

Drawing thinking: a lost currency?

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Introduction

Analog architectural drawing is losing currency in both the schools and professional world of architecture. Critical to its stand in the practice and thinking in architecture is a revisiting of how drawing is taught, addressing particularly the 1st year under graduate architectural curriculum and the role of hybrid drawings in subsequent studios. The teaching of drawing is nowadays separate from design, reducing drawing to the obedient apprenticeship of drafting board skills focusing on learning conventions of architectural representation. This denies the act of drawing is inseparable from design imagination, and like design imagination it is in continual transformation.

The imagination of drawing cannot be demoted to execution of ideas, nor should drawing aim at graphic virtuosity for the purpose of producing duplicates of present or future buildings through skilful renderings whether analog or digitally farmed, the latter conveying a misleading idea of scale-production efficiency. Introducing drawing as proficiency, a system to acquire rudiments, conventions and rules of representation in expedited fashion is deceptive. This is reflective of an increasingly codified and fast paced practice offering fewer opportunities for reflection. Architectural drawings accomplish more than an efficient translation of ideas into building.¹ As much as we should think of drawing as design, design studios in the upper years should also think of design as drawing, investigating the traction of drawing as an open laboratory drawing-out design imagination, transferring from drawings to buildings as a completed act. This happens when the drawing/thinking remains open and ambiguous, allowing for on-site interpretations and future reimagining of a building.

While there is a great deal of focus on the continuous development of digital representation, an analogous effort to make visible changes happening within analog drawing is less evident. The drafting imagination course introduced at the Azrieli School of Architecture and Urbanism in Fall 2011 inspired by Marco Frascari's "11 Exercises in the Art of Architectural Drawing" (Routledge 2011) focuses on exploratory forms of hybrid representations based on a cross exchange with the Multimedia photography laboratory taught by Dave Lepage. The exercises challenge a current understanding of architectural representation as rendered image production, whether analog or digital, focusing on drawing thinking as imagination drafting. Emphasizing process rather than instant production students learn to interrogate their own making rather than attempt to validate it by providing new versions of known solutions. Design drawings are means of discovering ideas, creating always-new conventions, broadening the scope of design, and moving towards a less codified practice of architecture capable of redefining its own boundaries.

Deep Translations: drawing signs and drawing imagination

Presently the teaching of drawing in North American schools is often conceived as architectural drafting, teaching a shared graphic language aiming at the acquisition of technical skills that will introduce students to the current building industry reinforcing notions of production and efficiency in the creation of design development drawings. Both analogue and digital drawing courses are separate in the curricula organization from design studio and separate from each other. Often hand drawing precedes the introduction of digital drawing contributing to a perceived tension and contraposition between these modes of drafting and designing. Drawing courses based on codification and technical skills, offer

prescriptive notions of drawing limiting its role in architecture to a code reading/writing activity conveying a narrow understanding of it as a pragmatic translation from drawing to building reinforcing the hegemony of vision and communication over material imagination as a form of drawing thinking.²

The teaching of technical drawing in North America had been a distinct category since the beginning of academic teaching of architecture in the nineteenth century. The influence of the Beaux-Arts tradition in the last third of the nineteenth century contributed to an understanding of drawing as a set of given conventions within which to operate.³ While the history of the teaching of drawing is hardly reducible to the influence of the Beaux Arts tradition a lingering separation of skills versus imagination is still reflected in the architectural curriculum. Graphic skills are described as an “ability to employ appropriate representational media to convey essential formal elements at each stage of the programming of the design process”.⁴ While these are essential “standard minima” one must not forget the more complex role of analogue drawing in imagination drafting. Rather than reducing drawing to the learning of graphic skills the 11 exercises are crafted to allow experiencing the traction of drawing.⁵ While providing an awareness of the provisional nature of conventions, rather than conveying the present condition as one of frozen signifiers the exercises foster the introduction of variants and unique conventions contributing to discursive alterations of graphic signs as newly articulated demarcations of a living architectural drawing language.

In order to initiate a shift from ‘code abiding’ to ‘code making’ we need to conceive drawing as a form of material imagination capable of redefining itself over time. Umberto Eco explained this “*involves a type of discourse which announces a possible code, which produces a new articulation of the culture*”.⁶ The relationship between sign and signifier is renewed through a historical understanding of conventions through a time cross-section into the cultural and material transformations of architectural representation. The exercises instruct the imagination without being prescriptive of the work. The lectures maintain a careful balance between learning conventions meanwhile working within and without

them, providing an original angle of imaginative confrontation, potentially giving rise to a continual re-imagining of representation.

Hybrid Conditions: drawing print and multimedia

Being on what seems to be the cusp of a technological shift from analogue to digital drawing offers a fertile ground for the proliferation of possible hybrid conditions. Representational and technological paradigm shifts have historically offered ground for imagination. The introduction of printed drawings during the Renaissance period for example did not displace the role of hand drawing but rather informed new hybrid techniques contributing to a renewed understanding of representation. Hand drawing remained an essential practice of the Renaissance workshop. Prints became a way of disseminating complete designs meanwhile attending to a slow fast-track construction process.⁷

The question of whether digital drawing is going to overtake traditional media should be overcome by continuing to rely on traditional media. Meanwhile asking digital technologies to do something that is unique to the tool itself it is important to think about the potential of hybrid representations. Hand drawing has a crucial role in reminding us of the role of the architect as *maker*. Today's photorealistic digital renderings reduce representation to a question of instantaneous perception. The notion that architectural drawing is a portrayal of a building's assembling should be central regardless of drawing tools.⁸ One could compare architectural drawing to as a system of musical notation making ‘sound’/‘time’ visible.⁹ To see the music is different than to hear the music. In this kind of notation sign and signifier do not coincide. This can be related to being able to understand a construction process rather than view an external appearance of a finished building. The architect, like a composer, compares past and future events on the ‘drawing-site’, properly sequencing the construction of the building. The ‘stone laying score’ for the construction of the stonewalls at the Thermal Baths at Vals, in Switzerland by Peter Zumthor is telling.¹⁰ The “regularly irregular” wall was not drawn in a realistic way to anticipate a future likeness, rather the process of laying out stones was cadenced by providing a dimensional rhythm within which a degree of improvisation was possible, thus not attempting to

foretell a final image but rather guiding the stone masons' expert hands in the assembly of the wall. In Architectural drawings embody time as a continuum. Naturalistic depictions address a single moment in time corresponding to the viewpoint of the client rather than that of the maker, and for this reason should be used at the end of a design process. The making of a building is something other than the making of a hand or digitally rendered image. By relying on renderings we will no longer 'construct' representations; we will only look at them. The still shots of architectural renderings reduce architecture to skin-deep design lacking knowledge of construction. Amongst some of the most recent digital drawing experimentations BIM [Building Information Modeling] holds promise to direct digital drawing towards questions of assembly and fabrication moving out of the Flatland of the computer screen.

Exercise 11: A Weighty Line Drawing.

This exercise is a reminder of the phenomenological origin of lines as three-dimensional entities possessing unique materiality, weight, geometric propensities, structural properties, sensorial qualities which are time and culturally specific. Analogue drawings are three-dimensional material and cultural presences engaging with our multimodal sensorial perception system.

Flemish engineer Simon Stevin (1548-1620) depicted in his '*oeuvres mathematiques*' (1585 [1634])¹¹ a line segment as a rope stretched between two hands. This rope-line holds an undeniable physical materiality. The stretching of the rope implies a physical tension defining an embodied sense of geometry. The weighty rope-line is from a phenomenological viewpoint a three-dimensional element, with a certain weight, texture, and dimensions engaging our senses. This perhaps explains why the thickness of a line is codified in drawing through a notion of 'line weights'. This terminology carries memory of the analogical materiality of a drawn line, associating a sense of weight with the thickness of a line.¹² In its most current digital version lines have lost materiality and are reduced to two-dimensional virtual double click entities. Weightless wire frame (Autocad) drawings embody a Cartesian understanding of representation

as straight continuous extended lengths without breadth or sensorial properties.

In this exercise thread-lines, metal-lines, pasta-lines, paper-lines, rope-lines, glue lines, etc. inform design through their materiality and inherent "geomater".¹³ Discovering how a chosen material informs the geometry of making is a first critical lesson of analog drawing (Fig. 1). Being reminded of the materiality, weightiness and sensorial qualities of analogue drawings offers a different experience from one derived from weightless digital lines.



Fig. 1. Trevor Whitten. Lines of Light. Photo: Jeremie Lau.

Using at least three 'line weights', for ex. spaghetti n.1, n. 2 & n.3, students rethink their studio space. The materials chosen are used to draw three-dimensional lines relying on the propensity of chosen materials to inform geometry. At this stage there is no use of T-squares, triangles or rulers. The drawing exercise is conducted with the use of the body as primary instrument and simple tools. Experiencing materiality and weightiness of lines as they in-form analogical drawing students are invited to think of their drawings as being made of lines that move in-and-out of the paper transforming threads into traces and vice-versa.¹⁴

Exercise 10: A 111 sticks drawing

Blurring the distinction between drawing and model students create a labyrinth-like space for the body out of 111 sticks of various lengths, using one material with consistent thickness (Fig. 2).



Fig. 2 Antoinette Tang. Balsa lines labyrinth. Photo: Jeremie Lau.

Multimedia Assignment 1: Photogram

The labyrinth is recorded on photographic paper as horizontal projection of lines and shadows becoming a track-drawing tracing the point of contact where each element meets the ground. The application of the photogram as a pedagogical tool exploiting the technique of camera-less image offers the opportunity to scan a vast topography of cross-disciplinary notions that are arguably the foundation of design imagination.¹⁵ The exercises generated by the ability to modulate light and object in a construction of positive-negative space, light-dark tonalities, hard-soft lines etc., offers the opportunity to explore, discover and redefine architectural representation. The quality of materials, surface characteristic, tonal values, opacity, transparency, refraction, diffusion, filtration, etc. are all elucidated by the simple technique of the photogram. In 1839, William Henry Fox Talbot was among the first to explore the potential system of camera less image making which he would later name 'photogenic drawings' and which would subsequently become the basis of many modern negative/positive imaging processes.¹⁶

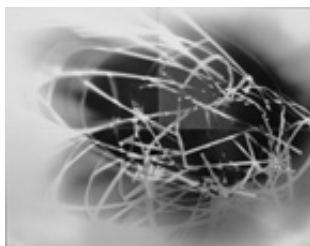


Fig. 3 Antoinette Tang. Photogram.

The photogram exercises are inspired by the works of artists such as Christian Schad (schadographs), Man

Ray (rayographs) and Laszlo Moholy-Nagy (photogram) who pushed the boundaries of photographic representation with the creation of camera less abstract image making by the technique of layering various objects on a photosensitive substrate while exposing these arrangements to a light source. In Moholy-Nagy's first book, *Malerei, Fotografie, Film*, part of the Bauhaus Book series published in 1925, he articulates an extensive photographic program based on the proposition that "the photograph could reveal that which could not be observed or would not be noticed by the human eye".¹⁷ At the Bauhaus Moholy-Nagy expounds the use of the projection of images on top of each other and side-by-side, extreme close-ups or unusual angles as well as the photogram to reveal unnoticed properties of objects such as texture and form.¹⁸

The 111 sticks labyrinth was brought into the multimedia lab where a photogram was created. Students construct 3 photograms on a sheet of 8x10 photosensitive paper (Fig. 3). Placing the 111 sticks drawing on the contact paper mimics the grounding of the labyrinth on the site. Shadows are casted in time. A close-up zenithal light projection gives orthographic *light-weight* presence to the labyrinth in the medium of photosensitive paper.

Exercise 8: The Recto Verso Depths of Drawing

This exercise relies on a tension between the shifting notion of footprint and plan counter posing them on two sides of a sheet of Mylar. The theoretical and temporal gap between a Renaissance notion of footprint (Lat. *Ichnography*) and the modern idea of plan (horizontal section) inspires the construction of this 2-sided hybrid drawing. The drawing allows experiencing the depths of orthographic projections and the depths of paper as a medium analogous to architectural space. The layered space between these two moments/notions in history offers the imaginative lens to experience a deep orthographic gaze in the medium of Mylar capturing a three-dimensional space between footprint and plan.



Fig. 4 Antoinette Tang. Recto/Verso depths of the plan.

The shadow cast photogram is traced onto Mylar (13"x19") demarcating both literal footprints and casted shadows (recto). This is a track drawing timely presencing through shadow casting the drawing/model grounding its feet into the earth. In addition to a clear marking of the footprint and redrawing of shadows (recto) a horizontal section cut of the labyrinth is drawn (verso). A counter viewpoint is established flipping the paper and looking towards the footprint while tracing the plan. A notion of reflected ceiling plan is experienced looking upwards capturing the space between footprint and plan. The choice of materials should be evocative of the sensorial qualities of the place created using different tones of a same color, changing from dark to light in addition to graphite –or– ink. Outlining the outer walls of the footprint (recto) and drawing a solid poché conveys a sense of presence and weight of the labyrinth on the site. The plan side (verso) is a line drawing identifying significant internal spaces and critical paths (Fig. 4).

Multimedia Assignment 3: Multiperspective Photomontage

Raoul Hausmann's prophetic statement made in 1931 bares witness to the capillary nature of the photomontage genre as visual representation. *"The field of photomontage is so vast that it has as many possibilities as there are different milieus, and in its social structure and the resulting psychological superstructure the milieu changes every day."*¹⁹ The photomontage is an imaginative multi-perspective redefinition of a space within the school.²⁰ Students use a 36 exposure roll of Black & White chromogenic film (Ilford XP2) to produce 36 small prints. This film yields high contrast negatives and has extremely wide exposure latitude making it suitable for use in varied lighting conditions. Using Paul Citroen's Metropolis

1920 photomontage as an example of multi-perspective and David Hockney's photomontage or "joiner" technique students are encouraged to assemble all the prints. The photomontage captures the building and reinvents it through the interaction of the eye, the light, the camera and the photographic paper (Fig. 5).

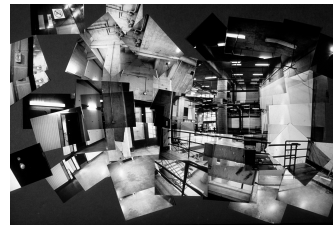


Fig. 5 A. Foote. Multiperspective photomontage

Exercise 4: A Slow Daydream Drawing

Invention means both to find and to imagine beyond a seen visible world through original re-readings. Students go back to the space that they photographed and create a measured plan drawing of that space (1:50 scale) on Strathmore paper (32"x40" white sheet, 2 ply). This is a graphite line drawing with appropriate line weights. Once the original plan is completed an outline of the re-imagined spaces is drawn in blue lead (plan) while elevation details are drawn in red lead (doors & windows). The daydream is inspired by Enric Miralles' drawings for his House in Mercaders Street (Barcelona 1994). Doors and windows exist as floating details within an orthographic fold out surrounding the plan (Fig. 6).

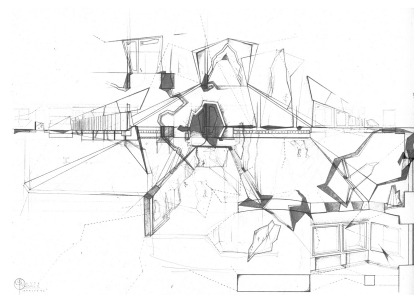


Fig. 6 Thomas Quayce. Daydream.

Exercise 3: Performing Details

Using the photomontage as substratum for creativity students develop the design of one detail. Designing from the details allows for unexpected ideas, increasing the complexity of a more traditional design approach where details are the last step following the organization of the overall space through the design of a plan.²¹

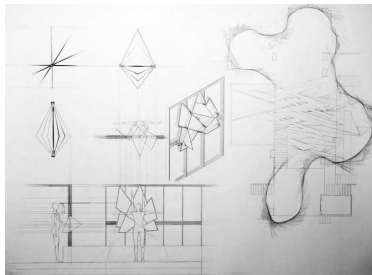


Fig. 7 Victoria Hamatani. Window detail daydream.

Students trace the movement and modular dimensions of their bodies in chosen postures on a blackboard with chalk or on a large sheet of brown paper in charcoal or graphite. Once the tracings are complete they are photographed and printed (1:10 scale). Using the body-traces as guidelines the details are drawn in plan, elevation, section and axonometric views. Different colors are used to differentiate body tracings from detail drawings (Fig. 7).

From Practical Training to Imagination Drafting

The teaching of hand drawing in architecture schools should exceed the minimal objective of learning drafting conventions dealing with imagination drafting. Thinking about drawing as image production reduces drawing to a final short act of performance producing seemingly finished mirror-like images of buildings, rendering an increasingly flattened 'picture' of architecture in both cultural and material expression. This is particularly relevant at a time when analogue drawing seems to become a lost currency in architectural schools and the world of professional practice. The 1st year UG course taught at the Azrieli School of Architecture and Urbanism in conjunction with the Multimedia Course brings to focus the question of imagination drafting reading into the depths of hybrid material artifacts that are part of the architect's own 'first hand' making, opening up the

depths of critical thinking about design. Hybrid drawings could be explored in vertical studio format engaging the upper years. The introduction of digital drawings should not be viewed as the end of hand drawings but rather as an opportunity for new hybrid techniques informing a renewed understanding of representation. Increased attention to the development of hand drawing and its role in the process of design is critical to the teaching and practice of architecture, this is a challenge and an opportunity for a generation of architects *one step ahead*.

Notes

¹ Robin Evan. 'Translations from Drawing to Building'. *AA Documents*, 2. MIT Press, 1997.

² Levin, David. *Modernity and the Hegemony of Vision*. University of California Press, 1993.

³ Paul Emmons. 'Drawing and Representation - the uncertain future of craft: from tools to systems', in Joan Ockman and Rebecca Williamson. *Architecture School: Three Centuries of Educating Architects in North America*. MIT Press 2012: 300.

⁴ CACB 2012 Edition. http://www.cacb-ccca.ca/documents/2012_CACB_Conditions_and_Terms_for_Accreditation.pdf.

⁵ Marco Frascari, Jonathan Hale and Bradley Starkey. *From Models to Drawings. Imagination and Representation in Architecture*. Routledge 2010: 1-2.

⁶ Eco, Umberto. Looking for a Logic of Culture, in *The Tell-Tale Sign*, edited by Thomas Sebeok. Peter De Rider Press, 1975: 9-17.

⁷ Eisenstein Elizabeth. *The Printing Press as an Agent of Change* [vol. 1 & 2]. Cambridge University Press 1980. 1999. Federica Goffi. *Fragmented Drawings & the Drawing of Fragments: Architecture's Exquisite Corpse*. *In-Form*. March 2009. Waters Michael. *A Renaissance Without Order. Ornament, Single-sheet Engravings, and the Mutability of Architectural Prints*. *JSAH* 71, 4. 2012: 488-523.

⁸ Marco Frascari. 'The Drafting Knife and Pen'. *Implementing Architecture: Exposing the Paradigm Surrounding the Implements and the Implementation of Architecture*. Nexux Press, 1988.

⁹ Simon Shaw-Miller. 'Thinking through Construction: Notation-Composition-Event (AA Files 53).

¹⁰ Sigrid Hauser, Peter Zumthor, Hélène Binet. *Peter Zumthor: Therme Vals*. Scheidegger & Spiess, 2007.

¹¹ Simon, Stevin. *Oeuvres Mathématiques*. 1585 [1634]: 342. LOC, Special Collections.

¹² Frascari (op. cit. 2011: 99) argued that Alberti's notion of *lineamenta* holds a material connotation (linum = linen thread).

¹³ William Braham and Marco Frascari, "The Geometer of Architecture." *Paradosso* 8 (1995) 16-27.

¹⁴ Tim Ingold. *Lines. A Brief History*. Routledge 2008.

¹⁵ James, Christopher. *The Book of Alternative Processes*: 2nd Edition (Albany, NY: Delmar Cengage Learning, 2009: 83.

¹⁶ Gordon Baldwin. *Looking at Photographs, A guide to Technical Terms*. British Museum Press, 1991: 67.

¹⁷ Margolin, Victor. "Moholy-Nagy" In *Contemporary Photographers*, edited by George Walsh. New York: St. Martin's press 1982: 527-529.

¹⁸ Moholy-Nagy, L. "A New Instrument of Vision," Nathan Lyons *Photographers on Photography*. NJ: Prentice Hall (1966).

¹⁹ Ades, Dawn. *Photomontage*. New York: Thames & Hudson, 1976: 158.

²⁰ Lucie, Fontein. *Reading Structure Through the Frame*. *Perspecta* 31, MIT Press 2000: 50-59.

²¹ Marco Frascari, *The Tell-Tale Detail* 1984.