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Insuring Artificial Stone

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Abstract

This paper examines experiments to increase the durability of architecture as a means to manage the risk of catastrophic loss through tangible systems of artificial material and intangible systems of insurance. At the intersection of these dyads is Coade's Artificial Stone Manufactory conducting experiments in architecture to yield an ornament useful in securing capital from 1769 - 1821. Selling goods from the south bank of the River Thames in London, Coade's made use of a catalog to mediate the global exchange between the site of production and construction. For architects and builders, these commodities construct a modern architecture relying upon cheapness, mass production, and abstraction. The utility of this artificial stone explicates a relationship between durability and catastrophic failure at work in the manufacture of modern architecture.

Keywords: artificial stone, Eleanor Coade, risk, ornament, modern architecture.

1. INVENTING ARTIFICIAL STONE

In 1759, bankruptcy brought an untimely end to the Coade family's textile undertakings in Dorset, England. Leaving behind financial misfortune, husband George and wife Eleanor left for London with their two daughters Eleanor and Elizabeth. Typical of many families across the British Isles during this time, the Coade's urban migration follows changes to labor and economic conditions as a result of increasing industrialization and the growth of consumer culture. Arriving in London, records reveal a family with adequate capital from liquidating their textile holdings and substantial social capital deriving from Nonconformist religious affiliations. Neither Roman Catholic nor members of the Church of England, Nonconformist Protestants made use of close ties for business and social ventures. George made use of this social capital joining the Society for the Encouragement of Arts and Science as a fellow and Eleanor and Elizabeth began a linen drapery business. By all accounts the Coade family typifies the transition of England from an agrarian economy into centers of urban industry. Unusual to the family Coade, daughter Eleanor sought to capitalize on her circumstances by entering into partnership with the manufacturer Daniel Pincot who was known through religious affiliations. Taking over the venture in 1769, advertisements and lease agreements demonstrate the manufacture became singularly Eleanor Coade's following Pincot's

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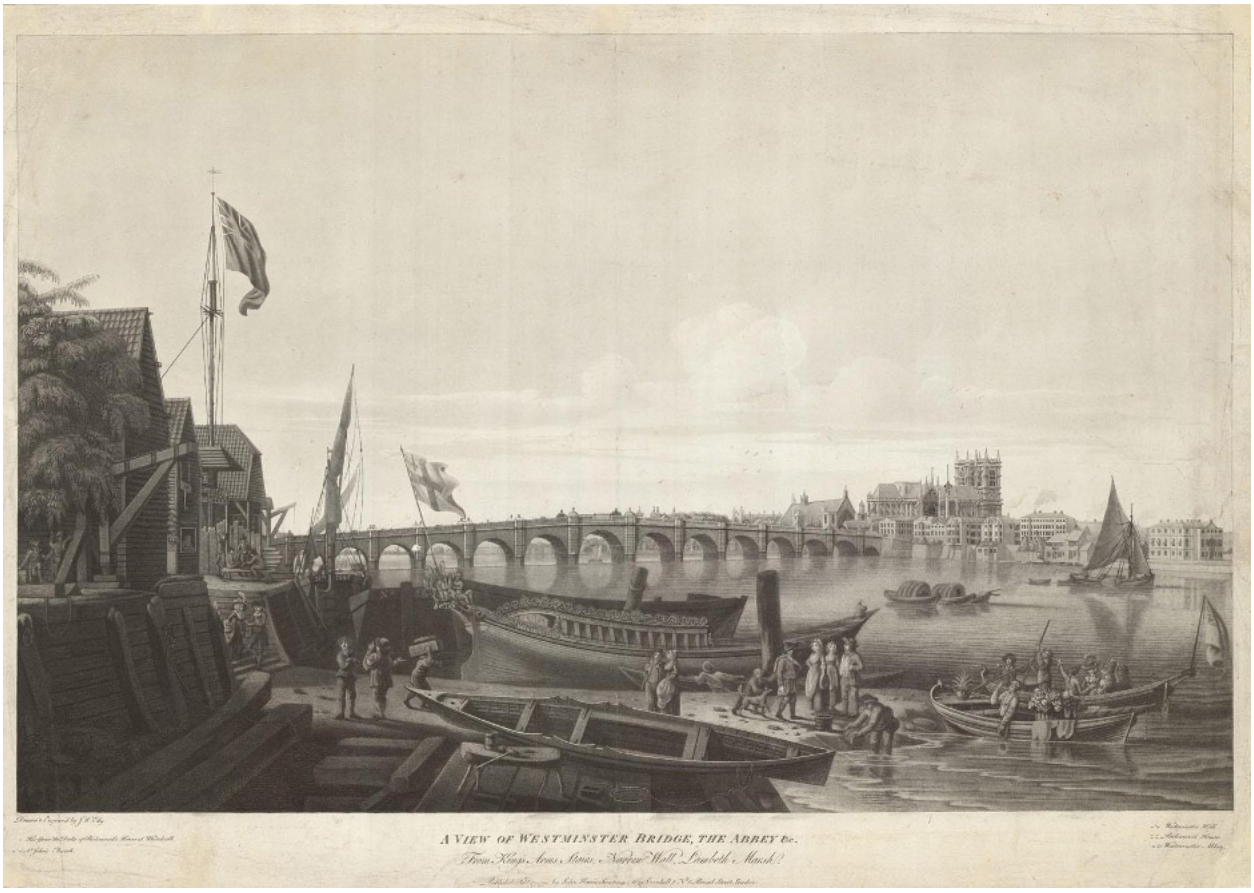

Figure 1.1: John Edy, A View of Westminster Bridge, the Abbey, 1791. © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license

departure. (Daily Advertiser, 1771; Jesus College, 1828). As the proprietor, Eleanor Coade's responsibilities included writing advertisements and gallery guides, circulating literature, calculating cost estimates, handling finances, mollifying interpersonal disputes, hiring, firing, and modeling molds. Using designs from architects, artists, and friends, Coade sold commodities by the dimension with a construction tolerance of one quarter inch including fascias by the foot, capitals by the diameter, prefabricated entablatures and bespoke orders for commissions not relying upon stock commodities. (Coade's Artificial Stone Manufactory, 1784). Providing works for architects and builders such as Robert Adam, Lancelot Brown, William Chambers, John Johnson, John Nash, Giovanni Battista Piranesi, Sir John Soane, and James Wyatt; it is not so much a question of who made use of Coade's artificial stone as a question of who did not. (Kelly, 1990). Following the dissolution of the partnership with Daniel Pincot, Coade brought in artist John Bacon as superintendent from 1769 - 1799, her cousin John Sealy from 1783 - 1813, and in-law William Croggon from 1813 - 1821. Although a woman could not typically acquire a bank account in English society, there is no doubt that Eleanor Coade's manufacture wrought changes in architecture, gardening, construction, and the built environment. Making use of river-front access, the manufacturer sent commodities by ship to ports as distant as St. Petersburg, Russia and British Ceylon. Flooding the anglosphere with durable and precise ornaments and commodities for construction, Coade's Artificial Stone Manufactory is an early example of a transnational construction supply company. This extensive commercial success came as a result of the artificial stone ceramic substance making the mass manufacture of architecture possible. Contemporaries such as architect Sir John Soane knew this substance as "Coade's Marvel" and a material history of artificial stone constructs two ontologies of substance. (Soane Office et all, 1816, 1828). The first species deriving in the use of lime and an aggregate includes mortars, plasters, and cement including those from Mohenjo-Daro, opus caementicium in Ancient Rome, and Portland cement. Coade's artificial stone is of the second species being a ceramic earthenware with an equally long and worldly history. This paper uses Coade's as an ontology to organize diverging artificial

stone nomenclatures, disparate commodities, visual material, and heterogeneous literature. Coade's is a place, a person, and a substance.

Historiography invented Coade Stone from Eleanor Coade's *Lithodypira* on January 19, 1940. Writing in *The Architect & Building News*, K.A. Esdaile wrote this was "probably one of the most successful synthetic building materials ever invented, Coade Stone still adorns nearly every considerable street square in West London." (Esdaile, 1940, p. 94). Post-War excavations at the historical site of Coade's Manufacture unearthing samples sent to The Chemical Branch of the Public Health Department for analysis conclude, "We are in fact left with the knowledge that Coade Stone contained as its main ingredients china clay with a finely ground grog prepared from broken Coade Stone either mixed with, or used alternatively to, sand. There were also small amounts, probably varying from time to time, of other materials found to have a useful effect in reducing the furnace temperature needed to produce vitrification." (Hamilton, 1954). Four days of firing in a kiln converts these ingredients into the glass-like ceramic substance known historically as artificial stone, burnt stone, *Lithodypira*, or Coade's Imperishable Stone. The results of such sampling point to craftsmen at Coade's heterogeneous adaptation of their craft more so than an exact formula or secret recipe where methods of making can change as needed. Despite the empirical weight of the evidence, there continues to exist "the popular tale relating the reason for the closure of Coade's suggests that the composition of the material was a well-guarded secret handed down through the family and only known to the senior partner, so that when William Croggan died in 1836, it was lost." (Wyatt, 1973, p. 136). The durability of a secret recipe continues in claims such as Ruth Guilding's in Country Life, the self described quintessential English Magazine of country luxury lifestyle suggested it required "two years of experimenting by Stepehn Pettifer to rediscover [the] lost art of producing Coade Stone." (Guilding, 2008, p. 60). While totally false, Pettifer continues to apply this 'rediscovered' art through his sculpture workshop under the name Coade Ltd. on the picturesque grounds of Wilton House.

2. EXPERIMENTS AND ARTIFICIAL STONE

Experiments in Coade's day participate in a 'chymical' change separating a modern material world from the arcane alchemical affiliations of Isaac Newton's 'New Sciences.' Although the teleological assumptions of Herbert Butterfield's *The Origins of Modern Science* remain flawed for assumptions of continuity in scientific progress, there nonetheless remains a 'big picture' of modern science relying heavily upon discursive changes during the late eighteenth century. (Cunningham and Williams, 1993). Only the quixotic historian searches for disciplinary origins in a period where scientific inquiries frequently rely upon a theological understanding of the natural world. Nonetheless, Coade's years managing the manufacture overlap with the professionalization of science at European institutions collectively organizing knowledge into discrete disciplinary fields such as biology and chemistry. Although we should not understand experiments and science of this time to be entirely modern, those in Coade's day often did as a means to differentiate themselves from historical forms of intellectual inquiry. Alongside formal debates at institutions of science such as the Royal Society, science as a popular topic of conversation informally circulates through London coffeehouses, social organizations, and halls of Parliament. Drawing on this popularity of science, Coade's trade card depicts the vitrifying chemical change of using a kiln to transform clay into a non-crystalline amorphous solid she sold as *Lithodypira*. (Coade's Artificial Stone Manufactory, 1808 - 1849). Drawn by artist superintendent John Bacon, the trade card is a visual allegory of the artificial stone manufacturing process depicting a trio of figures standing in front of an open kiln. On the far left is Father Chronos bringing the decay of age with his harvesting scythe serving to mark seasonal time. On the far right is the spark of invention Igneavis, a young woman holding the power of fire and extending her hand to restrain Chronos and his decay. Mediating between is architecture holding the utensils of her trade and wearing a Doric headpiece. This representation of manufacturing artificial stone relies upon the cognition of chemistry to brand and sell the 778 commodities in Coade's catalog with durable properties withstanding the ravages of time. Using the in vogue linguistic nomenclature of science, Coade's *Lithodypria* translates the phrase "twice-fired stone" into Pseudo-Greek referencing the ground grog aggregate necessary to the manufacturing process. With genealogical affiliations through her father as a fellow of the Royal Society of Artists of Great Britain and their cash prizes for conducting "Trials" and "Experiments" in the arts and industry, Eleanor Coade's nomenclatures and advertising appeal to learned persons of property in English society. Attending the exhibition of science experiments such as Benjamin Wilson's Lightning Conducting Apparatus in the Pantheon gave Coade further opportunity to establish her market. With science, Coade came to increase her commerce and the value of artificial stone.

Deriving from the Latin 'experiri' meaning to try, test, prove, and attempt; the experiment provides a technical means to manipulate matter and make knowledge. Writing in her 1784 catalog, Eleanor Coade aligns her commodities with this etymology saying they are, "in common, with most original undertakings, the great

expense incurred for experiments necessary to its perfection, leaves but an inadequate remuneration to the Proprietor." (Coade's Artificial Stone Manufactory, 1799, p. v). These statements advertise the cost of trial and error in deriving a manufacturing process as a means to assuage consumer anxiety regarding the risk of failure. As a new commodity to construct architecture, Coade's experiments are primarily commercial, operating as assurance for users and consumers. Fields of inquiry such as material science did not yet exist and Coade's claims of testing operate in the design of consumer trust. Coade knew well the effects of failure on consumer trust having to defend her *Lithodypira* against misinformation resulting from defects in a similar lime artificial stone by John Liardet that consumers could not differentiate. Answering the charge of this misinformation in her 1784 catalog, Coade writes "some specimens may be met with which do not answer this character, it is needful to inform the Enquirer, that in the course of the above period there have been several other Manufactories passing under the same denomination, which having been extinct for some years past, their productions have often been ascribed to this Manufactory — an instance of which misapplication is a Gateway, leading to Sion-House [sic], in the Brentford Road." (Coade, 1784, p. i). Replacing a defective variation circa 1777, the difference between the two artificial stone species remains visible today.

While Daniel Pincot did not remain a partner in Coade's venture, his 1770 *Essay on Artificial Stone* includes descriptions of experiments for those who doubt if a stone is artificial or natural. Pincot suggest doubters "try for themselves the following experiment" to burn material samples so as to determine that "clays are nothing more than the dust of stones, sands, metals, fossils, &c, each containing its own proper principle of nature." (Pincot, 1770, p. 19). Pincot believes the origins of making artificial stone to be lost by the Genesis Deluge and the art having been carried into this world by Noah and his sons. This essay seeks to convince users and consumers on the merit of an artificial substance to mitigate "the destructive effects of weather [as] many of the modern artists are eye-witness to the ruin of their own work." (Pincot, 1770, p. 6). Aligning with John Woodward's Biblical interpretations of the natural world, Pincot argues these experiments reveal clays not to be a "distinct species of creation" but rather are "formed of all the other species of substance that constitute this earth." (Pincot, 1770, p. 19). This Genesis theory of worldly dissolution and recreation in strata relies upon catastrophe to divide time between an unknowable antiquity and a modern present. As General Baptists of the same religious congregation, it is reasonable to assume that Pincot and Coade might share a similar worldview on matters of creation and the nature of materials. Latent within this worldview is the experiment producing an enduring modernity after the loss of antiquity.

3. RISK AND ARTIFICIAL STONE

As a procedure, the experiment simultaneously creates knowledge and destroys the sample substance under observation. For example, conducting an experiment by burning a sample to determine if it is artificial or natural stone results in destroying that sample. Thus, there is a risk to making knowledge within the uncertainty of experimental procedures. What arguably remains the paradigm in defining risk is Stanley Kaplan and John Garrick's definition that quantitatively calculates the scenario of an adverse event, the probability of that event's occurrence, and the adverse outcome or consequences of that event. (Kaplan and Garrick, 1981). Or, uncertainty plus consequence equals risk. This article extends thoughts from the 2022 Precarity Conference calling on respondents to consider precarity as 'the circumstances of global capital, its extractive industries, the financial arrangements that imperil labor, the accumulation of material and data waste, and the specter of environmental collapse.' Precarity indicates an insecurity of human well being alongside states of uncertain circumstance and the risk of failure or danger. A precarious architecture is one which might collapse. The precarity of Eleanor Coade derives in the uncertainty of earning an income amidst changing labor conditions and family bankruptcy. And yet, the experiment of Coade's artificial stone demonstrates the upside of risk and uncertainty seeking to change her circumstances and those of constructing architecture. This article suggests that by only relying upon the negative consequences of precarity there is a failure in considering the positive consequences of risk. An example of the positive consequence is the insurance industry which generates and preserves capital at the expense of holding risk on behalf of a social collective. Insurance manages precarity in the built environment from risk such as fire by pooling profit socially as a countermeasure to individual catastrophic loss. Because such catastrophic events are so rare, the management of precarity becomes effective in the aggregate.

Purchasing insurance to secure her artificial stone commodities, Eleanor Coade is one of many Londoners using insurance to manage precarity by acquiring policy 534771 from the Sun Fire Office In 1787 for £2.10 annually on her "utensils & stock in her warehouse only (two kilos therein) situated as aforesaid timber not exceeding one thousand pounds." (Sun Fire Office, 1769 - 1841). Coade's policy umbrellas over previous policies held with the Royal Exchange Assurance Office and the New Fire Office to secure the materials necessary for her livelihood. In eighteenth century London, insurance

Figure 1.2: The Pantheon, the Morning after the Fire. Joseph Mallord William Turner, 1792. © Tate. Shared under a CC-BY-NC-ND 3.0 license.

corresponds to the material of architecture with common rates for brick and stone buildings, hazard insurance for timber-buildings and goods within them, and double hazard insurance for thatched, timber, and plaster buildings. (Trusler, 1790). Facing many constraints due to gender, Eleanor Coade could acquire insurance on property held legally in her own name. It is unclear on the reasons Coade would require a third insurance policy on her goods, however it is plausible she felt more at risk during the manufacturer's largest undertaking for the Nelson Pediment at the Royal Naval Hospital (Coade, 1787). The earliest use of insurance contracts in London and the British Isles dates to the middle of the sixteenth century with the arrival of Italian merchants seeking to manage the risk to their maritime trade. Over time, the desire to protect capital undertakings from catastrophic loss led to a diversification of insurance from maritime into fire. Economist Nicholas Barbon's 1681 Fire Office ranks among the earliest efforts to insure the built environment of London offering contracts from the back of the Royal Exchange. Undergoing consolidation from 1696 - 1720, the insurance market in the city largely split between six companies including the Hand-in-Hand Fire Office (1696), the Union (1714), Sun Fire Office (1710), Westminster Fire Office (1717), the London Office (1720), and the Royal Exchange Assurance (1720). Remaining static until the end of the century, this market underwent disruption by the Phoenix Assurance Company and the invention of life insurance.

The precarity of life, livelihood, and property intersect this history of artificial stone in 1797 as the trustees of the Phoenix Assurance Company establish the Pelican Life Insurance Company at 70 Lombard Street mere steps from Exchange Alley, the Royal Exchange, and the Bank Of England in the historic center of London. Offering contracts to a policy owner who pays annual premiums, life insurance pays money to a beneficiary upon death of the policy owner. Distinct from other forms such as fire or maritime, life insurance evidences a turn towards treating life as a substance whose durational existence can be predicted by statistical calculation.

As a means to advertise this security in life and death, Pelican Life company sought out Coade's Artificial Stone Manufactory to install a cornice of figures and install an urban storefront. Modeled by Royal Academy graduate John de Vaere from a design by Lady Diana Beauclerk, the single prefabricated cornice contains the following description in a Pelican prospectus; "a youth in the center [who] holds up in the form of a banner, the symbol of the office, a Pelican sustaining its young ones from its vital springs. On the one side, he is approached by two Damsels who are rushing on with emulation to snatch the Garlands...The subject on the other side of the group is the graver cast, calculated to dispose the mind to the Contemplation of the brevity and uncertainty of Life... fleeting moments by which we are incessantly pressing forward to the end of our toils." (Pelican, 1801). These allegories in artificial stone render the uncertainty of existence visible in architecture ornament. Bearing the manufacturer's trademark COADE, LAMBETH, the cornice is an artifact of a modern architecture combining material and insurance to preserve the property and wealth deriving in colonialism, class, and ventures in capitalism. This combination of tangible and intangible systems manages the precarity of existence.

The test of Coade's artificial stone came in the random accident of fire in 1792 to James Wyatt's Pantheon. Arriving the morning after to forensically record the scene, Royal Academy student J.M.W. Turner's watercolor depicts fire agents using wagon mounted water pumps to douse the façade which remains standing in front of a collapsed interior. As a pivotal early commission for Coade's, Turner's representation includes the Pantheon's artificial stone commodities as surviving the disaster unharmed. Serving as the preeminent winter entertainment venue catering to a clientele of aristocracy, gentry, and other persons of property, the Oxford Street facade had long stood as proof of concept for the climatic performance of Coade's artificial stone in resisting the ruinous effects of British weather. In catastrophic loss, the ruin of the Pantheon gave Coade a rare opportunity to capitalize on the event of fire. In her 1799 Gallery guide, Coade writes, "where [artificial stone] has been applied in buildings which have been burnt down, or damaged by fire... memorable testimonies remain that it has not received the smallest injury, on the contrary, fire purifies it." (Coade, 1799, p. iv). The modernity of Coade's artificial stone derives in replacing a faulty natural counterpart liable to destruction by weather or accident. Deriving from the crucible of experimentation, Coade's artificial stone participates in constructing a durable architecture which is cheap, mass produced, and abstract. Most users and consumers did not have the opportunity to directly observe artificial stone through experiment or catastrophic event as did Turner and the curious onlookers in 1792. Alternatively, the success of Coade's relies upon an enduring reputation which is social and exists without failure. Similar to insurance, one does not necessarily have to directly experience catastrophic loss to understand its value. It is atypical to locate a historical precedent of modern architecture in ornament, however, Coade's artificial stone provides such a narrative suggesting that ornament has always had a use after all.

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