Drawing the Line, or *"Surrender, surrender, but don't give yourself away…"*

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In 1999, I hosted a conference at UCLA on the beginning design student. It was called "2000 Tools," and was meant to be a searching discussion of the role that the computer was increasingly to play in architectural design. At that time, one could sense a division: the Luddites and the Providentialists-or, those who abhorred the computer and saw it as the herald of architecture's imminent death, and those who glowed with the brightness of a possible future – new tools, new media, new architecture, and perhaps more than anything, new opportunities. Sylvia Lavin, then Chair of architecture at UCLA, seized on the love/hate divide, or to be more Freudian, the divide between fear and desire, and characterized it along the lines of Victor Hugo's famous chapter, "this will kill that" – if the "the book will kill the building," it could be imagined what the computer would do to architecture.

And, in so little time, times have changed.

The computer is now architecture's fact. Resistance to it is tantamount to career death – from the lowliest "CAD monkey," to the hoity-toitiest "starchitect," all must interface at some point if they want to see anything built. So de rigeur and necessary, computer drawing is outsourced to Bangladesh, emailed to Joe Blow contractors, even tiny city planning offices will request "j-peg files." All architecture schools now offer courses in advanced software. All software skills regularly appear on resumes.

With the computer itself no longer at issue, the question has become actually much deeper – not "to be or not to be," or "what kills what," but "in what manner," and more germane "how far?". Are there limits to the use of the computer when intersected with the discipline of architecture? And if so, to what extent do those limits describe the extant discipline?

It is no longer a question of computers versus no computers, but rather a far reaching set of questions over the nature of architecture itself. Indeed, at the heart of every inquiry of the other, the outsider, is *self*-definition. No less so for architecture – where the slings and arrows of criticality and disciplinary doubt have been especially insufferable.

In architecture, then, when we search the core of the computer matrix, the floor of the self-defining problematic, we necessarily acknowledge the germinating force of drawing. For, of course, lurking behind and under the introduction of new tools, and especially new media, is a much deeper problematic. What is being discussed here ultimately is *drawing*.

Drawing has always occupied a curious place in architecture. To the outside world, or to those who move through the profession without attention to the discipline (and there are many, many of them) – drawing is merely a means to an end. The project, and most likely in their minds, the building, is drawn first. Drawings allow the architect and their client to "see" the finished project beforehand; allow them to envision how it will look aesthetically in its context, which is especially helpful when presenting it to a private funder or public entity; and allow principally for the production of a set of building construction guidelines. Ranging from conceptually schematic to absolutely precise, the drawing set, and its in-the-field interpretation, is the primary job of the architect. The relation between

drawing and building in architecture is imagined as fairly straight-forward and clearly delineated.

Not so for architectural academics and its disciples. Within the discipline, understood here as a set of modern institutions more or less agreed on a common canon of theory and with a formative self-critical aspect, drawing is perhaps the LEAST straightforward aspect of the architectural life-cycle[1]. If imagined as a starting-point for architectural presence, as discussed above, then disciplinarily-speaking, drawing stands at a crucial nexus between the architect and the design. Concomitantly, there are a whole host of critical theoretical issues: questions of authorship (e.g, is the architect the author of the drawing or of the building?), questions of representation and its evil twin, authenticity (e.g, if the former or the latter, which is then the architecture?), questions of means and ends (e.g., why is drawing only a means to an end, and can there be better, faster, etc means to the same or different ends?), and questions of process (e.g., can drawing ever follow building?) among many others. To take the "starting-point" premise further, into the initial question here on the role of the computer, another set of issues compounds and confounds: e.g., how does the computer medium, or the software, affect the eventual outcome of the building? Does modeling count as drawing or as building? Does the computer allow for drawing in the truest sense, or is modeling really all that the computer does? And, so it goes.

That is, if the initial premise is valid, for even the youngest disciple can see that drawing is far more than a starting-point. A cursory glance at any architectural history text introduces students to "architecture," in other words, accepted parts of the canon, that are no more than drawings. Albeit, some are archeological – an extant drawing may have survived well past the physical existence of the building. But, many are unbuilt, speculative, or clearly never meant to be buildings at all. Indeed, the fantastic, to which most of these drawings belong, are as much a part of architecture's canon as the concrete. Piranesi's drawings of *carceri* are an obvious example – the once-glorious classical language of architecture made grotesque and dark could only really exist in the 18th century as a harbinger dream. But, add in Lord Burlington's drawings of English Palladianism shown merely as geometric blocks, Le Corbusier's sketches of Seurrat and Algiers with their visions of a beachy breezy

modernism, and Terragni's perfectly ir/rational mazes – and drawing takes architecture not just to its fantastic outer limits but to its soul of space and rhythm, line and form, place and program.

Thus, while it may be troubled waters, drawing may also be the exact center place wherein the discipline finds itself, reasserts itself, defines itself. After the slings and arrows of criticality have been fielded, what we may discover is that any battle over computers was really a battle over drawing. And, with the computer itself no longer that troubled, in the critical scheme of things, it does induce a new set of critical issues around drawing and its tools. The issue of the computer itself may be resolved, in other words, but drawing, at the heart of the discipline, is still troubled.

The time has come to re-assess drawing in architecture, and to do so with full acceptance of the computer. The categories: drawing, modeling, rendering, even representation (another ontologically unstable term): may actually no longer hold. They are used here as place-markers to describe a relation between architect, tools, media and process of design – an act of making while creating, inspiration plus outcome.

To make this re-assessment, I would embrace the edge. Here, architects who draw, some on the computer, but who do not rely on software to carry out the full formal outcome of their building designs.

The implications are wide and complex: as mentioned previously, it enforces an utter acceptance of the computer to even begin contemplation of its disciplinary trajectories. It asks us to reconsider the discipline of architecture – to assess drawing within it and to contemplate what is drawn. And, most urgently, it begs a question – how much is too much?

Nowhere are the disciplinary constructs of drawing more evident, more pressing, than in the question of authorship in architecture. Ever since Roland Barthes penned his "Death of the Author" essay, architects have agonized over this problem. To make a building and to put it on the Earth was either an act of Author-ity, imagined as a kind of violence in which the author imposed their (his) will upon the physical environment of humanity; or was translated critically into the author's "death." a project's legibility, its' "reading," rested in the eyes

and minds of its users and readers. The author's intention or the criticality invested in the project would in other words, only take it so far. The rest was left to the forms, and perhaps, but only perhaps, the contexts, to carry meaning.   The "heroic stage" of architecture, as described by Alison Smithson, was indeed over, and yet, architecture continued, with an increasing (not decreasing) set of new tools and media.

Some reacted by rejecting authorship altogether. Determined to avoid the violence of Authority, or the violence of death, architectural design cast its eye over the quotidian happenstance of the city street, or the authorless-seeming design-by-committee approach, often with disastrous results. Even though Robert Venturi still continued to design as an architect, many literally adopted the "significance of A&P parking lots," as images of random built environments began to proliferate in architectural journals and texts. This was non-design – however well-intentioned, it was impossible to discern, and even harder to *draw*.

Others, and especially others associated closely with academics, preferred more "automatic processes," hoping that authorship (now the taint of) could be removed through surrender. Enabled by software or not, design processes began to emulate catastrophe. The Santa Fe Institute gained in popularity, with Rene Thom and D'Arcy Thompson's theories of the "jumping universe" at the heart of every creative project.   In this world, also heavily influenced by Deleuze, it was believed that originality could be reinterpreted as difference, and that difference could not be Authored but would "emerge" through a non-deterministic series of processes and combinations. Like a radical revision of 18th-century Deism, the architect would merely set the processes in motion and allow for disaster or catastrophe or bifurcation to introduce an unforeseen difference.   And, interestingly though hardly mentioned, this difference was introduced at the level of the drawing.

Peter Eisenman, already enamored with automatic processes and the critical project of difference as explored with Derrida in the Chora Works, contributed early and influentially to this discussion with his work on the diagram. This history is well-documented elsewhere, most notably by RE Somol. Suffice for this venue, Eisenman's emulation of catastrophe, and hence his overthrow of the Author,

immediately connected this activity to formal geometries. Indeed, to recount this now is to recognize a correlation akin to the Bush regime's insistence on WMD's supposedly lurking in Iraq to the long-term Road Map to Peace, for one can easily suspect that Eisenman's interest in the connection between automatic processes and formal geometries dates back much earlier to his Houses I-X. At the heart of this work was an important supposition: given Cartesian regularity; manipulation and iteration would eventually yield unexpected, unplanned irregularity.

In the diagram, Eisenman found his panacea. Latent geometries, and hence forms, were lurking in a sort of architectural unconscious. These could begin to be unlocked through manipulation and iteration. Or, in a perfectly Freudian move, the irregular geometries and forms could be drawn out through writing. Peter Eisenman, in a supremely Oedipal overthrow of his theoretical father, Colin Rowe, found not 9-square geometric regularity in Palladian villas, but latent geometric irregularities, moments of lost control, catastrophe. And, over 10 years ago, he urged architects to not design through determinism, but to act as psychoanalysts to draw out these latencies – to indeed, seek complexity far beyond the single mind of any one author. But, while Eisenman may have likened the diagram to a form of "writing," perhaps to reinforce the Freudian aspects, most diagrammatic effects were little more than iterative drawings.

Eventually, to those for whom authorship in architecture was a problem – motivated by political correctness or by a new found sense of *kunstwollen* – the computer was salvation. Only the computer could manipulate advanced geometries. Only the computer could manage such complexity. Only the computer could steward catastrophe. The iterative value of the diagram, that which would hopefully produce "difference," could be accomplished more quickly, and more honestly (e.g., with little chance of authorial adulteration), with animation software.

These days, evidence of authorial anxiety lays with the now-basic terminology for the computer as "generative." In this sense, the computer acts as a tool for formal transformation. Following a set of algorithms, often "genetic," the software behaves as an evolution machine, digesting the form under a given set of guidelines or parameters. While perhaps ultimately "authored," by dint of choices, those who

advocate this use of the computer in architecture believe that form is a kind of self-organizing system that exists prior to its architectural manifestation. In the recent publication, Tooling, Aranda & Lasch speak of computer-aided formal transformation as if it existed in a pre-material state, willing itself to matter, but otherwise undifferentiated. The job of the "architect" in this case is to establish "very coherent pre-material rules" to "control the algorithms."[2]

And, for anyone who respects drawing in architecture - that may just be too far.

In his essay "Industrialization and the Crises in Architecture", Kenneth Frampton characterizes the architecture of industrialized technology (the engineered or mass-produced or, one could extrapolate, the scientifically-imagined), as an architecture more concerned with the "how" than with the "what."[3] In Frampton's formulation, technology insists that the process of architecture takes precedence over its meaning.

For lack of a better terminology, we may divide architectural drawing into process people and outcome people – each with varying levels of determinism and authorship, *but determinism and authorship nonetheless*. Some process people may be engaged in the exploration of a range of techniques enabled by software, but very heavy-handed in terms of aesthetic choices of line weights, background colors, the size of void spaces, the effect of rhythms and other aspects of the visual appearance. And in that sense, we cannot say that they are not deterministic or authorial. Nor can we claim that they are not interested in outcomes – only that their primary interest is one which engages the technologies of process. We might call this group the "somehows" – in that while they haven't rejected authorship altogether, they are interested in using the computer as a tool for unlocking potentials within its processes. Drawing, and by that extension, modeling (another deeper conversation) is therefore the computer's preferred medium of communication, and so, drawing it is. Through the drawing of the computer and its software, they get there *somehow*.

Outcome people might then be called "somewhats." Their means are also their ends. Whether employing the computer or not, they make a drawing in order to make a drawing. Potentials may be opened up by that, but they are embedded within

the effects of the "product." Along that line of reasoning, we should also be open to accepting that some outcome people are deeply invested in process, or engaged with the instrument of the computer and its software. This is a more uncertain group in many ways – as they will only know it when they see it – a "what" not entirely understood or even useful, therefore a "somewhat."

What is in fact held in common, and must be considered in relation to the more developed question of the computer is that drawing can be *explorative*. Moreover, it can be explorative within the very language of architecture. The "somehows" are therefore fascinating in their own right – the use of animation software to collect formal modules (Preston Scott Cohen), the tight relation between rendering-as-drawing and fabrication (Andrew Atwood) or the stunning beauty of a tiled structure (Andrew Zago) – in that they begin with architecture's own building blocks to effect transformations through drawing. Volumes, skins, structures differentiate and dance but they essentially remain volumes, skins and structures. And in so doing, preserve the "architectural" aspect of architectural drawing, even if the level, or to be more precise, origin, of determinism, so crucial to drawing, is suspect.

The new "somewhats," on the other hand, use drawing as a visioning tool, more akin to Hooke's microscope of the 17th century – the organism itself is not so much in question, a measured amount of determinism is still at work in the design, but drawing is used to see different sides, different views, usually impossible to the "naked eye." Whether this is the machinic kudzu of Bryan Cantley, the wild worlds of Lebbeus Woods, the comic strips of Bjarke Ingels or Wes Jones, or the maps upon maps upon maps of COA, OMA, AMO, drawing is imagined as enabling the designer to discover new effects. And, these new effects – of shadow and light, space and shape, thickness and drama – can, through the very same medium, be readily translated into buildings.

Exploratory drawing is *already* in architecture's discipline. Whether evident in the darkness of a Piranesi *carceri* or the purity of Boullee's cenotaph, the architecturality of architecture located through different media (think Auguste Perret and the development of ferroconcrete), or the imagination of new effects – ones that eventually found their way into picturesque gardens or John Soane's house –

drawing has always existed as architecture's eye into other possibilities. With the unabashed acceptance of the computer as a drawing tool, we can only stand to gain. But, draw the line somewhere.

ENDNOTES

1   Even Robin Evans, the arguable expert of architectural drawing, sees a need to make an operative definition for drawing that dismisses or at least bypasses the critical layers. "A technique of drawing does not compel designers to do this or that: there are too many ways around it. Its influence though strong, is too local for long strings of instrumental effects to be hung on it. More likely it is a matter of things belonging in sets, of a type of drawing being conducive to a certain range of taste, lending itself to a certain kind of social practice, a certain arrangement of space, a certain pattern of planning." Robin Evams, "The Developed Surface" (1989), Translations from Drawing to Building and Other Essays, MIT Press, 1997, p.200
2   Benjamin Aranda & Chris Lasch, Tooling, Pamphlet Architecture 27, Princeton Architectural Press, 2006
3   Kenneth Frampton, "Industrialization and the Crises in Architecture," (1972), in The Oppositions Reader, K. M. Hays ed., Princeton Architectural Press, 1998, pp.39-64