Thank you to Jonathan Bate, Kate Tunstall, Mark Bainbridge, Daryl Green, and Michael Waters

Organised by Christy Anderson and Laura Moretti

Director of Conference Katie Jakobiec

Worcester College

Thinking 3D

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UNIVERSITY OF OXFORD

Thinking 3D

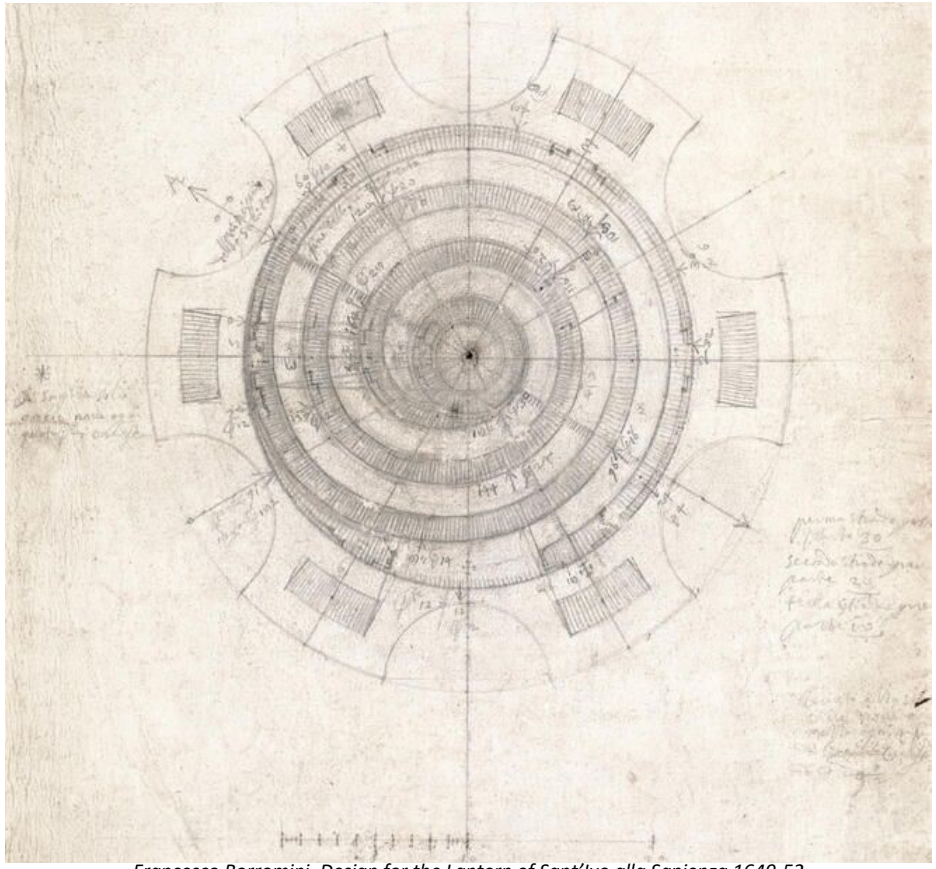
Architecture & Audience

International Conference

27-28 September 2019

The Sultan Nazrin Shah Centre

Worcester College, Oxford



Francesco Borromini, Design for the Lantern of Sant'Ivo alla Sapienza 1649-52
The Albertina Museum, Vienna. Artokoloro Quint Lox Limited/Alamy Stock Photo

Conference Schedule

Friday, September 27

8:30 Coffee and Registration

8:45 Welcome and Introduction

Session 1:

9:00—11:45

Chair: Christy Anderson

Tod A. Marder, Rutgers University

The Social Dimension of Bernini's Architectural Drawings

Jesús Escobar, Northwestern University

Architectural Migration in the Early Modern Spanish World

Coffee

David Hemsoll, University of Birmingham

The Codex Coner and the New Science of Architectural Representation

Elizabeth Deans Romariz, University of York

Flipped, Flapped, Folded: Objectifying Drawing Practices in William Dickinson's Sketchbook

Sara Galletti, Duke University

On Philibert de L'Orme's stereotomic dome in the chapel of the Château d'Anet: a hypothesis on design, geometry, and models

Discussion

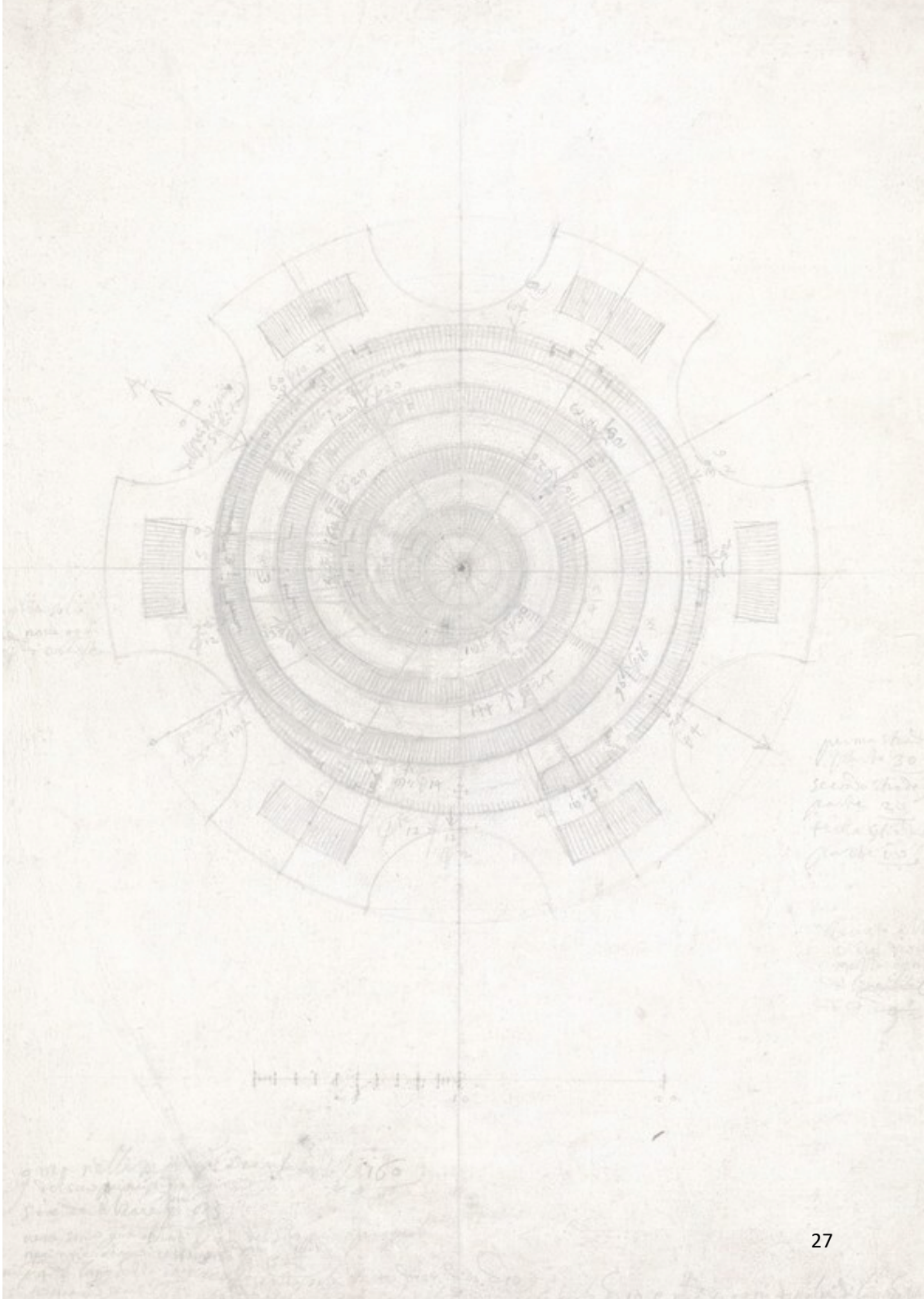
12:00 Lunch & Coffee

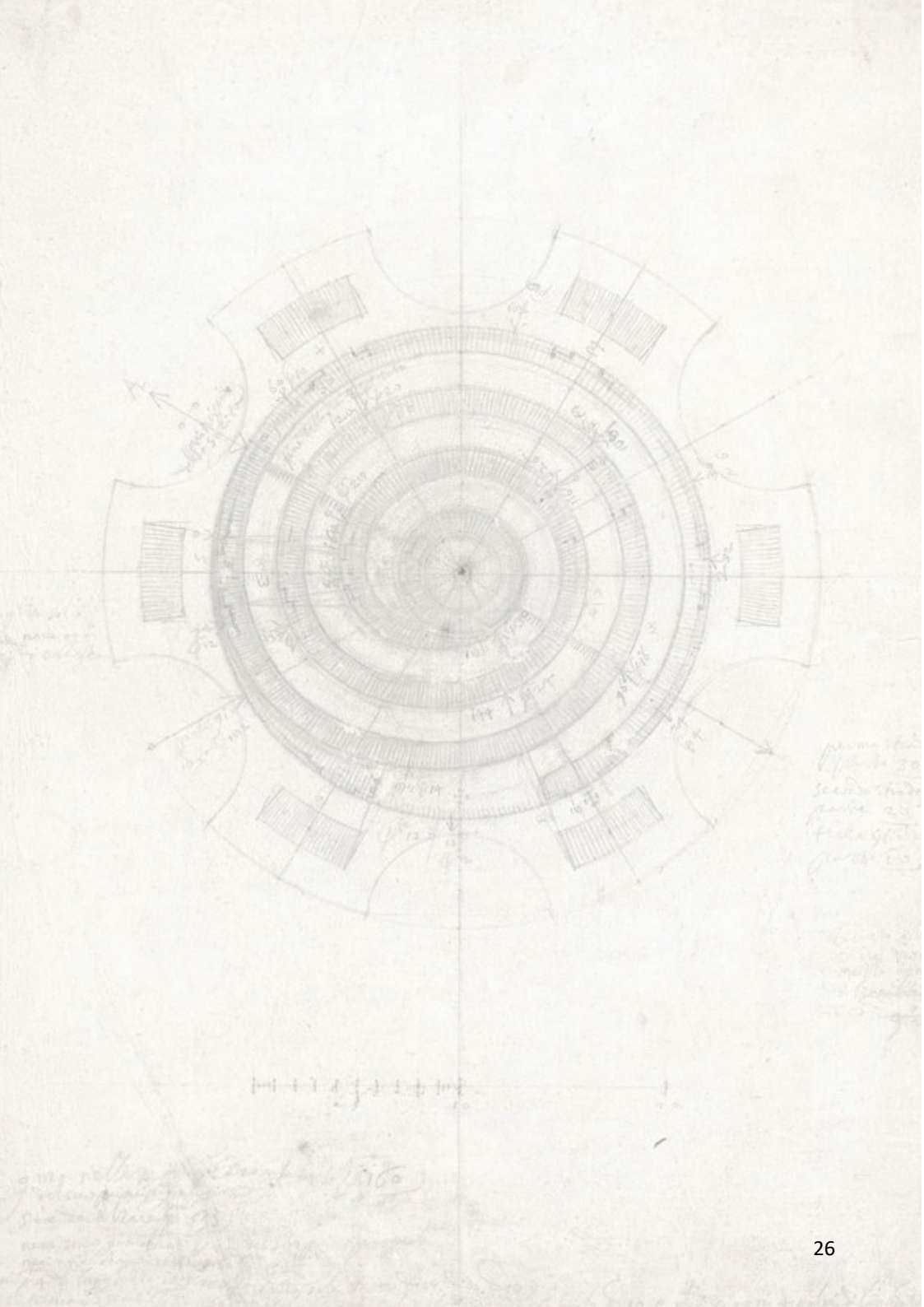
1:30 *Hieronymus Cock's Diascopic Baths of Emperor Diocletian*
Led by Michael Waters, Weston Library

2:30 Duke Humphrey's Library Tour(s)

3:30 Tea at Worcester College

4:00 Worcester College Library Drawings
Led by Mark Bainbridge, Worcester College





Conference Schedule

Saturday, September 28

9:00 Coffee

Session 2:

9:30—12:15

Chair: Laura Moretti

Noam Andrews, Ghent University

Architecture of Disorder in the Age of Perspective

Emanuela Vai, Worcester College, Oxford

Paper Architecture: Three-dimensional Thought and Practice in the Works of Salomon de Caus (1576-1626)

Paul Davies, University of Reading

Spatial representation in a fourteenth-century project for Siena Cathedral and reflections on the development of early Renaissance project drawing

Coffee

Frédérique Lemerle, Centre d'Études supérieures de la Renaissance, Tours

Three atypical publications in France (1536-1560)

Deborah Howard, University of Cambridge

Frozen Movement: The Representation of Technology in Early Modern Italy

Discussion

12:30 Lunch & Coffee

1:30 Roundtable Discussion & Conclusion

2:45 Tea

Thinking 3D Exhibition Tour Led by Laura Moretti & Daryl Green, Weston Library

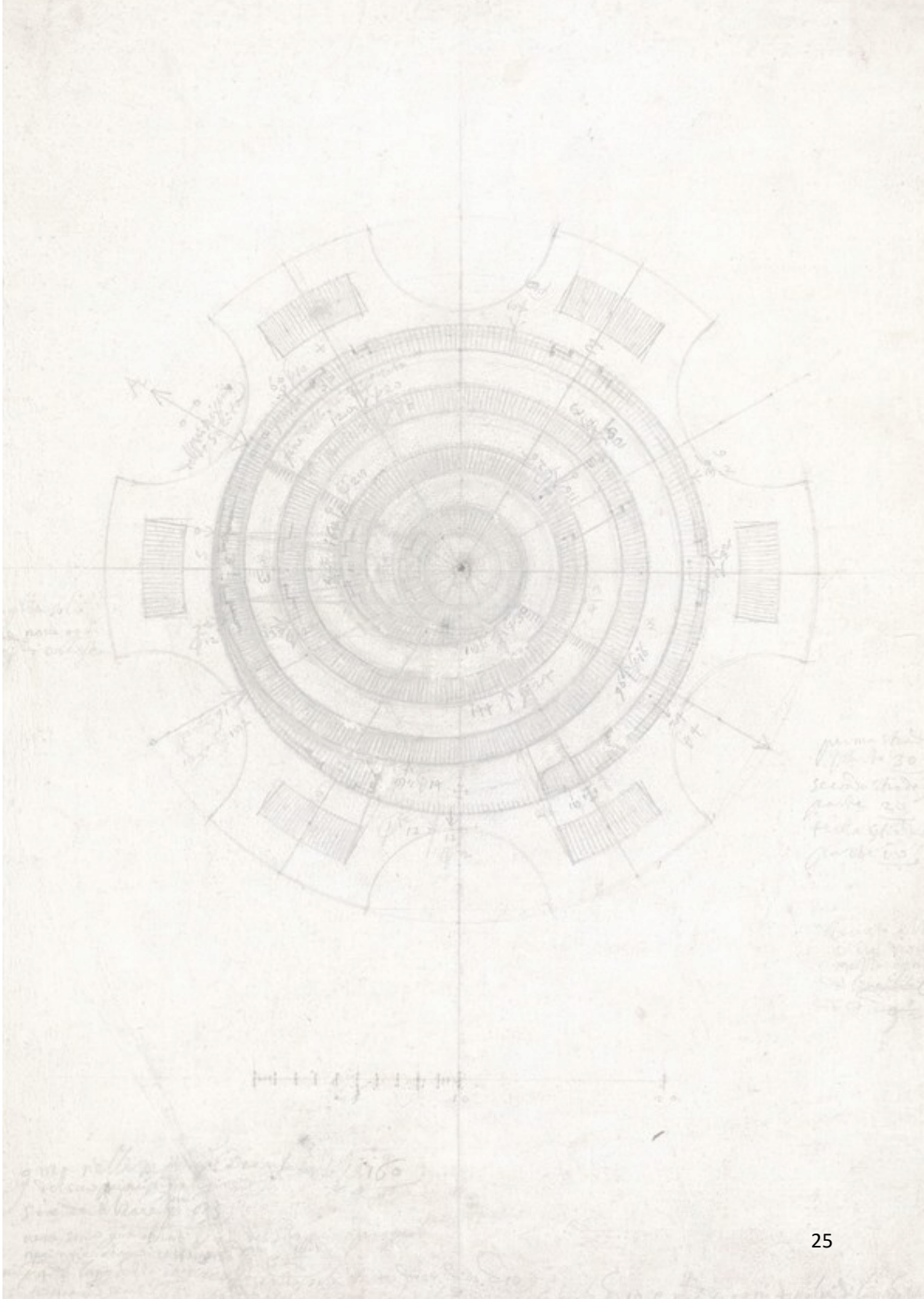
3:15 1st Tour (45 min)
4:00 2nd Tour (45 min)

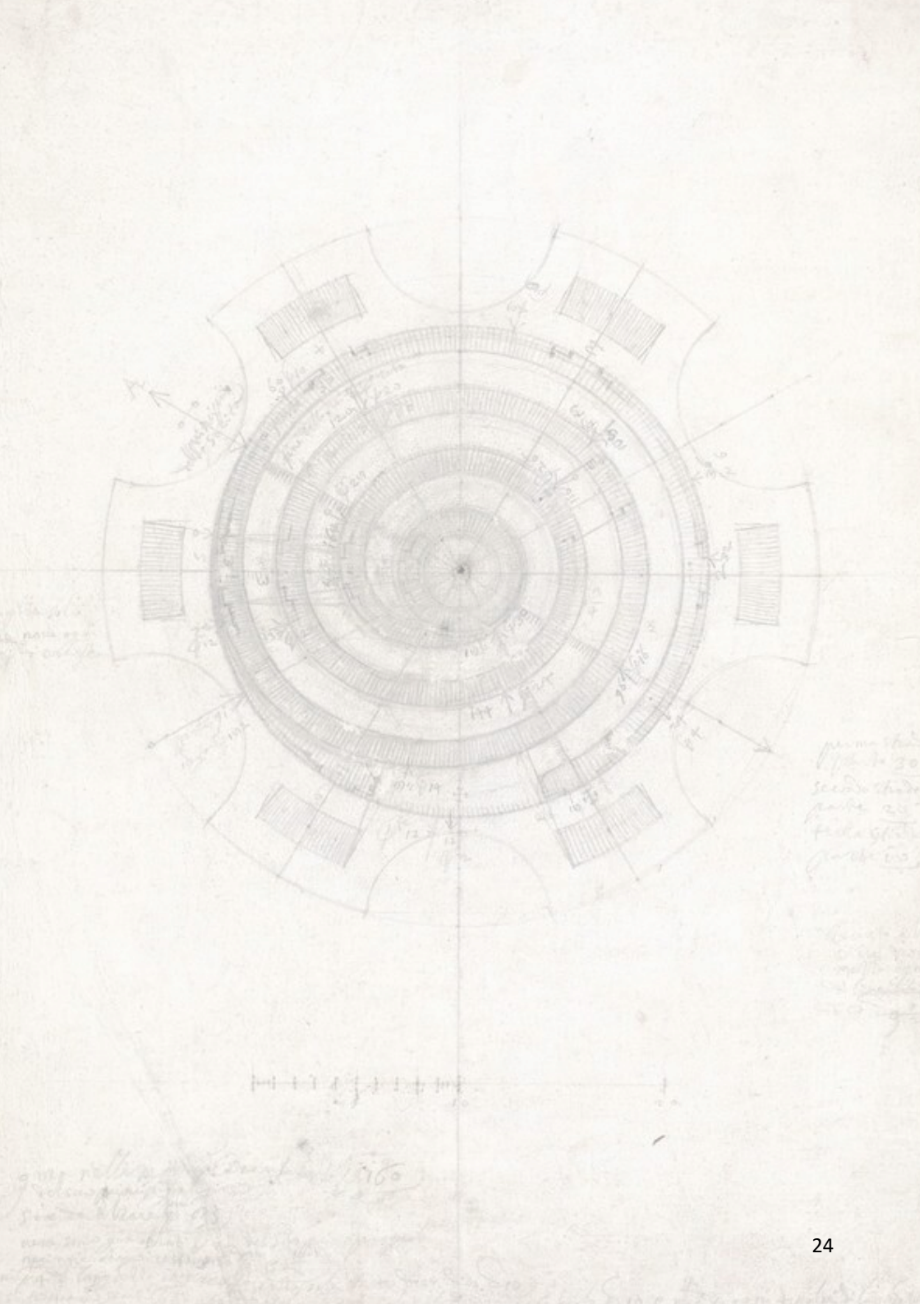
PAPERS

Tod A. Marder, Rutgers University

The Social Dimension of Bernini's Architectural Drawings

Brauer and Wittkower's catalogue of Bernini's drawings, published in 1931, was a landmark in the study of Italian seventeenth century graphics. The architectural material was well-received and limited only by the authors' insistence on autograph works to tell the story. To revise and update this 90-year-old classic, however, one now needs to include the workshop drawings as extensions of the master's formal thinking, because documents establish his role as designer and payments testify to the use of assistants to draft his ideas. Accepting this corporate approach to the drawings has also led to a more refined understanding of the autograph sheets. From the evidence there emerges a new phenomenon: autograph drawings intended primarily to communicate with patrons rather than builders and laborers. Moreover, it appears that some of these graphic conversations were composed after the fact, as record drawings rather than the working drawings they have always been thought to be. The social dimension of these sheets does not change their value, but it does dramatically challenge their interpretation. Understood in this way Bernini's architectural graphics are consistent in crucial ways with autograph sheets from his figural work. These considerations may also be useful in assessing the drawings of other historic architects and may even explain their absence when other means of communication proved more efficient than marks on paper.





Jesús Escobar, Northwestern University

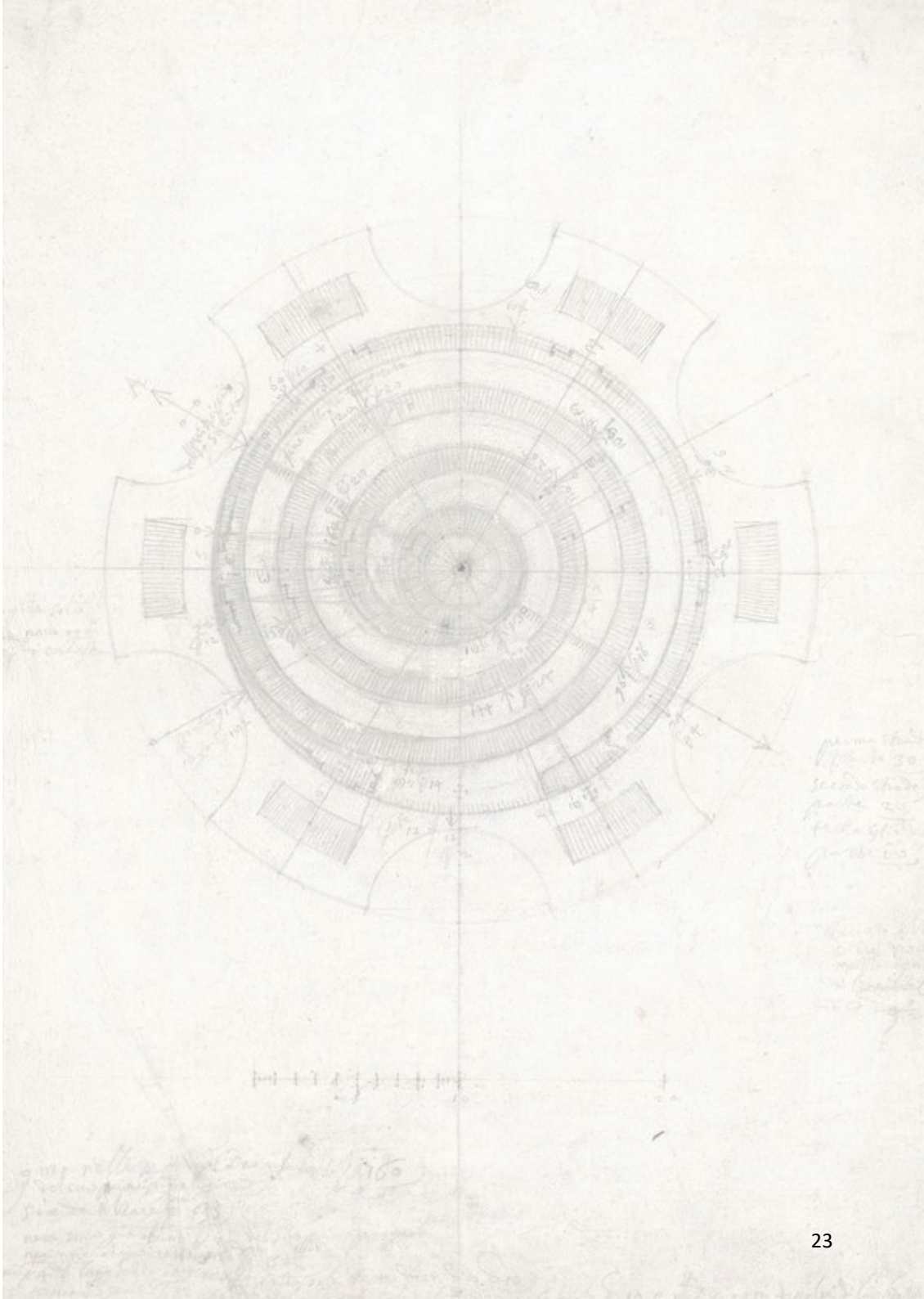
Architectural Migration in the Early Modern Spanish World

This paper will explore the transmission of knowledge about architecture across the transatlantic empire of the Spanish Habsburgs. Building was an expensive imperial undertaking that promised great return given the symbolic potential of architectural monuments in towns and cities, as well as along coastlines. In the design of churches, fortifications, courthouses, and a range of other building types, architects and amateurs used prints and architectural books as sources for buildings intended to communicate messages of power and beneficence. The presentation will focus on the importance of classical design principles for Spanish Habsburg monuments and consider the role that singular individuals, including a royal architect and a high-ranking prelate, played in shaping architectural theory and practice on both sides of the Atlantic Ocean.

David Hemsoll, University of Birmingham

The Codex Coner and the New Science of Architectural Representation

The celebrated Codex Coner, in London's Sir John Soane's Museum, Is the most coherent and perhaps the most instructive book of architectural drawings to survive from the Renaissance period. Compiled soon after the death of Bramante in 1514, it bears witness to the rapid advancements in architectural representation at this particular moment in time, which was also when so much energy was being directed at Bramante's fast-evolving project for New St Peter's, and at how to design and construct it. The book's contents include detailed renditions of many of ancient Rome's most imposing ancient monuments, which often depart from the simple formula of plan and elevation (or elevational view) seen in previous depictions. In fact, the Coner drawings allow ready and detailed understandings even of those buildings or complexes of exceptionally elaborate design, such as the Pantheon and the Colosseum or the Baths of Caracalla and Diocletian, which are further enhanced by new levels of accuracy and precision, suggesting that many of the drawings were dependent on new and recently conducted surveys. Just when these surveys took place is not entirely clear, but they are likely to have been carried out by skilled operatives assembled in Rome to work on the St Peter's project. The Coner drawings certainly illustrate the practical and conceptual ingenuity that was required for measuring the ancient buildings and then recreating them in drawn form – a skill directly equivalent to the procedures of design and representation that were needed for St Peter's. They also allowed the buildings to be scrutinised and understood in new ways by a wider public, while drawings of similar kinds from the same period would provide a basis for later practitioners, such as Antonio da Sangallo the Younger and Palladio, to build on earlier accomplishments with ever increasing sophistication.



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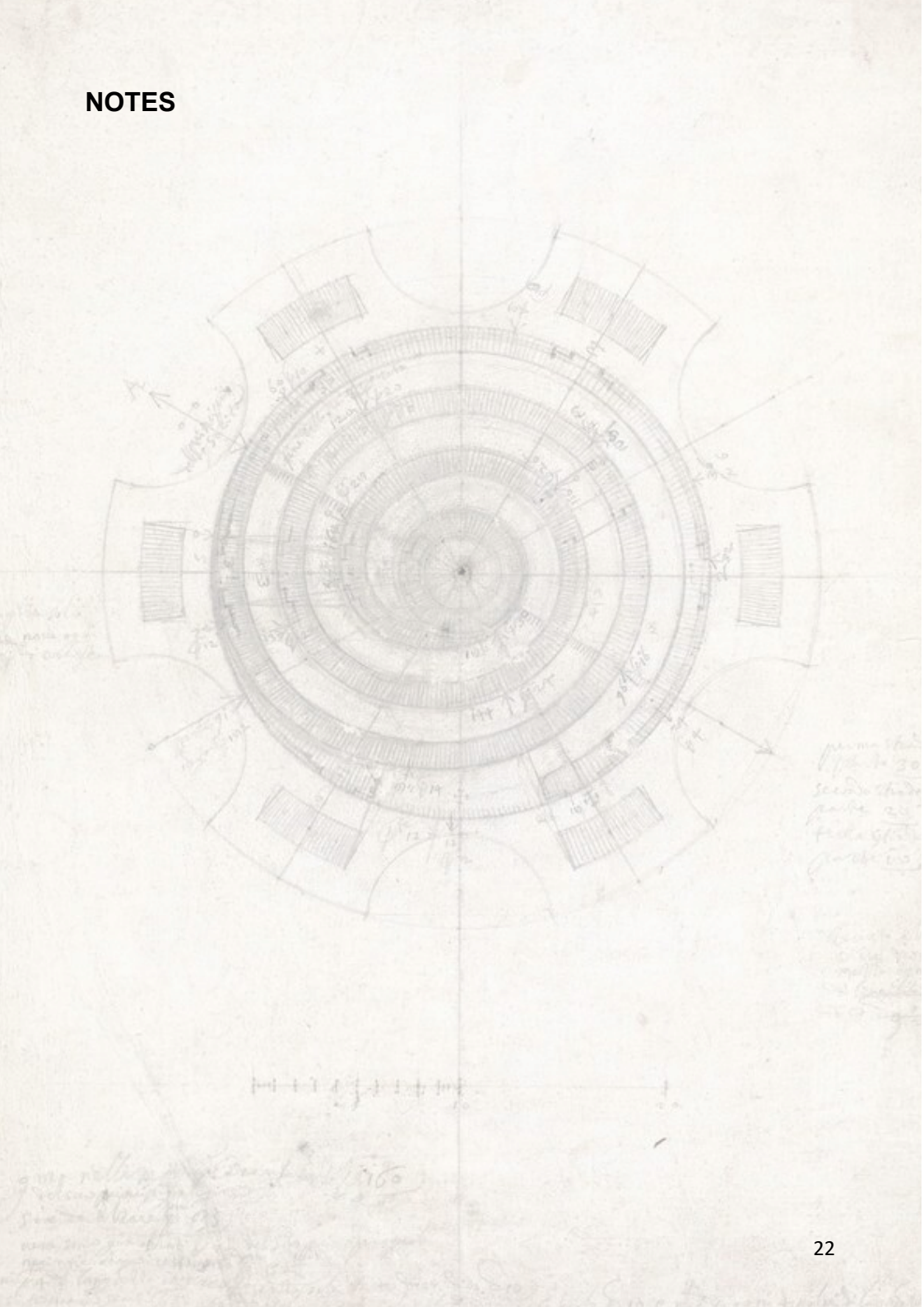

Elizabeth Deans Romariz, University of York

Flipped, Flapped, Folded: Objectifying Drawing Practices in William Dickinson's Sketchbook

This essay explores the materiality and meaning of William Dickinson's sketchbook as a tool that informed his ability to communicate complex architectural ideas on the site of the page. The sketchbook (ca. 1700) contains drawings of important projects under Sir Christopher Wren in the Office of Works including St. Paul's Cathedral, St. James's Palace, and Westminster Abbey. Dickinson's experience at these sites working as a clerk, measurer, draughtsman, and surveyor undoubtedly impacted how he manipulated paper to compose large-scale architecture within the limits of a small-scale object. I analyse formal elements like size, material, and media, paying particular attention to the way the sketchbook worked—how it flipped, flapped, and folded—to illustrate Dickinson's artistic language for communicating spatially, materially, and temporally to his audience.

In considering Dickinson's sketchbook as a guide to 'reading' his drawings, several questions loom into view: what was in his sketchbook and how does it relate to his drawings; what does a sketchbook do that drawings do not; what can the physical evidence tell us about his professional role as an assistant; and finally, who was his audience and how did they interact with his drawings?

Ultimately, the aim of this paper is to demonstrate how Dickinson's material method for conveying space was conceptually linked to the form of the book. As a result of this essay, I hope to shed light on William Dickinson's professional contribution in the Office of Works and his role as an assistant and draughtsman which is seldom discussed in architectural history contexts.

Sara Galletti, Duke University

On Philibert de L'Orme's stereotomic dome in the chapel of the Château d'Anet: a hypothesis on design, geometry, and models

The coffered dome designed by Philibert de L'Orme for the chapel of the Château d'Anet is a masterpiece of stereotomy—the art of cutting stones into particular shapes for the construction of vaulted structures. The dome was executed by first individually cutting its large voussoirs so that they would fit each other precisely, and then dry assemble them like the pieces of a three-dimensional jigsaw puzzle. The helical ribs that form the coffers added a layer of complexity to the work, for they are embedded in the voussoirs; thus, the exact shape and position of each rib section had to be precisely calculated before cutting to ensure that, after mounting, they would form the correct pattern over the vault's surface. The design and execution methods of the Anet dome have puzzled architectural historians for decades. In this paper, I offer a hypothesis for the geometrical process de L'Orme may have employed to realize it, as well as for the sources and models he may have used as reference.

SCOTT OPLER FELLOWS

Maarten Delbeke, 2001- 03

Ann Huppert, 2003 - 05

Anthony Gerbino, 2005 - 07

Laura Moretti, 2007 - 10

Eleanora Pistis, 2011 - 13

Michael Waters, 2014 - 16

Katie Jakobiec, 2016 - 18

Emanuela Vai, 2019 - 21

THE SCOTT OPLER FELLOWSHIP IN ARCHITECTURAL HISTORY

WORCESTER COLLEGE, OXFORD

Worcester College, Oxford offers a two year residential Fellowship in the study of Renaissance or Baroque architectural history through the generosity of the Scott Opler Foundation. The Research Fellowship supports younger scholars for an extended period of advanced research after the completion of their doctoral thesis. This unique opportunity allows a scholar to pursue a research programme in the intellectual community of Oxford at an important point in their career.

Worcester College and Oxford offer unique scholarly resources for the study of Renaissance and Baroque architectural history. The Scott Opler Fellow has access to the rich holdings in architectural history of the University and Colleges including the collections of the Ashmolean, Bodleian, and Taylorian Libraries. Further resources are easily accessible in London and Cambridge.

Applications are invited from scholars of any nationality and academic affiliation in the final year of their dissertation or within the first four years after the completion of their Ph.D., D. Phil or comparable degree. Topics may include any area or aspect of European architectural history during the Renaissance and Baroque era including urbanism, landscape and garden history, drawings and design method, theory and publication, architectural representation, as well as inter-disciplinary studies of architecture and related subjects.

The Fellowship is named in honour of Scott Opler (1956-1993) whose wide ranging interests and own field of research included the art and architectural history of Renaissance Italy. Scott Opler attended Princeton University (AB 1978), Williams College (MA 1987), and was a Ph.D. candidate in Art History at Harvard University in the field of Italian Renaissance architecture. Shortly before his death of AIDS-related illness he created the Scott Opler Foundation Inc., to continue his charitable interests. The Foundation supported the charitable and educational activities in three areas: the scholarly study and preservation of art and architecture, the conservation of nature, and the support and provision of Aids-related services and education.

The Scott Opler Research Fellowship is awarded without discrimination based on race, colour, national origin, sex, religion, disability, political belief, or sexual orientation.

Noam Andrews, Ghent University

Architecture of Disorder in the Age of Perspective

From Alberti's *De pittura* (1435) through Erwin Panofsky's *Perspective as Symbolic Form* (1927) and beyond, the emergence of perspective has been framed as a grand narrative of Cartesian logic. And yet, in the hands of many sixteenth-century artists, architects, and mixed-mathematicians, the capacity to more convincingly represent form in three dimensions offered an opportunity not to diminish spatial illegibility but to demonstrate bravura by increasing it. The paper will aim to address how images of architecture, as a representational subject, came not to coopt but to be coopted by three-dimensionality as vehicle and motif for the demonstration of mastery over geometry and perspective. Appearing (and repeating) in the interconnected media of print and intarsia, architecture served to stage scenes of perceptual disorientation made even more believable in 3D. Centering on the popular print series *Vues d'Optiques* (1551) by Jacques Androuet Du Cerceau (c. 1520-1586) as well as Lorentz Stöer's (active 1557-1620/21) influential booklet of intarsia designs, *Geometria et Perspectiva* (after 1567), the paper queries the epistemic implications of a new crop of architectures expressly designed to toy with spatial order, exploit scalar ambiguity, and elude the primacy of the human gaze. As evidenced by the characteristically virtuosic surfaces of the intarsiated cabinets (*Schreibtische*) for which Southern Germany was famous, an architecture of disorder bearing little relation to the ideals of *The Ideal City* was a visual commodity highly prized by wealthy audiences across Europe. Collaged together from prints such as these and embellished to represent a state of perpetual transformation and temporal instability, the resulting cityscapes capitalized upon the tastes of a nascent perspectival culture that favored complexity over restraint. In so doing, they pointed both to the hubris of deigning to map the real through geometry and to the optical vulnerabilities inherent in the representation of the third dimension.

Emanuela Vai, Worcester College, Oxford

Paper Architecture: Three-dimensional Thought and Practice in the Works of Salomon de Caus (1576-1626)

A leading expert in scientific subjects, Salomon de Caus (1576-1626) authored a number of treatises and manuscripts concerning architecture, engineering, music and perspective. Many of these are lavishly illustrated with three-dimensional diagrams, architectural drawings, sketches, plans, designs and models. The sciences became extravagantly visual in the sixteenth century and drawings were employed as key scientific thinking tools, used to organise, represent and configure certain sets of relations by way of graphic construction. De Caus' treatises are not only a valuable repository of three-dimensional early modern draughtsmanship, but also incorporate crafted paper objects within them. Pop-out paper models and other paper constructions are employed as communicative and epistemic tools that visualise, in three dimensions, De Caus' architectural designs for patrons. The diverse three-dimensional representational technologies used throughout De Caus' works invite us to rethink the relational entanglements of patronage and to further explore the possibilities of three-dimensional thought and practice in early modern manuscripts and books. Here, paper is not only a backdrop for three-dimensional drawings - a material site for inscriptive practices - but an expressive material for the imaginative enactment and measurement of architectural designs, guiding the viewing audience's experience of architecture. Through an exploration of Salomon de Caus' architectural drawings and paper objects, this talk will explore what these three-dimensional representational devices may tell us about early modern architectural thought, theory and practice, as well as the relations between architectural design, the materiality of media and their audiences in the early modern period.

EXHIBITION TOUR

Laura Moretti, University of St Andrews

Daryl Green, Magdalen College, Oxford

Thinking 3D from Leonardo to the Present

For centuries, artists and scientists have wrestled with how to convey three-dimensional objects on the page. Using some of the Bodleian Libraries' finest books, manuscripts, prints and drawings, Thinking 3D from Leonardo to the Present tells the story of the development of three-dimensional communication over the last 500 years.

The exhibition shows how new techniques, developed from the Renaissance onwards, revolutionized the way that ideas in the fields of anatomy, architecture, astronomy and geometry were relayed and ultimately how this has influenced how we perceive the world today. Timed to celebrate the 500th anniversary of the death of Leonardo da Vinci, the exhibition shows how Leonardo and his contemporaries made great strides in the realistic depiction of 3D forms. Thinking 3D explores technological advances up to the present day including 3D modelling, photography and stereoscopy; and also highlights the works of modern practitioners and researchers in Oxford.

The exhibition is accompanied by a range of other exhibitions and events across Oxford in 2019 as part of the Thinking 3D research project.

www.thinking3d.ac.uk

Paul Davies, University of Reading

Spatial representation in a fourteenth-century project for Siena Cathedral and reflections on the development of early Renaissance project drawing

In piecing together a history of the development of Italian Renaissance architectural drawing and its forms of spatial representation, many scholars have identified a pattern of increasing levels of sophistication and systematization. But how valid is this view? The argument does not take into account the huge number of losses nor does it consider how representative the survivors are of drawing types and practices as a whole. Most of the drawings that have come down to us from the fifteenth century are record drawings of antiquities or ideal illustrations to treatises, drawings in which modes of rendering can be simple, flexible and experimental. Only a tiny proportion are project drawings, and most of those are copies, which may well have been simplified. Focusing on project drawings, this paper discusses a fourteenth-century ground plan made for Siena Cathedral, arguing that its mode of spatial representation and its graphic techniques reveal a level of sophistication that is unparalleled in any known fifteenth-century project drawing. It raises questions about what fifteenth-century project drawings in general really looked like and whether our understanding of the development of Renaissance architectural drawing is fundamentally distorted.

Frédérique Lemerle, Centre d'Études supérieures de la Renaissance, Tours

Three atypical publications in France (1536-1560)

Three illustrated publications, very different from one another, followed each other in France in less than twenty five years, each of which had great importance in their respective fields : the French translation of the *Medidas del Romano* (*Measures of the Roman*) by Diego da Sagredo (1526) published in Paris in 1536, the "Digression" on the five orders that Guillaume Philandrier inserted in his commentary on Vitruvius' *De Architectura* (Rome, 1544 ; Paris, 1545) and the *Discours historial de l'antique cité de Nîmes* (Lyon, 1559-1560) by Jean Poldo d'Albenas. These books present distortions between text and images which deserve to be studied both from the point of view of the author of the text or of the translation and the involvement of renowned publishers in the choice of images, according to the audience for whom they are intended. How to explain the additions, the explanatory diagrams, the new illustrations in the case of the translation of the treatise of Sagredo, the weakness of Philandrier's illustrations for a fundamental text of architectural theory and the confounding modernity of the illustrations of the main antiques of Nîmes, some in oblique perspective as in the Codex Coner, well before the illustrations of Philibert de l'Orme's treatise (1567)?

WORKSHOP

Michael Waters, Columbia University

Hieronymus Cock's Diascopic Baths of Emperor Diocletian, Weston Library

In 1558, Hieronymus Cock, the prodigious Antwerp printmaker, produced a monumental publication on the Baths of Diocletian. Consisting of five exceedingly long views of the reconstructed ancient structure rendered in perspectival section, these etchings measure over fourteen-meters when placed end to end. Based on drawings produced by the architect Sebastiaan van Noyen, the combined prints are impossible to take in with a single glance and difficult to comprehend at a distance. Rather, once unrolled, one slowly pans each composite etching at close range, looking across and through the ancient structure at a variety of different points. As one surveys this continuous architectural progression, moving horizontally in real space, the splayed one-point perspective, heavy shadows, and diminutive figures pull the viewer's gaze inward. More than merely unusual images that combine cross-section and perspective, this talk argues that these views constitute a distinctive diascopic way of depicting architecture. Derived from the Greek prefix dia- (through and across) and verb skopein (to see, view, look, examine, behold, and consider), the term encompasses both a method of representation and a mode of viewing. As a technique, it emerged from the experimental drawing practices of early modern architectural culture, relied on contemporary surveying technology, and took inspiration from processional prints, panoramic city views, and physical models. Stretching the field of vision and expanding the realm of the visible, this diascopic mode created a new means of engaging with paper architecture, transforming flat images into a perceptual experience that simulated moving through three-dimensional architectural space. As such, it emphasized the corporality of the ancient structure, and along with the imbedded figural imagery and accompanying text, sought to give the impression that antiquity had been brought back to life through the medium of print. It was, in this way, not only a novel approach to visualization, but also an instrument of enlivenment.

Erin Giffin I Ludwig-Maximilians-Universität

Paper Pilgrimage: Engravings of the Santa Casa di Loreto

Images and textual descriptions of the Santa Casa di Loreto circulated widely in print throughout the early modern period. Such was the popularity of the devotional interior that devout communities sought to replicate the sacred edifice in urban and rural centers across Europe, from Italy to Poland, Slovakia to Spain. In in an era before standardized measurement and axonometric representation, print culture provided textual and visual detail for dedicated devotees and powerful patrons alike, and potentially served as structural manuals for artists and craftsmen in the construction of regional *Sante Case*. This presentation traces the evolution of schematic engravings of the Santa Casa di Loreto by focusing on Adam Philippon's 1649 compilation, entitled *Le veritable plan, et pourtrait de la Maison Miraculeuse de la S.te Vierge, ainsy qu'elle se voit á present á Lorette*. With careful renditions of all four internal walls of the Holy House—including structural, decorative, and deteriorative minutiae—these prints manifest a comparable iteration of the Santa Casa in miniature, complete with a measurable floorplan, shrine, and cult altar. In their inventive specificity, these two-dimensional *Sante Case* shed light on a tradition of architectural replication nascent in the sixteenth century that evolved over the centuries following.

Deborah Howard, University of Cambridge

Frozen Movement: The Representation of Technology in Early Modern Italy

Inventions of new industrial processes – like refinements of existing technologies - were most effectively proposed in the form of working models, but few of these have survived to this day.

It is obvious that the depiction of moving parts was far more difficult on paper because of the need to convey three-dimensional structures and temporal fluctuations. Artists such as Francesco di Giorgio and Leonardo devised various means of explaining complex mechanisms through drawings, but these images circulated within restricted circles. Indeed, secrecy was often desirable to prevent plagiarism, for example in patent applications; again, the audience was a privileged one.

From the later sixteenth century, however, books of engravings of machinery – for example, by Agricola, Stradano, Ramelli and Zonca – were published both north and south of the Alps and began to reach a wider audience. These artists had to devise effective ways of representing elaborate industrial processes that not only involved movement, but also extended through different spatial compartments, both inside buildings and in the open air. Some were more fantastic than practical, but many were well-honed familiar technologies, and all expressed an element of technical virtuosity. As a consequence secrecy began to break down, and industrial production developed rapidly.

POSTER PRESENTATIONS

Chloé Demonet, French Ministry of Culture

From building to parchment: the creation of a graphic language

Based on built, drawn and printed examples, this talk examines the dialog between real and virtual architecture during Renaissance, illustrating how the practice of representing existing architecture led to the elaboration of a specific language, to be used by "those who want to care for architecture" as Raffaello said. The practice of drawing and measuring ancient buildings and fragments increased during the Renaissance, and was soon considered as a key practice for the architectural training of artists. Field sketches, usually finalized in the workshop, were used as a formal and technical catalog, but also as a demonstration of the architect's skill and as a sort of guarantee for the construction project. As they analysed existing architecture, Renaissance architects realised two-dimensional representations which gave them the tools to think and conceptualize their designs in three dimensions. This graphic culture was common amongst artists but also patrons, who wanted to understand the architectural language not only to control the project but also to be part of it and showcase their own architectural knowledge.

A key figure for this development of a specific approach to architectural representation is the Florentine architect Giuliano da Sangallo, whose drawings show the evolution of his own practice between the late fifteenth and early sixteenth century. His drawings are informed by predecessors and contemporaries as well as by his many experiences in measuring and drawing existing architecture. He experimented with several graphic solutions and did not consider mixing technical and artistic figuration a problem, but rather a good solution to show multiple aspects of the object and reach different audiences with a single drawing. Some of Giuliano's solutions remained specific to a single purpose, but most were adopted and disseminated in the artistic environment of the Renaissance to become real and durable graphic instruments for architectural practice and theory.

Nick Mols, University of Edinburgh

Sebastiano Serlio's spatial representation through 'linee occulte.'

Sebastiano Serlio (1475-1554) was a virtuoso of spatial representation through his theory of 'linee occulte' or hidden lines. Serlio stated his Architettura could be used by laymen yet mentioned that a mathematical construct of 'linee occulte' exists behind every drawing. Thus, every architectural representation consists of the ornamental and the mathematical. The ornament pleases the modal observer, whilst, its mathematics is only distillable by the initiates of 'linee occulte.'

By utilising 'linee occulte,' Serlio was able to emulate form as well as represent his own inventions, and, he was able to link the material world of drawing to the neo-platonic world of the mind. Further, 'linee occulte' were ideal instruments of spatial representation since these related plans to perspectives, making these representations more communicative and comprehendible. Inquiring on Serlio's hidden lines outlines Serlio's mathematical and ornamental thinking, but also elaborates on how mathematics was applied for creating spatiality on a two-dimensional plane.

Since the theory of 'linee occulte' is mathematically informed, I propose to bring together historical, digital laser-scanning, and, architectural CAD skills to examine Serlio's 'linee occulte' by analysing one of Serlio's licentious gates. Engaging technologically with historic drawings questions the notions and modes of architectural representations. It will be argued that through its geometry, 'linee occulte' were not only technical forms of spatial representation but also, rhetoric ones. Rather than judging or justifying, the research tries to understand the correlation of theory and practice for representing architectural space. Thus, 'Linee occulte' allow us to understand how technology and rhetoric worked symbiotically to communicate space in architecture.