Did Benjamin Franklin invent transferware?

by WENDY W. ERICH

ON 3RD NOVEMBER 1773 Benjamin Franklin (1706–90) wrote a letter to Peter Perez Burdett, a young engraver then based in Liverpool, thanking him for sending his recently produced specimen of transfer-printed chinaware (see Appendix below). Following words of appreciation and encouragement for the china, the elder statesman then makes an astonishing claim that he himself had pursued his idea for transferring pictures to pottery more than twenty years earlier, only to be laughed at by the English pottery trade. The invention of transferware pottery has been subject to academic dispute, but credit was ultimately bestowed on John Brooks as the creator and John Sadler, of Sadler & Green, Liverpool, as the developer of the transfer-printed style that revolutionised the surface decoration of ceramics for the following two hundred years. However, the importance to ceramic history of this 1773 letter written by Franklin has been overlooked.

By 1773 Franklin was sixty-seven years old and a well-respected figure in worldwide political and scientific realms. His image appeared ubiquitously in periodicals, on trinkets and on home furnishings, including popular exported items such as the transfer-printed creamware bowl celebrating America’s heroes (Fig.20). Serving in London as a diplomat, Franklin wrote this letter to Burdett from Craven Street, near Charing Cross, today his only extant London residence (and currently a museum). The letter is addressed to the thirty-nine-year-old Peter Perez Burdett, a cartographer and engraver who had established himself creating topographical surveys of Derbyshire and Cheshire, and by recent work on newly built English canals. Burdett was an occasional model for and close friend of Joseph Wright of Derby, who in 1765 painted a celebrated double-portrait of Burdett, survey instruments in hand, with his first wife, Hannah (Fig.21). Wright encouraged Burdett to form the Society for Artists in Liverpool in 1769, and Burdett confidently elected himself its first President. Described as ‘awkward, self-opinionated, and unpleasant’, Burdett also claimed to have invented aquatinting, a new technique for producing tonal areas on print-ed engravings by use of a resist compound on a chemically washed copperplate, rather than the usual methods of cross-hatch or stipple with an engraver’s burin. In fact, he had not invented it at all, as it was being done in France at least a year earlier, and samples from Holland had existed for decades.

A year before Burdett and Franklin corresponded, Burdett had been vying unsuccessfully for Josiah Wedgwood to approve his new aquatinted designs for transfer-printing onto creamware, but Wedgwood was reluctant. Burdett had given Wedgwood a few engravings: a landscape, dead game and a third with shells and seaweed, but the great potter did not want to confuse his customers who may not have known how to ‘draw the line betwixt printing and painting, and may take it into their heads that we apply the former to everything’. Wedgwood delayed payment for the designs, and their relationship soured. The following year, just six months after receiving Franklin’s letter, the disgruntled Burdett left England permanently to work for the royal court in Karlsruhe, Germany.

Franklin had had numerous opportunities to start a friendship with Burdett, among them during Franklin’s 1771 tour of the manufactories of Derbyshire, during Franklin’s visits to the Lunar Society meetings in his ancestral city of Birmingham, via their mutual active memberships of the Freemasons, or as a result of the former printer and publisher’s long-standing interest in the art of engraving.

The letter opens with Franklin expressing his thanks and praise for some chinaware Burdett had sent him, coupled with hopes for the profitability of Burdett’s invention. Although this gift has never been identified, the closing paragraph of Franklin’s letter tells Burdett that he sent one of the samples ‘containing a number of Sprigs’ to the great naturalist Sir Joseph Banks, who was at the time preparing to publish a folio of botanical specimens from the discoveries made on the journey of the Endeavour. Whether the samples sent to Banks were engravings on paper or ‘that on
China’ is not known, but Franklin’s description of Burdett’s work refers to its visual appearance as botanical. Franklin greatly admired ceramics, and in 1758 sent his wife in Philadelphia ‘something from all the China Works in England’ inviting her to inspect ‘the Difference of Workmanship’. He also acquired a large china dinner service for his Craven Street home, as he was ‘obliged sometimes to entertain polite Company’. Today, few ceramics with a Franklin provenance have survived, and none with transfer-printed botanical motifs that might be identified as Burdett’s: most of Franklin’s household goods were sold by his daughter after his death.

Franklin’s written tone changes subtly when he wishes to clarify a matter to Burdett, one that seems to have troubled the diplomat for some time. Franklin is reluctant to contest the Honor of the person ‘who pretends’ to have invented the transfer-printed process by which Burdett’s designs appear on the china ware, yet he asserts that ‘I have reason to apprehend I might have given the Hint on which that improvement was made’. Franklin professes ignorance regarding the inventor of transferware, today credited to John Sadler. Yet if Franklin was ever compelled to vindicate himself, he had found his golden opportunity: at the time of this letter, Burdett was an engraver in John Sadler’s employ. By pointedly stating that the ‘Hint’ for the invention was his own, Franklin desires to set the historical record straight.

John Sadler was not a potter by trade, but, like Franklin, a publisher and printer of newspapers. It is probable that Franklin knew of Sadler, for Franklin was in Liverpool just two years after Sadler’s initial production of transfer-printed tiles. Franklin had shown great interest in the British manufactories on his original 1758 tour, and it was from this excursion that he sent home the various china samples to his wife. Sadler conducted his tile printing on material bought ‘in the white’ from various manufactories, such as Wedgwood. On 27th July 1756, he claimed he had miraculously printed ‘without the aid or assistance of any other persons’, twelve hundred earthenware tiles in six hours, printing them ‘neater than one hundred skilful pot painters could have painted in the like space of time’, with a new invention that he had been trying to perfect for seven years. Other than Sadler, John Brooks is the inventor given credit by historians for the creation of transfer-printing, although not on ceramics. Brooks was an Irish engraver who began working in the York factory in Battersea in 1753, producing the first enamelled boxes transfer-printed with copperplate engravings. His partners were Stephen Theodore Janssen and a Mr Delamin at the York House factory, and Brooks had registered a patent to transfer-print in Birmingham in 1751. However, Sadler’s affidavit of 1756 stated he had been ‘upwards of seven years in finding out the method of printing tiles, and in making trials and experiments for that purpose, which they have now, through great pains and expense, brought to perfection’, placing Sadler’s starting point for experimentation in 1749, a full two years earlier than Brooks’s 1751 patent application. The ceramic historian Hilary Young suggests that in the competitive environment that was standard within the industry, Sadler may have intentionally dated this ‘seven year’ period of experimentation to predate John Brooks’s claim.

If Sadler’s claims and dates were to be juxtaposed with Franklin’s recollection of events, one could establish a possible timeline for the fruition of the idea to transfer-print on ceramics. Franklin provides his information when he explains to Burdett that it had been ‘more than twenty years since’ he had communicated his original transfer-printing idea to his friend Dr Mitchell from America.

Peering back twenty years into Franklin’s and Mitchell’s lives shows certain events that give verifiable credence to Franklin’s claim. By 1748 Franklin’s long and lucrative career as America’s most successful printer had ended and he sold the business to his partner. Civic minded and creative, Franklin had by then carried out plans for a first library, a first fire company and a new university, and had invented such diverse and useful items as the odometer, swimming fins and the now famous Franklin stove. At the age of forty-two, he took early retirement to pursue his burgeoning interest in electricity, after first receiving a glass Leyden jar from English botanist Peter Collinson. This interest consumed him. In March 1747 Franklin wrote that he ‘never was before engaged in any study that so totally engrossed my attention and my time as this has lately done; for what with making experiments when I can be alone, and repeating them to my Friends and Acquaintance, who, from the novelty of the thing, come continually in crowds [sic] to see them, I have, during some months past, had little leisure for any thing else’. The time before and after his electrical experimentation proved to be the turning point in Franklin’s life, a clear demarcation for him to recall events ‘twenty years since’.

over-impressed by aquatinting, and preferred the folio engravings from the *Endeavour* travels to be done by ‘traditional black line method’; see www.nhm.ac.uk/ourwork/nature-online/endavour-botanical/about3.dsm.
8 B. Franklin to Deborah Franklin, 19th February 1758; POBF.
9 Ibid.
10 Ibid.
13 Ibid.
14 Ibid.
18 B. Franklin to P. Collinson, 28th March 1747; POBF.
Long before he was a recognised statesman or flew his famous kite, when Franklin was a younger man in the early 1740s (Fig.22), he had focused his passion on a different unsoluble problem of American families, that of home heating. Eighteenth-century fireplaces were inefficient, wood fuel was already declining in availability, there was constant bothersome chimney smoke within the house and a persistent danger of fire causing loss of homes and lives. By the time he was thirty-seven, Franklin had spent years searching for a solution, culminating in the invention of the ‘Pennsylvania Fireplace’ (or Franklin stove), produced in 1744 and still copied for use today.

Franklin tells Burdett that he proposed the idea for printing onto hearth tiles to ‘Dr. Mitchell from America’, not to be confused with other mid-eighteenth century John Mitchells in England, including one in Staffordshire. Franklin refers to the Virginia doctor he had first met through their mutual friend, the Philadelphia botanist John Bartram, in the autumn of 1744 when Mitchell visited Bartram for three weeks and was introduced to Franklin. The two spent three days together at Franklin’s home eagerly sharing their many philosophic and scientific interests, including a demonstration of Franklin’s new fireplace. Dr Mitchell, a dedicated botanist and map maker who later gained fame as the cartographer for the first accurate map of the American colonies, left America two years after meeting Franklin because of his fragile health. In 1746 Mitchell and his wife, Helen, moved permanently to England, and while the former’s health improved the latter’s failed, resulting in her death two years after arriving in London. Despite these personal setbacks Mitchell established himself in the Royal Society and was elected a Fellow in 1748, but the scholarly correspondence both Franklin and Mitchell enjoyed all but ceased by 1750. At that time, Mitchell’s health suffered and he no longer wrote letters, a loss Franklin greatly lamented.

Given the narrow six-year span of personal communication that existed between the two (1744–50), Mitchell played a significant role in the establishment of Franklin’s future fame. In 1749 Mitchell recommended the then unknown Franklin to Royal Society colleagues in regard to his theories on thunder-gusts, electricity and heat. The report was not well received, and Franklin later wrote in his memoirs how his ideas were ‘laughed at by the Connoisseurs’. It was not until the 1751 publication of these experiments that Franklin and his discoveries became an international sensation. By 1753 the Fellows of the Royal Society awarded Franklin the prestigious Copley Medal, further spreading his fame.

When Franklin wrote to Burdett in 1773, he clearly recalled an event that had taken place twenty years earlier and presumably before he had become a well-known figure in Britain. The scientist explained how he had described to Mitchell the detailed process for printing onto chimney tiles, the ‘manner in which I thought it might be done’, including which engraved pictures to use in transfer-printing and why, and his certainty of the demand for such a useful product.

The idea for transfer-printing onto tiles had come to him as a domestic improvement to replace what Franklin called ‘wretchedly scrawled’ Dutch delftware tiles so prevalently used in American colonial hearths. Having meticulously studied the mechanics of the inner chimney, he pondered its exterior aesthetic as well, and developed the idea that morality pictures printed on tiles and ‘constantly in the eyes of Children [. . .] might give parents an Opportunity, in explaining them, to impress moral Sentiments’. At the time of Mitchell’s introductory visit, Franklin had just become a new parent again to a third child, a daughter barely a year old, and was thus alert to the teachable moments that occur as children gathered by the hearth with their parents.

Franklin delighted in the visual teaching tool that reflected his own hardworking ethics, and often used illustrated text for his published maxims in his annual publication, Poor Richard’s Almanac. He suggested to Mitchell that they use prints from Moral Virtue, delineated, a 1726 reprint of an older emblem book (Figs.23 and 24). Moral Virtue, delineated is an extremely rare volume of morality stories with copperplate illustrations, each with an instructional description of the picture’s meaning in both French and English, reiterated with adjacent poetry to interpret the Homeric vignette. This book was enthusiastically advertised for sale on eight different occasions in Franklin’s Pennsylvania Gazette between 1748 and 1750, each one mentioning its ready availability at Franklin’s Post Office.

In the thirteenth illustration from Moral Virtue, ‘He That Lives Well Conceals Not His Actions’, the accompanying explanations inform the reader that Man should be careful not to reveal his good ideas to prying Fame, but rather demonstrate humility in them, disclosing them for the public good, without robbing Virtue of her due by the courting of a crowd. The lesson of this tale chimes with Franklin’s own stance as an inventor who never took out patents on his stove or his lightning rod: ‘That we enjoy
great Advantages from the Inventions of others, we should be glad of an Opportunity to serve others by an Invention of ours, and this we should do freely and generously. While Franklin wryly hoped that Burdett’s aquatinting prospects ‘will be (what Inventions seldom are) profitable to the Inventor’, his sardonic tone reflects past experience with unprincipled claimants. He may vicariously have been directing a comment at the man ‘who […] pretends to that of Copper-Plate Engravings for Earthen-Ware’, Burdett’s employer, John Sadler.

Franklin claimed that he gave ‘the Hint’ of how to transfer-print onto tiles, including ‘the Manner in which […] it might be done’, yet the technique he relayed to Mitchell years before is not redefined for Burdett. Was Franklin’s idea to print directly onto tiles, or is he saying that he thought of taking the impressions from printed paper but did not think of putting them ‘to other than Flat forms’? Franklin’s boxy printing press required a strong back to operate, and the force of torque onto paper left strong indentations, making fragile earthenware an unlikely recipient for a transfer-print. The logical conclusion is that he envisaged taking the impression from paper and transferring it onto a flat tile.

An apprentice printer since the age of twelve, with thirty years experience in the pressroom, the inventive Franklin understood all the physical processes of printing. Transfer-printing onto pottery bears a relationship with eighteenth-century printing techniques: both used the hand-operated printing press to make impressions on wetted paper, which were then hung up to dry. The pigments of some eighteenth-century printing inks were so sticky and deep that smudging was a common spoiler of the printed page, even years and decades after its printing. This problem of the newly printed page was undoubtedly the bane of any printer, and tissue-like interleaves of special paper separated pages as they hung to dry (Fig.25). For a frugal man with a curious mind like Franklin, perhaps this wasted interleaf was re-engineered to good use, as a transfer medium for decorating tiles. To transfer-print on pottery, inked tissue paper is pressed onto the earthenware with a stiff brush and removed with a soapy solution, leaving behind only the permanently transfer-printed ink. Eighteenth-century transferware techniques are still used at Burgess, Dorling and Leigh in Burslem, one of the last transfer-printing English potteries in operation. As both the printed page and transfer-printed chinaware use paper as the medium,
BENJAMIN FRANKLIN AND TRANSFERWARE

Franklin may well have recognised the advantage of an easy application to the flat surface of tile, but never went beyond his ‘first idea’ and his focus on the fireplace.

Franklin recalled to Burdett the comment he had made to Mitchell regarding the ‘great Demand for them if executed’. After John Sadler transfer-printed onto tiles in 1756, the innovation became an instant success. Owing to the large number of tiles Sadler was able to produce quite effortlessly, he was soon undercutting the labour-intensive Dutch tile painters by half, and Sadler’s biggest struggle was keeping enough stock of blank tiles on which to print. When the quality was considered too inferior for the English market, the printed tiles were shipped to less demanding clients in the Colonies on the next sailing vessel by 5.5 cm. (Benjamin Franklin Collection, Rare Books, Library of Congress, Washington DC).

The Jeremiah Lee Mansion is currently a museum operated by the Marblehead Museum and Historical Society. Along with original Sadler tiles, the house is also noted for its rare original eighteenth-century English hand-painted wallpaper.

As Franklin reviewed the decades-old conversation with Burdett in his own memory, he lamented the reason why his invention had never come to fruition: ‘Dr. Mitchell wrote me in answer, that he had communicated my Scheme to several of the principal Artists in the Earthen Way about London, who rejected it as impracticable’. The London potters sought out by Mitchell echoed the derisory reaction to the young Franklin by the Royal Society. Mitchell became familiar with many tradesmen shortly after his arrival in London, when he became engrossed in important research on potash. Used in glassmaking, the making of potash was a ‘mechanic Art, practiced only by the Vulgar, and neglected and overlooked by the Learned’, and Mitchell recorded a visit in 1747 to tradesmen making ‘white glass’. This documented visit was potentially one of Mitchell’s ideal opportunities to communicate Franklin’s idea to London manufacturers. John Brooks may even have been among ‘the Vulgar’ via his association with the opaque-white glass industry in London, and Brooks’s 1754 patent specifically refers to printing on ‘Enamel, Glass, China and other ware’.

Towards the end of his letter to Burdett, Franklin mentions his curiosity when he first saw someone with a small enamelled box many years afterwards, clearly transfer-printed with a copperplate design, and was curious about the technique. In vogue by the mid-1750s, the tiny domed patch boxes had printed designs on their lids created by a gelatinous substance used for the transfer medium that would accommodate nearly any shape. Called glue bats, this transfer-printing process was ‘beyond [Franklin’s] first idea’, and strengthens the case that Franklin’s invention, presented to potters by Mitchell, was to transfer-print only flat paper onto flat tiles. Finally, Franklin concludes his letter with one or two other passing remarks of interest: he has sadly heard that the China Works in his hometown of Philadelphia were closing, and ends the letter with the offer to forward Burdett’s aquatinted specimens to Sir Joseph Banks for potential use in Banks’s new folio.

And so a last question arises: where is the earlier correspondence between Franklin and Mitchell that would prove Franklin’s claim? According to J.A. Leo Lemay, the biographer of Franklin, none exists. Perhaps the letter was never copied before being sent, as was the contemporary practice; additionally, Franklin stated in his autobiography that he lost many of his papers during the War of Independence; and there is the possibility that Franklin’s idea was communicated in person when he and Mitchell met in 1744, rather than by letter. But there is one very possible explanation for this lost earlier letter. In their biography of Mitchell, the Berkeleys relate the story of Mitchell’s departure from America in May 1746. As he and his wife, Helen, crossed the Atlantic, their ship was seized and robbed by pirates.

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decoration of pottery. Nevertheless, this analysis of Franklin’s invention that became a revolution in the surface same as the production of transferware, and John Sadler and John Brooks deserve due credit for the pursuit and implementation of the invention that became a revolution in the surface decoration of pottery. Nevertheless, this analysis of Franklin’s aboard the Tiger, commanded by a Captain Pallier of St Malo: ‘With horror, Mitchell saw his years of study represented in his notes disappear along with all of his herbarium specimens and all of the parcels’. If Franklin’s letter was then among Mitchell’s papers, the pirates’ actions assured it would not be recovered and Mitchell arrived in England with nothing to show the English potters.

The idea for transfer-printing onto ceramic material is not the same as the production of transferware, and John Sadler and John Brooks deserve due credit for the pursuit and implementation of the invention that became a revolution in the surface decoration of pottery. Nevertheless, this analysis of Franklin’s overlooked 1773 letter shows the writer’s clear declaration of ownership for the original idea to decorate tiles by transfer-printing. It is not known how long Franklin’s invention brewed in his mind before he described it to Mitchell, but at some point between the years 1744 and 1750 it was relayed in full to the Virginia doctor. When Mitchell responded with the chorus of negative responses regarding the idea’s impossibility, it was simply because it had never before been done. Nonetheless there were those who may have listened to the carefully conceived idea, believing that transferring prints to pottery was an invention worth pursuing and, by the middle of the next decade, were producing English transferware.

Appendix


Nov 3, 1773
Sir,
I was much pleased with the Specimens you so kindly sent me, of your new Art of Engraving. That on the China is admirable. No one would suppose it any thing but Painting. I hope you meet with all the Encouragement you merit, and the Invention will be, (what Inventions seldom are) profitable to the Inventor.

I know not who (now we speak of Inventions) pretends to that of Copper-Plate Engravings for Earthen-Ware, and am not disposed to contest the Honor of it with any body, as the Improvement in taking Impressions not directly from the Plate but from printed Paper, applicable by that means to other than flat Forms, is far beyond my first Idea. But I have reason to apprehend I might have given the Hint on which that Improvement was made. For more than twenty years since, I wrote to Dr. Mitchell from America, proposing to him the printing of square Tiles for ornam enting chimneys and advising the Borrowing from the Bookseller, the Plate that had been used in a thin


27. Delaware Bible hearth tiles at Stenton, Philadelphia PA. c.1730. (Courtesy of the National Society of the Colonial Dames of America in the Commonwealth of Pennsylvania).