

WestminsterResearch

<http://www.westminster.ac.uk/westminsterresearch>

Drawing as Research

Difford, R.J.

A paper presented at the *Robin Evans Memorial Series: About Bob Evans*. University of Westminster, 3 March 2016 .

The WestminsterResearch online digital archive at the University of Westminster aims to make the research output of the University available to a wider audience. Copyright and Moral Rights remain with the authors and/or copyright owners.

Whilst further distribution of specific materials from within this archive is forbidden, you may freely distribute the URL of WestminsterResearch: (<http://westminsterresearch.wmin.ac.uk/>).

In case of abuse or copyright appearing without permission e-mail repository@westminster.ac.uk

Robin Evans Memorial Series Inaugural Lecture: About Bob Evans
Thursday 3rd MArch 2016

Richard Difford: “Drawing as Research”

Unlike some of the other speakers this evening, I never knew Bob personally. I knew him instead, as a teacher, and as an academic. In fact the start of my architectural education here at the Polytechnic of Central London coincided almost exactly with his appointment as a lecturer in Architecture.

Crucially for me, these were the years in which Bob’s attention was focussed on architectural representation. Beginning with the essay ‘Translations From Drawing to Building’ (published in 1986)¹, his research from that point on would concentrate, in one way or another, on the special significance that drawing has for architecture. Over the next few years, this work would lead him through many fascinating avenues of enquiry – culminating in the ‘The Projective Cast’.²

“I was soon struck”, he says, “by what seemed at the time the particular disadvantage under which architects labour, never working directly with the object of their thought, always working at it through some intervening medium, almost always the drawing...”³ Understanding how drawings are used to explore and convey architectural ideas was, he realised, crucial for the practice of architecture. And as such, the nature of the correspondences that exist between the abstract world of drawings and the material reality of buildings were of particular significance. On the one hand dependence on drawing seemed to condemn the architect to an inevitable distance; but on the other, this was how his or her involvement in the built object was nevertheless assured. Drawings then were not mere vehicles for conveying information. What gets preserved and what gets lost, across this divide, sets the terms for the architect’s engagement. So rather than seeing the drawing as obstacle to direct involvement, Bob chose instead to investigate its “transitive” and “commutative” properties.⁴

The significance of projective geometry to this investigation became, it seems, immediately apparent and in much of what follows he sought to trace the way projection can inform the generative potential of architectural drawing. His concern was not so much with how “meaning and likeness are transported” intact “from idea through drawing to

¹ Robin Evans, ‘Translations from Drawing to Building’, *AA Files* no.12 (Summer 1986), pp.3-18. Republished in Robin Evans, *Translations from drawing to building and other essays* (London: Architectural Association, 1997), pp.153-193.

² Robin Evans, *The Projective Cast: Architecture and its Three Geometries* (Cambridge Mass.: MIT Press, 1995).

³ Evans, ‘Translations’, *op. cit.*, p.156

⁴ *Ibid.* p.160.

building” but rather how they are transformed...⁵ How through projection the reach of drawing is extended beyond the unaided imagination.⁶

Far from being a deterministic or stiflingly technical convention, projection in this context could be understood as the means by which architects could counteract the instrumentality of essentialism.⁷ In ‘Architectural Projection’⁸ published in 1989 Bob brings to our attention a drawing by Bertrand the Elder in which the shadows cast by a Tuscan column upon itself are carefully plotted.⁹ The drawing employs projective geometry to trace sectional slices through the column. The direction of the light and ultimately, the profiles of the shadows are all conveyed in precisely rendered ink lines. Bob notes how the vividly portrayed shape of the shadows in drawings such as this brought out certain characteristics of classical architecture. One might expect that such an exercise might emphasise the solidity of the form but although technically precise, the results are far from stolid. The shadows, as Bob points out, challenge the static qualities of the stone by superimposing a projection of the column capital onto itself. Despite the “frozen sharpness of geometric delineation”, the insubstantial and transient nature of the shadow becomes integral to the depiction.¹⁰

The origin of drawings such as these lies in the mathematics of descriptive geometry and nowhere is the abstract nature of the line more evident than in its linear tracery. For some, descriptive geometry signified a mathematisation of architecture – the triumph of function over intuition, in which design becomes a purely instrumental technological building science.¹¹ But by looking much more closely at these techniques Bob was able to discover the “unrecognised possibility within drawing”¹² and to challenge both the suggestion that drawing techniques such as perspective and orthographic projection were mere arbitrary conventions; and the notion that they must inevitably lead to soulless instrumentality.

It was not only however what Bob had to say about drawings that was important; it was how he used them. Indeed, his own drawings feature in almost all of his publications; they illustrate, explain and illuminate his writing. And with the same ease as with his writing, the often complex and challenging ideas that he explored, were conveyed with absolute clarity, through diagrams and drawings. But as with architectural drawing more generally,

⁵ Ibid. p.181

⁶ Ibid. p.180

⁷ Ibid. p.181

⁸ Robin Evans, ‘Architectural Projection’ in Eve Blau and Edward Kaufman (eds.), *Architecture and its image: four centuries of representation: works from the collection of the Canadian Centre for Architecture* (Montreal, Canadian Centre for Architecture, 1989), pp.18-35.

⁹ F. Bertrand the Elder, *Shadows Cast by a Tuscan Capital* (1817). Pen and black and red inks with grey wash on laid paper. Collection Centre Canadien d'Architecture, Montréal. See Evans, ‘Architectural Projection’, op.cit. pp.27-28.

¹⁰ Ibid. pp.27-30.

¹¹ See for example, Alberto Perez-Gomez, *Architecture and the Crisis of Modern Science* (Cambridge Mass., MIT Press,1983), pp.272-295.

¹² Evans, ‘Translations’, op. cit., p.182

his own drawings were not simply, as he put it, “trucks for pushing ideas from place to place”¹³, they were also investigative tools.

He was, of course, by no means the only, or even the first, architectural historian to use drawings. Drawings have always formed an important adjunct to architectural writing. Especially to analyse and compare historical precedents. But with Bob there was something different; something about the way he used drawings which meant that they did much more than just illustrate – importantly they occur prior to writing – not after it. These drawings clearly functioned as part of his own thinking process; a way of testing and exploring possibilities and ideas – much, in fact, as they are used in design. But they were also, I suggest, his way of bridging the intervening centuries to disclose meaning not only lost to the modern viewer but sometimes actively obscured by previous art historical interpretation. The closest analogy I can think of is the practice of experimental archaeology - in which researchers reconstruct artefacts and techniques from the past in order to better understand the people and culture in which they were originally produced. Drawing in this case provides a link between objective technical understanding and historical interpretation. As exemplified here by Bob’s pencil rendering of Delorme’s Trompe at Anet,¹⁴ such drawings can also help to visualise architecture that either never existed – or, as in this case, existed but now lost.

His analytical drawings also demonstrate how much can be gained by actually doing something as opposed to just reading about it. Our modern sensibilities ensure that that we can never, of course, experience what it was like to have actually made a drawing such as this in the 16th century; but by engaging with drawing as a process we can at least overcome the tendency to understand them merely as something to be looked at. And by understanding and reproducing the technique we can perhaps gain some insight into the how the original author of the drawing saw the world. But nowhere is the power of drawing as research better exemplified than in Bob’s analysis of the Royal Chapel on the same site.¹⁵ Delorme himself had intimated that there was some kind of projective relationship between the pattern of ribs in the dome and the floor tiling below. And this apparent correspondence had led generations of interpreters to casually assume the floor to be a direct map of the dome. Remarkably no one, it seems, had bothered to investigate further - despite the fact that the number of intersections in the floor and dome did not match. Bob’s detailed analysis, through drawing, not only revealed the assumed correspondence to be incorrect – it also drew out the complex subtlety of Delorme’s actual process which did more to exploit the generative potential of parallel projection than simply to create a tile pattern from the plan of the dome. Significantly it is in the interaction between a pattern of

¹³ Evans, ‘Translations’, op. cit.

¹⁴ Evan, *The Projective Cast*, op.cit., pp.184-189.

¹⁵ Evans, ‘Translations’, op. cit. pp.173-180.

circles drawn in plan and the notional hemisphere of the dome that the elegant vortex of tracery is actually produced.

Having been tutored by Bob, I have tried, in my own way, to apply some of something of this approach. My research on the relation between the work of Theo van Doesburg and n-dimensional geometry has, for example, relied quite heavily on drawing and has allowed me to highlight some errors in the way van Doesburg's work had previously been understood.¹⁶ But perhaps more significantly this approach has also been the basis for a dissertation group that I have run here at Westminster on the part 2 course for almost 20 years. So I would like to finish by quickly showing you just a few examples of some of the most successful dissertations.

One of the more remarkable dissertations I have tutored was that of Joanna Rapp in 2007.¹⁷ Using a technique derived from descriptive geometry, known as restitution, Joanna decided to examine Piranesi's use of perspective. As is well documented, Piranesi's perspectives often combine more than one viewpoint but whilst art historians have made much of this in terms of its implications for the spatial qualities of the drawings, no one had bothered to look any more closely at how they were actually constructed. Joanna realised that in many of these drawings (particularly those of buildings where the actual dimensions of are known) it would be possible to precisely calculate the viewpoints and structure of the combined views—a kind of reverse engineering of perspective. What she revealed was far from the fragmented space that is often talked about. Instead, Piranesi's perspectives are shown to be a cleverly contrived meshing of different views into a single coherent representation.

In 2008 Rebecca Gregory looked at another feat of descriptive geometry – this time as related to stereotomy and stone-cutting in the 19th century.¹⁸ Beginning with a drawing published in the *Builder* in 1845, she not only figured out how the drawing worked but also traced the technique from its origins in continental Europe to the practical treatise of 19th century Britain.

Similar concerns were explored by Catherine Archbold in 2011, this time following in Bob's footsteps by looking at the work of Philibert Delorme, and in particular the role that

¹⁶ Richard Difford, 'Developed Space: Theo van Doesburg and the *Chambre de Fleurs*', *Journal of Architecture* 12/1 (2007), pp.79-98.

¹⁷ Joanna Rapp, 'A Geometrical Analysis of Multiple View-Point Perspective in the work of Giovanni Battista Piranesi', 2006. (RIBA Dissertation Medal 2006/7). Subsequently published in the *Journal of Architecture* 13/6 (2008), pp.701-736.

¹⁸ Rebecca Gregory, 'The art of skew bridges', 2008. (RIBA Dissertation Medal 2008/9). Subsequently published in the *Journal of Architecture* 16/5 (2011), pp.615-674.

models might have played in his investigations - Including making a number of models based on Delorme's drawings.¹⁹

Bringing the subject matter into the 20th century, Teresa Rodriguez's study from 2010, looked at a Le Corbusier's use of curvilinear perspective.²⁰ Here the focus is on a drawing of his infamous city plan – versions of which can be found in the Corbusier archive and tantalizingly show signs of the technique used to construct them. Teresa's investigation used a rigorous form of analysis to establish the methods employed and to contextualize this in relation to the use of curvilinear perspective more widely; and also to speculate about the connection (or otherwise) to the diorama in which similar drawings were once displayed. Meanwhile in 2013 computer modelling was employed by Oscar Sedkowski to explore the qualities of Guarini's unbuilt churches.²¹ And in 2013 Yat Hang Wu also used computer modelling to analyse the anamorphic projections that form the basis for Pozzo's quadratura paintings.²²

Contemporary developments in architectural practice driven by computer technology now seek to minimise the role of drawing as intermediary between architect and building. Indeed the age of the architectural drawing may well be waning as object-oriented modelling and CAD/CAM technologies take the place of representation. We can only speculate what Bob might have made of all this but I suspect these approaches would have been the subject of a similar close examination and critical analysis. And importantly, if the interest that Bob had in drawing was in how its transitive properties could be used to better effect, this is not a question that need be limited only to drawing and we might reasonably expect to find similar or analogous transformations that can be exploited in contemporary techniques – provided we look at them closely enough.

¹⁹ Catherine Archbold, 'Le Premier Tome de l'Architecture: An analysis of models in the work of Philibert de l'Orme' (2010/11)

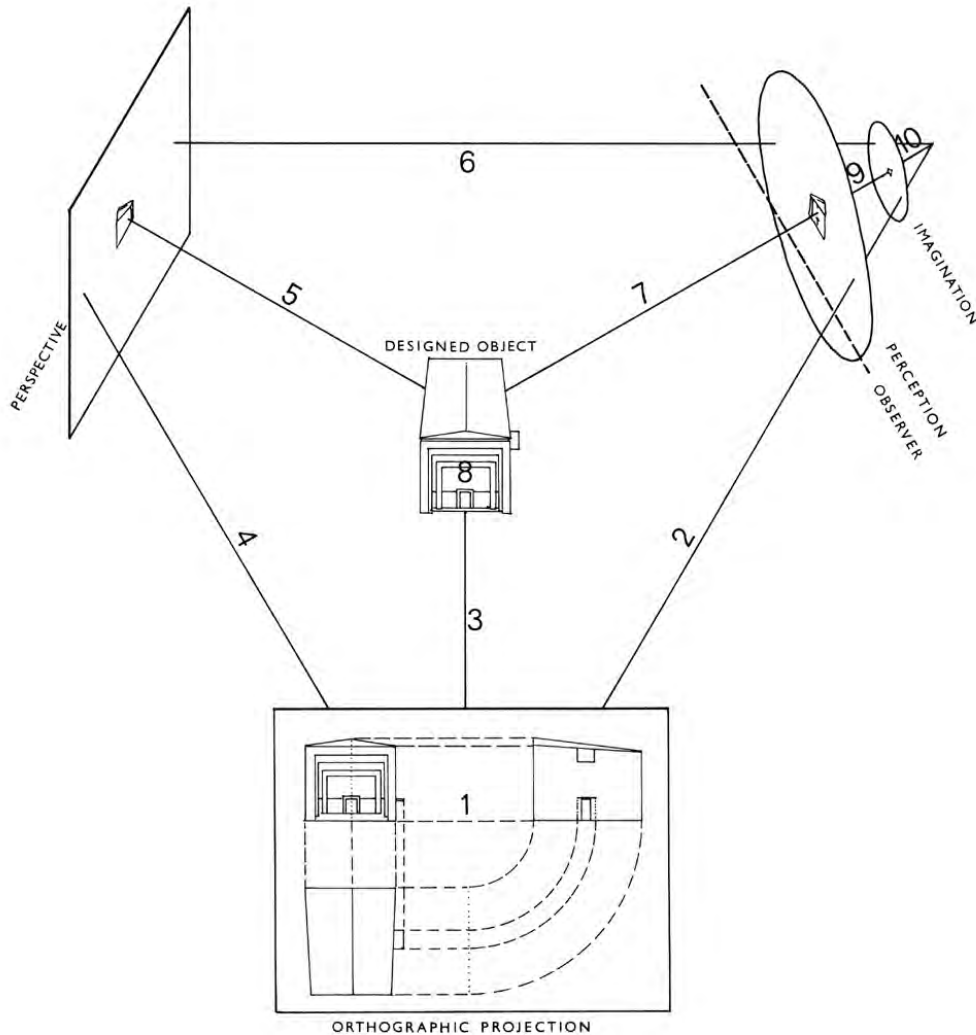
²⁰ Teresa Rodriguez Nikiforova, 'Curvilinear Perspective in the Work of Le Corbusier' (2010/11)

²¹ Oscar Sedkowski, 'Guarino Guarini's Unbuilt Churches' (2013/14)

²² Yat Hang Wu, 'Andrea Pozzo's Transmission of the Divine Spirit' (2014/15)

Drawing as Research

Richard Difford



“... I was soon struck by what seemed at the time the particular disadvantage under which architects labour, never working directly with the object of their thought, always working at it through some intervening medium, almost always the drawing...”

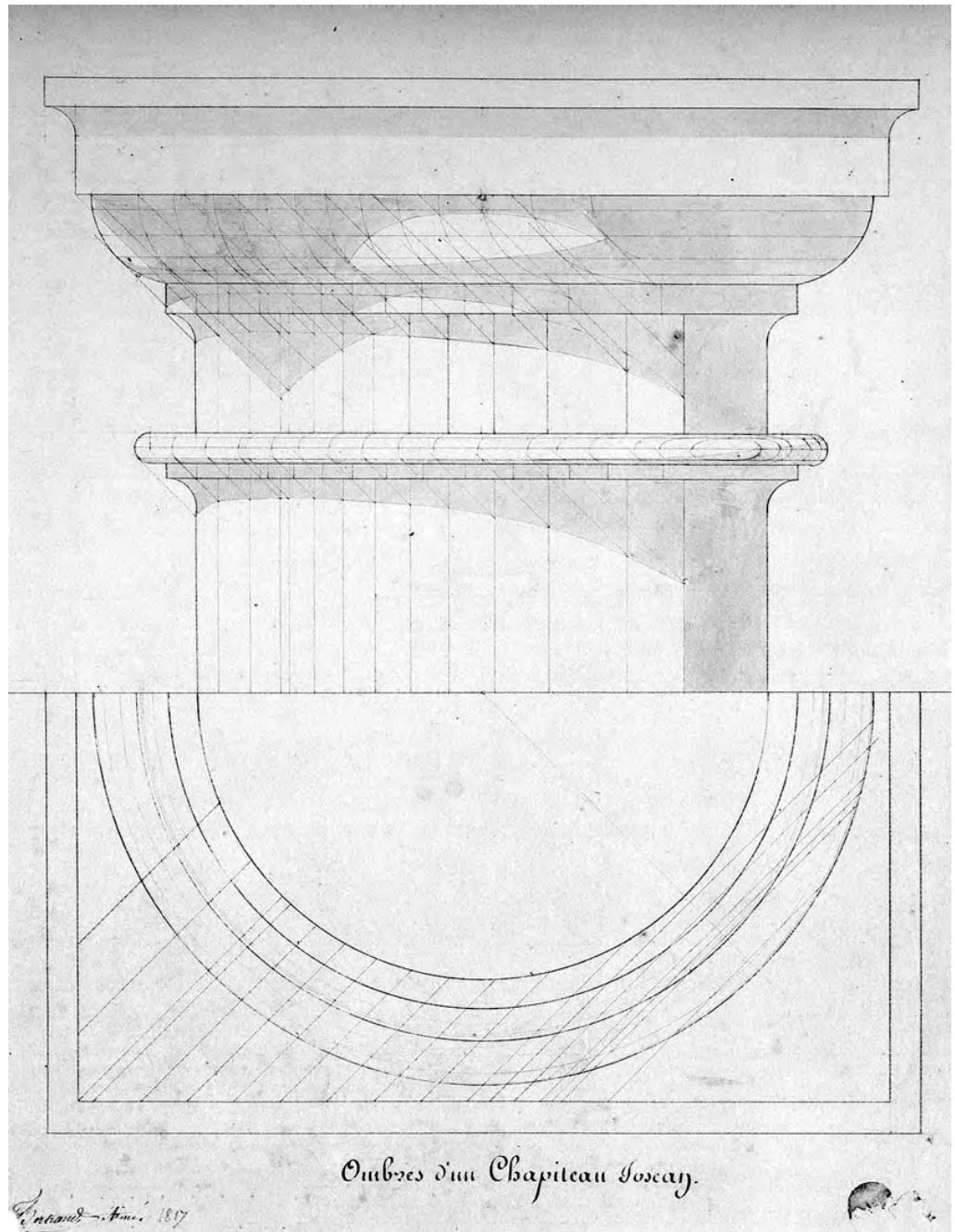
Robin Evans, 'Translations from Drawing to Building' (1986)



David Allan, *The Origin of Painting*, 1773.



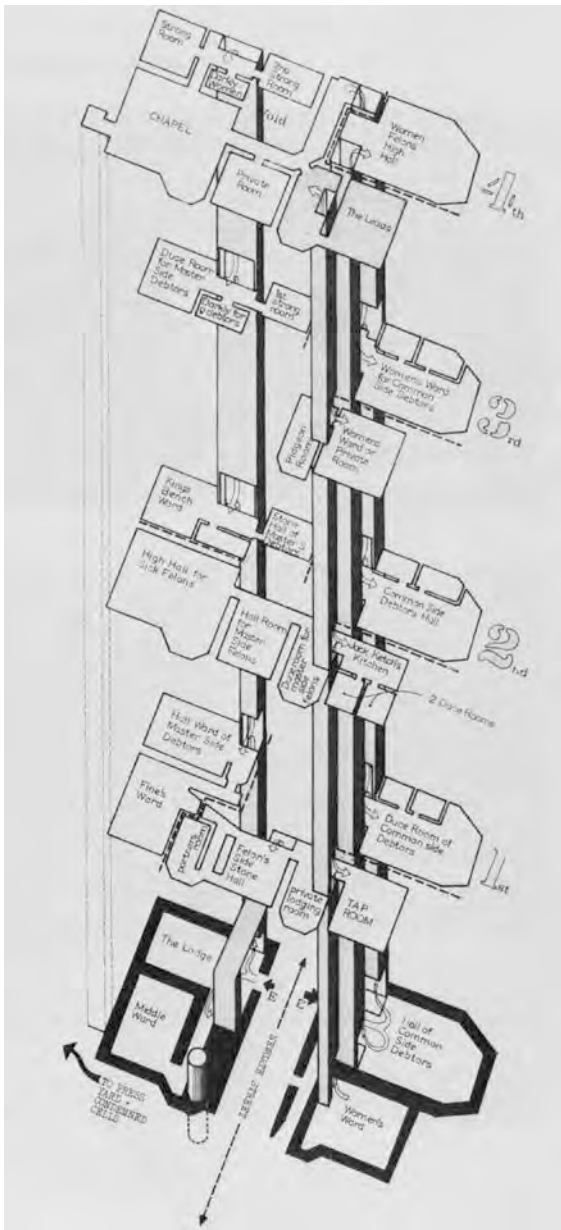
Karl F. Schinkel, *The Origin of Painting*, 1830.



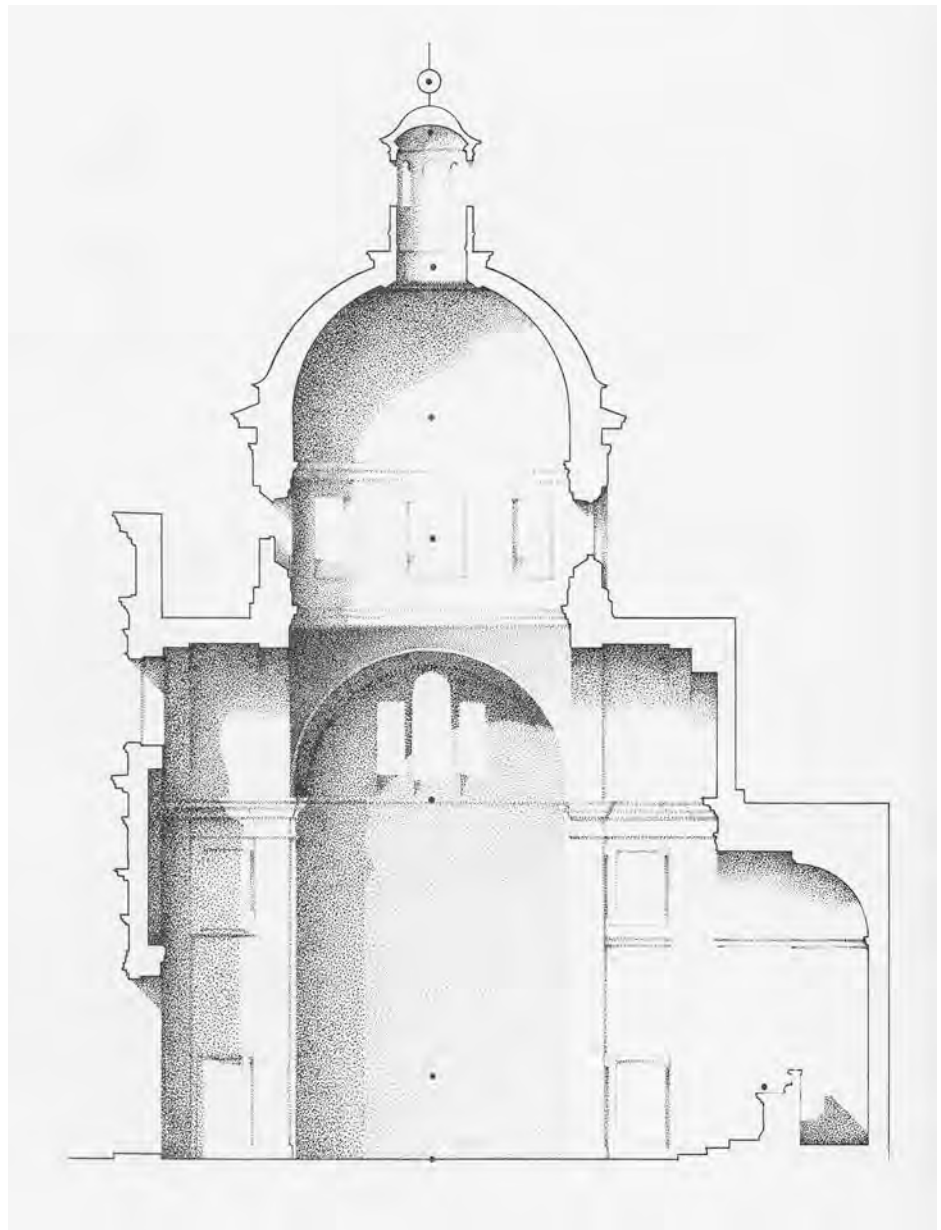
Bertrand the Elder, 1817

Ombres d'un Chapiteau Dorique.

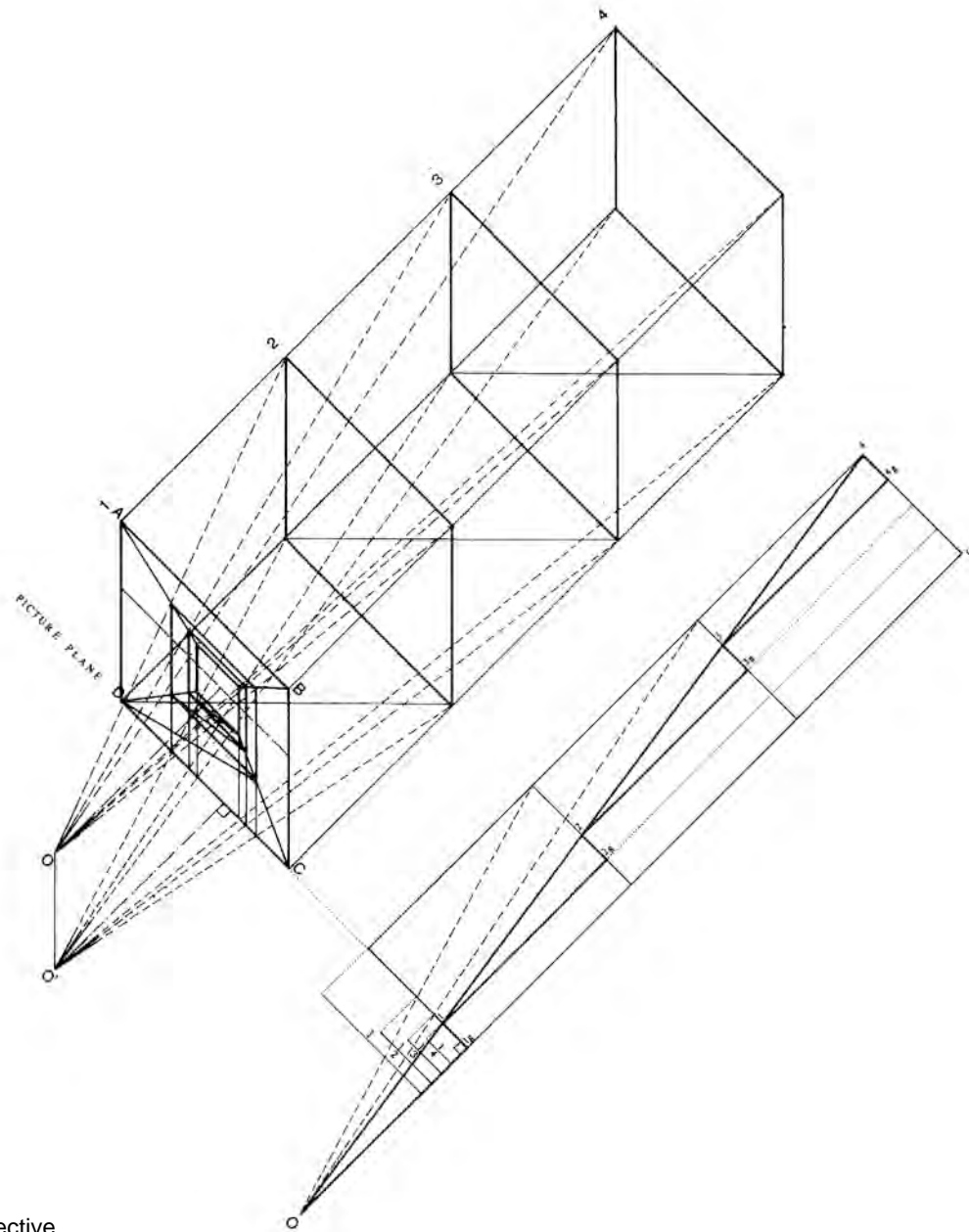
Bertrand - fin. 1817



Newgate Prison, based on the survey of 1767
 Robin Evans, *The Fabrication of Virtue*, 1982

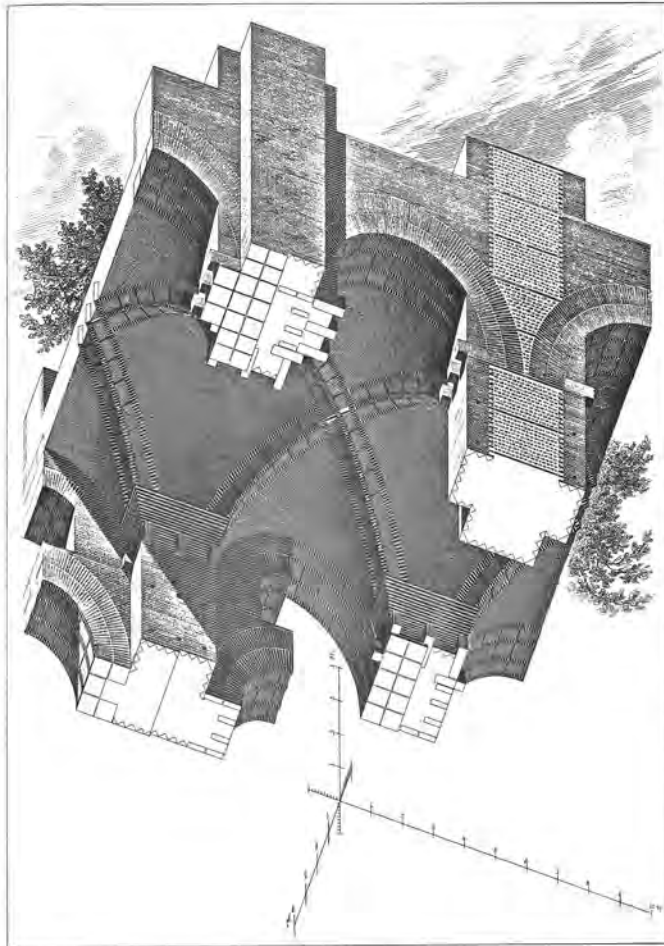


Sant'Eligio degli Orefici, section showing nine centres
 Robin Evans, *The Projective Cast*, 1995



The generation of harmonic ratios in perspective
Robin Evans, *The Projective Cast*, 1995

VIII



DESSINE PAR A. CHOISY

GRAVE PAR J. BURY

PALATIN

Auguste Choisy, *L'art de bâtir chez les romains* (1873).

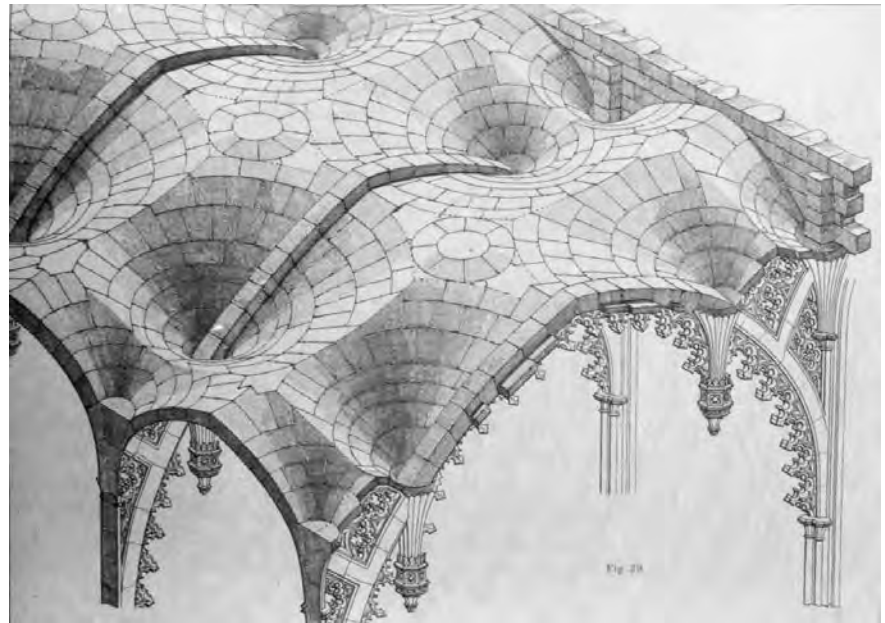
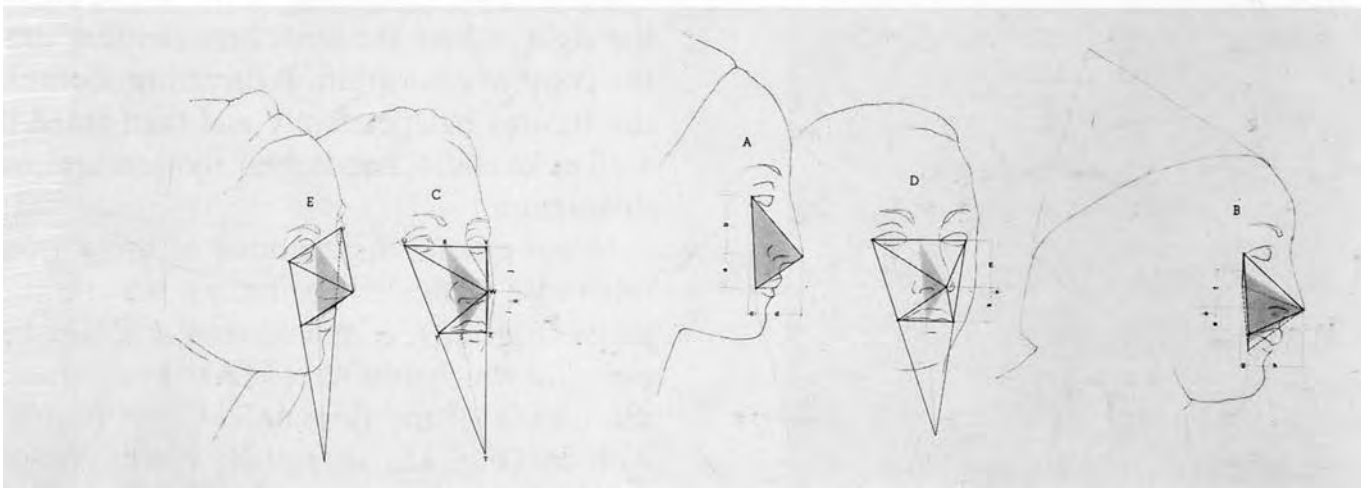
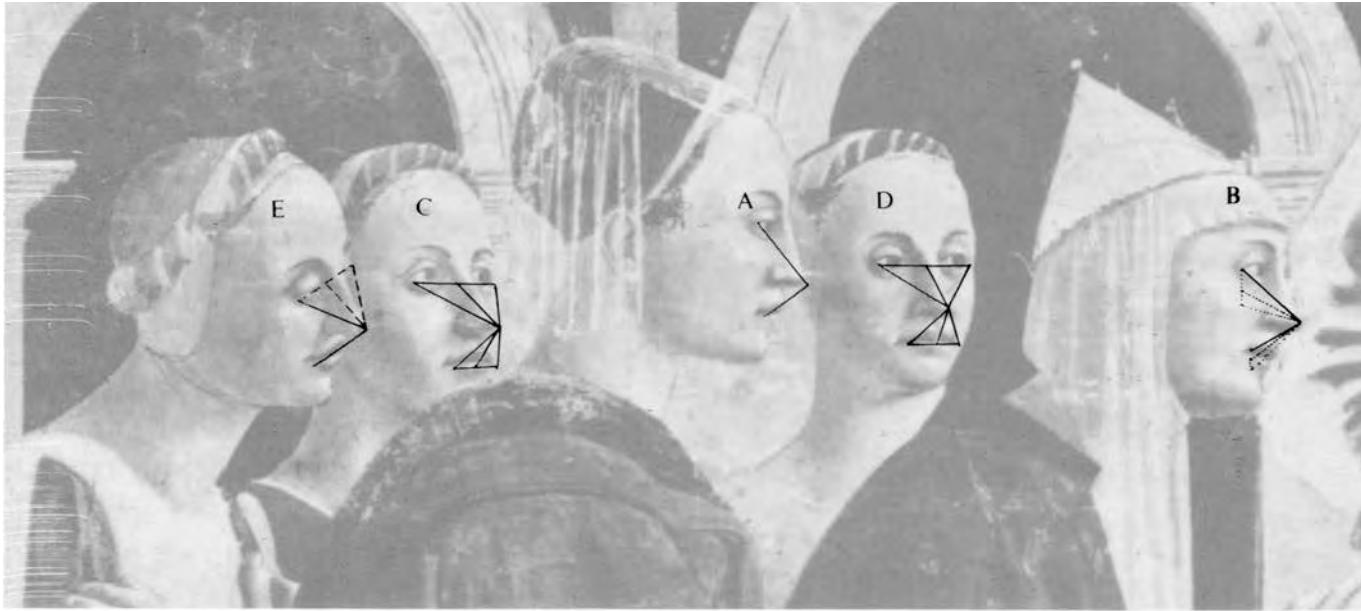
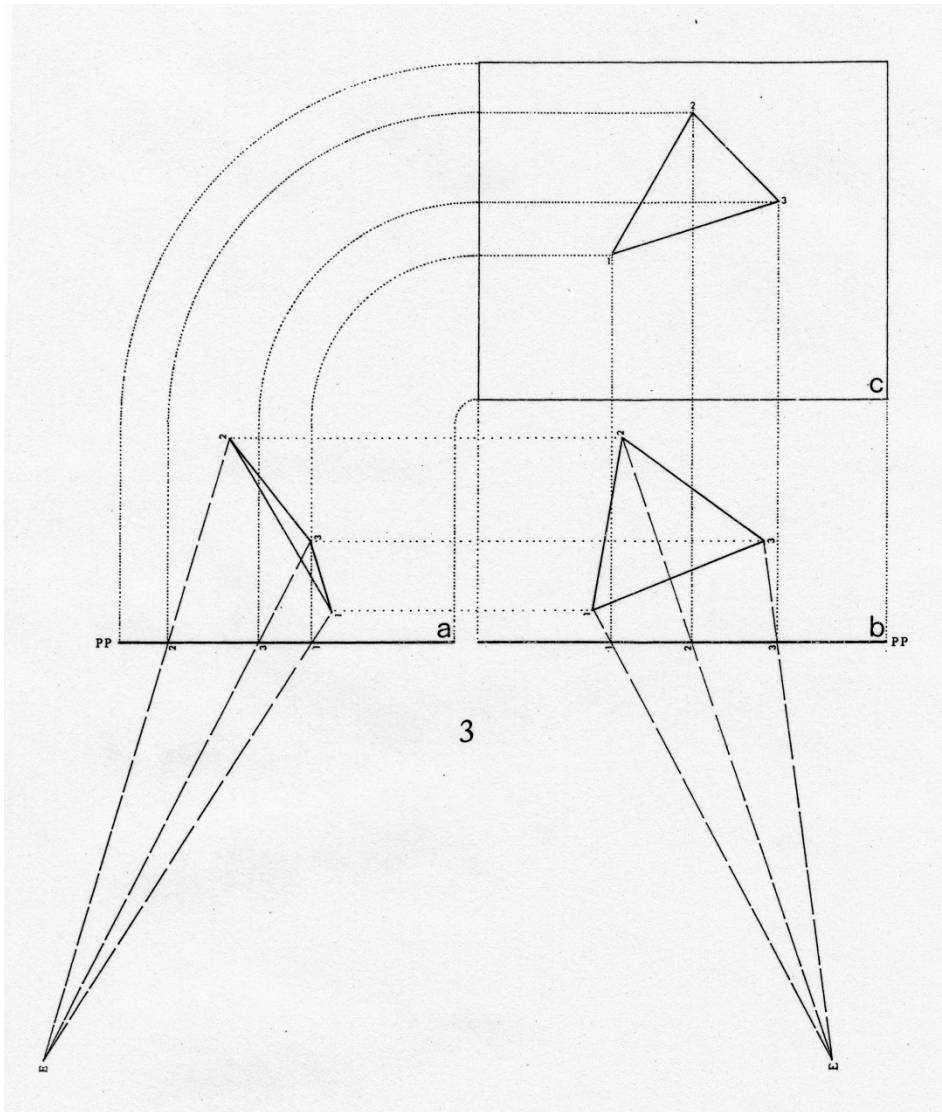


Fig. 28

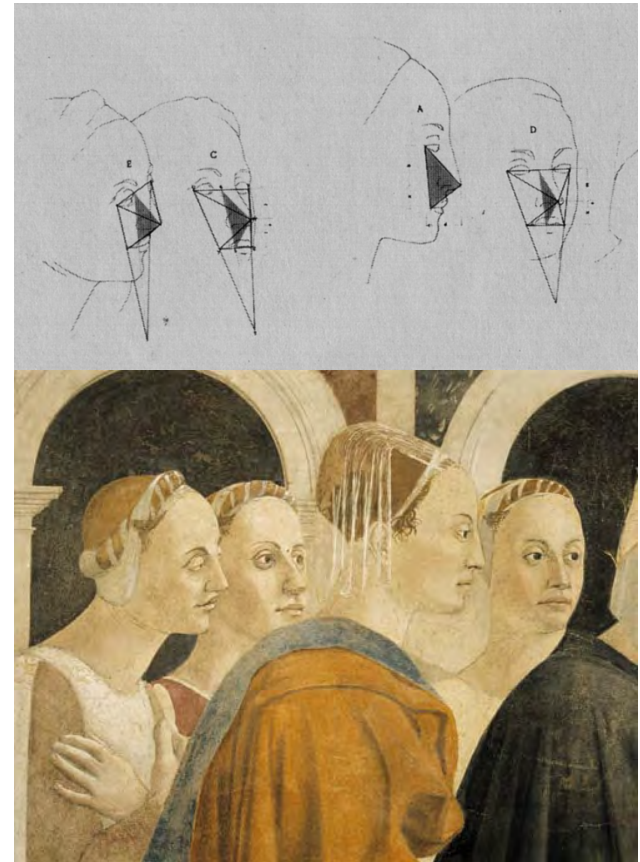
Robert Willis (1842) – Study of the Henry VII Chapel, Westminster Abbey

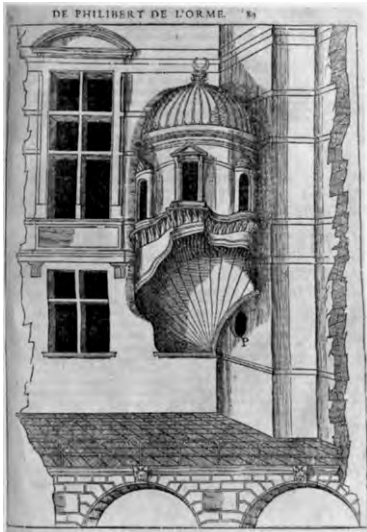


Analysis of a detail from Piero della Francesca's *The Proving of the True Cross*
Robin Evans, 'When the Vanishing-Point Disappears' (1992)

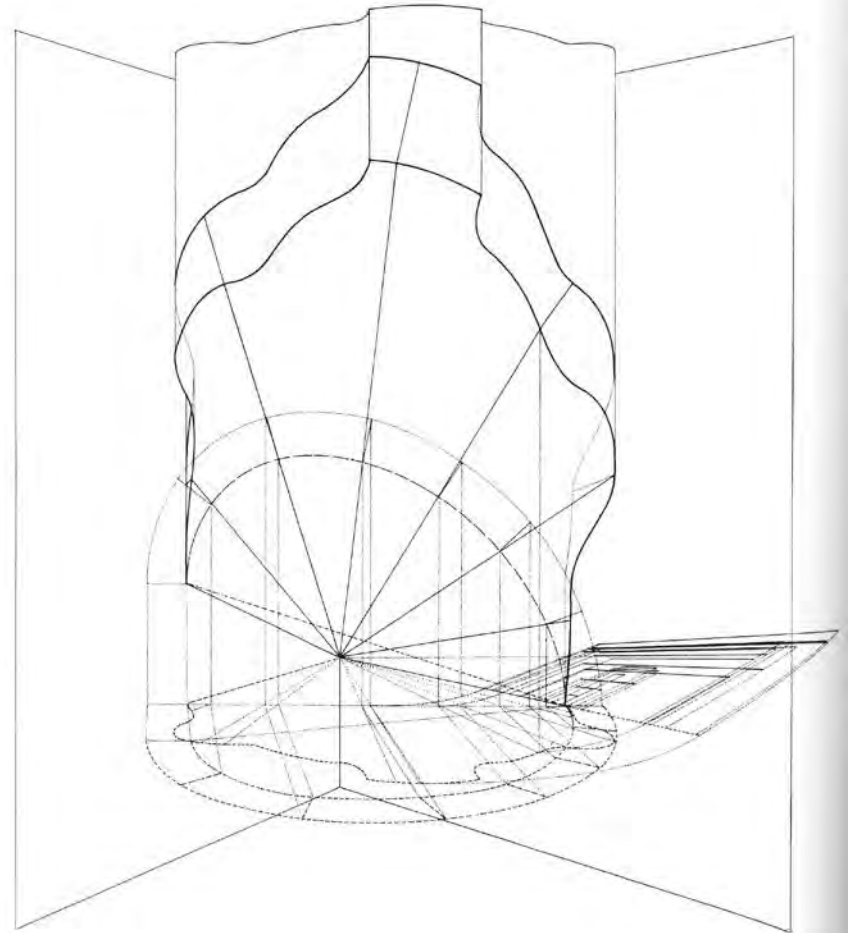
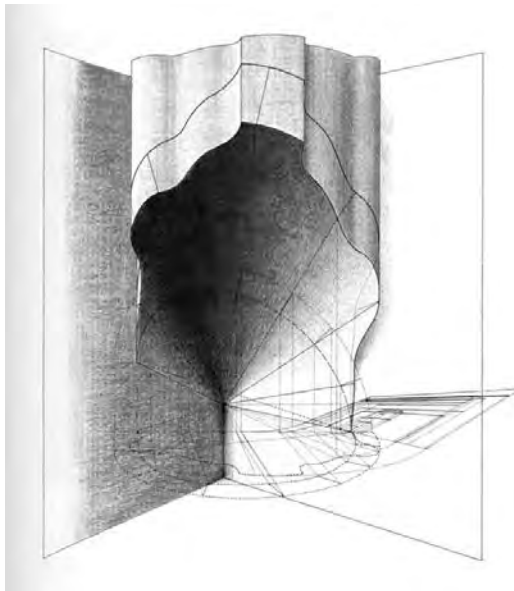


Piero della Francesca's "Other Method" for perspective construction
 Robin Evans, *The Projective Cast*, 1995

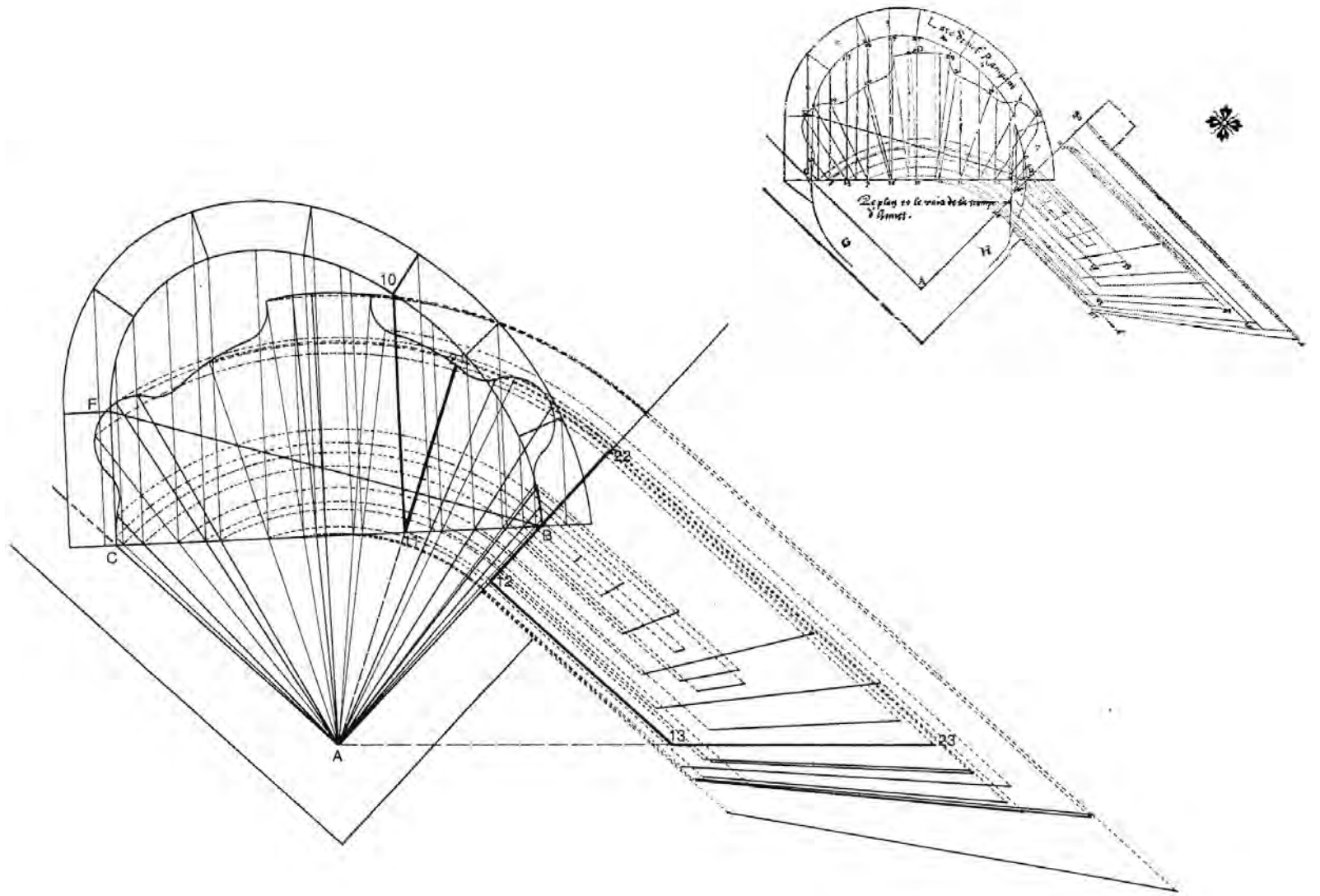




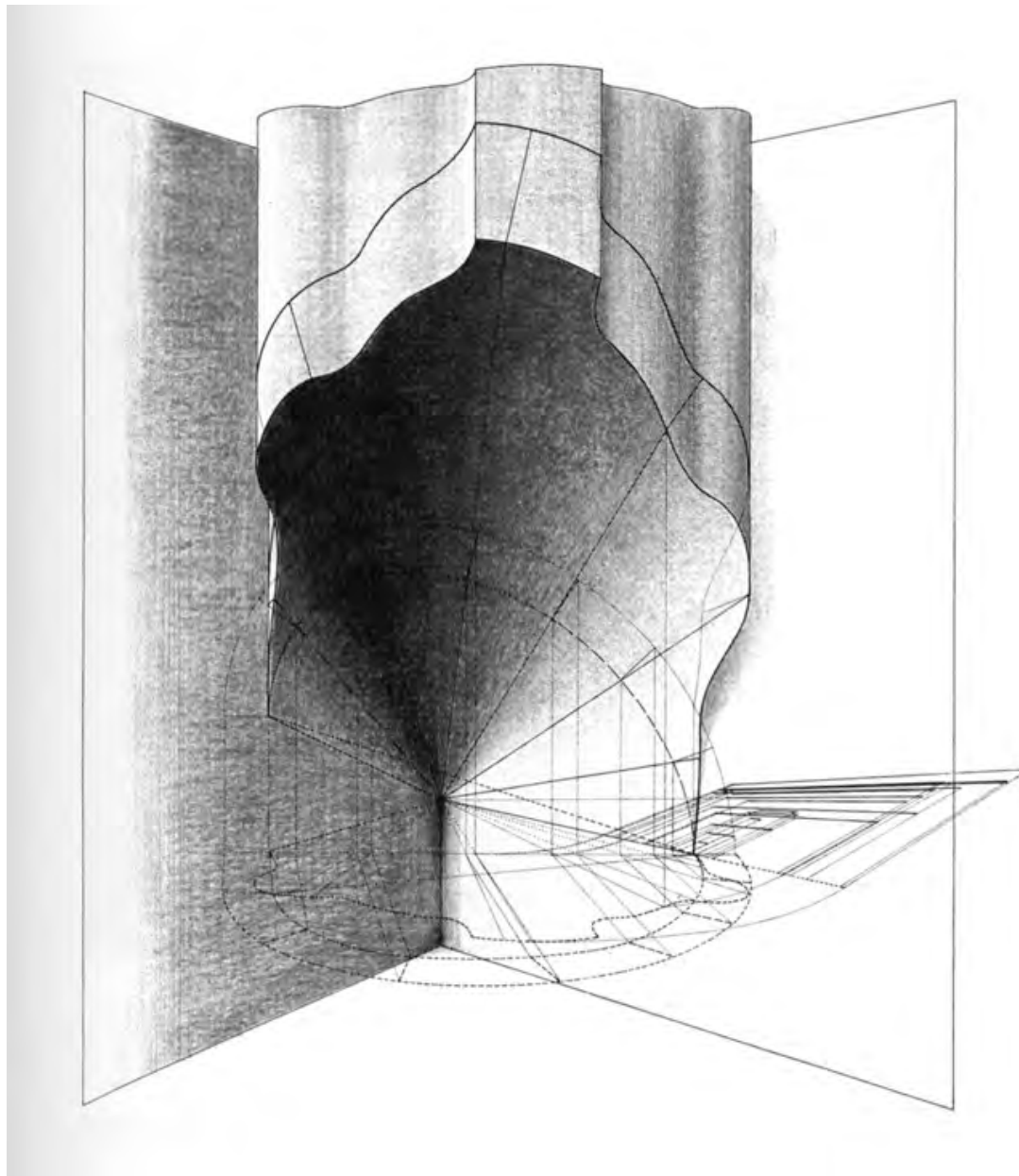
Philibert de l'Orme, Trompe at Anet, c.1550



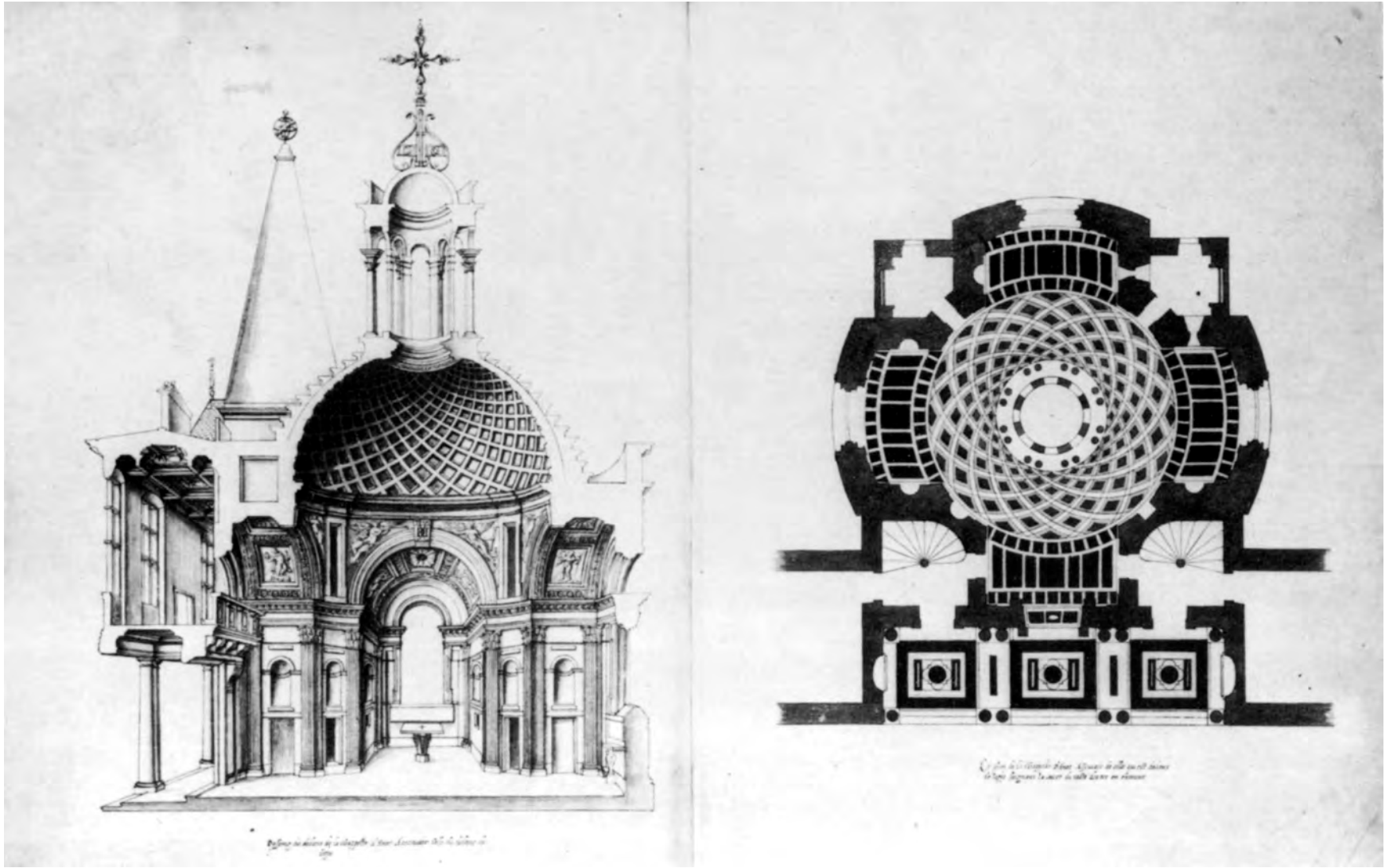
Philibert de l'Orme, Trompe at Anet, c.1550
Analytical Drawings by Robin Evans, from *The Projective Cast*



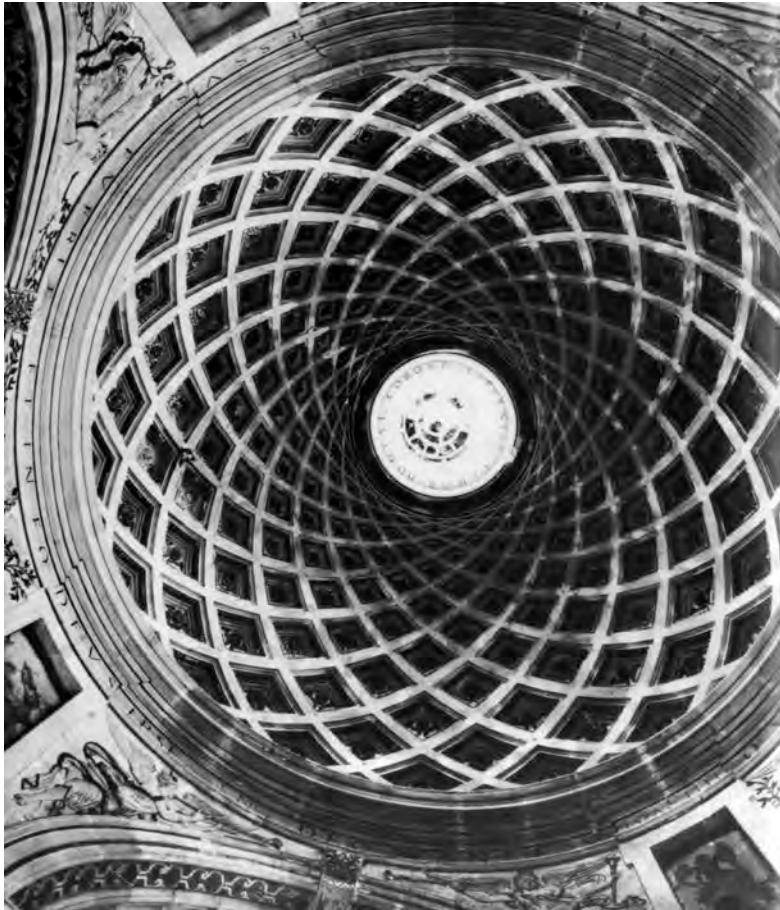
Philibert Delorme, *Trait*, c.1550 (Redrawn by Robin Evans)
The Projective Cast, 1995.



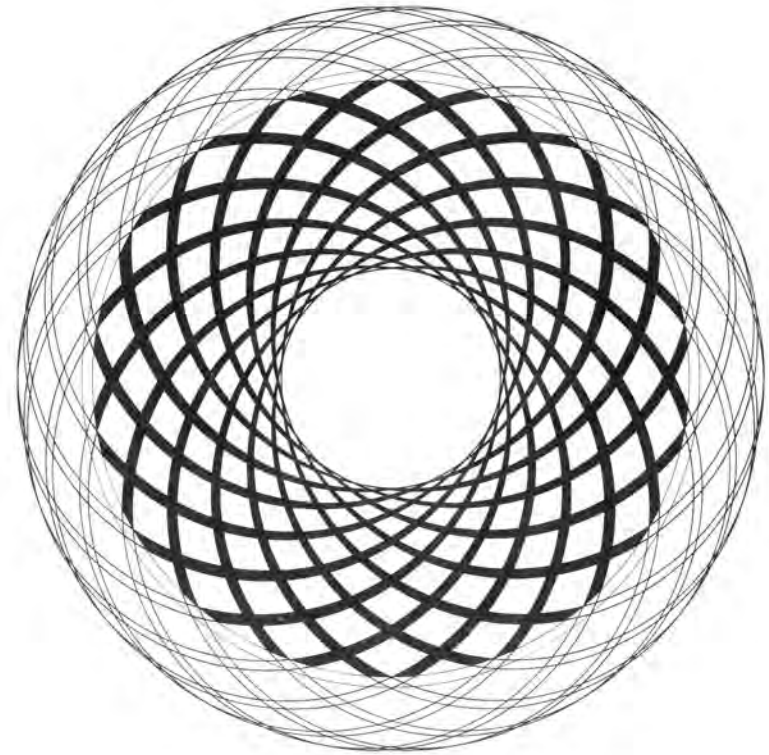
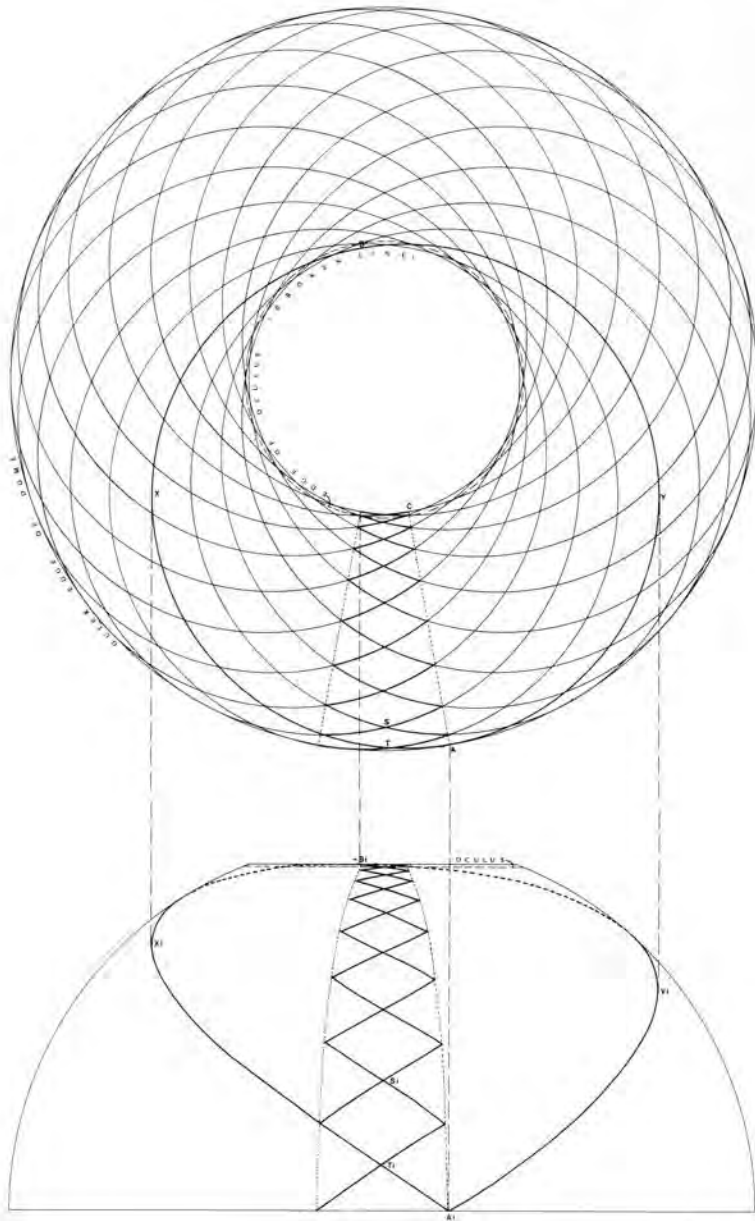
Philibert de l'Orme, trompe at Anet, c.1550.
Perspective reconstruction, Robin Evans, *The Projective Cast*, 1995.



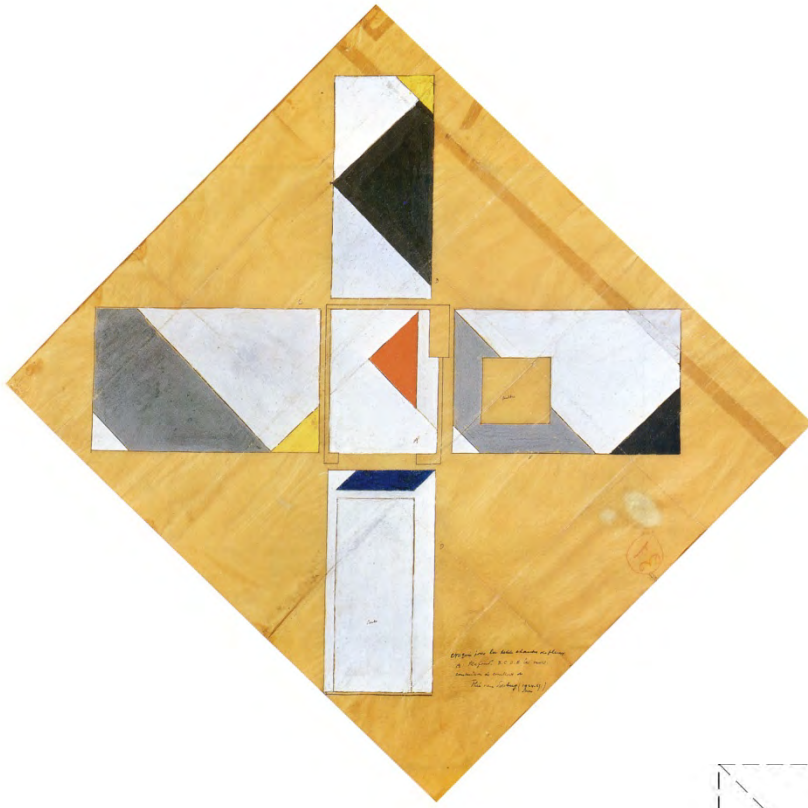
Plan and perspective section of Philibert de l'Orme's Royal Chapel, Anet
Engraving J-A. du Cerceau



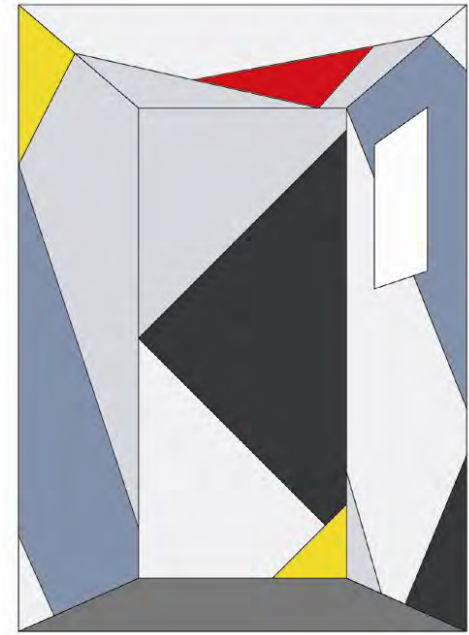
Royal Chapel, Anet, Philibert de l'Orme, 1547-52



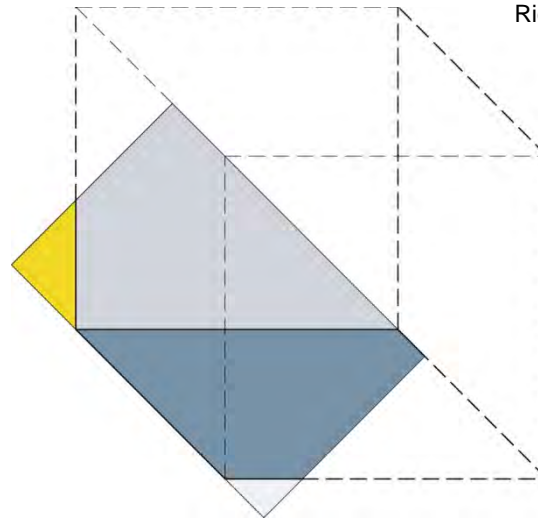
Geometrical analysis of Philibert de l'Orme's Royal Chapel, Anet
Robin Evans, 'Translations from Drawing to Building' (1986)



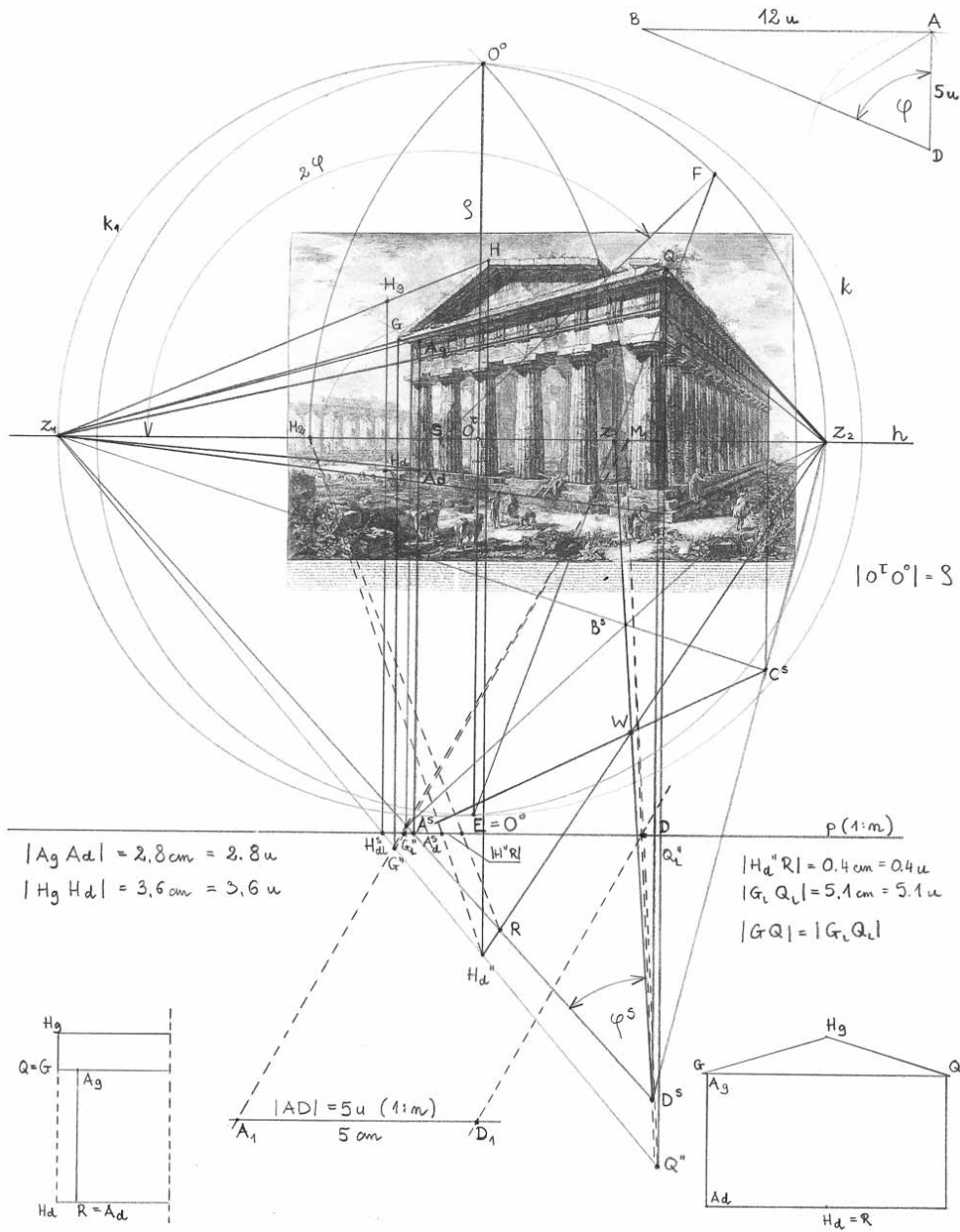
Theo van Doesburg, *Chambre de fleurs*, Villa Noailles, Hyères, 1924-25.



Analysis and reconstruction of the interior as it might have been executed.
Richard Difford, 'Developed Space' (2007)

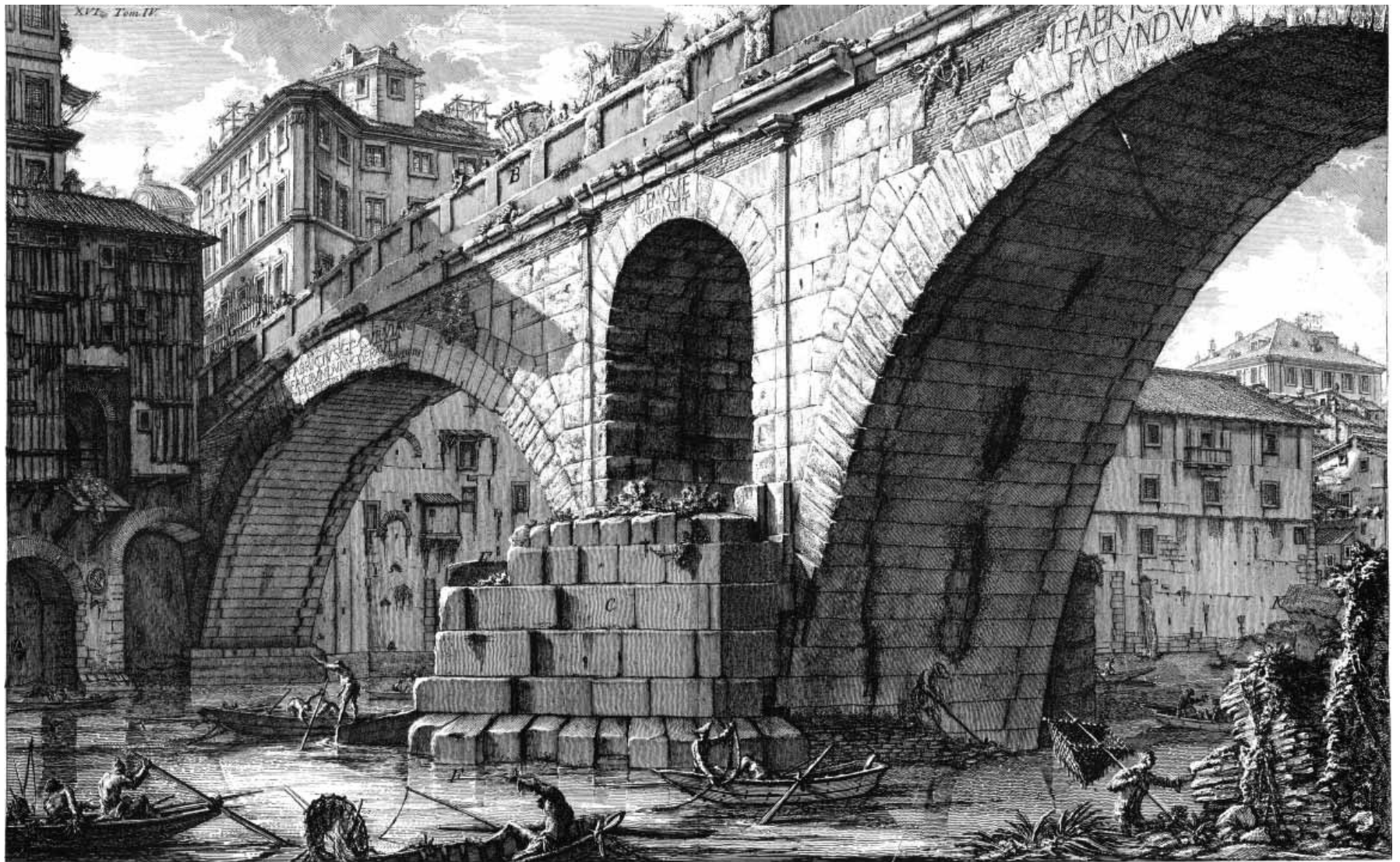


*Models of Perception:
MArch Dissertation Group, 1998-*

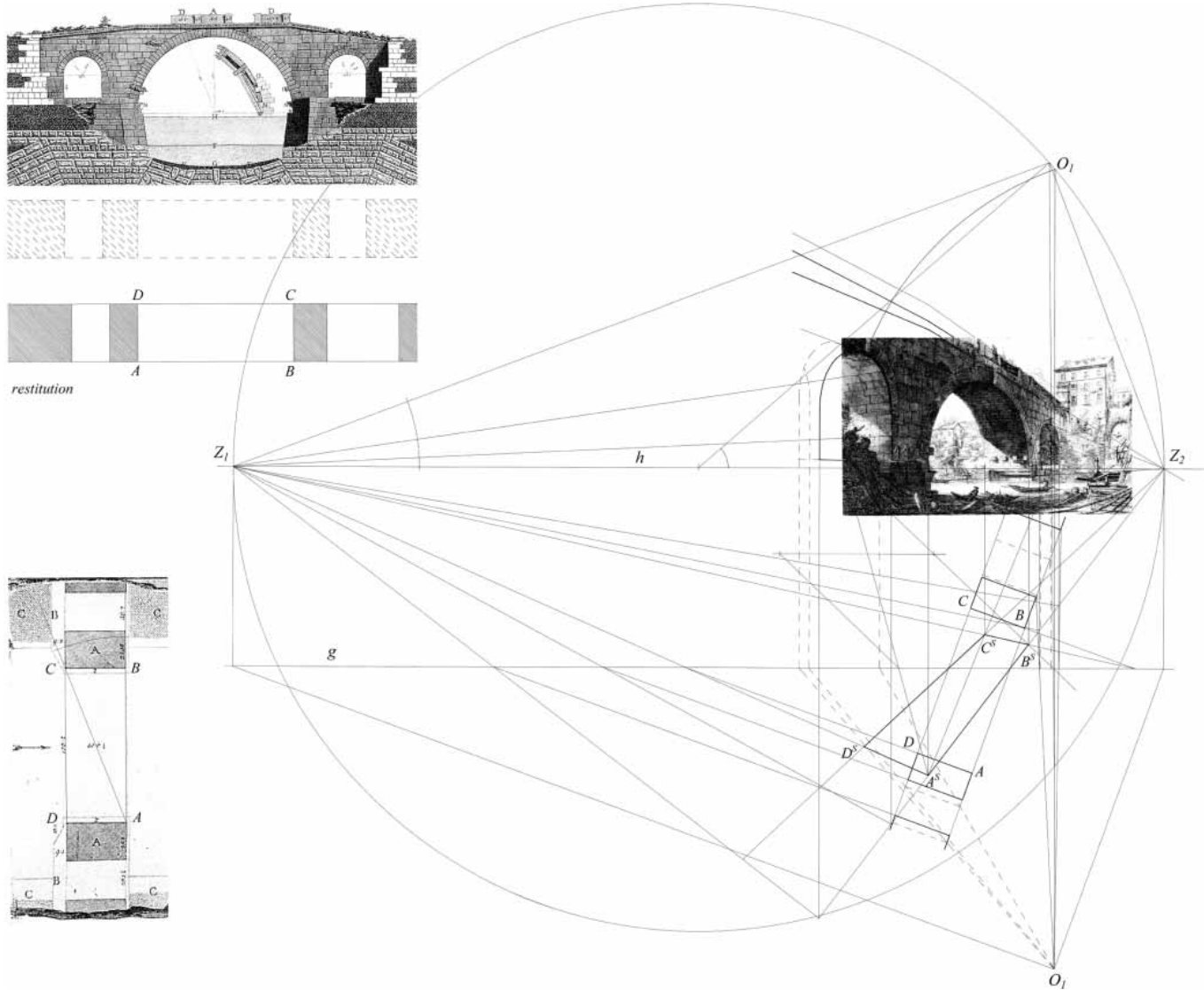


Joanna Rapp, *A Geometrical Analysis of Multiple View-Point Perspective in the work of Giovanni Battista Piranesi*, 2006. (RIBA Dissertation Medal 2006/7)

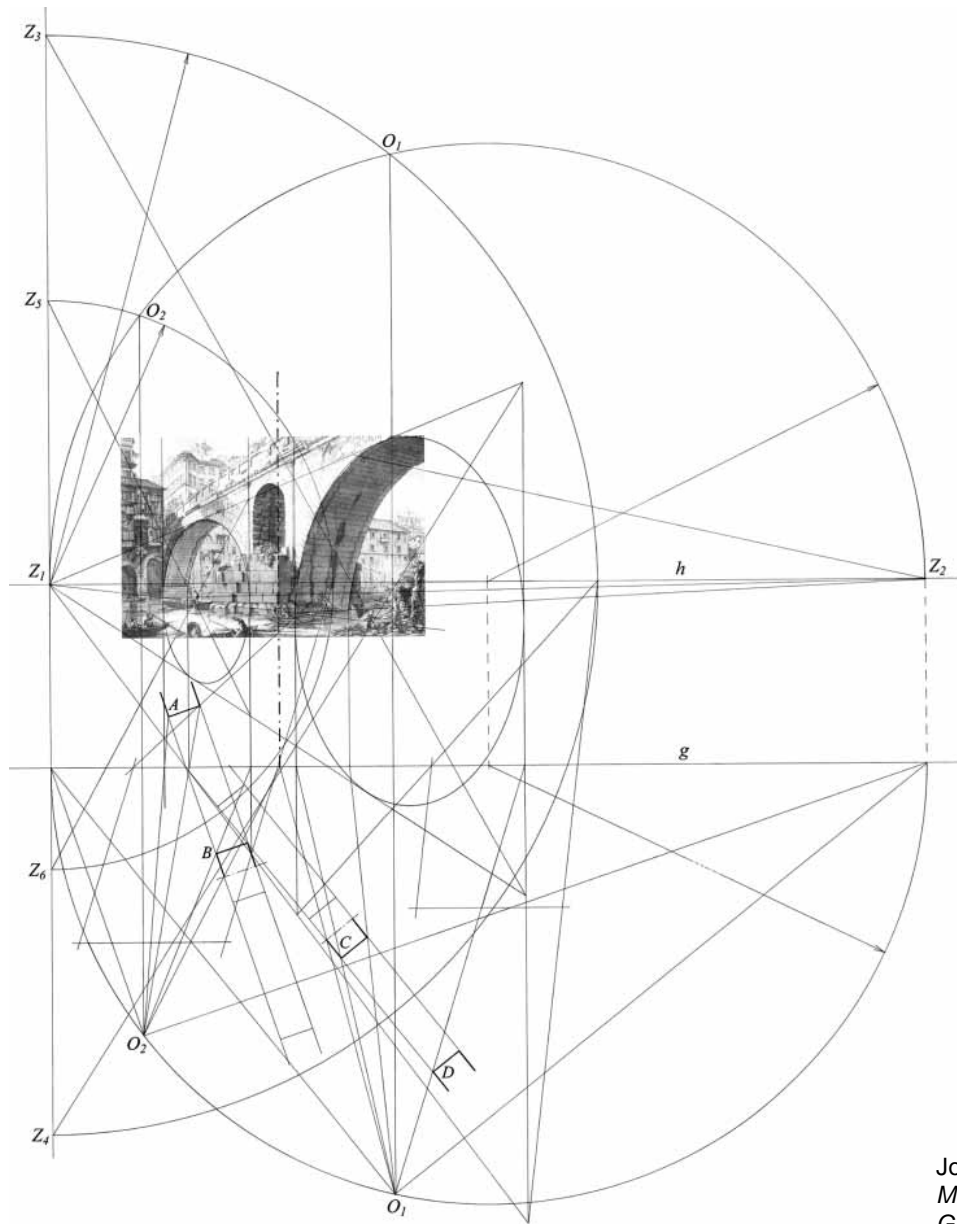
Perspective restitution of Piranesi's etching of the temple of Neptune



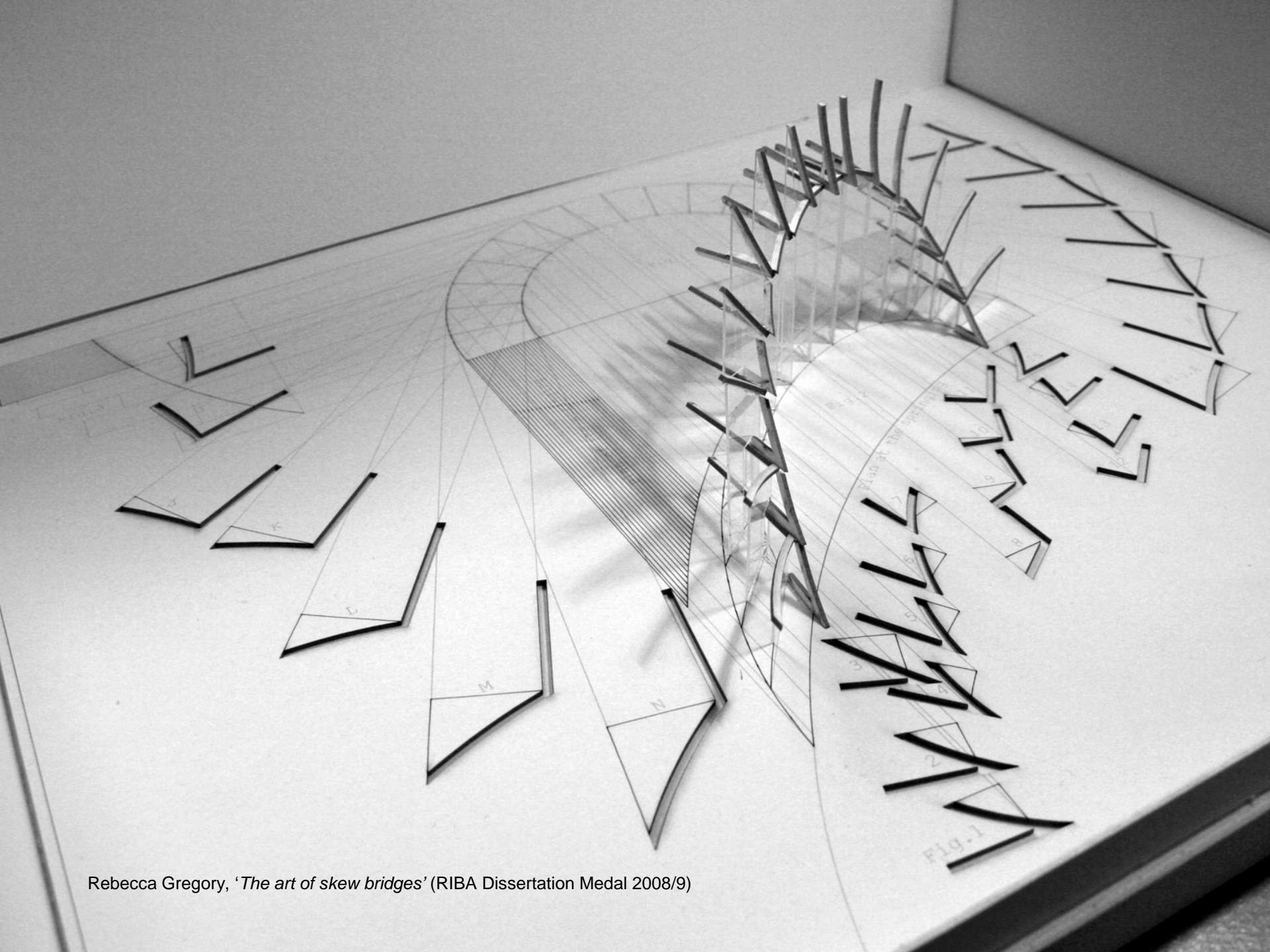
*FABRIZIA del Ponte Fabricio oggi detto quattro Capi. Questo Ponte è spogliato nel di sopra de' suoi antichi Invenimenti, et ornamenti, i quali per avventura rendevano un' Opera intera, qual' opere dovea nel suo primiero stato. A Restauro moderno di Mattoni in mancanza de' Travertini antichi. B Parapeti moderni di mattoni * quivi furono cancellati i Caratteri C Spione aggiunto da Consoli posteriori a Fabricio, si riconosce il nuovo intacco in D, non eguagliando esso la primiera Fabbrica. E Parte de' Macigni portati via dall' acqued' nell' escrescenza dell' Anno Santo 1550 F Palo dell' Acqued' in tempo di Giugno. G Quartiere de' Soldati per guardia dell' Orto stevere H Ghetti degli Oboli, et abitazione de' Crutiani attaco a' mignani del Ghetto, contrassegnati colla Croce I K Rovine, e grandi Macchi delle Volte, e Parco del Portico dietro la scena del Teatro di Marcella.*



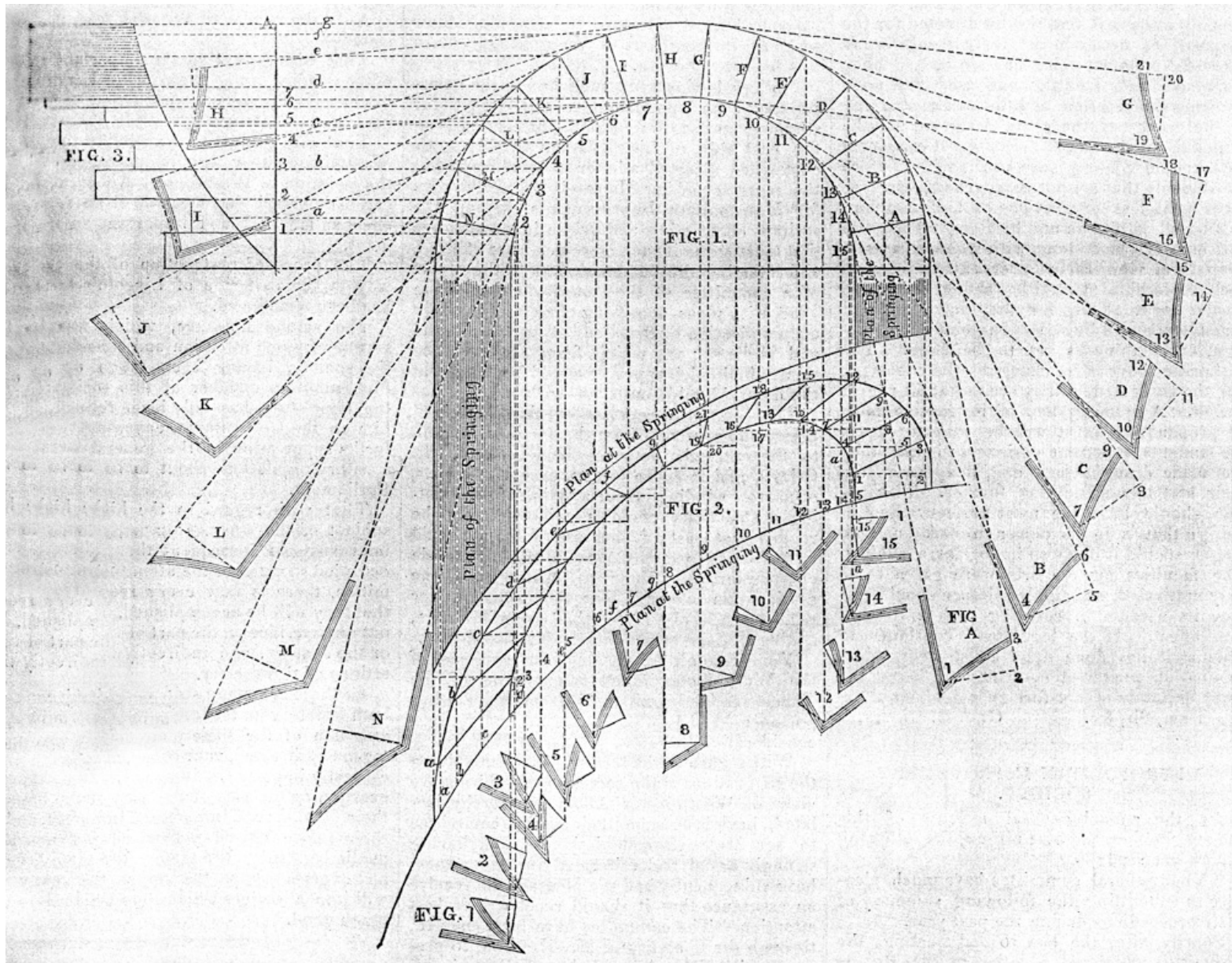
Joanna Rapp, *A Geometrical Analysis of Multiple View-Point Perspective in the work of Giovanni Battista Piranesi*, 2006.



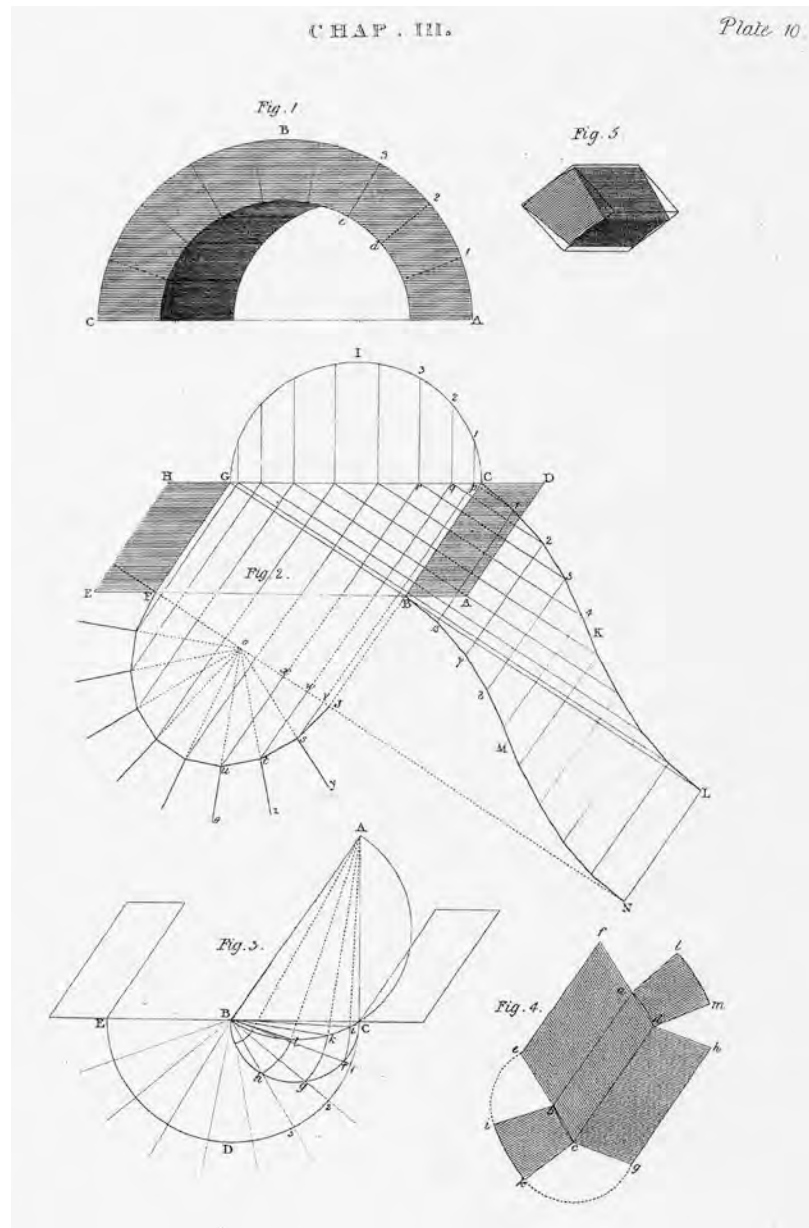
Joanna Rapp, *A Geometrical Analysis of Multiple View-Point Perspective in the work of Giovanni Battista Piranesi*, 2006.

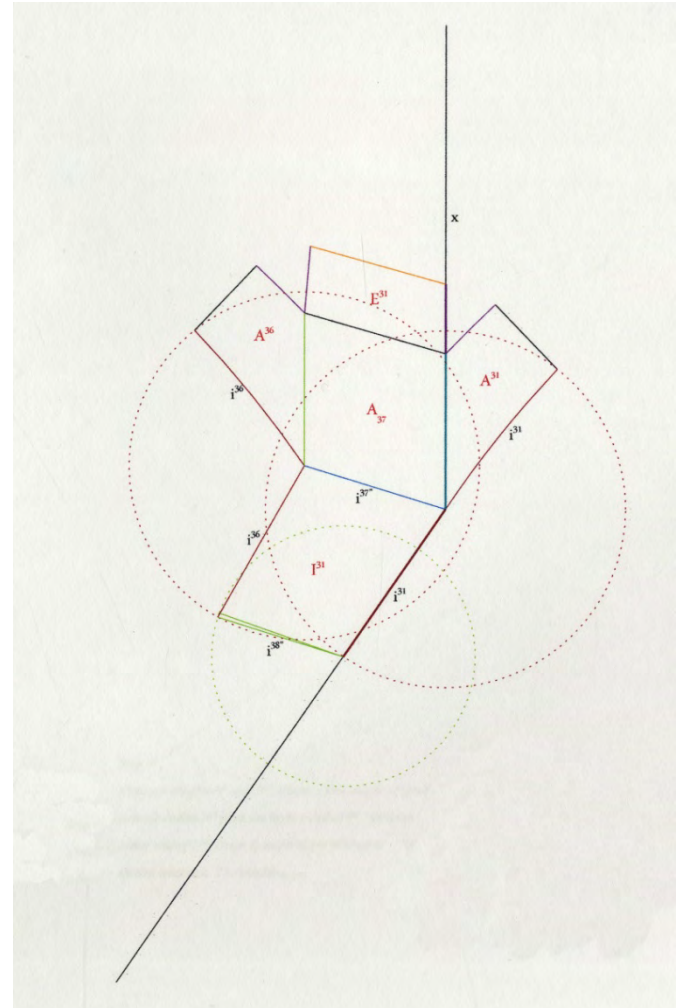
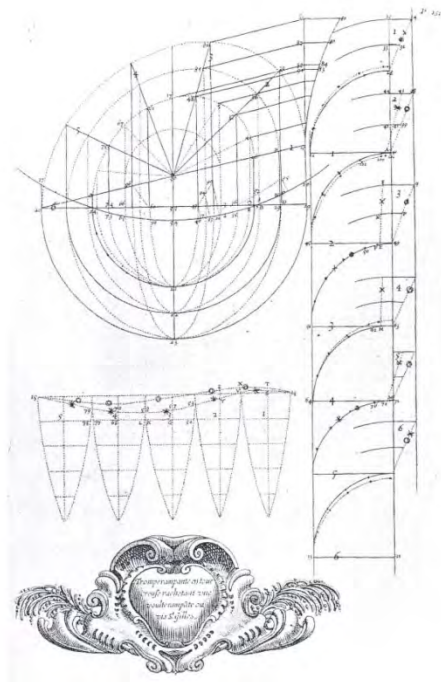
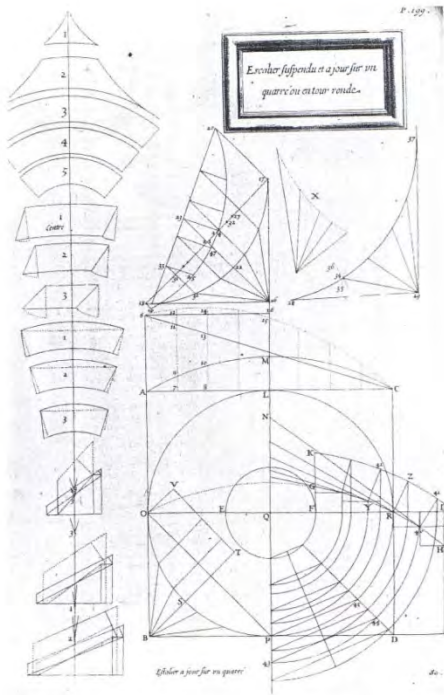


Rebecca Gregory, 'The art of skew bridges' (RIBA Dissertation Medal 2008/9)



Ben Green
 'On the Construction of Skew Bridges', *The Builder*, 1845





Catherine Archbold, 'Le Premier Tome de l'Architecture: An analysis of models in the work of Philibert de l'Orme' (2010/11)

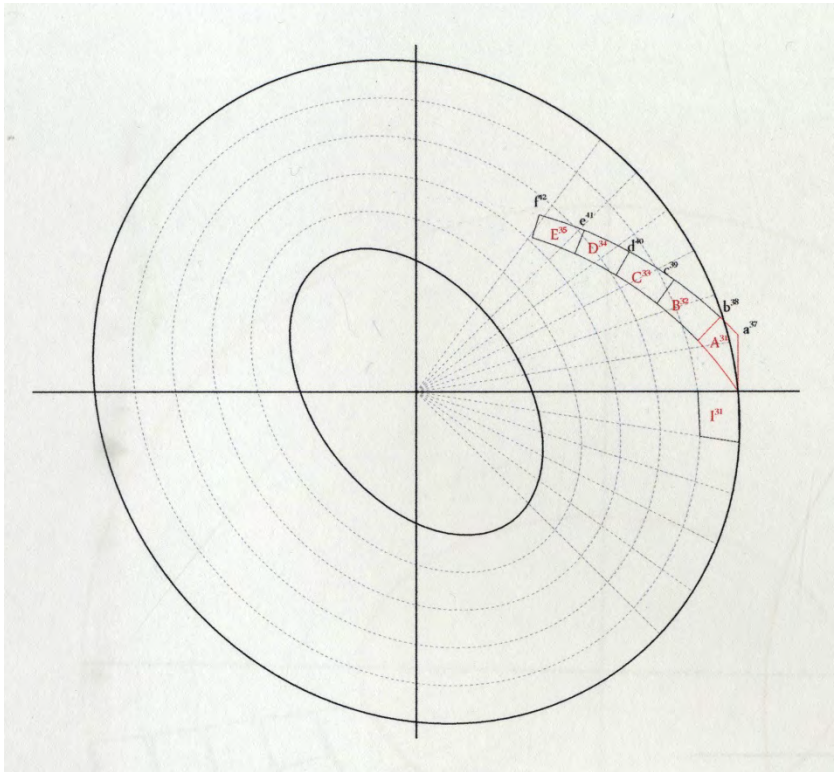
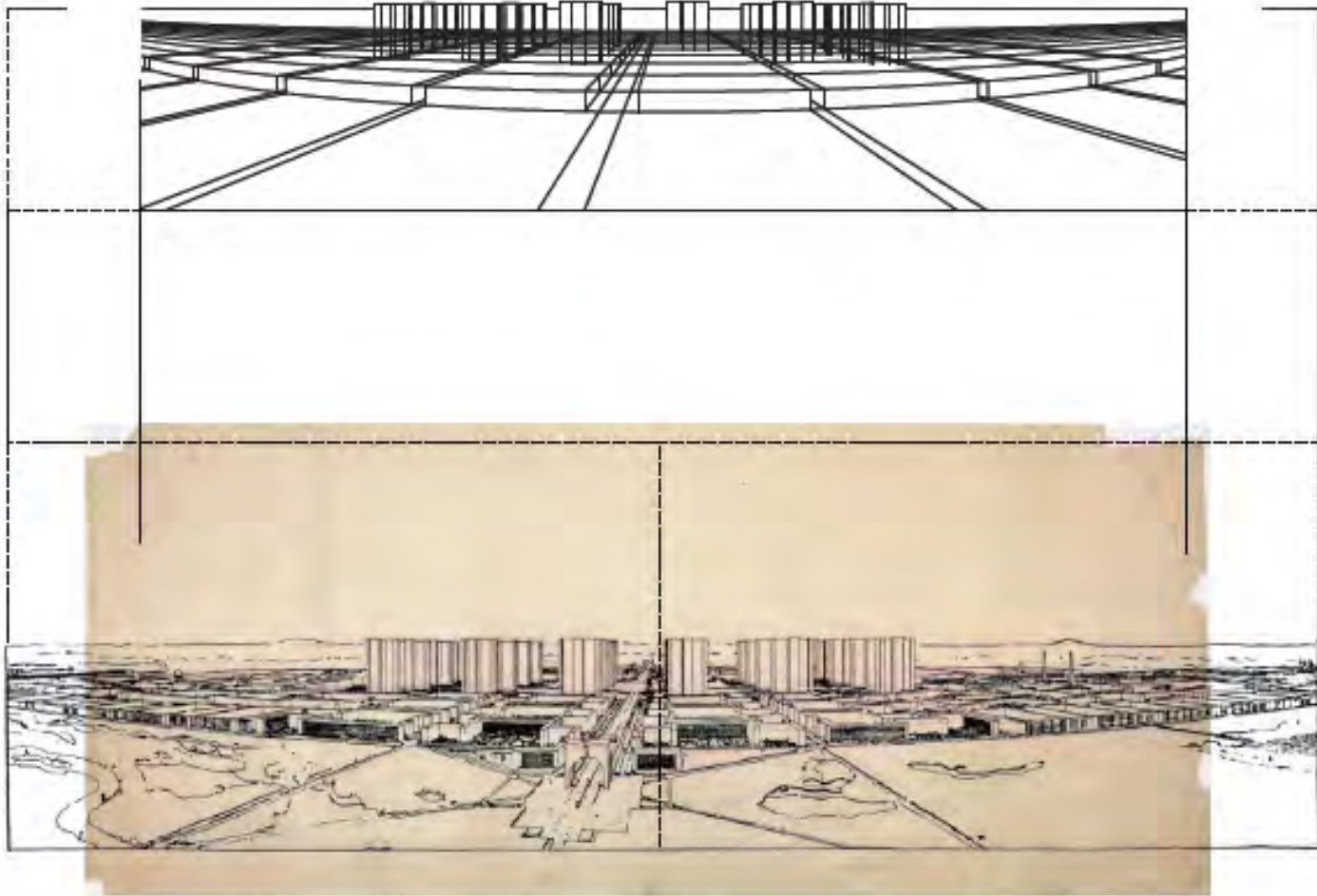
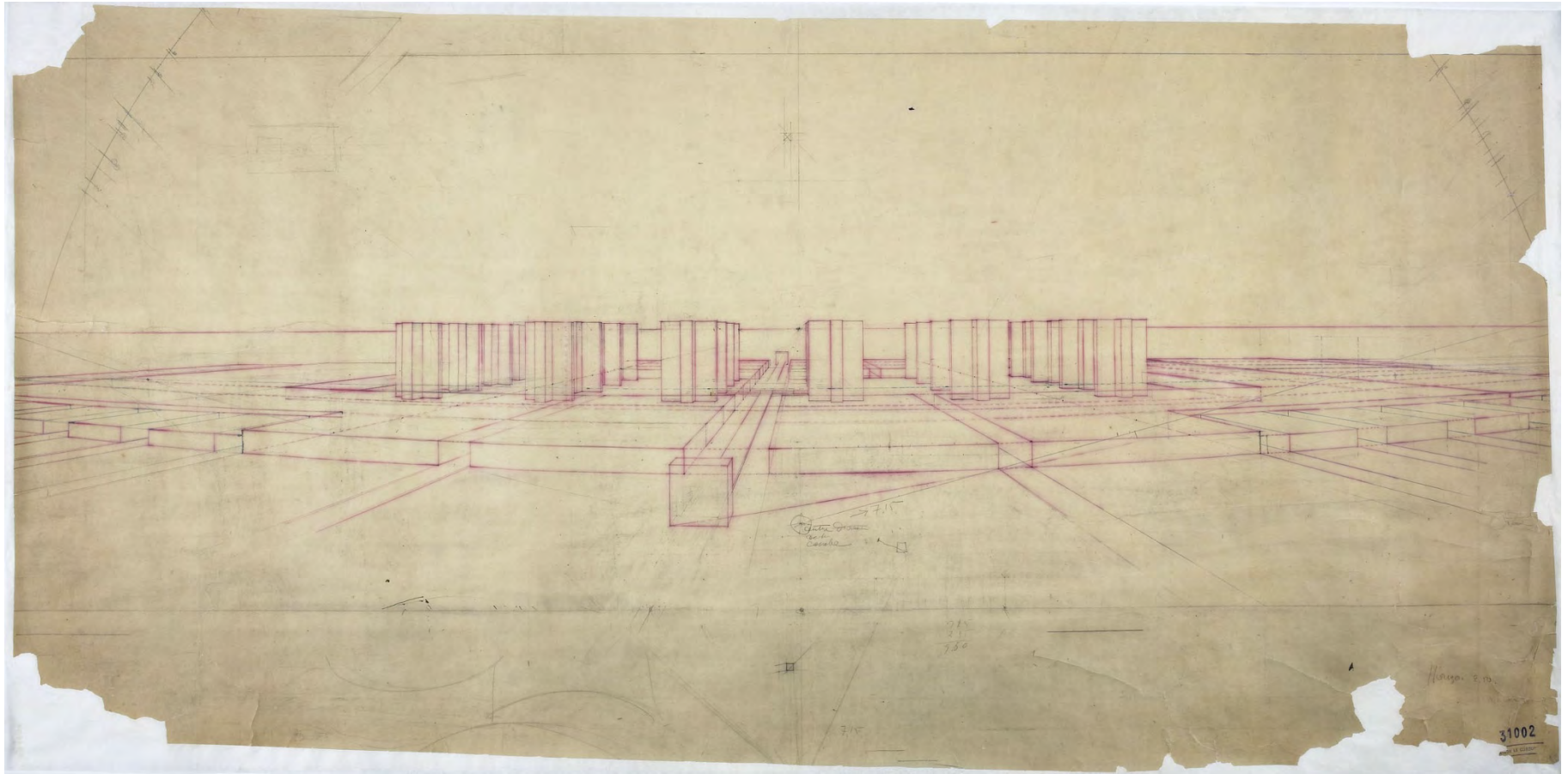


Fig. 8

Catherine Archbold, 'Le Premier Tome de l'Architecture: An analysis of models in the work of Philibert de l'Orme' (2010/11)



Teresa Rodriguez Nikiforova, 'Curvilinear Perspective in the Work of Le Corbusier'
(2010/11)



Le Corbusier, *Ville Contemporaine*

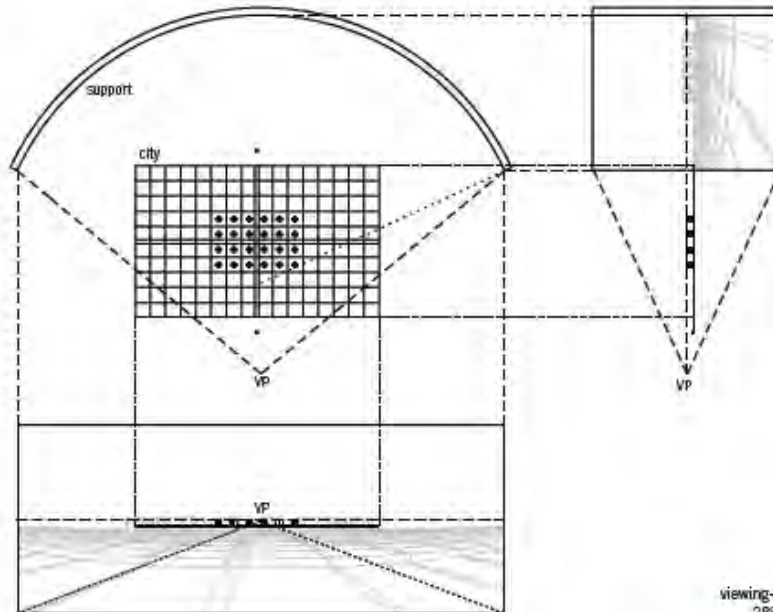
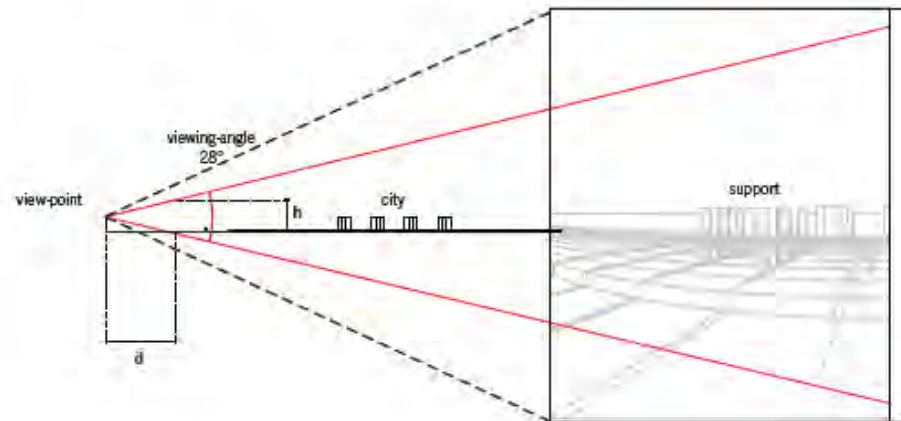
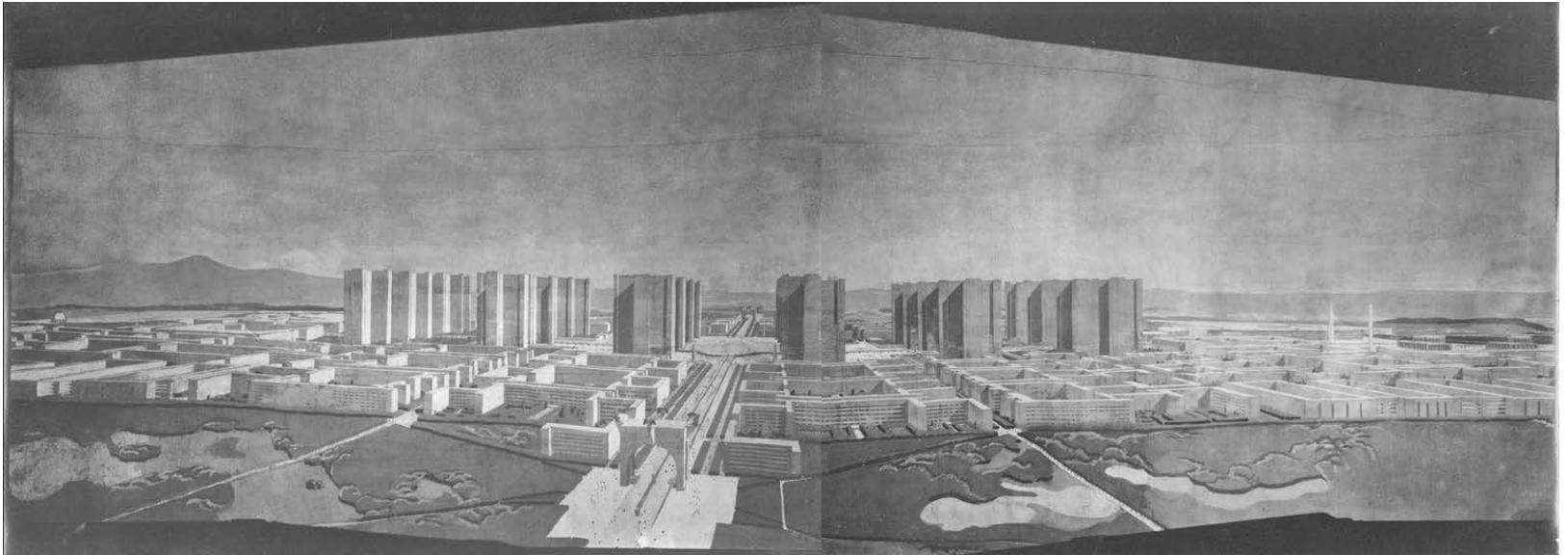


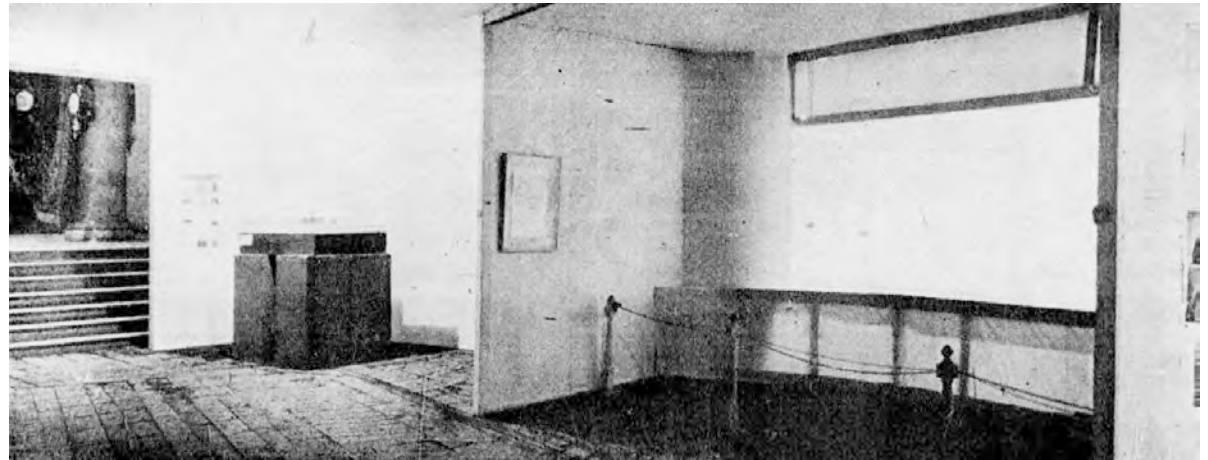
Figure 44. Left: the ensemble on plan, section, elevation.

Figure 45. Below: section (conventional 28° viewing-angle). The view-point has been placed so that the perspective does not present distortions, even at the front of the city, where we can see the gate and its plaza. $d = 2 \times h$ (resulting in 28° viewing-angle). Height (h) is twice the height of towers, in order to place the horizon in the middle of the composition.





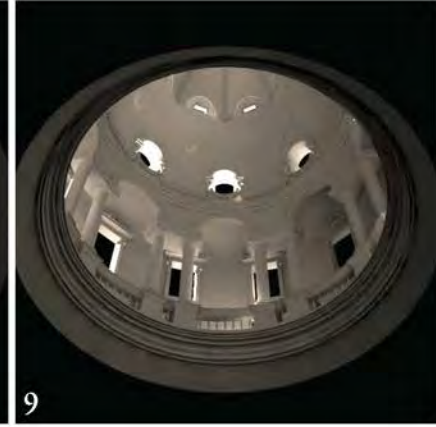
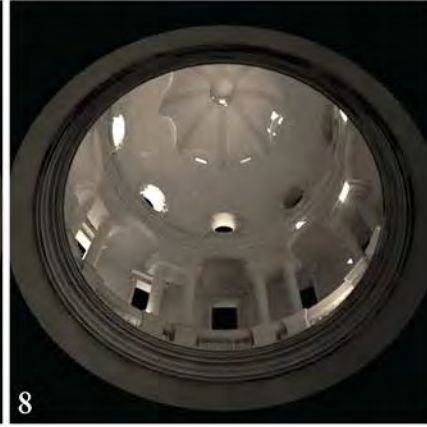
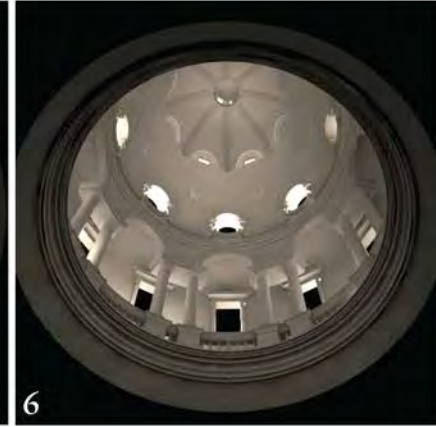
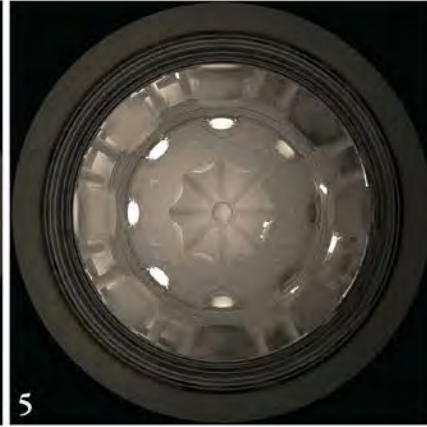
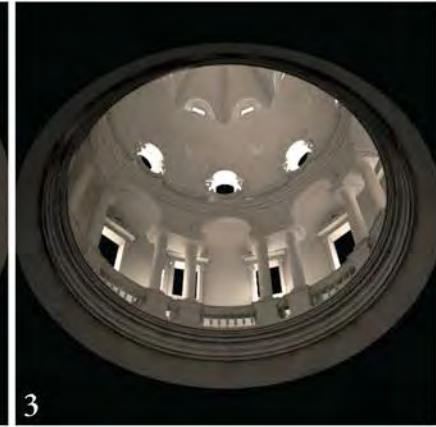
Le Corbusier, *Ville Contemporaine*



Le Corbusier, Salon d'Automne Diorama, 1922

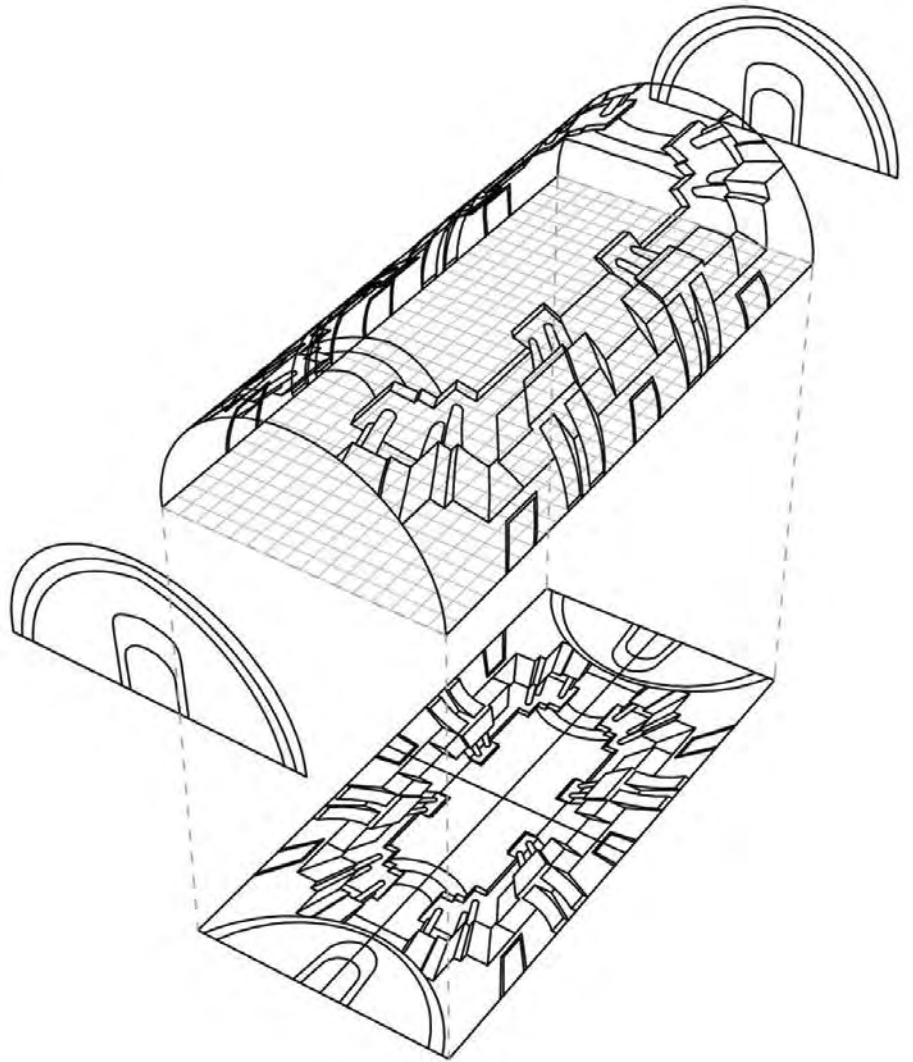


Oscar Sedkowski, 'Guarino Guarini's Unbuilt Churches' (2013/14)

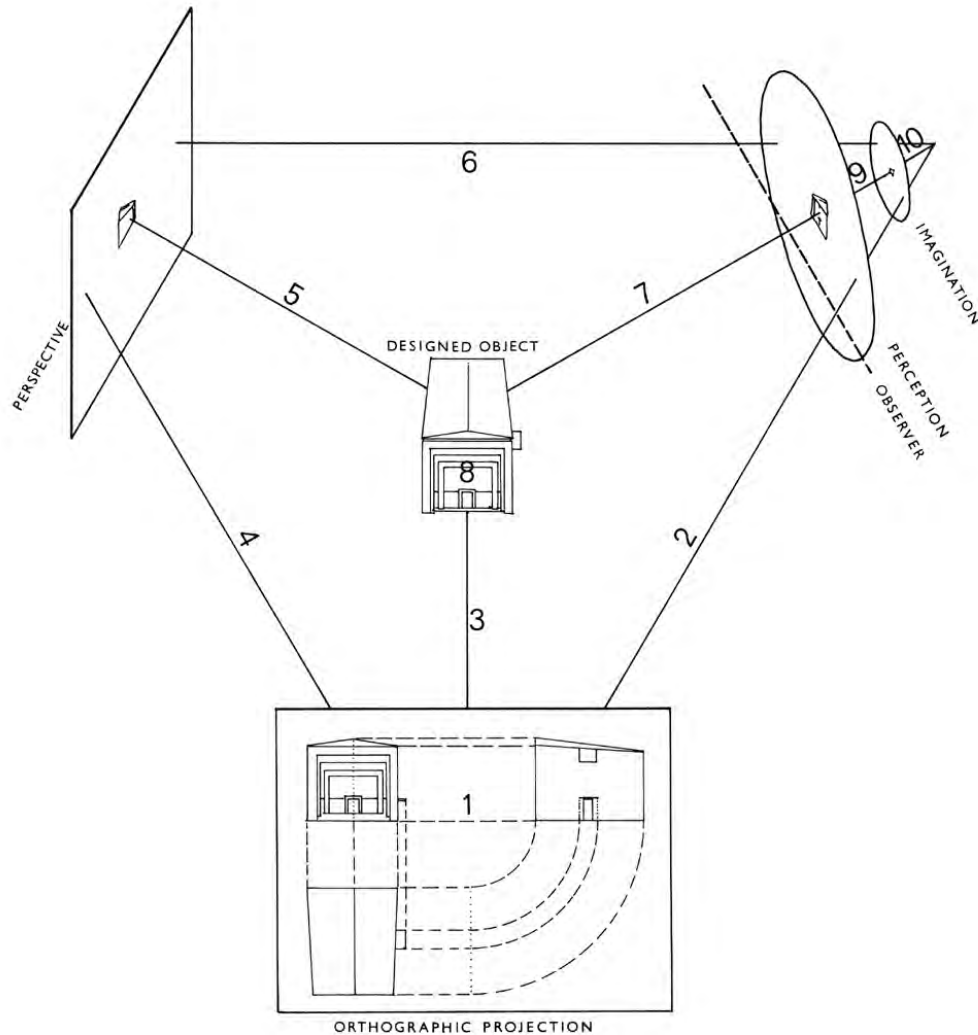




Yat Hang Wu, 'Andrea Pozzo's *Transmission of the Divine Spirit*' (2014/15)



Yat Hang Wu, 'Andrea Pozzo's *Transmission of the Devine Spirit*' (2014/15)



“If one way of altering the definition of architecture is to insist on the architect’s direct involvement, either calling the drawing ‘art’ or pushing it aside in favour of unmediated construction, the other would be to use the transitive, commutative properties of the drawing to better effect.”

Robin Evans, ‘Translations from Drawing to Building’ (1986)