Drawing an Education
Influence and Evidence

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Master of Architecture

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sketching, line, sketchbook, interpretation, representation, analysis
This thesis is concerned with the art and act of sketching existing architecture. “Drawing an Education” refers to both educating the line by the practice and habit of drawing and to allowing the line to be the educator by drawing from buildings and places, disclosing relationships, structure and meaning. “Influence and evidence” refers to the influences that affect the process and the evidence as exhibited in a finely tuned intuition.

This thesis is arranged as a three-part inquiry:

· **Drawing**: how sketching facilitates an intimate connection between the architect and the place, the effect on the collective reality and cultural transmission, and sketching in relation to the photograph, both as a device and as a source;

· **Influences**: how six major influences impact the drawing process, each investigated individually and in relationship to one another, both in an historical as well as a poetic context—eye and perception; interpretation; representation; hand and discipline; media and format; and the line itself;

· **Implications**: how an architect’s drawing an education through sketching the built environment is evidenced as a developed intuition and imagination.

It is intended that the reader will have a greater awareness of the process of architectural sketching and be encouraged to draw more, perceive more, and understand more as he sketches along the way, as well as when he embarks on his own Grand Tour.
Drawing an Education
influence and evidence
In memory of Bobby

Coach Barnes, for starting me on this path and making me draw so many perfect lines twenty-something years ago;

My committee, for their encyclopaedic knowledge, kind patience, and willingness to lead me through this process:

Dr. Rodriguez, for his personal encouragement and straight answers,
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And the rest of my family, my loyal friends and church, for always believing in me and keeping me accountable.

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Drawing an Education
Influence and Evidence
"It is art that makes life...and I know of no other substitute whatever for the force and beauty of its process."

As Henry James so beautifully states, art is the very substance of life. Within this world of art lies the line,

"...[simply] a spot on the emptiness of a white sheet flooded by light; no yielding to technical artifice, no dawdling over a complicated alchemy."

I have always been drawn to the line in particular, even to the parameters it imposes. There is freedom in its potential as well as in its limits, and within that, I can let my hand do as it pleases.

The impetus for this thesis was the large format pencil drawings that I accomplished during the European Study Abroad Program and the smaller pen and ink drawings that were done at various times, some drawn on site, some from slides. This thesis is based on *pen and pencil media* in accommodation of these drawings as well as for the following reasons:

- its limitations restrain and focus the inquiry to the line;
- it is the media I have used exclusively until now— my area of expertise;
- I wished to investigate its implications and influences thoroughly before moving on to other media.

Two sources in particular have been my inspiration from the very beginning: Henri Focillon’s essay, “In Praise of Hands” and Edward Hill’s, *The Language of Drawing*. Their articulation of theory is presented in such an impressionable manner that therein I found hope and lumination for my own unformed thoughts. Indeed they will help guide me in paths down which I would like to travel from this point forward.

*Schaller 1997, preface
Focillon 1948, 74
“In Praise of Hands” is an intimate look at how we as artists and architects are physically connected to the drawing and the subject itself. Focillon’s poetics on the gracious gift of hands and drawing ability are contagious, and they offer a wonderful read, leaving me ever grateful for the portion that I have been given. The Language of Drawing is broader in scope and just as inspiring with the vast array of investigative possibilities that are set before the one who draws and his responsibility to do something with them, when drawing both from the environment and from the imagination.

Yet, the most architecturally influential source has been Louis Kahn’s sketches—predominantly from his travels abroad. They have been documented, well analyzed, and rightly admired by Eugene J. Johnson and Michael J. Lewis in their book, Drawn from the Source: The Travel Sketches of Louis I. Kahn. Although Kahn himself deserves the greatest applause for his provoking and prolific work, the authors’ succinct and memorable analyses of Kahn’s drawings were just as influential. In addition to their drawing analyses, they included an interesting look at sketching as opposed to photography.

Three of my sources dealt directly with the representation in drawing. Jill Lever and Margaret Richardson’s, The Art of the Architect was very informative on the historical aspects of representation, but lacked the theoretical depth of Robin Evan’s singular chapter on “Architectural Projection”. Although historical in scope, his essay demystified as well as challenged architectural projection in an engaging and thorough way. In particular, it encouraged me to question the theory underlying different modes of representation that I may use, thus giving my future work a richer basis.
Bruno Zevi’s *Architecture as Space,* and “Representation and/or the Making of Form” by Giuseppe Zambonini also helped illuminate the mysteries within representation — specifically how they affect perception.

As a professional perspectivist, the one area that I have always felt confident in was, obviously, the area of perspective drawing. However, that illusion was challenged by David Hockney in his film, “A Day on the Grand Canal with the Emperor of China”. In it he very simply and forthrightly explains the Eastern approach to perspective through the analysis of two Chinese scrolls. In a moment, I was made aware of the narrowness of my approach. It is not that I will soon adopt the Eastern way of depicting space, but the film has definitely challenged my near-sightedness in this area of representation.

Another source was Wassily Kandinsky’s, *On the Spiritual in Art.* Even though it dealt almost exclusively with drawing from the imagination and was not readily translatable in the body of my thesis, it was quite inspirational in the final chapter, “Implications”. Likewise, *Drawing,* by Daniel Mendelowitz and *The Art of Responsive Drawing* by Nathan Goldstein each provided clues to the responsibility of the line as an investigative tool. Although not the awakening that some of the other sources were, these sources did help me substantiate my own ideas.

The last source that I will mention is Cennino d’ Andrea Cennini. Although his ancient book, *The Craftsman’s Handbook* was for the most part, outside my scope of investigation, one small verse has been a lantern and an encouragement for my continual education of drawing from the built environment as an exercise of the mind in order to prepare the intuition and fertilize the imagination:

“... your hand and your mind, being always accustomed to gather flowers, will ill know how to pluck thorns.”

*Cennini [1390] 1954, 15*
The title phrase of this thesis, “Drawing an Education”, refers to both educating the line by the practice and habit of drawing and to allowing the line to be the educator by drawing from buildings and places, disclosing relationships, structure and meaning.

It is arranged as a three-part inquiry into the process of drawing an education:

- **drawing**: the way drawing from the built environment edifies the architect by creating an intimate connection with place (a binding relationship proven in the diary of a sketchbook) and the impact of photography and the collective reality on the architect as he sketches,

- **influences**: the influences within the drawing process and the unique contributions and characteristics of each: the eye and perception; interpretation; representation; the hand and discipline; and media and format,

- **implications**: the evidence of the architect’s having drawn an education as seen in the development of his intuition and imagination.

My intention is that the reader will gain a more significant and thorough understanding of the process of architectural sketching. I hope that he will be encouraged to draw more, perceive more, and understand more, both as he sketches along the way, as well as when he embarks on his own Grand Tour.
A Chinese proverb—

“I hear and I forget, I see and I remember, I do and I understand.”

To draw and to study architectural drawing, both its processes and images, provide a deeper understanding of the world. Although the proverb says to see is to remember, this vision lasts only for a short while as the mind’s “eye” fades over time. Therefore, a place might be better remembered through a photograph. Yet how superior a sketch—even if it recalls only a shadow of the visual image, as it carries an understanding of the place, being the tool that originally realized it.

Guiseppe Zambonini notes that the “drawing stops maturing at the time it is abandoned”, and even though he is referring to design drawings, it is similarly true for documentary sketches. The place will always be as it was, or just as it seemed that day—irreversibly interpreted on paper. Therein, both memory and understanding are made indelible by studying the tangible evidence left by the line.

The architectural sketch can take visual notes, record impressions, analyze, design, influence, and extricate vague thoughts, memories, and impulses from the subconscious. Sketching permits both the drawer and the viewer of the drawing to imagine themselves in another dimension.

The act of sketching is a way of “living in the intensity of the experience”. The lines intimately connect with the place as they deliberately maneuver over the forms and through the spaces. Years later when one comes upon the forgotten sketch, the richness of the experience returns with the retracing of the path the old lines took—timeless evidence of a past studious endeavor. It is tangible proof of the binding relationship between architect and place.
As even an architect’s trained eye cannot absorb everything by simple observation, it is his sketchbook that bears witness to the influences and ideas that press upon him. It is an intimate look into his artistic conscience and an indicator of his patterns of growth and introspection. It is his diary; the lines, entries of discovery, “a collection of notes upon which the author can draw to reinforce memory.” In a way, it is a welcome transferal of responsibility away from the conscious memory to the sub-conscious and to the page.

One way drawing makes entries in the “diary” is when the line is used to study different facets of the architectural subject. For instance, the drawings to the left are interesting in the multiple ways the same subject is drawn—a study of the shadow, roof structure, outline, etc. They indicate a genuine attempt at knowing the place on many levels. A different approach is that of contemplative investigation as evidenced in this drawing of a Venetian neighborhood.

“Looking down from the Rialto Bridge I was removed from the happy chaos below—the moorings, big boats, little boats, big buildings, little buildings, the formal and informal, all busy and tight—yet only a segment of a long string. This bridge marks the half-way point in the broad ‘S’ of the canal; that my elevated vantage point afforded an expansive view of the curvature of the buildings, more than would be evident if I had been drawing at canal level.

There was so much to absorb that it was difficult to know where to begin. However, because of the limited media, especially in regard to the fine lead, I was able to concentrate more on the lines and particularities of shape and organization of elements—Byzantine, Arabic and Gothic.

Had I not done this sketch of the Canal, the smaller buildings pressed between the larger ones, as well as the fact that many buildings have two unique facades, might have escaped my notice.”

Grain silos
Franklin, TN
(drawn by Matt Smith)
No two sketching experiences are alike, especially with regard to the variables concerning physical involvement. One investigative approach is to simply absorb the sight in a relaxed contemplative manner, with the pencil challenged only to reflect the experience and the day. This classic view of Notre-Dame is such a reflection similarly done by countless others—some better, some worse. Nevertheless, this awe-inspiring sight simply had to be rendered first, in order to set the tone and context for subsequent drawings.

Perhaps, though, it is sitting in one place (or two, or three) in an attempt to find the best spot there—somewhat like holding up an object in hand, turning it to catch the best light, perhaps trying to see the whole thing at once. Perhaps it is meandering through, lying about, leaning over, and peering under, in order to see what no one else sees. For some monuments it is almost rote exercise, but for more obscure buildings, it is true exploration—the markings of the findings like those of an archaeologist.

“The most intriguing aspect of the lakeside town of Gandria is the sense that the houses are clinging to the hill and attempting to peer over one another to view the mountains and Lake Lugano. Many stairs wind around the buildings with seemingly nowhere to go but up. As it was easy to get lost in the near-labyrinthian space, I had to climb and peer over in order to remember from where I had come.

There is only meager public access to the water in many places. It seems to be the benefit of the lower few. They might not get an elevated view, but they do command access to the water. It is interesting to see how the houses are accessible both on the uphill as well as on the downhill side. I chose to make assumptions within this construct about the interior of the houses, both to highlight the dual entries and to add flavor to the drawing.

This type of sectional drawing, therefore best shows the relationship between one building to another—the layering of buildings up and over. The inclusion of the plan drawing was helpful to fully illustrate the context of the section and the complexity of the spatial arrangements.”
A lakeside town
Gandria, Switzerland
A tangential issue surrounding the influence of and on architectural sketching is that of the pencil versus the camera.

With sketching, the subject is internalized and played out as an impulse stemming from the mind, running down the arm into the fingers and pencil, and ultimately drawn out bit by bit on the paper. In this way the architecture moves inside — passes through — as if the one who draws is a medium or filter. Some residue is inevitably left inside to accumulate, perhaps to be drawn out later, mixed with other thoughts. The act of drawing concretizes memories, and, through this process, both interprets and transforms them.

Although there is no substitute for this physical act of putting pencil to paper to internalize the subject, a camera can obviously document it. Yet the taking of a photograph keeps the subject outside the person, no matter how carefully a space is physically investigated. Of course, a photograph is a vital medium for artistic expression, but, for these reasons, it rarely has the individuality and personality of a good sketch.²

On a more pragmatic note, the manipulatable nature of sketching gives the one who draws the freedom to put only what he wants on the paper, whereas the photographer cannot so easily discriminate. He has no opportunity to eliminate electric wires, signs, people, etc. Also, the artist or architect is free to emphasize and alter scale, proportion and hierarchy; the photographer is not.³

This drawing of the Cathedral at Plaza de Armas is indicative of the subtractive abilities of the sketch. Only the absolute essentials are documented here, allowing the viewer a memorable sense of the façade. Additionally, in its minimal state, the sketch is removed enough from the actual building so as to allow the image to be independently manipulated to form a new reality.

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²Tindall 1998, 44
³Johnson and Lewis 1996, 113
This freedom inherent in sketching provides an opportunity as well as a responsibility for pause and for subjective consideration. Louis Kahn was fond of reapportioning shadows however they looked best within a single sketch. He might have drawn a one o’clock shadow on one building and a three o’clock shadow on an adjoining one, so that each would emphasize and beautify its respective element. As a photographer, he would have had no such an opportunity.

Similarly, Philip Rawson points out that a photograph can capture only a single instant in a facial expression, whereas a good draughtsman can convey the intricacies of a personality and a multitude of layers both simultaneously as well as in great depth, with one frame signifying prior frames. In this way sketching approaches the moving picture, for by its nature, time passes as a sketch is accomplished; therefore, ideas and narrative have an opportunity to develop and exhibit themselves. (Yet a drawing’s singular frame can be gazed upon indefinitely, as opposed to film, where time is offered as perception of motion.)

Figure 6 demonstrates this multiple layering, simultaneously depicting the fortress walls, castle keep, and the interventions of the new Museo Civico. One’s eye is free to roam the page, picking up pieces randomly, never all at once, absorbing the relationships between the old irregular forms and the new square forms on several scales.

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12 Johnson and Lewis 1996, 115
13 Rawson 1979, 9
14 Zambonini 1988, 14
Even though sketching on site is generally considered the premium architectural experience, it is, nevertheless, unfortunate to limit one’s scope to accessible architecture, as sometimes it is impractical (distance or cost of travel) if not impossible (it may no longer exist) to sketch something on site.

In this way someone else’s past efforts with a camera can prove a useful surrogate. It can be surprisingly meaningful to sketch from an image—photograph or slide. It allows a head start or point of departure and provides the benefits of simplified choices, enabling more focused concentration. Even Kahn occasionally used postcards as his source, sometimes for a study of the inaccessible, but at other times simply as an inspiration for a composition.

Whether by sketch or photograph, the two-dimensionalization of a three-dimensional experience is a subjective filter, no matter how frankly documentary it may appear to be. Therefore, when drawing from an image instead of on site or in person, one must be aware that the referenced photograph is a derivative of reality and could be a negative or constraining influence, forcing the hand to some extent. Also, the vantage-point and the framed edges both include and eliminate, making it impossible to consider things that cannot be seen.

The choice of whether to draw on site or from an image contributes to a completely different manner of working and, therein, the resultant sketch. For instance, a comparison of the on-site drawing of Ronchamp with the one drawn during a slide presentation shows that aside from the standard vantage point, they are totally different in their approach.
Figure 8 had the time to attend to detail, both in fenestration and in pattern. Yet having done so, it does seemingly deny the power and drama of the Chapel. In comparison, figure 7 had the constraint of limited exposure, which forced almost impulsive decisions about essential qualities. In this case, the sense of movement and shadows (although outstanding in any interpretation) are about all one could manage to capture in fifteen seconds.

“When I sketch on site I automatically use a pencil with a dark but fine lead and draw slowly, deliberately and constructively. The physical experience itself is so fully and engagingly three-dimensional that, in order to capture it on the flat page, I feel compelled to work it to a fairly detailed level. There is a sense that I must be very careful to get it all right and, therefore, attempt to perfect it as the ultimate record for myself.

When I sketch from images, though, it is almost exclusively with a pen—fast, very fast. This freedom possibly comes from the knowledge that I can always come back to it for more; as a result I am uninhibited. The irony is that these sketches, which are drawn from a single image, portray more of the essence than my on-site drawings that are in the very presence of it. How can that be? Possibly it is because the building is already confined to two-dimensions, and it is my challenge to breathe fullness back into it and swell it to the third dimension again. There is so much already removed through the photograph that I can capture it all at once and even add something.”
Drawing is an old form of cultural transmission. In previous centuries it was the draughtsman’s obligation to preserve culture, history, events, and the people who lived them. In 1908, John Tindall stated that for most of history the drawing—the etched line—had been the “sole informant of the form and features of the past.”

“Blest be the art that can immortalise!”…Such an immense debt we owe to pencil and brush in the past.”

The act of drawing is a direct way of researching the past, determining its worth, discarding or embracing that which is pertinent, acceptable, or merely lovely to the eye. It is a way to learn about past cultures, their habits, priorities, and values; and it is a way to pass on the narrative, becoming a part of the collective reality for the next generation.

The drawings of the Beaux Arts architects both depict and preserve the beauty and grandeur of that age’s aspirations. Likewise, even though the Futurist’s left little built evidence of their theory, their drawings continue to impact architectural thought today.

This ability to influence spans from this macro cultural transmission to the micro (as T. S. Eliot states, “from one poet to another”). In this way, to study another’s sketches not only inspires and encourages different ways of drawing and seeing, it exposes and illuminates different aspects of the architecture itself.
For instance, these two drawings of Santo Spirito were made at the same time and have some similarities: a common elevational view and a particular concern with the outline. Yet, figure 10 is sensitive to the outline in terms of proportion, scale and detail, whereas figure 11 is concerned with it in terms of its outstanding figure-ground qualities. After the sketches were complete, the subsequent comparison and debate became intertwined with the history of the sketch itself. Thus, there was a micro transmission between the two who drew, edifying them on several levels.

In still another way, a good drawing can encourage the architect to continue the investigation elsewhere. For instance, the following drawing of a typical city block in Paris 12 motivated similar drawings and a subsequent comparison of the diverse personalities of similar elements to be made in other cities (Venice 2, Amsterdam 13, and Strasbourg 14); thus gaining a cultural education.
Although the drawings are descriptive in nature when viewed independently, there is actually an analysis that happens externally during the comparative process.

The different elements become evident and more interesting and more meaningful when compared—roof and cornice treatments, the overall building shapes in relation to their contribution to the street wall, the varieties of perforations of the blocks (public, private, etc…), and the rhythm of the building masses.

“Venice. (refer back to figure 2) Although the typical block is not located on the Grand Canal as is this one, these relationships still prove typical enough by the city’s standards. There is no predominant roof type; yet most of the buildings are fairly flat in façade; the differentiation and interest lying in the depth of fenestration—some loggias, some windows, some only reveals. The buildings range from narrow to wide, with some appearing to be afterthoughts placed in gaps between larger ones. There is a hierarchy of public access from the canal, some provide private generous landings and piers, some engage in a cooperative effort, and some simply borrow their neighbors’ facilities. If there is any penetration through the block, it is nearly always for private use.”

“Paris. This neighborhood has a fair standard of five stories capped by some version of a mansard roof, or at least a horizontal cornice. There is little differentiation from one building to the next, except for window treatment or balconies. The greatest interest is on street level within a totally commercial zone. Formal elements occur fairly often at the street corners (in the form of a turret in this case). Public access occurs only at cross streets.”
A typical block in Paris
Paris, France
“Amsterdam. 13 Here are three- to five-story buildings with roofs that are nearly all gabled perpendicular to façade, with a variety of stepped ornamental treatments at the ends. The buildings are uniformly narrow, creating a standard that allows all to share equally in the canal and street presence. The front entrances on the “long” streets are accessed from a wide sidewalk, separated from the street by bollards, which protect the pedestrian. The perforations in the block itself have a discriminatory hierarchy, which seems to alternate for boat, pedestrian, bicycle or automobile.”

“Strasbourg. 14 The roof types are many and varied; thus it is impossible to claim a standard. They are in a picturesque arrangement with dormers and clerestories abounding. The buildings themselves are just as varied and irregular, with the public wall perforated by a mix of public, private and semi-private passageways and courts. A bit of foliage is present here and there, softening the connection to the canal. Some blocks have public landings, but this particular one does not; yet it does have individual openings for boat entries. It is difficult to discern whether the “front” faces the canal or the street.”
A typical block in Amsterdam
Amsterdam, Holland
A typical block in Strasbourg

Strasbourg, France
In his essay “Architectural Projection”, Robin Evans writes about the effect that architectural drawings have on the collective consciousness: how they form, alter, or obscure the very buildings that they represent. He articulates the argument surrounding “images on either side of architecture” as drawings are everything and buildings are the unfortunate aftermath, or buildings are everything and the drawings only obscure reality. Either way, he says,

“...great buildings [are]....so completely surrounded by their own projected images. They are set in an aura of illustration that no doubt alters the way we see them.”

For instance, if one has studied the plan of a building, the “experience of walking though is altered by its memory.” Once one has seen the whole picture, so to speak, then one cannot help but predetermine the preferable path, sequence, etc.

As this affects any visitor to a building, it is of profound consequence to the first-time sketcher. Not only is there a pre-conceived idea of what the building is about, but there might be volumes of past architects’ drawings to persuade, inspire, or even intimidate.

As an example, Piranesi’s masterful drawing of the Colonnade at San Pietro sets up a formal, and perhaps optimum, viewpoint for illustrating this space. Even though the elevated station of the viewer is unnatural, it seems to be the best way to capture it all; therefore, when sketching on site and thus knowing full well what the possibilities are, one is keenly aware of the limitations imposed by ground level sketching. So many drawings, then, attempt to break free of this constraint and follow Piranesi’s footsteps up and away to grasp the magnitude of this space.

17 Evans 1989, 20
18 Fraser and Henni 1994, 162
Another example of a sketch being influenced by the history of its image is this one of
the Eiffel Tower. This structure was built to celebrate the 100th anniversary of
the French Revolution, as well as to be a monument to 19th Century technology. It is
both graceful and strong, sinuous but geometrically pure, as the dark tracery pierces
with the sky in a mysterious and awesome way.

“This tower has been drawn so many hundreds of thousands of times,
and as it is perhaps the most recognizable of all structures in the
world, it was a challenge to add anything new at all to the inventory.

So I drew at night, sitting at the end of the Champs de Mars, elevated
somewhat on a monumental staircase (which surely gave me a dif-
ferent perspective than if I had drawn in the daylight).

When it is dark, the structure is absolutely luminous contrasted
against the black sky. It is like sinew being pulled from the earth.
Yet, in the day it appears just the opposite—as if it is a spillage of
iron being poured down from above.

Either way, the structure is splayed apart by an invisible hemisphere.
I overlaid the plan, comparing the elevational geometries of circle
in the square, finding amidst the dynamic shapes, many instances of
pure form.”
Influences
There are several influences which affect the line. But first, as not to be overlooked, there is the anatomy of the line itself — the embodiment of this investigation. It is an influence on the next line as well as corporately on the next generation of lines.

Although the line is the “characteristic graphic means” of graphic communication,* it is not merely a tool to be used in delineating a pre-formed idea. It is the evidence of a probing, determining, observing and dissecting force which has within it the power to evoke thought and the will to discover place and time in element, pattern, structure, and principle.

The line has many occupations. It can underscore, divide and separate one territory from another, enclose areas, join points and mark paths. It can direct, challenge, and create a sense of movement with only the barest substance — the residue of an inanimate thing being brought to life.†

One can contemplate with and through the line, the lines forming and reiterating ideas, slowly and deliberately, pushing the drawing farther, sometimes meandering, but with great control, meditating on itself and the task at hand. The contemplative line is a studious line, a function of discipline and analysis, culminating into conscious linemaking.

*Hill 1966, 44
†Evans 1983, 91; Mendelowitz 1980, 26; Focillon 1948, 73
The character of the line is a mirror of the hand’s attitude, grace and discipline. This personality of the line and the strength of individual style is therefore referred to as the “hand”. A good “hand” is evident in a line that is practiced and sure and has an intentional presence. It is luminous with experience; it reflects the attitude of the architect and will forever be his signature. One example of an outstanding “hand” is that of Frank Lloyd Wright.

“It is light... searching in space and not too linear. It is delicate usually, seems to be made with joy. Sometimes it seems impatient; sometimes the style changes to a delicate touch. [It is always] aware of shadows and light... never heavy handed.”

The line itself may discover a hidden order or relationship within the subject that the eye misses, thereby altering and enriching the original impression and perception.

Even more interesting are the developments in the drawing process that occur when the character of the line unintentionally imbues a quality or bias into the drawing that is then reflected back onto the way a building is perceived.

Proposal for a studio

Frank Lloyd Wright

1891

Hertz 1995, 141
It is not that the line can ever work without the eye’s assistance, but until the line is there to dismantle it, the underlying organization remains only assumed and somewhat vague. For instance, the process of drawing the Palazzo Farnese uncovered its organizational constructs and their relationship to the articulated surfaces by deliberate building up layers and prioritizing the elements along the way.

The line is situated within the drawing process as only one element of several that exist between the architect, his sketch, and his subject. Iain Fraser and Rod Henmi, in Envisioning Architecture: an Analysis of Drawing, describe these elements as a “third presence”:

“Just as an author inserts his or her conceptual presence into a drawing through a mode of seeing, interpreting, and changing a scene, drawing tools impose a material influence. Drawing thus intervenes between an author and her or his [work], becoming in effect a third presence. In this sense, drawing is not a transparent translation of thought into form but rather a medium which influences thought just as thought influences drawing.”

In The Language of Drawing, Edward Hill also alludes to this concept by specifying the three factors as materials, muscular action, and artistic intention.

The remainder of this section will investigate these influences as well as their relationship to one another.

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22 Fraser and Henmi 1994, viii
23 Hill 1966, 2
These influential elements within the drawing process are in loose cyclical relationship with each other; generally speaking, the eye-mind-hand-media-line. All elements are necessary, for if any were removed, it would render drawing impossible or at least greatly diminish it, because if the cycle is broken at any point, it becomes a linear system and, theoretically, cannot perpetuate itself. If the line is not enriched and enabled through this process, it lies on the paper, has nowhere to go, and is no inspiration; it is a dead end.

In the beginning, the eye receives the form and line of the subject and communicates to the mind the visual impression. Together with the mind’s reception of the other sensory input, the total perception is engendered.

The mind not only receives the stimuli but also transfers it into action, controlling and choosing (consciously or not) between the various modes of interpretation and representation (which is a cooperation between stored knowledge and stimulus response) and selection of media based on experience.

The hand, the ultimate influence and that which is closest to the line itself, is not simply forced to operate the implement by mere muscular control; it maintains its own range of influence modified by skill, discipline, habit, and (even though it is given direction) its own will.

Media, then, translates the hand’s intention into the drawn line. However, it does not do so without imbuing its own influence.

The forward cyclical manner in which these influences work is not quite so simplistic, as these elements work neither independently nor always so directly. Though it seems that the subject would have a somewhat predictable path to becoming a line, there is at each stage a subtle transformation—something added, removed, or altered.
These almost indecipherable metamorphoses imbue the line with the richness, texture and meaning that can not be consciously devised. Perhaps it is also the mood of the artist, the varying degrees of friction between the pencil and paper, the tautness of the hand muscles, even one’s position, or the lighting that makes the difference.

The cycle can be compared to the game of gossip. When a story is passed from person to person around a circle, although it comes back around eventually, it somehow has evolved and become richer, more detailed and more interesting. This is evidence of the non-cyclical relationships at work— vectors dissolving into eddies.¹

The following chapters investigate these influences that present themselves as filters within the sketching process and thereby have an impact both intentionally and unintentionally on the evidence— the line:

- the eye and perception,
- modes of interpretation,
- modes of representation,
- the hand and discipline,
- media and format.

¹Evans 1989, 20
Influences
The eye and perception
Perception is the beginning of the architectural sketch; the eye becomes critic, audience, and messenger to the mind. It is the receiving of stimuli—first the building or place and then the line as it is drawn.

Figuratively speaking, to have an “eye” means to have the faculty of discrimination—the difference between the educated eyes of the architect or artist and those of the layman. Edward Hill refers to this phenomenon as “awakening of numb vision”. The act of drawing forces the eye to slow down and truly see, which requires discipline and a heightening of perception and sensitivity, the higher order of artistic vision.

When the architect’s disciplined eye encounters its subject, an immediate impression is not merely composed of the physical attributes of the building itself, but of external factors as well. Sometimes it is even the pre-disposed attitude of the architect, whether or not he feels good, tired, excited, or bored. It might be the fact that it is bright yet cold and the building seems frozen that contributes to the impression as do the surrounding sounds—a splashing fountain or a nearby river, the sounds of traffic, or of children playing. This is evidenced in the drawing of Il Campo.

\[\text{\textsuperscript{22}}\]
"When I was standing before the Palazzo Pubblico, the echo of tourist voices, the monochromatic walls both illuminated and shadowed by bright sunlight, and a sense of being on stage all heightened the sense of enclosure and directionality within this irregular sloped piazza. It is a vast, roofless room with vast walls of brick and stone, going around and around. I used the convention of one-point bird’s eye perspective to convey these amphiatheric qualities within a single frame, excluding all buildings outside the piazza in order to maintain the central focus.

As I desired to be true to the actual physicality of the space, I utilized a descriptive investigation. Still, I wanted to exaggerate those qualities in order to reinforce the strong centrifugal spatial sense that cannot be captured in a photograph or in any other way. Although this drawing seems to concentrate on the delineation of the varied facades, roof forms, and the rhythm of the elements, the detail really serves to reinforce the contrast between the richness and complexity of wall texture with the openness and simple dynamics of the piazza floor.

For the most part, I drew at piazza level in front of the Palazzo Pubblico, but I eventually climbed the tower to determine the roof shapes and detail."
Il Campo
Siena, Italy
1289 - 1309
Sometimes in a moment or two, a quick sketch can set down the impression and the essence with a lack of pretension that is hard to maintain when it is worked over again and again.

As an example, these Egyptian pilasters 23, remarkable in their relief, need no detail or completion of line. The sketch has an unselfconsciousness that possibly would have been forfeited had it been finished later on, re-drawn, or had the awareness of its public display been foreknown. Whether or not it is successful by any imposed standards, the first sketch is an important piece of documentation that can provide clues for further investigation and development.

Likewise, in musical performance, particularly in the types that emphasize individual improvisation, the first take is also the most important. As Bluegrass artist Jimmy Martin said during a recording session,

“Put everything you’ve got into it… don’t say ‘oh we’ll take it over and do it again’ because every time you go through it you lose just a little something. So let’s do it the first time and the heck with the rest of it.” 27

23 Columns at Zoser’s complex 2600 B.C. Sakkara, Egypt

26 Hill 1966, 19

27 Martin 1972
The first impression, which occurs before the first line is even laid down, alludes to
deeper, although less tangible, aspects that are unveiled during the process of sketch-
ing — internal order, “inner force” or essence.

“...the artist’s soul goes out in sympathy with his object— to him it almost ceases to be
inanimate...He becomes at once historian and poet.”

Wassily Kandinsky separates *impression* (“a direct impression of nature”) from *im-
provisation*, which is “a largely unconscious, spontaneous expression of inner char-
acter, [of a] non-material nature”. Although he is generally referring to art which
springs from within the artist, the latter also can be translated into the architect’s
perception of the essence of an existing place.

When sketching, Le Corbusier entered into an intuitive communion with his subject in
order to connect with that “inner force” and find the harmony beneath the surface.

“...he repeats lines again and again along the contours of the cow, as if calculating its shape. He
feels along the spine of the animal with his pen, setting the inner nuances of its shape into the
recesses of his mind.”

Le Corbusier once said,

“I would like architects... [to draw] the spirit of a tree, the harmony of a sea shell... so as to
discover different expressions of an inner force. I would like their hands and minds to become
passionately involved in this kind of intimate investigation.”

Still, the essence is not always a distortion or ephemeral drawing; rather it might be
expressed through the media or even the composition. For example, the following
drawing of the Piazza San Marco 25 conveys the primary essence of a collage-city
into a collage-drawing.

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28 Tindall 1908, 3
29 Kandinsky 1947, 77
30 Fraser and Henmi 1994, 2, 3
31 Ibid
“There was no one vantage-point that would allow me comprehen-
sive understanding of this long, trapezoidal and complex space; 
therefore, sketching was absolutely necessary to capture it on more 
than one or two levels.

The motivating impression was that this vast piazza was the only 
free space in town, and in it stood a strong tower overlooking the 
thick pile of stones, the textural fullness of Venice. The seemingly 
endless loggia is the common gate that prevents the plethora of 
forms, textures and patterns from rushing in and filling it up. This 
density is visually diverted, parted by the heraldic columns and 
released into the Lagoon.

My intent was to convey that density and contrast with the empti-
ness of the piazza — pattern, rhythm, square, circle, octagon, tri-
angles at all points.

I drew from a number of locations, although the central vanishing 
point keeps the eye focused on the piazza. One can see, though, how 
the eye wants to wander into the periphery, but where? This repli-
cates the spatial experience. What is the focal point? Nothing, 
really. Even the Church of San Marco, although being a striking 
and important building, is only one of several grand edifices within 
this space; therefore, in this drawing it is only one part of the whole.”
Piazza San Marco  11th Century and later
Venice, Italy
Guiseppe Zambonini describes essence in terms of the subjective as opposed to the objective. While no sketch is void of either, the subjective contains the mysterious intentions, even though it may remain hidden, while the objective is derived from physical reality.\(^3\)

In comparing the two drawings of Ponte Storto (both drawn from the same bridge), one can see that figure 26 is fairly objective, documenting the building in true perspective, even the haphazard realities of laundry drying and cracking plaster. On the other hand, figure 28 is quite a bit more subjective in that it distorts the angle of view and over-emphasizes the contrast of the water to the buildings with a near figure-ground quality, illustrating the convergence of two canals as a context.

Another way that subjectivity (perception and subsequent representation) works is by representing things hierarchically, as they are seen not as they are. Philip Rawson points out that children have an enviable sense of what is important and what is not.\(^4\) For instance, the status that a child gives the hand in this drawing is obvious.\(^5\)

The arm, forearm and hand are one element with the fingers nearly as long as the rest of the combination.

Coincidentally, the ancient Greeks’ definition of hand did indeed include the entire appendage from the shoulder down. Is this possibly an affirmation of the child’s innate sense of essential hierarchy, an ephemeral connection that modern man misses?

\(^{3}\)Zambonini 1988, q.3

\(^{4}\)Rawson 1979, 7

\(^{5}\)Momma 1999

Della Smith

26 A view from Ponte Storto
Venice, Italy (drawn by Matt Smith)

27 Momma
1999
Della Smith
Zambonini adds that perhaps because of the complexity and magnitude of a subject, the adult creative mind seeks to examine it in approximate reality using the "artifice of scale", which, while being the objective reality, suppresses one's natural instinct to draw things in relation to their subjective importance. Rawson also comments on how this instinct is further driven out of man as he develops as an artist. He points to modern culture as the culprit that eliminates or suppresses this instinctive sense, imposing standards, expectations and a repertoire of graphic signs.

Nevertheless, an architect has the opportunity to focus on the objective reality while remaining true to his primal perceptions and conceptions and still maintain this sensitivity. By its simple nature and lack of device, sketching has within it the freedom to be subjective or objective, or anywhere in between. It is free of the constraints of scale, rightness, or expectations.

\[\text{Zambonini 1988, m2} \]
\[\text{Rawson 1979, 9} \]
Influences

Interpretation
What is there to learn from this space or building?
- What aspect is most interesting?
- How should it be approached?
- Where can it go from here?

These are questions that can perpetuate the drawn investigation. Interpretation is the process of answering these questions. It is the attitude of thought at the backbone of the sketch. A conscious desire or decision can be made concerning the mission of the sketch: to describe, analyze, or synthesize. Ideally, if the impression is strong, the decision will be made (or at least influenced) by the subject itself — a reflection of perception that naturally imposes itself in the corresponding drawing type.

Usually the sketches with the most life to them are the ones that grow organically, their lines disclosing surprises as they knit a story together.

If perception is indeed allowed to influence interpretation and subsequently representation, then the drawing could be called “responsive” — an articulation of the essential, successfully merging investigation and intuition. The following sketch of St. Agnese is a good example of an unselfconscious response to an image.

Nathan Goldstein notes that all drawings “should begin with a sense of excitation about the possibilities for expressive order among the parts of the subject” and the artist should base his mode of interpretation on that.  

Interpretation through the sketch can be loosely divided into three types: descriptive, analytical, and synthetic.

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*Goldstein 1984, 1
Descriptive sketching ranges from documenting the image or outward appearance of a building (usually the skin) to drawing out the essence, or the ephemeral presence. Regardless of speed, it is both the vehicle and the evidence of intense observation, which requires a long look at the subject, so that while the pencil is doing its work, the various forms can become etched simultaneously into the paper and the mind.

"After studying the monastic complex of San Giorgio Maggiore from photographs, then from afar (across the Lagoon) for several days, then again during the slow approach by boat, I had plenty of time to constitute an opinion about the buildings and their relationship to each other, to the rest of Venice, and to the water.

Yet, after some consideration, I chose to illustrate mainly the interior three-dimensional cohesiveness of Palladio’s design, utilizing the conventions of isometric, section and elevation. The transparent isometric allowed me a more comprehensive look at the harmony between the rounded shapes—vault, transept plan, window, and arches—while the section, in a more documentary fashion, illuminated the relationship between parts to the whole and the elegant proportions of and between forms.

The isometric is a brief composition of the seams between elements. For instance, even though no vault plane is drawn, there is an illusion of one, filled in by the eye. It is what is left out of this drawing that shapes the space. Another example is the clerestory window: by simply delineating the seam between its minor vault and the main vault, the eye can complete the fullness of the interlocking shapes."
San Giorgio Maggiore 1565 - 1610
Venice, Italy  Andrea Palladio & Scamozzi
Because of its documentary or utilitarian value, a physically descriptive drawing is sometimes referred to as “visual-notetaking”—a personal record for the architect, a way to remember what something looked like in a general sense—the physical presence. Although no drawing escapes subjectivity on some level, it is usually not an overt commentary or intentional distortion, but the appearance of the building in line or form, the interplay between light and shadow or the texture and detail of its surface.

The elevation of San Giorgio Maggiore is mainly concerned with the line and relationships between elements. It is, more or less, a straightforward commentary on its own.

In contrast, the sketch by Louis Kahn is of a wholly different descriptive nature. One can see the luminosity of the façade as light reflects off the water. Kahn captures the essence of the place. The glimmering other-worldliness of a stone church floating on water may or may not have been his original intention, but the drawing certainly embodies that quality.
The second mode of interpretation is analysis. As Edward Hill states,

“… [analytical] drawing is the instrument of an inquiring eye that teaches us to see.”

Analytical drawing is more concerned with the physical order that generates and supports the building’s design than is descriptive drawing. Analysis de-laminates the building into individual layers for deeper investigation and comprehension. It is cutting away with tool in hand in order to get inside the object.

Analytical sketching moves toward science, its development mirroring the rise of empirical thought during the Renaissance. Marco Frascari remarks that the architects of that time became fascinated by analysis and notation of the fragments of the great Classical buildings as they filled their survey-notebooks with the architectural ruins of Rome.

“Their graphic annotations were not merely records of historical pieces and patterns, but rather, carefully done anatomical studies of parts of buildings.”

Hill 1966, 39
Frascari 1988, p2
Many analyses require a natural vacillation between the drawing types and hybrids of perspective, exploded view, axonometric/isometric, cut-away, diagram, and parti as well as the usual plan, section and elevation. This drawing of the Pantheon demonstrates an intermeshing of vertical section and plan, comparing geometry and scale.

As even small and/or direct buildings are difficult to comprehend at a single glance, so much more are the complex. Analysis enables the comprehension of these forms by building up knowledge step by step, enabling the forms to be internalized, to become part of oneself and thereby allow an ownership of place. It is this dismantling which allows the architect to regulate the flow of information in order to concentrate on and investigate the relationships, subtleties, and individual elements within.

This sketch of The Crystal Palace is an example of how a structure, when reduced at the onset, creates a base of understanding before continuing the investigation. Had this analysis not been done, the strength of its simplicity might have been lost in the images that would follow.

“I began this drawing of the Church of San Marco with a concentration on the rose window, basically the most straightforward element in the church, in a selfish effort to add it to my collection. I was interested in the unusually heavy mullions and the dual application of Gothic and Romanesque shapes, but as I continued, the directness of the design and its mosaic quality were unveiled.

The by-product of spending a great deal of time in concentrated drawing is that the space has time to conform around the artist — the awe developing into knowing. This church is so spatially extraordinary that it requires no exterior knowledge to complete the experience. It is well suited to the three-dimensional investigative tool of the isometric as the interconnected circles and spheres of domes, arches, niches, and windows create a sense of a piling up of volume and space — the domes bubbling up from the waters below. One is able to ascertain through the transparency of the isometric the Byzantine character of its thick walls and generous rounded volumes, penetrated by tiny windows.”
Church of San Marco
Venice, Italy
1063 - 1085
Analysis is a fundamental building block in developing an internal library of form, knowledge, and idea. It is a way to systematize the learning of the architectural language. There are many foci within an analytical drawing—spatial context, architectural principles, and geometry, to name a few.

An analysis of spatial context affords a look at how buildings relate to other buildings or the space surrounding them, possibly within a figure/ground relationship or as a topographical response. These aspects can, of course, be portrayed descriptively as well, but an analytical viewpoint can focus on several tangential aspects or demonstrate the relationships within several viewpoints or drawing types.

Other analyses focus on architectural principles. In attempting to determine what guided the architect, the pursuit oftentimes creates surprisingly rich sketches, since the line itself does seemingly disclose this information on its own by probing and dissecting the underlying thought and principle.

The drawing on the right of the Pronaos is an example of an investigation of the principles— the balance between solid and void and the rhythms imposed by the columns and bands. However, the drawing of Wagner’s church has a more holistic or comprehensive approach.

“The austere interiors of the Church am Steinhof (located within a sanatorium) were designed to maintain cleanliness, as mental illness was considered a communicable disease at that time. Consequently, it is an open design and is easy to comprehend at a glance; it is volumetrically simple, empty, perhaps even cold in its white smoothness. The perfection and clarity of the building’s execution are reflected in the drawing. It is an object— almost sculpture-like in its siting and regal silence.

I sought to explain the outstanding characteristics of the simple geometric organization of the plan, the cohesiveness of proportion, clarity of hierarchy, from the imposing towers down to the articulation of surfaces with mechanical fasteners— rivets, dots, lines, grids.”
Another focus within architectural principles can be of geometry. The architect’s eyes naturally search for order, and geometry is, many times, a primary basis for that order. This drawing of St. Chappelle is an example of geometrical analysis even though it is accomplished in an artistic/pictorial rather than a scientific manner.

“My first impression upon entering this church was of a cathedral of glass, bright color and shimmer, a marvelously illuminated jewel box with one strong form— a singular apsidal nave.

The sketch began with the rose window and, as I discovered commonalities, they were added to the composition. For instance, to complement the drawing’s central figure (the rose window), I overlaid the plan of the apse in order to reinforce the circular theme.

Capturing the jewel quality in the windows without the use of color posed a challenge that encouraged laborious documentation to offset this handicap; and therein, it allowed me time to discover the underlying order and harmony inherent in the design. As a result, this drawing actually became a geometrical analysis, in a subtle or covert way, as it is well camouflaged by the prettiness of the articulated panes and patterns.

Some discoveries were the commonalities between the side and rose windows, even the intermixing of multi-lobular shapes in the floor and window patterns. Most interestingly, the act of drawing disclosed the swimming quality of the window mullions and muntins—a feeling that was sensed but not identified previously. The lines snake in and out between the circles, up and down and around: minute detail almost like tapestry—everywhere.”
La Sainte Chappelle 1243 - 1248
Paris, France
Pierre de Montreuil 39
Finally, a synthetic interpretation can be described as a personal commentary on the subject. It could mean altering the building or the context, even going so far as to recreate the building as a ruin. It could be a dismantling of the building to suit the purpose of the study or adding elements that are deemed inherently missing, fixing a problem situation, or simply removing the odd, offending element.

Louis Kahn spent a great portion of his career as an architect sketching what he saw in the world. Although in his later years, after a lifetime of drawn observation, he no longer felt the need to document places as they were, he drew thoughtfully as a way to improve them."

He could not refrain from commentary. His synthesis revolved tightly around his past experience and education of what could and, perhaps, should be. In his sketch of Carcassonne, for example, he altered the relative size of the tower in the background and reduced the number and size of crenellations on the front wall as if he had found a better solution to the design of the fortress.

"Johnson and Lewis 1996, 118"
Influences

Representation
Another influence on the sketch is representation, which is the tangible dimensionality of the subject in elevation, perspective or axonometric, etc.—the type of drawing.

In the first century B.C., Vitruvius grouped representational types into: ichnography (the plan), orthography (the front elevation), and scenography (the front and side elevations together in a primitive perspective or axonometric). Centuries later, Daniele Barbaro (Palladio’s patron) added profilo—the profile or sectional drawing.*

Now, however, representation is generally loosely divided into two groups: perspective (linear and pictorial) and orthographic (plan, elevation, section and axonometric). There are, however, countless other less utilized modes such as overlay, lay-out, cut-away and exploded view that challenge any label.

The perspective is oriented toward the viewer, making it more easily readable (especially by the layman) as it “belongs to the world of naturalistic painting”. The orthograph, on the other hand, is oriented toward the building, and is therefore, part of another language that has to be learned to be understood.*

The selection of a certain representational type can be either a conscious choice (a personal bias or directive) or an open responsiveness to interpretation.

A conscious choice is more often made than not, since the drawing type itself usually requires some attention and/or preparation, even if it comes naturally to the architect. This manner of pre-selection has a tremendous impact on the sketch, as it structures the way of seeing.* It is not inherently good or bad to utilize a pre-conceived drawing type, but the awareness of its limitations as well as its advantages contributes to a richer outcome.

*Frascari 1988, v3
*Fraser and Henmi 1994, 173; Lever and Richardson 1984, 18
*Fraser and Henmi 1994, 161
Sometimes the conscious choice is the result of a personal bias. For example, one may be more adept at perspective drawing, may be more comfortable drawing plans, may have a style that lends itself more to composite drawing, or perhaps, being an analytical person, may naturally see things in section. On the other hand, the choice could be the result of a directive: perhaps a project has been given wherein one must work in plan or deliver a perspective rendering.

In contrast to this, a responsive decision is sympathetic to the fact that each mode of representation has unique characteristics that are readily utilized within certain interpretations, not that they must always go together as such, but that they naturally gravitate toward one another. For instance, a picturesque interpretation would be naturally represented in a perspective and a structural analysis, an axonometric or section.

More importantly, though, a responsive decision respects that lines may begin with one intention and end up with another. Ideally, one should let the mark indicate the next gesture and allow the form to develop naturally as an embryo would, changing and developing until the moment of its birth.

Also, as Fraser and Henmi recommend, instead of fighting the drawing’s natural inclinations, one should let the limits become advantages.

“The author of a drawing attempts to raise a drawing from its ‘flatland’, pulling lines from the paper. Yet this is the irony of drawing, for it is its flatness, its two-dimensionality that is at once its limit and single greatest advantage.”

Following is an investigation into the basic modes of representation: plan, elevation, section, and axonometric, and linear and pictorial perspective.
The plan is a graphic means by which the building is sectioned horizontally, thereby describing the circulation, hierarchy and relationships between parts. This is a graphic equivalent to, perhaps, the experience of walking the ruins of Pompeii, being able to see exactly where one stands in relation to the whole.

The plan should not stand alone, since it does not take volumetric issues into consideration, and being an abstraction or diagram, it is removed from real experience. Yet, for the one sketching, drawing the plan is a way to make sense of the elements, putting them in some containable format. While this is usually not an experiential drawing, it serves as an important reference.

Still, the plan is not an inferior convention because it only articulates two, rather than three, dimensions. Rather, it can be the most informative drawing type, especially if rendered, parti’d, or otherwise translated into an understandable language. Some what like map reading, it can communicate or be a guide to the viewer on how to assemble the pieces as they are apprehended. (For this reason, plans historically have been called plots or plattes.)

The drawing of Fischer von Erlach’s Karlskirche is an example of how the plan can refer to the underlying geometrical arrangement. In this example, even though the plan is only fully disclosed on one side, it still reads as a symmetrical whole, with the radiating lines indicating the foci and the relationships between the side chapels.
“This drawing of Santa Maria della Fiore is in one way a comparison of the geometrical similarities and relationships between the floor plans of the Church and the Baptistery, the intermeshing of circles and octagons and squares. In another way, the plans investigate the relationship between the interior and exterior articulation of wall planes: the niches or undulations contained within the relatively smooth outer surface.

The church was built around the old Santa Reparata in the form of a Latin cross. It has an unbuttressed nave, four very large bays, and, in lieu of traditional transepts, three immense apses, each containing five radiating chapels. As these characteristics are all quite unusual, it was imperative that I investigate and document them in plan.

The Baptistery, which was originally built as a church on Roman foundations and ultimately converted in the middle of the 11th Century, was presumably influenced by the Pantheon and was an inspiration for Brunelleschi’s dome for the church. In retrospect, because of this significance, I should have included a section of the space as well.”

Fletcher 1975, 747
Santa Maria della Fiore  1296 - 1462
Florence, Italy    Di Cambio & Brunelleschi

Baptistery of San Giovanni  11th Century
Campanile  1334 - 1359
Giotto & Pisano
An elevation is a two-dimensional representation, the direct frontal view projected onto a vertical plane. For this reason, historically it has been called an *upright* or *front*.

Elevational drawings are used to help organize the building, create and check proportions, and balance elements. Bruno Zevi states the need for other drawing types to supplement the elevation; without them the subject is reduced to sculpture, or relief, no matter how nice it is.

Although Palladio used the two-dimensional drawing types of elevation, plan and section almost exclusively, he seemed to sense this limitation; therefore, he carefully shaded and toned his elevations to communicate depth, curvature, etc. Zevi does allow that this shading is somewhat helpful, but only for simple buildings. The more complex the building, the more drawing types are needed to supplement the elevation.

The elevation is extremely versatile and can accommodate itself to many modes of interpretation—analytical, materially pictorial, descriptive (a study of shade and shadow or a comparison of elements). Figure 44 is a compositional study of the different towers of Lucca. In real experience, as well as in the drawing, each tower is unimportant on its own; rather, it is the corporate effect that is outstanding. The use of an elevation is a simple and straightforward way to incorporate a lot of information into a small format.

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**Influences**

**Representation**

**Elevation**

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44 The towers of Lucca
Lucca, Italy

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50 Lever and Richardson 1984, 18
51 Zevi 1957, 28
52 Lever and Richardson 1984, 18
53 Zevi 1957, 55
A sectional drawing represents the building or space as it is cut through, either across or longitudinally. It can stand alone or can be joined with an elevation or even a perspective for better and more thorough communication. Frascari states that the use of a sectional drawing indicates an anatomical view of architecture that is used to examine or illustrate profile and/or the constructs behind it. He succinctly refers to the sectional drawing as the “stereotomy of building parts— an anatomical representation of architecture” and the “cut feature demonstrating the construction of a building”.

The cut section can either demonstrate the actual construction of the building or element. Or, it can simply portray a profile, either the parts of the whole or the whole in relation to its surroundings.

Figure 45 (page 11) is an anatomical example of a construction section. It is detailed and informative in demonstrating the literal connection between parts.

On the other hand, the drawing of Gandria and Strasbourg Cathedral are both examples of profile sectioning: Gandria in regard to the larger context and Strasbourg in regard to the internal context.

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*Frascan 1988, q3*
“To respect the inherent integration of the Gothic structure of Strasbourg Cathedral [46], my intention was to incorporate the exterior and the interior into one sketch. The façade, though beautiful, was not necessary to show the strength of the design. I simply wanted to investigate more of the inner workings. It was a good exercise on “guesstimating” dimensions, using the thumb-as-rule technique.

The gothic vaulting in the central nave is shown in relation to that over the side windows, as well as to the shape of the rose window. The harmony between the nave and side aisles is an important architectural experience; therefore, the section focuses on this aspect.

This drawing is not a construction section, as I was not concerned with the specifics or mechanics of masonry and framing; therefore, it could be more aptly called a profile section. Through the layering of elements, you see the interior vaulting superimposed with the buttresses and the harmony between strong and delicate and heavy and light.

The heart of the cathedral, though, is the rose window; therefore, it is the focus of the sketch. As I feel it to be the most beautiful of all the windows I have drawn, I studied its intricacies by “unwrapping” it around the circle, thereby reconstructing it to better understand the hierarchy and the geometry inherent in the design.

At the bottom of the drawing there are two sections of the same pier type — one in profile and one in detail. As the design of the piers is an important element within the architecture of Strasbourg Cathedral, these additional drawings add a bit of information that the elevation/section could not portray.”
Strasbourg Cathedral
1230 - 1365
Strasbourg, France
Axonometric (“measurement of axes”) is the umbrella term for several variations on scaled three-dimensional parallel projections. They demonstrate structural and volumetric properties, both plane and volume and their relationships. Stuart Cohen describes the axonometric as a “miniature of reality” in opposition to the perspective, which he regards as “a systematized representation of real experience.” Furthermore, he states that the normal order of cognition (from the parts to the whole) is reversed in the axonometric, thereby allowing one to understand the whole first, then the parts.«

The Modern Movement dismissed the perspective and heralded the axonometric as the drawing which best suited the modern idea of non-hierarchical space. “The plan is hereby brought into the third dimension without distortion or subjective pictorial comment. Corbusier used axonometric drawing extensively for this reason as well as for its conducivity to his theory of “plan as generator”.»

Figure 47 is an example of how an isometric allows an understanding of perpendicular planes in relationship to one another. The many stair levels are clearly differentiated and easily understood in this type of drawing.

“The pilgrimage Church of San Francesco in Assisi 48 is perched on the side of a hill, thereby allowing the construction of an upper and lower Basilica, both of which have unusual aisle-less interiors. There are several side chapels, which are very closed off from the main space; they are accessible only by a couple steps and do not intrude spatially with the nave.

The lower Basilica Inferiore, which was quite dark even though covered in colorful frescoes by Giotto and Cimabue, attracted my attention much more than did the upper Basilica Superiore. Because of the extremely heavy crypt-like feeling, there was no doubt that I was at least partially underground.

I chose the convention of an isometric, as it would best illustrate the proportions and rhythm of the perfectly rounded low vaulting—the main architectural event. I overlaid a sectional drawing to emphasize the unusual scale and a plan to set up a context for the isometric, even though the vaults are not evident in therein.

"Lever and Richardson 1984, 19
Cohen 1978, 3
Fraser and Henmi 1994, 166
Lever and Richardson 1984, 20
In Medieval times, foreshortening or non-mathematical perspective was utilized to represent depth in architectural drawings as well as painting. That practice changed around 1420 A.D., following the discovery of one-point perspective by Brunelleschi. L. B. Alberti’s mathematical theory and its systematization by Albrecht Durer were subsequently enlarged by Leonardo Da Vinci, with his contribution of atmospheric perspective.

Alberti’s advice against using perspective drawing divided architects from then on into two camps: those who did (Da Vinci), and those who did not (Palladio, Inigo Jones). However, the latter group reluctantly had to use it at times to clarify the depth of elements in an elevation.

Da Vinci’s bird’s-eye perspective nevertheless had their limitations, although they offered an understanding of the whole and the relationship between the parts. Because he did not use figures, the scale was indefinite; therefore, in some ways, it became an abstraction, leaning toward that of the axonometric.

“Influences Representation Perspective”

“Powell and Leatherbarrow 1982, 15
“Lever and Richardson 1984, 18
“Powell and Leatherbarrow 1982, 16

Sketch of a church
1490
Leonardo da Vinci
During the Renaissance, perspective drawing was laden with meaning, as it mirrored the new humanist, rational way of looking at the world. Nowadays the perspective drawing is nearly void of meaning, since it is so commonly used both because of its ability to test an idea and its ability to promote understanding of how the architect intends the building to be experienced.\textsuperscript{62}

Curiously, Frank Lloyd Wright rarely utilized perspective during his design process but reserved it for presentation after-the-fact \textsuperscript{63}. (His assistants formally constructed the perspective, and Wright adjusted it and added the entourage and color.)\textsuperscript{64}

To the Western mind, perspective generally refers to the type of three-dimensional drawing wherein objects are foreshortened as they recede and converge into infinity according to the spectator’s viewpoint. These drawings are generally described as either linear or pictorial, each accommodating a one-, two-, or even three-point; interior or exterior; aerial, eye, or ground-level view.

\textsuperscript{62} Fraser and Henmi 1994, 166 - 168
\textsuperscript{63} Cohen 1978, 2
\textsuperscript{64} Fraser and Henmi 1994, 173
For the architect who is sketching what he sees, what does the perspective accomplish and how is it utilized? Under these circumstances, obviously, any linear (constructed) perspective is not only impractical; it is a contradiction to sketching, since it relies on the rule and straight edge. Still, it is necessary to learn the methods through this practice in order to better control free-hand drawing. Mai-Mai Sze remarks in The World of Chinese Painting that the Ancient Masters could work without rules, only because they had first mastered drawing with square and rule.

"Some who believe themselves independent claim that they follow no rules. Actually, the stage at which one is most free [occurs when] one is most keenly aware of [the masters’] presence and methods. Often those without method will find in taking up the brush that all ten fingers suddenly freeze into a knot and for a whole day not a dot of ink is dropped."

Sze adds that perfecting traditional technique allows one to experiment and gain the mastery needed to “work daringly”. She compares first learning a structured “hard-line” technique with the practice of Buddhism. Both must be mastered in order that one will not stray into evil influence (discipline being the purifier). This is, therefore, the first step for any beginner.

The linear perspective, whether mastered through technical or intuitive projection, is then the point of departure for the pictorial perspective or for sketching.

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“See 1959, 260
Ibid”
Whether a linear perspective is constructed technically or intuitively, both require some usage of a straight edge and a scale. Although they are systematized representations of real experience, even the most sophisticated projection is still subject to scrutiny.

A technical projection imposes the requirements of one or more orthographic drawings. Herein lies the conundrum: a technically projected perspective can be drawn only from other drawings, relegating it to an after-the-fact re-presentation of an idea and rendering it useless, not only during sketching, but also during the design process.

The more flexible intuitive approach, while still being a constructed method, is not dependent on projection alone and is able to be used independently, allowing one to draw from the environment, the imagination or from orthographies. Although intuitive projection is a constructed representation and roughly maintains the rules of correctness, this approach can be somewhat subjective.

That is acceptable (if not agreeable) as even the great draughtsman, Hugh Ferriss, validated the subjective element by claiming that the delineator “is not so much permitted as actually required to slight incidental facts…in favor of the essential”.

\[51\]

Cohen 1978, 3

Fraser and Henni 1994, 173
Leonardo da Vinci at first accepted several methods of linear (constructed) perspective, but later became disillusioned with any type of projection as the results were not realistic enough for him. For example, they did not take into consideration the curvature of the periphery or atmospheric dimming, etc.; therefore, he preferred the pictorial perspective which is the free-hand painterly approach to three-dimensional drawing.

Similarly, Louis Kahn was able to combine the best of all types of perspectives because of his training as a painter. Consequently, his main interest was to convert what he saw into pictorial arrangements. Zevi notes that whether or not Kahn ever studied the Cubists, he obviously utilized their method of including multiple viewpoints—the outer edge of pictorial perspective.

Figure is an example of how relaxed, yet intentional, vanishing points can contribute to a rich, well-balanced artistic composition. Zevi notes that whether or not Kahn ever studied the Cubists, he obviously utilized their method of including multiple viewpoints—the outer edge of pictorial perspective.

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69 Powell and Leatherbarrow 1982, 16
70 Johnson and Lewis 1996, 112
71 Zevi 1957, 26
This plural representation of a body or place from many angles is the incorporation of the fourth dimension of time. Although the simultaneity may be a bit confusing to the untrained eye, it is actually an accurate representation of reality, as man himself creates the fourth dimension by the natural experience of going through or walking around a building.

Zevi states that if one loses the ability to see or incorporate this fourth dimension—time—then he is prisoner to the frame. In order to transcend this constraint, one might either provide layers of meaning within the drawing or even literally move the drawing like a scrolled Chinese painting.

One can also refer back to the drawing of Il Campo to see a variation on how the fourth dimension can be incorporated into a more or less static drawing.

“One interesting thing about the bird’s eye perspective is that (sans the overlaid elevations) it can be viewed from any direction, altering the sense of the space. One can turn the page around in order to see each section of building “upright”. Although the drawing was intended to be viewed as it is now framed, after completing the drawing I realized I had unwittingly incorporated the fourth dimension of time— as the drawing is spun, it mimics turning or walking around the space, albeit from an elevation position.”

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17 Zevi 1957, 26
18 Zevi 1957, 58
This challenge of traditional representation leads to the interesting contrast between Western *converging* perspective and Eastern *diverging* and *scattered* perspective. Figure 54 is indicative of the parallel projection method that allows the viewer to experience simultaneously planes that would be otherwise hidden, thereby allowing the viewer's eye to choose the path he takes, in this way becoming an active part of the scene. According to David Hockney, in the Eastern approach the viewer (man) is at the center, yet moving, and infinity (God) is all around. In contrast, the Western viewer is stationary, while the vanishing point moves to wherever the viewer is looking.\(^n\)

This approach is indicative of the *separation of viewer (man) and infinity (God)*: God is at the center, and man is always looking toward it but not ever reaching it. This center is more conceptual than formal, as the chosen depiction is the way each culture behaves in space.\(^n\)

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\(^n\)Hockney 1988

\(^n\)Fraser and Henmi 1994, 174; Hockney 1988
Influences
The hand and discipline
Another important influence within sketching is that of the hand and discipline. In Sketching Notes, John Tindall conferred that the only way to gain skill is to exercise discipline. He states, 

"The true road to excellence is that of steady work under sound direction. This can hardly fail to advance the traveller on his journey."  

There is no virtue in technical ignorance. Even two thousand years ago, Vitruvius specifically addressed the need for architects to be skilled draughtsmen in order to make sketches of proposed work. Specifically disciplining the hand by copying masterful works has been a central practice for artists since the Renaissance. In 1390, Cennino D’Andrea Cennini dictated:

"Take pains and pleasure in constantly copying the best things which you can find done by the hand of great masters… then you will find… that you will eventually acquire a style individual to yourself, and it cannot help being good: because your hand and your mind, being always accustomed to gather flowers, will ill know how to pluck thorns."  

(Emphasis added)

John Ruskin also addressed this issue in his Letters to a Beginner, although he focused on the pre-eminence of practice, promising at least modest results, even from one with no natural ability as long as a set number of hours are spent at the task of drawing from nature. Ruskin further states, 

"The character of the drawing of a great master in a hurry, whose hand is so thoroughly disciplined that when pressed for time he can let it fly as it will, and it will not go far wrong. But the hand of a great master at real work is never free: its swiftest dash is under perfect government."

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76 Tindall 1908, 45
77 Hill 1966, 97
78 Vitruvius [1960], 6
79 Cennini [1390] 1954, 15
80 Ruskin 1991, 18
81 Ruskin 1991, 23
Practice enables the hand to become a fluent extension of the mind, transcribing ideas deftly and ably. Even something as simple as a rectangle or circle offers limitless opportunities for disciplined exercises in drawing. Through repetition of forms and elements, the hand becomes a perfector of geometry—a trusted delineator of the intention. Figure 55 demonstrates that the ability to draw shapes and determine angles well with a free hand contributes to drawing coherency.

With or without the eye’s assistance, the hand learns to discern the moment when it should stop drawing or how heavy a line should be in regard to the whole. As an analogy, a pianist cannot perform effectively if he is aware of the mechanics instead of allowing his hand to respond naturally. In sketching, this awareness is "all that you are as you stand before your subject".  

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55 S. S. Sindone  
Turin, Italy  
1667 - 1690  
Guarino Guarini

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55 Schneider 2000
Henri Focillon indicates in his essay, “In Praise of Hands”, that not only should the hand be trusted to carry out the mind’s intention, but he suggests also that the hand even precedes the mind with its own will:

“Habit, instinct and the will to action all are stored in [the hand], and no long practice is needed to learn what gesture it is about to make.”

As the hands are the instruments of creation that make music and art, they do seem to have intelligence stored in them as they impose form, outline and style.

It is because of this influence, the hand’s proximity to the line itself, and its inherent animation, that one understandably may be convinced of its ability to originate.

“The mind rules over the hand; hand rules over mind.”

Although the hand must give perception some form through representation by engaging an implement and delineating it, the tautness of the hand muscles, its position and level of skill ultimately influence the line by controlling the stroke of the pencil and determining the rhythm, speed, and magnitude of the gesture. Architects rely on hands as much as any artist, for architecture lives half a life as a drawn image, the other half as a built form.

Focillon engages the reader with a poetic and introspective look at the relationship between the artist and his hands. He advocates that the artist’s mind, when separated from his hands, is thrown into internal chaos. He is generally referring to impulses that arise from the imagination, but this thought also holds true if the artist is somehow prohibited from exploring his environment — touching, painting, or sculpting.

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83 Focillon 1948, 71
84 Focillon 1948, 65, 66
85 Focillon 1948, 78
86 Focillon 1948, 70
An artist’s hands are needed to explore, dismantle and absorb the environment. There is something remarkable in the tangible directness of the hand’s touch. Corbusier once said that it was not until his hand actually felt the pediments of the Parthenon (then lying on the ground) that he understood them.

When studying buildings, the ones that invite a closer inspection, hands go first to touch, measure, and draw. In their grasp, the hands alone take the subject from the level of observation to the level of understanding. They wrestle its form and, through drawing, press it into the two-dimensional world to keep.

“The interior of Il Redentore was one of those instances where hands had to touch and measure to fully understand what was there. The intricate contours of the side chapels, with their undulating rhythm, had to be carefully examined in their geometry, proportions, and placement for the drawing to be an accurate analysis. The church felt as if it were carved from a rock, which is the reason I illustrated the plan on one side as more of a figure-ground study.

Through the perspective drawing, I attempted to convey the openness and simplicity of the design. It was not until the sketch was well under way that the overriding organization of the plan became totally clear to me—the hierarchy of the circles in the squares.”

As hands are needed to absorb the environment, they are also ultimately responsible for birthing idea into form. The hands seem to know intuitively what is next, know what goes with what, and know how large and how many. Is it this that has caused many artists to be preoccupied by the hand—Rembrandt, Escher, Da Vinci?"
Il Redentore
Venice, Italy
1577 - 1592
Andrea Palladio
Focillon communicates the harmony and vitality that exists, not only in the hand and implement, but in their relationship with each other.

“Between hand and implement begins an association that will endure forever. One communicates to the other its living warmth, and continually affects it… A harmony must be established between it and the fingers that hold it, an accord born of gradual possession, of delicate and complicated gesture, of reciprocal habits and even of a certain wear and tear.”

Indeed, most of the time the hand holds the implement as a dear friend, each comfortable in its respective tasks, knowing full well what is expected. When they are in harmony, they perform gracefully, contributing to an easily finished and pleasing drawing.

Yet the hand’s relationship to the implement and media is fickle at best and sometimes it becomes a despairing situation; as when the fingers attempt to force an impossible quality. An implement ill suited to the hand or the task will inevitably corrupt the balance, and the drawing will likely fail.

“Truth to material”… proves to be as much a question of whether the materials are true to the idea.”

“Focillon 1948, 69
“Hill 1966, 99
Influences
Media and format
Of course, there will always be arguments concerning a substitute for the pen or pencil. Chalk, paint, and charcoal will produce a similarly responsive and poetic line, but in no way is a pen or pencil interchangeable with a computer mouse. The impulse that runs from the brain, down the arm, into the hand is simply short-circuited at the click of the button. Obviously, the computer cannot be used on a sketching jaunt, but it is mentioned here as an argument in the context of all architectural drawing.

This argument is not an inference that the physical drawing may lose graphic interest by being perfectly machine executed; it is simply a deduction that since the connection between the hand and the line is broken, the line loses its flavor and intimacy and strength to motivate and inspire the next generation of lines. This fact is true for all drawing, whether in the design studio or in the field. The line relies on the hand’s sensitivity to draw it out, to move along it, to feel its length and breadth, density and character.

No matter how sophisticated the computer, it cannot create the subtleties of line and color that the eye can see and appreciate. Nor can it give the architect the benefit derived from the pencil/paper relationship. Only by holding the implement in hand, can one experience the poetics of drawing and the meditative and contemplative within the art of architecture.

Even though the implement is totally inanimate on its own, it is the conduit for the whole force of the artistic endeavor, which is a lot of responsibility funneled into one narrow thing. Still, it willingly accepts the responsibility and, in a way, sacrifices itself in the process. It deposits a portion of itself on the paper, leaving a trail of evidence of the generative thought. In this way the implement is the line.
Pencils and pens are the primary instruments of drawing and writing, although they are inert until given life through some external force. The varying degrees of friction between the implement and paper react with the intention of the hand and have the ultimate influence on the line.

Pen and ink is the aggressive, most willing medium. The ink is readily bled from the nib through capillary action, soaking the paper. It is loathe to stop. In contrast to the pencil, which will patiently wait and rest on a point, pen and ink have no quiet rest. They must move on or the point will be overwhelmed. As it can so easily self-destruct, the pen is more of a challenge to control than the pencil; yet if one is up to it, its opacity can be a ready assistant for the bold.

This drawing of Michelangelo’s stairway is an impression that was easily captured by the pen line—a strong tumbling nature and commanding presence. The rhythm of the form was mimicked by the pen, spilling and spreading out and down with a few hurried, bold, and bleeding lines.
On the other hand, because of its reticent nature, the pencil has to work to carve its lines into the nap of the paper. When viewed under a microscope, the pencil line is really a series of dots formed by the graphite being deposited on the tops of the ridges of the paper’s fibers. The firmer the stroke, the more compressed the nap, which simultaneously allows a connecting of the dots and a greater quantity of graphite to be held in the paper, creating a bolder line.

Because of graphite’s passive nature, it completely relies on the force of the hand, and it can be controlled to the minutest level. It can be delicate, deliberate, and laboriously constructed, or it can be a bold dash, a strong dark stroke, like a wound in the paper.

Figure 59 exemplifies how a pencil line can be finely manipulated: the gradual increase of line weight permitting control of the plan. Although it is an artistic device, this control allows selective disclosure of detail, pattern, building and construction lines. In some ways it accomplishes what words cannot; it emphasizes, gestures, and diminishes, with the simplest of means.

*Hill 1966, 44
In order for the artist to have firm control of the deposit of lead, he must be able not only to see, but also to hear and to feel the stroke. There is an elementary excitement generated by the scratching of graphite on paper. For this reason, generally speaking, the gritty leads are superior, since they reverberate more in their activity and one can use multiple senses to gauge and simultaneously adjust the gesture. Although there are those who object to erasure, it does serve a purpose when a nearly complete drawing is at stake.

“All of the drawings that I did during my study abroad (the large format drawings) were done with a .5 mm. Lamy 2000 mechanical pencil using only an “F” lead. While this particular lead holder is fat and comfortable to use, it does have limiting factors. To begin with, it is difficult to shade or produce texture of any kind and any bit of speed breaks or at least threatens the lead, thereby forcing slow and deliberate linemaking. Also, as there is little opportunity to change the line thickness or weight, I had to create hierarchy through the layering of lines, therein contributing to the drawings’ deliberate nature. This carefulness encourages and provides the opportunity of time, allowing for thoughtful compositions.”
Selection of an appropriate paper is equally as important as the implement, yet being as common as it is, paper has lost its status as an influence on drawing.

“It has ‘disappeared’ under our eyes.”

Yet its physical qualities affect the marks made on it. Hardness repels ink and speeds graphite, while softness absorbs and slows. A rough or smooth surface gives the images texture, which could suggest strength, trepidation, or any attitude at all, intentional or unintentional. Cloth, parchment, or vellum each will have its own way of influencing the drawing.

Whatever the medium, there are qualities which “foster or inhibit certain inclinations”, altering the outcome. Frascari and Henmi note that drawing on brittle tracing paper with charcoal, as did Louis Kahn, makes erasure and transparent gray tones easy, but makes thin crisp lines almost impossible.

Paper’s neutrality or lack of it also influences the line as there is quite a difference between drawing on white, lightly-toned, or dark paper. A white pencil line would play a different role in a sense, taking away rather than adding to. This negative state can indicate a whole range of thought that might or might not be present.

“While abroad, I used loose ivory-colored sheets of Strathmore 400 Series Drawing paper (regular surface, 11” x 14”) exclusively. It is fairly soft but substantial enough in body to live through constant manhandling. I chose ivory paper for the softened contrast between the line and the background, because it was easy on the eyes in bright sunlight, and I was going to be doing a lot of sketching out-of-doors. As I planned on making large compositional drawings, I determined 11” x 14” to be an appropriate size of pleasing proportions—not so large as to be unmanageable, but not too small to limit the drawings.”

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Rawson 1979, 14
Rawson 1979, 15
Fraser and Henmi 1994, 162
What are the effects of drawing on a rectangular sheet as opposed to a torn, directionless scrap? What are the effects of boundaries or the lack of them—drawing on a wall or even a scroll? What if the boundaries are extreme, perhaps within the margins of a text? The drawings, then, would certainly have some differences.

However since this is a right-angled world, where “we automatically refer marks down on a sheet of paper to its edges” (even sub-consciously), and since architectural sketching is generally about straight lines by structural necessity, then perhaps it is perfectly all right to submit to their influence. If the rectangle is the norm, and not up for consideration, then the real substance of choice lies in the size and binding style of the sketchbook. Almost every architect has a preference.

“I carried all the paper I would need for the entire Europe trip in a 3” x 12” x 15” box with a removable lid, handmade out of ordinary triple-ply chipboard. This box kept the papers and finished drawings dry, flat, and safe. Also, I made a portable drawing folio from the same material (and hinged together with flaps) so that each day I could take just a few sheets with me as well as have a portable drawing surface. I specifically chose chipboard for the drawing foundation for its exact measure of hard and soft qualities which both submit to the pencil’s force, but at the same time do not bear any grooved evidence.

I kept the folio closed with four large butterfly clips which were also used to secure the paper and keep it from billowing in the wind while I was sketching. Being moveable, they had the added benefit of not getting in the way of my hand.”
A loose page allows freedom of orientation; it also can imbue the drawing with a sense of uniqueness and individuality, which may or may not be desirable.

On the other hand, if one is using a bound sketchbook, the drawing is forever part of a whole, a fact that is hard to ignore while one is sketching. It serves as a constant reminder that the sketch is only one of many, encouraging an informal approach, which could be either positive or negative.

Corbusier sketched almost exclusively in small bound books, usually 5” x 7” or less. As his mode of sketching was the quick visual note, he was obsessive about having his sketchbook ready at all times both to design as well as to leaf through as a refresher of memory. On the other hand, Kahn used a variety of media and sketchbook types as made his foray into the world.

A small format is easily carried and can be proffered in an instant to capture a passing thought or to take a visual note. The larger the format, the less convenient is it to carry at all times; therefore, the sketching event is likely to be formally orchestrated. No size is inherently good or bad; each simply has different uses and, consequently, different influences on the sketching process.
Implications
What, then, is the evidence of an architect’s having sketched his entire life? Not only will he have developed a cultural education and have a grand diary of his experiences, but perhaps, more importantly, he will have created an internal library of form, a storehouse of ideas, and a finely tuned intuition.

Robin Evans agrees that while drawing feeds, it also discloses the imagination. He denounces St. Thomas Aquinas’s idea that an architect “first has an idea of a house and then he builds it” as blind creativity, comparing it to the folly of putting fully-formed ideas onto paper.

“Imagining with the eyes closed as if the whole world were held in the mind, is an impossible solipsism. The imagination works with eyes open. It alters and is altered by what is seen.”

Indeed in order to design, there must be first a well-fed imagination and a sympathetic intuition, both formed by years of patient study and discipline, through filling sketchbooks with impressions and memories of event and place. As Hill succinctly states, “Experience is the leavening of art.”

Kandinsky admitted, however reluctantly, that grammar (for architects—form, element, and principle) is all right, even necessary, to maintain (although it needs to be modified from time to time to be relevant). He referred to it as a training not only of the hand or the eye, but of the soul. As Leonardo da Vinci relentlessly studied proportion, structure, and anatomy, continually searching out the universal principles in them, his mind was “led naturally from observation to hypothesis, from things seen to things envisioned”. Similarly did Rembrandt record life, attitudes, and experiences from which he drew upon as needed.

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97 Evans 1989, 20
98 Hill 1966, 41
99 Kandinsky 1947, 67
100 Hill 1966, 11, 33
Hill notes the close relationship between drawing as “an inquiry directly into our environment” and drawing as “an investigation of the terrain of the imagination”. His viewpoint agrees with that of Evans’ and further states that ideas are not “born from ether”; rather, they are the evidence of participation in experience. As an artist draws, he is able both to form the imagination and to “seize the conflux of vague, yet insistent images that exist in their minds…the convoluted diagrams of private vision…the diagrams of an idea”.  

As drawings are born of ideas, so ideas are born from drawing. Either way, the line itself serves as the conduit between building and thought. The line then can be employed as a tool—cutting away at the imagination, penetrating the vague thoughts and faint remembrances.

Hill describes drawing in terms of its ability to disclose the imagination:

“…[drawing] coalesces spirit and perception, conjures imagination…[it] is an act of meditation, an exorcism of disorder, a courting of artistic ideas; above all it is the lean instrument of visual formulation and the vortex of artistic sensibility.”

Drawing the line and seeing the line create the impetus for the imagination and recollection of architectural memories. The sub-conscious architectural impulse is somewhat akin to looking at a star: upon looking at it directly, it disappears; only when viewed somewhat askance, does it come into view. Still because it is a peripheral view, the star cannot be seen actually, only ideally. The line is not only the impetus that can call this impulse forward; it can be the vehicle of its realization, as well.

According to Paul Klee,

“We do not always know at once what flows into us from the elemental realm of nature, what comes up from the depths in order to become images.”

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101 Hill 1966, 33
102 Hill 1966, 1
103 Rawson 1979, 9
It is true liberation that can admit not knowing from whence something comes, unafraid of accident or failure, graciously allowing the intuition to take the moment and make something of it.

Thus the idea of chance or accident is eagerly grasped as an opportunity to develop, combine, and experiment with the elements at hand and those rooted in the intuition. Henri Focillon mentions the Japanese artist Hokusai, whom he imagined “…provoked accident with an impatient finger in order to see what it would do”.

Certainly Daniel Libeskind has accomplished the education and subsequent liberation of his intuition as he states that his drawings (Chamber Works) have no conscious meaning behind them; it is the line that composes. In his essay, “In Front of Lines that Leave Nothing Behind”, Robin Evans comments that,

“[Libeskind’s] procedure is therefore more like augury than writing: first form the signs, knowing only how, never what, and then look to see if they signify anything: sometimes they do, sometimes they don’t, sometimes good new, sometimes bad, sometimes nothing.”

The making of lines, the process of thinking on paper, is not unique to architects and visual artists. The musical sketches of Mozart reveal “notes, corrections, changes, additions, and new ideas written over the page at a seemingly break-neck pace”. Making marks on paper is the very nature of artistic endeavor.

Paolo Soleri identified a direct correlation between a musician’s total production and the power of his compositions. Similarly, it is no coincidence that the most important and influential architects have also been prolific sketchers. The works of Kahn, Le Corbusier, Wright and Da Vinci, for instance, substantiate the Italian proverb:

“One butterfly does not make spring.”

**Focillon 1948, 74**
**Evans 1983, 90**
**Schaller 1997, 114**
**Soleri 1971, preface**
**Ibid**
To expound further on the Chinese proverb that provoked this thesis ("I hear and I forget, I see and I remember, I do and I understand."), drawing is not only a means to understand, but a means by which to search and to find.

Although the thesis began as explanation, it really became search, and as a result, I found. My original intention was to explain good sketching and the influences therein, but my investigation ultimately became an instrument of learning. My eyes have been opened to many possibilities which have up until now been latent. I have been challenged in every way to expand my realm of inquiry, repertoire, and methods of research. Through this experience I feel that my perceptive abilities have been heightened and sharpened. I still maintain that some limitations are good, but so are discovery, trial and error.

I have spent a good portion of my life both teaching my hand to draw well and then learning from those lines. Yet during the many years I have been engaged in sketching the built environment, I have been unable to articulate what it is exactly that inspired me. Now, I am more able to translate my unformed thoughts, not into lines as before, but into words and explanations; this evolution brought me out of the realm of silence about my art.

This thesis has given me the opportunity to examine the “force and beauty of its process” — specifically what it is that happens while I am sketching, what the influences are, and how they develop my intuition; consequently, I will have a richer vein to tap when I draw from my imagination.

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109 Goldstein 1984, v
110 Zambonini 1988, x3
111 Schaller 1997, preface
“Drawing an Education” can be likened to the twin activities of sowing and reaping. Sowing is the process of inquiry through sketching and observing, thereby filling one’s vessel with idea, form, and experience. Reaping is the ultimate test of that success; the quality and depth of one’s design, sensitivity, and intuitive response. This cycle is the substance of an architect’s life of study and development.

Le Corbusier once said,

“We learn to see how things are born, we see them develop, grow, change, blossom, flourish and die. . . . And the grain matures.”\(^{112}\)


Hockney, David. 1988. *A day on the grand canal with the emperor of China*. New York: Milestone Film & Video, Inc. Film.


Notes


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<th><strong>Brenda Forrester Smith</strong></th>
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