MATERIAL EVIDENCE

New Designs for Architectural Practice

Editors

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Acknowledgements

This publication is the first volume of the 'Conversations in Practice' series that document various annual public activities sponsored by the College of Architecture and Design at New Jersey Institute of Technology. These public lectures and symposiums are the kind of events that afford the opportunity for dialogue - a conversation between the academy and the profession. Such events are thought of as an open conversation in which we pause from our respective 'daily grinds' to share projects, experiences, and ideas. These opportunities remind us that the academic and professional communities are partners in the broader mission of advancing the discipline of architecture with the notion that, 'design matters.' The idea that the construction of buildings and the construction of knowledge are mutually exclusive enterprises - the former typically belonging to the profession and the latter to the academy - is a false dychotomy. We are becoming increasingly aware that an inter disciplinary approach of theory and practice, thinking and doing, research and application, are the important keys to our future.

This publication brings together a variety of perspectives. It catalogs the activities of the Material Evidence Symposium held in the Fall 2009. It documents presentations made, projects shown, and discussions that followed concerning the status of architectural practice. It expands upon the proceedings of that event in an effort to disseminate both its content and process to a larger public.

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MATERIAL
EVIDENCE

Material Evidence

Matt Burgermaster

The ideas, projects, and discussions documented in this publication were originally part of the AIA/NJ-sponsored symposium held at the College of Architecture and Design at NJIT in Fall 2009, entitled "Material Evidence". That event offered a public forum for discussion and debate on the changing nature of technology in architectural practice and emerging potentials for its role in the design of our built environment. This publication aims to expand upon those conversations by re-presenting them as further evidence of new models for contemporary design and architectural practice.

In recent years, contemporary architecture has been fundamentally changed by the evolution of digital technologies as a mainstream production process, sometimes as a design technique, and even as a way of design thinking. These developments have opened up new relationships between previously divergent - and sometimes irreconcilable - terms of material and virtual, representation and production, process and product. Amidst these changes, emerging information and fabrication technologies have acted as a catalyst for disciplinary experimentation with complex form and surface articulation and, more recently, in the realignment of traditional relationships between design and construction. Similarly, they have led to explorations of new models of design integration and professional collaboration emerging within the broader context of sustainability. Fundamentally changing how architects work, these disciplinary shifts and explorations parallel substantial changes to the various environmental, social, and economic conditions within which architecture is produced and encountered today. Within this evolving - and often unstable - context for practice, technology's application to design has consequently produced an increasingly complex understanding of what contemporary design itself is, what its objectives are, and where its values lie. With technology's greater agency in design practices come questions of the authorship of its intended effects. In such a predicament of responsibility, 'change' may no longer be marked only by the fact that a given technology is used, but also by how it is applied to problems of design. The Material Evidence symposium, and this publication, considers the interrelations between changes occurring both within and beyond architecture proper and their corollary challenges, opportunities, and responsibilities. As emerging technologies continue to become more and more sophisticated and ubiquitous, they will play an increasingly influential role in design. What are the impacts and potentials of these technologies on design practices? How does the discipline's application of technology to design enable architecture as a productive agent of change within the broader conditions of the world-at-large?

This publication begins with the same provocation embodied in the so-called 'Exhibit A' that was put forth at the Material Evidence symposium – a digitally generated and fabricated Z-print created by the 'wizards' at the NJIT Digital Fabrication Lab. It is, perhaps paradoxically, both a solid block of real material and a frozen flow of information. While not architecture per se, this 'hybrid' object of resin and letters is offered here as evidence of some of the emerging possibilities for contemporary architecture, in which - to quote Victor Hugo - "the dominant idea of each generation would no longer be written with the same matter."

The Thing Itself

Gabrielle Esperdy

An accumulation of *material evidence* suggests how contemporary technologies are shaping emerging forms and practices of architecture. The rapidity with which technology changes suggests the rapidity with which architecture now changes, Moore's Law on the expanding capability of integrated circuits having done more than a century of modernist and post-modernist critiques to up-end the discipline's customs and hierarchies. But this rapid change also suggests that the *material evidence* accumulated here will soon be obsolete. It will be discarded deliberately and intentionally, out of necessity, as technological "improvements" force architects to reconsider the forms and practices of the here and *now* in light of the here and *a moment from now*.

Before this material evidence becomes the architectural jetsam of the immediate present, it is worth considering what it all means. Not simply for the immediate future—the temporal orientation of all progressive development - but for the immediate past as well, a

backward glance that even the most ardent members of the digerati will welcome, providing it's no larger than a few thousand bytes. To the historian, then, falls the inevitable, though not unwelcome, task of making sense of our architectural present through the lens of our architectural past.

In a recent lecture on the intersection of performance driven design and digital form making, Thom Mayne described how Morphosis uses BIM. For Morphosis, what began as an evolution of computer-aided representation was no longer either its means or its ends. Transcending representation, BIM had become a way to "build the thing itself." [1]

The *thing*, most obviously, is the building, or the object of architecture. The thing-ness of the building recalls the way Colin Rowe theorized the importance of the Chicago frame in the formulation of modern architecture. In an essay from the 1950s, Rowe wrote that "the frame has been the catalyst of an architecture," explaining the impact it had by virtue of its existence as a constituent technological fact of U.S. building practice beginning in the 1890s. But Rowe understood that the frame had a utility beyond its structural function: "the frame has also ***become*** architecture," fostering, in other words, an ideological shift in architecture's conceptualization. [2] From Corbusier's Maison-Domino to Mies' Concrete Skyscraper, the frame was a driving idea in architecture, even if it was not yet a material fact for European practitioners before World War II. After 1945, fact and idea merged to produce the Seagram Building, Lever House, and countless others that didn't simply deploy frames; these buildings ***were*** frames, in an ontological as well as physical sense. The same relationship exists between BIM and the building: Mayne's *thing* is both (im)material and meaningful. It is fact and idea.

If identifying the thing is straightforward, ***to build*** that thing is

considerably more nuanced, implying a seamless merging of conceptualization, schematization, specification, fabrication, and construction. Designing and building are understood as a processive continuum in which the distinction between representation and realization is rendered irrelevant. Though this blurring of virtual and actual, of digital and physical, has become a common trope of the information age, its relevance to architectural practice, and to architectural theory, is far more significant than it might first appear. For at its foundation lays a challenge to architecture and its allied disciplines more profound than any since the 15th century.

I refer not to the collapse of the Albertian professional ideal. Romanticized since Ruskin and Morris fulminated against industrialization in the 19th century, and championed since Gropius urged Bauhaus students to embrace craft in the 20th, the return of the designer/craftsperson, retooled for digital action in the 21st century, has been heralded since the emergence of CAD/CAM techniques in the past two decades. Alberti, nonetheless, provides a convenient starting point.

When *De re aedificatoria* appeared in 1485, it was not only the West's first treatise on architecture since Vitruvius, it was also the first book on architecture published after Gutenberg invented the printing press in the 1440s. Without the printing press, Alberti's ideas about the relationship between architectural design and architectural production would have been far less influential. But the printing press effected another change on architecture, one that is well known in architectural discourse, but whose contemporary import is not yet fully understood.

In *Notre Dame de Paris*, Victor Hugo famously declared "ceci tuera cela." This will kill that. The book will kill the edifice. Printing will destroy architecture. [3] Hugo's dyspeptic view, as numerous critics have observed, was that the proliferation of printed texts

that began in the 15th century displaced architecture's hegemonic cultural position. [4] Architecture maintained its centrality from pre-history through the ancient world to the end of the middle ages. But in the Renaissance, according to Hugo, books, rather than buildings, became the principal repositories and distributors of human knowledge. In its decline, architecture could do little but reproduce itself, repeating the same forms and the same thoughts, in perpetuity ad nauseam.

In "The Art and Craft of the Machine," his well-known Hull House speech of 1901, Frank Lloyd Wright shares this gloomy architectural outlook; for him the intervening seventy years had proven Hugo all too correct. The printing press had, indeed, "dethroned" architecture as "the chief register of humanity." But from his Machine Age vantage point, Wright understood something that Hugo did not. The printing press also changed the nature of human knowledge: "As architecture it was solid; it is now alive." For Wright, this "first great machine" rendered human knowledge dynamic and volatile, imperishable and indestructible. Knowledge, in other words, no longer required the permanence and monumentality of stone to exist or to perpetuate itself. Knowledge found an alternate delivery system, one that, in Wright's view was simpler and easier than architecture had ever been. [5]

From our vantage point in the Information Age, we understand something that Wright did not. Knowledge no longer requires even the semi-permanence of the printed page. It has become far more ***alive*** than Wright could have ever imagined. "Ceci tuera cela." This will kill that. The computer will kill the book. And what of the edifice? Wright believed that architecture could reconstruct itself by learning the lessons of the machine, by embracing the very means of its own destruction. Modernism in the 20th century devoted itself to this pursuit. But the book that killed the building is very nearly dead itself. The integrated circuit and its digital technologies have seen

to that, and architecture in the 21st century has already begun to embrace the means of the book's destruction. The accumulation of material evidence contained in these pages demonstrates clearly this turn of events (notwithstanding the irony of writing about the death of the book in a book).

The death of the book does not mean the rebirth of the building, at least not as an edifice of singular cultural dominance, which is all but impossible in this relativist era. It does, however, offer the opportunity for the building to become more like the book. Architecture in the information age can take on those characteristics that Wright ascribed to post-Gutenberg human knowledge - characteristics that were, therefore, denied to architecture when it was solid and permanent. By adopting dynamism and changeability as critical attributes, architecture becomes what for Wright was the exclusive domain of the knowledge contained on the printed page: "it passes from duration in point of time to immortality."

Understood pragmatically, this shift from duration to immortality echoes the notion of life-cycle performance inherent to building information modeling. This is not a romantic idyll: the time has come to re-imagine BIM. The printing press, like so many subsequent technologies, began as a simple fact; but it became a culturally transformative idea. At this moment, BIM offers a significant opportunity to refocus and re-center human knowledge. After all, what is BIM but a dynamic repository of diverse bits of human knowledge, at once social, economic, material, and political?

In using BIM "to build the thing itself," as Thom Mayne would have it, we may yet succeed in rebuilding architecture, not just as a discipline or as a profession, but as one of the 21st century's most significant cultural projects.

[1] Thom Mayne quoted in Bill Millard, "Mayne Challenges Performative Notions," e-Occulus, 26 January 2010, AIANY.ORG.

[2] Colin Rowe, "The Chicago Frame," reprinted in The Mathematics of the Ideal Villa and Other Essays (Cambridge: MIT Press, 1982): 90 & 99.

[3] Victor Hugo, Notre Dame de Paris, trans. Jessie Haynes (1831; rpt. New York: P.F. Collier & Son, 1902): 174.

[4] Of these critics, the first and most comprehensive is Neil Levine. See his "The Book and the Building: Hugo's Theory of Architecture and Labrouste's Bibliothèque Ste-Geneviève," The Beaux-Arts and Nineteenth-Century French Architecture, ed. Robin Middleton (Cambridge: The MIT Press, 1982): 139-173.

[5] Frank Lloyd Wright, "The Art and Craft of the Machine," reprinted in The Essential Frank Lloyd Wright: Critical Writings on Architecture, ed. Bruce Brooks Pfeiffer (Princeton: Princeton University Press, 2008): 23-33.