

A Case for Drawing

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INTRODUCTION

In many schools of architecture, hand drawing (and perhaps drawing itself) has become marginalized while digital modeling has increased in scope and complexity. Resources are increasingly redistributed from hand drawing to digital media. Even with the development of more agile and useful digital technologies, hand drawing in the architectural curriculum remains necessary.

Drawing, by definition, requires the presence of physical forces and resistances during the operational act.¹ Between the tooth of the paper and the guided pressure of the hand, the tool leaves a residue of graphite or pigment on the page. One might speculate how built works of some architects such as Carlo Scarpa or Louis Kahn would have differed without the presence of the hand in design. For architects such as Jorge Silvetti or even Daniel Libeskind, the act of drawing is the act of design. In certain cultures - Italian, for example - drawing and design are the same: *disegno*.

The discipline of drawing, or designing, by hand allows for the emergence and development of particular relationships between drawing, experience, and building. This paper reviews and reveals benefits of hand drawing and argues for the primacy of drawing in educating the architect and making works of architecture. Although currently overshadowed by emerging digital design and fabrication processes, hand drawing, particularly free sketching and pre-

cision orthographic projection must continue to be pervasively integrated into architectural education and practices.

SKETCHING

The value of the sketch should not be framed as a question of dissonance between the potentialities of digital production and nostalgia for hand craft. A sketch is

a rough drawing or delineation of something, giving the outlines or prominent features without the detail, especially one intended to serve as the basis of a more finished picture, or to be used in its composition; a rough draught or design; Also, in later use, a drawing or painting of a slight or unpretentious nature.²

This describes not only an object but also a process or methodology for thinking. Others, who have suggested that "sketching as thinking" is transforming the nature of the discipline, have reinforced this understanding.³ Sketching is more than simply a tool for recording ideas. Rather one may understand sketching as a way of thinking and as part of an iterative process.

The iterative process as thinking is essential to the development of architectural ideas. Just as the author produces numerous drafts before publication, the designer attempts numerous iterations of a work before arriving at a satisfactory conclusion. When subsequent designs relate to prior attempts, the iterative process is observed. Having media

that allows one to quickly and efficiently engage multiple and sometimes fleeting thoughts, ideas and images, is critical to the process of design development. Frascari suggests that for Carlo Scarpa the notion of drawing was not so much about the representation of the object as it was about expression of some essence or idea.⁴ An observation of Scarpa's drawings and sketches clearly reveals an overlapping of ideas and an iterative process so important to the buildings he would produce.

The accessibility of the media with which Scarpa worked (graphite, colored pencil, ink, paper) allowed him to quickly move from paradigmatic idea to detail and back again with fluidity to achieve a direct connection between ideation and work likely impossible with more compartmentalized method and media. Scarpa's drawings had an 'unformed' quality like a sketch which may be described as

a short record made to help memory, an observation quickly expressed in visual or linguistic form, a thought at the impulse of creation, a suggestion for something to be researched further, a free illustration of something spontaneously imagined, a drawing of seemingly insignificant detail, a proposal for future research or drawing. Most importantly, the 'unformed drawing' is 'alive' and changeable.⁵

Historically, hand media have been the primary means of engaging the design process because they allow accessibility that, until recently, digital media has not afforded. Even as new hardware and software developments transform the ways in which we engage these technologies, it's reasonable that hand media will continue to be the predominant method for investigating formal and spatial ideas, primarily because of their intuitive nature. Portability of media is essential to the notion of sketching. Whether using charcoal stick or a digital sketch mimicking program, the tool must be readily accessible, intuitive, and easy to use. Williams and Sanchez del Valle review various digital sketch based systems, but it is unproven how intuitive or easy to use these tools are, and whether they are applicable within a studio setting. They do conclude in the end, however, that "the quest to physically merge traditional hand sketching with digital mediating technologies echoes the perceived importance of the role of sketching in architectural design."⁶ This merging of methods and media and the fact that the digital media so far tend to mimic hand media, suggests the continued importance of the role of hand sketching in the studio.

Field and Documental Sketching

Field and documental sketching are important ways of learning architecture. Williams and Sanchez del Valle categorize these types of drawings, which describe some existing condition of the physical environment,⁷ as a referential mode of expression. These types of drawings typically create a direct and distinct relationship between the environment, the body and the media. The acts of occupying a place, and of physical and visual interaction with a subject, results in a greater degree of exploration than might be possible in the more sterile and focused environment of a studio or office. Relationships sensed when first surveying the subject, for example, become more clearly understood after they have been engaged through the act of sketching. Rocco Ceo suggests that the loss of traditional drawing classes in the academy is "taking its toll on architecture, where buildings often appear divorced from their sites and bear meaningless detail or articulation."⁸ He goes on to suggest that through the act of drawing from plaster casts, students might learn lessons of materiality, arrangement or composition applicable to any design aesthetic or paradigm, at various scales.⁹ This position suggests that the field and documental sketch contribute to, and have value in, the education of the architect.

Perhaps through the physical act of measuring a column, or through a proportional study of a facade, one becomes more aware of systems and strategies for design. This hand-eye-body activity leads the designer to perceive and understand in a more complete way than might be possible through analysis of technical documents or photographs. Through careful observation and onsite documentation of the buildings on the Campidoglio in Rome, for example, one might more fully understand the systems of layering and organization that Michelangelo applied to his architecture.¹⁰ However, to know a building through observation and sketches requires several ways of looking. Technical documentation *in situ*, while perhaps painstaking, may facilitate better understanding of various characteristics of the building, and this technique has been of great use to architects since the renaissance.

Pictorial documentation (whether site sketching details of a building or a panoramic view of a city) requires a different skill set and is often more difficult to achieve. Others have asserted that the

misperception of the object is the major source of drawing errors,¹¹ citing significant artists and theorists¹² who have considered the role of pictorial documentation in art and architecture. Common among their positions is that the essence of the object drawn is more important than correctly perceiving it visually. Must one “draw to know” or must one “know to draw”? Indeed, both must be true in order for these types of drawing to be truly useful and successful.

Design Sketching

The design sketch, classified by Williams and Sanchez del Valle as an experimental mode of expression, is used to capture or generate the non-existent.¹³ The design sketch also helps us to link the abstract world with the material world particularly when used as research tools to explore various concepts or relationships.¹⁴ This position reinforces the notion of “sketching as thinking” while simultaneously creating a condition of ambiguity which perhaps is one of the most significant components of the design sketch. Manolopoulou states

Accidents and mistakes, the minutest slips, the random fleeting of inconsistent ideas . . . are significant aspects of the creative process that should not be neglected. The process of architectural thinking is as important as the finished product because it opens new possibilities.¹⁵

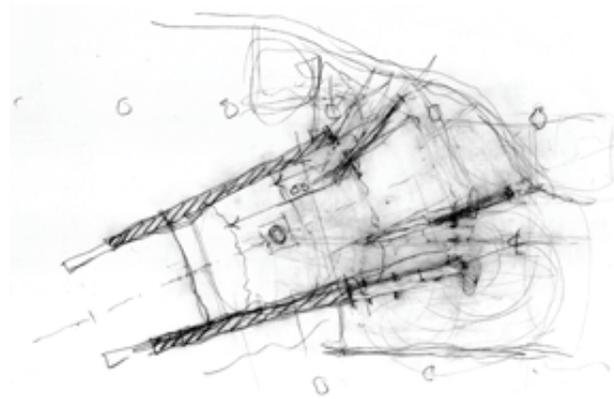


Figure 1. Design Sketch, Bernard Cywinski, FAIA

It is the persistence of exploration of possibilities, through drawing, that leads to a disciplined design process.

Kiel Moe describes an iterative process based on his students' use of digital media within the stu-

dio. In his course, students are asked to cycle through various software types as they reiterate the design of a building envelope resulting, effectively, in a digital analytique.¹⁶ This is a process that is not far removed from the one practiced by Scarpa, albeit with different media. More significant than the media here is the idea that certain types of design processes persist within the studio. So the rigorous use of digital media in the iterative process of design begs the question: Are these sketches? Although they do possess certain qualities of a design sketch, in that they demonstrate a thinking process, they may lack the sensorial quality demonstrated by designers who draw by hand. This may in part be due to the ease with which one may make changes to a digital drawing, but also to the physical, emotional and temporal distance that results from the act of drawing by clicking on a mouse and viewing a constantly changing image on a monitor.¹⁷ Mark McGlothlin describes the act of drawing as a physical act in which the medium responds to the needs of the body, and vice versa. Contrasting this condition, he notes that although drawing with digital tools is a similar intellectual exercise, the tactile influence on the drawing is less significant.¹⁸

In the end, the act of sketching by hand, of putting pencil to paper in order to explore a series ideas or impulses seems to involve more than an intellectual exercise. It allows the body to fully participate in the production of the work, whether through the feel of the paper as the graphite is laid down, or through the emotional contact with a physical product that has no duplicate, or through any number of other physiological and phenomenological responses. These acts of drawing during the process of design are particularly important as they imbue the work with an essence that is holistic, an essence that is less evident in the digital medium. The physical attributes of the hand drawn sketch arguably precede a final product that more specifically expresses the intuitions of the designer.

PRECISION HAND DRAWING

The tradition of the modern architect originates in the transfer of design from the building site to paper during the early Renaissance. Prior to the Renaissance to design was to “designate” (*designare*) directly upon the site the locations of key points of the structure during construction.¹⁹ Design quite

literally ruled the process of construction, but it did so from within the manual building crafts. With the edification of drawing as a reliable representation of the world²⁰ and through the rise of the artist-architect of the Renaissance came the understanding of design (*disegno*) as the designation upon paper of the ideas ruling an imagined structure.²¹ Today, we are experiencing another disciplinary paradigm shift where, aided by digital modeling, information, and fabrication tools, the architect is reemerging with the building trades. Some call for the total abandonment of the architect's traditional drawing tools and their limitations²² while moderate voices embrace both traditional and emerging design media and suggest that we must, at least for the moment, include both in order to maintain the widest collection of tools to meet a particular application. Against the *Luddite*, one²³ may revive Le Corbusier who famously stated "The tool is the direct and immediate expression of progress; it gives man essential assistance and essential freedom also. We throw the out-of-date tool on the scrap heap . . ." ²⁴

The paper is situated in the middle ground. While tools are used in their development, precision hand drawing, unlike emerging digital modeling, information, and fabrication media, are not tools at all but are rather analogical *corpora* that uniquely conserve the act of architecture as the act of *disegno*. It is the inherent disposition of hand drawing within the tradition of architectural design to analogize idea and essence rather than to represent fact. Furthermore hand drawing is inclined to embody experience rather than embed the body and to rule construction rather than build rules. These strengths of precision hand drawing are best realized during the construction of design documents rather than the production of construction documents. Because the formal pedagogical component of an architect's education is focused on specifically architectural design thought, actions, and processes, the integration of precision hand drawing within architectural curricula is necessary for continued cultivation of design as it is distinguished within the discipline of architecture. Within the educational setting, precision hand drawing offers the tremendous benefit of reinforcing extemporaneous collaboration. The processes, tools, and techniques of hand drawings must maintain currency in the education of the architect.²⁵

Idea or Essence

At a time when the organization, processes, and products of design disciplines are increasingly indistinguishable,²⁶ perhaps the persistent nostalgia for hand drawing in architecture results from a sense of loss of our disciplinary identity closely associated with hand media engaged by the architect from the early Renaissance to the late 20th century. A recent study using architecture students as subjects determined that, in spite of student recognition of the numerous advantages of digital media, students preferred hand drawing primarily because individual authorship was more discernible²⁷. By extrapolation, we may speculate that it is the unique author-identity of architecture as a discipline within the design fields that is perceived to be at risk with the disappearance of hand drawing. The student study concluded that students associated individual authorship with artistic expression and that the "stubborn resistance against total computerization, can be traced within its bonds of artistic discourse"²⁸ rather than scientific discourse. Because of the expediency of a plot and the potential for perpetual revision, it seems reasonable to suggest that these types of drawings tend to have less value to the author than something crafted by hand.

While the individual artist-architect emerged from the building crafts tradition, the formal classification of Architecture as a Fine Art coincided with the Industrial Revolution.²⁹ Architecture as an aesthetic discipline, not only further separated itself from the traditional building crafts but also from the applied arts (graphic, industrial, fashion, and interior design) that emerged from industrialization. Jonathan Hill suggests a split within architecture that resulted from the application of 'design' to the applied arts wherein design becomes associated with drawing an "appliance" rather than drawing a form "synonymous with an idea." He goes on to say,

Most people associate design with the newer design disciplines which affects how architecture design is understood. But in the discourse of architects, the older meaning of design, as drawing ideas, and the newer meaning of design, as drawing appliances, are both in evidence.³⁰

This infiltration of design as "drawing appliances" into the architectural tradition of "drawing ideas"

made it possible to conceive of architectural work as object and allowed the migration of product design media into architectural practices.³¹ Within the tradition of architecture, to design is to draw ideas, and an idea does not necessarily correlate directly and solely with a particular object. Others have recently argued that incompleteness of the abstract orthographic view associated with hand-based projection makes it a more likely vehicle for the construction within the drawing of ideas (design)³² while perhaps the strength of the more representational, perspectival, and cinematic qualities of digital media is its ability to thoroughly describe the factual conditions of a building and site.

However, the “incompleteness” of content in the orthographic hand drawing does not preclude a specific concretization of the idea. Carlo Scarpa, for example, is renowned for his ambiguous design palimpsests and for the intimate, sensual, and detailed conditions of his buildings. Frascari, who worked in Scarpa’s studio, tells us for Scarpa, “The drawings should express essence – some perceptual presence of an architectural idea – rather than just pretending to be a photographic substitute.”³³ Idea and essence are not equivocal, but Frascari’s coupling of these terms suggests that not only is design primarily the act of drawing ideas rather than objects, but that it is the development of essence – drawing is an analog for qualities as much as it is for drawing forth ideas which raises the issue of media conditioning. Buildings are traces of design media.³⁴ How different might Scarpa’s buildings be had he drawn with object-oriented digital media? As educators we must critically consider how the limitation or omission of any medium limits or omits particular qualities of buildings and impacts the *fundus* of our discipline.

Further Considerations

The potential for hand drawing to embody experience rather than embed the body, and to rule construction rather than build rules presents tremendous benefits uniquely present within the activities of orthographic hand drawing. While perspective is generally presented as a viewpoint associated with a body’s position in space, it actually represents a monocular viewpoint of a disembodied eye. While the proportions of elements intersected by the picture plane correspond to the proportions of an orthogonal drawing, these proportions do not neces-

sarily correspond to a standard architectural scale. Given a constructed design perspective to view, the eye alone would likely find it difficult to identify the location of the picture plane and thus the corresponding proportions and scale of the space. As such perspective at best can provide the most general scale.

While a benefit of digital modeling programs is the ability to fluidly change viewpoints in perspective space and to understand formal relationships three-dimensionally, its tendency to lead to decision-making according to perspective view increases the potential for insensitivity to scale during design. While digital media’s orthographic views contain vestiges of orthographic projection, the zoom command in digital media further compounds the potential for mis-scale.³⁵ Emmons argues that “imaginative inhabitation of the drawing” is only fully possible through bodily reference when scaling between drawing and nature (“full scale”). Emmons speculates “Perhaps this relation of the designer in the drawing . . . explains why dividers were used for centuries to scale plans. The compass becomes the architect walking across the drawing.”³⁶ In a 1996 lecture in which he describes his orthographic intensive design process, Enric Miralles states, “the process of walking may be seen as a kind of writing on the surface of the ground.”³⁷ So scale is the matter not only of body-relational proportion but, as Emmons argues and Miralles suggests, is also the means of moving within and between the construction of the drawing and of the building. Precision orthographic hand drawing, both literally and imaginatively, maintains bodily experience in the act of design. The labor invested by the body, which results from this attention to scale, may also promote a more patient development of the project and a scale-based hierarchy of decision-making where details are developed analogously to the construction process.

Finally, precision orthographic drawing, due to its abstraction and labor intensiveness, is inclined and more apt to rule construction rather than to build rules. At the origin of *disegno*, ideas, drawn by the artist-architect, ruled construction. Rather than the traditional designation on the site of patterns conveyed primarily through oral tradition, the act of *disegno* by the artist-architect was a performative act - the initiation of rules for a constructive, improvisational game to be played to completion

by skilled craftsmen.³⁸ Orthographic drawings, as abstract views of a future building, deferred resolution until the contribution of craft would be made during construction.

With the advent of industrialization, the transfer of skilled crafts to industrialized production and an increasingly litigious society has led to more prescriptive contract documents describing quantity, quality, and the relationships between products as well as architectural elements. Emerging digital design media provide exceptional means for the production of and for automating fabrication. The tendency toward reliance on prescriptive drawings, while perhaps efficient, should be resisted during the initial phases of design. Kiel Moe observed in his students' work "the condition today is characterized by a disconcerting emphasis on the drawing of a building as an object rather than the drawing as a set of implied actions, performances, and effects."³⁹ Moe, referencing Louis Kahn, goes on to make a case for drawing as analog for construction. The deliberateness, even slowness, required by hand and mind during hand precision drawing, reinforces an economy of expression based upon constructive thought rather than graphic thought.

McGrath and Gardner, in their argument for the abolishment of the drawing board and its viewpoint, distinguish hand drawing as a static "artifact" from digital drawing as a dynamic "set of information." To use digital code to parametrically manipulate a set of information describing an object may certainly benefit the process of developing and fabricating a building and its components. However, the emphasis on drawing ideas and essences (*disegno*) as "actions, performances, and effects" through the artifacts of architectural work remains the distinct role of the architect. The difference between these two modes of production may be understood through James Carse's distinction between infinite and finite games. The rules of a finite game lead to a conclusive end while those of an infinite game extend play. The rules of an infinite game "are like the grammar of a living language, where those of a finite game are like the rules of debate. In the former case we observe rules as a way of continuing discourse with each other, in the latter we observe rules as a way of bringing the speech of another person to an end."⁴⁰

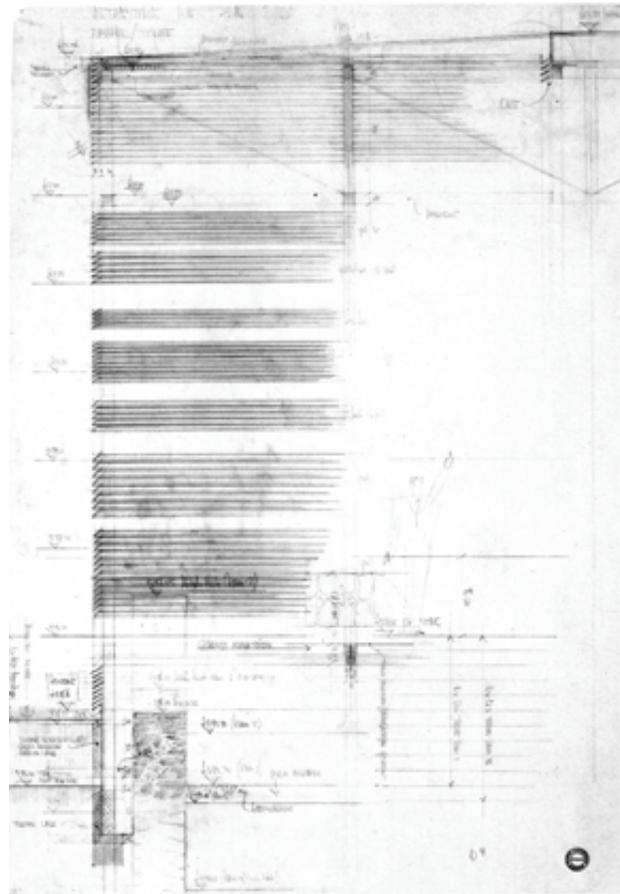


Figure 2. Precision Design Drawing, Peter Zumthor

Orthographic design drawing, embedded conventionally in hand drawing, designates rules of ideation, through which the multiple players may continue to enrich the ideas and experience of the work. This play occurs between the orthographic projections. While the current legal environment and emerging fabrication modes may lead construction documents to be increasingly prescriptive and finite, it is critical for the quality and development of the architectural idea that architectural design (*disegno*), as an infinite game played through the rules of orthographic design drawing, be extended as long as possible. Peter Zumthor recognized this when he stated, "design drawings that refer to a reality which still lies in the future are important in my work."⁴¹

CONCLUSION

Drawing as a method of expression is perhaps one of the oldest methods of human communication.

Indeed, the symbols used in many written languages derive from pictorial representations of the world surrounding us. If hand drawing is the traditional language for expressing, constructing, and realizing architectural works, its translation into emerging digital languages risks a "loss in translation." The marginalization⁴² and potential eradication of hand drawing in the wake of such translation, whether through intention or neglect, limits the potential of architectural work.

The development of various contemporary design paradigms is only possible because of the emergence and influence of digital media in design and production processes. This paper does not argue against digital media. Rather, it argues for the unique contributions and opportunities of hand drawing in the development of architectural thought and work. Maintaining sketching and precision hand-drawing as fundamental activities of the architect extends architecture as a distinct design discipline engaged in bodily experience (through the field sketch and scale hand-drawings), opened to imaginative transformation (through design sketching and orthographic projection), and directed to ideas and relationships (resulting from the abstraction and slowness of the media). Additionally, the qualities of the media of hand drawing may uniquely pre-condition important experiential or intellectual qualities of a built architectural work. These advantages, combined with the extemporaneous interaction possible through working in the open with sketch and precision hand drawings and the tracings of process furrowed into and layered upon the physical paper media, make hand-drawing a necessary and integral component of a well-educated architect.

ENDNOTES

1. Notes: Among the *Oxford English Dictionary's* definitions of 'draw' is "to make (a picture) by drawing a pen, pencil, etc. across a surface" and "to cut (a furrow) with a ploughshare."
2. *Oxford English Dictionary*
3. Daisy-o'lice I. Williams and Carmine Sanchez-Del-Valle, "Overlaps, Boundaries and Continuities: Transforming Sketch," *Seeking the City: Visionaries on the Margins - Proceedings from the 96th ACSA Annual Meeting* (Washington, DC: ACSA Press, 2008): p 547.
4. Marco Frascari and Martin Moeller, "The Tell-Tale Drawing: an Interview with Marco Frascari." *Blueprints*, v. 25 no 3 (Summer 2007):p 6.
5. Yeoryia Manolopoulou, "Unformed Drawing: Notes, Sketches, and Diagrams." *Journal of Architecture* (London, England), v. 10 no 5 (November 2005): p 519.
6. Williams and Sanchez-Del-Valle, 547.
7. Williams and Sanchez-Del-Valle, 550.
8. Rocco Ceo and Jose Grave De Peralta, "Drawing from Plaster Casts" *Drawing from Casts: The Plaster Cast Collection at the University of Miami School of Architecture* (Miami, FL: The University of Miami School of Architecture, 2008): 10-15.
9. Ceo, 10-15
10. Through an observation of the Duomo in Siena, one might in a similar fashion, begin to engage the histories of the physical, political and cultural conditions that resulted in the church that we see today.
11. Dale J. Cohen and Susan Bennett, "Why Can't Most People Draw What They See?" *Journal of Experimental Psychology / Human Perception & Performance* 23, no. 3 (June 1997): pp 609-10
12. Such as John Ruskin, Wang Wei and Leonardo DaVinci
13. Williams and Sanchez-Del-Valle, 550.
14. Manolopoulou, , 519.
15. Manolopoulou, , 523.
16. Kiel Moe, "Translations from (Digital) Drawing to Building," *Seeking the City: Visionaries on the Margins - Proceedings from the 96th ACSA Annual Meeting* (Washington, DC: ACSA Press, 2008): pp 542-3.
17. Mark McGlothlin, "Lamenting Fingerprints – Thoughts on the Passing of the Hand and Mind," *Seeking the City: Visionaries on the Margins - Proceedings from the 96th ACSA Annual Meeting* (Washington, DC: ACSA Press, 2008): pp 535-7.
18. McGlothlin, 535-7.
19. Frascari and Moeller, 8.
20. Recently, see Peter Schneider, "Disegno: Drawing out the Arch-Text." *Journal of Architectural Education* 61, no. 1 (September 2007): 19-22. and Paul Emmons, "Size Matters: Virtual Scale and Bodily Imagination in Architectural Drawing." *ARQ* 9, no. 3/4 (2005): 227-235.
21. The traces of this understanding are still evident in our contemporary contract language of 'design intent' (see Atkins, Jim & Grant Simpson, "Correlation and Intent: The Message of the Contract Documents," *AIA Architect*, V 15, http://www.aia.org/aiarchitect/thisweek08/0620/0620p_risk.cfm (accessed 09.09.2008)), although perhaps it is arguable how often the contemporary intent is one of ideation.

22. See Brian McGrath and Jean Gardner. *Cinematics: Architectural Drawing Today* (West Sussex, England: Wiley-Academy, 2007)
23. See Ryan Rory. "Should Architects be Masters of Technology?" *Architecture Ireland*, no. 224 (February 2007): p 73.
24. Le Corbusier. *Towards a New Architecture* (NY: Praeger Publishers, 1974): 17.
25. See Tod Williams and Billie Tsien, "Slowness," *2G International Architectural Review*, no. 9 (1999): 130-131. for lamentation over disappearance of drafting tools
26. See, for example the organization of Pentagram and Eight, Inc.; the processes of Frank Gehry and Kieran Timberlake; the exhibitions of Hewitt Cooper National Design Triennials and MOMA's Design and the Elastic Mind (2008).
27. Burcu Şenyapılı and Ýncý Basa, "The Shifting Tides of Academe: Oscillation between Hand and Computer in Architectural Education." *International Journal of Technology & Design Education* 16, no. 3 (October 2006): 273-283.
28. Ibid. p 273
29. See Hegel's *Aesthetics: Lectures on Fine Arts*
30. Hill, Jonathan, "Criticism by Design: Drawing, Wearing, Weathering." *Journal of Architecture* 10, no. 3 (2005): 286.
31. Consider the migration of parametric modeling programs such as CATIA into architecture and the recent emergence of object-oriented modeling programs such as REVIT.
32. See McGlothlin, 533-4. & Moe, 540.
33. Frascari, 6.
34. See McGlothlin, 534. for Corona-Martinez-based discussion of media conditioning.
35. Emmons, 232.
36. Emmons, 233. - Emmons references Serlio
37. Kenneth Frampton (ed.), *Technology Place and Architecture: The Jerusalem Seminar in Architecture* (New York: Rizzoli, 1998): 34.
38. Perhaps could be thought of as music for a dance between rule and craft?
39. Moe, 534.
40. Carse, James *Finite and Infinite Games: A Version of Life as Play and Possibility* (NY: Ballantine Books, 1987): 11.

41. Peter Zumthor, *Thinking Architecture* (Boston: Birkhauser, 2006): p32 as quoted in McGlothlin, 538.

FIGURE CREDITS

Figure 1: Design Sketch, Liberty Bell Center, Bernard Cywinski, FAIA; Used with permission of Bohlin Cywinski Jackson; Courtesy of Bohlin Cywinski Jackson.

Figure 2: Precision Design Drawing, Shelter for Roman Ruins, Peter Zumthor; Used with permission of Architekturbüro Peter Zumthor; Scanned from Nobuyuki Yoshida (ed.), *A+U October 1998 Extra Edition: Peter Zumthor* (Tokyo: A+U Publishing Co, 1998): 40.