
Enacting Transcendence: Design Then and Now

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While buildings have been part of our human story since prehistory, the persona we call the architect has not. Magnificent buildings all over the globe have been constructed through a variety of traditions, and few of these have required a separate class of workers whose main focus is the building's prefiguration. In other words, far from inevitable, the definition of this role we call 'the architect' represents a staggering cultural move, one of great importance to the questions posed by this panel. Of greater importance still is the fact that this role's emergence during the Renaissance was part of a process of technological sense-making. Whether we deem it beneficial or destructive, technology's deployment takes many forms in architecture, and yet in today's architecture, the technological is most often associated with the "computational architect." This connection is no coincidence. A similar linkage between a mode of design and the designer occurred during the Renaissance, and the birth of the architect owes no small debt to this link. The difference is that then, it was drawing (specifically the combined use of plan, section and elevation) that revolutionized how architecture was made and drawing that represented the forefront of science. Understanding the stakes involved with drawing's adoption and the ways it associated the Renaissance architect with the forefront of science clarifies why this new role represented such profound and difficult change. Therefore, if today we ponder the necessity of our own profound and difficult changes and whether technology offers us architectural salvation or damnation, the Renaissance truly can be a source of insight.

The idea that the discipline of architecture as we know it today was born out of the Renaissance use

of drawing is not new. And yet, predating Alberti's *De re Aedificatoria* are several medieval sources that document masonic traditions and methods of design. These include the thirteenth century sketchbook of Villard De Honnecourt and the later sketchbooks of Lorenz Lechler, Mathes Roriczer and Hanns Schmuttermayer. Rather than a picture of design devoid of drawing, these medieval sketchbooks reveal an increasing fluency with drawing that developed within a more dominant methodology of design and construction reliant on type and oral communication.¹ Within this system drawing was constrained, but it was present. The question, then, is how the technology of drawing could exist and yet exert such a limited influence on the architectural design until the moment of the Renaissance?

There are several answers to that question that can all be framed as a response to the challenge exerted by a paradigm-shifting technology on culture. One facet of this confrontation is particularly notable within the context of this panel: drawing's role was initially limited because it mounted a profound cultural and theological challenge. Drawing called into question not just to the outcomes or practices of the creative enterprise, not just its techniques or stylistic trends, but the very nature of what creativity meant during this period. It may seem audacious to credit such profound change to what is often seen as a tool, or at most technique of communication. And yet, clearly this is what drawing's adoption represented, and it is this essential shift, the scientific discoveries that finally authorize it, that marks the divide between the pre-Renaissance, craft-driven design practices of the guilds and the post-Renaissance, drawing-driven design practices of the architect.

Of the various scholars whose work supports this interpretation, Alberto Perez-Gomez is, perhaps, the most direct in his outline of the medieval mason's creativity. He writes that, "[the] master mason was responsible for participating in the act of construction, in the actualization of the city of God on earth. Only the Architect of the Universe, however, was deemed responsible for the conclusion of the work at the end of time."² According to Perez-Gomez, the master mason's role should be understood as passive. He operated as a kind of vehicle or means of transcribing God's vision. In sum, the act of design was not a properly human endeavor but, instead, was to be understood and enacted as a divine one (*deus artifex*).

Of course Perez-Gomez is hardly the only scholar to describe a creative reliance on god. At this point in history, the relationship lay at the core of a wide range of human endeavors, not just building, even extending to the very conception of self during the medieval period. Robert Branner wrote that, "[medieval] man considered himself but an imperfect 'refraction' of the Divine Light of God."³ As typology served as a conservative model for architecture, so to did this conception of self serve to support of the socio-political status quo. Like buildings, people were understood as types fulfilling roles or forms given to them by God.⁴ As such, it is unsurprising that a great resistance existed to transformation the standing roles and hierarchies.

One example of such resistance in an architectural environment comes from the famous sermon of Nicolas de Biard in which he derides the role of the master mason. "The master masons, with rod and glove in hand, say to the others, 'Cut it for me here,' and do none of the work themselves, although they receive the greater pay."⁵ De Biard seems to be objecting to what today we might call the 'upwardly mobile' status of the master mason—the laborer who deigns to wear gloves and order others around. The larger point de Biard's seems to make is that improper to make too much of oneself, or to use Stephen Greenblatt's terminology, to self-fashion.⁶ One did not design oneself to a new or personal vision but instead performed the duties of one's type. As de Biard demonstrates, attempts to expand ones own place were seen to violations of the vision God laid out for you. "Hands off yourself," Augustine declared. "Try to build up yourself, and you build a ruin."⁷ If the development of one-

self can be viewed as the primary creative act and the basis for all further creativity, here is a model of creativity that is divested of any personal expression, rooted instead in the transcription of a divine design (*deus verbatim*).

An avenue of this thinking that is, perhaps, more clearly applicable to the design process can be found from the late twelfth century, in a well-known story of a Irish scribe's attempts to illuminate a gospel book. The scribe dreams of an angel who shows him a design for the frontispiece for the manuscript. When the scribe says that he lacks the talent, the angel tells him to pray to God with the help of St. Brigid of Kildare so that "God will guide his hand and help him draw correctly (*ad recte protrahendum manus dirigat*)."⁸ In the end, this process brings the book to a successful conclusion. "And so, with the angel indicating the design, Brigid praying, and the scribe imitating, that book was composed."⁹ Here again we see the creative act defined as transcription. Creativity belongs to divine realm not the human one.¹⁰

In light of such an understanding of creativity, the limited role of drawing during the Gothic period becomes more understandable. The combined use of scaled plan, section and elevation allowed the construction of entire buildings from the micro to the macro scale to be directed by a single vision. It made a place for the single artist to impose his will over all the details of the building. Drawing allowed the forms of a building to be clearly determined and stabilized. It even provided a means through which an entire building could be prefigured as a coherent totality. In sum, scalar drawing allowed one individual to appropriate control over much of the building's form, where previously this control had been held by many (with God alone directing the final composition). The greater emphasis on the individual designer's expression allowed by scalar drawing, and the changes it presented to the process of design, were untenable within the Gothic tradition which used collective effort, in part, to dilute the threat of potential heresy within the design act. As Panofsky concludes in his study of Scholastic aesthetics, "the aesthetic views of medieval Scholasticism are no more than auxiliary constructions for theological trains of thought."¹¹ In short, the very things that drawing empowered within architecture, the things we have today learned define architectural creativity, were secondary within a definition

of architecture which understood the transmission of God's message as the act of creation.

From the sum of these contemplations, a picture of drawing's origins within architecture emerges in which its deployment, though technically quite possible, was restrained by several ontological layers. Informed by the passage of time, we can see the usefulness of these various drawing techniques and their essentialness to design, but the Gothic form of design and their understanding of creativity differed from our own to such an extent as to render a larger purpose for drawing unnecessary. Standing in contrast to this environment are internationally renowned Humanist figures like Alberti, Dürer, Michelangelo, Serlio and Palladio. It is no coincidence that drawing played a prominent role for each of these later artists. In part it was scalar drawing (and for the latter two, the facsimile of those drawings through printing) that occasioned their fame. The rise of architectural drawing in the Renaissance, and the fame of figures like these, is often linked to the codification of perspective and its use in painting. The precise nature of this link is still debated, but for the sake of this argument, the important lesson from this large body of detailed and at times contentious scholarly work has less to do with the historical development of technique and more to do with how both forms of projection transcend the technical to demonstrate express our best understanding of how the universe operates.

For example, in Hubert Damisch's reading of Brunelleschi's famous perspective experiments, Damisch contends that when Brunelleschi was demonstrating the "truth" of his system of representation, he was less interested in learning about the baptistry and more involved with the contemplation of perception, perspective and the structures and logic they share. These efforts were not merely an attempt to learn better how to picture places but more vitally an attempt to peel back the primordial veil of reality and see the geometrical essence (or Divine patterns) which regulated it. In short, much of the early work that many have interpreted as an argument for perspective's legitimacy as a technique can also be seen as an argument for its legitimacy as a means to better understand the human-divine relationship. As Perez-Gomez writes about perspective,

Thus it can be argued that it was the geometrisation of the world that allowed access to a new transcendental truth. ... Perspective marked the moment

of an epiphany, the revelation of meaning and the God-given geometric order of the world.¹²

If God has provided this geometrical order, and if humans could master its use, they could move closer to the Divine through their own creative work. In a neat trick that tied our senses to optics and therefore the universality of mathematics, the artists of the Renaissance sidestepped the fallibility of our senses. In short, the cultural adaptation of the technology of perspective, and therefore the related system of orthographic projection found in architecture, authorized man the creator (*homo artifex*).

Both primary and secondary sources provide evidence of this cultural shift. Père Mersenne (1588-1648), for example, claimed in his *Questions in Genesis*, that "geometry [was] useful for expressing more fully God's qualities and works."¹³ Samuel Edgerton wrote in his study of the interplay between the cartography and perspective that, "Mathematics seemed to be the chief instrument of the Divine Will, and the geometric grid was its earthly metaphor."¹⁴ Nuti similarly contended that, "Ptolemaic maps lack any viewer at all, because they are not representations of the world seen, but of the mathematical essence of the world."¹⁵ In sum, although all the projective systems instrumentalize the experience of an object or place, the "truth" they express became authoritative because such images were governed by a Divine geometry. Pictorial projection provided a "matrix symbolic of a world in which everything has its ordained place and man himself is in harmony with God's master plan of the universe."¹⁶ It allowed a human being to see God's underlying design. The unification of the various systems of projection through the discovery/creation of relationships like *costruzione legittima* demonstrated that rather than expressing different essences or truths about an object, these projective systems revealed the same Divine geometry.

In other words, during the Renaissance the instrumentality of images became symbolic. The difficulties and partialities exuded by drawing's instrumentalization could be justified because they were the same difficulties humans always had understanding Divine plans. So although drawing put an emphasis on formal aspects of design, and formal considerations replaced much of the symbolic aesthetic that governed the Medieval world view, this switch was mediated by the transfer of symbolic power to the act of designing. Rather than simply

relying on the symbolism of the object imitated, the act of design itself became imitative. It was an emulation of God's actions. While the ritualized aspects of the Medieval process were also symbolic, the masons were passive participants. They enacted the mystic rituals passed down to them. During the Renaissance, when artists prefigured architecture through drawing they were using Divine tools to engage in a God-like process. Thus designers took on an active role, and drawing became their sacred medium for design prefiguration. Initially such designers applied their skill to a wide range of subjects, but eventually the unique demands of building created a specialty. Out of this environment, the professional architect was born. Here was a designer whose training and social class was higher than that of the mere craftsman or builder. This new designer was a scholar, a practitioner of the fine arts. Still imitating God, but this time imitating God's actions rather than believing they transcribed His results. The result was one of the most hubristic appropriations of all time: the annexation of design as a human act.

While this story of the designer's rise may seem a distant struggle, one not applicable today, I would argue opposite is true. Many of the same issues are at play. It is clear that 'computer-assisted' design techniques offer more than simply a high-tech mimicry of our analog methods. Computational design leverages new logics and puts an emphasis on process in ways no drawing can. It offers efficiencies and new levels of control over both the building's design and construction. In so doing it opens up new avenues of specialty (e.g. Gehrytechnologies or Front Incorporated). As more and more buildings are realized using computational design, we see it altering material aesthetics, and while Deleuze may tremendously applicable to such work, his writing cannot explain the fullness of the cultural creation that is the built structure. These deficiencies, among others, are recognized and expressed in the polarity of opinion framed by this panel.

One of the most serious impediments to better explanations for computational architecture is its own reliance on the classic tropes of an avant-garde. In a sense this position has been architecture's legacy since the early twentieth century, but the current degree of forward-focus destroys more than a reliance on historic styles. It undermines this moment's own understanding of its place.

When Hani Rashid, for example, declared that, "[o]ur generation is finally becoming active and getting out from under the shadow of the older generations," and that he was "deeply respectful of the preceding generation in terms of the sheer amount of dismantling that was necessary," he was giving a nod to Peter Eisenman's generation of designers.¹⁷ To look back a decade hardly constitutes robust historical awareness. In such a climate how is one ever to surmise what might be long-lasting, much less eternal, about architecture?

In reality, the questions pondered today are not new. Although the 'computational architect' is a recent phenomenon, many of its most fecund veins of thinking contemplated by this newest avant-garde have been mulled over culturally for nearly two-centuries. This longer time frame exists even as the dominant narratives for this highest-tech work speak of its lack of precedent. Detlef Mertin's scholarship on what he terms 'bioconstructivism' delves into some of the historic basis for thinking as current as generative design.

The recent re-engagement of architecture with generative models from nature, science and technology is itself part of a longer history of architects, engineers and theorists pursuing autopoiesis, or self-generation...The well-known polemic of the early twentieth century avant-garde against received styles or compositional systems in art and architecture—and against style per se—may, in fact, be understood as part of a longer and larger shift in thought from notions of predetermination to self-generation.¹⁸

According to Mertin self-generation offered as a means to counter theories of prefiguration in nature. Scholars like the Count de Buffon engaged these themes as early as the 18th century. Rooted in Aristotelian doctrine Buffon was elaborated Caspar Friedrich Wolff and Johann Friedrich Blumenbach during the nineteenth.¹⁹ Similarly applicable thinking emphasizing the importance of process can be found in the formation of fields of study like morphology, and the emergence of evolutionary theory and the development of genetics. Like ideas about self-generation, the emphasis on process as a new means of conceiving of nature was carried on throughout the nineteenth and twentieth centuries outside of architecture, but it held influence with architects, as well. Auguste Choisy suggested that it was process that governed style. In *Histoire de l'Architecture* he writes, "Style does not change according to the caprice of more or less ar-

bitrary fashion, its variations are nothing but those of processes."²⁰ And Reyner Banham summarized Choisy's beliefs by saying that he viewed "form as the logical consequence of Technique."²¹ When Architects of the twentieth century sought to avoid stylistic eclecticism or predeterminism, instead responding to the conditions of industrialization and mass production, according to Merton their work "was conceived more in terms of procedures than formal idioms."²² And finally, beginning in the late 1960's architecture began to take autogenesis on in earnest, with figures like Lionel March making use of the new definitions given to it through cybernetics and systems theory. As this new avant-garde developed, they would eventually reconceive architecture in terms of dynamic, open systems of organization and patterning. Once again architecture aligned the act of making with science, pointing to a way design might return to a definition which allows it to enact the transcendent.²³

In short, such examples demonstrate that the concerns of computational design are not emerging in a vacuum. In fact, what we can see throughout the last 150 years of architecture is once again an attempt to re-align design with a radical shift in the way we understand our place in nature through science. Only recently has technology reached a level where it can offer direct assistance with these efforts. We are, therefore, in the midst of a technological sense-making enterprise that rivals that of the Renaissance. As was the case with drawing, this new understanding reflects our best conceptions of how nature works. The subjects that ricochet around computational architecture today are the same ones that are redefining science. Themes of process and self-generation permeate and radically oppose centuries of previous scientific and cultural thinking. The work it takes to adapt to these new understandings, much less to adopt the technologies that embody and facilitate such thinking, is long and drawn out.

It is no wonder, then, that such revolutionary work seems threatening, but technology alone is neither a saving nor destroying angel. As the history of architectural drawing shows us, a technology can be developed and remain latent, with little effect on the culture around it. It is only when that technology reflects the priorities of a culture that it gains the power to assist and catalyze changing values. Computational methods bring both the promise

and specter of a transformed practice of architecture. Some roles currently occupied by the architect will likely become less precarious, gain a sound footing and go forward as a re-stabilized profession, others will not, and still others may splinter away from the current wheelhouse of architecture to form their own. The moments when such boundaries are realigned are profoundly uncomfortable for both the profession and the academy, but they also, of course, represent profound opportunity.

It is important, however, that in the face of such awesome and dazzling change, we take note of one historic truth. Though the architecture certainly changed between the Gothic and Renaissance periods, it was the discipline that underwent the more radical revolution. The arguments put forth in this paper all depend on this important but often elided distinction. As buildings Chartres and San Carlo alle Quattro Fontane are indeed distinct, but there is far more that unites them as socio-cultural expressions within our built environment than unites the process or persons responsible for their design. Likewise, computational technology may radically change our discipline, and certainly it will have effect on our buildings, but history suggests that some qualities like "the poetic" are socio-culturally important within our built environment on a very basic level, predating the creation of the architect's role. Provided they are remain valued in our larger culture, the suggestion a mode of design would eliminate such qualities in the built environment, likely overestimates the power of our own discipline while simultaneously underestimating our own agency in technology's deployment. By taking the essential step to disambiguate the architect from the architecture, the profession's history from the building's, it becomes possible to stipulate that what is fundamental to architecture is beyond change while maintaining that what is fundamental to the architect may be change itself (and in particular, change in the form of technological adaptation). Perhaps, then, the operative question is this: when these current attempts at technological sense-making have had their effect, will we still manage to recognize the architect?

ENDNOTES

1 See especially Mario Carpo, *Architecture in the Age of Printing: Orality, Writing, Typography and Printed Images in the History of Architectural Theory*, trans., Sarah Benson, (Cambridge, Massachusetts: The MIT Press, 2001), 362, Lon R. Shelby, *Gothic Design Techniques: The Fifteenth-Century Design Booklets*

of Mathes Roriczer and Hanns Schmuttermayer, (Carbondale, Illinois: Southern Illinois University Press, 1977), Francois Bucher, "Design in Gothic Architecture," American Society of Architectural Historians, Journal 27, n. 1 (1968), and Paul Frankl, "The Secret of the Mediaeval Masons," *The Art Bulletin* 27, n. 1 (1945).

2 Alberto Perez-Gomez, "The Revelation of Order," in *This Is Not Architecture*, ed. Kester Rattenbury, (London: Routledge, 2002), 6.

3 Robert Branner, *Gothic Architecture, The Great Ages of World Architecture*, (New York, NY: George Braziller, 1961), 10.

4 Robert Scheller writes that basis for this thinking is to be found in, "the first chapter of Genesis which states that God created man in his own image and likeness ('imago et similitudo'). This immediately raises the question of the extent to which man is a 'copy' of God". Robert W. Scheller, *Exemplum: Model-Book Drawings and the Practice of Artistic Transmission in the Middle Ages (Ca. 900-Ca. 1470)*, trans., Michael Hoyle, (Amsterdam: Amsterdam University Press, 1995), 12.

5 Robert Bork, "Plan B and the Geometry of Facade Design at Strasbourg Cathedral, 1250- 1350," *Journal of the Society of Architectural Historians* 64, n. 4 (2005), 442.

6 Stephen Greenblatt, *Renaissance Self-Fashioning: From More to Shakespeare*, (Chicago: Chicago University Press, 1980).

7 Peter Brown, *Religion and Society in the Age of Saint Augustine*, (London: Faber and Faber, 1972), 30, Augustine, Sermon 169.

8 Scheller, 11.

9 Ibid.

10 Ibid., 16.

11 Erwin Panofsky, *Idea: A Concept in Art Theory*, trans., J.S. Peake, (Columbia, SC: University of South Carolina Press, 1968), 40.

12 Perez-Gomez, 15.

13 Alberto Perez Gomez and Louise Pelletier, *Architectural Representation and the Perspective Hinge*, (Cambridge, Mass.: MIT Press, 1997), 133.

14 Samuel Y. Edgerton, "Florentine Interest in Ptolemaic Cartography as Background for Renaissance Painting, Architecture and the Discovery of America," *The Journal for the Society of Architectural Historians* 33, n. 4 (1974), 287.

15 Lucia Nuti, "The Perspective Plan in the Sixteenth Century: The Invention of a Representational Language," *The Art Bulletin* 76, n. 1 (1994): Note 71.

16 Edgerton: 287.

17 Hani Rashid in Bernard Tschumi and Matthew Berman, *Index Architecture: A Columbia Book of Architecture*, (Cambridge, MA: MIT Press, 2003), 3.

18 Detlef Mertins, "Bioconstructivisms," in *Nox: Machining Architecture*, ed. Lars Spuybroek, (London: Thames & Hudson, 2004), 360.

19 Helmut Muller-Sievers, *Self-Generation: Biology, Philosophy and Literature around 1800*, (Stanford: Stanford University Press, 1997).

20 Auguste Choisy, *Histoire de l'Architecture* quoted in Reyner Banham, *Theory and Design in the First Machine Age*, (London: The Architectural Press, 1960), 24.

21 Ibid., 23.

22 Mertins, 363.

23 As opposed to identifying and acting on and with transcendent universals which was a project of the early twentieth century.