

# *Attribution Enhanced: Possible American 18<sup>th</sup> century porcelain finds in England*

*A paper by Nicholas Panes and J Victor Owen  
read by Nicholas Panes at Kensington Town Hall on 19<sup>th</sup> November 2011*

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## *Introduction*

For English collectors the porcelains of Colonial America have been a slow burning interest. Bonnin and Morris operated for only a very short time between 1769 and 1773. That Bonnin and Morris had tried to manufacture china was mentioned in a letter from Dr James Mease to the Franklin Institute in 1841, but these facts were erased from memory until the ideas were revived one hundred years later. The factory was mentioned in four or five publications through the late 19<sup>th</sup> and 20<sup>th</sup> century, but it was to be an Englishman, Graham Hood, who wrote the first book on the topic: *Bonnin and Morris: The First American China Manufactory*, published in 1972.

Following this and prior to 2007 only a few papers were added to the body of knowledge on this factory, generally by American authors. Bonnin and Morris was staffed at least partly with English workers, including several from the Bow works seemingly led by the former head painter and founder's son, Thomas Frye. Former Liverpool workers may also have been present, a theme expanded in this paper, and of these men the most senior may have been the potter William Ball<sup>1</sup>.

It was not until excavations at another location, Cain Hoy, South Carolina in 1991 that the seeds were sown for a further discovery concerning American 18<sup>th</sup> century porcelain. This related to the pottery of John Bartlam, an emigrant Staffordshire potter. Although the sherds recovered from this site were dominated by Staffordshire-type earthenware, some blue-and-white decorated specimens were described as 'either pearlware or a poorly fired porcelain'<sup>2</sup> Based on his interpretation of SEM spectra collected for these

samples<sup>3</sup>, Stanley South concluded that 'these data indicate that these blue and white sherds of a ware being made by Bartlam are not porcelain, but are his "china" attempt to make it'<sup>4</sup>. Only through later analysis in 2007 by J Victor Owen was it discovered that John Bartlam had in fact made porcelain in Carolina between during the 1760s. Bartlam thus became the (second) first American china manufactory, though until recently not a single extant piece of it was known.

In 2007 the publication *Ceramics in America* featured the 18<sup>th</sup>-century American porcelains. It was published to coincide with an exhibition in Philadelphia curated by Alexandra Alevizatos Kirtley at which all nineteen known pieces of Bonnin and Morris were shown. This book reached England and this stimulated further interest in a little studied topic.

The rediscovery of the Isleworth porcelain manufactory in England after it had been forgotten for more than a century resulted in efforts by a number of collectors to assemble groups of these rare phosphatic wares. A publication on the factory was produced which included some of the more tentative attributions in a section at the back.<sup>5</sup> A few collectors, including the first author, noticed a resemblance between a teabowl shown in the back as 'possibly Isleworth' and the shards found on the Bartlam site. The London dealer Rod Jellicoe did better. He actually found such a teabowl, the first ever piece of Bartlam porcelain to be identified. This teabowl is now in pride of place in the collection of the Chipstone Foundation in America<sup>6</sup>. Following this find another English dealer identified an identical teabowl plus a saucer of different design which may be connected to the Bartlam factory. Both these pieces were subsequently sold privately.

It is interesting that an English porcelain dealer and collector should find such a piece in England. Later in this paper further finds in England will be reviewed, almost certainly with the result that further pieces will have been attributed to these rare American factories.

*John Bartlam porcelain found in England*

Let us now deal with the first such find, which was in the collection of an English Ceramic Circle member and subsequently sold appropriately to the Philadelphia Museum of Art. This teabowl illustrated below (1, 2) is identical to the find by Rod Jellicoe which

matches sherds from the excavated Cain Hoy site. The teabowls which have been discovered so far have been the subject of non-destructive analytical testing methods. We understand that these tests produced results consistent with the known composition of Cain Hoy porcelains<sup>7</sup>. The teabowls (for there are two!) illustrated in this paper have not been tested. Bartlam porcelains are made from a phosphatic paste which is distinguishable from the reported composition of Isleworth porcelains, the former being free of lead, and the latter normally containing significant quantities (2.2%-4.2% PbO) of lead.<sup>8</sup>



1. Teabowl, John Bartlam factory, c 1765-70, now at Philadelphia Museum of Art



2. Another view of the teabowl in Image 1



3. Collage of teabowl in Image 1

The Bartlam bowl is slightly flared at the rim and has a convex conical base. The diameter is 7.5 cm and the height 4.2 cm. The printed pattern is illustrated fully in the collage. (3) The principal decoration on one side is of a figure in a boat house situated under a rock and a pine tree. Two figures occupy a boat on the adjoining water. On the other side is a two storey building with a single storey one next to it. On one side is a rock from which a palm tree is growing, and on the other a rocky promontory. Between these two main prints there is a sailing boat and an exotic plant with two large flowers. The palm tree seems to be a particular feature of Bartlam, and another is to be found inside the bowl. (4)

After this paper had been read to the ECC meeting,

a copy of the PowerPoint presentation was sent to an ECC member in America. He was very pleased as he had a teabowl of the same type and pattern that he had bought in England. (5) As it turned out, he had taken the teabowl back home! The teabowl was subsequently sold at Christie's New York on 25th January 2013.

It is gratifying that in this first part of this paper we are thus able to report the finding of two further identical Bartlam teabowls to the one found by Rod Jellicoe. When adding the further one sold privately this makes a total of four teabowls, all of which were originally found in England. All four share the same pattern so may perhaps originate from the same service. In addition there is the printed saucer sold



4. Palm tree inside the teabowl that seems to be a feature of the John Bartlam factory



5. Another Teabowl, John Bartlam factory, c 1765-70, sold at Christie's New York



6. Printed saucer with a palm tree in its pattern which may be from the John Bartlam factory

recently, which may be related. (6) It also has a palm tree in its pattern, which has been placed slightly over the painted border. To the left of the palm tree is an exotic flower, and whilst this saucer, like the teabowls, is decorated in a Chinese style one cannot help but wonder if the palm tree is a favourite motif of the South Carolina factory.

#### *Why were they here?*

These finds of American porcelain purchased by their owners in England together with further pieces dealt with later in this paper raise interesting questions. Firstly, why should such pieces be found in England? Perhaps the first point is that both American factories employed English workers. Wedgwood, who was very concerned about the possible emigration of his workers, published pamphlets, perhaps in part to discourage his own workforce by citing the perilous fate of those who left for America. Wedgwood was a representative of the Staffordshire potters in the House of Commons, and published a pamphlet on this topic in 1783. In the case of Bartlam workers he suggested, perhaps based upon information from a returning Bartlam potter William Ellis, that shipwreck and subsequent illness had decimated their numbers.

Wedgwood also obtained first-hand information about Bonnin and Morris from his nephew Thomas Bierley, who, if he did not work at the factory, certainly was aware of it and of the fate of its workmen. Wedgwood claimed in an address to his workforce<sup>9</sup> that workers who went to Philadelphia had been impoverished when the factory closed and that none had lived to return to England. Certainly Bonnin did return to England, as did the Bartlam worker William Ellis. They may not have been alone but to what extent Wedgwood exaggerated the position in order to deter his workers from emigration may never be known. It is also worth remembering that Philadelphia in particular would not have been a comfortable place for English loyalists to live, and many returned to England (perhaps with the family china) during and after the War of Independence. In any event returning workers, proprietors and others, and even those who did not return, may have sent samples to loved ones. In the case of Bonnin and Morris it is known that wares were sent to Scotland and also to Benjamin Franklin in England.<sup>10</sup>

It is also possible that American porcelain was offered for sale in England. Jonathan Gray in a recent paper to this Circle cites a November 1764 advertisement for china imported from Georgia to London.<sup>11</sup> No manufactory in Georgia is known and it is possible this may in fact relate to porcelain from South Carolina.

Both the colonial American factories were undertakings which rode on the bow wave of patriotic sentiment in the first stirrings of the independence movement. There was resentment against unfair duties and taxes and the desire to make America self-sufficient in manufactured goods. The Non-Importation Agreements, leading to the boycott of British goods followed from 1765.

The desire to make America self-sufficient had been around for a long time, as generations of new Americans regarded themselves as just that, in contrast to their parents, many of whom had regarded themselves as English ex-patriots abroad. The English policy of mercantilism had regarded America solely as a source of raw materials and legislation depressed

even the smallest endeavour, such as the 1732 Hat Act which limited exports and restrained expansion of hat makers by restricting apprenticeships.

All across Europe porcelain was prized. The quest to manufacture it in the Chinese style had been funded across Europe by Royalty and noblemen. The collections of porcelain in Royal palaces stirred the aspirations of people of all ranks to own porcelain. In England the manufacture of porcelain did not have royal support, so given the commercial imperative for such factories the achievements in England were all the greater. Likewise in America the almost iconic status of porcelain was bound to lead to a commercial attempt to manufacture it. It would be not simply a matter of pride but financially beneficial to America. Writing a letter of support for Bonnin and Morris in the Pennsylvania Gazette on 8<sup>th</sup> January 1771, a 'Pennsylvania Planter' put it thus:

The Manufacture of China Ware in this Province certainly deserves the Attention of Every Man, who prays for the Happiness of his Fellow-Subjects, or that the very Semblance of Liberty may be handed down to Posterity ... the Use of China is introduced, and well established; Custom has rendered it some how necessary. We must and will have it, whatever be the Consequences. No less than Fifteen Thousand Pounds worth of China has been imported into the Province since the first of April last; if this Clay is to be paid for there are Fifteen Thousand Pounds of Gold and Silver less in the Province than we should have had if the same Ware had not been imported, rather manufactured amongst us...

In such an environment it seems likely that as soon as products were available attempts would be made to sell the wares back to England. The fact that English workers were present at both of these American enterprises increases this possibility. Furthermore Bonnin and Morris had appointed a china dealer in Philadelphia to handle their wares. If this dealer knew his business he would presumably have been importing wares from England. It would be unsurprising if that

the dealer, Archibald McElroy, promoted a reverse trade, himself sending the new American wares back to correspondents in England.

To bring the discussion up to date, England today is naturally the place where blue and white English porcelains are most collected. Collectors have developed considerable connoisseurship in these wares over the forty years or more since they became recognised as worthy of study. Given the rarity of Isleworth, porcelain items that were thought to be from that factory (as was the Bartlam teabowl) have been in particular demand.

Not only do these collectors scrutinize anything that does not fit in to a neat grouping with other English wares but in the 21<sup>st</sup> century these same collectors (the eBay generation) have purchased many such wares from the USA. No figures are available but it seems possible that England has been a net importer of English blue and white soft paste porcelains for many years. Given the concentration of collectors in England and the additional sources of information about American wares, it should not perhaps be surprising that finds are starting to be made.

#### *Bonnin and Morris decorative features*

The discovery of a printed pattern for which there is American archaeological evidence has been very helpful in the first part of this paper, but no such circumstances apply to the painted pieces which are reviewed next. There have to date been only nineteen accepted pieces of extant Bonnin and Morris porcelain and most of these have painted patterns. The only other relevant find has been two wrecked sauceboats, excavated in a domestic context in Philadelphia.

Before reviewing three further pieces which deserve consideration, it may be helpful to illustrate some of the decorative features which appear on Bonnin and Morris. It should be stressed that whilst such features indicate the possibility of a Bonnin and Morris attribution, they also occur on some English wares.

An example is a Bonnin and Morris pickle dish. (7) The pattern includes a rock with deep blue shadows





7. Pickle dish, Bonnin and Morris Manufactory, Philadelphia, c 1770-72. Courtesy of Philadelphia Museum of Art and the Chipstone Foundation



8. Teabowl and saucer attributed to James Pennington of Liverpool with similar pattern as the pickle dish in Image 7. Courtesy of Bonhams

drawn as horizontal blobs below it. On each side of the rock is a picket fence. Further ‘blobby’ shadows appear under the house and the rocks in the upper part of the pattern. To the left of the other tall rock here are two groups of curling over reeds, and to the right is a pylon tree. This same pattern, in a slightly less squashed format, is repeated on a saucer sherd from the Bonnin and Morris site, and is of particular interest because it broadly matches the teabowl and saucer (8), attributed to James Pennington of Liverpool.

James Pennington operated at the Brownlow Hill site in Liverpool. Prior to his period at Brownlow Hill the site was first operated by William Reid, and following his bankruptcy under the management of a potter called William Ball. The first author’s last paper to this Circle on American porcelain concerned the death of an English potter called Mr Ball in Philadelphia, postulating that he was William Ball, previously of Liverpool<sup>12</sup>. When making comparison of decorative features it would be dangerous to ignore the fact the features on American porcelains also appear in England. It is interesting that with Bonnin and Morris some such decorative motifs appear most often on Liverpool porcelains, strengthening

the argument that William Ball and other Liverpool workers may have gone to Philadelphia where they joined a Bonnin and Morris workforce mainly comprising potters from the Bow manufactory. A selection of decorative features used by Bonnin and Morris are shown here on Liverpool porcelains. (9) Such features are not unique to Liverpool porcelains but in England they seem to recur more often in Liverpool than elsewhere.

The next Bonnin and Morris piece is the fluted sauceboat. (10) This sauceboat has been said to be similar in shape to Bow but it is closer to the Plymouth fluted shape. The feature to note is the painted spray of three leaves on the foot of the sauceboat. Note also that underneath the spout appears another picket fence.

#### *A possible Bonnin and Morris star shaped dish*

The first possible Bonnin and Morris piece for consideration is the P-marked pointed dish or saucer. (11) Although referred to throughout this paper as a dish, its precise purpose is uncertain. It is of a size such that it could be a saucer. Pointed saucers with twelve sides are known in early Worcester (c 1752-3) and octagonal shapes with straighter sides are known in Chinese and English porcelain too. Although this

9. A selection of decorative features on Liverpool porcelains that were also used by Bonnin and Morris



10. Fluted sauceboat from Bonnin and Morris manufactory, c 1770-72. Courtesy of Philadelphia Museum of Art and the Chipstone Foundation



11. P-marked pointed dish or saucer possibly made by Bonnin and Morris

was not the case with Worcester, if this piece is a saucer the matching teabowl may have been somewhat taller than the norm, i.e. shaped more like a beaker.

The dish was acquired in 1990 by the London dealer Simon Spero, who felt that its appearance was unlike any English porcelain he had seen. Further investigation suggested to him that it may be Bonnin and Morris. In 1991 the piece was offered for sale as Bonnin and Morris by Sothebys in New York estimated at \$25,000-\$35,000 but it did not sell. It appears that American collectors and institutions had reservations about the attribution, and whilst speculative offers were received by Spero after the sale, he decided to retain the piece.

An inspection of the dish reveals a colour of pale blue painting which is not typical of Bonnin and Morris, and the hand is not one obviously linked with any accepted piece from the factory. The paste is quite white in colour. However, the depiction of the picket fences and the (albeit lightly shaded) shadows under the rocks has links with Bonnin and Morris decoration. So too does the three-leaf sprays used on the back of the piece. The 'P' mark on the back is similar to that used on Bonnin and Morris, and whilst occasional 'P' marks are seen on English porcelain, they are rare, likely to be painters marks, and not usually of this large size.

Spero exhibited the dish at the International Ceramics Fair in London in 1994 and it was purchased by a UK collector. However, the journey was not over for this piece, as the owners offered it to the exhibition of Bonnin and Morris porcelain which took place in Philadelphia in Spring 2008. However, doubts persisted about the piece and it was declined for the exhibition, following which Spero repurchased it. He was subsequently persuaded to have it chemically analysed. He was still convinced that the piece was not from an English factory, so it seemed to him that it was either genuine Bonnin and Morris or a deliberate fake. To address this concern J Victor Owen agreed to analyse a sample taken from the foot rim of the piece which was duly despatched to him in Canada.

#### *A second star shaped dish*

At this point an exciting development occurred which much assisted the investigation of the dish. The London dealer Errol Manners, who had seen Spero's piece, was visiting the Curtis Museum in Hampshire, when to his surprise he saw a dish of identical shape. It too was marked with a 'P' in the style associated with Bonnin and Morris. (12)



12. P-marked pointed dish or saucer possibly made by Bonnin and Morris



This dish is painted in a darker blue and its paste is less white than the Spero dish. It may be that the glaze itself is slightly discoloured, a feature documented in contemporary correspondence below. The pattern is not replicated on any known Bonnin and Morris piece but certain features are familiar. Picket fences abound, including either side of the lower rock, below which shaded shadows occur. On the rear is a 'P' mark and three-leaf sprays which make their way round the dish. The darker colours (both of the paste and the blue painting) are much more like those occurring on recognised Bonnin and Morris pieces.

### *Comparison of the two dishes*

In view of the differences in colour between these two dishes it was felt that a useful line of enquiry would be to try and establish whether they were from the same manufacturer. Colour differences do occur on Bonnin and Morris and on English porcelains, as do differences of painting style, so the differences were not thought incompatible with the attribution of both pieces to the same source. Indeed Joseph Shippen Junior, the son of a Philadelphia Merchant, told us as much when writing to his father in early 1771:

...Jenny promises herself the pleasure of being one of the first at the shop, when the next kiln of china is sent there, in order to choose out a good set for Mammy; for there is often a great deal of difference among the cups and saucers, as well as other articles, as to the goodness of painting and glazing.

This china is generally esteemed preferable to that made in England, as to its fineness or quality; but as yet it has too yellowish a cast owing to the want of a particular ingredient used in the composition for glazing...

In order to provide a comparison of these two pieces the dimensions of each were compared. Firstly a measurement was taken from the rim of the dish to the surface on which it stood. This revealed that both pieces had warped in the kiln. Spero's dish measured 3.8 cm at the highest point and 3.0 cm at the lowest. The Curtis Museum piece was slight less distorted,

but the similar measurements were 3.6 cm and 3.2 cm. Both pieces centred around an average height of 3.4 cm.

The next dimensions to be measured were the 'tip to tip' diameter from point to point across the dish. It was apparent that both dishes were slightly irregular. A similar exercise was carried out on the footrims, with similar results. With the footrim this irregularity is important. Given the complicated shape of the piece, it seems likely that the footrim was moulded in, not applied later. Whilst the dish as a whole was made in a mould, the outside rim would be vulnerable to being distorted further during the hand fettling of the piece once removed from the mould. Unless the piece was very roughly handled, the footrim might be expected to retain its original shape.

The results of the measurements (**13**) are arranged to that the longest of the external diameters is presented first. In the same way the footrim dimension first presented is that immediately beneath the largest recorded external diameter. When viewing the front view of each dish the measurements are then presented for each point to point dimension travelling clockwise around the piece.

The conclusions of this exercise are as follows:

- 1 The Curtis Museum piece is consistently slightly smaller than the Spero dish, the difference being 3% or less except for the third external diameter which is 4%. The latter diameter may have been extended during hand fettling. The magnitude of these differences overall is within the ambit of differential shrinkage, occurring according to where the pieces were placed in the kiln
- 2 For the external diameter measurements, the first and the fourth dimensions of each dish are the largest and the shortest, respectively
- 3 For the footrims of each dish the second dimension is largest and the fourth is smallest

Each dish was weighed and the smaller of the two was found to weigh 116 gms, the larger 118 gms. It is concluded that the matching imperfections and close dimensional fit between these pieces strongly suggest that the two dishes were made in the same mould.

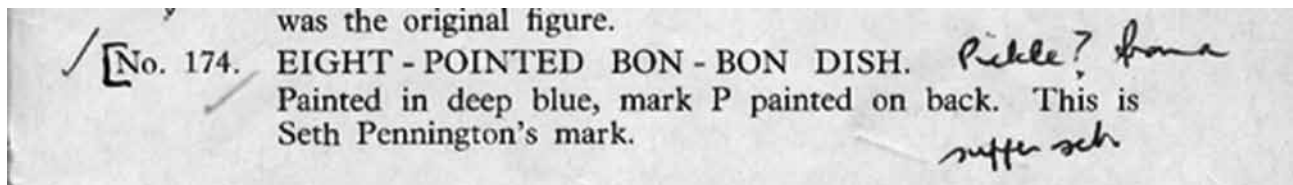
Saucer Dimensions	Spero Piece (cm)	Curtis Museum Piece (cm)	DIFF cm	DIFF %
<b>Starting from the longest side, moving clockwise</b>				
<b>First Diameter</b>	13.9	13.5	0.4	2.9
Second	13.8	13.4	0.4	2.9
Third	13.9	13.3	0.6	4.3
Fourth	13.3	13.1	0.2	1.5
<b>First Footrim external</b>	7.2	7.1	0.1	1.4
Second	7.6	7.5	0.1	1.3
Third	7.4	7.2	0.2	2.7
Fourth	7.2	7.0	0.2	2.8

13. Comparison of Spero and Curtis Museum star-shaped dishes

*Provenance of the Curtis Museum dish*

An important benefit from the finding of two similar dishes is that the piece in the Curtis Museum has a long provenance. It was donated to the Museum by Major R G Bignell, a collector whose army career took him across the world before he married and settled in Hampshire. Bignall was born in India but schooled as a boarder in Cheltenham College. He donated a few individual pieces from his collection to the V&A before the Second World War, but in 1943 gave the whole of his collection, some 400 pieces which mainly comprised of earthenwares, to the Curtis Museum. The Museum copy of the catalogue (14), describes the dish as ‘Eight-pointed Bon-Bon dish, painted in deep blue, mark P on the back. This is Seth Pennington’s mark.’ However, today a ‘P’ would not be recognised as a mark for Seth or any other Pennington, though the attribution is prescient in view of the noted similarities between Bonnin and Morris and Liverpool pieces.

The provenance of the Curtis Museum piece provides a rebuttal to the thought that these pieces may be Bonnin and Morris fakes. The documented history of Bonnin and Morris studies is well set out in Graham Hood’s book, referred to above. Mention was made of the factory in once in 1811 and then not again until 1841. Dr James Mease, Edward Atlee Barber, John Spargo, and John Ramsey all wrote about Bonnin and Morris, with only Spargo, in 1926, speculating that porcelain may have been made. Ramsey in 1939 attributed three pieces of ‘fine white earthenware’ to the factory. In 1947 Arthur Clement attributed more, but only in 1951 did he decide that one of them may be porcelain. It is clear therefore, that anyone seeking to fake Bonnin and Morris before or during the Second World War (if indeed there was any financial incentive to do so) would have produced an earthenware body. With the lack of translucency in this dish an earthenware body may indeed have



14. Catalogue from the Curtis Museum in Alton describing their star-shaped dish from the Bignall collection as ‘Eight-pointed Bon-Bon dish’

been what Ross Bignell thought he was donating in 1943.

This leads to the analysis of the Spero dish, carried out by J Victor Owen. The Curtis Museum dish has not been analysed but the study set out above suggests an identical origin. The dish owned by Spero has proved to be a phosphatic porcelain.

#### *Chemical analysis of the Spero star dish*

Apart from a few samples interpreted to be exotic artifacts, most analysed sherds (11 of 12) from the Bonnin and Morris factory site have sulphurous phosphatic compositions with 11.2-16.1%  $P_2O_5$ , 16.3-22.8% CaO, 49.6-58.5%  $SiO_2$ , 5.8-7.4%  $Al_2O_3$ , 0.9-2.2%  $SO_3$  (one sample has only 0.08%  $SO_3$ ), and up to 1.2% PbO.<sup>13</sup>

The sherds have CaO/ $P_2O_5$  ratios, molecular proportions (MP) of 3.1-3.7. They contain silica polymorphs, two texturally and compositionally distinct phosphate phases (derived from calcined bone ash), calcic plagioclase (bytownite,  $An_{80-88}$ ), a melt phase, and, in some samples, traces of a ternary feldspar. The Bonnin and Morris glaze is variably lead-rich (34-52% PbO); its lime content varies by an order of magnitude (0.2-5.2% CaO); the glaze on most of the analysed sherds is tin-bearing (2%  $SnO_2$ ).

In terms of its bulk composition, the body of the star dish falls within the range of compositions shown by the analysed Bonnin and Morris sherds. Below are shown the compositional data for the dish (**15**), and the comparison with Bonnin and Morris, including one similar sherd. (**16**)

	Bulk paste	Glaze	Melt phase	Bone ash no stipples	Bone ash stippled
$SiO_2$	49.8	45.0	62.6	0.2	14.3
$TiO_2$	0.8	0.2	0.2	0.0	0.2
$Al_2O_3$	7.7	1.2	20.0	0.0	3.0
FeO	0.6	0.4	0.4	0.1	0.4
MnO	0.0	0.1	0.0	0.0	0.0
MgO	0.5	0.1	0.1	0.0	1.3
CaO	22.7	2.5	12.2	59.7	45.4
$Na_2O$	0.6	0.7	1.6	0.1	0.3
$K_2O$	2.2	2.4	1.7	0.1	0.6
$P_2O_5$	13.7	0.12	1.2	39.4	30.7
PbO	0.1	45.3	0.0	0.2	0.2
$SnO_2$	0.0	1.3	0.0	0.1	0.1
BaO	0.0	0.2	0.0	0.0	0.0
Cl	0.0	0.1	0.0	0.1	0.0
$SO_3$	1.3	0.1	0.1	0.0	3.6
CoO	0.0	0.2	0.0	0.1	0.0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
N=	26	3	12	1	2
Data are normalized to 100 wt%					

15. Chemical composition of the Spero star-shaped dish

	<b>B&amp;M sherds Average %</b>	<b>Sherd BM6 %</b>	<b>Star Dish %</b>
SiO <sub>2</sub>	54.9	49.6	49.8
TiO <sub>2</sub>	0.3	0.3	0.8
Al <sub>2</sub> O <sub>3</sub>	6.6	6.3	7.7
FeO	0.5	0.6	0.6
MnO	0.0		0.0
MgO	0.5	0.5	0.5
CaO	18.6	22.8	22.7
Na <sub>2</sub> O	0.6	0.6	0.6
K <sub>2</sub> O	1.6	1.4	2.2
P <sub>2</sub> O <sub>5</sub>	14.2	15.8	13.7
PbO	0.4	0.3	0.1
BaO	0.0		0.0
Cl	0.0		0.0
SO <sub>3</sub>	1.9	1.6	1.3
CoO	0.0		0.0
<b>Total</b>	<b>100.1</b>	<b>99.8</b>	<b>100.1</b>

16. Comparison of composition of the Spero star dish with excavated Bonnín and Morris porcelain

The dish contains 13.7% P<sub>2</sub>O<sub>5</sub>, 22.7% CaO, 49.8% SiO<sub>2</sub>, 7.7% Al<sub>2</sub>O<sub>3</sub>, and 1.3% SO<sub>3</sub>. Its lead content approximates analytical detection limits for this component (~0.1% PbO), as do four of the twelve analysed, lead-bearing phosphatic sherds from the factory site. In both cases, the lead is sequestered in the melt phase and, in some instances, relict bone ash. The lime/phosphate ratio of the star dish, however, is relatively high (= 4.2 [MP]). Its glaze is zoned, a common feature of lead-rich glazes on early porcelains, showing a decrease in lead from the external surface inwards (from 49-42.6% PbO) and increase in silica (44.4-48% SiO<sub>2</sub>) and alumina (0.66-2.03% Al<sub>2</sub>O<sub>3</sub>). Averaged, this glaze falls within the range of compositions shown by the glazes on the

excavated phosphatic sherds from the Bonnín and Morris site.

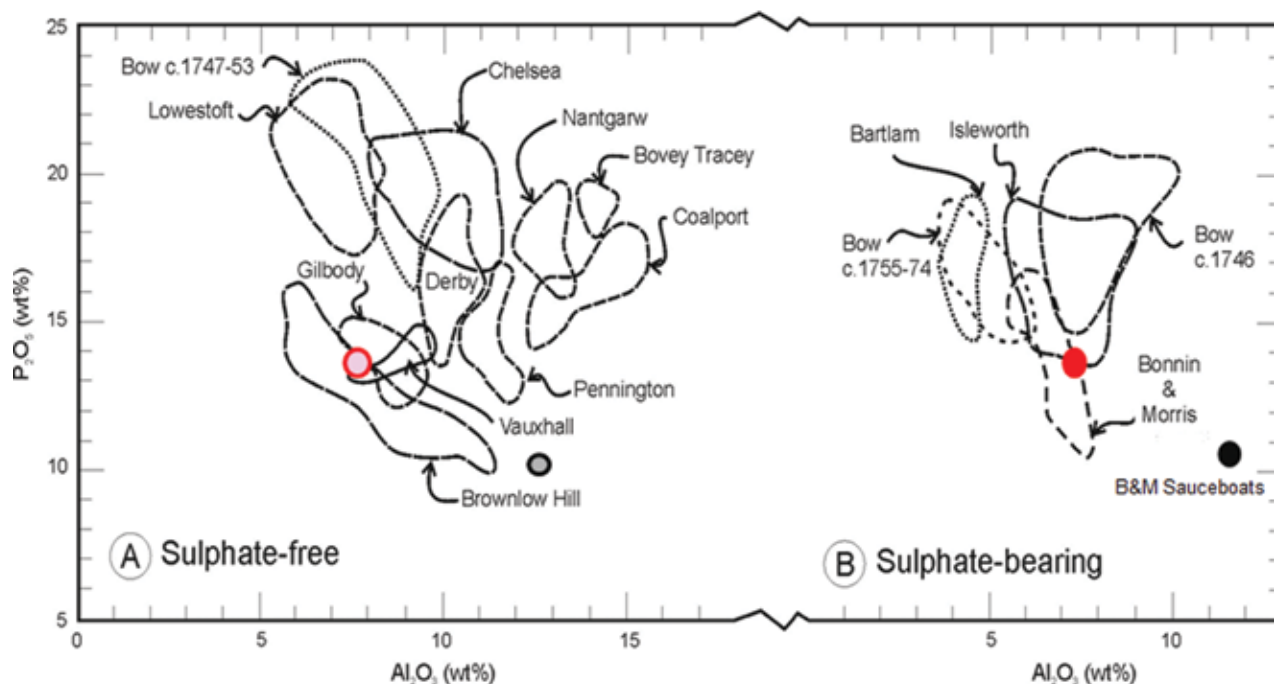
A comparison of the proportions of Al<sub>2</sub>O<sub>3</sub> and P<sub>2</sub>O<sub>5</sub> in the paste of phosphatic porcelains provides a proxy for the mix of clay and bone ash used. The composition of the body of the star-shaped dish plots on the edge of the Bonnín and Morris field on a phosphate-alumina diagram. (17) As such, it has lower phosphate contents than the contemporary Isleworth porcelain as well as Bow porcelain with which the Philadelphia wares are often compared. Thus there are at present no other analysed early English or American sulphurous phosphatic wares similar to composition to the star dish other than Bonnín and Morris.

The main difference between the star dish and the excavated sherds concerns their differing lime/phosphate ratios. Although its higher CaO/P<sub>2</sub>O<sub>5</sub> ratio at 4.2 vs 3.1-3.7 (MP) might suggest a non-Philadelphia origin for the star dish, available data indicates that Bonnín and Morris experimented both with the composition and the type of paste that they produced during the short production history of the American China Manufactory. Not only did they produce an S-A-C openware basket in 1773<sup>14</sup> – a type of paste long considered obsolete in the UK – but two sauceboats excavated from Independence National Historical Park (Philadelphia) have forms, bulk and glaze compositions, and an enrichment in heavy minerals that link them to Bonnín and Morris<sup>15</sup>. However, the recipe for these sauceboats had notable differences from other Bonnín and Morris phosphatic wares. Their lime/phosphate ratios at 3.7, 4.0 (MP) match and exceed the highest determined for the analysed sherds from the factory site, and approach those for the star dish.

#### *Analytical results for the star dish*

The analytical database for historical Anglo-American porcelains is woefully small, and researchers risk having categorical attributions based on these limited data overturned by subsequent work. Increasingly, further studies have revealed the range of recipes used by particular factories in what was, after all, an experimental phase in the manufacturing of such wares.





17. Composition of the body of the star-shaped dish plots on the edge of the Bonnin and Morris field on a phosphate-alumina diagram

This is particularly true of phosphatic porcelains, where the potential overlap between pastes made at different factories could give rise to mistaken attributions if the scientific results are viewed in isolation.

As an example of this, the presence of sulphate (evidently derived from gypsum) and the presence of lead have been regarded as helpful identifiers for narrowing the number of factories which could have made a particular object. Whilst today this is still the case, work by W Ross Ramsay<sup>16</sup> has demonstrated that Bow porcelain produced over the 25-year history of this factory contains between zero and 4% lead oxide and between zero and 4% sulphate. Other factories (notably except Bonnin and Morris) have generally been found either to use these components continuously or not at all. New information may in the future arise to modify this view.

Based on current knowledge, the star-shaped dish has lower phosphate and lead contents than any recorded Isleworth porcelain, and lower phosphate than any contemporary Bow porcelain. Comparison with some of the Liverpool factories also throws up

distinctions, as the presence of sulphate in the star-shaped dish makes the recipe different from any recipe for William Reid, John Pennington, or Gilbody porcelain so far recorded. Analyses of single specimens of James Pennington and Seth Pennington porcelain were made for the purposes of this paper. The analysis of single samples cannot, of course, be expected to be representative of the entire corpus of a factory's production line. Nevertheless, it is noteworthy that the star-shaped dish contains significantly less alumina than both Pennington porcelains. Moreover, both are essentially devoid of sulphate, whereas the star-shaped dish contains 1.3%  $\text{SO}_3$ .

#### *Conclusions on the star-shaped dishes*

The two dishes have been reviewed in detail and a comparative analysis of their dimensions suggests strongly that they were made in the same mould. These dishes both have decorative features linking them to Bonnin and Morris, as well as 'P' Marks. The dishes significant support each other in that one has analysed within the range of compositions used in

Bonnin and Morris phosphatic pastes, and the other has a long provenance which appears to preclude it being a fake. The Curtis Museum star dish has more typical colouring and decoration linking it with Bonnin and Morris.

‘P’ marks, although occasionally seen on English porcelain, are not recognised as a factory mark from Pennington or from any other English factory and when found have usually been of much smaller size than those on the star-shaped dishes. Longton Hall used various letters of the alphabet including ‘P’ but never made a paste resembling these dishes. Indeed, if such a factory mark were found on an English piece we would suggest that any of the accepted Bonnin and Morris shapes for which there is no archaeological evidence should be reviewed again to ensure the attribution is correct. The marks on the star dishes and those found on Bonnin and Morris are similar. (18)

The combination of connoisseurship, provenance, and science applied to these dishes in our view provides some support for a Bonnin and Morris attribution and we have identified no particular reason to disbelieve the marks on these pieces.

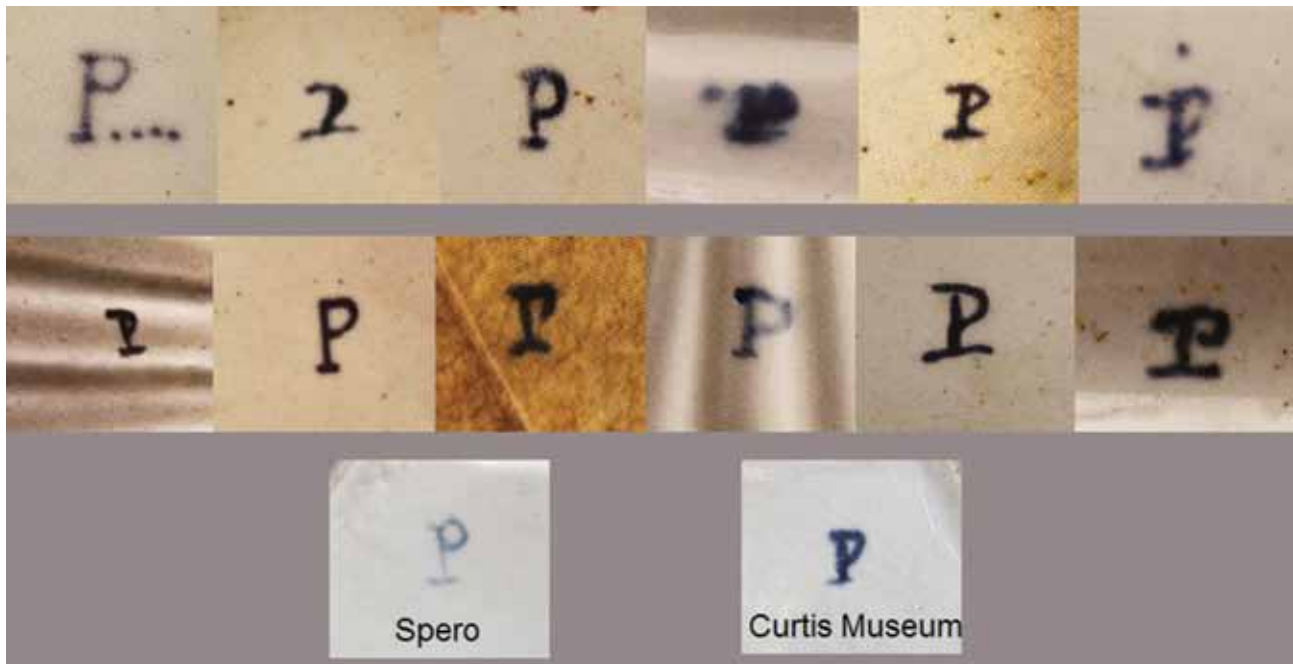
#### *An unrecorded saucer*

The next piece we shall consider is a saucer in the collection of another ECC member. His own studies of this piece led to the tentative conclusion that it might be Bonnin and Morris. (19)

This saucer is thinly potted, and has misfired, having spit in the glaze which is often seen on Bonnin and Morris sherds. It is painted naively in underglaze blue with a house and a willow tree growing from a rock. Other features of the pattern are familiar in Bonnin and Morris pieces, such as the curling reeds, the pylon tree, and the picket fences each side of a boulder, beneath which is a blobby shadow used several times elsewhere on the piece.

The diameter of the saucer, at 12.4 cm, compares with sherds found on the Bonnin and Morris site which were 12.7 inches. The footrim diameter of 7.6 inches is identical to the Bonnin and Morris sherds.

Not only has the misfiring led to spit out on the surface of the piece, but on inspection under a bright light its reddish translucency is speckled with moons or bubbles. Both the features have also been recorded on Bonnin and Morris porcelain. The paste and a close



18. Marks on the star dishes and those found on Bonnin and Morris. Courtesy of Chipstone Foundation

up of the rear of the piece with the contrast turned up, demonstrating a yellowish tinge in the glaze. (20)  
The neat potting of this piece, particularly the footrim,

resembles that of an almost complete saucer sherd illustrated in *Ceramics in America*.



19. Saucer possibly from the John Bartlam manufactory



20. Paste and a close up of the rear of the saucer in Image 19



21. Two reconstructed sauceboats found in a domestic waste pit in Philadelphia with similar analysis to the saucer in Image 19. Courtesy of the Independence Archaeology Laboratory at National Historical Park, Philadelphia

A sample was taken from the footrim of this saucer and analysed. Any glaze was lost during processing so the analysis is of the paste only. Before discussing the results of this analysis, it is useful to review the finding of the two sauceboats, referred to above, in a domestic waste pit in Philadelphia. The analysis of the saucer resembles that of the sauceboats. These sauceboats were reconstructed for the photograph. (21) Unfortunately the discoloured coating covers any decoration, and plans to remove what is believed to be the result of deleterious soil conditions have not yet been implemented.

At first sight an English porcelain collector would probably conclude that the sauceboats resemble those made at Plymouth and Bristol. There are, however, small but significant differences. The construction of the foot is quite different, the thumb rest less flamboyant, and the shell motif on the side slopes more sharply downwards than on a Plymouth example. These differences match exactly the sauceboat (22), a Bonnin and Morris example.

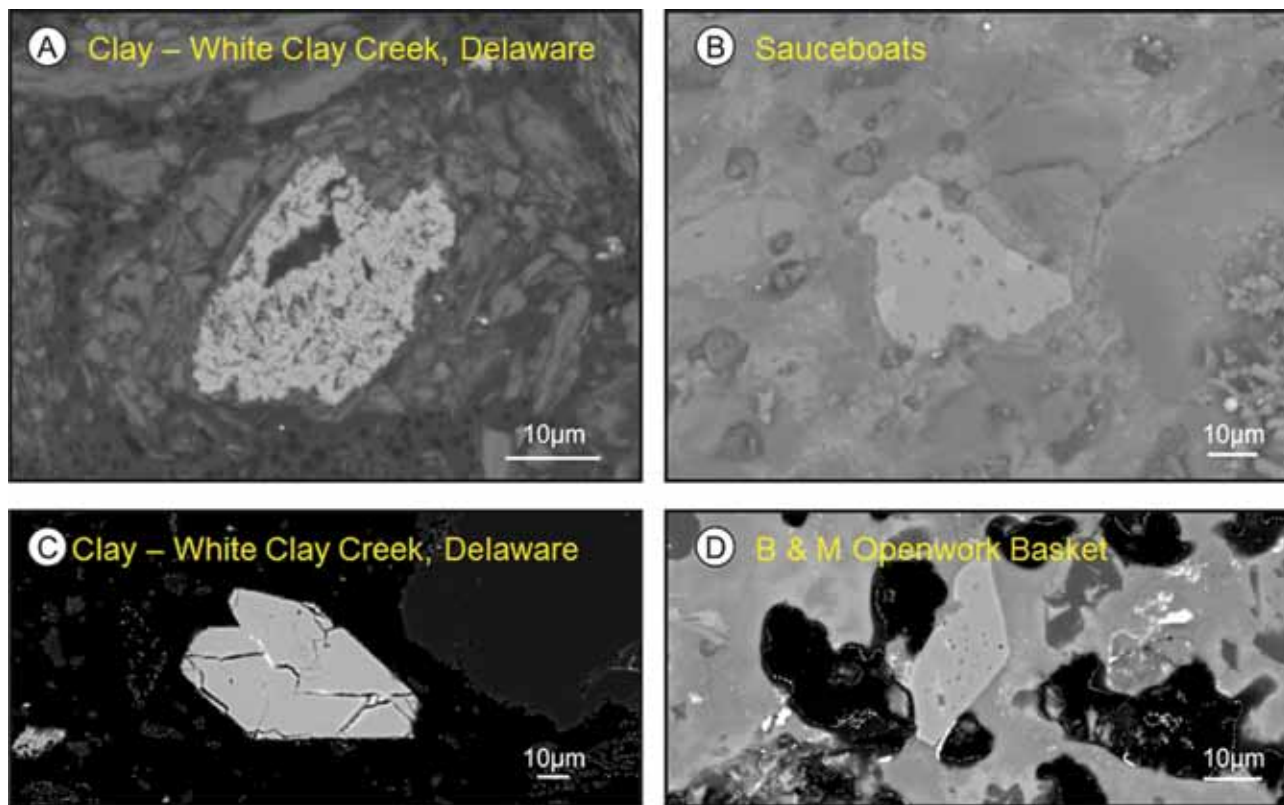
The sauceboats have sulphurous phosphatic compositions, but are relatively aluminous compared to porcelain sherds from the Bonnin and Morris factory site<sup>17</sup>. However, they are

enriched in heavy minerals, notably titania ( $\text{TiO}_2$ ) polymorphs (23), a feature also noted in a dated (1773) Philadelphia openware basket that has been firmly assigned to Bonnin and Morris<sup>18</sup>. Based on their trace element contents, some of these polymorphs can be compositionally linked to heavy minerals recovered from the clay source (at White Clay Creek, Delaware) exploited by the American China Manufactory<sup>19</sup>. This substantiates a Bonnin and Morris attribution for these artefacts.



22. Sauceboat, Bonnin and Morris manufactory, c 1770-2. Courtesy of Brooklyn Museum and the Chipstone Foundation





23. Backscattered-electron images of titania (TiO<sub>2</sub>) polymorphs in (A, C) clay from White Clay Creek, Delaware, (B) a sauceboat excavated in Philadelphia, and (D) a dated (1773), Bonnin and Morris, S-A-C openwork basket

#### *Analytical results for the saucer*

The results for the saucer are compared with the sauceboats below. (24)

#### *Discussion of analytical results for the saucer*

As will be seen, there is a fairly close correlation between the saucer and the Bonnin and Morris sauceboats, though the saucer has higher lead and calcium and lower sulphate contents. The lead content at 1.9% is the maximum possible percentage, as there was a potential for lead used in the sample preparation process being absorbed. Whilst the sauceboats contained little or no lead, other sherds found on the Bonnin & Morris site contained lead between zero and 1.2%.

The phosphate and alumina contents of the saucer are similar to those of the two excavated sauceboats. (25) Indeed, they plot quite close to those

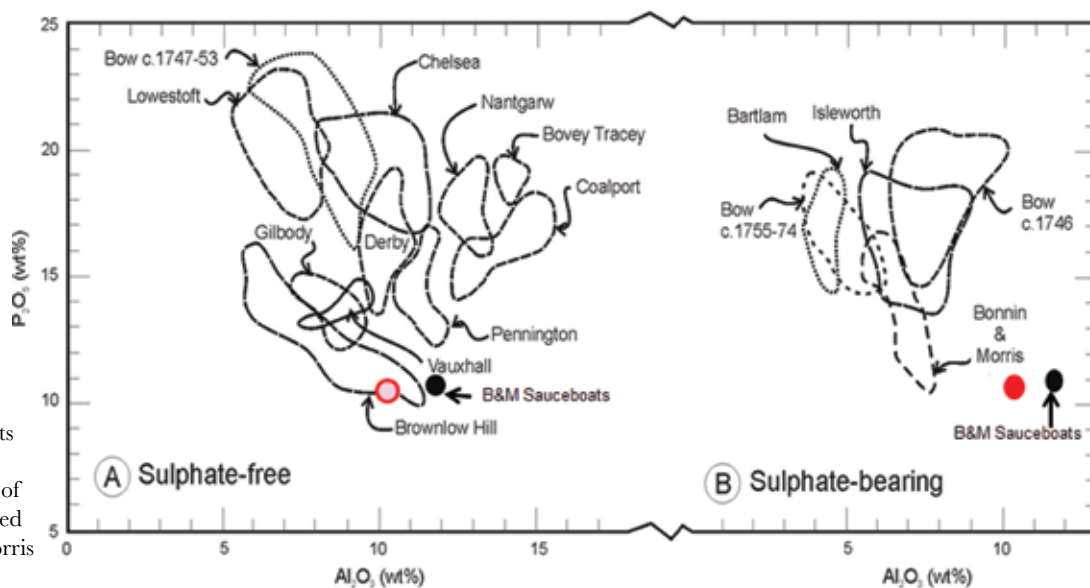
for the sauceboats, which were themselves notably different from other Bonnin and Morris sherds and different from any English factory except Brownlow Hill. However, Brownlow Hill (Reid) phosphatic porcelains analysed to date contain no detectable sulphate or lead. Neither does Lowestoft. Generally the composition of the saucer does not closely resemble those recorded for Bow, Derby or Isleworth phosphatic wares.

The caution expressed above in relation to the small pool of comparative analytical results applies equally in this case, particularly the paucity of data for some Liverpool factories. The analysis of this saucer is, in the light of available analytical databases, necessarily inconclusive, although it is supportive of a Bonnin and Morris attribution.

	Saucer %	B&M Sauceboat 1 %	B&M Sauceboat 2 %
SiO <sub>2</sub>	54.8	55.3	54.7
TiO <sub>2</sub>	0.4	0.4	1.1
Al <sub>2</sub> O <sub>3</sub>	10.6	11.3	12.4
FeO	0.4	1.0	0.9
MnO	0.0	0.0	0.0
MgO	0.3	0.4	0.4
CaO	18.3	16.9	16.9
Na <sub>2</sub> O	0.4	0.6	0.6
K <sub>2</sub> O	1.7	1.4	1.4
P <sub>2</sub> O <sub>5</sub>	10.5	11.5	10.6
PbO	1.9	0.1	0.0
BaO	0.0	0.0	0.0
Cl	0.2	0.0	0.0
SnO <sub>2</sub>	0.0	0.0	0.0
SO <sub>3</sub>	0.2	0.9	0.8
<b>Total</b>	<b>99.9</b>	<b>99.8</b>	<b>99.8</b>

24. Comparison of the paste composition of Saucer and Sauceboats

25. Phosphate and alumina contents of the saucer similar to those of the two excavated Bonnin and Morris sauceboats



### *Conclusions relating to the saucer*

There has not been the opportunity to handle the extant Bonnin and Morris pieces. However, the thinly potted saucer is from the photographs visually quite similar to the Bonnin and Morris pickle dish. (7) There are several decorative features and aspects of the modelling, glaze, and paste linking it to Bonnin and Morris. This saucer lacks provenance or marks which might support an attribution, but it has an unusual phosphatic composition similar in its clay / bone ash ratio (as mirrored by its  $\text{Al}_2\text{O}_3/\text{P}_2\text{O}_5$  ratio) to that of both the excavated Bonnin and Morris sauceboats and to Brownlow Hill phosphatic porcelains.

However, to date, plumbian and sulphurous variants of Brownlow Hill wares are unknown. Further work on this artefact failed to find titania polymorphs. However, if the clays were thoroughly washed such constituents would largely be removed (none were found in sherds from the site, only in the openwork basket and the sauceboats). Neither the apparent absence (or relative paucity) of heavy minerals, nor the absence of lead in the paste of this piece preclude a Bonnin and Morris attribution.

Whilst an attribution to an English (Liverpool) factory cannot conclusively be ruled out at this point we believe that both the composition and the appearance of this piece provide reasonable support for a Bonnin and Morris attribution.

### *General conclusions*

Finds of American 18<sup>th</sup>-century porcelain in England should not come as a surprise. Recent finds have helped to re-classify certain tentative Isleworth attributions to John Bartlam and have perhaps made the likelihood of further discoveries in England more likely as English collectors strive to identify their problem pieces. Two years ago there were no known pieces of Bartlam porcelain and only 19 pieces of Bonnin and Morris. Recent finds have expanded these numbers and are therefore significant. These pieces benefit from similarities in aesthetic criteria as well as analytical data, all against an historical background which made it likely that late Colonial American productions would find their way to British shores.

## NOTES

- <sup>1</sup> Panes, Nicholas, 'Mr Ball the English Potter and the American China Manufactory', *ECC Transactions*, Vol 20 Pt 3 (2009)
- <sup>2</sup> South, Stanley, *Staffordshire in Carolina*, (University of South Carolina, 2004), p 27
- <sup>3</sup> South, Stanley, op cit, Figure 4
- <sup>4</sup> South, Stanley, op. cit., p 27
- <sup>5</sup> *Isleworth Pottery and Porcelain, recent discoveries*. English Ceramic Circle and Museum of London Exhibition Catalogue, 2003
- <sup>6</sup> American Ceramic Circle Newsletter, Spring 2011
- <sup>7</sup> Sherds from the Cain Hoy site were analysed by Owen, J Victor, 'Geochemistry of High Fired Bartlam Ceramics', *Ceramics in America 2007*, (Milwaukee: Chipstone Foundation, 2007)
- <sup>8</sup> Freestone, Ian C, Joyner, Louise, and Howard, Ray, 'The Composition of Porcelain from the Isleworth Manufactory', *ECC Transactions*, Vol 18, Pt 2 (2003)
- <sup>9</sup> An Address to the Workmen in the Pottery: On the Subject of Entering the service of Foreign Manufacturers (Newcastle, Staffordshire, 1783)
- <sup>10</sup> In late 1771 Benjamin Franklin wrote from London thanking his wife for some sauceboats and expressing pleasure at the progress made by the Bonnin and Morris manufactory
- <sup>11</sup> Gray, Jonathan, 'American Porcelain in 1764 English newspapers – a reassessment', *ECC Transactions*, Vol 22 (2011)
- <sup>12</sup> Panes, Nicholas, 'Mr Ball the English Potter and the American China Manufactory', *ECC Transactions*, Vol 20, Pt 3 (2009)
- <sup>13</sup> Owen, J V, 'Geochemical and mineralogical distinctions between Bonnin and Morris (Philadelphia, 1770-1772) porcelain and some contemporary British phosphatic wares'. *Geoarchaeology: An International Journal*, No. 16, 2001, pp 785-802
- <sup>14</sup> Owen, J V, and Hunter, R, 'Too little, too late: the geochemistry of a 1773 Philadelphia openwork porcelain basket', *Journal of Archaeological Science* 36, 2009, pp 333-342
- <sup>15</sup> Owen, J V, Meek, A, and Hoffman, W. 'Geochemistry of sauceboats excavated from Independence National Historical Park (Philadelphia): evidence for a Bonnin and Morris (c 1770-1773) provenance and implications for the development of nascent American porcelain wares', *Journal of Archaeological Science* 38, 2011, pp 2340-2351
- <sup>16</sup> Ramsay, W R H and Ramsey, Elizabeth G, 'A Classification of Bow porcelain from First Patent to Closure', *Proceedings and Transactions of the Royal Society of Victoria* 119 (1) (Melbourne: Royal Society of Victoria, 2007)
- <sup>17</sup> Owen, J V, 2001, op. cit.
- <sup>18</sup> Owen, J V and Hunter, R, 2009, op. cit.
- <sup>19</sup> Owen, J V et al (2011), op. cit., 38, pp 2340-2351.