RELATIONS AND REFLECTIONS TO THE EYE AND UNDERSTANDING: ARCHITECTURAL MODELS AND THE REBUILDING OF THE ROYAL EXCHANGE, 1839–44

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All fields of scholarship have habits of mind. This relates to the many scholars who have explored the history of architectural drawings, or constructed narratives from the drawings of a building or an unrealised project. As a counterpoint, the purpose of this article is to re-examine, through architectural models, the competition for and rebuilding of the Royal Exchange. The episode involved a series of architectural models, produced and used for a variety of reasons and intended for various different audiences. From these models, it is also clear that tensions came to the surface between individuals and institutions about the authenticity, validity and potential agency of models in nineteenth-century architectural practice.

Important studies of nineteenth-century models have been made by Martin Briggs (1929) and John Wilton-Ely (1965, 1967 and 1969).[1] In 1967, in the *Architectural Review*, Wilton-Ely proposed there were three reasons for the wholesale decline in the use of models by architects in the nineteenth century: first, a reduction in concern for the sculptural qualities of architecture during this period;[2] secondly, the increased standards of draftsmanship and technical knowledge of an established profession, and the development of specialised drawings that replaced many of the functions which models previously fulfilled;[3] and, finally, the reduced importance of the model as a result of the

primacy of drawing that employed contrived perspectives and romantic settings to seduce the viewer.[4] Following Wilton-Ely, John Physick and Michael Darby offered a revisionist interpretation of the role played by the nineteenth-century architectural model, in the catalogue accompanying the exhibition 'Marble Halls: Drawings and Models for Victorian Secular Buildings' at the Victoria and Albert Museum (1973).[5] Although writing only a few years after Wilton-Ely, Physick and Darby now proposed that 'there is every reason to believe that more models were made during the Victorian period than during any previous era'.[6] Later studies by Margaret Richardson (1989), Tim Knox (1992 and 1993) and Matthew Williams (2003) then began to use architectural models as a tool to unpick and reveal new aspects of building history and architectural practice.[7] Other scholars, including Fiona Leslie (2004), Edward Bottoms (2007) and Isabella Flour (2008), have also looked at how and why key institutions acquired models and plaster casts during the nineteenth century.[8]

A notable tendency of this secondary literature has been to categorise and sort architectural models into different functional groups, for example design model, sketch model and exhibition model. Rather than organise models in taxonomies formed in this way, the article will begin to explore why the models were actually made and how they were used. Through the analysis of a wide variety of material from key public and private collections this article will utilise the Royal Exchange as a case-study to demonstrate the multiple roles that models played in architectural practice and in the the public perception of the profession.

Background

On the 10 January 1838 the Royal Exchange in the City of London was destroyed by fire (**fig. 1**). According to George Smith, Surveyor to the Mercers' Company, the whole building was 'reduced to a heap of Ruins'.[9] The loss of the building was seen to be potentially catastrophic for trade in the City. The Joint or Grand Gresham Committee, formed jointly from the Corporation of the City of London and the Mercers' Company, were responsible for the rebuilding process. Negotiating the complexities caused by the involvement of two organisations in the decision-making process, the chairman of the committee, Richard Lambert Jones, resolved that the design of the new Royal Exchange would be procured by an open competition.[10]

In various forms, this episode has been explored before, beginning in 1896 with J. G. White's *History of the Three Royal Exchanges*.[11] Many twentieth-century accounts of the Royal Exchange, including those by Katharine Ada Esdaile (1931), Henry-Russell Hitchcock (1954), and Joan Bassin (1984), were based on White's original work and they perpetuated his inaccuracies.[12] In his monograph (1974), on Charles Robert Cockerell (1788–1863), David Watkin also drew on White's history to provide the background for Cockerell's competition design,[13] and this included discussion of an album compiled by Cockerell's assistant, John Eastty Goodchild, which was subtitled 'Reminiscences of My Twenty-six years Association with the late Professor C. R. Cockerell Esq', and comprised ninety-six sheets of sketches, notes and presentation drawings.[14] More recent scholarship by M.H. Port (1997),

however, has questioned White's inaccuracies and offers a revised building history of the Royal Exchange.[15] Despite his brilliant account of the rebuilding process, however, Port overlooks the crucial role played by various forms of architectural representation, in the competition, construction and ceremonial opening of the Royal Exchange. In order to develop our understanding of the enterprise yet further, this article will explore the episode through the examination of architectural models and drawings, in tandem with various documentary sources and evidence from print culture outside of architectural communities. Alongside the textual and print evidence, the study of two particular architectural models will result in a revision to Port's narrative, and to our understanding of how architects used and thought about models in this period. In particular, the article will also explore the relationship between the representational culture of architectural practice and the socio-economic forces of production in nineteenth-century London. This is a history of the relationships between people, things and ideas.

The Competition

The new Royal Exchange was to be located on the site of the previous building, to the east of the Bank of England in the City of London. In its previous incarnation, it had entrance porticos on both north and south elevations to face the two main City thoroughfares of Threadneedle Street and Cornhill. The new Royal Exchange, however, was re-oriented with its primary façade facing to the west. Lambert Jones and the joint committee had urged the need for improvements to the surrounding streets that would allow a larger Exchange to be constructed. With financial support from the Metropolitan

Improvements Committee, the two main streets were to be widened. Through compulsory purchases of various properties on Sweetings Alley to the east, and the demolition of old bank buildings to the west, the site was extended to form an irregular oblong of 302 by 168 feet.[16]

By 26 March 1839, the Joint Gresham Committee decided upon the rules of the competition for a new Royal Exchange.[17] Upon payment of £1, competitors could obtain a list of instructions and a site plan. Influenced in part by the competition rules for the Houses of Parliament, the instructions decreed that the new building should be in 'the Grecian, Roman, or Italian style of architecture, having each front of stone of a hard and durable quality'.[18] Three premiums were offered for designs judged by the committee to be the best, although the competition rules clearly stipulated that the winner would not definitely be offered the commission. Each entrant was required to submit orthogonal drawings, including plans of each storey, elevations of each front, longitudinal and cross sections, and an internal elevation. It was specified that perspective drawings were permitted, but only from two specified views – from the west and a courtyard interior – and these were to be produced in brown or Indian ink. A further regulation stated that 'no model, sketch, perspective, or coloured drawing (save two such perspective drawings as are described in the previous resolution) shall be received'.[19] To avoid any problems resulting from the selection of an overly expensive design, as had occurred in the Palace of Westminster competition, entrants were also required to submit a specification and cost estimate of their schemes; and, to avoid questions of favouritism, each entry was required to be submitted

anonymously. The date for final submissions to the competition was set at 1 August 1839.

Various individuals and institutions, however, raised concerns about the competition process. The Royal Institute of British Architects (RIBA) requested a longer period to prepare designs, whilst the Architectural Society requested further details about the building's various functions.[20] *The Civil Engineer and Architect's Journal* felt that the £1 charge for the competition instructions was unwarranted. In response, the journal then published the particulars of the competition in full in their May 1839 issue and offered potential competitors the opportunity to attend their offices to trace the site plan.[21] Also published in the May issue were the conclusions of a committee appointed by the RIBA in 1837 to consider public competitions. This committee's report had declared that 'Perspective drawings, if correctly made, are certainly desirable to show the proper effect of designs; but they should be restricted to specified points of view. The committee also had a view about architectural models, which, they recommended, should be received with caution as not being unexceptional tests of the merits of a design.'[22] Thus, in the eyes of the profession's own committee, it was 'correctly made' perspective drawings that should hold primacy in the judgement of an architectural competition.

Other architects made alternative proposals for selecting designs in competition. Thomas Hopper, an architect who had been narrowly defeated in competitions for the General Post Office (1819–20) and the Houses of

Parliament (1836–37), used the occasion of the rebuilding of the Royal Exchange to published a polemical pamphlet on the correct way for competitions to be judged. He proposed an extended competition process by which two different sets of judges, by means of drawings, would each choose three-to-five designs. Then these six-to-ten entries would be made into models and exhibited publically before a winner was chosen.[23] He believed this method would reduce nepotism and the tendency for judges to select beautiful drawings in preference to the best proposal for a building. In their review of his pamphlet, *The Civil Engineer and Architect's Journal* agreed with Hopper's proposal and further suggested that, in a design competition, all models should be made to the same scale and accompanied with a perspective view, in order to show the scheme's 'appearance when executed, and seen in combination with the buildings or other objects belonging to the proposed site'.[24]

The reason for this combination of representative techniques was the misleading nature of architectural models alone. The author in *The Civil Engineer and Architect's Journal* declared that 'in themselves models are most fallacious, and moreover captivate and delude the eye by a certain prettiness that would not belong to the buildings erected from them.' [25] In fact, there were a host of differing approaches to the use of models in architectural competitions, and, as regards the Royal Exchange competition, architects, clients, critics and the general public also took a variety of conflicting positions. In the second phase of the competition these issues would come to the surface, while the idea that the architectural model was a

truthful or reliable visualisation of a proposed design was also again contested.

On 7 September 1839, following a drawn-out process, Robert Smirke (1780–1867), Joseph Gwilt (1784–1863) and Philip Hardwick (1792–1870) were appointed judges.[26] Thirty-eight submitted entries were exhibited for the judges in the Mercers' Hall. On 10 October 1839 the judges submitted a shortlist of five entries that fell within the cost limits of the project to the Joint Gresham Committee, these being schemes by Alexis de Chateauneuf and Arthur Mee, William Grellier, James Pennethrone, Sydney Smirke, and Thomas Wyatt and David Brandon. [27] Based on the demonstration of artistic skill rather than economical planning and a concern for building costs, a second list of entries was also submitted by the judges, which included schemes by T.L. Donaldson, David Mocatta and Henry Richardson. No overall recommendation was made, but premiums were awarded to the entries by Chateauneuf and Mee, William Grellier and Sydney Smirke. Following the judges' decision, the exhibition of the anonymous entries was opened to the public for seven days.[28] As the judges had established no clear winner, the Committee approached Robert Smirke, Gwilt and Hardwick to prepare an agreed plan and specification for the new building on the basis of the competition entries awarded premiums.[29] Smirke declined the opportunity but the other two agreed. Confusingly, it was then revealed, in November 1839, that the entry from Henry Richardson was in fact from the hand of his master, C.R. Cockerell.[30] Cockerell was evidently distrustful of competitions: in the rough notes for his third Royal Academy lecture of 1848, he declared

that ‘tho’ all of us have been invited to plans and Estimates, and until taste has its exclusive attendance ... convenience, cheapness and interested views will of course prevail’.[31]

Unhappy but initially reluctant to abandon the competition, the committee eventually approached George Smith (1782–1869) and William Tite (1798–1873) to analyse the competition entries and suggest possible alterations.[32] As Surveyor of the Eastern Railway, Tite had a longstanding connection to the committee’s chairman, Lambert Jones, who was the Railway’s Valuer, but, at this stage, he politely declined the committee’s offer. In February 1840, however, the committee asked six architects to submit a new design.[33] These architects comprisedthe original judges, Smirke, Hardwick and Gwilt, together with one of the original entrants, Cockerell, and two new names in Tite and Charles Barry (1795–1860), but all declined the invitation except Tite, who then suggested to Cockerell that they should collaborate as they had done previously at the London and Westminster Bank building in Lothbury (1837).[34] Cockerell declined Tite’s offer but this did not dissuade Tite. The result was that, on 11 February 1840, the committee set up a limited competition between Tite and Cockerell ‘to furnish plans and designs for the building of the new Royal Exchange’.[35] According to Goodchild, however, Cockerell accepted the challenge on the understanding that a new design would not be required, and that he would just prepare a ‘model to a good scale, with the addition of other drawings’ so as to demonstrate his design to the committee.[36] According to the committee minutes, however, Cockerell’s intention to demonstrate the merits of his competition design through a

model was not as explicit as Goodchild indicated. His competition entry included a rendered perspective view of the courtyard, drawn with two columns removed from a ground-level colonnade to offer a fuller representation of the space than would be possible in reality (**fig. 2**). All this is of some consequence, since one of the issues at the centre of the Royal Exchange episode was the opposing claims of drawings and models to provide valid or truthful representations of proposed designs. In producing both a model and a drawing, Cockerell's intention may have been to provide as response to Gwilt's earlier observation that in Cockerell's design 'no more than 2/3 of the Court[yard] could be treated with Sun's Ray'. [37] In order to calculate this, Gwilt had produced a small sketch section of the Cockerell courtyard with the position of the sun during winter and summer solstices. [38] Such a scientifically precise drawing is strikingly at odds with Cockerell's misleading but artistically optimistic perspective of the courtyard.[39]

On 28 April 1840, the Joint Gresham Committee received plans and accompanying reports from both Tite and Cockerell. Cockerell wrote to the Committee, offering them eleven drawings of his design and to invite them also to inspect his model, 'explanatory of my design for the new Royal Exchange', at his offices near the Mercers' Hall at 20 Old Jewry.[40] At the same meeting a letter from William Tite was read, which stated:

[indent] The mode, sometimes adopted, of exhibiting an architect's intentions by a model was prohibited in this instance by the instructions of the committee. I do not complain of this, for models are said to raise expectations that are rarely realised.[41]

[follow on]As a response, the committee allowed Tite and Cockerell to attend the next meeting to present their designs in person on 4 May 1840.[42] Cockerell's report, which he read at the meeting on 4 May 1840, provides an especially clear indication of the importance of the model in the mind of the architect:

[indent]I am sorry that it is not convenient to offer these explanations with the model before us ... during the interval allowed, I thought myself best employed upon that model, because it is certain that no drawings however complete or numerous could convey all those relations and reflections which a model at once presents to the eye and understanding.[43]

[new paragraph]Previously unconsidered, these comments indicate that Cockerell believed the model to be a vital tool in the development of a proposed design, and also an instrument of visual rhetoric in representing that design to the client. And without wishing to fetishise the model, here we have a clear case of material agency in nineteenth-century architectural culture. For Cockerell, the model had a role both as an externalised representation of an object in the world and as a depiction of an object previously present in the mind of the architect. [44] To develop a new understanding of how the model was used, it is clear Cockerell's model was not an example of *hylomorphism*, where in the process of design and making architects impose internalised ideas onto the material world.[45] Rather the model is an object that both represents the proposed design, and acts as a causative agent in its own right.

Unfortunately the model produced for Cockerell did not survive for very long. Goodchild, however, tells us it cost £400,[46] and he describes it in some detail:

[indent]The model was made chiefly in wood, to a scale of half an inch to a foot, the total length being nearly twelve feet, it was raised upon a stage, to a proper height for the eye of the spectator, the floor of the inner quadrangle being absent so that the spectator could fit in his head and walk about it from end to end, the scale was sufficient for all the sculpture and chief ornamental parts were fairly represented, some of the ornamental parts were in plaster and the sculptures modelled in wax by W.H.G. Nicholl. All the Kings and Queens in their niches as in the previous building, the allegorical figures over the columns and in the spandrils [sic] of the arches of the exterior. After all the labour and disappointment, but little care was afterwards bestowed upon it, it was left in an empty house under a skylight which became dilapidated and broken, letting in the weather so that the model gradually dropped to pieces, and by degrees for the want of space was broken up.[47]

[follow on]A second description from 1841 offers some rather different insights:

[indent][The model] was nine feet six inches long. The streets on either side, from the Mansion House to St Peter's, Cornhill, inclusive, on the south, and from Princes street, comprising the Bank to Bartholomew church on the north, were also modelled to scale, making altogether 28 feet long. It expressed the internal architecture of the Exchange, as well as its external west, south, and east fronts, and elevated to the level of the eye, enabled the spectator to judge of its relation to all the surrounding buildings.[48]

[new paragraph]It is likely, therefore, that the model was not simply of the proposed building but was also of the surrounding streets. This is conformed by an article in the *Morning Chronicle* from May 1840 which mentions 'a large model, calculated fully to explain the design itself, and its relations to all the surrounding buildings and streets'.[49] A model set within its neighbouring context would also have responded to earlier criticism in the architectural press about a lack of information as regards 'the comparative heights of the neighbouring buildings, which must exercise an important influence on the design'.[50] There is no clear evidence to indicate who the produced the model for Cockerell. One possibility is that William Grinsell Nicholl (1796–1871) and his workshop made the whole model, not just the sculptural portions. This hypothesis is suggested by the absence of other names, by Nicholl having a long-term working relationship with Cockrell, and by Nicholl made a model of the pedimental sculpture of the Fitzwilliam Museum, to designs by Charles Eastlake, that was displayed at the Royal Academy in the summer of 1840.[51] Whoever the maker, however, the model served as a site of collaboration, as Goodchild made clear, between different disciplines to show and display ideas the physical form of the proposed building.

There are three further aspects ofnote about Cockerell's model. First, which is something that is often under-considered by scholars, the model and the drawings were to be used in tandem. Cockerell did not attempt to present the committee with one or other independently but wished them to be considered together as part of a whole scheme. In much the same way, prior to beginning work on the model, the model-makers would have been furnished with their

own set of drawings together with a verbal explanation.[52] Secondly, in both Goodchild's and Leeds's descriptions, the model is an object to be experienced. The manner of its production, and its scale and presentation, allow the 'spectator' to experience both the internal courtyard and its urban context; and unlike other forms of representation, such as perspective drawings, the viewer can move in and around the model, whereas in a drawing, however detailed, the subject and object are separated at the paper surface. Finally, the model and the viewer interact not just in the physical world but in a unified realm of shared experience. In his 2008 study of the visual mechanics of Victorian society, Chris Otter discusses how judgement through thought and vision created a world of consensual perception. [53] For Cockerell and his audiences, architectural models presented a series of 'relations and reflections' to act directly on the mind; and, for Cockerell, new kinds of experience were produced in the contact between the model and the world. The model, in Cockerell's conception of it at least, had the epistemic potential to create new forms of knowledge in both tacit and explicit forms, and it offered a medium for knowledge to be exchanged between 'actors' with different disciplinary backgrounds.

Prior to a meeting on 7 May 1840, Cockerell wrote to request again that the committee visit the model he had prepared in illustration of his drawings. The minutes of the meeting noted that, following a discussion of the matter, 'most of the gentlemen of the committee ... stated they had already inspected the said model'.[54] According to a report in the *Morning Chronicle*, Cockerell's model had been seen by twenty or twenty-one of the committee twenty-three

members.[55] Yet despite this, and after a protracted discussion followed by a vote of thirteen to seven, Tite was declared the winner. It is clear from later meeting minutes that Cockerell wrote letters to object to this result;[56] and, although not corroborated by the minutes, Goodchild reaffirmed that 'the Committee had asked for *designs* and not for a model'.[57]

On 22 May 1840, Cockerell then appeared at the Court of Common Council to petition in person. Following a discussion about the validity or otherwise of the written competition instructions, he proposed, so as to reach

[indent] a safe conclusion on the relative merits of the two designs, that you will be pleased to instruct the city side of the joint committee to require my respected competitor, Mr. Tite, to prepare a model of his proposed edifice on the same scale with that prepared by your petitioner.[58]

[follow on]In support of Cockerell, two members of the committee advised that 'a model was the best test, as it displayed defects as well as perfections'.[59] One member cited the example of James Walker's model of the proposed alterations to Blackfriars Bridge, which 'convinced him of the advantages to be derived from making those alterations'.[60] In response, however, one Mr. Prior, chairman of the Blackfriars Bridge, denied the necessity of a model in either situation and declared that 'Tite's drawings were quite sufficient and most fully described the merits of the designs'.[61]

During the summer of 1840, there was praise for Cockerell's design by the critic W.H. Leeds, as well as condemnation of the committee and of Tite's design in *The Times* and the *Globe*. Much of this criticism is recorded in

Goodchild's folio, with later annotation added. One aspect of it is enshrined in an editorial from the *Globe* from 3 June 1840, which proposed that Tite's design 'could not be modelled without betraying its defects'.[62] These defects, it continued, were apparent in the perspective drawing submitted by Tite in May 1840 (**fig. 3**). Underneath a lithograph copy of the drawing in the Goodchild album an annotation reads: 'The portico is made to appear of much greater projection by the depth of shadow than it would be in reality.'[63] Both the editorial and Goodchild's comments suggest, therefore, that there was a substantial section of the profession who believed that models revealed the physical truth of a design, whereas drawings, especially perspective views, projected a reality that existed only on paper.

In the same edition of the *Globe*, an anonymous letter quoted at length the benefits of models used in design, as proposed by the fifteenth-century architect Leon Battista Alberti in the first book of his *De re aedificatoria*.[64] The letter, in addition, cited the more recent discussion by Quatremère de Quincy, probably his essay 'On Effect in Architecture', which had been published in monthly instalments in J.C. Loudon's *Architectural Magazine* from 1835 to 1837.[65] The letter drew attention to the use of a scale model by Michelangelo for the Palazzo Farnese in Rome, and of a full-scale model of a triumphal arch, designed in the seventeenth century by Claude Perrault for the Rue St-Antoine in Paris. Architectural models by Christopher Wren were also cited, including those for a design of St Paul's and for the chapel at Pembroke College, Cambridge. Finally the anonymous letter concluded:

[indent]In truth the model is a troublesome and expensive preliminary that exposes those architects to impertinent criticisms, and puts an end to that suspense and curiosity in which it is in their interest to keep the public mind – till it is too late to alter and amend, and the percentage is duly received.'[66]

[follow on]Most striking about this debate is that there is little mention of stylistic or aesthetic judgement. Rather there is simply the invocation of methodological precedent from the great architects of Renaissance and Enlightenment Europe. The contemporary relevance of the debate is reflected n the sheer number of letters and editorials in the popular press. For one summer at least, it is clear that architectural models were both relevant and of great interest to the general public.

By June 1840, the press had now become aware of the commercial link between Tite and Lambert Jones and was beginning to declare that foul play had occurred in the competition process.[67] Further anonymous letters cast aspersions on the validity of the competition – and on the neglect of architectural models in design. In relation to the Royal Exchange and the design of the inner quadrangle, one anonymous author declared that a model 'can alone give the *true* idea and effect'.[68] Another letter, on this occasion to *The Times*, proposed that the committee should visit St Martin-in-the-Fields, the National Gallery and University College London 'before they allow anything so preposterous as the selected [Portico] to be put up in the front of the Royal Exchange'.[69] Cartoonists illustrated the supposed defects of Tite's design through drawings from contrived viewpoints that exaggerated the shallowness of the portico (**fig. 4**).

Following an appeal by Cockerell to the Treasury in July 1840, the First Commissioner of Works interviewed Lambert Jones who reaffirmed that the committee had not visited Cockerell's model in their official capacity.[70] Later in 1841, the *Westminster Review* reported that Lambert Jones told the Common Council of the Corporation of London that 'he found all the best authorities opposed to models'; and that a City builder, who was a friend on whose experience he trusted, had seen the model and assured him 'it was a complete deception'.[71] The final result was that, despite all Cockerell's appeals to various committees and groups, on 27 September 1840 Tite was formally awarded the Royal Exchange commission.

This, however, was not the end of the story. In January 1841, W.H. Leeds condemned the Joint Committee for their running of the competition, the selection process, and, in great detail, the designs by William Tite.[72] Every aspect of Tite's scheme, from the functionality of the plan to the proposed rental yields of the shops, was shown to be inferior in comparison to Donaldson's and Cockerell's proposals. Leeds's main comparative instrument was a series of scaled ground plans, including Cockerell's proposal, Tite's design, Robert Smirke's General Post Office, and the Pantheon in Rome, which were laid out alongside one another to illustrate various aspects of his argument.[73] His greatest ire was reserved for the portico of Tite's design, and he openly mocked Tite's claim that his design displayed 'plain grandeur'.[74] Moreover, as well as promoting the merits of the Cockerell design, Leeds openly accused Tite of plagiarising Donaldson's entry, which was awarded

first place in the second class of winners (**fig. 5**). He agreed with Goodchild that the perspective drawing produced by Tite concealed the lack of depth and 'character' in the portico, stating that

[indent]The objection we are speaking of (to be well appreciated in a model of good size, or in the final execution only) was skilfully evaded in Mr. Donaldson's perspective view; but would be fatal to the effect of a portico projecting in rectangular direction from a plane, having an obtuse angle in juxtaposition, challenging the eye so consciously.[75]

Leeds then proposed, that in future, public competitions should be judged solely by members of the profession, and from much simpler instructions that would allow each architect to develop their own ideas for the arrangement of the plan, form of the building, and style of its elevations.[76] Alongside a written description, each architect would then be required to submit simple plan and perspective drawings only. If the judges have difficulty in choosing between two sets of designs of equal merit, then 'each candidate should be requested to furnish a model, for which, whether successful or otherwise, he should be paid.'[77] Despite the expense and time consuming nature of model-making, Leeds affirmed that there was an objectivity and a truth to models that was absent in drawings, which could evade potential issues by careful selection of views.

Construction

In 1997, Port concluded that Tite was instructed, in response to criticism in the press that his design of the portico was too shallow, to consider alterations. On 12 February 1841 Tite produced a model and drawings that doubled the depth of the portico by inserting an extra column at each side. From study of the primary sources, however, this article is able to offer a revision to Port's proposal. There are in fact no discussions in the committee minutes regarding public criticism of the design or requests for revisions; and the only changes proposed by Tite relate to converting plans into working drawings for the building contract.[78]

There is, however, a model that shows the revised scheme. Produced in plaster by Richard Day, the model shows the portico with an extra column, the corner arrangement, and one bay of the building's southern flank (**fig. 6**).[79] The son of a mason, Day was based in south London and active between 1816 and 1851. Ingrid Roscoe has identified his early independent work as the sculptor of a pair of Greco-Egyptian funerary monuments, before his involvement as a stone-carver at Buckingham Palace in 1827–28.[80] Between 1831 and 1847, he exhibited with his son Robert exhibited five times at the Royal Academy. Four of these works were original compositions under their own names, but in 1837 a design was exhibited by Charles Fowler for his monument to Walter Scott in Edinburgh, which was in the form of a model that Day made.[81] Day probably met Tite through his association with the Architectural Society where, in January 1834, he exhibited 'numerous models'.[82] A few months later, in March 1834, he produced a model for William Wilkins of his proposal for the National Gallery, which was exhibited to the public alongside other models by

Day, first at the Adelaide Gallery, just east of St Martin-in-the-Fields, and then transferring to 13 King William Street in the City.[83] Little has been written about the background and training of model makers; in 1967 Wilton-Ely suggested that model making only became a specialist endeavour in latter half of the nineteenth century.[84] The prominence of individuals such as Day, however, would suggest that there were specialist model-makers already operating in the pre- and early Victorian periods.[85] The transition of Day from architectural sculptor to model-maker would also seem to confirm that there was a blossoming market for models during this period.

Unfortunately, due to an absence of documentation, it is unclear how much the model of the portico cost, or exactly what services Day provided. Made at the same scale as Cockerell's model, half an inch to the foot, the model includes carved details showing the proposed capitals of the columns and pilasters, and establishes the depth and form of niches and the shaping of mouldings at the juncture with the façade. Despite providing so much detail about the ornamentation, profile and form of the proposed building, however, there is still a disjunction between the materiality of the model and the material reality of the proposed building: in the model, wall and window are both shown abstractly in plaster with no attempt to represent stone or glass. One reason for this, of course, is that the committee had already decided at the competition stage that the building was to be construction of 'stone of a hard and durable quality'.[86]

The obvious question is why a model was made at this particular stage. In order to explore the model's purpose, it is important to discuss the contractual basis for the Royal Exchange's rebuilding. The joint committee had decided early on to divide the new work into two lump sum contracts, one for the foundations and the other for the rest of the building. At a meeting on 16 October 1840, the committee received tenders for the foundations.[87] As the minutes noted, however, one of the committee members suggested, prior to the tenders being considered, that the excavation of the area beneath the proposed portico should be excluded. Tite had estimated that the cost of this work, including excavation and concrete and the vaulting of this area, was approximately three thousand pounds,[88] and, as a result, the committee decided to omit it from the contract. This allowed time, while the ground workers were on site, for the portico design to be considered more fully. In fact, following the committee's decision, the minutes recorded that 'Mr. Tite be requested to consider what alterations he would propose as to the portico, or any other suggests which may occur to him'.[89] Tite then returned to the committee on 15 January 1841 and 'produced a model and various drawings explanatory of the arrangements he suggested for the portico and the ground plan of the new building'.[90] As described in these minutes, he proposed to deepen the portico with an additional row of columns in order to improve 'the effect of the building ... with reference to the surrounding objects'.[91] Despite his comments to the committee six months earlier, when asserting that models created unrealistic expectations of an architect's design, Tite now saw a role for the model in the communication of a design and its effects to others. The model, unlike the perspectival drawings submitted in competition, also

offered an opportunity for the effects of a building to be examined within an urban scenography.

In June 1841, however, the model's role then changed. It was exhibited at a meeting of the Architectural Society where it received 'considerable praise and attraction'.[92] As *The Times* reported:

[indent]A model of the portico of the new Royal Exchange was exhibited and looked exceedingly handsome. The pillars are a series of eight columns with Corinthian capitals, with a row of four behind them, while the order is carried round the building by a series of Corinthian pilasters.[93]

[follow on]The aim of the Architectural Society, founded in 1831, was to advance architectural knowledge and it held the long-term ambition of establishing a school of architecture.[94] Several members donated models and casts to the society, where Tite held the presidency from 1838 until its union with Royal Institute of British Architects in 1842.[95] One of the society's distinctive events was the *conversazione*: an open occasion where work was exhibited and discussed in public. These particular events have received little attention from historians, unlike similar gatherings staged by scientific bodies but, by all accounts they were very well-attended: the society's first *conversazione* in 1834 attracted '200 professors and amateurs of architecture'.[96] It is likely that thay also performed an important didactoic role during this period. Historians in the field of science have suggested that the *conversazione* served just such a role, through the transfer of 'approved knowledge' and as an arbiter of taste.[97] Other scholars have emphasised the symbolic significance of participating in a *conversazione* where both

individual and collective identities were expressed in the public sphere, and often led to the formation of consensual judgments.[98] It appears that similar events for the architectural community could also provide opportunities for collective judgement: the Manchester Architectural Society dedicated their April 1838 *conversazione* to the recent competition for Manchester's proposed catholic church, as 'public examination is the most effective mode of insuring just decisions in competition'.[99]

Within the confines of the *conversazione,* the physical, textual and visual products of the architectural profession were presented to an urban public as evidence of architectural and cultural achievement and sophistication, and the capacity of architecture to cultivate. Tite's model of the portico, removed from the context of the committee meeting, ceased to be a revision of his design and instead began to act as a mediator between present and future. In several descriptions of the model, it is referred to as an object 'as approved and decided by the Gresham Committee'. It became a rhetorical device, or metaphorical object, used to mediate between notions of idea and building, or of decision and form. In July 1842, the *Civil Engineer and Architect's Journal* complained about the absence of the portico model from that year's Royal Academy Exhibition: 'Neither do we see Tite's model of the portico of the Royal Exchange, as now extended, and improved from the first design'. [100] The grumble was wrapped up within a larger complaint about the lazy attitude of the profession towards the Royal Academy and the lack of support of the Royal Academy for architecture. Sections of the architectural press certainly recognised the importance of presenting contemporary designs to the general

public at the Royal Academy Exhibition through the medium of models. Tite's model, however, was now entering a different arena, which was well outside of the confines of the exhibition room.

Ceremony

On 17 January 1842, under a large fabric canopy designed by Tite and illuminated by candlelight, Prince Albert laid the foundation stone for the new Royal Exchange.[101] Prior to the ceremony, Tite had presented two models of the new building to Prince Albert.[102] One of these, as is clear from a lithograph by Thomas Allom documenting the event, was the portico model, while the other appears to be a model of the east-facing elevation with its two towers (**fig. 7**). According to newspaper reports, the exhibition of these two models 'excited general admiration',[103] an admiration generated by a twofold dynamic. On the one hand, the models had a performative role as a testimonies and proxies for the building being constructed. The visual witnessing of the model, blessed by the prince, is further acknowledged by the gathering crowd. On the other hand, the models were obviously not the building, and not simply the projection of an idea, but they held a particular reality of their own.

With construction delayed by four months because of frost, the new building was officially opened by Queen Victoria at a large-scale public ceremony and banquet held on 28 October 1844.[104] Shortly after ten o'clock, the queen and her royal escort left Buckingham Palace for the City. Either side of the Mall and the Strand, crowds nine or ten deep gathered to see the procession and, at

noon, the royal party arrived at Temple Bar to be greeted by the City of London's Lord Mayor and Aldermen before the party proceeded to the Royal Exchange. By quarter past twelve, the queen and Prince Albert climbed the steps, and progresses through the portico into the courtyard, before ascending the Grand Staircase and being received in the Lloyds Rooms on the first floor. One large room, the Subscribers' Room, was prepared for a lavish *déjeuner* while, a smaller room, the Reading Room, on the building's southwest corner was to serve as a reception room for the queen. It was here that Tite presented two other models to the queen, which were positioned either side of the room's mantelpiece: one of the east end of the Exchange and the other of the quadrangle.[105]

Unfortunately neither of these models appears to have survived, but they are visible in a lithograph of the event published in the *Illustrated London News* on 9 November 1844 (**fig. 8**).[106] Judging from this image, the two models were similar in scale to the portico model. There are no mentions of any additional models made for or presented in front of the Joint Gresham Committee. Nor do accounts of the opening ceremony note any specific payment for models, although Tite was paid £101 'for commission, drawings, &c'.[107] It is most likely that these models were the work again of Richard Day and probably invoiced through Tite to the Mercers' Company. With no evidence that these models were connected to the design or construction process, it seems reasonable to presume that they were produced after the building, externally at least, was finished. They this do not look forward to a future, and nor do they necessarily allow the viewer to comprehend something

previous unknown. Instead, they are performative objects that allow the building to be consumed by the viewer.

Legacy

In October 1848, an article in *The Builder* lamented the lack of commissions for Richard Day and commented that 'There are few architects who are not acquainted with the admirable models made by Mr. Day. We are sorry to hear that after struggling for some years to make a living by the practice of his art ... he must either seek some other occupation or starve'.[108] The lack of commissions suggests that attitudes towards models by architects and the public had begun to change. Certainly, fewer models were being exhibited at the Royal Academy.[109] Isabella Flour has proposed that from 1850 plaster casts became the preferred medium for architectural displays in newly formed museums.[110]

Nevertheless, architectural models would still feature in various smaller exhibitions in galleries, and in artistic and scientific institutions, and some were displayed at the International Exhibitions of 1851, 1862, and 1867.[111] At the 1851 International Exhibition, under 'Class 30 – G: Models in Architecture, Topography, and Anatomy', Richard Day exhibited five architectural models: the portico of the Parthenon, The Temple Church, the portico of the Pantheon at Rome. the Martyrs' Memorial at Oxford, and a window from St Paul's Church on Herne Hill.[112] Further along in the exhibition hall, and displayed next to a cardboard model of York Minster carved with a penknife, the portico model of the Royal Exchange was

exhibited under Tite's name alone.[113] Eleven years later, at the International Exhibition of 1862, in the Fine Art Department, a group of architects, including T.L. Donaldson, George Gilbert Scott and William Tite, now the president of the RIBA, selected twenty architectural models to be displayed.[114] Exhibited as a group on the first floor of the building, parallel to Exhibition Road, Tite and Day's model of the Royal Exchange portico was again exhibited to the visiting public,[115] and, as at the previous exhibition, it was presented under Tite's name only. Such differences in classification and attribution between architects and model-makers offer a glimpse as to the reasons for now exhibiting architectural models. In 1851, Day had exhibited models for commercial reasons, and by producing models at different scales and in styles of differing periods, he was demonstrating his ability to produce work based on a customer's requirements. The portico model of the Royal Exchange exhibited in 1851 and 1862, by contrast, was purely a vehicle to transmit the design of an architect to the visiting public and to celebrate contemporary British architecture. Tite then presented a second model of the Royal Exchange to University College London in August 1865, as a reference specimen for the teaching of architecture.[116] Architectural models also constituted a presence in the early collections of the South Kensington Museum, as Fiona Leslie has outlined.[117] In 1873, the museum received a donation from Lady Emily Tite following her husband's death, which was Tite's Royal Exchange portico model.[118] The probable intention was to help consolidate Tite's architectural legacy – but the model has never been exhibited.

Conclusion

As has been demonstrated, our understanding of the competition and construction of the Royal Exchange is incomplete without the knowledge of architectural models produced in its connection. Although models were evidently perceived by Cockerell as having an ability to generate new forms of knowledge, they were not considered by all as being a truthful or valid form of representation. The re-presentation of the model in different situations, by Tite and others, however, allowed it to play multiple roles in architectural contexts and in nineteenth-century social and cultural life. The Royal Exchange episode also offers a glimpse of the relationship between the representational culture of the model and the socio-economic forces and contractual aspects of construction. It raises questions as to why so few historians have explored architectural models and their potential ability to breech historiographical disjunctures between the economic infrastructure and the cultural superstructure of a building's history.

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[1] Martin Briggs, 'Architectural Models – I', *The Burlington Magazine for Connoisseurs*, 54, 313 (1929), pp. 174–75, 178–81 and 183; Martin Briggs, 'Architectural Models – II', *The Burlington Magazine for Connoisseurs*, 54, 314 (1929), pp. 245–47 and 250–52; John Wilton-Ely, *The Architect's Vision* (Nottingham, 1965), catalogue of an exhibition held at the Nottingham University Art Gallery in 1965; John Wilton-Ely, 'The Architectural Model', *Architectural Review*, 142 (July 1967) pp. 26–32; and John Wilton-Ely, 'The Architectural Models of Sir John Soane: A Catalogue', *Architectural History*, 12 (1969) pp. 5–38 and 81–101.

[2] Wilton-Ely, 'The Architectural Model', p. 32.

[3] Ibid., p. 32.

[4] Ibid., p. 32.

[5] John Physick and Michael Darby, *Marble Halls: Drawings and Models for Victorian Secular Buildings* (London, 1973).

[6] Ibid., p. 13.

[7] Margaret Richardson, 'Model Architecture: Sir John Soane's Collection of Architectural Models', *Country Life*, 183, 38 (21 September 1989), pp. 224–27; Tim Knox 'Ecclesiastical models', *RIBA Journal*, 99, 8 (August 1992), pp. 30–33; Tim Knox, 'Cockerell's Model for Langton: a House for the Dorsetshire Nimrod', *The Georgian Group Journal*, 3 (1993), pp. 62–67; Matthew Williams, 'Lady Bute's Bedroom, Castell Coch: A Rediscovered Architectural Model', *Architectural History*, 46 (2003), pp. 269–76.

[8] Fiona Leslie, 'Inside Outside: Changing Attitudes Towards Architectural Models in the Museums at South Kensington', *Architectural History*, 47

(2004), pp. 159–200; Edward Bottoms, 'The Royal Architectural Museum in the Light of New Documentary Evidence', *Journal of the History of Collections*, 1 (2007), pp. 115–39; Isabella Flour, 'On the Formation of a National Museum of Architecture: the Architectural Museum Versus the South Kensington Museum', *Architectural History*, 51 (2008), pp. 211–38.

[9] London, Mercers' Collection [hereafter 'MC'], Joint or Grand Gresham Committee minute book [hereafter 'GC'], minute of meeting held on 18 January 1838.

[10] MC, GC, minute of meeting held on 4 January 1839.

[11] J.G. White, *History of the Three Royal Exchanges* (London, 1896).

[12] Katharine Ada Esdaile, 'Battles Royal: No.1. The Royal Exchange', *Architect and Building News* (9 January 1931), pp. 47–49; Henry-Russell Hitchcock, *Early Victorian Architecture in Britain*, 2 vols (London and New Haven, 1954), 1, pp. 305–06; Joan Bassin, *Architectural Competitions in Nineteenth-Century England* (Ann Arbour, 1984), pp. 42–47.

[13] David Watkin, *The Life and Work of C.R. Cockerell* (London, 1974), pp. 207–10.

[14] London, Royal Institute of British Architects, British Architectural Library [hereafter 'BAL'], vol/77, `Reminiscences of my twenty-six years association with the late Professor C.R. Cockerell Esq. with a supplement of the late F. P. Cockerell Esq. to 1878' [hereafter 'Reminiscences'], f. 42.

[15] M.H. Port, 'Destruction, Competition and Rebuilding: The Royal Exchange, 1838–1884', in *The Royal Exchange*, ed. Ann Saunders (Leeds, 1997), pp. 286–93.

[16] The ground plan of the site issued for the competition offers the clearest depiction of this: MC, GC, minute of meeting held on 26 March 1839, Instructions to Architects, p. 4.

[17], MC, GC, minute of meeting held on 26 March 1839.

[18] London, London Metropolitan Archives [hereafter 'LMA'], CLA/062/04/019, *Royal Exchange: Extracts and Reports*, 'Proceedings Connected with the Rebuilding of the Royal Exchange, 1838–1844' [hereafter '*Proceedings*'], 26 March 1839.

[19] MC, GC, minute of meeting held on 26 March 1839.

[20] MC, GC, minute of meeting held on 24 April 1839, letter from T.L. Donaldson to the Joint Gresham Committee; 'Paper read by W. Tite, esq., President of the Architectural Society, at the Last Soiree of the Season, 1839', *The Civil Engineer and Architect's Journal*, 2 (July 1839), pp. 242–43.

[21] 'Royal Exchange', *The Civil Engineer and Architect's Journal*, 2 (May 1839), pp. 173–74.

[22] 'Extract from a Report of the Committee appointed to consider the subject of Public Competitions for Architectural Designs. Laid before the Special General Meeting, held 24th January 1939', *The Civil Engineer and Architect's Journal*, 2 (May 1839), p. 183.

[23] Thomas Hopper, *A Letter to Lord Viscount Melbourne on the Rebuilding of the Royal Exchange* (London, 1839), p. 5.

[24] 'Reviews: A Letter to Lord Viscount Melbourne on the Rebuilding of the Royal Exchange. By Thomas Hopper, Architect', *The Civil Engineer and Architect's Journal*, 2 (April 1839), p. 143.

[25] Ibid., p. 143.

[26] MC, GC, minutes of meetings held on 27 August 1839 and 6 September 1839.

[27] LMA, CLC/521/MS04952, bound volume of papers by Joseph Gwilt relating to the Royal Exchange' [hereafter 'Gwilt Papers'], 'The Royal Exchange – Report of the Architects', 2 October 1839, f. 2v.

[28] For a rough plan of the exhibition and Gwilt's initial comments see LMA, CLC/521/MS04952, 'Gwilt Papers', 11 September 1839, ff. 11r–12v.

[29] LMA, 'Proceedings', minute of a meeting held on 5 November 1839.

[30] LMA, ' Proceedings', minute of a meeting held on 14 November 1839.

[31] BAL, CoC/1/31: C.R. Cockerell Royal Academy lecture notes, 20 January 1848, ff. iv–v.

[32] LMA, CLA/062/04/019, *Royal Exchange: Extracts and Reports*, 'Proceedings', minute of a meeting held on 5 November 1839.

[33] MC, GC, minute of meeting held on 3 February 1840.

[34] RIBA, BAL, VOL/77, 'Reminiscences', f.42.

[35] LMA, CLA/062/04/019, *Royal Exchange: Extracts and Reports*, 'Proceedings', minute of a meeting held on 11 February 1840.

[36] RIBA, BAL, VOL/77, `Reminiscences', ff. 42–43.

[37] LMA, CLC/521/MS04952, 'Gwilt Papers', 28 September 1839, f. 17v.

[38] LMA, CLC/521/MS04952, 'Gwilt Papers', undated, f. 27r.

[39] London, Royal Institute of British Architects, Drawings Collection, SC88/15(13): C.R. Cockerell, preliminary studies for competition design for the Royal Exchange, perspective sketch of interior courtyard looking east.

[40] MC, GC, minute of meeting held on 28 April 1840. Letter from C.R. Cockerell to the Joint Gresham Committee.

[41] MC, GC, minute of meeting held on 28 April 1840. Letter from William Tite to the Joint Gresham Committee.

[42] MC, GC, minute of meeting held on 28 April 1840.

[43] BAL. CoC/3/16: 'Copy of C R Cockerell's report to the Committee of the Gresham Trustees for carrying into execution the rebuilding of the Royal Exchange in London, 4 May 1840', f. 1v.

[44] Lambros Malafouris, *How Things Shape the Mind*: *A Theory of Material Engagement* (London, 2013), p. 27.

[45] Tim Ingold, *Making: Anthropology, Archaelogy, Art and Architecture,* (Abingdon, 2013), p. 21.

[46] £400 in 1840 was worth approximately £24,430 in 2010. As a point of comparison, in 2010 a professionally made 4.5m long architectural model, in painted timber and perspex of a site in central London at 1:50 scale, cost approximately £20,000.

[47] BAL, VOL/77, 'Reminiscences', f. 43.

[48] W.H. Leeds, 'Article III: The New Royal Exchange', *Westminster Review*, 35. 1 (January 1841), p. 66.

[49] 'New Royal Exchange', *Morning Chronicle*, 22 May 1840, p. 4.

[50] 'Royal Exchange', *The Civil Engineer and Architect's Journal,* 2 (May 1839), p. 173.

[51] Royal Academy, *Royal Academy Exhibition LXXII* (London, 1840), p. 46, no. 910.

[52] This occurred in a model of Langton House produced for Cockerell in 1825. See: Knox, 'Cockerell's Model for Langton', p. 66.

[53] Chris Otter, *The Victorian Eye: A Political History of Light and Vision in Britain, 1800–1910* (Chicago and London, 2008), pp. 47–48.

[54] LMA, CLA/062/04/019, *Royal Exchange: Extracts and Reports*, 'Proceedings', minute of meeting held on 22 July 1840.

[55] 'New Royal Exchange', *Morning Chronicle*, 6 June 1840, p. 4.

[56] MC, GC, minute of meeting held on 14 May 1840; 10 June 1840.

[57] BAL, VOL/77, 'Reminiscences', f. 43.

[58] 'New Royal Exchange', *Morning Chronicle*, 22 May 1840, p. 4.

[59] Ibid., p. 4.

[60] Ibid., p. 4.

[61] Ibid., p. 4.

[62] RIBA, BAL, vol/77, `Reminiscences', f. 53, newspaper cutting on far left of sheet: Leader, *Globe*, 3 June 1840.

[63] BAL, vol/77, `Reminiscences', f. 50.

[64] BAL, vol/77, `Reminiscences', f. 53, newspaper cutting on centre left of sheet: 'New Royal Exchange', *Globe*, 3 June 1840.

[65] In particular see: Quatremère de Quincy, 'On Effect in Architecture', *The Architectural Magazine*, 3.26 (April 1836), pp. 144–49.

[66] RIBA, BAL, vol/77, `Reminiscences', f. 53, newspaper cutting on centre left of sheet: 'New Royal Exchange', *Globe*, 3 June 1840.

[67] Editorial, *The Globe*, 6 June 1840, p. 1.

[68] 'Anon. Letter', *The Globe*, 6 June 1840, p. 5.

[69] 'A Constant Reader', *The Times*, 9 June 1840, p. 3.

[70] MC, GC, minute of meeting held on 27 July 1840.

[71] 'W. H. Leeds, 'Article III: The New Royal Exchange', *Westminster Review*, 35.1 (January 1841), pp. 52–88 (p. 67).

[72] Ibid., pp. 62–88.

[73] Ibid., p. 77.

[74] Ibid., p. 78

[75] Ibid., p. 80

[76] Ibid., p. 87.

[77] Ibid., p. 88.

[78] MC, GC, minute of meeting held on 30 September 1840, letter from Tite to the Joint Gresham Committee.

[79] Victoria and Albert Museum, Sculpture Department, museum number: 1069-1873.

[80] Ingrid Roscoe, M.G. Sullivan and Emma Hardy, *A Biographical Dictionary of Sculptors in Britain 1660–1851* (New Haven and London, 2009), p. 349.

[81] Royal Academy, *Royal Academy Exhibition LXIX* (London, 1837), p. 56, no. 1155.

[82] 'Architectural Society', *The Gentleman's Magazine*, 1 (February 1834), p. 209.

[83] 'Architectural Exhibitions', *The Architectural Magazine*, 1.1 (March 1834), p. 89.

[84] Wilton-Ely, 'The Architectural Models of Sir John Soane', p. 10.

[85] This author is in the process of compiling a bibliographic index of architectural model-makers active between 1830 and 1920.

[86] LMA, CLA/062/04/019, *Royal Exchange: Extracts and Reports*, '*Proceedings*', 26 March 1839.

[87] Ibid., minute of meeting held on 16 October 1840.

[88] Ibid., minute of meeting held on 16 October 1840.

[89] Ibid., minute of meeting held on 16 October 1840.

[90] Ibid., minute of meeting held on 15 January 1841.

[91] Ibid., minute of meeting held on 15 January 1841.

[92] 'Architectural Society', *The Civil Engineer and Architect's Journal*, 4 (4 June 1841), p. 237.

[93] 'Architectural Society', *The Times*, 2 June 1841, p. 5.

[94] 'Art. X. *Laws and Regulations of the Architectural Society*', *Architectural Magazine*, 2.19 (November 1835), pp. 513–14.

[95] S. P. Parissien, 'Tite, Sir William (1798–1873)', *Oxford Dictionary of National Biography*, Oxford University Press, 2004; online edn, May 2013 (http://www.oxforddnb.com/view/article/27479, accessed 3 Sept 2016)

[96] 'Architectural Society', *The Gentleman's Magazine*, 1 (February 1834), p. 209.

[97] Jane Wood, 'A Culture of Improvement: Knowledge, Aesthetic Consciousness, and the Conversazione', *Nineteenth Century Studies*, 20 (2006), pp. 79–98 (pp. 80–81).

[98] S.J.M.M. Alberti, 'Conversaziones and the Experience of Science in Victorian England', *Journal of Victorian Culture*, 8.2 (Autumn 2003), p. 223.

[99] 'Architectural Society', *The Civil Engineer and Architect's Journal*, 4 (May 1841), p. 201.

[100] 'Architectural Drawings, Royal Academy', *The Civil Engineer and Architect's Journal*, 4 (July 1841), pp. 232–33 (p. 232).

[101] For a full description of the ceremony see: Effingham Wilson, *Description of the New Royal Exchange* (London, 1844), pp. 80–92.

[102] 'New Royal Exchange', *Observer*, 17 January 1842, p. 3.

[103] 'The Ceremony of Laying the First Stone of the New Royal Exchange by Prince Albert', *The Ipswich Journal*, 22 January 1842, p. 1.

[104] There are various accounts of the occasion. See: LMA, 'Proceedings', 28 October 1844; 'Opening of the New Royal Exchange', *Illustrated London News*, 2 November 1844, pp. 276–85. 'The New Royal Exchange', *Illustrated London News*, 9 November 1844, pp. 291–93.

[105] 'Opening of the New Royal Exchange by Her Majesty', *Chelmsford Chronicle*, 1 November 1844, p. 2.

[106] 'The New Royal Exchange', *Illustrated London News*, 9 November 1844, p. 292.

[107] LMA, 'Proceedings', p. 67.

[108] 'Day, The Architectural Modeller', *The Builder*, 7 October 1848, p. 490.

[109] From 1831 to 1847 there were fifty-three architectural models exhibited at the Royal Academy. Then between 1848 and 1894 there were only four models exhibited: two in 1853, one in 1862 and another in 1866.

[110] Flour, 'On the Formation of a National Museum of Architecture', pp. 229–34.

[111] At present this author is working on a history of architectural models and their exhibition in nineteenth-century Britain.

[112] *Great Exhibition of the Works of Industry of all Nations, 1851: Official Descriptive and Illustrated Catalogue*, 4 vols (London, 1851) 2, p. 830, no. 161A.

[113] Ibid., p. 831, no. 182.

[114] *International Exhibition of 1862: Official Catalogue of the Fine Art Department* (London, 1862), pp. 101–02.

[115] Ibid., p. 101, no. 2126.

[116] 'University College', *Illustrated London News*, 19 August 1865, p. 158.

[117] Leslie, 'Inside Outside', pp. 159–200.

[118] Department of Science and Art, *Twenty-First Report of the Science and Art Department of the Committee of Council on Education* (London, 1874), p. 411, no. 1069.1873.