REVISITING THE ORIGINS OF COADE STONE

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Eleanor Coade's fired artificial stone was widely used in the embellishment of architecture, and also achieved unique reputation in the reproduction, and indeed creation, of sculpture in the late Georgian period. Coade stone's fame persists, but so too do certain myths about its composition and origins. This paper provides a distillation of current knowledge on Coade's predecessors in the manufacture of artificial stone from 1720; on the Coade stone formula, and on the Coade manufactory in Lambeth. It also sets Mrs Coade within her contemporary context and identifies the key reasons for her enduring success

The existence and ubiquitous use of Eleanor[1] Coade's eponymous artificial stone is widely known. Coade stone is a fired ceramic, a combination of raw ball clay and finely ground pre-fired terracotta, silicates and glass. The firing process sets it apart from cast cements, also widely but less durably used for architectural embellishment and sculptural reproduction, but which relied on chemical reaction with the air to harden rather than on firing in a kiln. The Coade process was more skilled and more labour intensive than the casting method, and produced results that were at once highly durable, weatherproof and aesthetically convincing. The material was produced in Lambeth under Eleanor Coade's management from 1769 until (broadly speaking) her death in 1821, the manufactory then limping on until the mid-1830s.

Alison Kelly's self-published work, *Coade Stone* (1990), remains the most authoritative treatment of the subject, a near comprehensive gazetteer of surviving and lost examples. Buried within it are references to most extant Coade examples and documentary sources. However, Kelly's material does not lightly yield its nuggets to the reader and provides little on Coade's contemporary context. Even if dispelled by Kelly, misapprehensions about Coade stone continue to circulate widely – that it was a single secret recipe that died with Coade herself; that she invented it; that it was a cast, rather than ceramic stone. Kelly initiated scientific analysis of Coade stone's composition as early as 1985, but the publication of these results was obscure to the general researcher.

The published eighteenth-century sources about artificial stone and the practitioners that preceded Coade are relatively little known or published. This paper therefore seeks to dispel the myths about Coade stone; to provide a concise compilation of current knowledge about it, and to position Coade more precisely within her contemporary context and contributing influences. It is the result of a comprehensive survey of the field in the course of researching the history of Belmont, Lyme Regis, owned by Coade from 1784 until 1821, and a showcase for every kind of her wares.[2]

The development of a successful artificial stone formulation was in many ways the arcanum of architecture in eighteenth-century Britain. Indeed, both the search for such a material and its actual

composition have parallels with the alchemical search of Johann Friedrich Böttger for the secrets of how to produce porcelain in Saxony earlier in the century: the endless trials, the secrecy of production, the rivalry and the discrediting of rivals.[3] That an unmarried female entrepreneur should head up a near monopoly in such a ubiquitous field is a unique achievement indeed. As Roger White, then Secretary of the Georgian Group put it in his foreword to Kelly's book, Coade stone:

> 'may not have revolutionised the architecture of the late Georgian period in any structural sense, but its aesthetic contribution was much more considerable than is generally realised; paradoxically, indeed, its popularity amongst architects and clients was in direct proportion to its subsequent anonymity, since its success in imitating the real thing was the reason both for its widespread use and for the fact that modern writers have tended to ignore its existence…. Coade stone made it possible for architects of the greatness of Soane and Wyatt to exploit, develop and deploy the infinite variety of the classical vocabulary of ornament in a way that reliance on natural stone would have rendered impractical.'[4]

Yet even in 1990, White referred to the stone as 'patented by Mrs Eleanor Coade.' It is to dispel such persistent myths that this paper is in part directed.

MISTRESS ELEANOR COADE

Eleanor Coade, eldest daughter of George Coade and Eleanor Enchmarch, was born in Lyme Regis on 3 June 1733, and was baptised at the Presbyterian Bow Meeting House in Exeter on 24 June.[5] A sister, Elizabeth, followed in 1735. The Coades and Enchmarches were large Dissenter families in the South West, active in the wool trade. George Coade was a hot presser, or finisher, of wool cloth and Eleanor grew up among the Baptists of Exeter. The family also retained close links with Lyme Regis, and in 1784, George's brother Samuel would transfer the lease of his villa, Belmont, at the top of Cobb Road to his niece. Samuel was also involved in the wool trade, as a fuller, a process that uses clay. Eleanor would thus have been exposed to the sources and uses of the clay deposits of the southwest peninsula from an early age.

By 1750 the Exeter wool trade was in decline, and in April 1759 notification of George Coade's bankruptcy appeared in the *Gentleman's Magazine*. He reappeared in London in 1762, when he was elected, for one year only, a Fellow of the Society for the Encouragement of Arts and Sciences, while living at Charterhouse Square.[6] It can be reasonably inferred that his wife and two daughters, then in their mid to late twenties, came with him to London, for by 1766 Eleanor was describing herself as a linen draper. She insured stock worth £200 with the Sun Assurance Company while living in Charles Square and storing her stock in nearby Shoreditch.[7] By 1767, her stock value had risen to £750: 'Wearing Apparel and Plate in her Apartments in the Dwelling house' at No.21 Little St Thomas Apostle Street in the heart of the City.[8] She was now living with her sister Elizabeth, and clearly insuring and operating independently of her father. Trading as a linen draper was not unusual for women who were in business in Georgian London, linen fripperies and clothing being an acceptable trade for women to engage in and sell to each other.

1769 was another *annus horribilis* for George Coade. He went bankrupt for a second time and his Exeter property (which he seems to have regained) was sold once again. He died in the same year, and can have left little or nothing to his wife Eleanor or his daughters. Yet in 1769, the two Eleanor Coades, mother and daughter, went into business with one Daniel Pincot who ran a struggling artificial stone manufactory at King's Arms Stairs, Narrow Walk in Lambeth.[9] Perhaps the Coade women were bankrolled by the extended family network: certainly, Samuel Coade forgave the younger Eleanor her debts to him in his 1808 will. The Coade mythology had begun.

One of the enduring confusions of the Coade stone story was whether it was Eleanor Coade junior or her mother who was the driving force behind the success of the Lambeth manufactory. The Coades were a long lived family: Widow Coade, probably aged about 60 in 1769, did not die until 1796. However, Alison Kelly demonstrated convincingly that it was Miss Coade, 36 by 1769, who was the prime mover at the Coade manufactory from very early on. As early as 1771, receipts were being made out to her. 'Miss Eleanor Coade, sculptor' exhibited annually at the Society of Artists from 1773 to 1778, and again in 1780, although whether these were works modelled by herself or produced in her name is still unclear – the documentary evidence implies the latter. Eleanor Coade senior is not evident in the surviving manufactory records after 1773, and it therefore seems certain that Eleanor junior earned her respect title of 'Mistress' or Mrs very early in the manufactory's life.

THE SEARCH FOR ARTIFICIAL STONE

It is a mistake to imagine that the appearance of artificial stone coincided miraculously with the Coades' arrival at the Lambeth manufactory. Men had been searching for an effective artificial stone since at least the early eighteenth century, and Coade was by no means the first to try to meet this demand. The researches of the Royal Society towards a history of trades in the 1670s and 80s include references to fine cements counterfeiting marble in the repair of statues and to the creation of original works from casts.[10] A terrier for The Hopes in Lambeth, the holding where Coade's manufactory stood from 1769, provides a further early reference to the manufacture of artificial marble. This eyewitness walk through the streets of Lambeth, undated but before 1720, cited tenants who included 'Robinson Esq who makes artificial marbles' and who sublet from a glass grinder.[11] The significance of a glass grinder will become apparent.

Then, in 1722, Richard Holt took out a patent with the carpenter-turned-architect Thomas Ripley for:

> 'A certain Compound Liquid Metal never before known and used by the Ancients or Moderns, by which Artificial Stone and Marble is made by casting or running the metall into Moulds of any Form or Figure ... which being petrified or vetrified [sic] and finished by Strong Fire, becomes more durable and harder than Stone and Marble ...'[12]

Crucially, this formula is thus known to be fired in a kiln.[13] In 1730, Holt published *A Short Treatise of Artificial Stone,* dedicated to the Earl of Burlington 'From the Artificial Stone-Ware-House, over-against York Buildings Stairs, and near Cuper's Bridge.' This is just down-river from the future Pincot/Coade manufactory, pinpointing it in relation to still familiar landmarks: on the north bank of the Thames the Duke of Buckingham's monumental stone Water Gate, commissioned in 1626; and on the south bank the long landing stage, or bridge, to the popular pleasure grounds known as Cuper's Gardens, which centred on the north end of today's Waterloo Road.[14]

It seems no coincidence that Holt describes his material as 'liquid metal,' evoking the red hot temperatures required of kiln firing. His *Short Treatise* invokes the seventeenth-century alchemists, and Trismegistus and other ancient sages, archaically it may seem, until one remembers that even in the 1720s, Böttger still combined his search for perfect porcelain with his quest to turn base metal into gold.

Holt claimed he had researched a lost formula of the ancients, having 'been' to Asia, 'African Turkey', Turkey and Egypt, although his claim that both the pyramids and the sphinx were created of such an artificial stone suggests he went there in imagination only. He claimed that his new invention resisted fire and weather, and was stronger than iron, impervious to chisel and mallet.[15] His *Treatise* tells us a lot about the challenges of the manufacturing process: he knew workmen sometimes passed off a broken piece by mending it or correcting flaws with putty, and wrote that he was:

> 'ready to detect and lay open this great Fraud, as becomes an honest Man; and for my own part, am resolv'd, if possible, to prevail with such Gentlemen, as favour me with their Commissions, to be present, as well as myself, at the Drawing of the Kilns; that they may see their Goods in puris Naturabilis, as they come out of the Fire.'[16]

He also touched upon the skill of the kiln fireman: by varying the quantity of 'dry substance' used to bind the clay 'I can raise all my Goods to what Pitch, to what Excess of Strength I please to bestow upon them.'[17]

Holt, presumably through his partnership with Thomas Ripley, appears too to have made a significant innovation in the application of his formulation, in proposing to use it for applied architectural ornament. Apparently for the first time, his proposition took a fired ceramic stone beyond the applied mouldings on stoneware vessels and the tentative salt-glazed busts and figurines produced by John Dwight's Fulham pottery from the 1670s.[18] The eventual Coade formula was closely related to stoneware in its inclusion of silicates and ground glass.

Holt's *Short Treatise* informs us that:

> 'a good round Catalogue of these [applications] has already been published for me…and runs as follows, viz. Columns, Pedestals, Entablatures, Cornices, Pediments, Ballustrades, Statues, Rusticks, Fascias, Coppings of Walls and Chimneys, Chimney-pieces, Hearth-Stones, Architraves, Frontispieces of Doors, Windows, Alcoves and Grotto's, Cascades, Obelisques, Arches, Piazza's, Key-Stones, Steps, Pavements, Urns, balls…Tomb-stones, Monuments, Sun-Dials, Crests for Doors, gates and Gateways, Statuary of all Sorts, Pipes of all Bores and Sizes…the prices are fix'd as near as I can, to about one Third part of the Price of Stone, and one Half of the Price of Lead.'[19]

It is an ambitious list and, if all were indeed produced by Holt's manufactory, was matched only by Coade fifty years later.

Holt, however, had a competitor. He reported that in August 1729, 'a certain pretending Architect, a Meddling, busy Man' had tried to steal his formula, by going to the manufactory and talking to the workmen, 'Decoy'd into Publick-Houses, that being Drunk, they might be more easily sifted and imposed upon.'[20] This was none other than Batty Langley, disparagingly described in this context by a contemporary as 'a bold face adventurer', who established a competing manufactory in Southwark.[21] The two manufacturers placed rival advertisements in the *Daily Advertiser* throughout May, June and July 1731, but Holt has the better claim to be the originator of the formula.[22] His *Short Treatise* manages to be both brief and rambling, and is certainly obfuscating. There is nothing here that would have enabled any rival to replicate his process or formula. For a better understanding of this, we must turn to a much more secret chance survival.

On 3 March 1731/2 John Mowbray and William Bridgeman jointly set down a solemn affidavit, whose contents they undertook 'by the most binding Oath … never to divulge, communicate or make known … without the Privity, Consent & mutual Advantage of us … our Heir Executors or Assigns.'[23] This document is 'Mr Holt's secret' and is the earliest known reference to the inclusion of ground glass in the dry material to be combined with clay that is then fired to produce artificial stone.[24] Six parts of finely ground glass to one of finely ground lead ore are to be mixed with an equal quantity of clay. Such a combination 'in a strong fire run's into a most Compact solid Mass and brings it to a Vitrification, and thereby tyes its particles fast, and shoot's off all wett or succion by rending it extremely hard and impenetrable.'[25]

The affidavit goes on to describe in detail the manufacturing process: 'cakes' no more than a quarter of an inch thick are used to take the impression from a mould and then laid as the outer surface of coarser filling eight to ten times as thick; the pieces are then assembled and retouched by skilled craftsmen, and the kiln-fired result is to be finished just as skilfully. This document shows that Holt had captured the essential characteristics of

the Coade process: all the key ingredients were there, with a good understanding of the scientific principles. What changed was that the Coade formulation omitted the lead ore, and was both sufficiently robust and malleable for the casts from the moulds to be taken in a single, thicker sheet of the same material.

Otherwise, all this fairly accurately describes Mrs Coade's eventual enterprise – the difference being that neither Holt's name (nor Mowbray's, nor Bridgeman's nor Langley's in this context), nor examples of his wares are known today, nor were they widely adopted by contemporary architects.

The timing of Holt's professional demise suggests he was perhaps an early victim of the building slump in London during the 1730s and 40s. His business disappeared after August 1732, and the final sale notice has an air of desperation: Holt's goods were 'To be sold at a very cheap Rate, for ready Money.'[26] There is then a long gap of thirty five years without any activity from artificial stone projectors in the *Daily Advertiser*. Of course, this does not in itself prove that artificial stone manufacture in an architectural context had ceased.[27] Demand for it was increasing. As London's expansion began to gather pace again in the 1750s, commentators expressed discontent with the appearance of the new terraced streets and with this came a gap in the burgeoning market for architectural materials. In 1766, John Gwynn, one such critic of the new streets, declared that:

> 'no publick edifice should be built with brick unless it is afterwards stucco'd, for a mere brick face in such buildings always makes a mean appearance… As the building with stone is so very expensive in this metropolis, it is to be lamented that encouragement is not given to some ingenious person to find out stucco or composition more durable than the common sort, and in which exterior ornaments might be easily wrought at a very small expense.'[28]

At an artisanal level, here was part of the ingenious Mrs Coade's market opportunity, and it is significant that a commentator as informed as Gwynn considered that no one was meeting this need in the mid-1760s.

The other, much grander, opportunity was that the launch of Coade stone coincided with Robert Adam's embellishment of Palladian prototypes with graceful and delicate classical ornamentation, to an extent completely impractical in natural stone. In Summerson's characteristically pithy summing up:

> 'The feeling for the externals of architecture changed, after the arrival of Adam, from the grimness of a mask to the delicacy of a feminine 'make-up'. Stucco and Coade stone have a slightly cosmetic character; they suggest, faintly and agreeably, the artificiality of powder and rouge.'[29]

The Adam brothers' exploitation of applied decoration on their buildings was, however, dependent upon finding a successful formula in which to execute it, and to this end they were open to experimentation with novel materials, not always successfully. From 1774, they formed a partnership with the Swiss clergyman John Liardet, who the previous year had patented a stucco 'Composition or Cement for all Branches concerning Buildings.' This 'cement' was as much for render as for cast (not fired) 'medallions, moulds [and] mouldings', and in July 1774, for example, it was used by Adam to provide 'a gay front' to No. 11 St James's Square. However, the formulation proved prone to failure when used as an external render, like John Johnson's and David Wark's similar compositions before Liardet's, and the latter's relationship with the Adams can be read mainly through the litigation brought against the firm by disappointed clients.[30] Such litigation also demonstrated the difficulty of defending such a generic patent, something perhaps noted by those at Coade's manufactory across the river from the Adelphi, in the basement of which Liardet mixed his stucco.

Earlier plasterers like Johnson, Wark and Liardet all made claims for their stucco compositions across all the applications of plaster both internally and

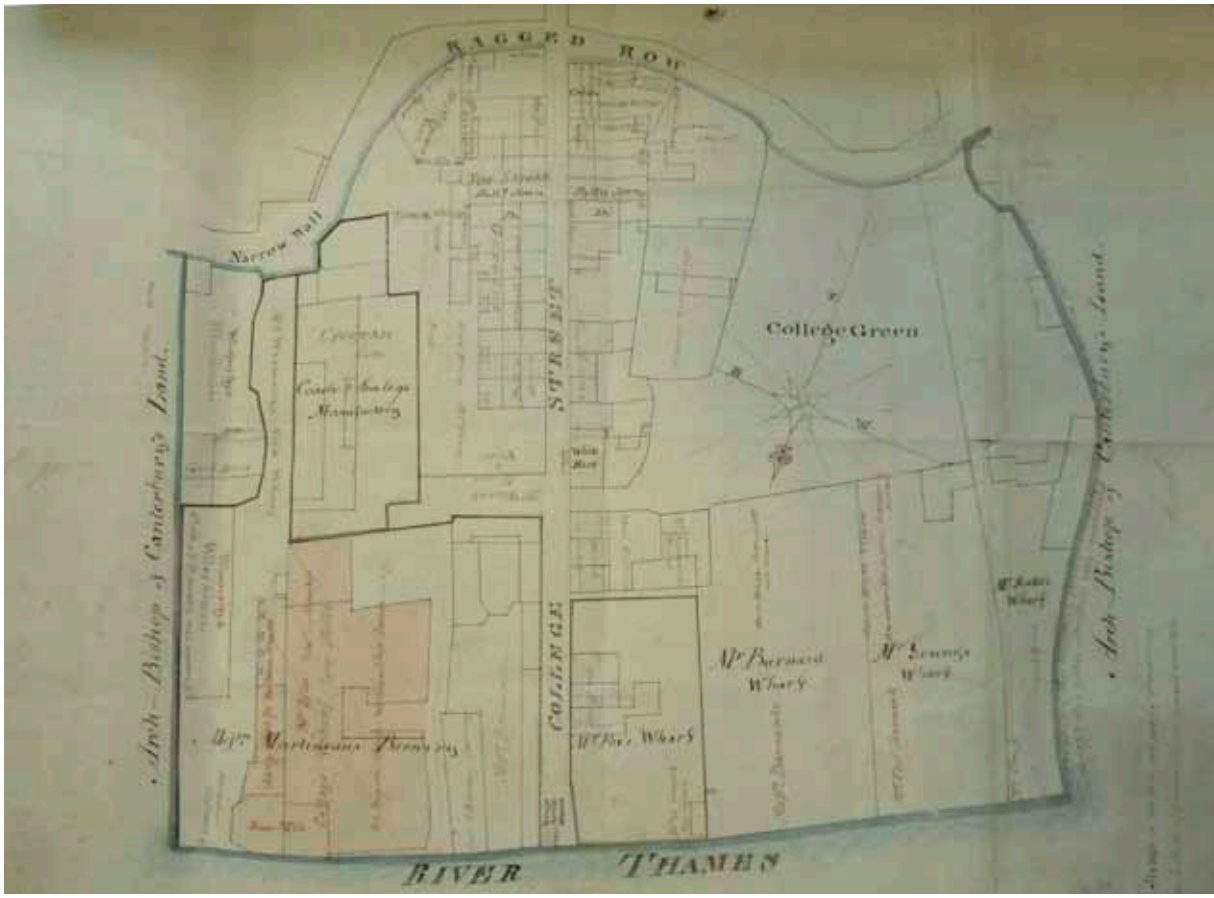

Fig. 1. A map of The Hopes done in 1804 (and further annotated after a fire in 1828). Coade & Sealey's Manufactory is left of centre. King's Arms Stairs are at the river end of College Street (*Jesus College, Oxford, SU.2/18*)

externally. Certainly, the firing process effectively ruled out using Coade stone as a render, and the manufactory made only occasional forays into more structural use, even if, in the cases of the fan vaulting on the organ screen in St George's Chapel, Windsor for Henry Emlyn[31] and the umbrello at Great Saxham Hall in Suffolk,[32] such essays were successful. Yet at a time when architectural materials were becoming more specialised, the Coade manufactory was perhaps also astute in single-mindedly limiting the application of their stone to embellishment and statuary rather than surfaces, setting it apart from its stucco rivals.

At this higher end of the market, Coade stone was able to meet the demand for a ready supply of wares of the highest, and consistent, quality, durability and dimension that architects could plan into their designs from the start, especially for exteriors. Unlike earlier decorative plasterwork, the runs and objects could be prepared off site and in

advance, minimising delays and hitches once on site, and reducing manpower. It also meant such refined decoration could be easily shipped intact overseas, without requiring skilled manpower or prolonged storage of curing lime or equipment.[33]

Advertisements placed in the *Daily Advertiser* in the 1760s and 70s reveal the other manufacturers of architectural embellishment in business in London in these years, one at least of whom was specifically working in a fired ceramic artificial stone. From January 1767, Daniel Pincot was trading from in Goulston Square, Whitechapel, producing architectural wares 'in several Compositions; some resembling Portland Stone, but much harder and much more durable, others still more beautiful, approaching nearer to marble.'[34] By October 1767, Pincot had been joined, or superseded, at Gouslton Square by George Davy; by October 1773, Davy's business had failed after successive, increasingly desperate sales of ranges of wares very similar to those that Coade would produce, and with claims of superiority to natural stone similar to those that Coade would make. Meanwhile, in August 1769 appeared the first advertisement of Daniel Pincot, trading 'at the Manufactory, King's Arms Stairs, Narrow Wall, Lambeth, opposite Whitehall Stairs.'[35] This became the Coade manufactory.

COADE'S ARTIFICIAL STONE MANUFACTORY

Lambeth in the eighteenth century still had a village character, a marshy area where small businesses and pleasure gardens clustered along the south bank of the Thames, almost opposite the Palace of Westminster. Since the Middle Ages, terracotta, glass and, latterly, stoneware and soft paste porcelain makers had been active there, generating a collective knowledge of such techniques, all dependent upon the refining influence of fire.

The manufactory site lay a couple of hundred yards back from the river frontage on a winding street called Narrow Wall, an extension of Ragged Row (Fig. 1). It was part of a seven-acre holding called The Hopes, owned since 1685 by Jesus College, Oxford, which signalled its ownership by building an incongruously straight cut through it (College Street), leading from King's Arms Stairs to Ragged Row and thence to the manufactory – ideal for customers arriving by river. The manufactory also had a 'trade' entrance on its eastern boundary for the shipment of raw materials and finished wares via 'Mr Warmsleys Slate Wharf' (Figs. 2 & 3). Immediately between the Coade manufactory and the river stood the Martineaux brothers' brewery.[36] In the 1760s, the whole of The Hopes was sublet to a Mr Biggins, who in turn leased it on to individual tenants, including, by 1769, Daniel Pincot.[37]

Until 1750, the Thames had been spanned only by the antiquated London Bridge, but from 1750, when Westminster Bridge opened, Lambeth became ever more accessible, and therefore more desirable as a place in which to trade. To the east, Blackfriars Bridge opened in 1769, as a retaliation by the City, opening up the whole of the South Bank, which became a hotbed of projectors. The Lambeth manufactory lay comfortably between these two new bridges.

In 1770, a year after the Coade women went into partnership with him, Pincot published *An Essay on the Origin, Nature, Uses and Properties of Artificial Stone, Clays and Burnt Earths in General.* Pincot says of his predecessor, Holt:

> 'it appears this work met with tolerable encouragement for some years till, the projector dying, the whole affair died also….It is evident from a considerable quantity of broken pieces now in my possession that there was neither taste in the designs, nor neatness in the execution, though time has proved the materials durable in the severest trials. It is covered on one side with an earthern ware, white glaze; and some of it is poorly painted with blue ornaments, baskets of flowers, &c.'[38]

Pincot's *Treatise* is more scientific in tone than Holt's, and while it gives nothing substantive away, it

Fig. 2. An 1804 view of the Coade & Sealey Manufactory, looking north from Narrow Walk. The Thames lies down the lane to the right (*London Metropolitan Archives, City of London*)

plainly sets out the criteria and challenges for good artificial stone. It:

> 'should, in the first instance, retain perfectly the form it receives from the mould; secondly, exactness in its dimensions; thirdly, it should be free from cracks, or fire flaws; fourthly is should be equally burnt, or have an even firmness throughout its whole substance; fifthly, it should have but small unconnected pores; and lastly, a bright stone colour should grace the whole.'[39]

To achieve such standards is difficult: 'the constitutions of natural clays, not only in diverse sorts but in several samples from the same pit, are so various and uncertain that no standing recipe can be performed; every fresh parcel of clay demanding new experiments to determine the proportions.'[40] It is significant that neither Pincot nor the Coades ever sought a patent: that Coade stone was a single, patented formula is perhaps the most persistent myth. The sheer range of size in Coade wares rendered a single formulation impossible: the proprietorial secret, if there was one, lay in the consummate skills of the craftsmen who mixed the clay and the fireman who tended the kiln.

The final obstacle to the success of artificial stone identified by Pincot were the naysayers, many of them masons themselves. 'One measure they take is by deterring modellers from working for the manufactory, telling them they will be despised by the whole trade, as forwarding a work it is their

Fig. 3. The yard at the Coade manufactory, *c.*1804. John Bacon's River God features prominently; workmen are grinding the ceramic's constituents (*London Metropolitan Archives, City of London*)

interest to suppress. "O Sir! Why will you have artificial stone? Nature must certainly be better than art; it is but an imitation, and a meer makeshift" (This term has been greatly used).'[41]

Pincot's *Treatise* neatly identifies the challenges for a successful artificial stone. Yet it cannot only have been bravura that led Mrs Coade to describe the Pincot works as 'failing' when she and her mother took them over, in the introduction to her 1784 catalogue of wares. One of the strengths of the Pincot-Coade manufactory was that its wares bridged architecture and fine art reproduction, and in 1771 Pincot submitted a copy of the Borghese Vase for exhibition at the Society of Artists. It was not displayed in the main exhibition since it was not an original design but being 'desirous of giving every encouragement in their power to merit and ingenuity' and 'in consideration of its being a very fine performance,' the committee allowed it to be placed in the entrance lobby.[42]

Pincot made no reference to Mrs Coade in his pamphlet and seems to have angered her by taking certain business transactions into his own hands, including an agreement to provide Borghese vases for Stourhead and Kedleston.[43] The Coades lost little time in imposing their authority. On 11 September 1771 Mrs Coade placed advertisements stating:

> 'WHEREAS Mr Daniel Pincot has been represented as a Partner in the Manufactory which has been conducted by him; Eleanor Coade, the real Proprietor, finds it

> proper to inform the Publick that the said Mr Pincot has no Proprietry in this Affair; and no Contracts or Agreements, Purchases or Receipts, will be allowed by her unless signed or assented to by herself.'[44]

Three days later she announced that Pincot was no longer employed by her. The Coade factory continued to use some of Pincot's moulds for many years after his dismissal, including the Borghese Vase and relief plaques depicting a Phrygian Shepherd and Shepherdess and the Aldobrandini Marriage.[45] But nothing more is known of the unfortunate Mr Pincot, except his death in 1797 and burial in Bunhill Fields cemetery, which reveals that he, like the Coades, was a Dissenter.[46]

THE 'SECRETS' OF MRS COADE'S SUCCESS: THE ARTISTS

In going into initial partnership with Pincot, the Coades inherited a much more promising partner in John Bacon (Fig. 4), a young sculptor of growing renown who was already working for Pincot, regardless of the 'despising' of fellow craftsmen.

Like Coade, Bacon was a Nonconformist, a Methodist, born the son of a Southwark cloth maker in 1740 and apprenticed in 1755 as a modeller to the ill-fated porcelain maker Nicholas Crisp. The race was on to discover how to make hard paste porcelain in England from English materials in these years, to match the imports from Dresden, whose processes were closely guarded. Obsessive in his search for these secrets, Crisp, who initially traded from Bow Church Yard, also had a manufactory in Nine Elms, Lambeth.[47] His trials involved firing many samples of raw materials from the West Country, in processes not dissimilar to the eventual Coade manufactory's. But Crisp's high hopes also ended in bankruptcy in 1761 and again in 1764, and in 1767 he relocated to Devon to continue his porcelain trials in Bovey Tracey, being in touch with William Cookworthy who was pursuing his own porcelain project in Plymouth.

John Bacon's aptitude emerged as being for sculpture rather than delicate porcelain shepherds and shepherdesses, and when Crisp when bankrupt for a second time he was freed from his apprenticeship. A trade card for *c.*1764–6 records Bacon as 'Stone Carver & Modeller at Mr Pincot's in Paternoster Row, Spitalfields.'[48] This trade card is important in extending our knowledge not just of Bacon's activities, but also of Pincot's, to before his time at Davy Square. Around this time, Bacon conceived the idea of making statues in fired ceramic stone and invented 'an instrument for transferring the form of the model to marble, (technically called *getting out the points.*)'[49] In 1769, he won a gold medal at the newly founded Royal Academy and became one of its first Associates in 1770. Bacon's brooding, heavy browed figures with their naturalistic, loosely modelled but still powerful muscularity are very recognisable, and reveal an almost vernacular sculptural style, developed independently of more Classical training (Fig. 10). Bacon became one of the most prolific and well known sculptors of his generation.

By declaring her works to be under this rising sculptor's 'superintendence,' Mrs Coade raised the artistic credibility of her wares at a stroke. The continuing employment of artists of the calibre of Bacon is one of the keys to Coade stone's success throughout the manufactory's life, making it acceptable to the highest levels of society alongside the 'Bustos, Figures and Various Ornaments, Chimney Pieces, Friezes etc' that were offered 'at a Price sufficiently low to encourage any Gentleman or Builder who chuses to treat about them.'[50]

Other sculptors of independent reputation and renown who also worked for the manufactory through the years included John Flaxman, John Rossi, Thomas Banks and Joseph Panzetta. The involvement of such skilled artists and reproduction modellers made items of Coade stone no less desirable in their own right to the cognoscenti than Wedgwood's Portland Vase; indeed the direct Coade

Fig. 4. John Bacon, sculptor (1740–99). Bacon was 'superintendent' of the Coade manufactory from 1771–99 (*Memoirs of John Bacon Esq.* London, 1821).

equivalents were its reproductions of the famous Borghese and Medici urns. Coade caryatids and herms, meanwhile, brought such artistic excellence in artificial stone directly into the architectural arena for architects like Soane and Wyatt.

THE FORMULA

A second reason for Eleanor Coade's success almost certainly lay in refinement of the raw mix that she no doubt inherited in part from Pincot, who may in turn have benefited from Holt's work, all of them part of the general chatter and buzz among the ceramics projectors of London's South Bank, as they explored the potential of Britain's mineral deposits.

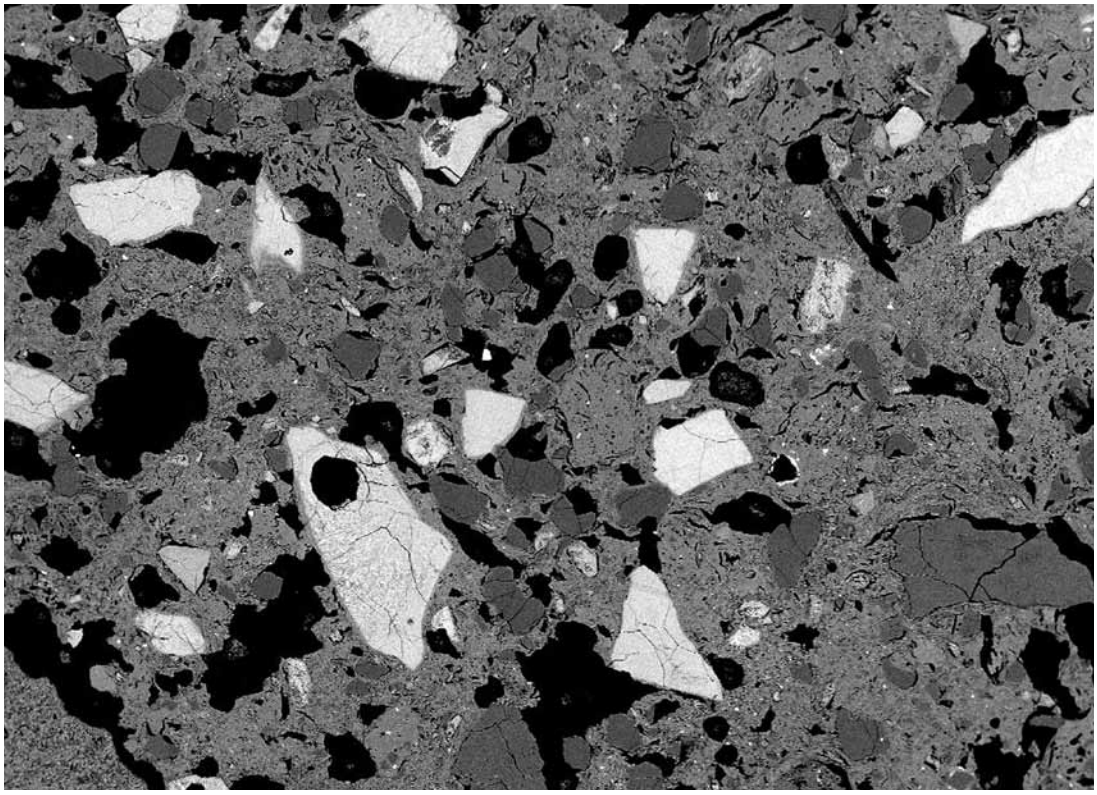

Fig. 5. Electron microscope slide of a chip of Coade stone from Belmont's gatepost. The white fragments are ground soda glass, helping to bind the stone. The angular grey fragments are flint. Particularly dense areas are grog, all bound by the raw ball clay. The black areas are tiny voids (*Photograph: © Ian Freestone*)

It is possible too that John Bacon brought more than just his modelling skill to the manufactory, having observed his master's obsessive experiments with the ingredients for porcelain, which, like Coade stone, can include ball clay, silicates, glass, and quartz. Indeed, Bacon's biographer claimed in 1821 that:

> 'It was during Mr Bacon's apprenticeship that he first formed a design of making Statues in Artificial Stone, which he afterwards perfected. By these exertions, he recovered the manufactory at Lambeth, now carried on by Mrs Coade, and which, before Mr Bacon undertook the management of it, had fallen into very low circumstances.'[51]

As we saw above in *Richard Holt's Formula* and Pincot's *Treatise*, the inclusion of pre-fired, ground 'grog' was already standard. We also know that every batch of clay brought its challenges, and that absolute reliability in long-term performance was crucial to the finished product. Earlier manufacturers of artificial stone did experience failures, some of them high profile like Adam's gateway at Syon House, over which the Coade manufactory went to the courts to disclaim responsibility.[52]

The total reliability of Coade stone does suggest that refinements to the mix were made. Coade stone was never, however, patented, nor was it a

single, 'secret' recipe. The architect David Laing summarised Coade Stone's composition accurately enough in 1818 when he wrote it was:

> 'a species of terracotta. It combines in one mass, pipe-clay, flint, sand, glass and stoneware, that has already passed the furnace. These are ground to very fine powder, and are mixed together in the proper proportions, and the whole is well kneaded together by means of the addition of water. In this state it forms a kind of paste which has the ductility of the clay usually employed in modelling.'[53]

The author and novelist John Fowles, who lived at Mrs Coade's seaside villa, Belmont, from 1969 to 2007, was in regular correspondence with Alison Kelly through the 1980s.[54] In 1985 he gave her a small chip from the Coade Stone gate-post at Belmont, which Kelly took to the British Museum. There its composition was examined under an electron microscope. Repeated in 1991 under more advanced techniques, this analysis confirmed that 'the production of Coade stone owed a good deal more to practical skills than to secret ingredients.'[55] (Fig. 5)

In essence, to the main constituent of 50–60% ball clay from the south west of England, the Coade mix incorporated around 10% grog (pre-fired stoneware, finely ground); 5–10% crushed flint; 5–10% fine quartz or sand, and 10% crushed lime soda glass, which had a higher calcium content in the eighteenth century than today's soda glass. The grind size of the grog varied according to the size of the finished piece, and this aggregate provided a matrix to strengthen and stabilise the inherently friable, single-fired raw ball clay, reducing shrinkage during firing. Its grittiness also gave a coarser texture closer to natural stone than traditional ceramic mixes.

The silicates – sand, quartz, flint – partially melted during firing, to increase strength, as did the fragments of glass. The glass also leaked alkalines which further enhanced the bonding properties. These additives collectively gave Coade stone its great durability and hardness.

The other interesting point about the composition of Coade Stone is the Lambeth context. The Coade manufactory's use of ground glass was not new, but it may be that the trials during Eleanor Coade's tenure succeeded in refining the percentages or perhaps type of glass. The soda glass component found in Coade stone is entirely consistent in its composition with the common glass used in the bottles of the day. Alongside her site in The Hopes were glass grinders and fortified wine producers whose broken bottles perhaps also provided raw materials. Just as Bacon brought relevant skills in modelling and firing porcelain from the Lambeth potters, so soda glass was a common waste product in Coade's Lambeth. It was a surprisingly symbiotic, integrated area.

Surviving records for the Coade manufactory are limited almost entirely to the day-books of William Croggan, Coade's cousin who took over the manufactory in her declining years, dating from 1813 to 1821.[56] There is more work to be done to trace the sources of the manufactory's raw materials, and the coteries that led Eleanor Coade to the Lambeth manufactory in 1769.

THE MANUFACTURING PROCESS

Having mixed the base constituents, every subsequent phase in the creation of a Coade stone object was a highly skilled and time-consuming one. First, the artist made the model in clay and this was allowed to dry somewhat. This model was created bigger than the desired end product by a carefully calculated percentage, to allow for shrinkage during firing. Then a plaster mould was made, and sheets of raw Coade mix carefully pressed into the negative volume. For very large works, the model might be cut into pieces, since the kilns were only some nine feet in diameter and the need for an even temperature throughout meant that the pieces could not be placed too close to the kiln walls.[57] All but the smallest items were created hollow, and the

Fig. 6. The frontispiece of Coade's 1784 catalogue, an adaptation of John Bacon's design for a 'card of Direction to the manufactory.' (*British Library*)

fingerprints of the eighteenth-century craftsmen, and probably women, can often be seen in pieces of broken Coade stone. Depending on size, the cast pieces might be reassembled before firing, using slip to mask the joins, and carefully re-finished. Larger, sculptural works were fired in several pieces, for subsequent reassembly.

The raw works were fired over four days in coal-fired kilns at 1100–1150 degrees centigrade – a process that required extremely careful control and skill in firing (Fig. 6).[58] The fireman was probably the most skilled workman in the manufactory, paid extra to watch the kilns overnight during firing, and was an employee closely guarded from the attentions of competitors. Even so, firing was by no means a certain process, and we can add strict quality control of the finished wares to the Coade manufactory's virtues. While in the kiln, the pieces would shrink, typically by 10–13%, at a rate that could be predicted according to the mix. No technical records survive from the manufactory during Mrs Coade's lifetime, but the trials and 'recipes' would surely have been recorded as meticulously as Josiah Wedgwood was noting his own, very similar, essays at his factory in Burslem.

Once out of the kiln and cooled, the works were again carefully finished, smoothing out any imperfections or snags in the surface. Sculptural works fired in more than one piece were reassembled using wrought iron dowels before the same careful

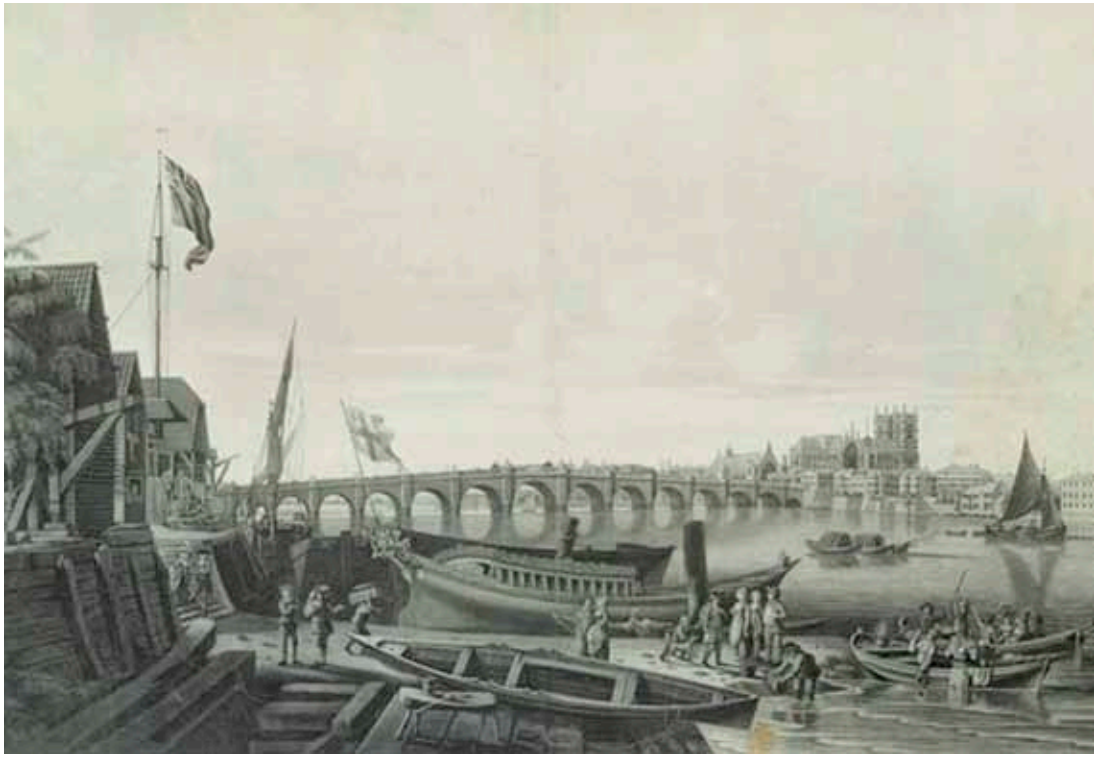

Fig. 7. View of Westminster Bridge by John Edy (1791) shows the King's Arms Stairs frontage as it was in Coade's day. Beneath the flagpole, the steps themselves are shown with a sign reading 'Artificial Stone Manufactory.' (*British Museum*)

finishing (the rusting and delamination of these iron dowels are generally the only cause of failure in Coade stone works).

From all this, it is clear that the manufacture of Coade stone wares was a highly skilled and labour intensive process. Even the architectural elements required careful finishing; there is no sense in which the work was 'mass produced' and the larger items required pre-enrolment by a number of subscribers. Bacon's instrument for taking the points no doubt came in handy when orders were placed for replicas of the very fine antique works then appearing in collections of connoisseurs.

MARKETING: 'THIS INFANT MANUFACTORY CERTAINLY DESERVES SOME DISTINGUISHING ENCOURAGEMENT.'

There is every indication in the records that Coade was a personable and forceful entrepreneur, not only adept in her own publicity but also conducting her affairs in such a way that others were inclined to add their own endorsements. John Nichols, printer to the Society of Antiquaries, singled out Coade's business uniquely for description in his *History & Antiquities of the parish of Lambeth* (1786) for 'distinguishing encouragement', and John Edy included a sign for 'Artificial Stone Manufactory' under the flagpole above King's Arms Stairs as the only trade sign in his 1791 engraving of Westminster Bridge (Fig. 7).

Mrs Coade named her stone *Lythodipyra* at first, from the Greek meaning 'twice-fired stone.' With supreme self-confidence, this was soon rebranded to the punchier 'Coade stone.' So too were many of the wares, stamped on the reverse with 'Coade' or later 'Coade & Sealy', aiding future identification as well as contemporary awareness of the Coade products. No examples of equivalent branding by Coade's fired stone predecessors are known to survive: their work, if indeed any survives, remains anonymous.

Like many of her contemporaries, Coade also published catalogue sheets, and in 1799 she opened as exhibition gallery on the south side of Westminster Bridge (Figs. 11 & 12). She placed frequent advertisements in the newspapers, and made sure that the best of the manufactory's works were exhibited at the Royal Academy. After John Bacon's death in 1799, she went into partnership with a cousin, John Sealy (sometimes given as Seely or Seeley), who seems to have reinvigorated the manufactory. Their efforts were, as we have seen, backed by a reliable product and rigorous quality control, produced at a site ideally positioned both to entice purchasers and to receive raw materials and despatch finished products along the Thames.

Fig. 8. A sheet from the Coade catalogues showing how stock faces could be customised. (*Courtesy of the Trustees of Sir John Soane*)

For all this, Coade's defining success in marketing her product lay in positioning it so that it came to be actively preferred to stone. Again remarkably, the antiquarian John Nichols quoted at length from Coade's 1784 *Catalogue*, in what may well be her own words:

> 'The property that this artificial has above a natural stone, of resisting the frost, and consequently of retaining that sharpness in which it excels every kind of stone sculpture, renders it peculiarly fit for statues in parks and gardens, also of tombs and monuments in the churchyards of this, or a severer climate. The reduction of price, which has all along been aimed at, may be found in a very great degree accomplished; for though a very considerable saving from the expense of Portland stone was one of its first recommendations, it is now become on that account, more than ever, worthy the public notice. A catalogue, which has long been desired by the nobility & others, must be peculiarly acceptable to architects in the country, who, when making elevations, will thereby be enabled to choose such ornaments as suit their purpose, and may be furnished with drawings of any articles they fix upon. Such are requested to observe that the dimensions of panels, medallions, key-stones, & co. may be somewhat varied as occasion requires, by increasing or diminishing the margin; putting in, or taking away mouldings; with many other accommodations; also, that their own designs will be executed with every advantage.'[59]

Here, the architectural promise of Coade stone was made explicit.

The 1784 catalogue contained no fewer than 788 designs. Often the pieces could be customised: a goddess's face given different headdresses, columns

Fig. 9 & 10. Coade stone keystones from Belmont, Lyme Regis. Amphritite (left) is dated 1785 and is typical of Coade catalogue wares. Execptionally for a Coade piece, its reverse inscribed 'J. Brabham fecit 1785.' Neptune (right) is a bespoke piece unique to Belmont and, while its sculptor is not known, it is typical of John Bacon's craggy browed style. (*Landmark Trust*)

and capitals mixed and matched, chimney pieces assembled by assortment (Figs. 8 & 9). The great architects of the day – the Adams, Soane, Wyatt, Wyatville and more – all found this positioning convincing, and they all incorporated Coade stone in their designs and interiors. Its fame spread and it was used from St Petersburg to the Caribbean. The Coade manufactory held the royal appointment to both George III and IV. And in 1810, a grateful nation chose the Coade manufactory to execute its memorial to Nelson in the King William Court of Greenwich Hospital: a pedimental group forty feet wide of the highest artistic quality, modelled by Joseph Panzetta after a design by Benjamin West. It is Coade stone's apogee.

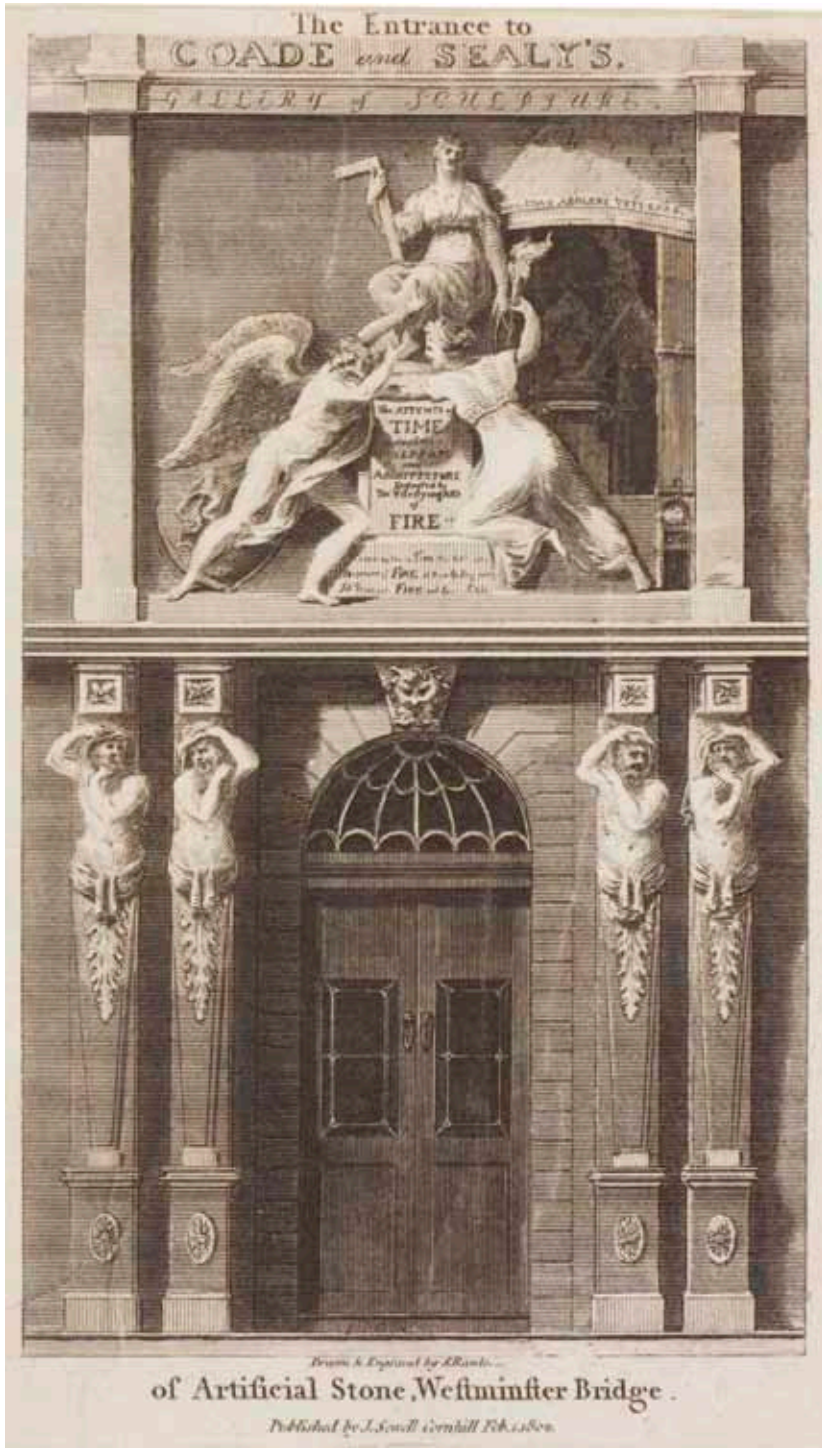

Fig. 11. Engraving of Coade & Sealy's Gallery of Sculpture which opened at the south end of Westminster Bridge in 1799. (*European Magazine, Jan-June 1809*)

Fig. 12. One of the finely modelled herms supporting the porch at Schomberg House, 80–82 Pall Mall, London. Similar figures formerly flanked the entrance to Coade & Sealy's Gallery, which stood on the corner where Pedlar's Acre/Narrow Wall met Westminster Bridge Road. The catalogue, (1799) attributes these herms to John Bacon: 'With no disparagement of others, many acknowledgements are also due to the genius and exertions of the late MR BACON, in the early years of its establishment, whose models now form a considerable part of the collection. The Frontispiece of the gallery, in particular, so happily descriptive of that work), we owe to a design of that excellent artist, which has been circulated by an engraving on cards, since the year 1787.'[60] (*Author's photo*)

CONCLUSION

The Coade manufactory outlasted its founder by less than two decades, fading into obscurity in the mid 1830s. Coade stone epitomised the late-Georgian period so entirely in scale, process and capabilities that it was perhaps always inevitable that it would not outlive it. The story of Coade and her manufactory illuminates eighteenth-century architecture and London life in a unique confluence between art and manufacture, an illustration of the permeability between life at Narrow Wall and high architecture.

John Bacon designed a 'card of direction to the Manufactory' that in 1799 was realised as a plaque above the entrance to Coade's Gallery at the end of Westminster Bridge, and widely reproduced in the firm's engravings (Fig. 6). Shown above the door of the kiln are a few words from a well-known

quotation from Ovid's *Metamorphoses*, 'nec edax abolere vetustas.' The whole translates as '[And now my work is done, which not Jove's anger, and not fire, nor sword,] nor the gnawing tooth of time shall ever be able to destroy.'[61] The survival and continued appreciation of the Coade manufactory's wares across Britain and beyond, as well as their enabling contribution to late-Georgian architecture, make this a fitting epitaph both for Coade and for the Lambeth manufactory.

ACKNOWLEDGEMENT

Professor Christine Stevenson's insights are gratefully acknowledged, and have prompted further research into the earlier origins of artificial stone that may form the basis of a future article.

ENDNOTES

1 She was baptised Elinor, but adopted the more elegant French spelling.

2 From 2014–15, Belmont was the subject of restoration by the Landmark Trust, and was the winner of the 2015 Georgian Group Awards in the category of Restoration of a Georgian Building in an Urban Setting.

3 For Böttger's remarkable life, see for example Janet Gleeson, *The Arcanum: the Extraordinary True Story of the Invention of Porcelain* (London, 2013); Paul Atterbury, *The History of Porcelain* (London, 1982).

4 Alison Kelly, *Coade Stone* (Upton on Severn, in conjunction with The Georgian Group, 1990)

5 John Havill, *Eleanor Coade: Artificial Stone Manufacturer*, 1986 (unpublished thesis, Exeter University). This includes an account of Coade family activity that belies the frequent assertion that the family originated only from Lyme Regis.

6 Kelly, *op. cit*., p.23, n.13: 'Royal Society of Arts' Records of Admission to the Fellowship.'

7 Kelly, *op. cit*., p. 28, n.14: Sun Assurance Company – Guildhall MS11936, *Vol.169–233501 – 4/- Midsummer 1767 4/7.*

8 Kelly, *op.cit*., p. 28, n.15: Sun Assurance Company – Guildhall MS11936, *Vol. 176–246717 – 18/- Midsummer 1768.*

9 The 1769 acquisition date and 'failing' state of the manufactory are stated by Eleanor Coade in the *Coade Catalogue* of 1784 and *Coade's Gallery* of 1799, and it is repeated in various secondary contemporary accounts.

10 Robert Boyle, *Some Considerations Touching the Usefulnesse of Experimental Natural Philosophy Propos'd in a Familiar Discourse to a Friend, by Way of Invitation to the Study of It. The Second Tome.* (Oxford: Ric. Davis, 1671), p. 22.

11 Jesus College, Oxford archives, SU.1–2/45.

12 Bennet Woodcroft, (ed.), *Referenced Index of Patents of Inventions 1617–1852* (1862), p.88: 'Richard Holt, 31st May 1722, 'Compound liquid metal, by which artificial stone and marble is made, by casting the same into moulds of any form, as statues and capitals; also for house-work, garden-ornaments and other sculpture work." And: 'Richard Holt, 13th June 1722 'Composition (without clay) for making white-ware, formed and moulded in a new method.' See also H.M. Colvin,

Biographical Dictionary of British Architects (New Haven & London, 4th ed., 2008), pp. 870–1.

13 Most modern artificial stones, some laying claim to the Coade heritage, are cast, cementitious mixes, relying on chemical reaction with the air to achieve hardness.

14 'The Hopes, King's Arms Stairs, and Jenkins Street', in Howard Roberts and Walter H. Godfrey (eds.), *Survey of London,* Volume 23*: Lambeth: South Bank and Vauxhall* (London, 1951), pp. 56–57 http://www.british-history.ac.uk/survey-london/vol23/pp56–57 [accessed 8 January 2016].

15 Richard Holt, *A Short Treatise on Artificial Stone* (London, 1730) p. 35–6.

16 *Ibid*, pp. 35–6.

17 *Ibid*, p. 36.

18 See for example James Ayres, *Art, Artisans and Apprentices: Apprentice Painters and Sculptors in the Early Modern British Tradition* (2014), p. 236.

19 Holt, *op.cit.*, p.49. It is interesting that Holt identifies ornamental lead, as much as stone, as competitor.

20 *Ibid*, p. 41. A common ploy in alchemical and early industrial espionage.

21 Ingrid Roscoe, *A Biographical Dictionary of Sculptors in Britain 1660–1851*, pp. 717–8. See also Emma Hardy and M.G.Sullivan, http://217.204.55.158/henrymoore/sculptor/browserecord.php?-action=browse&-recid=1603&from_list=true&x=0 for more on Langley's minor role in the field of artificial stone. Crucially for the story of Coade stone, Langley's formula seems to have been cast rather than fired, and did not contain glass or other silicates.

22 Nancy Valpy, 'Advertisements for Artificial Stone in the Daily Advertiser', *English Ceramic Circle Transactions*, 12(3) (1986), p. 208. See also http://217.204.55.158/henrymoore/sculptor/browserecord.php?-action=browse&-recid=1603&from_list=true&x=0

23 British Library (BL), Add MSS 11394, ff. 45–46, *cit.* Valpy, 1986.

24 Ground glass had however been trialled as an ingredient for soft paste porcelain by the 1720s.

25 Valpy, *loc.cit*., Plate 126, of *Richard Holt's Formula for Artificial Stone;* BL, Add. MS 11394.

26 *Ibid*, p.208. This advert appeared once a week in the *Daily Advertiser* from 12 April to 9 August 1732.

27 It also seems highly likely that similar forays into artificial stone for architectural embellishment were being made in provincial cities, and stoneware production of domestic vessels, etc, carried on throughout.

28 John Gwynn, *London Improved* (London, 1766), p. 83.

29 John Summerson, *Georgian London* (New Haven & London, 2003 ed.), p. 130.

30 Frank Kelsall, 'Liardet versus Adam'. *Architectural History*, 27 (1984), p.22.

31 G. Tyack, S. Bradley & N. Pevsner, *The Buildings of England: Berkshire* (New Haven & London, 2010 ed.), p. 665; Kelly, *op.cit.*,p. 217. See Kelly, pp. 112–116 for other, rare examples of 'structural' use of Coade in screens and in the tracery for church windows.

32 'Coade's Artificial Stone Works', in *Survey of London*, Volume 23, pp. 58–61 http://www.british-history.ac.uk/survey-london/vol23/pp58–61 [accessed 10 February 2016], citing *A descriptive catalogue of Coade's Artificial Stone Manufactory*, 1784; Julia Abel Smith, 'Great Saxham Hall', *Country Life*, 27 November 1986, pp. 1698–1702.

33 The plasterer Joseph Rose, jnr., for example, wrote to Lord Belmore at Castle Coole in Ireland on 2 July 1793 of his difficulty in persuading his 'ornament men' to cross to Ireland because of their fear of being press-ganged: Geoffrey Beard, *Decorative Plasterwork in England* (London, 1975), p. 95, n. 76.

34 Valpy, *loc.cit.*, p. 210: adverts appearing twice weekly through February 1767 in the *Daily Advertiser.*

35 *Ibid*, p. 213.

36 Jesus College, Oxford, SU.2/18, 1804 Plan of The Hopes.

37 *Ibid*, SU.2/5, 3rd November 1769 lease to Mr Biggins.

38 Daniel Pincot, *An Essay on the Origin, Nature, Uses and Properties of Artificial Stone, Clays and Burnt Earths in General* (1770), p.47. From this extract, the proximity of at least some of Holt's products to salt glazed stoneware is also clear

39 *Ibid*, p.59.

40 *Ibid*, p.61.

41 *Ibid*, p. 77. One wonders if this is the verbatim experience of the young John Bacon (see below).

42 Algernon Graves, *The Society of Artists of Great Britain, 1760–1791, the Free Society, 1761–1783: a complete dictionary of contributors and their work from the foundation of the Societies to 1791*, facsimile of 1907 edition (Bath: Kingsmead Reprints, 1969), cit. Valpy, *op.cit.*, p.220.

43 Kelly, *op.cit.* p. 38.

44 Valpy, *loc.cit.*, p. 215–6.

45 Online resource: *Biographical Dictionary of Sculptors 1660–1851* by Ingrid Roscoe Emma Hardy & M G Sullivan http://217.204.55.158/henrymoore/sculptor/browserecord.php?-action=browse&-recid=2133&from_list=true&x=0 [accessed 20 March 2016]

46 Kelly, *op. cit.*, p.38.

47 Timothy Clifford, 'John Bacon & the Manufacturers', *Apollo*, October 1985, pp. 280–304. This article demonstrates the breadth of the manufacturers for whom Bacon, as a pre-eminently successful artist of the period, supplied models from the 1770s until his death in 1799. They include the Wedgwood and Derby (successor to the Chelsea porcelain works) potteries, clockmakers, enamellers, gem cutters, engravers and medallists. Bacon's relationship with the Coade manufactory was therefore far from exclusive, and the astute Coade team were not slow to play up his involvement with their own works.

48 *Ibid*, p. 290; British Museum, Print Room (Banks Collection).

49 Rev. Richard Cecil, *Memoirs of John Bacon Esq* (London, 1821), p.137.

50 Valpy, *loc.cit* p. 212: *Daily Advertiser*, 11 September 1771.

51 Cecil, *op.cit.*, pp. 136–7. According to Clifford (*loc. cit.*,1985), John Bacon's son and namesake sought to play down his famous father's association with manufacturers, and it is interesting that Bacon's biographer does not mention Pincot by name during the apprenticeship phase, when that relationship was a pivotal one in the development of architectural stone embellishment.

52 *A Descriptive Catalogue of Coade's Artificial Stone Manufactory* (London, 1784) British Library, ESTC T31712.

53 David Laing, *Plans etc of Buildings Public and Private executed in various parts of England* (London, 1821), *cit.* Kelly, p. 64, n.2.

54 The correspondence between John Fowles and Alison Kelly covering the 1970s and 80s was deposited by Sarah Fowles with the V & A Archive at Blythe House, near Olympia in West London. As yet uncatalogued, it reveals Kelly working out her theories and gradually assembling the evidence of Coade's life, with Fowles contributing from his knowledge of local records, and sometimes pouring scorn on 'half-heard rumours hypertrophied into fact.'

55 See Maeve Bimson *et al*, 'Some Recent Research on Coade Stone', *English Ceramics Circle Transactions*, 12 (3); also I. Freestone, 'Forgotten but not lost: the secret of Coade Stone', *Proceedings of the Geolological Association*, 102(2) (1991), pp.135–8.

56 National Archives, C. 111/106, cited in John E. Ruch, 'Regency Coade: a study of the Coade record books 1813–21', *Architectural History*, 11 (1968).

57 Llewellyn Jewitt, *The Ceramic Art of Great Britain... (*1878), p. 141, quotes a contemporary letter that the Coade kilns were nine feet in diameter. Kelly (p. 61) casts doubt on this, in favour of an engraving of the interior of a Coade kiln in the *European Magazine* for 1784 that shows the nine-foot long River God being fired in one piece together with figures of the Four Seasons. The author's consultation with present day craftsmen in the Coade tradition, Stephen Pettifer of Coade Stone Ltd and Philip Thomason of Thomason Cudworth, suggests a nine-foot diameter is a plausible maximum size.

58 Kelly, *op. cit.*, p. 63.

59 John Nichols, *History & Antiquities of the Parish of Lambeth* (London, 1786), p. 83, n. 2.

60 *Coade & Sealy's Gallery or Exhibitions in Artificial Stone* (1799), British Library, ESTC T3.

61 *'Iamque opus exegi quod nec Iovis ira nec ignis nec poterit ferrum nec edax abolere vetustas.'* – Ovid, *Metamorphoses*, XV, l. 871–2.