were scattered around the north and east ends of keg K5 (Figs. 3-6). A seventh example concreted to the upper surface of keg K6 may reflect the original form of the pipes' stowage within wooden kegs reinforced with iron hoops (Fig. 7). Finally, a cluster of eight pipes along the keel line at the center of Area G may

denote the presence of a further decomposed container of these wares. In total, this pattern of deposition perhaps points towards the presence of a relatively minor consignment of cargo within two or three batches restricted to the stern half of the ship.

Recovery of 16 examples from this assemblage has led to the identification of two different pipe styles. The 13 Type 1 ribbed examples (also referred to as fluted or cockled) measure 18.2-21.4cm in length and feature 16 4.4cm-long raised vertical lines (excluding the pipe seam) set 0.2cm apart that encircle the entire pipe bowl, beginning at the stem bowl juncture and rising to within a few millimeters just below the pipe rim (Figs. 9, 11-23). The three Type 2 pipes are characterized by the attribute of the letters 'TD' (H. 0.4-0.6cm and W. 0.5-0.6cm) embossed in relief on the back of the pipe bowl facing the smoker and set on either side of the mold seam; the bowls are otherwise undecorated (Figs. 10, 24-28). Of these three examples, only one is nearly intact, measuring 14cm in length. All of the pipes visible on the wreck site photomosaic are of Type 1, which seems to have been the predominant form being shipped.

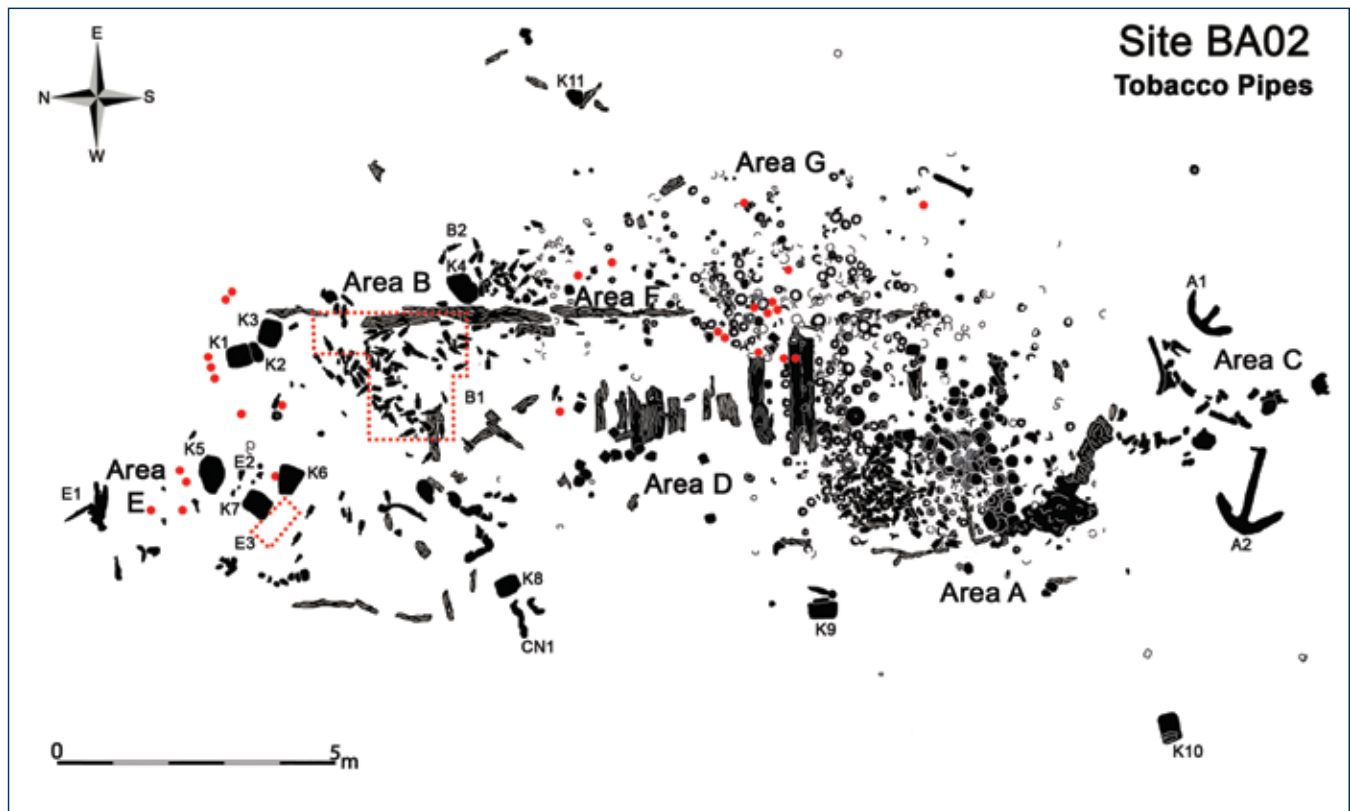


Fig. 1. The distribution of tobacco pipes on the Jacksonville 'Blue China' shipwreck (Site BA02).

All of these white clay pipes were manufactured as single pieces in two-part molds. Slight variations in the ribbing within the Type 1 assemblage indicate that production of the assemblage was executed using different pipe molds of identical style. The 'TD' pipe letter detail also displays minor discrepancies that similarly reflect manufacture using different molds. Thus, the variation within both forms suggests production by one of the larger 19th-century factories using multiple molds of one style to fill an order. Both pipe styles feature peg spurs at the juncture of the bottom of the bowl and stem. Unlike pointed spurs, the peg variant has a flat end, although the spurs are slightly tapered.

The pipes recovered from Site BA02 vary in levels of preservation from largely intact bowls and stems to fragmentary examples consisting of just a surviving bowl (sometimes broken) with very little of the original stem extant. Several of the pipes are heavily stained by what appears to be iron oxide. This may be due to alterations of the clay from the saltwater environment or perhaps caused by contamination from adjacent artifacts or ship structures. None of the pipes display any evidence of having been smoked in the form of use-wear marks, including teeth impressions on pipe stems, evidence of reworking of the

pipe bowls or charring, thus supporting the conclusion that the assemblage comprised ship's cargo.

## 2. An Overview of Mid-19th Century Pipe Production

Pipe making technology remained substantially unchanged from the 17th century onwards. A sausage or tadpole-shaped piece of clay was rolled to the right length and thickness and a wire was then inserted the length of the stem to form the bore. The clay with inserted wire was then placed in an open two- or three-part metal mold, which when closed formed the final shape. A plunger was used to make the bowl cavity and the wire to connect the stem bore to the bowl. Once removed from the mold, the pipe was cleaned and stamps for additional decoration or maker's marks could be applied.

By the mid-19th century, most decoration was imparted by the mold, so that a new mold was required for each style of pipe. Some pipe makers did equip their molds with changeable inserts so that individual names or motifs could be molded onto a pipe upon request. Once removed from the molds, the pipes were dried, placed in a kiln, fired and after cooling packed in shipping containers cushioned

with straw or wood shavings for transport. A skilled pipe maker working by hand could produce about 500 long-stemmed pipes a day. Production could be increased by breaking down the process into separate tasks or by using steam-driven machines for steps in the process (Gojak and Stuart, 1999: 38). Use of barrels for shipping pipes was documented *c.* 1830 (Stradling and Stradling, 2001: 183), whereas by 1864 wooden boxes were in use (Pfeiffer, 2006: 101-2, 106-7).

### 3. The Site BA02 Pipe Typology

None of the Site BA02 pipes incorporate any company names, maker's initials or symbols on the pipe bowls

or stems, an exclusion which the results of land-based excavation indicates was not uncommon in the mid-19th century. Nonetheless, this complicates attempts to identify the original pipe makers (Brassey, 1991: 27). To make matters more obscure, literally hundreds of 19th-century pipe manufacturers existed in a number of countries using thousands of molds, many of which were virtually identical because the craftsmen copied the most popular styles in production. A specific example of this phenomenon are the 'TD'-embossed pipes on the Jacksonville 'Blue China' shipwreck, which are not indicative of an individual maker or a particular company, but instead represent a 'trademark' used by many different pipe makers of the era (Walker, 1966: 86).

Artifact Reg. No. & Type	Pipe L. (cm)	Bowl H. (cm) **	Max Bowl W. (cm) ***	External Mouth Dia. (cm)	Spur W. (cm)	Th. at Spur/Stem Junction (cm)
BC-05-00010-CP (Type 1) *	13.4 (broken)	4.35	2.78 x 2.48	2.67 x 2.47	0.68 x 0.52	0.89
BC-05-00011-CP (Type 1)	18.2 (intact)	4.21	-----	2.67	0.65 x 0.49	0.98
BC-05-00012-CP (Type 1) *	10.8 (broken)	4.28	2.86 x 2.44	2.68	0.62 x 0.46	0.93
BC-05-00013-CP (Type 1) *	6.7 (broken)	4.19	2.89 x 2.44	2.65 x 2.42	0.65 x 0.43	0.97
BC-05-00014-CP (Type 1) *	13.0 (broken)	4.21	2.73 x 2.36	2.48	0.62 x 0.46	0.94
BC-05-00015-CP (Type 1) *	6.2 (broken)	4.27	2.72 x 2.47	2.62 x 2.41	0.61 x 0.45	0.98
BC-05-00016-CP (Type 2)	14.0 (broken)	3.70	2.50	2.10	0.50	0.90
BC-05-00220-CP (Type 1) *	21.4 (intact)	4.30	2.49 x 2.81	2.68 x 2.48	0.66 x 0.51	0.86
BC-05-00221-CP (Type 1) *	19.6 (broken)	4.28	2.85 x 2.82	2.68 x 2.54	0.62 x 0.52	0.96
BC-05-00222-CP (Type 1)	20.4 (intact)	4.35	2.90	2.30	0.60	0.80
BC-05-00223-CP (Type 1)	19.1 (intact)	4.30	2.80	2.30	0.60	0.80
BC-05-00224-CP (Type 1) *	10.5 (broken)	4.36	2.84 x 2.84	2.77 x 2.50	0.68 x 0.52	0.89
BC-05-00225-CP (Type 2)	11.7 (broken)	4.1	2.20	2.00	0.50	0.90
BC-05-00226-CP (Type 1)	5.2 (broken)	4.37	2.76 x 2.51	2.66 x 2.41	0.65 x 0.54	0.97
BC-05-00227-CP (Type 2) *	10.5 (broken)	3.95	2.35 x 2.19	2.29	0.50 x 0.44	0.98
BC-05-00228-CP (Type 1)	11.3 (broken)	4.32	2.58 x 2.82	2.77 x 2.50	0.69 x 0.52	0.88

\* Spur displays a prominent elevated clay mold seam line on proximal edge.

\*\* Measured from directly in front of spur.

\*\*\* Measured at mid height up the bowl.

Table 1. Relative dimensions of Type 1 and Type 2 tobacco pipes from Site BA02.

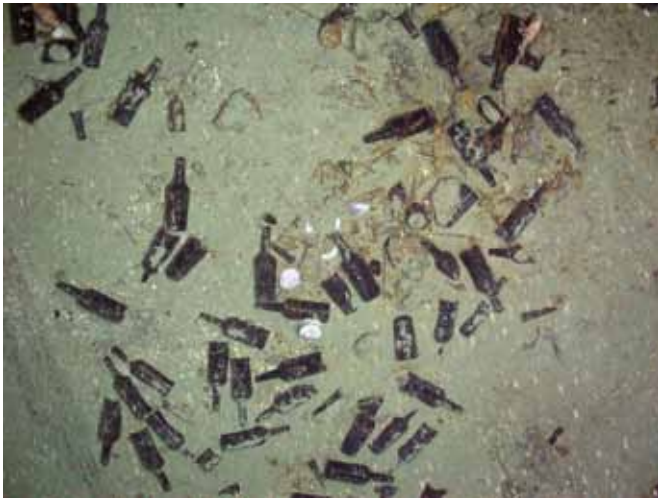
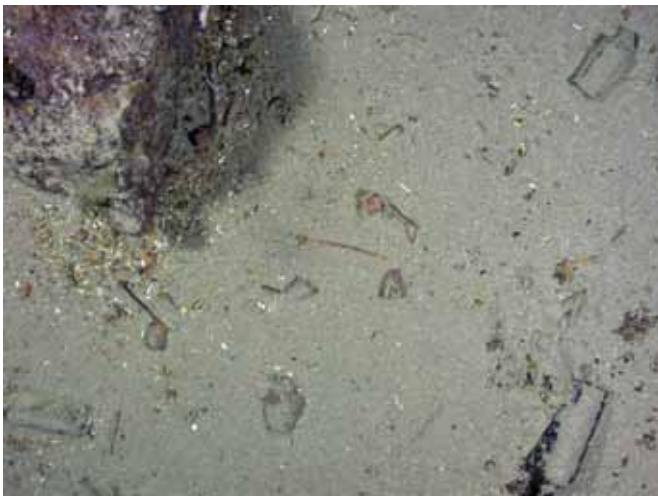
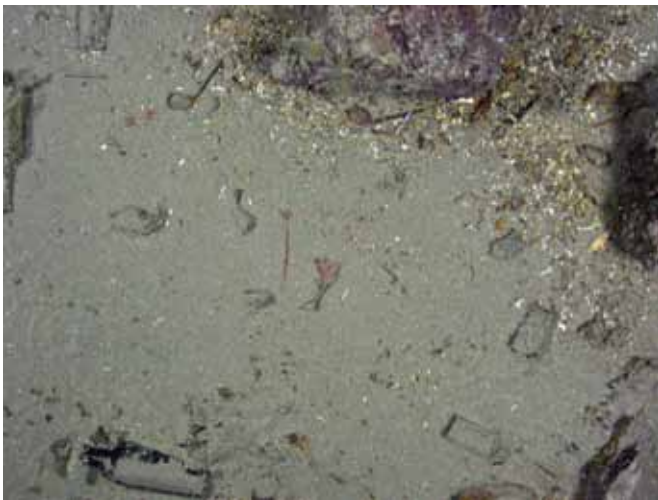


Fig. 2. A cluster of ribbed Type 1 tobacco pipes in situ in Area B1 in association with black glass liquor/spirits bottles.



Figs. 3-4. Type 1 tobacco pipes in Area E3 to the southwest of transport keg K7.



Fig. 5. Type 1 tobacco pipes on the eastern flank of Area E with the outline of the keel running north/south and a shattered transport keg at left.

Clay pipe fragments are extremely durable, survive in vast quantities on terrestrial sites and have been discovered underwater as shipwrecked cargos and domestic assemblages, while individual broken examples were deliberately thrown into harbors at the end of their useful lives. The clay tobacco pipe has become a very valuable archaeological clue for dating and interpreting historical sites. In most cases, pipes were manufactured, imported, smoked and discarded within a relatively short period of time, often less than two years. This factor, combined with a recognizable evolutionary change in the pipe bowl from before the start of the 17th century into the 19th century, permits individual styles to be identified and traced to specific periods of production (Higgins, 1995: 47, 50; Hume, 1974: 296).

Research, including analysis of dimensions, suggests that the two styles of tobacco pipe on the Jacksonville 'Blue China' wreck are indicative of examples produced between the years 1840 and 1860. The probable date of September 1854 for the loss of the schooner wrecked at Site BA02, based on a combination of artifactual and historical evidence (Gerth *et al.*, 2011), contributes to the fine-tuning of these pipe types' chronology.

A representative sample of four pipes from the Jacksonville 'Blue China' pipe cargo, which typify the assemblage as a whole, was examined in detail: two ribbed examples (BC-05-00010 and BC-05-00224; Figs. 16-17) and two 'TD'-embossed variants (BC-05-00225 and BC-05-00227; Figs. 25-26). This analysis confirmed that each of the four pipes was produced in a different two-part mold. The pipes appear to be lightly varnished, although glazing or varnishing is quite uncommon in this period. All four pipes are made of white clay, which is also apparently the case for the other 12 pipes recovered from the wreck.

The ribbed pipes BC-05-00010 and BC-05-00224 are

distinct from each other. Even though both examples are essentially typologically comparable, they were produced in two different molds, albeit most probably in the same workshop. Use of multiple molds in a single factory to fulfil orders for popular styles was not uncommon for the larger pipe manufacturers. A number of the other ribbed pipes, as well as the 'TD' examples, also feature slight variations and measurement discrepancies suggestive of production using different molds (Table 1).

Based on these minor differences in dimensions, many of the 16 pipes seem to be attributable to different molds (Table 1). Thus, the heights of the Type 1 ribbed pipe bowls vary from 4.19-4.37cm and their maximum bowl widths range from 2.49-2.89 x 2.36-2.84cm. The external diameter of the Type 1 mouths display an amplitude of 2.62-2.77 x 2.30-2.54cm; their spur widths range from 0.61 x 0.45cm to 0.69 x 0.52cm wide, while the clay thickness at the spur/stem junction varies from 0.80-0.98cm.

The three 'TD'-embossed Type 2 tobacco pipes display comparable minor discrepancies in their dimensions. Their bowl heights each measure 3.7cm, 3.95cm and 4.1cm, while their maximum bowl widths are 2.2cm, 2.5cm and 2.35 x 2.19cm. The external diameters of the mouths range from 2.0cm to 2.1cm and 2.29, while spur widths are all 0.5cm wide and the thickness of the clay at the spur/stem junction is also close at 0.90cm for two pipes and 0.98cm for the third (Table 1).

Analysis suggests that three of the examined pipes (BC-05-00224, BC-05-00010 and BC-05-00225), two ribbed and one 'TD'-embossed respectively, appear to be stylistically similar in production technology. While two of the three examples are stylistically different, in terms of manufacture they incorporate common overall traits evidenced in the cutting stroke used to trim the rim of the pipe bowl.

In terms of origins, the flat trimmed rim of pipe bowl BC-05-00227 suggests that this 'TD'-embossed Type 2 pipe appears to be British-made and crafted of white ball clay, deposits of which are indigenous to Dorset and Devonshire in southwest England. Ball clay was largely restricted to use in England, which was a major exporter of products made from this clay in the mid-19th century. Although kaolin clay was available in Britain, with notable sources near Glasgow in Scotland, it was typically reserved for better quality products, while ball clay was more commonly used in pipe manufacture (Sudbury, 1980b: 27).

The origins of pipes BC-05-00224, BC-05-00010 and BC-05-00225 remain unverified. They may be exports from the European continent, possibly of Dutch or more likely German manufacture, the latter of whose products were the predominant pipe imported into the United States



Fig. 6. A Type 1 tobacco pipe in Area E2 in situ in association with a glass salt cellar.



Fig. 7. The bowl of a Type 1 tobacco pipe concreted to the top edge of transport keg K6, perhaps reflecting the original stowage method of these wares within such containers.



Fig. 8. A Type 1 tobacco pipe being recovered by the ROV Zeus' limpet suction device from Area E3.

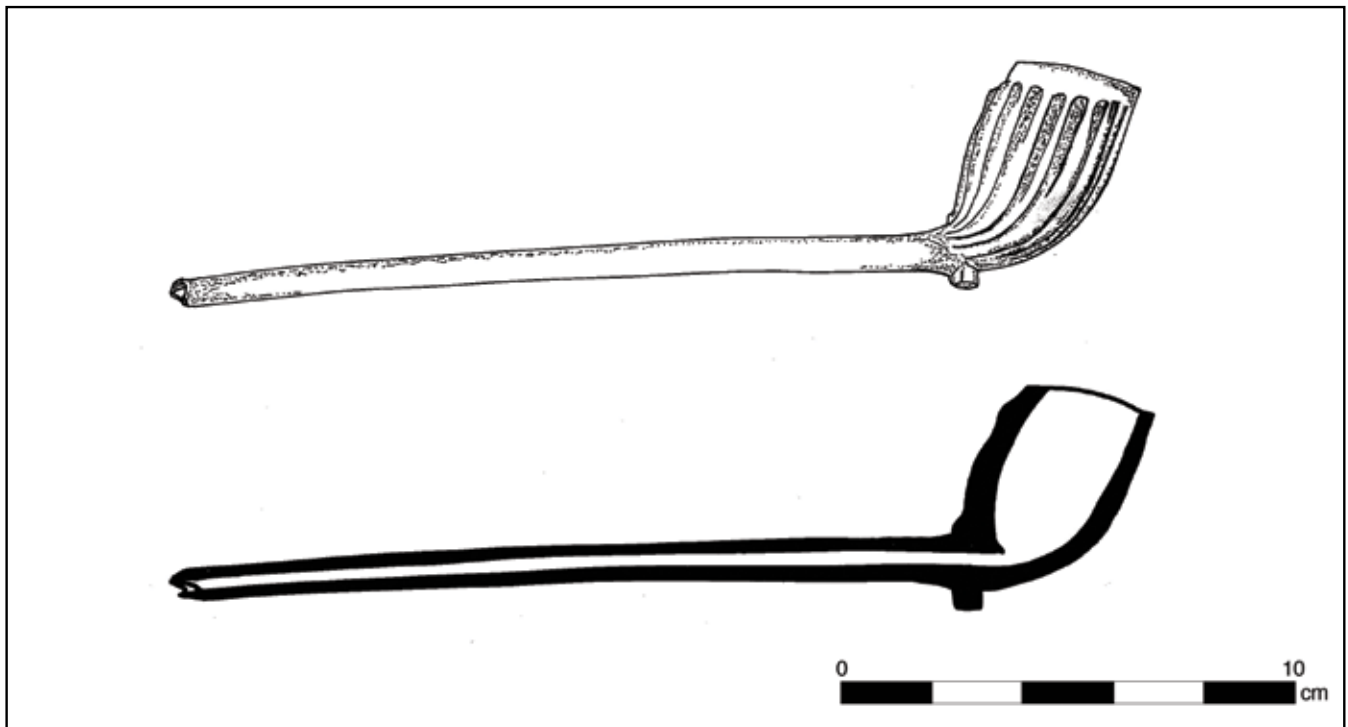


Fig. 9. Drawing of Type 1 ribbed tobacco pipe BC-05-00221-CP (L. 19.6cm). Drawing: Chad Morris, Odyssey Marine Exploration.

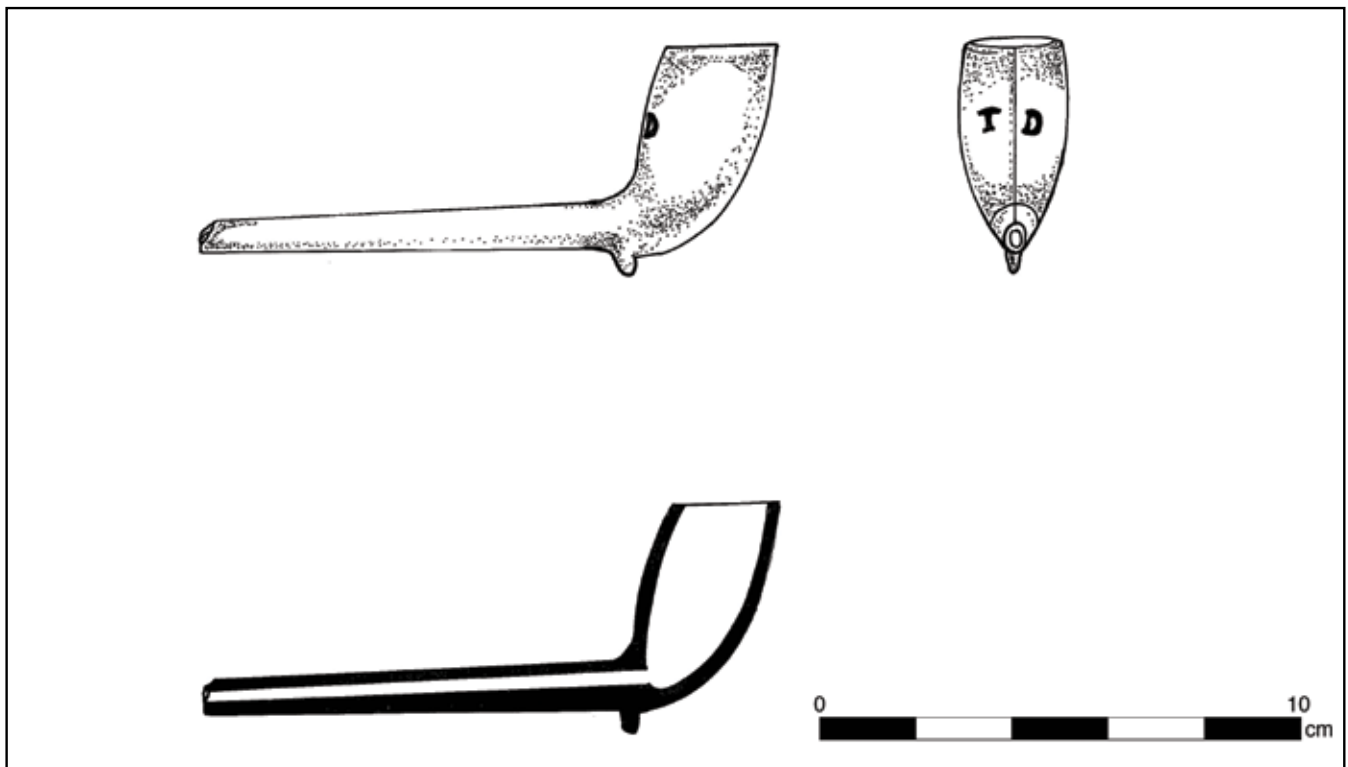


Fig. 10. Drawing of Type 2 'TD'-embossed tobacco pipe BC-05-00225-CP (L. 11.7cm). Drawing: Chad Morris, Odyssey Marine Exploration.

for several decades following 1845. European tobacco pipes were largely manufactured from kaolin clay because ball clay deposits were not present on the continent. Like ball clay, kaolin clay (also called china or porcelain clay) was white or near-white and caused little shrinkage when fired.<sup>1</sup> Potentially, but less likely, some of the Site BA02 tobacco pipes may have been produced in North America, either Canada or America. Increased American pipe manufacture was a feature of the post-1850 era and was possibly the result of improved efficiencies in manufacturing and distribution, as well as of new protective tariffs (Gartley, 2009: 215-16; Sudbury, 2009: 106-7).

Both Site BA02 pipe Types 1 and 2 incorporate design elements similar to styles excavated at the Fort Union Trading Post on the Upper Missouri River in North Dakota (see Section 10 below). The post's long occupation from 1829-67, and extensive trade activity, resulted in the deposition of an extensive and varied pipe assemblage attributed largely to suppliers in Germany, England and the United States. The Jacksonville 'Blue China' wreck examples closely resemble Fort Union's white clay pipes attributed to German manufacture, which prior to the study of the Fort Union Trading Post collection were generally identified as English or possibly American products (Sudbury, 2009: 104, 168). The problems of assigning provenances to pipes found in America are discussed in greater detail in Section 8.

Assessment of the origins of the Site BA02 tobacco pipes rests on typological attributes and ultimately on the nature of the clay fabric. Potters often exploited multiple clay sources that resulted in conspicuously different pipe finishes, but relying on fired ceramic clay colors to identify provenance is a problematic science. Divergences in clay color can occur during firing via exposure to thermal and atmospheric differences caused by the wares' location in the kiln and variations in the interior atmosphere. Thus, the visual appearance of red or yellow-fired clays is often not a manifestation of the clay source exploited, but rather caused by the state of oxidation of the iron within the clay (the oxidizing or reducing atmosphere). The presence of darker colors in pipe fabrics may thus not reliably reflect origins, but may be explained as the effects of overheating or reactions of or between different minerals.

The red stain on a number of the Site BA02 pipes – the ribbed versions, in particular – may be reactions induced by proximity to adjacent materials, notably ferrous materials, or by changes in levels of oxidation within the submerged anaerobic environment. The ribbed Site BA02 clay pipes notably display greater evidence of extensive red staining than the 'TD'-embossed types. This may be a direct consequence of mineral deposits in the clay,

perhaps was the result of firing in the kiln or was caused by a combination of both of these factors, possibly further influenced by the sea floor environment and contamination from nearby artifacts.

#### 4. 'TD'-Embossed Pipes: Historical Background

According to some historical accounts, white clay pipes incorporating the initials 'TD' on the bowl originate with the London pipe maker Thomas Dormer, who manufactured pipes between the mid-1750s and about 1780 along with his sons. The 'TD' insignia has also been credited to two other British mid-to-late 18th-century pipe makers, Thomas Duggan of London and Thomas Dennis of Bristol, thus making a definitive attribution inconclusive. In addition, an origin for the 'TD' pipes in the early 1700s has been argued (Sudbury, 1980b: 34).

An even earlier timeframe is provided by a clay pipe assemblage excavated from London's Bear Wharf at Bankside, London, which dates from 1660-80, where a number of the pipes are stamped on the base of the heel with the letters 'TD' in a heart-shaped frame above a Tudor rose. Towards the latter part of the 16th century, clay tobacco pipes had become an important part of everyday London life and many city pipe makers marked their products with their personal initials or symbols, very likely the case for the Bear Wharf examples.<sup>2</sup>

From about the time of the American Revolution, 'TD' pipes became synonymous with a style commonly found in North America. The design became so popular that by the early 19th century numerous pipe manufacturers had copied or modified the earlier form, so that a multitude of variations were in circulation. For example, at least 37 different types of 'TD' pipes were listed as in production amongst a number of firms operating out of Glasgow, Scotland, alone as late as 1900 (Cotter *et al.*, 1993: 422; Walker, 1996: 86, 88). Exported wares possibly made by both Duggan, Dennis and/or Dormer may have been imported through Hudson Bay and other large provincial ports and are found in numerous Colonial contexts, including urban and rural sites in Virginia, Maryland, Pennsylvania and New York, as well as in Western contexts (Hardesty, 1997: 106; Pfeiffer, 2006: 12).<sup>3</sup>

Eventually 'TD' pipes came to stand for a generic style of pipe and not for the actual pipe maker. The initials themselves became a 'trademark' used by numerous pipe makers to denote a certain style of pipe and not to publicize a manufacturer possessing the actual 'TD' initials (Cotter *et al.*, 1993: 422; Walker, 1996: 86). Today they represent a major recognizable decorative motif. Thousands of



Fig. 11. Type 1 ribbed tobacco pipe BC-05-00220-CP, L. 21.4cm.  
Photos in Figs. 11-28 by Alan Bosel, Odyssey Marine Exploration.



Fig. 12. Type 1 ribbed tobacco pipe BC-05-00222-CP, L. 20.4cm.





Fig. 13. Type 1 ribbed tobacco pipe BC-05-00221-CP, L. 19.6cm.



Fig. 14. Type 1 ribbed tobacco pipe BC-05-00223-CP, L. 19.1cm.



Fig. 15. Type 1 ribbed tobacco pipe BC-05-00011-CP, L. 18.2cm.



Fig. 16. Type 1 ribbed tobacco pipe BC-05-00010-CP, L. 13.4cm.

examples have been excavated from archaeological contexts across the United States dating from the mid-18th century into the early 20th century.

## 5. English White Ball Pipe Clay

Of Site BA02's four white clay pipes analyzed in detail, at least one is clearly of British production and was thus very likely manufactured from the white ball clay favored by pipe makers from at least the early 17th century until the cessation of the industry in the 20th century. Production close to the coast was favored due to extensive clay deposits present in Dorset and Devonshire in southwest England, followed by subsequent distribution around the coast in two main networks: one supplying the west and the other the south and east. Inland, other sources of clay were utilized, but probably only for intra-regional pipe use (Vince and Peacey, 2006: 17).

White ball clay had been exploited in Britain since the Roman period for pottery production. However, the introduction of tobacco into England in the 16th century, and the requirement for suitable clay for pipe manufacture, was a major catalyst for the start of the ball clay trade in the United Kingdom.<sup>4</sup> Consequently, with relatively few deposits available worldwide British ball clays became so highly-prized for tobacco pipes, and were judged to be so valuable, that exports to foreign countries were prohibited in 1662 by an Act of Parliament introduced under King Charles II. The Act was not repealed until nearly 200 years later in 1853, which triggered a thriving British ball clay export trade (Bristow *et al.*, 2002: 26).<sup>5</sup>

Ball clay was not discovered in the United States until the later 19th century and only then in the East, Midwest and South. A pit of ball clay was opened in Jefferson County, Missouri, in 1880, which became an important source of material for the East Liverpool potters of Ohio and other potting centers. Later developments in 1890 saw the exploitation of ball clay deposits in Florida, followed by the discovery of deposits in Tennessee, Kentucky and New Jersey. Many potters, however, did not consider the latter to be a true ball clay because it was not deemed to be as good in color or capable of vitrifying as easily as the English clay (Ries and Leighton, 1909: 59-61).

Prior to the emergence of the American ball clay industry, nearly all of the clay supply for American potters came from the Devonshire district of England. Unlike kaolin clay, which was more frequently used for porcelain and other fine china, English ball clay was typically used for producing disposable ceramic goods. Ball clays consist of ultra fine particles with chemical properties that give them special plasticity and resistance to breakage due to shrinkage as well as the capability to be easily shaped when damp.



Fig. 17. Type 1 ribbed tobacco pipe BC-05-00224-CP, L. 10.5cm.



Fig. 18. Type 1 ribbed tobacco pipe BC-05-00014-CP, L. 13.0cm.

The name of the clay derived from the original method of production, which consisted of cutting out the clay in open pits into cubes, the sides of which measured approximately 22-25cm and individually weighed 14-16kg. Due to the clay's high plasticity the cubes adhered together, and after being handled several times the corners rounded off and the cubes turned into balls. As a result, this white firing plastic clay was known to potters as 'ball clay'.<sup>6</sup>

## 6. The British Clay Pipe Industry

By the end of the 16th century the custom of smoking in public places had become widespread, as witnessed by a visitor to England in 1598, who noted that "The English have



Fig. 19. Type 1 ribbed tobacco pipe  
BC-05-00228-CP, L. 11.3cm.



Fig. 20. Type 1 ribbed tobacco pipe  
BC-05-00012-CP, L. 10.8cm.

pipes on purpose made of clay into the farther end of which they put the herb, and putting fire to it draw the smok into their mouthe” (Vince and Peacey, 2006: 13). At this time pipe makers established in England exclusively used white clay and two-piece molds to produce their wares in enormous quantities (Higgins, 1995: 47; Vince and Peacey, 2006: 13). Relatively quick and easy to manufacture, pipes were cheap to make and thus “could be bought for as little as one to two shillings per gross” (Higgins, 1995: 47). By

the 17th century pipes were readily available commodities and the clay pipe trade had extended to colonies all around the world. The Darien Company of Scotland, for example, commissioned the manufacture of over a quarter of a million pipes between the years 1696 and 1699 for its Central American venture (Higgins, 1995: 47).<sup>7</sup>

Supplied with ball clay exclusively from Poole and the Isle of Wight (Vince and Peacey, 2006: 16), London was the center of the tobacco pipe-making industry during the first half of the 17th century, dictated in large part by a 1624 Act that demanded imported tobacco pass only through London (Oswald, 1960: 42-3). However, within less than a century pipes were being produced in a network of centers across the whole country, including major cities, small market towns and rural settlements (Vince and Peacey, 2006: 11). The size of workshops varied from a single pipe maker to large export firms in Scotland, which employed several hundred workers (Gojak and Stuart, 1999: 39). Bristol, in particular, is the most thoroughly documented English pipe export hub for the period covering the 1600s to the mid-19th century (Walker, 1977). Beginning in 1639 with the royal recognition of this city as an outpost for tobacco, Virginia tobacco was sent to England in Bristol ships, which returned to Virginia laden with commodities. During the 18th century ball clay extraction from the Bovey Basin in Devon fuelled the growing demand for high-quality ceramic clay. Increasing use was made of the local port at Teignmouth to ship the clay to the ports of London and Liverpool (Bristow *et al.*, 2002: 26).

Bristol soon developed into an important center for the retail tobacco trade with a flourishing pipe making industry, which in fact became the model for the English pipe-making trade (Mitchell, 1983: 5-6; Sudbury, 2009: 109). Export records for the Bristol Ring pipe firm document that shipments to North America in the post-1850 period tended to enter the continent through New York, whereas earlier shipments more often arrived at Canadian destinations. By this time most Bristol pipes tended to be unmarked, making the identification of manufacturers problematic (Sudbury, 2009: 109, 113).

Based on parallel evidence from the vast pipe assemblage excavated from the Fort Union Trading Post in North Dakota (see Section 10 below), the one examined ‘TD’-embossed Jacksonville ‘Blue China’ pipe (BC-05-00227) attributed to British manufacture may very well be a product of Bristol, England, which was a major supplier to the Post until 1850 (Sudbury, 2009: 1) and continued to export to America in the post-1850 era. It seems reasonable to suspect that some of the other ‘TD’ pipes recovered from Site BA02 may also be British and have originated in the workshops of Bristol.

In addition to England, by the early decades of the 17th century large quantities of white clay pipes were made in Scotland, which was largely influenced by the fashion of the London court, where smoking had become en vogue. From its earliest known pipe manufacturer in 1618, the Scottish pipe-making industry witnessed an expansion in the 1660s encouraged in part by a tax that imposed heavy duties on imports (Gallagher and Harrison, 1995: 1131). By the middle of the 19th century the largest single exporter of pipes worldwide was Duncan McDougall of Glasgow. Founded in 1846, the Scottish company produced pipes until its close in 1967 (Pfeiffer, 2006: 12, 83; Walker and Walker, 1969: 132-33). Large quantities of its pipe fragments have been recorded on terrestrial sites around the world, including the 'TD'-embossed variety of which McDougall was a major 19th-century producer (Dixon, 2005: 114).

Contemporary with McDougall, other Scottish pipe manufacturers located in Glasgow were also mass exporters and distributors of white clay pipes to the United States. These included Alexander Coghill (1826-1904), William Murray (1830-61) and William White (1805-1955) (Pfeiffer, 2006: 12), who began in 1824 to manufacture pipes at Glasgow's Bain Street under the name of W. White & Son, before expanding with new buildings in 1867-77 (Smith, 2001: 393). As noted in a company catalogue, by 1900 William White had produced 606 separate varieties of pipes (Gojak and Stuart, 1999: 39). While it was common for pipe makers to stamp their names, initials and/or various symbols either on the stem or the bowl of their pipes, thus making it possible to associate specific makers with excavated examples today, many pipe manufacturers simply left their wares plain, as was the case with the Jacksonville 'Blue China' examples. Hence, the product of dozens of pipe makers remains anonymous.

By the second half of the 19th century the clay pipe industry began its demise, struggling with competition first from the meerschaum pipe and then from the much more affordable and durable briar. The number of English pipe makers eventually fell from over 600 to less than 150, with most firms ceasing manufacture by 1870 (Oswald, 1960: 47).

## 7. Continental White Clay Pipe Production

By the late 16th century the manufacture of white clay pipes had spread rapidly across northern Europe, first to the Netherlands, then into the Germanic states and central Europe and later into France. By the mid-1600s thousands of pipe manufacturers were operating across Europe



Fig. 21. Type 1 ribbed tobacco pipe  
BC-05-00013-CP, L. 6.7cm.



Fig. 22. Type 1 ribbed tobacco pipe  
BC-05-00015-CP, L. 6.2cm.



Fig. 23. Type 1 ribbed tobacco pipe  
BC-05-00226-CP, L. 5.2cm.

(Trubowitz, 2005: 146). Local manufacturing centers throughout the continent produced distinctive regional forms presenting a wide range of decorative styles that evolved over time. From the late 17th century onwards, clay pipes conformed to a basic shape: a hemispherical or egg-shaped bowl on top of a tapering stem (Gojak and Stuart, 1999: 38).

Until the mid-19th century, British pipes predominated amongst American white clay pipe imports. But other countries also manufactured and shipped pipes worldwide, including Holland and Germany, both of which were major exporters (Sudbury, 2009: 106, 170). White clay pipes were exported from France, Belgium, Canada, and other countries to a lesser degree, many of which entered the American pipe market after the Revolutionary War (1775-83), when some English products lost favor with the American public (pers. comm. Michael Pfeiffer, October, 2006).<sup>8</sup>

In the early period of manufacture, Dutch law prohibited German pipe makers from using ports in the Netherlands, which essentially landlocked and barred the Germans from participating in the overseas pipe trade (Stam, 2009: 116). By the end of the 18th century, however, the export of German pipes from Ulsar to Holland was underway and the export of German white

clay pipes to the US began in the 1830s. A decade later, German pipes had become especially abundant in the United States, as documented on archaeological sites and in export records. In 1845 an enormous 4.5 million pipes were exported to America from Ulsar (Gartley, 2009: 206; Sudbury, 2009: 106).

A large number of German products have been recorded on US historical sites, in particular at the Fort Union Trading Post (1828-67) in North Dakota (see Section 10 below). Most German pipes arrived mainly via the major ports of New York, Baltimore and New Orleans and were then distributed nationwide. By the mid-19th century, companies such as the Heye Brothers of New York were advertising the sale of both imported Dutch and German pipes (Sudbury, 2009: 106, 170-71).<sup>9</sup>

In one year alone the German manufacturing town of Grosselmerode exported more than 13.5 million pipes to the United States (Stephan, 1993: 56; Pfeiffer *et al.*, 2006: 12). In 1866, the peak year in German pipe exports, 95% of seven Grosselmerode pipe manufacturers' products were being shipped to the US. Three of the four Site BA02 white clay pipes (both of the ribbed and 'TD'-embossed variety) could quite feasibly be attributed to German manufacture based largely on comparisons with similar contemporary German pipes from the Fort Union Trading Post. This could also be the case for the other 12 pipes recovered from the Jacksonville 'Blue China' wreck site. In the absence of chemical analysis or positive identification by comparison to identical reference collections of known origin, this supposition must remain a matter of conjecture.

## 8. North American White Clay Pipes

Compared to Great Britain, whose extensive pipe data have been carefully documented and published for decades, the study of historic clay tobacco pipes in the United States and Canada is still in its infancy (Sudbury, 1979: 152). While the commercial manufacture of clay pipes was initially based in Great Britain and Continental Europe, following the political aftermath of the Revolutionary War and the War of 1812 some British products, including pipes, appear to have become less appealing to the American populace or were less easily accessible. However, this was a short-lived 'boycott'. After 1812, commerce with England re-commenced and a flood of other British products, such as cloth and pottery offered at reduced prices, in many cases actually drove American manufacturers out of business (Martin, 2001: 35; Wait, 1999: 282). A total of 19 US pipe makers have been identified as active in North America between 1776 and 1840, although

there were undoubtedly many other domestic specialists active during this period, as yet unrecorded. The mid-19th century continued to witness an increase in the number of known American pipe makers, which may be the result of superior documentation for these decades but is probably also due to improved mechanization, which no doubt contributed to the growth of the US industry.<sup>10</sup>

Canadian pipe makers also made their mark at this time with the emergence of the early Montreal pipe industry, which evolved from a single pipe maker recorded in 1847 to 18 in 1875, supported by a workforce comprised largely of Irish immigrants who had fled Ireland's potato blight. Of particular relevance to the Jacksonville 'Blue China' 'TD'-embossed pipes are similar wares produced by Montreal pipe makers such as Henderson and Bannerman. The recent excavations of a Henderson pipe wasters' dump in Montreal, used from 1847-72, revealed that the predominant style represented was the 'TD' form, which also had 'Henderson' marked on the stem (Roy, 2007: 47-51). Robert Bannerman, who also originated from a Glasgow pipe-making family, began his Canadian production line in 1854. By 1858, he had his own Montreal pipe factory, which remained active until 1888 (Sudbury, 1979: 175-6; 1980a: 4; 2009: 66).

In 1875 Robert Bannerman established the Eagle Tobacco Pipe Manufactory in Rouses Point, New York, apparently to meet the growing US demand and to avoid high export duties on his finished products (Sudbury, 1979: 175-76; 2009: 66). Output per employee during the first year of the New York operation was approximately 600 to 750 pipes per day (Sudbury, 1980a: 9, 11). Bannerman's US factory continued to remain under Montreal ownership and its pipe production line, including 'TD' examples, probably reflects a style consistent with pipes simultaneously manufactured by his Canadian company, part of whose wares were produced contemporary with the Jacksonville 'Blue China' ship's lifetime.

Importantly for the issue of determining the origins of the Site BA02 products, the white clay used in Bannerman's workshops was reportedly imported from Devonshire, England, because no US ball clay sources were available prior to 1880. Nearly all of the American supply also came from this distant location (Ries and Leighton, 1909: 59). Shipments arrived first in Montreal and were then transported to the Eagle Tobacco Pipe Manufactory at Rouses Point, New York (Sudbury, 1980a: 11).

On at least one documented Rouses Point 'TD'-marked pipe fragment, Bannerman's company name was stamped onto the stem (Sudbury, 1979: 51, 53, pl. 6.2), thus confirming the style's availability in New York. No doubt the type's production would not have been restricted to Robert

Bannerman's two factories (Sudbury, 1980a: 5). 'TD' pipes were still being manufactured in Detroit in the 1880s-90s (Sudbury 1979: 166-67, pl. 6.11), Philadelphia in 1892 (Jung, 1989: 8) and in Brooklyn, New York, in the early 1900s (Jung, 1988: 16). The availability of long-stemmed clay tobacco pipes is known from New York State due to advertisements published as early as 1735. The excavation of a 19th-century Long Island pipe kiln has uncovered fragments of long-stemmed white clay ribbed pipes, as well as a ribbed version of the 'TD'-embossed pipe (Sudbury, 1979: 175). Although this site, active from 1870-1920, post-dates the Jacksonville 'Blue China' wreck by around 15 years, it is quite plausible that earlier New York clay tobacco pipe factories will be uncovered in the future (Sudbury, 1980a: 6), whose wares may have included pipes similar to those found at Site BA02.

## 9. The Socio-Economics of the Tobacco Pipe Trade

In the absence of a cargo manifest or the remains of stamped shipping containers, it is impossible to determine to whom the Jacksonville 'Blue China' wreck's tobacco pipes were being shipped. Since Colonial days clay tobacco pipes were extremely inexpensive. The excavation of mid-19th century sites in America indicates that they were readily available across the socio-economic divide (Hume, 1974: 296). Of particular relevance are similar white clay pipes excavated in Virginia City, Nevada, which was founded in 1859 after the discovery of the Comstock Lode, the richest silver deposit in America. Virginia City became the most important town between Chicago and the Pacific and at its peak was populated by nearly 25,000 residents (Goldman, 1981: 13). Amongst its early 1860s inhabitants was the journalist and author Mark Twain (born Samuel Clemens), who was a reporter for the city's most influential daily paper.

Excavations conducted since 1993 have uncovered four Virginia City saloons yielding over 300,000 artifacts. The majority of the numerous tobacco pipe bowls and pipe stem fragments are of undecorated white clay – an especially telling factor since all four drinking establishments catered to town patrons of distinctly different social classes and ethnicities ranging from the wealthy to the poor and African-Americans to Irish (Dixon, 2005: 113). Some of the Virginia City finds include 'TD'-monogrammed pipe bowls recovered from Piper's Old Corner Bar and the Boston Saloon, which served Irish and African-American customers respectively, two clearly disparate populations within the broader Virginia City community (Dixon, 2005: 114). In light of this data the pipes from the

Jacksonville 'Blue China' wreck could have been intended for use by any strata of Southern American society.

## 10. The Fort Union Trading Post White Clay Pipes

Numerous mid-19th century American terrestrial sites have yielded both ribbed and 'TD'-embossed or stamped white clay pipes featuring a number of different variations. Of particular relevance is the Fort Union Trading Post due to its extensive occupation and the enormous quantity of white clay pipe fragments recovered. The most important fur trading post on the Upper Missouri River, Fort Union was occupied from 1828 to 1867 under a series of different company affiliations and served as the chief establishment where the Assiniboine, Crow, Cree, Blackfeet, Métis and other Indian tribes from both sides of the American-Canadian border traded buffalo robes and other furs in return for various goods, including beads, guns, blankets, cloth and tobacco pipes (Pfeiffer, 2006: 113; Sudbury, 2009: 1-2).<sup>11</sup>

Since its acquisition by the National Park Service in 1965, subsequent large-scale excavations at the Fort Union Trading Post between 1968-72 and 1985-88 uncovered over 500,000 artifacts, including 11,777 intact and fragmentary tobacco pipes (Pfeiffer, 2006: 113; Sudbury, 2009: 1, 7). Over 10,000 of these were produced of white clay and many feature pipe bowls with similar patterns to the two styles found on the Jacksonville 'Blue China' wreck. Significantly, these have been largely attributed to German manufacture (Pfeiffer, 2006: 114; Sudbury, 2009: 1, 7, 168, 170).<sup>12</sup>

Unlike the Site BA02 collection, however, the majority of pipe bowls in the Fort Union collection show evidence of having been smoked, suggesting that few if any of the pipes excavated were broken discards from shipping crates (Pfeiffer, 2006: 114). The Fort Union 'TD' pipe assemblage comprises dozens of different variations of the monogram, including a number of decorated varieties with stars, circles, braided ovals and radiating rays, as well as four different types of otherwise plain 'TD' motifs classified according to differences in letter heights and orientations (large angled letters, large letters, medium letters and small letters). Within these broader 'TD' categories are a number of different sub-types derived from further variations in the positioning of the letters (Pfeiffer, 2006: 118-19; Sudbury, 2009: 31, 46, 50-1).

While typologically very close to the Fort Union pipe variety designated 'Medium Plain TD' (Pfeiffer, 2006: 118; Sudbury, 2009: 48-54), the Site BA02 'TD' letter measurements are nonetheless not a perfect match.

Further differences, albeit slight, also occur in some of the pipe dimensions, including bowl depth and diameter and stem bore diameters. In some cases discrepancies amongst pipe component sizes presumably made from the same or similar molds may be due to changes in the water content of the clay: in effect, two different sized pipes can be made from the same mold as a result of differences in clay shrinkage (variations in original moisture content or clay type). Over the years, molds also wore down and may have been rebuilt or modified, further impacting measurement disparities.

The Jacksonville 'Blue China' wreck's ribbed pipes, each of which feature 16 raised flutes encircling the pipe bowl (with some minor variations), are also similar to a few of the Fort Union white clay ribbed or cockled pipe varieties, yet again are not exactly identical.

## 11. Mid-19th Century Shipwrecks

Excavations of early to mid-19th century American shipwrecks contemporary with Site BA02 have produced surprisingly few long-stemmed white clay tobacco pipe finds. Of the examples discovered, none appear to be the same as those recovered from the Jacksonville 'Blue China' wreck. The following overview discusses pipes associated with the steamboats *Heroine* (1838), *Arabia* (1856) and *Bertrand* (1865), as well as the sidewheel steamers *Maple Leaf* (1864) and *SS Republic* (1865).

The earliest example of the celebrated 'Western river steamboat' is the wreck of what historical research suggests is the steamboat *Heroine*, a 42.7m-long, 160-ton single centerline mounted engine vessel, which sank on the Red River in May 1838 while transporting military provisions and stores to the US army garrison at Fort Towson in Oklahoma. The wreck remained visible for five years before a major flood in 1843 shifted the river channel and buried the ship, which was not re-exposed until 1991 (Crisman, 2005: 220-21).<sup>13</sup>

The initial fieldwork on the Red River Project was conducted by the Oklahoma Historical Society in the late 1990s. Subsequently, in partnership with the Institute of Nautical Archaeology (INA) at Texas A&M University, the excavation was continued from 2003-2008 and yielded dozens of artifacts, including cargo, personal items, tools and equipment, as well as sections of the ship itself. Tobacco pipes proved to be highly limited and to date only one white clay pipe stem has been recovered. Some etching appears at the end of stem, but no maker's mark is apparent. The stem was clearly intended for use with a





Fig. 24. Type 2 'TD'-embossed tobacco pipe BC-05-00016-CP, L. 14.0cm.



Fig. 25. Type 2 'TD'-embossed tobacco pipe BC-05-00227-CP, L. 10.5cm.



Fig. 26. Type 2 'TD'-embossed tobacco pipe BC-05-00225-CP, L. 11.7cm.

separate pipe bowl and does not bear any resemblance to the integral long-stemmed Site BA02 examples.

The discovery of only one tobacco pipe is quite unusual considering the size of the vessel and the fact that the ship carried a crew of around 20 people (pers. comm. Kevin Crisman, 5 November, 2009). Since the wreck was heavily salvaged in the years after its loss and the original crew survived the disaster, the absence of material culture is not unexpected. Materials lost with the ship may also have been swept away by the river's fairly strong current. While sedimentation probably filled in the hull rather quickly, any items not secured, weighted or trapped in the hull are likely to have been eroded by the current and transported off site (pers. comm. Heather Jones, 6 November 2009).

More closely dated to the era of the Jacksonville 'Blue China' ship was the 51.3m-long *Arabia*, a wooden river steamboat built in 1853 by John Snyder Pringle in Brownsville, Pennsylvania. Heavily laden with 222 tons of cargo bound for frontier merchants, on 5 September 1856 the *Arabia* struck a submerged walnut tree, piercing the

vessel's thick oak hull. Within minutes much of the ship and virtually all of the cargo sank into the Missouri River (Hawley, 1995: 12, 17). Over the decades the river changed its course, so that when the wreck was discovered in 1988 it was located 13.5m under a Kansas farmer's cornfield and over 800m away from the riverbank (Hawley, 1995: 20). The salvage operation produced thousands of artifacts, including around 100 clay pipe bowls and some 100 bamboo pipe stems (Hawley, 1998: 210).

Unlike the white clay pipes with their integral stem, these elbow-style, short-shanked clay pipes had the advantage of incorporating easily replaceable stems. By contrast, the former had to be discarded when the stem broke (Pfeiffer, 2006: 105) or may have been salvaged, modified and/or reworked to permit additional use (Sudbury, 2009: 118-21). The flexible reed stem clay pipe was a more durable design – especially in a working environment – than the all-clay pipe because its removable reed stem was much less susceptible to breakage. Reed stem pipes became the style of choice carried by soldiers during the

American Civil War of 1861-65; oral history suggests that pipe molds were at times available in Civil War camps, enabling itinerant pipe manufacture.<sup>14</sup>

The Civil War US army transport the *Maple Leaf* was sunk on 1 April 1864 when the sidewheel steamer struck a Confederate enemy torpedo (or a mine in modern terminology) in the St. Johns River, just 24km from Jacksonville, Florida (Gaines, 2008: 42). Four crew members were lost as well as 400 tons of military equipment, including the goods of 'sutlers' (army camp peddlers), tents, garrison equipment and the personal gear of three regiments. In 1984 the Jacksonville-based St. Johns Archaeological Expeditions, Inc. (SJA EI) confirmed the presence of the *Maple Leaf's* remains at a depth of over 6m of water and under 2m of mud. The ship's hull and contents were preserved virtually intact in the muddy anaerobic environment (McCarthy, 1992: 66; Smith, 2002: 152-3).<sup>15</sup>

Excavation conducted by SJA EI in tandem with East Carolina University exposed thousands of artifacts with an equivalent weight of 1,100lb (Gaines, 2008: 42; McCarthy, 1992: 66). The personal effects recovered included around a dozen pipes, including both wood and vulcanite pipe stems and bowls, some of which feature ornately carved and molded decoration. A few hand-painted porcelain pipe bowls were also discovered, as well as at least one fragment of a long-stemmed clay pipe with the letter 'D' impressed in the bowl, probably indicative of the common 'TD'-stamped pipe. The pipe stem features the maker's name of H. White of Glasgow. This is the only example from the *Maple Leaf* that bears a resemblance to the Jacksonville 'Blue China' 'TD'-embossed pipes (pers. comm. Keith Holland, 8 December 2008; pers. comm. Marie Prentice, 9 December, 2009).<sup>16</sup> However, further excavations may produce additional pipe finds since only part of the 400-ton cargo has been recovered.

In addition to the *Arabia*, the steamer *Bertrand*, built in Wheeling, West Virginia, in 1864, also fell foul of the Missouri River. This 48.3m-long, low draft vessel sank less than a year later on 1 April 1865, when the steamer struck a submerged snag near De Soto Landing in Nebraska Territory carrying at least 10 passengers and over 250 tons of agricultural and mining supplies, household paraphernalia, munitions and clothing, as well as canned and bottled foodstuffs, wines and bitters. Also onboard was an estimated 35,000lb of mercury, probably intended to help extract gold through the amalgamation process. Two contemporary attempts to salvage the cargo were largely unsuccessful, other than apparently recovering most of the mercury (Switzer, 1974: 1).

After being preserved for over a century in deep mud and silt, the *Bertrand* was discovered with its enormous



Fig. 27. Detail of a Type 2 tobacco pipe with the letters 'TD' embossed on either side of the mold seam on the face of the bowl.



Fig. 28. Detail of the letters 'TD' embossed on the bowl of Type 2 tobacco pipe BC-05-00016-CP.

cargo largely intact. In 1968 and 1969 a recovery project supervised by archaeologists from the National Park Service and personnel from the Bureau of Sports Fisheries and Wildlife excavated the ship's voluminous shipment of frontier-bound trade goods – a collection of over two million artifacts (Corbin, 2002a: 14; 2002b: 201; Switzer, 1974: 1). The finds included a large quantity of diverse pipe stems and bowls, including two distinct types of the American-made Pamplin elbow-style short-shanked pipe bowl (see Sudbury, 2009: 87).<sup>17</sup> A quantity of reed or willow pipes of unknown origin was also found packed alongside the Pamplin pipes (Pfeiffer, 2006: 102-103).

The wreck of the *Bertrand* was also associated with 212 wooden pipes, 182 of which represent several varieties of briar; the remaining 30 are of a wood species that remains unidentified (Pfeiffer, 2006: 103). The absence of any evidence for white ball clay pipes from the *Bertrand's* large cargo is particularly noteworthy, reflecting the changing tastes of American smokers at the time. Another contributing factor, no doubt, was the mounting customs duties that impacted on British, French and Dutch white clay pipes imported into the United States. In combination, these factors probably played a role in stimulating the rise of the American clay pipe industry and influenced the shift towards the use of American tobacco paraphernalia (Pfeiffer, 2006: 102, 105; Sudbury, 2009: 107). While large numbers of European pipes continued to be imported into the United States, arriving in major ports and then distributed nationwide – often by waterways – by the late 1850s domestic output was beginning to supplant imports.<sup>18</sup>

Surprisingly, the excavation of the SS *Republic*, a side-wheel steamer en route from New York to New Orleans when it sank 150km off the southeastern coast of the United States in October 1865, did not yield any tobacco pipes, intact or fragmentary, despite the fact that the thorough excavation recovered artifacts as small as porcelain buttons, individual coins, fragile gaming pieces and toothbrushes. The archaeological excavation conducted by Odyssey Marine Exploration between October 2003 and February 2005 yielded over 14,000 artifacts and more than 51,000 gold and silver coins, a vast assemblage of material goods representative of daily life in post-Civil War America (Cunningham Dobson *et al.*, 2010; Cunningham Dobson and Gerth, 2010).

In an era when tobacco use was rampant (Martin, 1942: 81-82), one would have expected the excavation to have produced some clay tobacco pipes, especially since New York and New Orleans were major ports for the shipment of imported clay pipes. The lack of such wares from the *Republic* is intriguing and may reflect a preference

for chewing tobacco, which in 1860 was used by at least half of the tobacco consuming populace (Martin, 1942: 81-2). The vessel's cargo may have included the lighter, more durable briar wood pipe, examples of which would not be expected to have survived within this particular marine environment. By the late 1860s briar pipes would become prevalent as industries in France, England and the United States “greatly increased the number of pipe smokers” (Pfeiffer, 2006: 102-3).

## 12. Conclusion

The predominant significance of the Site BA02 clay pipe assemblage is as one example of the vast inter-regional trade once conducted along the East Coast of America by a small schooner probably based in New York. Perhaps stowed in two or three shipping containers in the stern half of the ship, the pipes were essentially low volume, low cost space fillers shipped to maximize the profits attainable from trade with the cotton ports of the South or frontier outposts. Most plausibly dated to 1854, the Jacksonville ‘Blue China’ shipwreck provides a new chronological context for these two common tobacco pipe styles.

The origins of this assemblage are obscured by an interlocking web of commercial, historical and political complexities. One Type 2 ‘TD’-embossed pipe has been identified as a British product manufactured from white ball clay, which most logically suggests comparable British origins for the remainder of this type from the Jacksonville ‘Blue China’ wreck. In this model the flourishing pipe industry in Bristol emerges as a credible source for the Type 2 collection, especially given similarities between the wreck material and ‘TD’ examples from Bristol excavated in the Fort Union Trading Post, North Dakota, and the fact that products from the Bristol Ring company entered America via New York, the Site BA02 ship's proposed home port.

However, identifications of British white clay pipe fabrics on mid-19th century American sites are not watertight proof of British origins: before the development of the American ball clay industry in 1880, almost all clay supplies for US white clay pipe makers were imported as raw material from the Devonshire district of England. Nonetheless, Henderson's products of this period appear to have all been marked, whereas Bannerman's Montreal ‘TD’ pipe output started in 1854 and his Eagle Tobacco Pipe Manufactory at Rouses Point, New York, opened in 1875. Both of the Bannerman production sources emerged too late to have served the markets with which the Jacksonville ‘Blue China’ schooner traded. A British provenance for some of the Type 2 tobacco pipes thus seems highly probable.

Analysis of three of the four Site BA02 pipes – both of the Type 1 ribbed and Type 2 ‘TD’ variety – are more suggestive of German manufacture. Such an interpretation is tempting in light of the notion that some British products allegedly lost popularity in America after the War of 1812 in tandem with the sharp rise in Germanic pipe imports starting in the 1830s. Nevertheless, the sheer presence of abundant ceramic wares from Staffordshire, England, on the Jacksonville ‘Blue China’ shipwreck of 1854 demonstrates archaeologically that perhaps too much has been read into this anti-British cultural bias. More detailed historical analysis actually demonstrates that British ceramics came to be preferred again over American products, partly due to reduced prices (Gerth, 2011).

Taking into account the large volume of the exclusively British ceramic cargo shipped aboard the Site BA02 vessel, the internal evidence favors a British origin for its tobacco pipes. If accurate, the Jacksonville ‘Blue China’ wreck assemblage can be interpreted as a microcosm of the final years of a traditional trade that was in decline, as was the age of the traditional small-scale schooner itself. By the late 1850s American-made tobacco pipes began to supplant European imports, and by 1860 a significant population of consumers had turned to tobacco chewing rather than pipe smoking. If the wreck of the *Bertrand* is typical of prevailing trends, then by 1864 wooden pipes may have found favor over clay by this date too. The introduction of the vulcanized rubber bit provided impetus for use of other materials in pipe manufacture.

However, objectively literally hundreds of pipe makers co-existed in the mid-19th century in five to ten different countries, each copying prevalent styles. In the absence of additional reference materials from the US, and despite the weight of evidence pointing to Britain, the origins of the Jacksonville ‘Blue China’ tobacco pipes currently remains unidentified.

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## Notes

1. See Hitchcock, J.A., *Clay Pipes - Then and Now*: <http://computeme.tripod.com/claypipe.html>.
2. See: [http://www.museumoflondon.org.uk/claypipes/pages/mark.asp?mark\\_name=TD](http://www.museumoflondon.org.uk/claypipes/pages/mark.asp?mark_name=TD).
3. See *Archaeological Excavations at Stenton*: <http://www.stenton.org/research/excavations.cfm>.
4. See the White Ball Clay Heritage Society: <http://www.clayheritage.org/pages/wideuses.htm>.
5. See the White Ball Clay Heritage Society: <http://www.clayheritage.org/pages/wideuses.htm> and *A Potted History of the Devon Ball Clay Industry*: <http://savikivi.blogspot.com/2009/07/potted-history-of-south-devon-ball-clay.html>.
6. See Note 4 above.
7. See: [http://ashadocs.org/aha/17/17\\_04\\_Gojak.pdf](http://ashadocs.org/aha/17/17_04_Gojak.pdf).
8. See *Politics of the Fur Trade: Clay Tobacco Pipes at Fort Union, North Dakota* (National Park Service, US Department of the Interior): <http://www.nps.gov/archeology/sites/npSites/fortUnion.htm>.
9. See Note 8 above.
10. See Note 8 above.
11. See Note 8 above.
12. See Note 8 above.
13. See the Red River Project: <http://inadiscover.com/redriver/history/ship.html> and <http://inadiscover.com/redriver/index.htm>.
14. See *Point Pleasant Pottery, 1838-1890*: <http://www.flickr.com/photos/42613470@N00/sets/72157602945863364/>.
15. See *Maple Leaf Shipwreck Site - National Park Service*: <http://www.nps.gov/history/Nr/travel/flshipwrecks/map.htm>.
16. See *Significance of the Artifacts Recovered from the Maple Leaf*: <http://www.mapleleafshipwreck.com/Book/other/contents.htm>.

17. See *Pamplin Clay Tobacco Pipes*, Museum of Anthropology, College of Arts and Sciences, University of Missouri: <http://anthromuseum.missouri.edu/minigalleries/pamplinpipes/pamplinpipes.shtml>.
18. See Note 8 above.

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