

FOR EVERY LINE CASTS A SHADOW

by

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I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

The blank page represents a void, an open area of space that holds the potential for architecture. Through a process of drawing points, lines and planes, the void of the paper is cut to become an arrangement of curated, smaller areas of architectural space. There is a moment of self reflection and inquiry about how to begin, where to place the first line. What is the specific method for reasoning to break the wall at two meters to create space for a window? If there are two or more buildings, what predicates their position in relation to one another?

At the height of Modern Architecture, the graphic environment of geometric abstract paintings participated in a reflexive exchange with the architect. Abstract painting acted as a tool for spatial inquiry for the architect, providing compositional solutions that informed architectural space.

A series of compositional studies explore how abstract, geometric compositions provide new avenues for spatial inquiry and can act as an active participant in the development of architectural ideas. As the point becomes the line and then the plane on the page, its final iteration is the translation into the third dimension. Each line contributes to the walls, beams, screens, doors and apertures that compose the experience of light within a building; these lines catch sun and cast a shadow.



ACKNOWLEDGMENTS

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I want to dedicate this work to my good friend Christopher Moran who once told me that “to design for life, you need to live one”.

« Fig 01 *The home studio.*
« Fig 02 *The school studio.*

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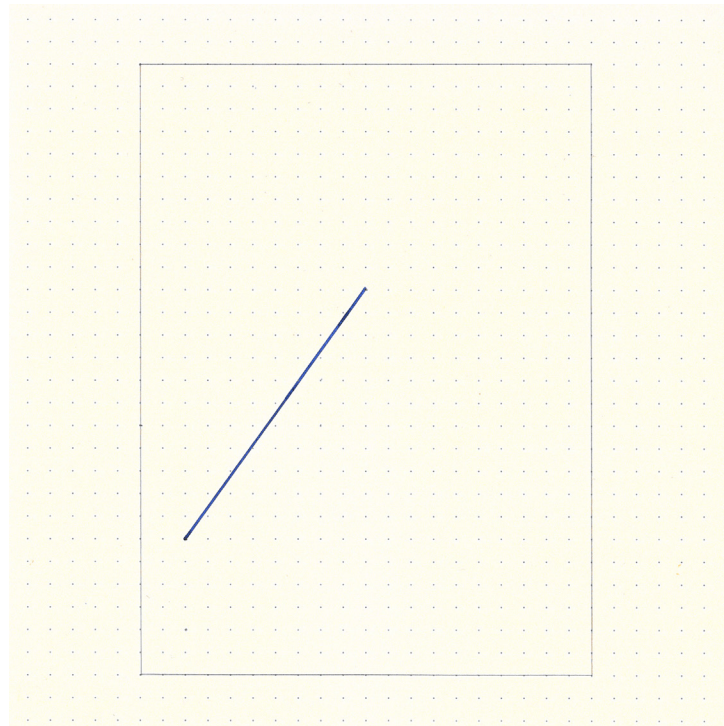
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THE LINE

The blank page represents a void, an open area of space that holds the potential for architecture. In the most primitive architectural iteration, a single line articulates space. A stroke is made, it hangs within the middle of the page on an angle. The line extends from the bottom left hand corner towards the top right, stopping somewhere in the middle. Although this line might seem arbitrary, the position of the two vertices on the page is carefully chosen. A single stroke transforms the large area of open paper to exist as two spaces; there is now one area of white paper and then a second. The placement of the line creates an exchange in proportion and balance with the white space that surrounds it. The author has thought about the transaction between the line itself and the edge of the paper. The length of the line determines how much of the void is cut and divided. A thick line is associated with boldness, a heavy division.

It is through this process of drawing points, lines and planes that the void of the paper is cut to

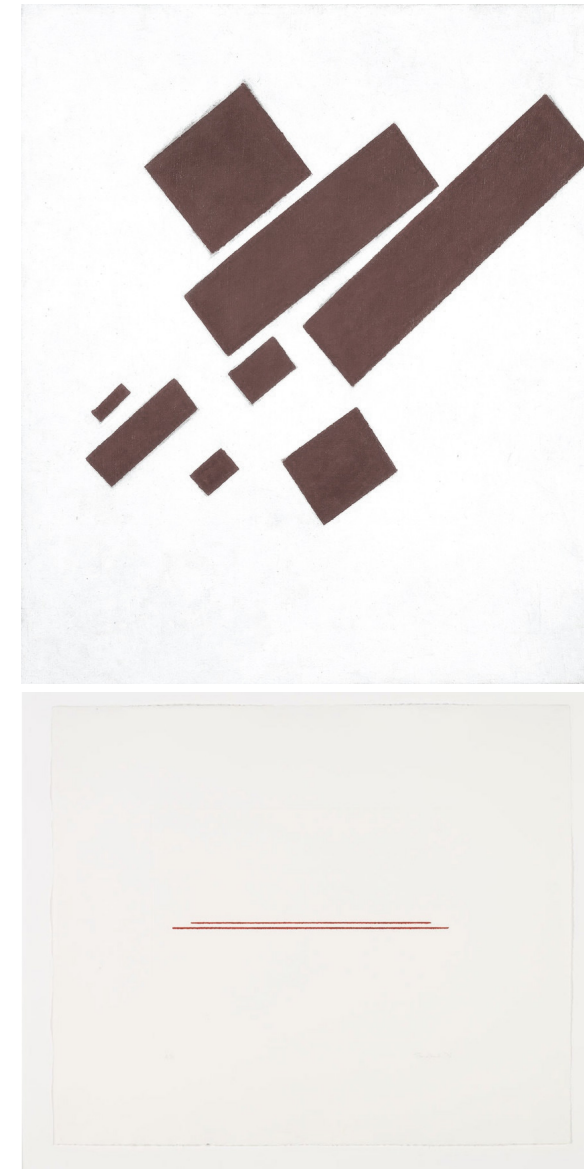
« Fig 03 *The space of the paper is cut.*

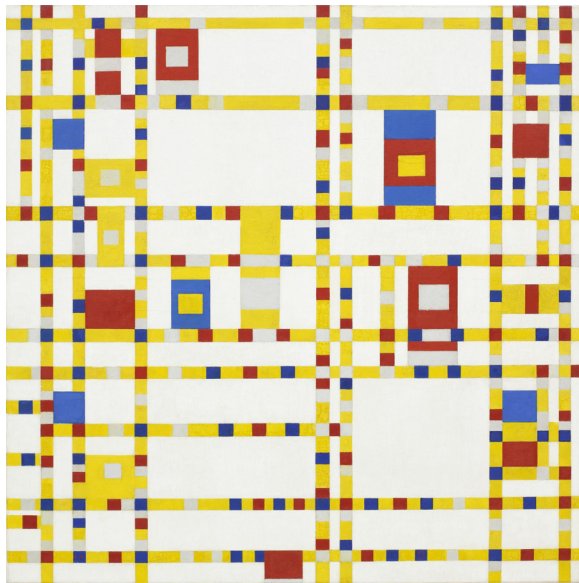
become an arrangement of curated, smaller areas of architectural space.

There is a moment of self reflection and inquiry about how to begin, where to place this first line. Within the border of a site, why place the outline of a building in the northeast corner? If there are two or more buildings, what predicates their position in relation to one another? Within a building, how wide, deep and tall should the atrium be? Why break the wall at two meters to create space for a window? The grade of the site, the direction of light and the surrounding landscape can generally inform these decisions. They do not, however, provide a specific method for reasoning. What is the precise motive for the placement of the pencil?

In my personal experience, geometric abstract paintings have helped provide a sense of line-reasoning for my architectural projects. The painted forms: the lines, curves and rectangles, within Kazemir Malevich, Ellsworth Kelly and Piet Mondrain paintings and the line drawings of Fred Sandback and Agnes Martin create detailed spatial conditions between each figure and the surrounding negative space on the canvas. This meticulous compositional language between the forms (the figure) and canvas (the background) inspire architectural conditions at different scales. The balanced, distributed rectangles within Malevich's *Eight Red Rectangles* (1915) informs an architectural iteration of balanced, distributed buildings over a site. The sliding pattern of two lines within Sandback's drawings informs the length of two walls and their distance within the interior of a building.

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- » **Fig 04** Kazemir Malevich, *Eight Red Rectangles* (1915).
 - » **Fig 05** Fred Sandback, *Untitled* (1976).





- ^ **Fig 06** Piet Mondrian, *Broadway Boogie-Woogie* (1943).
» **Fig 07** Ellsworth Kelly, *Brushstrokes Cut into Forty-Nine Squares and Arranged by Chance* (1951).
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Composition gives the line intention. There is a difference in a disconnected grouping of eight red rectangles and the intentional placement of each form to create a beautiful whole. Malevich makes delicate adjustments, translating and rotating the eight rectangles to achieve a refined, balanced, visually interesting composition. The architect and the abstract painter make decisions and conceive of a work following a set of principles or rules to guide and provide reason for lines to exist on their page. In the same way that the lines and shapes on the canvas are composed, the lines and shapes on a plan within a site border, are composed also. Abstract painting can act as a tool for spatial inquiry for the architect, providing compositional solutions that can inform architectural space.

There are different types of architectural drawings and each have their own intention. In one instance, drawings exist as a means to an end, having an applicability to the architectural practice through the plan, section or elevation. In a second instance, drawings intend to emulate a building, sometimes employed to augment and market a design. Drawings are equally intended to occupy a role within the design process, potentially existing as formal studies or preliminary sketches.

As two dimensional architectural drawings: the plan, the section, the detail and the axonometric are translated to three dimensions, the intention of the line becomes complex as it relates to physical space. The line represents walls, columns, windows, apertures, doors and screens. There is a spatial sensation explored in their combination. These elements affect the sense of light, the experience of movement and the structure and materiality of a building. A space can be open and vibrant, tight and dark, silent and contemplative.

In reference to drawing, the dictionary defines the line as “a boundary of area” and “a mark recording a boundary, division or contour”.

Division: to separate into two or more parts, areas or groups. To cause to be separate, distinct or apart from one another.¹

Boundary: something that indicates or fixes a limit or extent.²

Contour: an outline especially of a curving or irregular figure. The general form or structure of something.³

The architect’s intimate relationship with the line - to understand its delicate and refined articulation - provides them an opportunity to design delicate and refined architectural space.

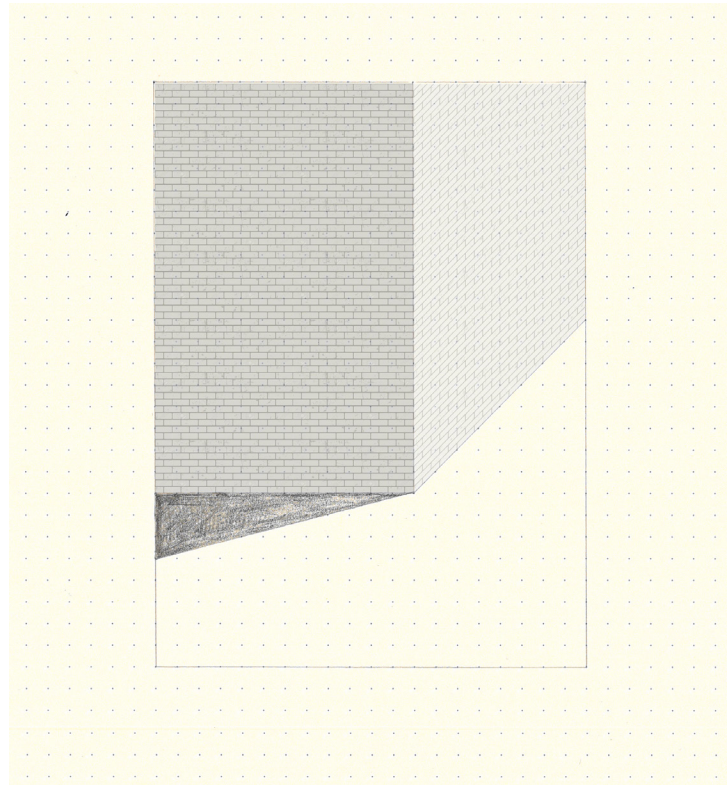
The point becomes the line and then the plane on the page and its final iteration is the translation into the third dimension to become the volume. It is through this translation from plane to volume that each line drawn on paper contributes to the sense of space within a building. Each day, the sun will catch the brick wall. It will be caught along the entire face and include where the wall meets the ground, the vertex where the line is translated upwards to become the brick wall. Through this, every line casts a shadow: the mark on the page defines much of the built environment that surrounds us.

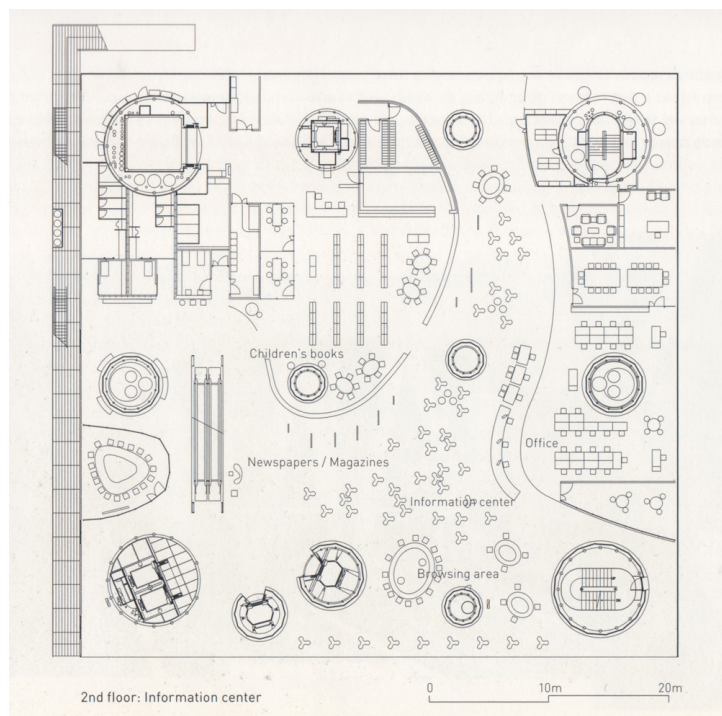
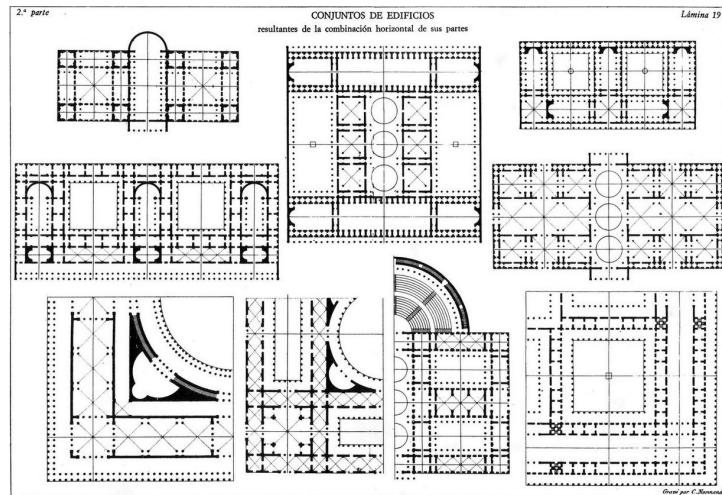
¹ “Line.” *Merriam-Webster*, Merriam-Webster, <https://www.merriam-webster.com/dictionary/line>.

² *Ibid.*

³ *Ibid.*

Fig 09 (following) *The sun catches the face of the brick wall to include its vertex, where it meets the ground.*





A SURVEY

George Lucan, in his book *Composition, Non-composition: Architecture and Theory in the Nineteenth and Twentieth Centuries* (2009), outlines examples of abstract painting's compositional influence on architecture. Lucan defines two eras of architectural composition. Closed order refers to the rigid spatial organizational ideals of the Ecole des Beaux Arts and the decades that preceded its foundation.⁴ Open order refers to the years that preceded the Ecole des Beaux Arts, the industrial revolution and the innovations that took place within the scientific, mathematical and cultural communities.⁵

Lucan's writing elucidates that each era of architecture is driven by a central, uniformly accepted, method for spatial organization. In the centuries that preceded Modernist Architecture,

⁴ Lucan, Jacques. *Composition, Non-Composition: Architecture and Theory in the Nineteenth and Twentieth Centuries*. EPFL Press, 2012, p. 6.

⁵ *Ibid*, p. 7.

« **Fig 10** Jean-Nicolas-Louis Durand, Edifice ensembles resulting from horizontal combinations of their parts (1813).

« **Fig 11** Toyo Ito, Mediatheque (1995-2001), Sendai, first floor plan.

architectural composition is rooted in the compositional ideals of the Ecole des Beaux Arts. Symmetry is the cornerstone of composition. Architecture is heavily rooted in the dominance of the plan. Plans are arranged in a hierarchical pattern of enclosed spaces around a central, main room and program. At the turn of the 20th century, however, architecture shifts from the regular, hierarchical, planimetric symmetry of the Ecole des Beaux Arts to the irregular, universal, planimetric asymmetry of modernism.

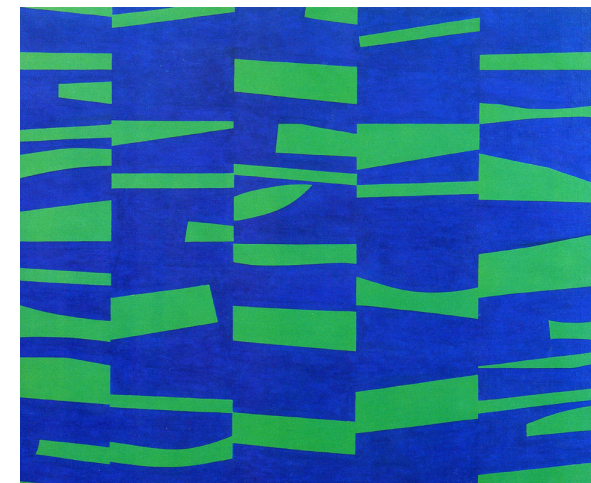
This new, open order becomes uncharted terrain for compositional methods. There is no longer the inherent logic of regularization and symmetrization in the Ecole des Beaux Arts school, through which the architect understands and conceives buildings. The 20th century architect seeks a new system for architectural composition; a new ethos from which to compose space. The architect's search for this ethos comes from a variety of inspirations. Architects turn to philosophy, literature, music and visual art for cues to understand and regulate asymmetrical space. Amongst these, the compositional freedom of non-objective painting becomes a large source of inspiration for architecture.⁶

In 1907, George Braques and Pablo Picasso conceive of Cubism; a system of painting that occupies a new role for the medium within society. Braques and Picasso still channel ideas, opinions and stories in their paintings but these are no longer conveyed with realistic representation. In the years

⁶ Ibid, p. 403.

» Fig 12 Henry Matisse, *L'Atelier Rouge* (1911).

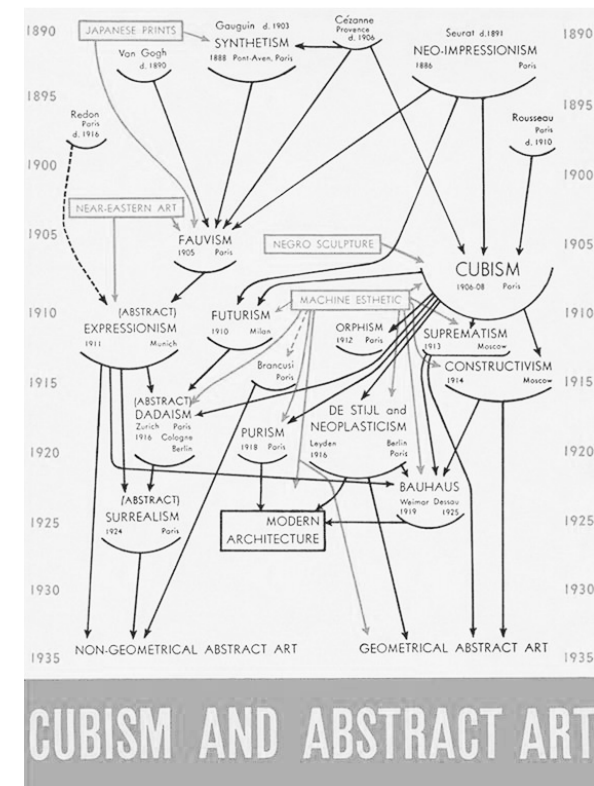
» Fig 13 Ellsworth Kelly, *Meschers* (1951).



following Braques and Picasso, painting transitions from realistic representation to abstraction. The subject and its background, as seen within the portraiture, landscapes and still lifes of Impressionism and Post-Impressionism is eliminated. The canvas becomes a flat, one dimensional plane where free, distinct forms and colours exist within a bordered edge. These abstract ideas expand within the 1920s to include the geometric abstraction painting movements such as Suprematism, De Stijl and Purism.

Visually, the disciplines of architecture and non-objective painting begin to operate within a similar language: geometry. The forms making up geometric abstract art resemble those making up architecture. Composed lines in painting could represent the composed lines demarcating space within architectural drawings. The methods of composition for painting and architecture can be interchanged. Abstract painting's language of operations can be applied to understand and compose asymmetrical architectural space.

Alfred H. Barr Jr. documents this close relationship between geometric abstract art and architecture in 1936, through his curation of the Cubism and Abstract Art Chart for the Cubism and Abstract Art Show at the Museum of Modern Art. Barr maps the relationships between early abstract art movements and their influence over other disciplines. From the Cubism and Abstract Art Chart, we follow the influence of the abstract graphic environment on Modernist Architecture. From his map, we visualize



» Fig 14 Alfred H. Barr Jr., *The Cubism and Abstract Art Chart* (1936).

the significant and specific moment at the beginning of the twentieth century when the gap between painting and architectural composition closes; a moment when architects begin to interpret the operations occurring within painting for their own personal architectural composition.

Le Corbusier, Purism and The Picturesque

Le Corbusier uses his art movement Purism as a method for spatial inquiry, providing compositional concepts for his architecture. His architecture offering a reciprocal compositional value for his paintings. For a majority of his career, Le Corbusier composes architectural space through the manipulation of “organs”, which Le Corbusier defines as separate elements that retain structural integrity and autonomy when assembled together.⁷ Organs are distinctly separate architectural elements: walls, rooms, volumes, that provide a sense of diversity for the overall architectural project in their liberation and autonomy from one another. Within Le Corbusier’s painting, his term Purism refers to pure organs. Le Corbusier uses the concept of organs as a framework for the distribution of figures within each discipline.

The concept of organs within Le Corbusier’s Purist paintings is inspired by both Post-Impressionist and Cubist still lifes. From analyzing Barr’s Cubism and Abstract Art Chart, one traces the influence of Cubism on Le Corbusier’s artwork. However, Lucan argues Le Corbusier’s Purist paintings were specifically influenced by the freedom that separated elements enjoy in relationship to one another within Paul Cezanne’s still lifes.⁸ The subjects within Cezanne’s still lifes enjoy independance while still

⁷ Ibid, p. 372.

maintaining structural integrity within themselves. Within a scene of fruit, each element has its own attributes, some are ripe while others are rotten and forgotten, but all contribute to the overall essence of the painting. This quality transforms primitive relationships into a complex set of specified relationships; a relationship between part and whole.

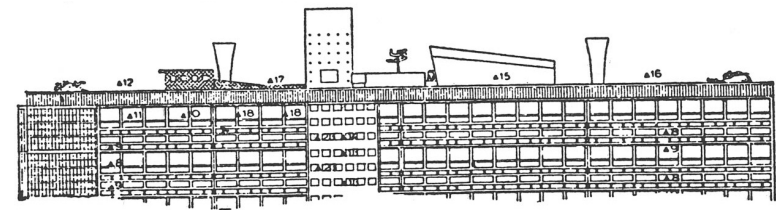
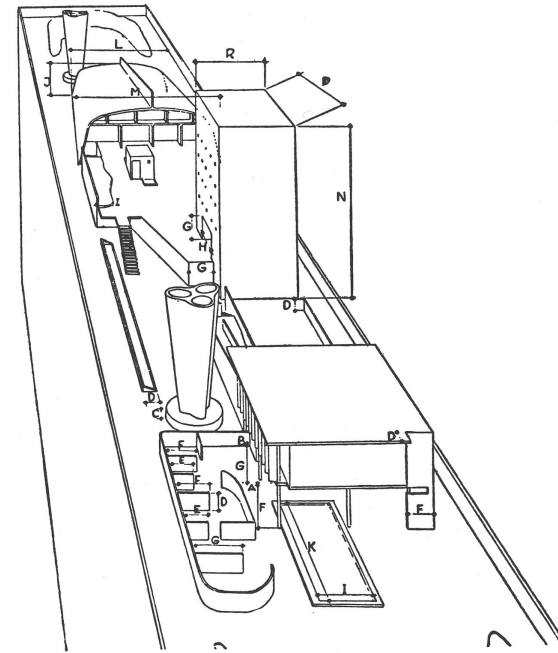
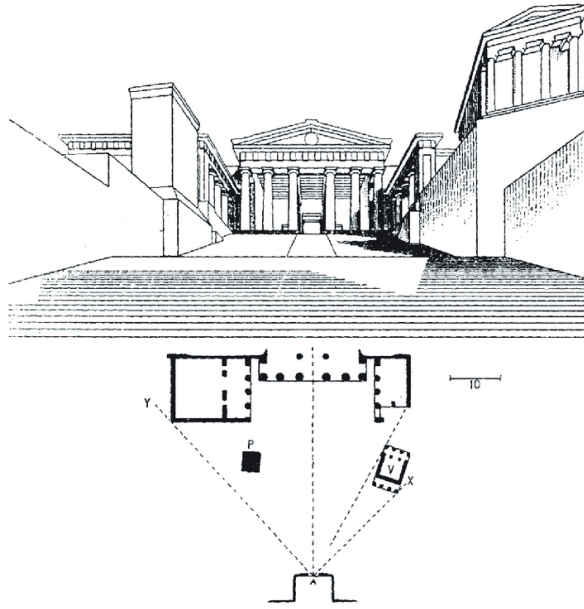
We see this part to whole relationship with Le Corbusier’s architecture. The roof of Le Corbusier’s Unite d’Habitation is an extension of the decisive volume present within still life paintings. The garden terrace, the running track, the club, the kindergarten, the gym, and the shallow pool exist as separate elements that contribute to the composition of the overall building. Volumes are lit differently, some elements are short while others are tall. The organs, or elements, on the roof are arranged in order to compose a balanced still life as a suite of tableau.

Lucan describes Le Corbusier’s trip to Pisa and his observation of the The Greek Picturesque on the Acropolis as a main source of inspiration for the processional experience the patron experiences of organs at eye level.⁹ The French architectural historian Auguste Choisy (1841-1909) surveyed the Acropolis in Athens and the published findings in *Histoire de L’Architecture* (1899). In this text, Choisy represents the autonomous placement each historic building has on the Acropolis hill.¹⁰ It is through Choisy’s survey and his experience during his visit that Le Corbusier understands the placement of the Temples on the Acropolis hill as a processional

⁸ Ibid, p. 405.

⁹ Ibid, p. 362.

¹⁰ Ibid, p. 356.



^ Fig 15 Auguste Choisy, Views of the Acropolis Athens, *Histoire de l'architecture*, (1899).
 » Fig 16 Le Corbusier, Views of Unite d'Habitation, (1947).

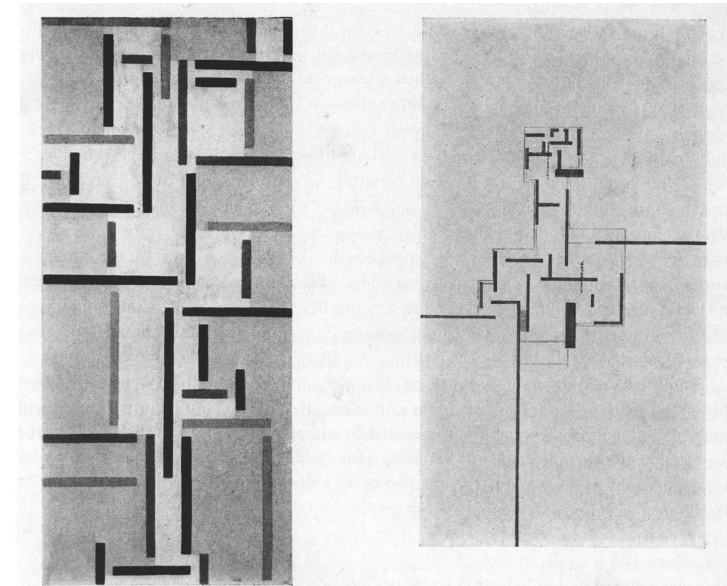
experience. The temples are placed over the site to compose a series of pictorial views along the path that are in equilibrium. The temples hold a sense of static, precise and a fixed nature in these moments; similar to a still life.

Organs become a way Le Corbusier moves away from the compositional hierarchy of symmetry present within Ecole des Beaux Arts architecture. They enable Le Corbusier to create his own sense of architectural composition. The free disposition of organs within his architecture eliminates the corridors and courtyards, creating instead a combination of elements that provides more space around themselves.

Le Corbusier's experience of Pisa, the Greek picturesque and the autonomous ideas he explores through organs inform the architecture he creates for a large majority of his architectural career. He spends the morning working through ideas painting and the evening practicing architecture. Lines in painting translate into drawings that represent buildings.

De Stijl

In the 1920s, the Dutch De Stijl movement develops a suite of compositional concepts for both art and architecture, collectively. The De Stijl movement includes architects and artists and the ideals informing both buildings and paintings are almost identical. The movement is driven by ideas of openness and universality. Within De Stijl painting, the enclosed area of the canvas is broken up into groups of smaller areas with straight, horizontal and vertical lines, squares and rectangles. These horizontal and vertical lines are represented in architecture to become planes, creating spatial divisions intended to create the impression of inside and outside that is not entirely closed off.¹¹ These



planes are intended to reflect light and sound instead of delimiting and closing space.¹² De Stijl buildings aim to provide a sense of space that is universal and inclusive.

Mies Van Der Rohe's Brick Country House (1922) is an example of the pictorial influence of De Stijl art on architecture. The composition of many of Mies Van der Rohe's architectural projects deal with a tectonic slippage of planes, a concept developed in paintings by Piet Mondrian and Theo van Doesburg. The formal approach of The Brick

¹¹ Padovan, Richard. *Towards Universality: Le Corbusier, Mies, and De Stijl*. Routledge, 2010, p.15.

¹² *Ibid*, p. 15.

[^] Fig 17 Theo Van Doesburg, *Russian Dance* (1918).

[^] Fig 18 Ludwig Mies van der Rohe, *Project for a Brick Country House* (1922).

Country House is directly inspired by Theo van Doesburg's *Rhythm of a Russian Dance* (1918). Mies composes the materiality of the building, its glass and solid materials, to replicate a similar rhythm of the horizontal and vertical lines within van Doesburg's painting. The concrete load bearing walls replicate a similar rhythm of the positive space, the thick strokes, while the glass affects a sense of openness and inclusivity, shying away from enclosing a room entirely.

As mentioned previously, L'Ecole des Beaux Arts' emphasizes the prominence of the plan's central room and program. All design decisions stem from this central room as the generative spatial principle for the rooms and corridors that surround it. Lucan describes the manipulation of the center of the floor plan as a distinguishing shift between closed and open order. The manipulation of the center of a spatial arrangement within Modernist Architecture aims to achieve the opposite; the distribution of figures within the plan lacks a central focus. De Stijl's over-arching grid of horizontal, vertical lines and rectangles is efficient in achieving this sense of equilibrium and balance. The paintings create a surface of repetition to produce a uniform textural block of infinite free floating planes.

Suprematism, The Bauhaus, Deconstructivism

In Russia, the industrial enlightenment inspires Suprematist painting. Suprematist painting is concerned with representing the industrialism and scientific discoveries that occur at the turn of the twentieth century. The square root of negative one is a concept too complex to describe with math, science and literature at the time. Kazemir Malevich seeks to visually represent this concept through his paintings.



Black Square (1913), is art at 'point zero' alluding to a visual depiction of the square root of negative one.¹³ These complex ideas are represented through a number of his paintings at the 0.10 *The Last Futurist Exhibition* (1915) where more, simple geometries are painted on canvases.

The ideals of Suprematism seep beyond Russia's border and into the realm of contemporary abstract art culture. El Lissitzky is an apprentice of Malevich and brings the ideals of Suprematism to the Bauhaus when he begins teaching. His personal work, the PROUN series, deals with the assemblage of elementary forms and the illusion 3D structure set in motion, concepts influenced and developed

¹³ Lucan, Jacques. *Composition, Non-Composition: Architecture and Theory in the Nineteenth and Twentieth Centuries*. EPFL Press, 2012, p. 432.

[^] Fig 19 Kazemir Malevich, *0.10 The Last Futurist Exhibition* (1915).

by Suprematism. El Lissitzky teaches various basic theory, drawing and compositional courses at the Bauhaus with academics such as Moholy Nagy and Paul Klee.¹⁴ Through this, Suprematism's geometric compositional strategies reach Germany, Europe and North American as the Bauhaus teachings perforate on the global scale.

Reflexivity

More recently, Suprematism has provided a sense of spatial influence for Deconstructivism, through Zaha Hadid. The simple geometric shapes within Malevich's paintings are intended to represent a slice into an unknown three dimensional, perspective space beyond the canvas; where the complex idea can exist within the unknown further dimension. Hadid's interpretation of Suprematism concerns itself less with its mysticism and more with her fascination with shapes existing in this unknown free-floating world.¹⁵ The swooping, interweaving nature of Hadid's London Aquatics Centre (2011) exemplifies this, where the figure ground extends to become a floating concrete form.

In each of these instances, the architect, as observer, is participating in a reflexive exchange with the paintings. In his essay *Paintings and Atrocity: The Tuymans Strategy* (2011) art historian Peter Geimer describes the reflexive process present between the viewer and the painting. He describes reflexivity as a circular relationship between cause and effect.¹⁶ The work projects a visual concept onto the viewer. Through the viewer's mental makeup, this concept

¹⁴ Klee, Paul, and Sibyl Moholy-Nagy. *Pedagogical Sketchbook*. Faber and Faber, 2000, p.7.

¹⁵ Hadid, Zaha. 30 Oct. 2014, London, UK.

¹⁶ Peter Geimer. *Thinking Through Painting: Reflexivity and Agency beyond the Canvas*. Sternberg Press, 2014, p.20

becomes an idea which is then projected back onto the work and the meaning of the painting changes. The observer interprets the work and translates its meaning for their own creative purpose.

The specific and deliberate combinations of geometry produces a form of spatial knowledge for the architect. It provides insight to the behavior of shapes when combined together with composition and colour. The elements of abstract paintings are illusive, while at the same time their geometric nature is concrete and visual, ready to support interpretation. A reflexive quality specific to the spatial thinker is their ability to orient themselves in the third dimension and imagine the brightness and darkness, the behind or in front, what is heavy and light.

This reflexive process between artist and architect, of an architect consuming a concept in a visual work and projecting their own spatial meaning onto it, exists all over the twentieth century. As architecture moves away from formal composition, and art does too, architects still participate in this reflexive process. Robert Venturi and Denise Scott Brown's *Learning from Las Vegas* (1972) is inspired by the glorification of the ordinary present Andy Warhol's Pop Art screen prints.¹⁷ Herzog and De Meuron look to Matisse's brush strokes as a way to explain their desire to slow down the eye through building ornamentation. Peter Eisenman hails hard edge painting and minimalist artists such as Donald Judd and Robert Morris for their works that aim to provide *no meaning other than what it is*.¹⁸

¹⁷ Lucan, Jacques. *Composition, Non-Composition: Architecture and Theory in the Nineteenth and Twentieth Centuries*. EPFL Press, 2012, p. 509.

¹⁸ Ibid, p. 571.

A GENERATIVE FRAMEWORK

As painting progresses through abstraction, a critical language to describe purely abstract art-making emerges. A series of texts are published to formulate an academic backing and teach students during this moment within the institution of painting. Two instructors at the Bauhaus, Johannes Itten and Paul Klee, write *Design and Form: The Basic Course at the Bauhaus* (1910-1930) and *Pedagogical Sketchbook* (1953). As time progresses through Abstract Expressionism and towards Minimalism, during the 1950s and 1960s, Maitland Graves publishes *The Art of Colour and Design* (1951) and Maurice de Saumarez publishes *Basic Design: The Dynamics of Visual Form* (1971).

Throughout the four texts there is a series of consistent themes that emerge: movement, rhythm, proportion, harmony, balance, contrast and emphasis. Each theme is explained as an exercise that engages the student through their own abstract compositional explorations. The exercise becomes a closed-off territory, exploring a specific sensation. The exposition of the second theme develops on the first with modulation eventually resulting all themes swept up in a complete expression where no single theme is

distinctly recognized.

In an effort to better understand painting's relation and applicability to architectural composition, can we explore the exercises informing the abstract painter, within architecture? Can they inform or be represented within architectural spaces and to what end? Can the closed off, sectioning nature of each of these individual themes address individual sensations within architectural drawing and therefore within architectural space? Can they offer excerpts for the architect to consider when they first place their pencil and conceive of architectural space?



- » **Fig 20** Johannes Itten, *Design and Form: The Basic Course at the Bauhaus* (1963).
- » **Fig 21** Paul Klee, *Pedagogical Sketchbook* (1953).
- » **Fig 22** Maurice de Sausmarez, *Basic Design: The Dynamics of Visual Form* (1971).
- » **Fig 23** Maitland Graves, *The Art of Colour and Design* (1951).



1
An active line on a walk, moving freely, without goal. A walk for a walk's sake. The mobility agent is a point, shifting its position forward (Fig. 1):



Fig. 1

The same line, accompanied by complementary forms (Figs. 2 and 3):



Fig. 2



Fig. 3

16



4
Passive lines which are the result of an activation of planes (line progression) (Fig. 8):

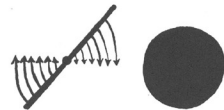
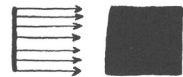


Fig. 8

Passive angular lines and passive circular lines become active as planar constituents.

19



2
An active line, limited in its movement by fixed points (Fig. 6):

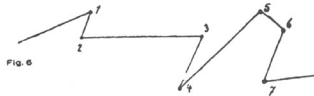


Fig. 6

3
A medial line which is both: point progression and planar effect (Fig. 7):

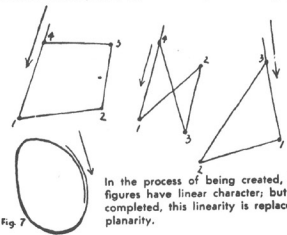


Fig. 7

In the process of being created, these figures have linear character; but once completed, this linearity is replaced by planarity.

18

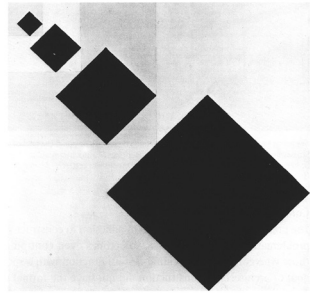
Movement:

1. The quality (as in a painting or sculpture) of representing or suggesting motion.²⁰

Paul Klee describes the relationship between line, point and plane as kinetic force, translating each element to the next. Within visual arts and painting, movement is associated with the energy held in the relationship between the elements in a painting that cause the viewer's eye to move over the surface of the picture plane.

²⁰ "Movement." Merriam-Webster, Merriam-Webster, <https://www.merriam-webster.com/dictionary/line>.

« Fig 24 Paul Klee, Line movement diagrams, *Pedagogical Sketchbook* (1953).

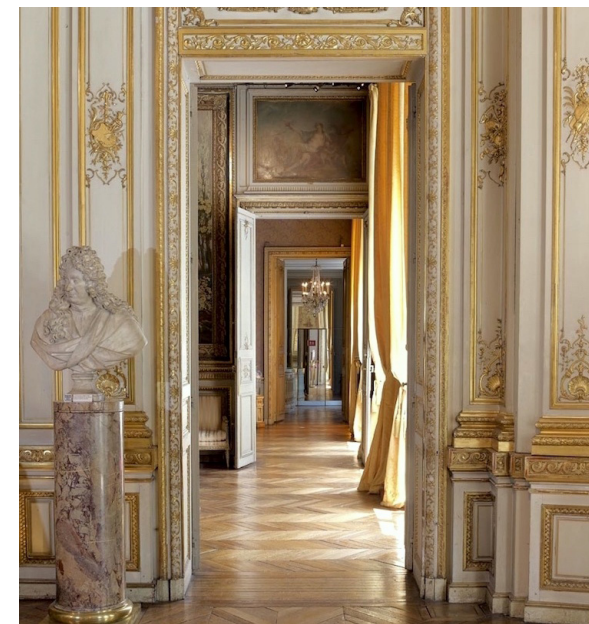


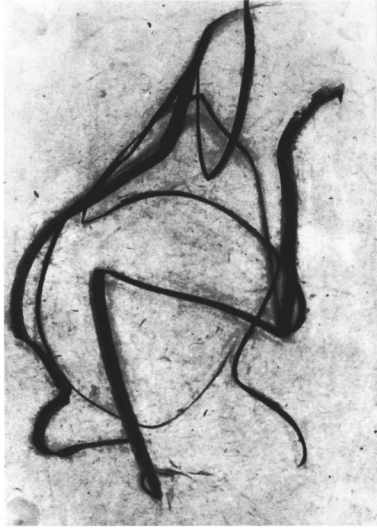
In Theo Van Doesburg's *Composition Arithmetique* (1930) the outline of a square is felt to have within itself and the next square, potential energies of expansion and contraction which activate the space between them. There is a sense of measurement and implied direction which causes the eye to move from the top left portion of the canvas to the bottom right.

Lucan describes movement within architecture as the connection between perception and displacement at eye level.²¹ The Ecole des Beaux Arts' enfilade creates a linear connection between perception and displacement. Within Modernist architecture, the plan becomes a shifting pattern of walls that exist independently, creating diagonal visions that differ from the perceived straightness produced by enfilades. The space reveals itself and is understood as the patron walks through it in real time.

²¹ Lucan, Jacques. *Composition, Non-Composition: Architecture and Theory in the Nineteenth and Twentieth Centuries*. EPFL Press, 2012, p. 355.

- [^] Fig 25 Theo van Doesenburg, *Composition Arithmetique* (1930).
- » Fig 26 Carlo Scarpa, Brion Cemetary (1978),
- » Fig 27 Henri Parent, Musée Jacquemart-André (1869).





142 This form was found in intuitive and free linear rhythm without model or reference to a theme. Weimar, 1919. F. Dickler.
136



143 This broadly drawn form shows a rhythmic motion which is entirely different from the preceding illustration 142. Weimar, 1920. W. Groff.
137

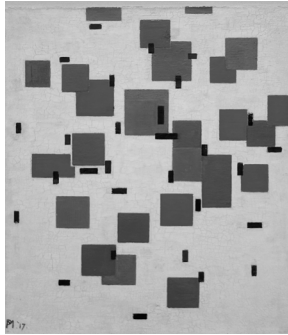
Rhythm:

1. The aspect of music comprising all the elements (such as accent, meter, and tempo) that relate to forward movement.²²

Rhythm has a close association with motion, it is movement made with a specific sequence, sometimes caused by repetition. Within music, rhythm gives all other notes their place within a composition as it progresses temporally.

²² "Rhythm." Merriam-Webster, Merriam-Webster, <https://www.merriam-webster.com/dictionary/line>.

« Fig 28 Johannes Itten, Exercise in Rhythm, *Design and Form: The Basic Course at the Bauhaus* (1963).

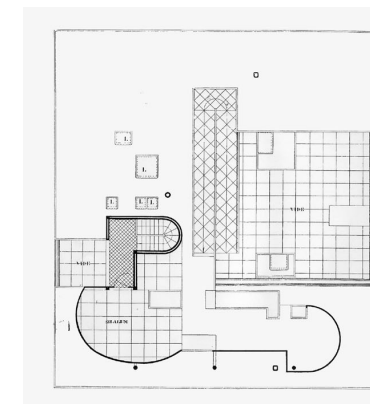
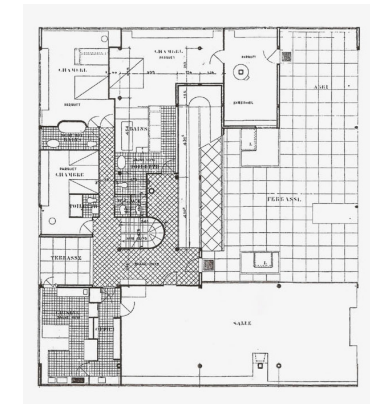
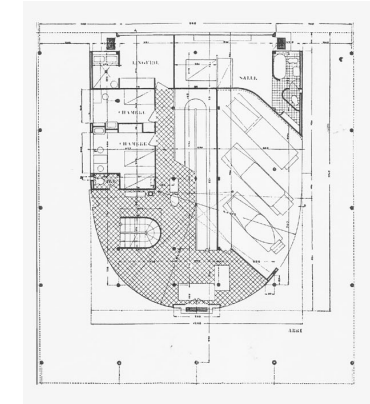


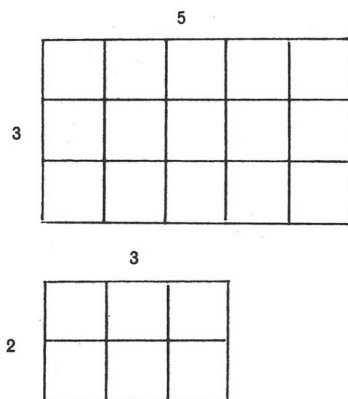
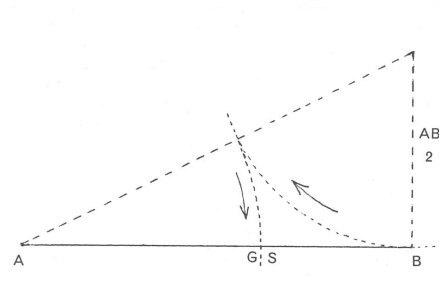
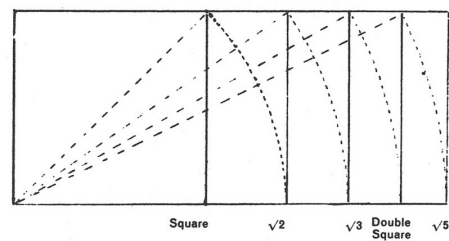
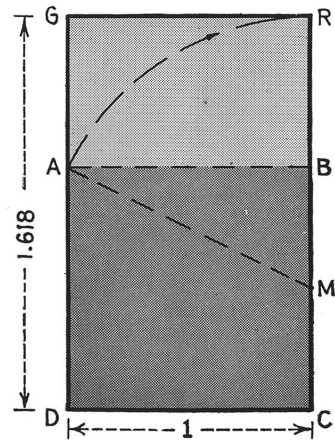
Rhythm holds Piet Mondrian's *Composition en Couleur A* (1917) together. There is a proportional relationship, a sense of regular interval dictating the distance between rectangles, causing the viewer's eye to move with a specific sequence.

Le Corbusier believed the plan carried a dominant rhythm. It was through the plan's structure that "its geometric laws and their modular combinations unfold through all its parts".²³ The Domino Structure provides a framework for Le Corbusier to regulate his free plan. The columns occur at a regular interval, providing a consistent rhythm that offers freedom for the disposition of the other elements in plan.

²³ Lucan, Jacques. *Composition, Non-Composition: Architecture and Theory in the Nineteenth and Twentieth Centuries*. EPFL Press, 2012, p. 367.

[^] Fig 29 Piet Mondrian, *Composition en Couleur A* (1917).
 » Fig 30 Le Corbusier, Villa Savoye floor plans (1929).





Proportion:

1. The relation of one part to another or to the whole with respect to magnitude, quantity, or degree: ratio.²⁴

Systems of harmonious proportion create a pleasing aesthetic quality when used in the composition of art and architecture. A well known example of a harmonious proportion is the golden ratio (1:1.618), a ratio that has been found in various elements of nature.

²⁴ "Proportion." Merriam-Webster, Merriam-Webster, <https://www.merriam-webster.com/dictionary/line>.

« Fig 31 Maitland Graves, Proportional System Diagrams, *The Art of Colour and Design* (1951).



The lines in Fred Sandback's *Untitled* (1958) are self-referential. The lines exist higher or lower on the paper in proportional relationship with the length of the lines alongside. There is a relationship between part, share, to a comparative whole.

There are a handful of known architectural proportional systems. These proportional architectural systems were first documented with the Greeks, existed in Renaissance and Gothic architecture and ended in its short rediscovery within Modern Architecture. Walls, columns, windows and staircases are adjusted in size relative to other parts or things within the plan, section or elevation.

[^] Fig 32 Fred Sandback, *Untitled* (1958).

» Fig 33 György Dóczy, Greek Temple proportional system, *The Power of Limits: Proportional Harmonies in Nature, Art, and Architecture* (1981).

» Fig 34 Leon Battista Alberti, Proportional Diagram of the facade of Santa Maria Novella (1360).

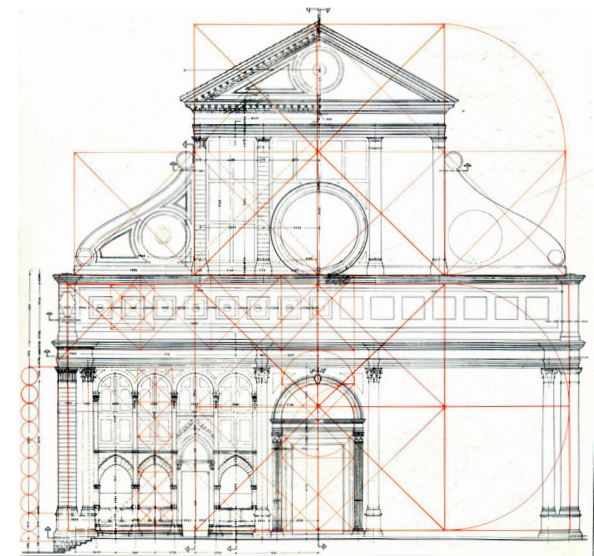
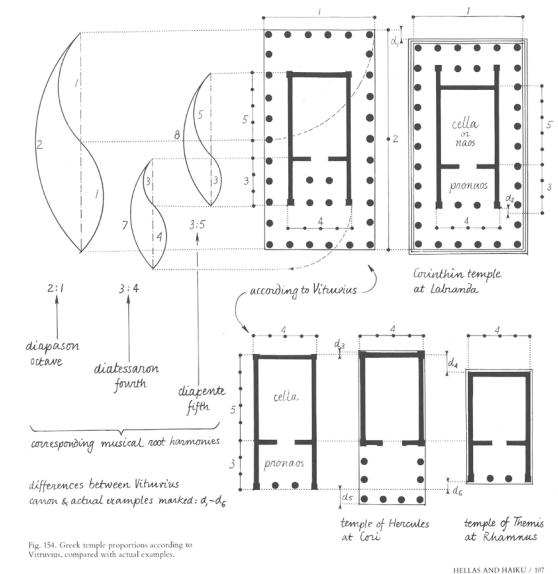


TABLE 10.3

COMPOSITION (PERMUTATIONS OF A, B, C)	CF	METRES (CF × 0.32)	METRES (ACTUAL)
A 1A	12	3.84	4.05
B 1B	15	4.8	4.74
C 1C	18	5.76	5.73
D A + B	27	8.64	(1) 8.52 (2) 8.79
E B + C	33	10.56	10.58
F A + B + C = 3B	45	14.4	(1) 14.4 (2) 14.25 (3) 14.53 (4) 14.63
G 2A + 3B + 2C	52.5	16.8	16.89
H 2A + 2B + C = 4C	72	23.04	23.05
I 2A + 3B + 2C	105	33.6	(1) 33.58 (2) 33.63

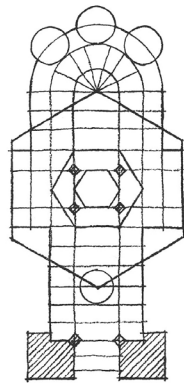
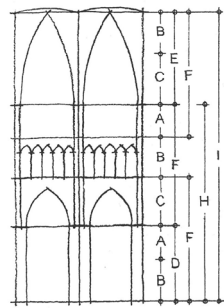
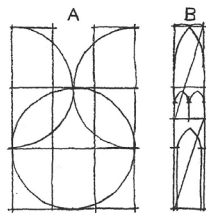


Figure 10.11 Chartres: ground plan derived from the regular hexagon, according to J. James.

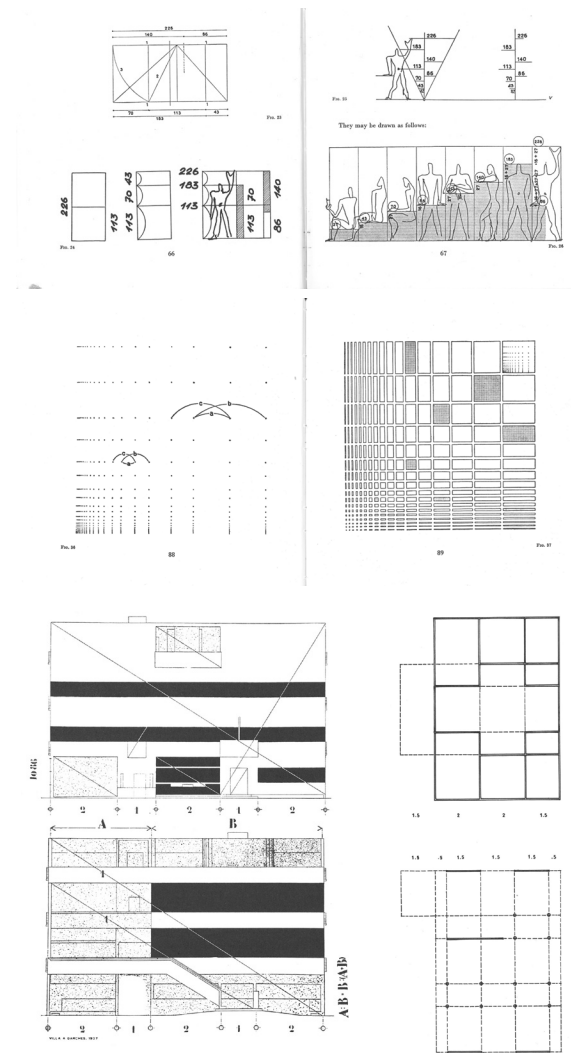


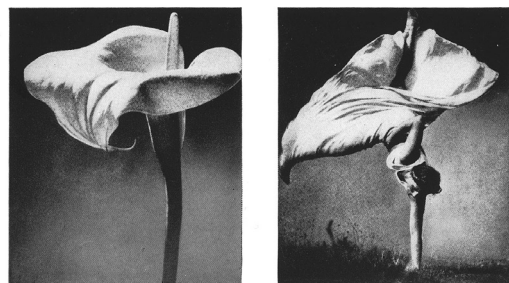
^ Fig 35 John James, Chartres cathedral interior elevation and plan proportions, *The Contractors of Chartes* (1978).

^ Fig 36 August Choisy, Notre Dame and Amiens proportional diagrams, *Histoire de l'architecture* (1899).

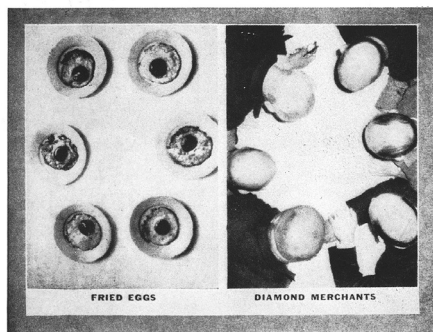
» Fig 37 Le Corbusier, The Modular proportional system, *The Modulor* (1900).

» Fig 38 Colin Rowe, Villa Garches elevation proportional system, *The Mathematics of the Ideal Villa* (1976).

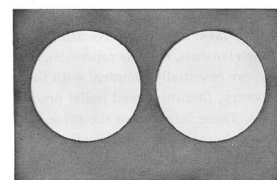




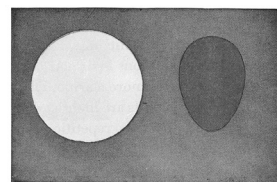
"ARUM LILY AND DANCING LILY"



"FRIED EGGS AND DIAMOND MERCHANTS"

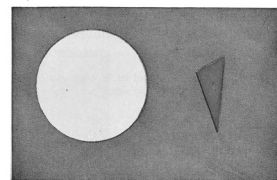


HARMONY



DISCORD

(Extreme Contrast)



Harmony:

1. Pleasing arrangement of parts.²⁵
2. The combination of simultaneous musical notes in a chord.²⁶

As noted above, harmony is a specific proportion (1:1.618). Harmony is further defined by Maitland Graves in *The Art of Colour and Design* (1951) as the aesthetic value similar, but not identical elements share; dissimilar but commonly associated. Maitland asserts, "Harmony is a combination of units which are similar in one or more respects. Units are harmonious when one or more of their elements or qualities, such as shape, size or colour are alike." His diagrams visualize this similarity. The two shapes under 'harmony', although different, share similar characteristics that make them harmonious. Discord, or contrast, is considered the opposite of harmonious.

²⁵ "Harmony." Merriam-Webster, Merriam-Webster, <https://www.merriam-webster.com/dictionary/line>.

²⁶ Ibid.

« Fig 39 Maitland Graves, Harmony Diagrams, *The Art of Colour and Design* (1951).



Within a composition, harmony offers a sense of sameness and cohesion to diverse elements appearing again and again with new, slight variance. We see harmony within the elements Le Corbusier's Still Life.

[^] Fig 40 Le Corbusier, Notebook Sketch.

» Fig 41 Richard Padovan, Harmonious diagram of Le Corbusier's *Composition a la guitare et a la laterne*, *Towards Universality: Le Corbusier, Mies and De Stijl* (2002).

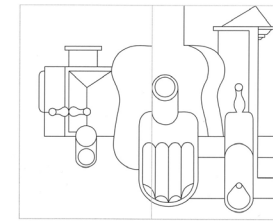


Figure 1.6 C.-E. Jeanneret (Le Corbusier), *Composition à la guitare et à la lanterne*, 1920. Vertical division of the whole canvas into two golden rectangles

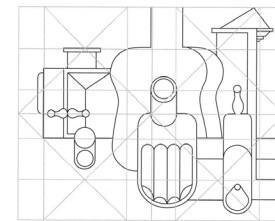


Figure 1.9 Division of the square into four small squares separated by four golden rectangles, with a still smaller square at the centre

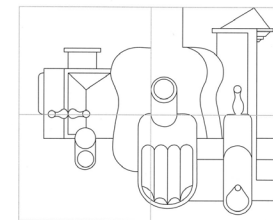


Figure 1.7 The golden rectangles halved to produce four rectangles similar to the whole

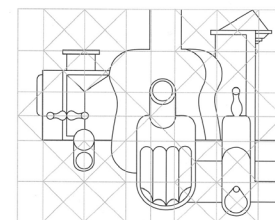


Figure 1.10 Quadripartite division of each small square

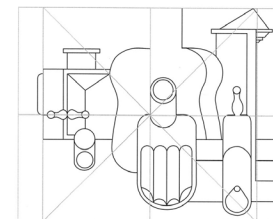


Figure 1.8 Central superposition of a large square

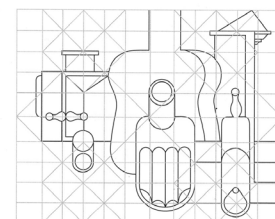
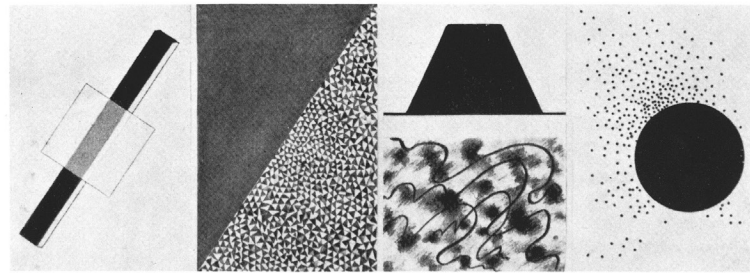
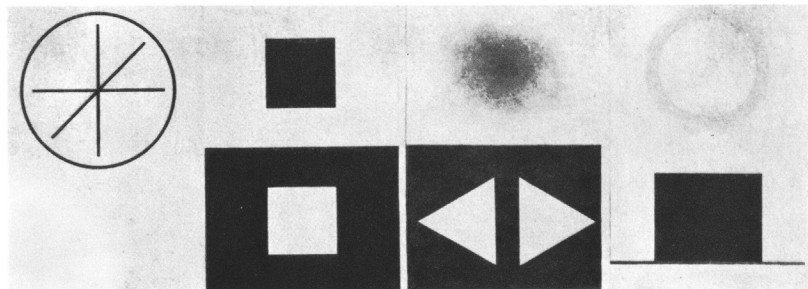


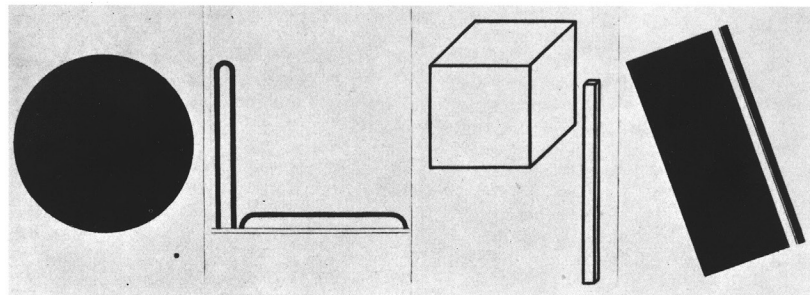
Figure 1.11 Further subdivision giving the final grid composed of 80 squares and 40 double golden rectangles which repeat the shape of the whole painting



transparent-opaque smooth-rough rest-motion much-little



directional contrasts light-dark soft-hard light-heavy



large-small high-low thick-thin broad-narrow

Contrast:

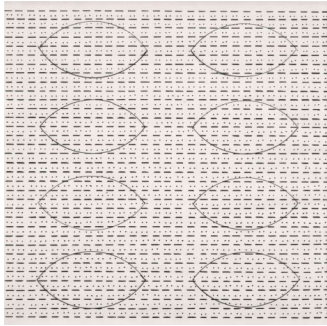
1. Juxtaposition of dissimilar elements (such as color, tone, or emotion) in a work of art.²⁷
2. Degree of difference between the lightest and darkest parts of a picture.²⁸

Johannes Itten's Basic Course at the Bauhaus is based on a general theory of contrast, a collection of divergent relationships. Contrast creates variety, it stimulates interest in compositions that are otherwise too coherent and similar. Too little contrast results in monotonous design. Too much contrast disassociates elements from themselves.

²⁷ "Contrast." *Merriam-Webster*, Merriam-Webster, <https://www.merriam-webster.com/dictionary/line>.

²⁸ *Ibid.*

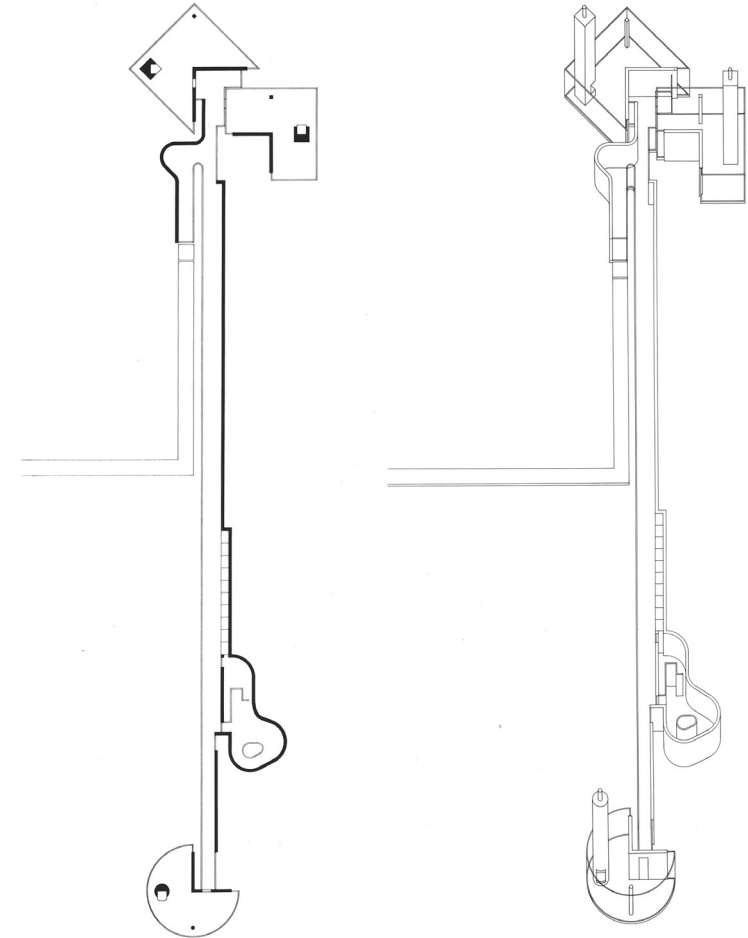
« **Fig 42** Johannes Itten, Contrast Diagrams, *Design and Form: The Basic Course at the Bauhaus* (1963).



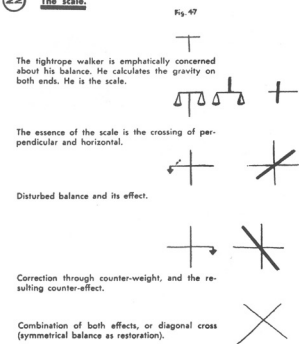
Contrast exists within lines. According to Paul Klee, basic lines are considered the straight and the curved. The curved line possesses the absence of the quality of the straight line. The diversity in the shapes offers different sensations when combined. We see the effect of this contrast within Agnes Martin's *Eight Fish Under Water* (1963).

Contrast within buildings occurs through various means. In one instance, there is a variety of light: full sun, diffused light, and shadow. Material contrast offers variety also. We see this affect of contrasting line within John Hedjuk's *House 10* (1966)

[^] Fig 43 Agnes Martin, *Eight Fish Underwater* (1963).
 » Fig 44 John Hedjuk, *House 10* (1966).

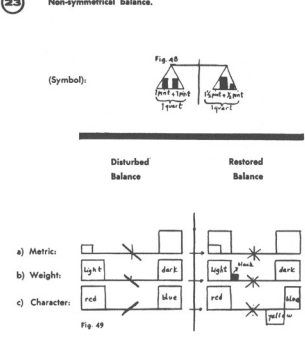


22 The scale.



42

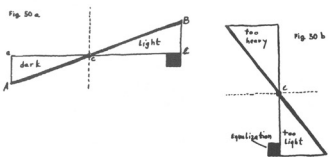
23 Non-symmetrical balance.



43

24 Diagrammatic presentation to Fig. 23.

Fig. 50a: Overloaded through the heavy dark, the axis AB has dropped from a to A, and has risen from b to B. Its original horizontal position was ab. Both axes, ab and AB, have the point C as a common pivot. As the result of a turn around this point, left-dark is now lower than right-light. To restore balance, black is added to the right-light. Or, I am stumbling toward left and reach out toward right to prevent a fall.



44

25 Building a tower.

Fig. 51: Stone I rests on the foundation stone. This upsets the balance toward left. To equalize, and causing a new disturbance, stone II is added to the right. Following this pattern, stone III pulls toward left; stone IV equalizes and pulls toward right, etc., until finally the keystone establishes a definitive equilibrium.

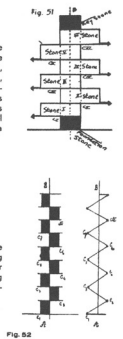


Fig. 52: P₁, P₂, P₃, etc., are the pivot points of the toppling stones. Connected with each other by a line, they form a zig-zag pattern that circumscribes the vertical axis.

Fig. 52

45

Balance:

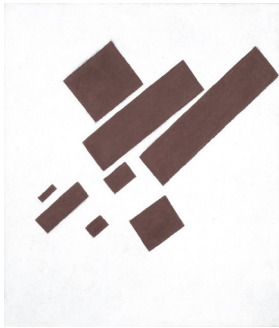
1. Physical equilibrium.²⁹
2. Stability produced by even distribution of weight on each side of the vertical axis.³⁰

Symmetrical balance occurs when one image is mirrored and balanced by its reflection. Asymmetrical balance occurs when non-identical elements are visually distributed so the weight is offset to appear equal. Paul Klee illustrates non-symmetrical balance in his *Pedagogical Sketchbook* (1953) as a combination of dynamic forces that balance visual scales.

²⁹ "Balance." Merriam-Webster, Merriam-Webster, <https://www.merriam-webster.com/dictionary/line>.

³⁰ Ibid.

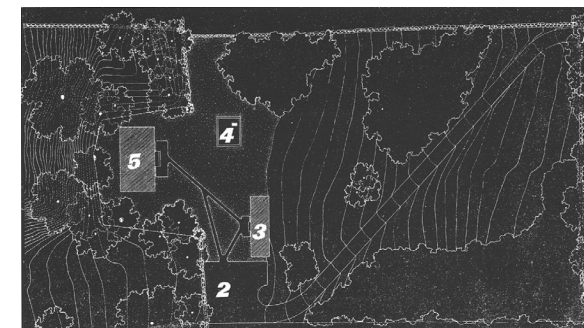
« Fig 45 Paul Klee, Balance Diagrams, *Pedagogical Sketchbook* (1953).

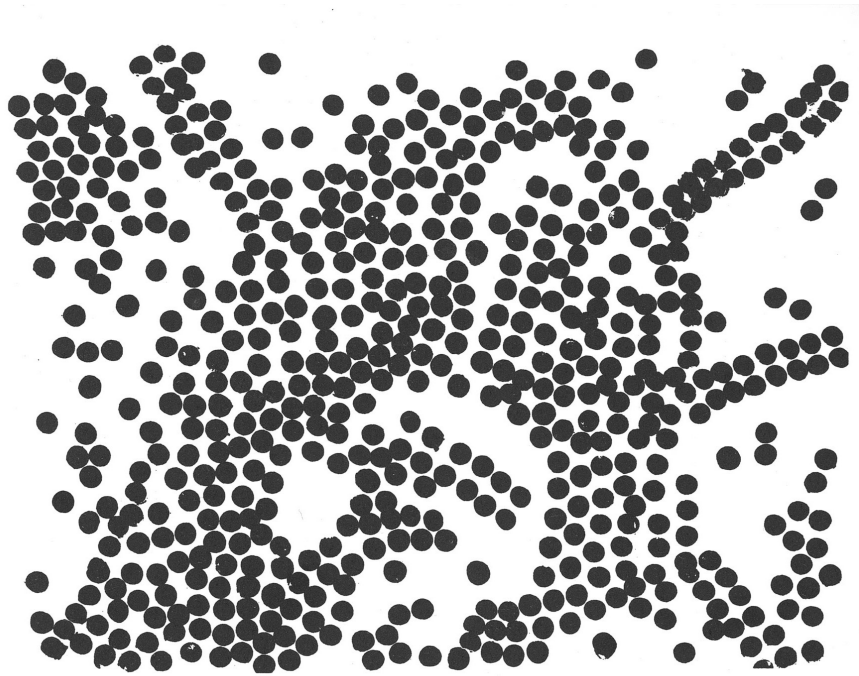


In mathematics, something is in equilibrium when all the forces acting within a system are neutralized. It signifies something that is static. Architects took cues from abstract painting's ability to achieve equilibrium.

Modern Architecture was essentially founded on the notion of the asymmetrical floor plan. Without planimetric symmetry to provide a sense of stillness within a plan's disposition, equilibrium becomes a tool for the architect to neutralize the various forces acting within the plan. We see this stillness in the disposition of buildings over the site in Philip Johnson's *Glass House* (1949).

[^] Fig 46 Kazimir Malevich, *Eight Red Rectangles* (1915).
» Fig 47 Philip Johnson, *Glass House* (1949).





Emphasis:

1. Force or intensity of expression that gives impressiveness or importance to something.³¹

When one point of accent dominates, the viewer's eye will rest on it longer than on accompanying, weaker points; the glance will always return to the major accent. Several points of equal accent call for gliding vision and an experience of motion. Maurice de Saumarez describes a series of dots in *Basic Design, The Dynamics of Visual Form* (1964), "Freely used spots, in clusters or spread out create a variety of energies and tensions activating the entire area over which they occur".

³¹ "Emphasis." *Merriam-Webster*, Merriam-Webster, <https://www.merriam-webster.com/dictionary/line>.

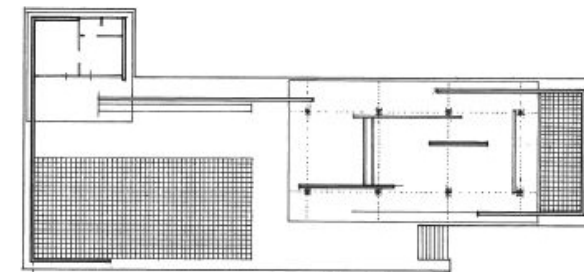
« **Fig 48** Maurice de Saumarez, Emphasis Diagram, *Basic Design: The Dynamics of Visual Form* (1971).



Emphasis, or lack the of emphasis, played a large role in defining the art of the 20th century. Graves goes so far to argue, “If one part is made so prominent that the others have no reason for being there, the art is gone.”

The transition from the architecture of L'Ecole des Beaux Arts to that of Modern Architecture is heavily focused on the lack of emphasis of the central room within the Ecole des Beaux Arts Floor plan. Mies Van der Rohe's Barcelona Pavilion (1928) uses a series of planes, carefully composed, to create a sense balanced and lack of emphasis within them.

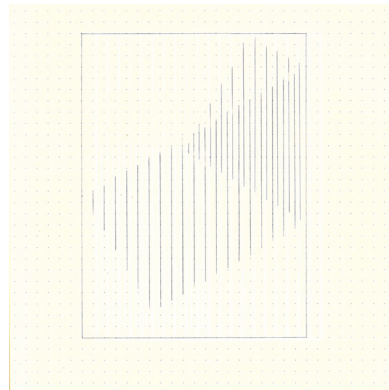
[^] Fig 49 Jackson Pollock, *Echo Number 25* (1951).
[»] Fig 50 Ludwig Mies van der Rohe, Barcelona Pavilion (1928).



48 SPATIAL SPECULATIONS

A SERIES OF COMPOSITIONAL STUDIES.

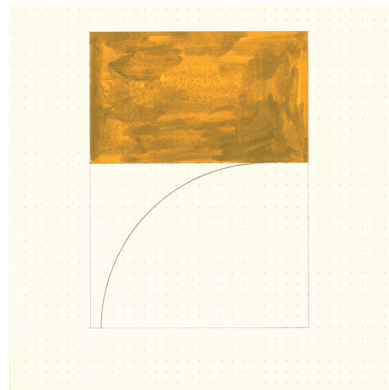




1/48
Folded Rectangle
Intersecting Walls
Proportion

-
- ^ Fig 51 (previous) 48 Spatial Speculations (2019), Exhibit.
 - ^ Fig 52 *Folded Rectangle* (2019), Notebook Sketch.
 - » Fig 53 *Folded Rectangle* (2019), Acrylic on Paper.

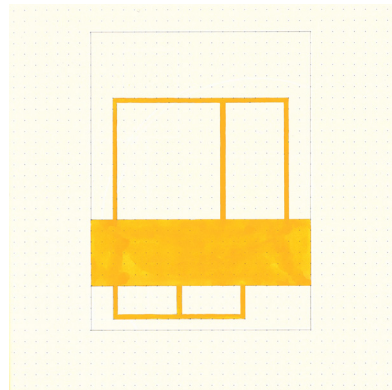




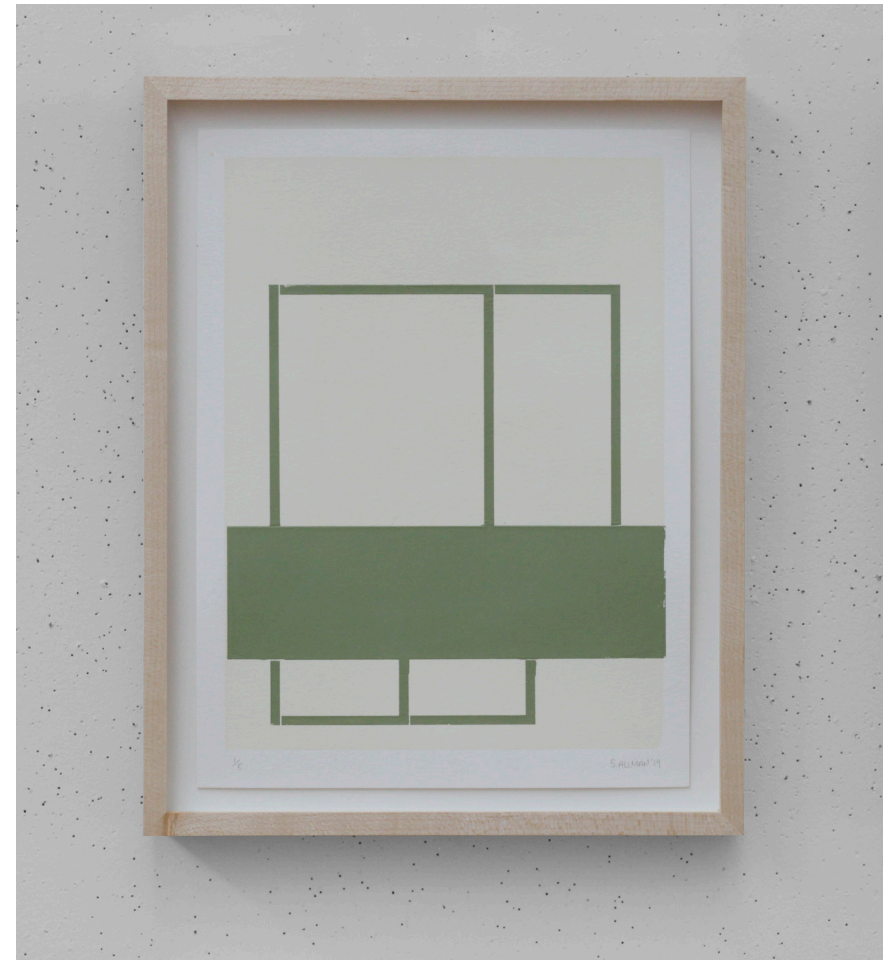
2/48
Rectangle Meets Curve
Rounded Touching Flat
Proportion

^ Fig 54 *Rectangle Meets Curve* (2019), Notebook Sketch.
» Fig 55 *Rectangle Meets Curve* (2019), Acrylic on Paper.

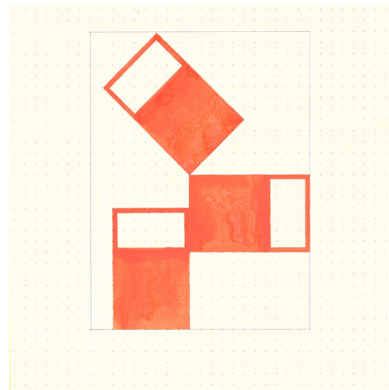




3/48
Five Rectangles
Separate Courtyard
Proportion



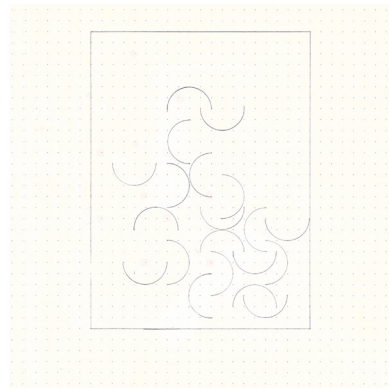
^ Fig 56 *Five Rectangles* (2019), Notebook Sketch.
» Fig 57 *Five Rectangles* (2019), Acrylic on Paper.



4/48
Rotated and Copied Rectangles
Enclosed Space
Movement

^ **Fig 58** *Rotated and Copied Rectangles* (2019), Notebook Sketch.
» **Fig 59** *Rotated and Copied Rectangles* (2019), Acrylic on Paper.

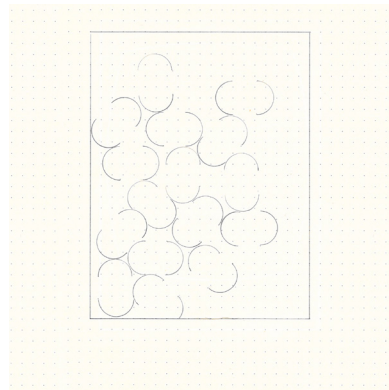




5/48
Rotated Curves
Micro Climate
Movement

[^] Fig 60 Rotated Curves (2019), Notebook Sketch.
[»] Fig 61 Rotated Curves (2019), Acrylic on Paper.

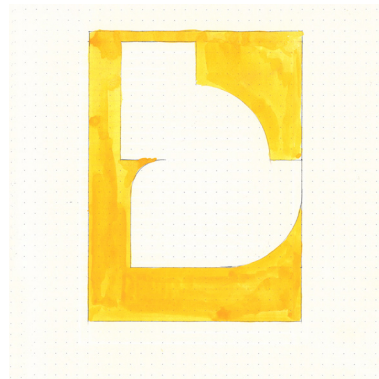




6/48
Faced Curves
Inside and Outside
Balance



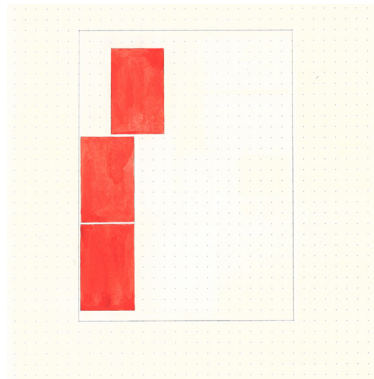
^ **Fig 62** *Faced Curves* (2019), Notebook Sketch.
» **Fig 63** *Faced Curves* (2019), Acrylic on Paper.



7/48
Three Circles, Two Rectangles
Carved Earth
Balance

^ **Fig 64** *Three Circles, Two Rectangles* (2019), Notebook Sketch.
» **Fig 65** *Three Circles, Two Rectangles* (2019), Acrylic on Paper.

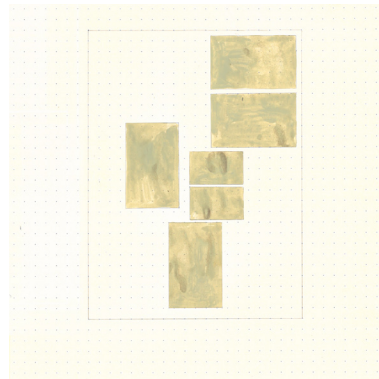




8/48
Three Rectangles
Three Buildings, Open Space
Contrast

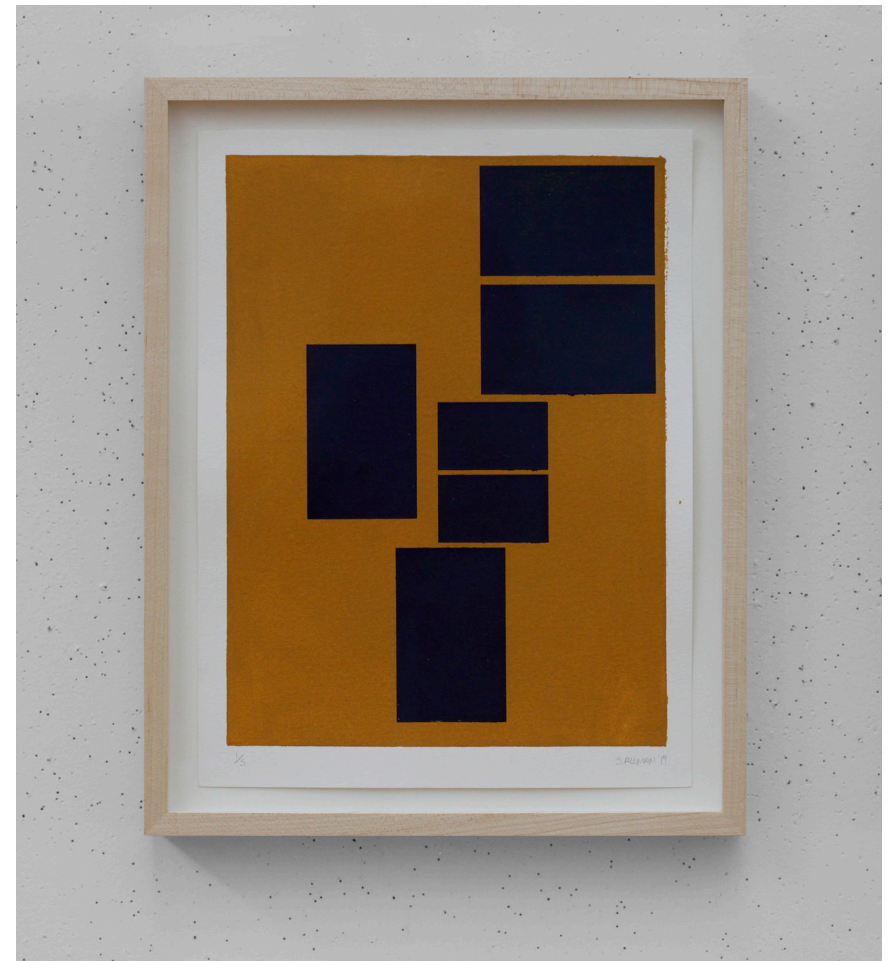
^ Fig 66 *Three Rectangles* (2019), Notebook Sketch.
» Fig 67 *Three Rectangles* (2019), Acrylic on Paper.

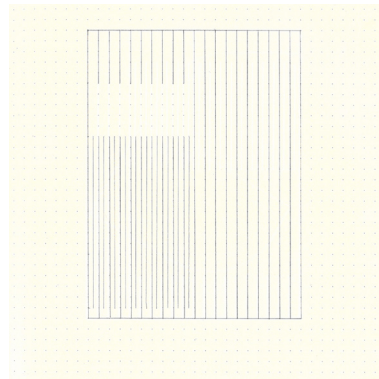




9/48
Six Rectangles
Six Buildings, Open Space
Balance

[^] Fig 68 *Six Rectangles* (2019), Notebook Sketch.
» Fig 69 *Six Rectangles* (2019), Acrylic on Paper.

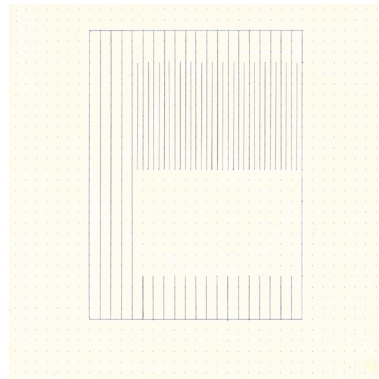




10/48
Translated Lines #1
Courtyard
Proportion

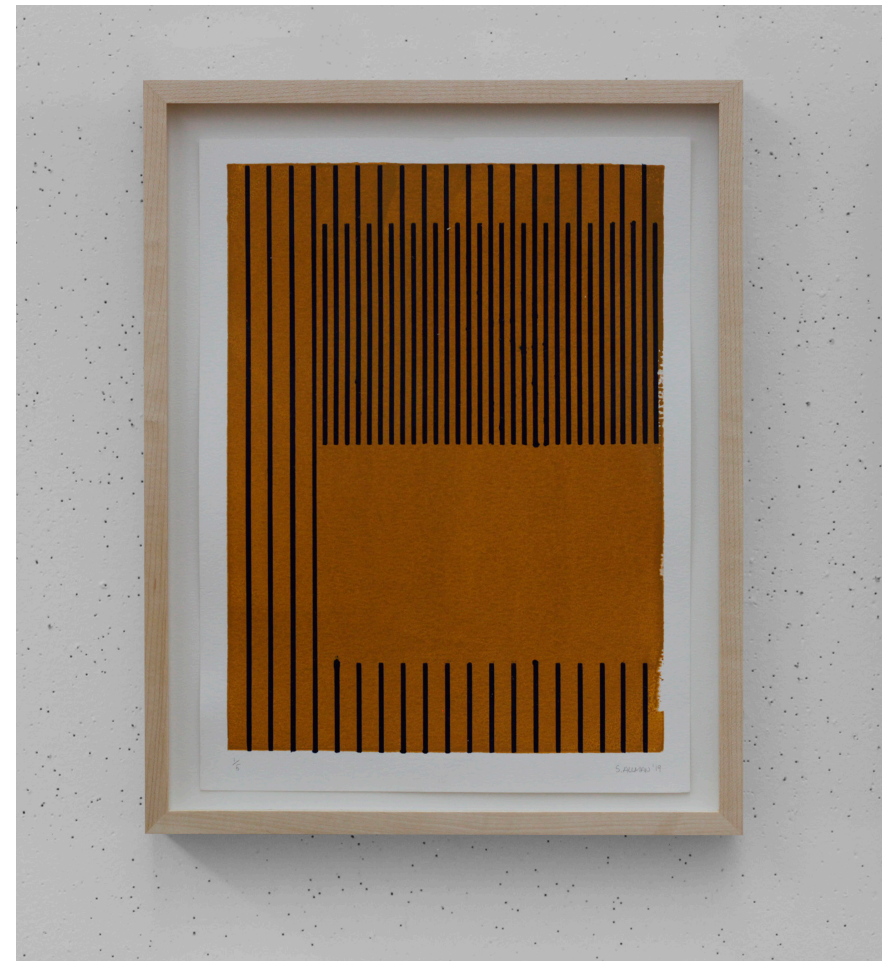


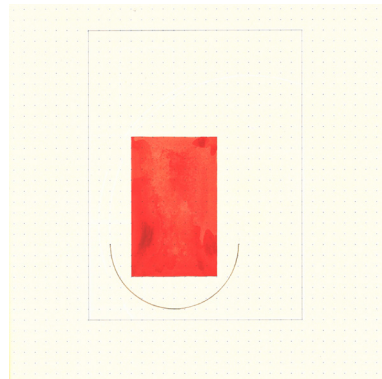
^ **Fig 70** *Translated Lines #1* (2019), Notebook Sketch.
» **Fig 71** *Translated Lines #1* (2019), Acrylic on Paper.



11/48
Translated Lines #2
Courtyard
Proportion

^ **Fig 72** *Translated Lines #2* (2019), Notebook Sketch.
» **Fig 73** *Translated Lines #2* (2019), Acrylic on Paper.

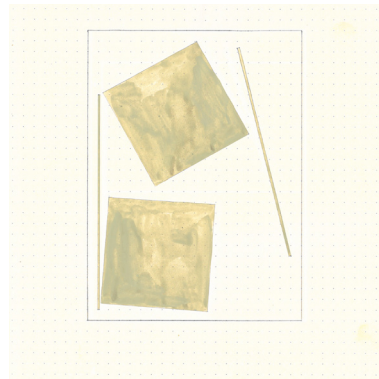




12/48
Circle Swallowed Square
Framed Negative Space
Balance

^ **Fig 74** *Circle Swallowed Square* (2019), Notebook Sketch.
» **Fig 75** *Circle Swallowed Square* (2019), Acrylic on Paper.

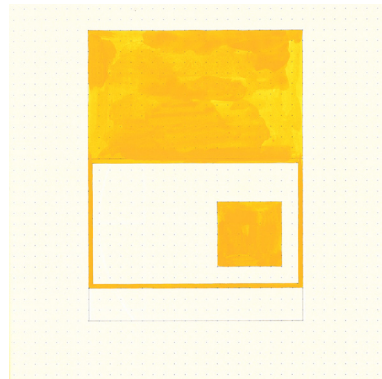




13/48
Line and Rectangle
Wall and Room
Harmony

^ **Fig 76** *Line and Rectangle* (2019), Notebook Sketch.
» **Fig 77** *Line and Rectangle* (2019), Acrylic on Paper.

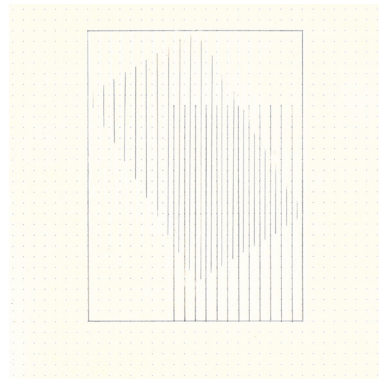




14/48
A Frame and Two Forms
Wall as a Frame
Proportion

^ Fig 78 *A Frame and Two Forms* (2019), Notebook Sketch.
» Fig 79 *A Frame and Two Forms* (2019), Acrylic on Paper.

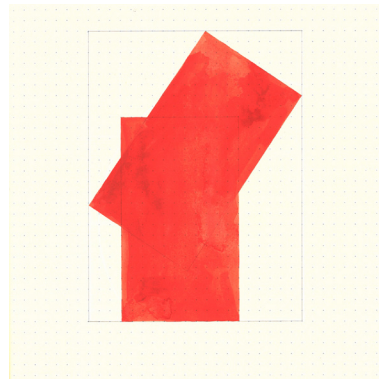




15/48
Two Rectangles
Intersecting Rooms
Harmony

[^] **Fig 80** *Two Rectangles* (2019), Notebook Sketch.
[»] **Fig 81** *Two Rectangles* (2019), Acrylic on Paper.

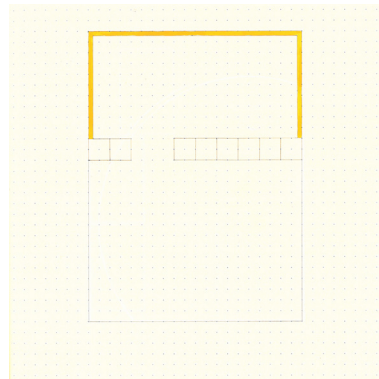




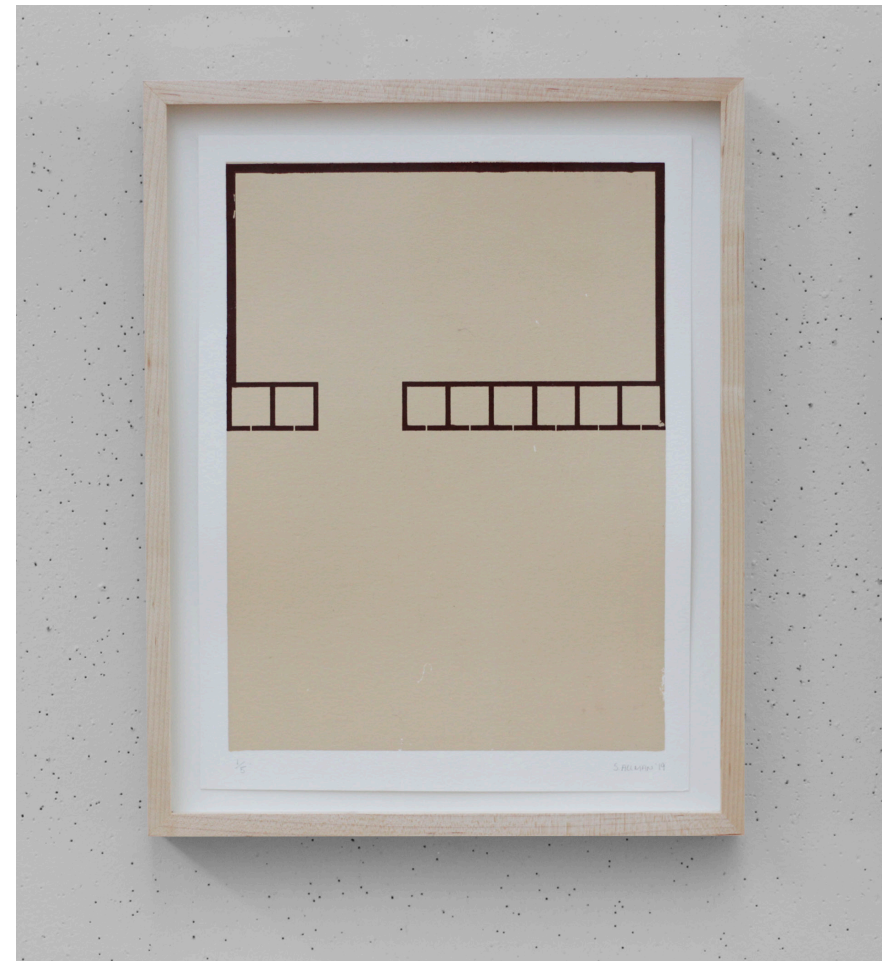
17/48
Two Overlapping Rectangles
Separate Courtyards Around Site Boundary
Proportion



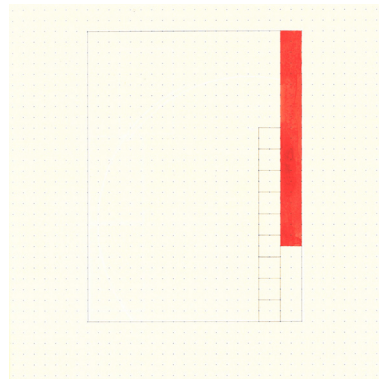
^ **Fig 84** *Two Overlapping Rectangles* (2019), Notebook Sketch.
» **Fig 85** *Two Overlapping Rectangles* (2019), Acrylic on Paper.



18/48
Eight Squares and One Line
Rooms Along A Courtyard
Proportion



^ Fig 86 *Eight Squares and One Line* (2019), Notebook Sketch.
» Fig 87 *Eight Squares and One Line* (2019), Acrylic on Paper.



19/48
Nine Squares and One Rectangle
Rooms Along a Thickened Wall
Balance

[^] Fig 88 *Nine Squares and One Rectangle* (2019), Notebook Sketch.
» Fig 89 *Nine Squares and One Rectangle* (2019), Acrylic on Paper.

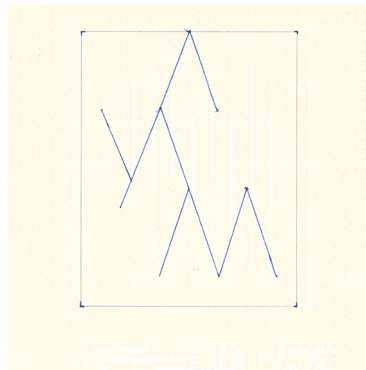




20/48
Eight Squares and a Mass
Rooms Along a Large Room
Contrast

^ Fig 90 *Eight Squares and a Mass* (2019), Notebook Sketch.
» Fig 91 *Eight Squares and a Mass* (2019), Acrylic on Paper.

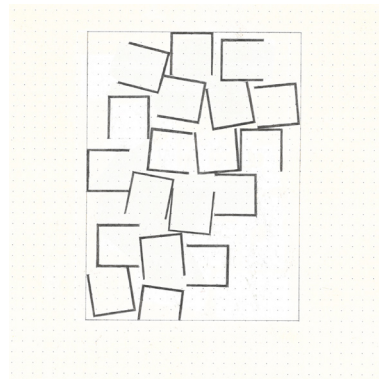




2148
Two Sided Triangles
Sheltered and Not Sheltered
Movement

[^] **Fig 92** *Two Sided Triangles* (2019), Notebook Sketch.
» **Fig 93** *Two Sided Triangles* (2019), Acrylic on Paper.

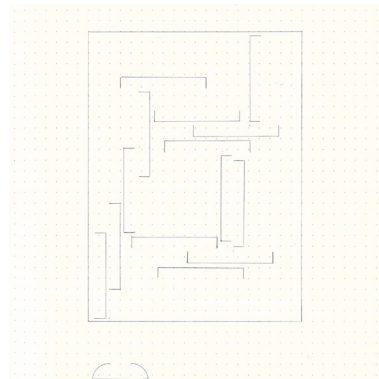




23/48
Nested Squares
Solid and Glazed
Rhythm

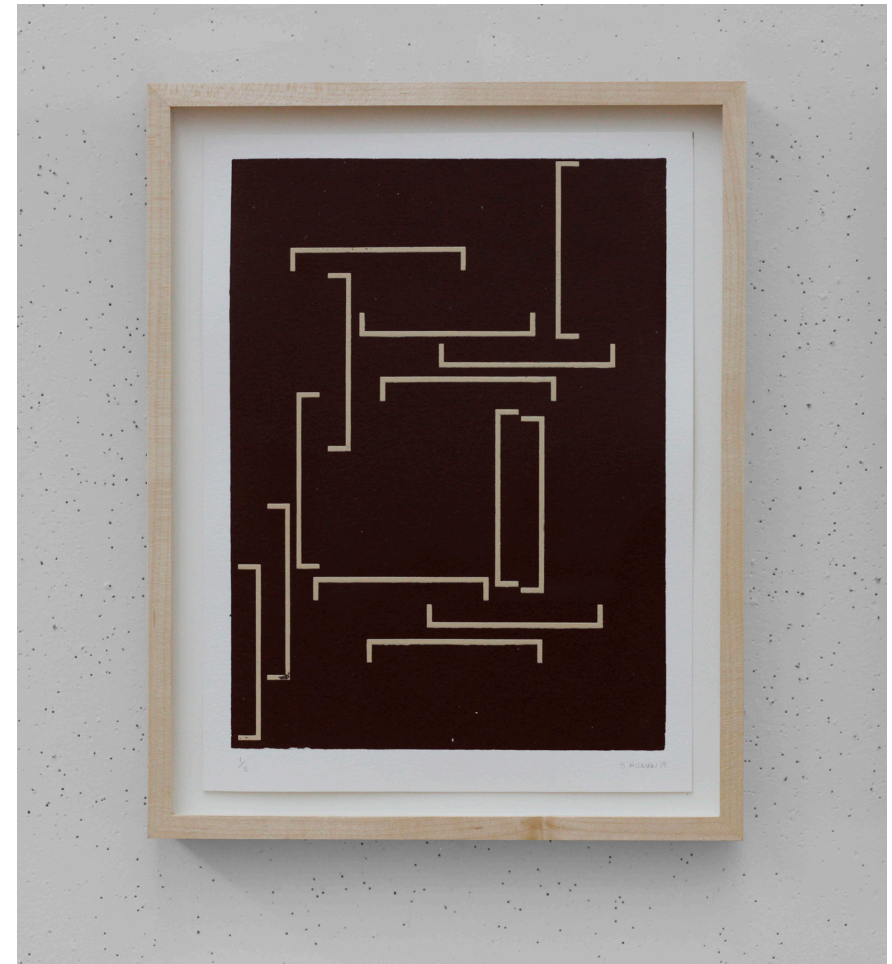
^ Fig 96 *Nested Squares* (2019), Notebook Sketch.
» Fig 97 *Nested Squares* (2019), Acrylic on Paper.

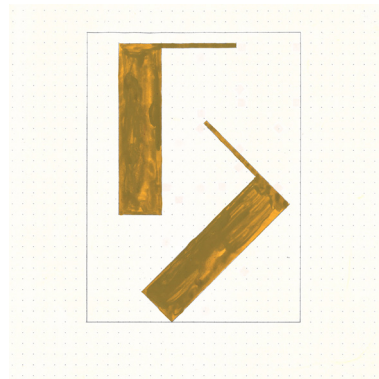




24/48
Repeated, Long and Skinny
Repeated Space
Proportion

^ **Fig 98** *Repeated, Long and Skinny* (2019), Notebook Sketch.
» **Fig 99** *Repeated, Long and Skinny* (2019), Acrylic on Paper.

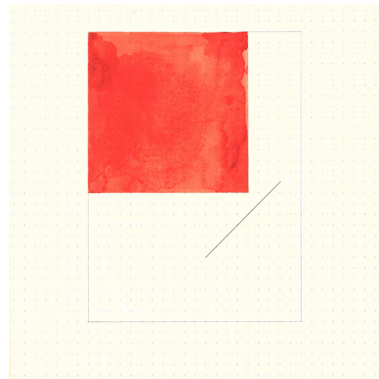




25/48
Two Ls
Courtyard
Proportion

^ **Fig 100** *Two Ls* (2019), Notebook Sketch.
» **Fig 101** *Two Ls* (2019), Acrylic on Paper.

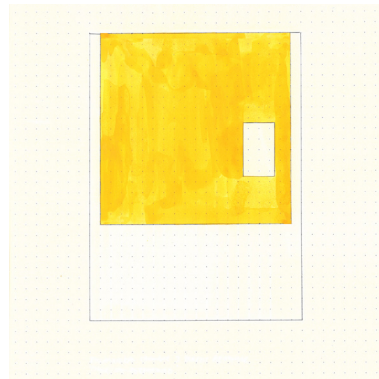




26/48
One Rectangle, One Line
A Vertex Approaching a Line
Movement

^ **Fig 102** *One Rectangle, One Line* (2019), Notebook Sketch.
» **Fig 103** *One Rectangle, One Line* (2019), Acrylic on Paper.

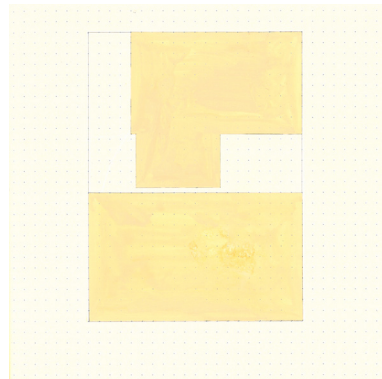




27/48
Square and Small Rectangle
Punctured Courtyard
Contrast

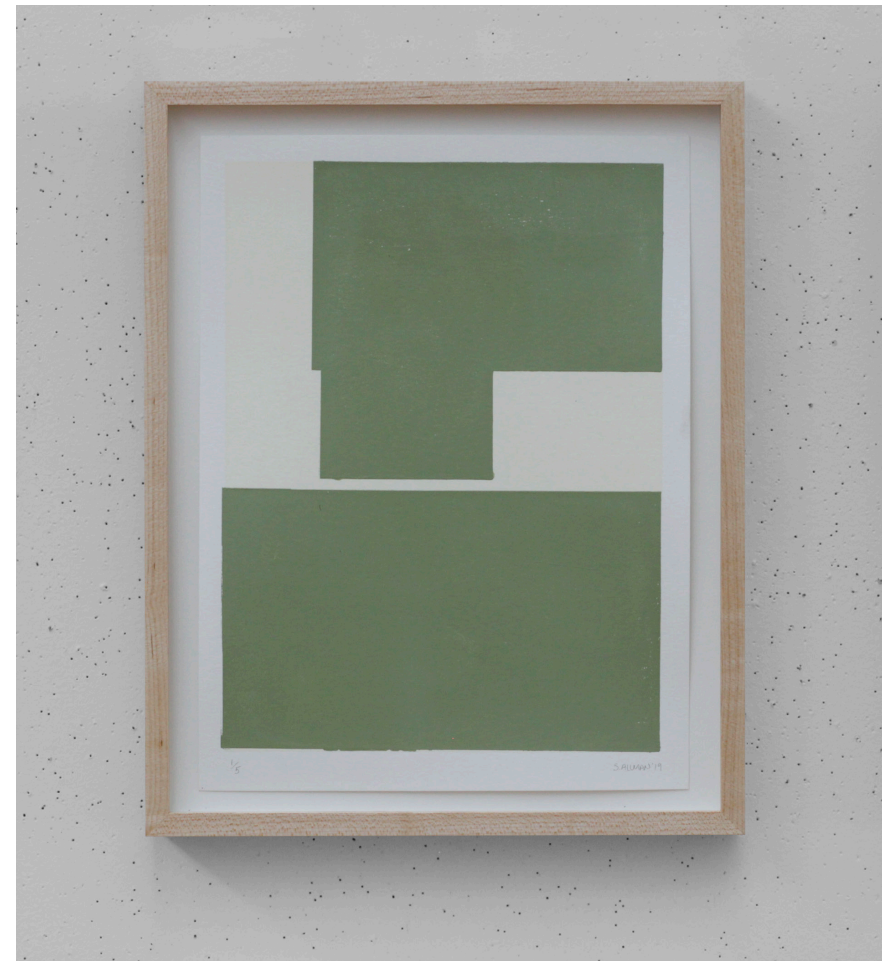
^ Fig 104 *Square and Small Rectangle* (2019), Notebook Sketch.
» Fig 105 *Square and Small Rectangle* (2019), Acrylic on Paper.

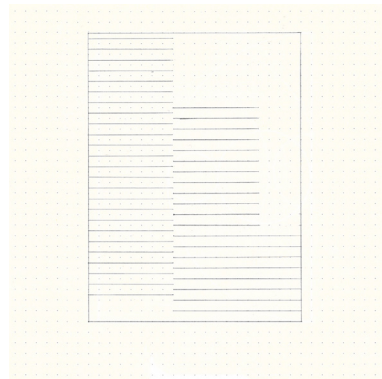




28/48
Three Rectangles
A Mass Separating Space
Movement

^ Fig 106 *Three Rectangle* (2019), Notebook Sketch.
» Fig 107 *Three Rectangle* (2019), Acrylic on Paper.

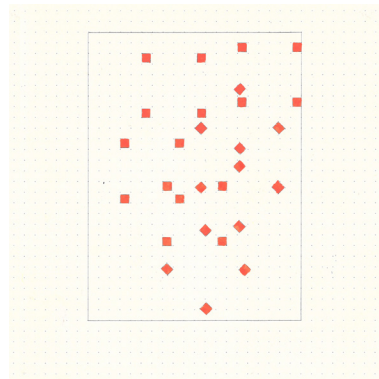




29/48
Offset Lines
Line of Sight
Contrast

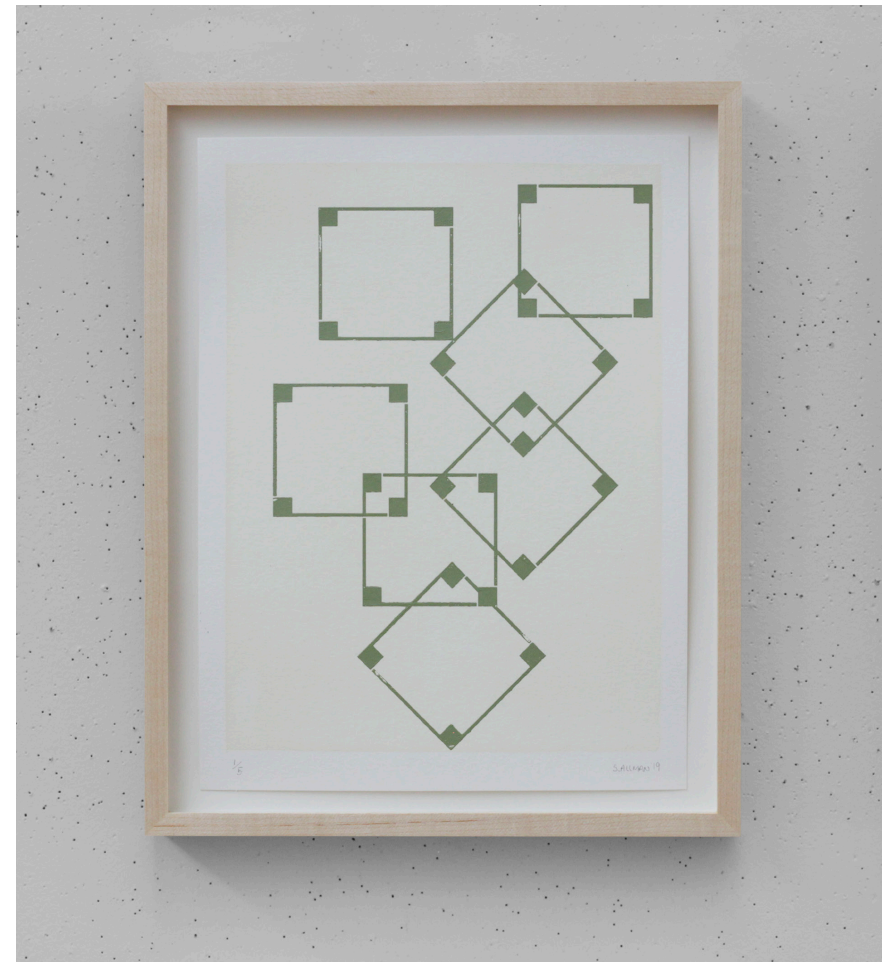
^ Fig 108 *Offset Lines* (2019), Notebook Sketch.
» Fig 109 *Offset Lines* (2019), Acrylic on Paper.

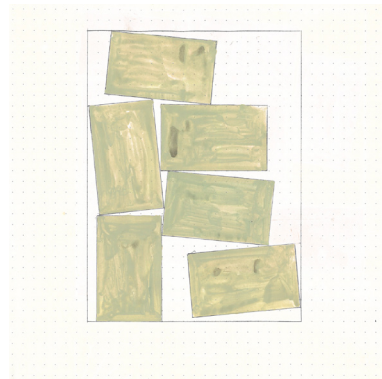




30/48
Sets of Small Squares
Column Grid
Emphasis

^ Fig 110 *Sets of Small Squares* (2019), Notebook Sketch.
» Fig 111 *Sets of Small Squares* (2019), Acrylic on Paper.

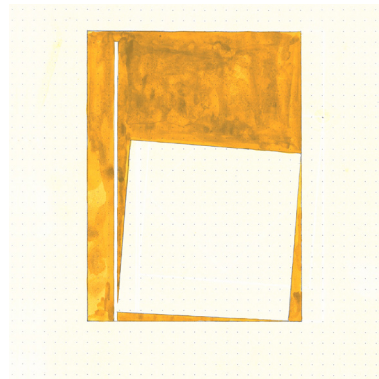




31/48
Tilted Rectangles
Sliver of Light
Movement

^ **Fig 112** *Tilted Rectangles* (2019), Notebook Sketch.
» **Fig 113** *Tilted Rectangles* (2019), Acrylic on Paper.

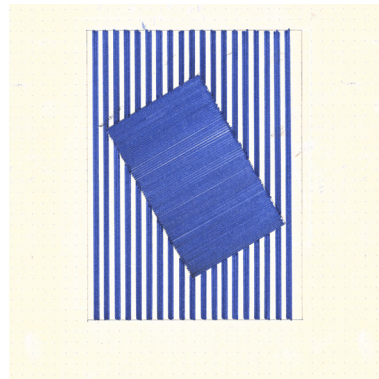




32/48
Line and Rectangle #2
Dark Room
Contrast

^ **Fig 114** *Line and Rectangle #2* (2019), Notebook Sketch.
» **Fig 115** *Line and Rectangle #2* (2019), Acrylic on Paper.

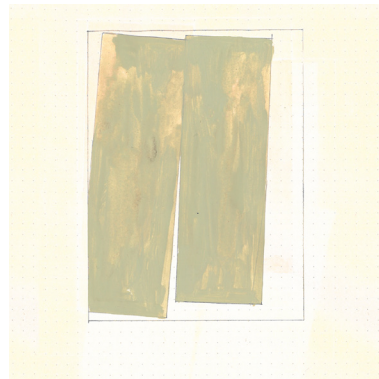




33/48
Rectangle Intersecting Lines
Suspended Room
Harmony

^ **Fig 116** *Rectangle Intersecting Lines* (2019), Notebook Sketch.
» **Fig 117** *Rectangle Intersecting Lines* (2019), Acrylic on Paper.

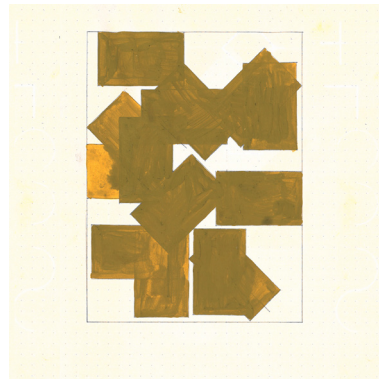




34/48
Two Rectangles
Sliver of Light
Balance

^ **Fig 118** *Two Rectangles* (2019), Notebook Sketch.
» **Fig 119** *Two Rectangles* (2019), Acrylic on Paper.

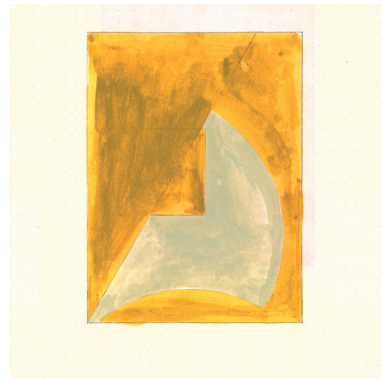




35/48
Fourteen Rotated Rectangles
Aggregate Roof
Movement

^ **Fig 120** *Fourteen Rotated Rectangles* (2019), Notebook Sketch.
» **Fig 121** *Fourteen Rotated Rectangles* (2019), Acrylic on Paper.

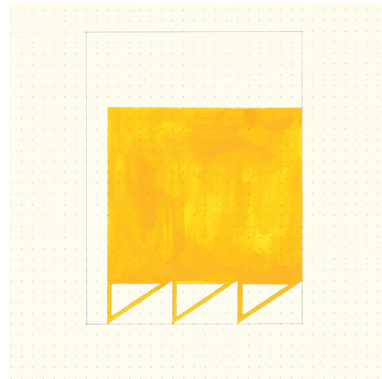




36/48
One Triangle, Two Curves, One Square.
Carved Earth
Emphasis

^ **Fig 122** *One Triangle, Two Curves, One Square* (2019), Notebook Sketch.
» **Fig 123** *One Triangle, Two Curves, One Square* (2019), Acrylic on Paper.

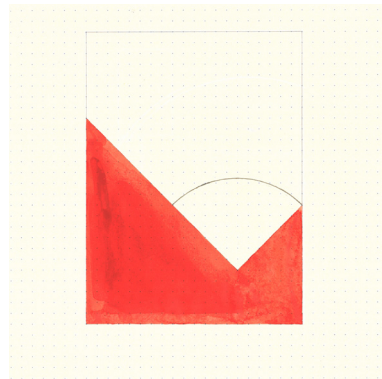




37/48
 Three Triangles, One Rectangle
 Pointed Space
 Contrast



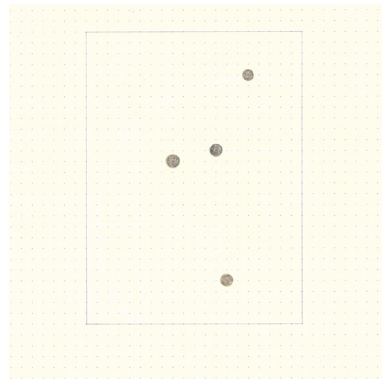
^ **Fig 124** *Three Triangles, One Rectangle* (2019), Notebook Sketch.
 » **Fig 125** *Three Triangles, One Rectangle* (2019), Acrylic on Paper.



38/48
Two Triangles, One Curve
A Curved Courtyard
Harmony

^ **Fig 126** *Two Triangles, One Curve* (2019), Notebook Sketch.
» **Fig 127** *Two Triangles, One Curve* (2019), Acrylic on Paper.

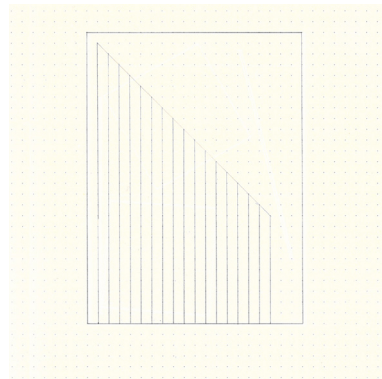




39/48
Four Circles
Large Columns in a Large Space
Rhythm

^ Fig 128 *Four Circles* (2019), Notebook Sketch.
» Fig 129 *Four Circles* (2019), Acrylic on Paper.

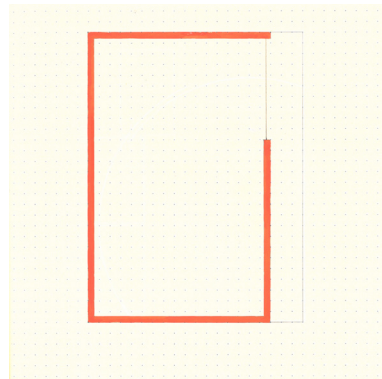




40/48
Triangle and Rectangle
Solid and Perforated
Balance

^ Fig 130 *Triangle and Rectangle* (2019), Notebook Sketch.
» Fig 131 *Triangle and Rectangle* (2019), Acrylic on Paper.

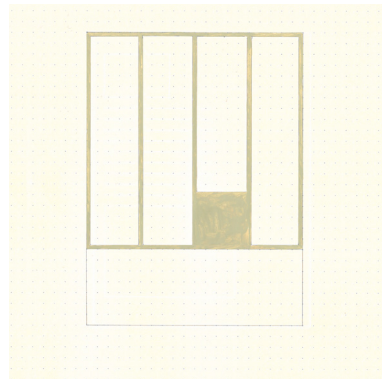




41/48
Almost One Rectangle
Curated Light
Proportion

^ **Fig 132** *Almost One Rectangle* (2019), Notebook Sketch.
» **Fig 133** *Almost One Rectangle* (2019), Acrylic on Paper.

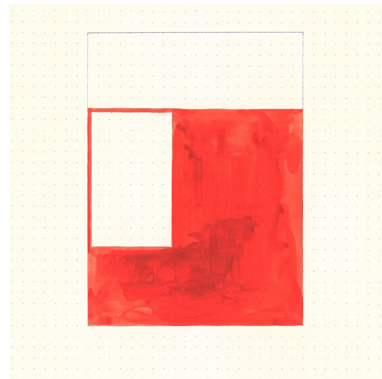




42/48
 Four Frames, One Square
 Multiple Courtyards, One Room
 Balance

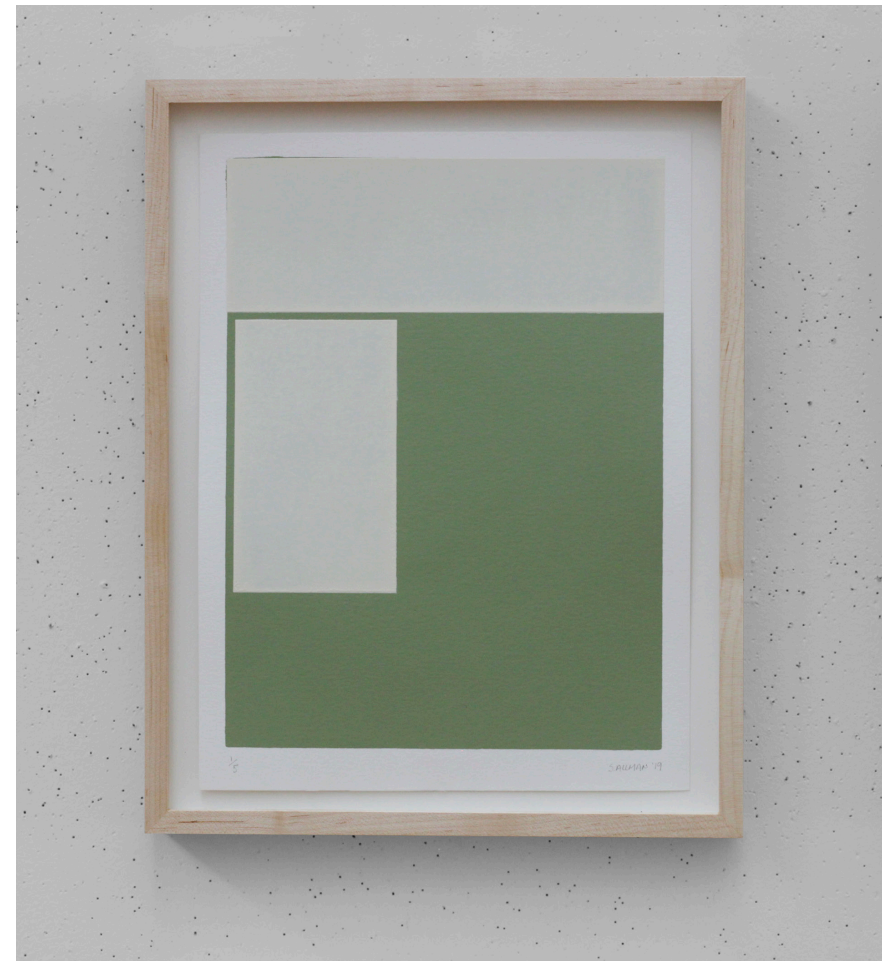


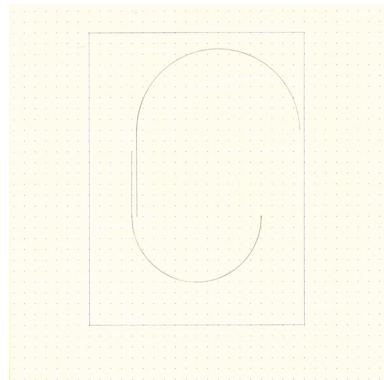
^ Fig 134 *Four Frames, One Square* (2019), Notebook Sketch.
 » Fig 135 *Four Frames, One Square* (2019), Acrylic on Paper.



43/48
A Rectangle Inside A Square
Enclosed Space and a Courtyard
Proportion

- ^ **Fig 136** *A Rectangle Inside A Square* (2019), Notebook Sketch.
» **Fig 137** *A Rectangle Inside A Square* (2019), Acrylic on Paper.

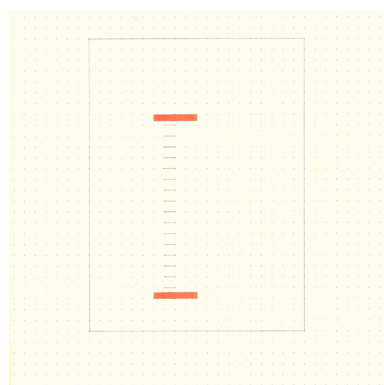




44/48
Two Lines with Curves
Enclosed Space, Circulation
Movement

^ **Fig 138** *Two Lines with Curves* (2019), Notebook Sketch.
» **Fig 139** *Two Lines with Curves* (2019), Acrylic on Paper.

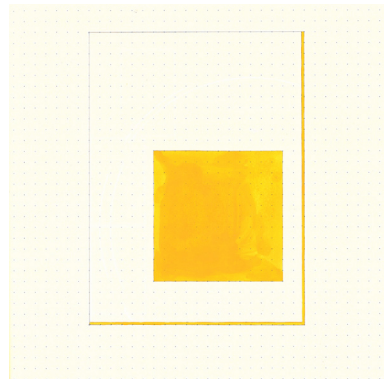




45/48
Two Rectangles, Sixteen Lines
Thin Elements Within Thick Ends
Rhythm

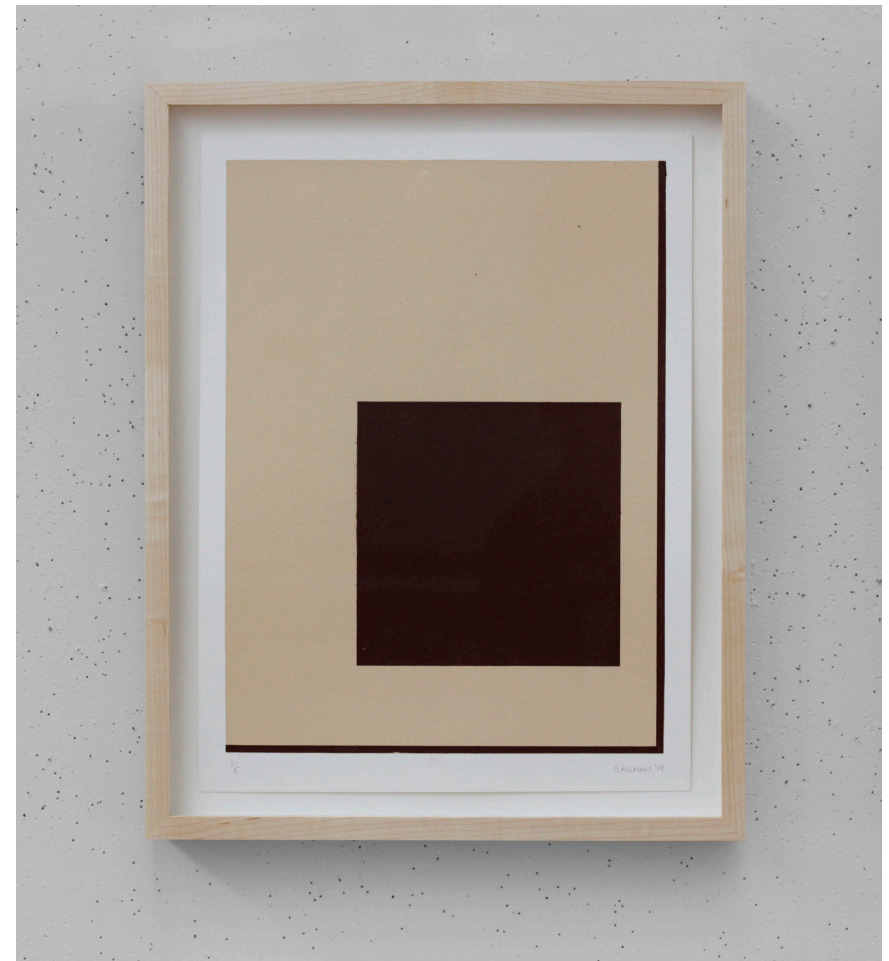


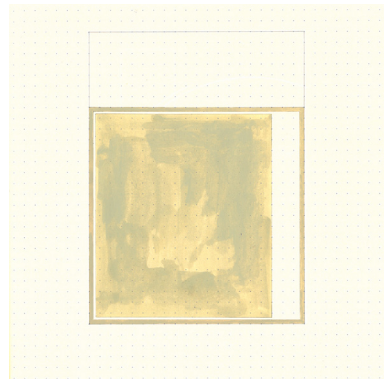
^ Fig 140 *Two Rectangles, Sixteen Lines* (2019), Notebook Sketch.
» Fig 141 *Two Rectangles, Sixteen Lines* (2019), Acrylic on Paper.



46/48
Two Lines and a Square
Activated Area Between Wall and Room
Movement

^ **Fig 142** *Two Lines and a Square* (2019), Notebook Sketch.
» **Fig 143** *Two Lines and a Square* (2019), Acrylic on Paper.

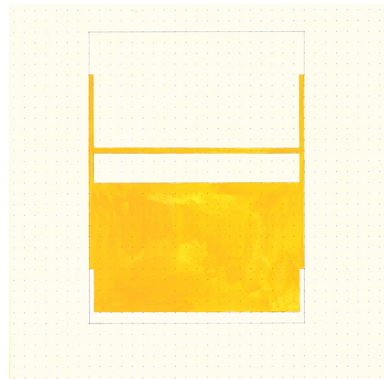




47/48
Framed Rectangle
Density With a Reveal
Harmony

^ **Fig 144** *Framed Rectangle* (2019), Notebook Sketch.
» **Fig 145** *Framed Rectangle* (2019), Acrylic on Paper.

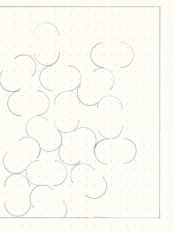
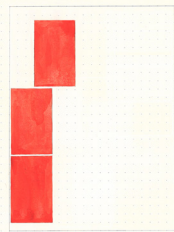
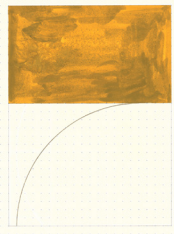
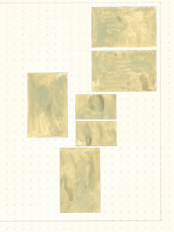
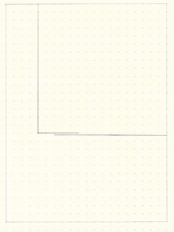
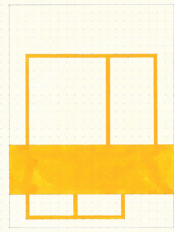
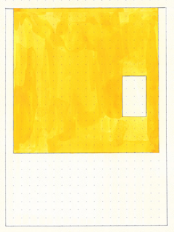
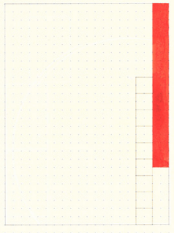
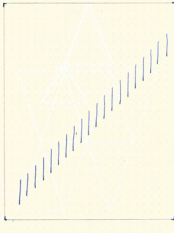
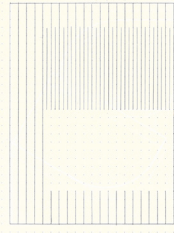
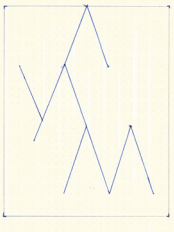
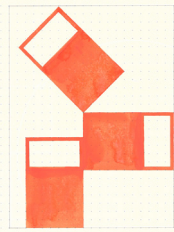
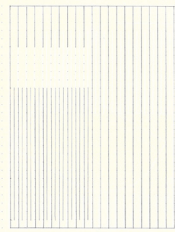
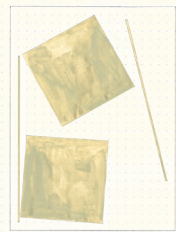
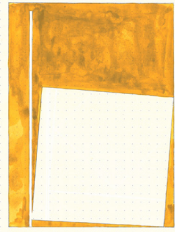
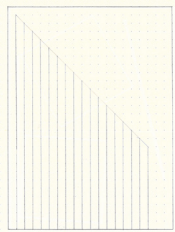
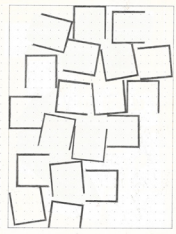
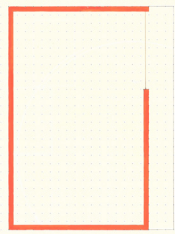
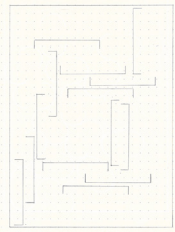
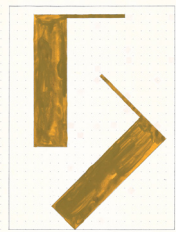
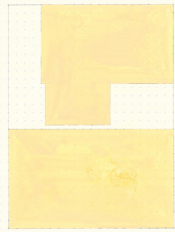
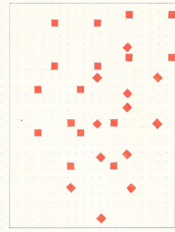
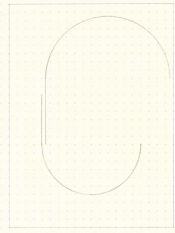
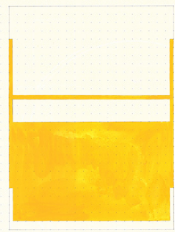




48/48
 Three Lines, One Rectangle
 A Variety of Framed Space
 Harmony



^ **Fig 146** *Three Lines, One Rectangle* (2019), Notebook Sketch.
 » **Fig 147** *Three Lines, One Rectangle* (2019), Acrylic on Paper.



THE EXERCISE

A set of guidelines frames the creative process of *48 Spatial Speculations*.

Within a 4:3, portrait orientation rectangle, investigate the potential combination of the curved and straight line, the square, the rectangle, the circle and the triangle. Only these shapes and the combination of these shapes are permitted to be used. The spatial concept has two qualities of space on the page: positive and negative. Two colours will to be used indicate this. Ideas present within the compositional themes of movement, rhythm, proportion, harmony, contrast, balance and emphasis will help guide the size, shape and placement of the elements on the page.

Fig 148 (previous) *48 Spatial Speculations* (2019),
Process Sketches.

Gilles Deleuze and Felix Guattari discuss the bloc of sensation preserved in painting in *What is Philosophy* (1994), chapter seven *Percept, Affect and Concept*. Specifically within abstract art, they describe sensation as the summoning of forces: gravity, heaviness, rotation, the vortex, explosion, expansion, germination and time.³² These sensations are not representational, but instead exist as “vision through thought”. *48 Spatial Speculations* becomes a search to find sensation within architectural drawing; to discover and understand these forces. How can two shapes create a sense of enclosure without touching? How does a curved line touch a flat line? What spatial affect occurs between a shape and its repeated and translated outline? How tight does the space around the small mass get in relation to a larger, framing mass? How big is it?

48 Spatial Speculations are series of compositional studies that work through these sensual problems through drawing. The set of basic elements: the line, curve, rectangle, circle and point are manipulated: rotated, translated, reflected to create delicate and refined spatial force.

These studies achieve two things. The first lies within the experience of the exercise. The creative process for *48 Spatial Speculations*, equips the designer with an arsenal of spatial opportunity for future architectural work. The directed drawing process gives the designer an appreciation for simple spacing, a general plan for the distribution of figures and ways of putting lines and space together. The designer better understands the forces present with abstract painting. This understanding acts as a tool

³² Deleuze, Gilles and Guattari, Felix. *What is Philosophy? Centuries*. Columbia University Press, 1994, p. 182.

for sensation. Through this arsenal decisions can be made. One can critically decide the point at which to break the wall at two meters to create space for a window, the position of a building in relation to another, the placement of a building within the border of a site.

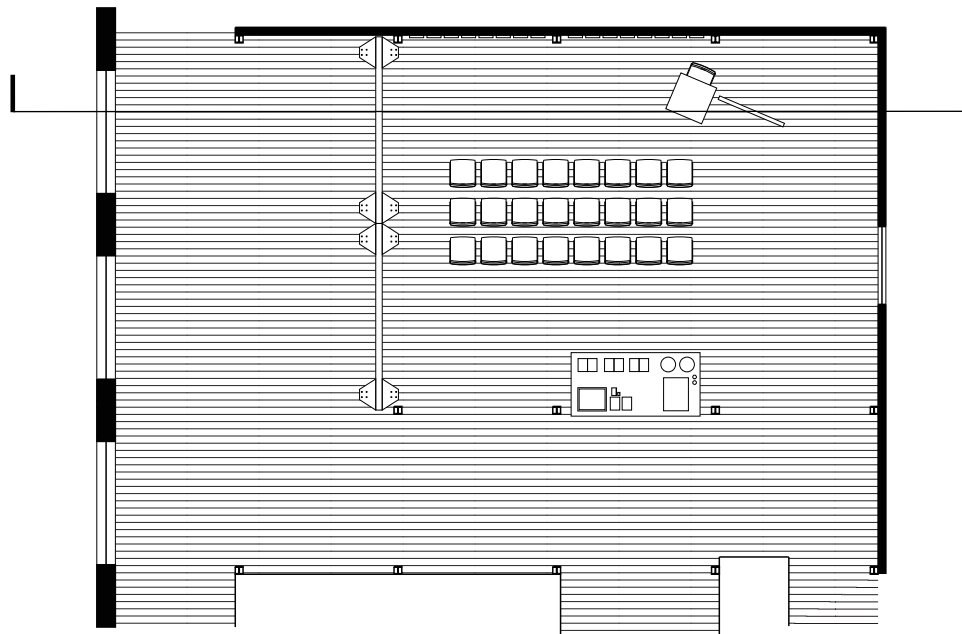
The second facet of the *48 Spatial Speculations* lies within its observation by the patron, specifically the architect. The exercise is completed 48 times to create *48 Spatial Speculations*. As the patron observes, there is reflexivity. Through observation, the viewer projects their own meaning onto the work, and the compositional exercise is iterated to mean something else. As the curved line negotiates its placement on the page with the rectangle, the spatial thinker interprets it to resemble a study of the vertex of a room approaching a curved wall in plan or the leg of a chair approaching a seat, or the detail of grout on a paving stone.

Specific to *48 Spatial Speculations*, these abstract works have a spatial scaffolding embedded within the creative process. As each study was iterated, a spatial reflexive exchange occurred between myself and the lines and shapes as their composition developed. *48 Spatial Speculations* offers a reflexive process, by the architect, for the architect. In a way, the work is inherently spatial before the reflexive exchange occurs with the viewer.



THE EXHIBIT

48 Spatial Speculations, provides a platform for this observation and reflexivity to occur. The drawings are created in a notebook and require a method to increase their size and display them in a public setting. The process of silk-screening becomes a way to display the spatial speculations for an audience. The initial compositional studies in the notebook gain a viewer.



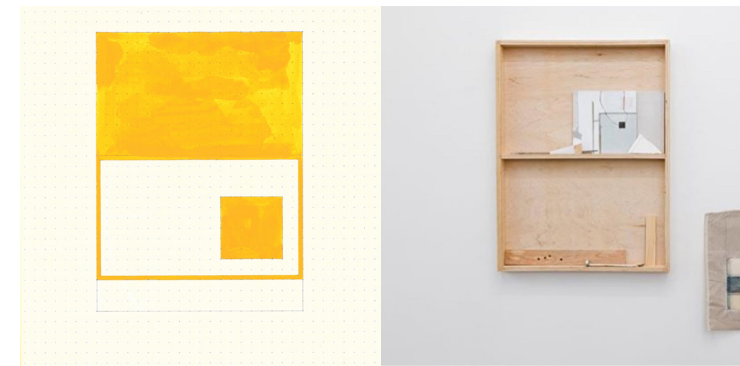
« Fig 149 *48 Spatial Speculations*: Exhibition Layout, Section, Floor plan, 1:200.

1. A spatial concept.

Inspiration for the spatial concepts occurs in daily life, from objects in the real world. Many photographs are taken on my mobile phone, which for two years has been full of paving stones, fruit and industrial objects to inspire compositions

» **Fig 150** *A Frame and Two Forms* (2019).

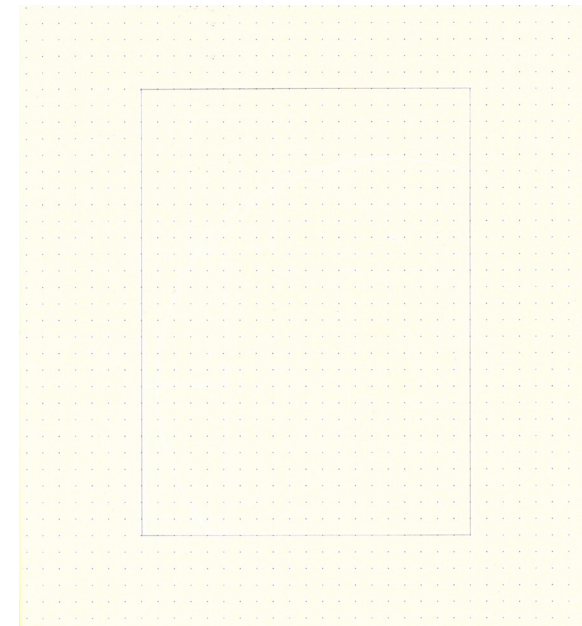
» **Fig 151** Image of a everyday object: the bookshelf
Image used for *A Frame and Two Forms* (2019).



2. The idea is placed on the page.

The dot grid notebook is opened and the 10cm by 13.5cm rectangle is drawn. There is hesitation to draw the first line. Sometimes there is a staredown with the bordered rectangle that lasts for 5 minutes until the placement of the shape within the context of the border is decided.

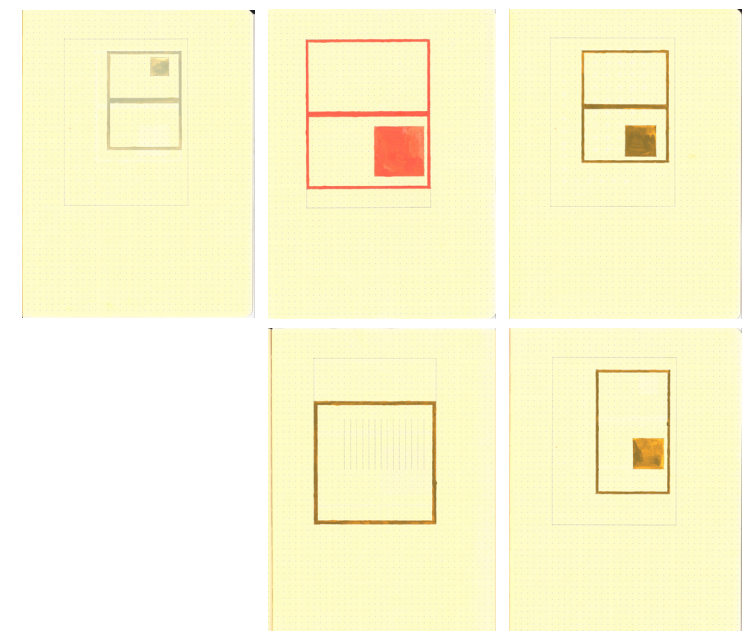
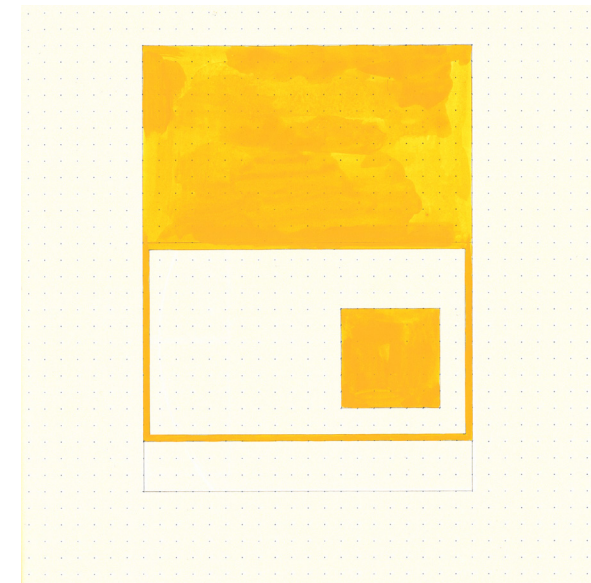
» **Fig 152** 10cmx13.5cm border drawn in notebook.



2.1 Border

The graphic context is contained within a boundary line, which possesses strong perceptual similarity to the limit of a site line. The placement of the elements within the border condition are carefully considered, specifically the way lines and planes approach the bounding rectangle. The line may be embedded on a boundary line, or it may be discrete. Forms lying near the boundary present an intense tension with the bounding line, while those lying about the center interact less with the boundary and augment stability within themselves.

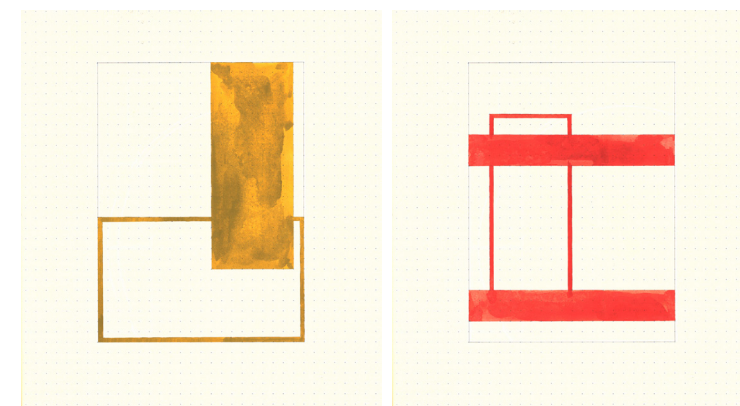
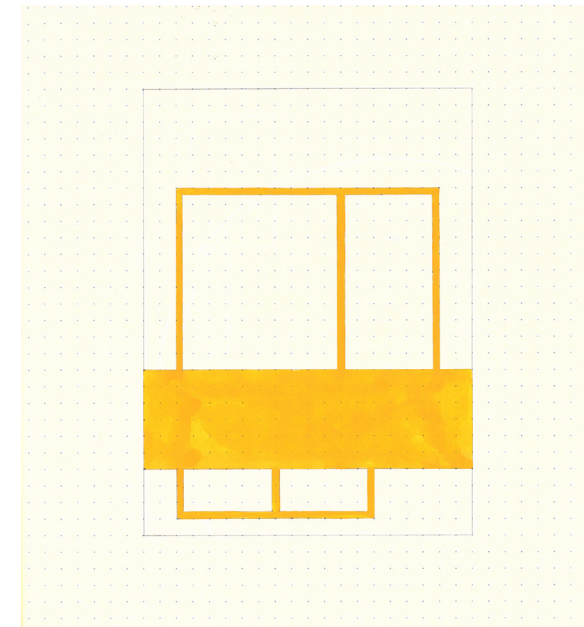
» **Fig 153** *A Frame and Two Forms* (2019), A series of iterations that work through composition in relation to its border.



3. Iteration

In some instances the spatial concept is considered finished after the first iteration. In other instances translation is required to achieve a desired relationship.

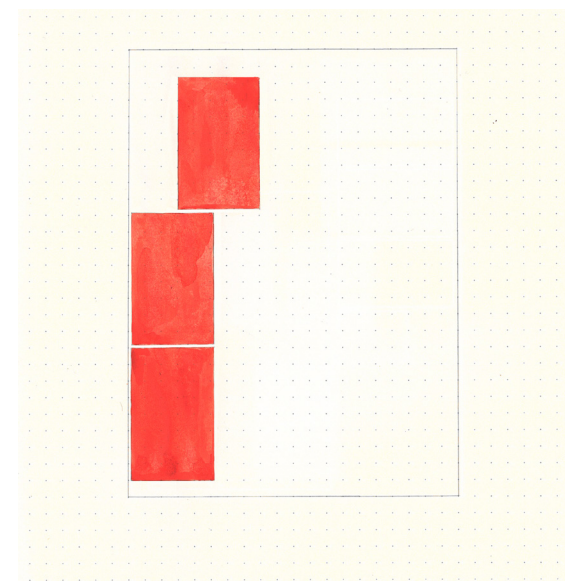
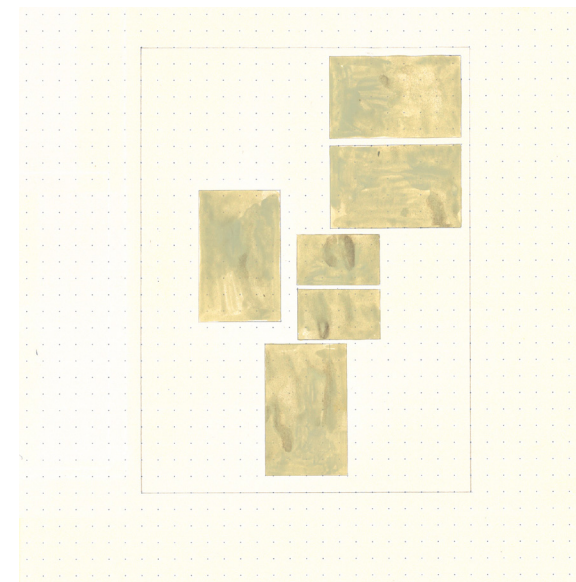
» Fig 154 *Five Rectangles* (2019), A series of iterations.



3.1 Translation

The dot grid notebook carries an inherent language throughout the work. As forms are translated slightly through iteration, the dots act as a framework for this translation. As a result, the spacing and size of shapes carry consistent 0.5cm interval. Shapes may be discrete, may lie side by side, or overlap. The relation between their parts may be: no contact, contact or contact in point.

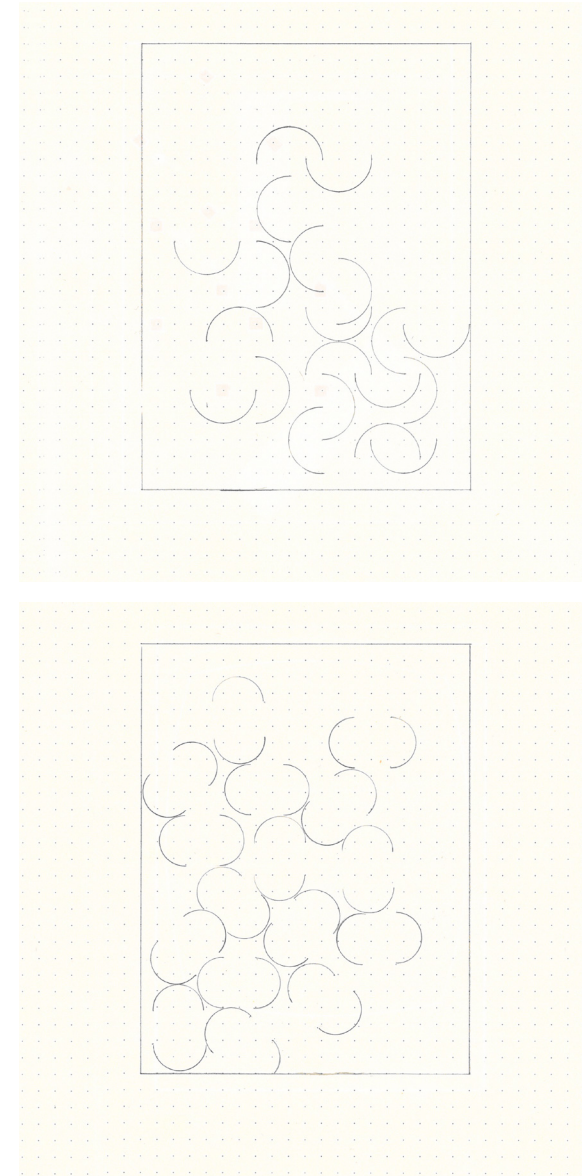
-
- » Fig 155 *Six Rectangles* (2019).
 - » Fig 156 *Three Rectangles* (2019).



3.2 Translation

In some instances, concepts appear to be frozen through a period of translation. The drawing process of *Rotated Curves* and *Faced Curves* develops as an aggregate process. One curved line is placed on the page and the next is placed in relation to this first curve. These are both concepts that had one iteration, but could have many more.

-
- » Fig 157 *Rotated Curves* (2019).
 - » Fig 158 *Faced Curves* (2019).



4. Painted with gauche.

The work is considered finished when nothing can be added or subtracted and the placement should not be shifted upwards or downwards. At this point, one portion of the dots in the notebook is covered over with gauche to develop some indication of what will recede and what will come forward within the colour scheme.

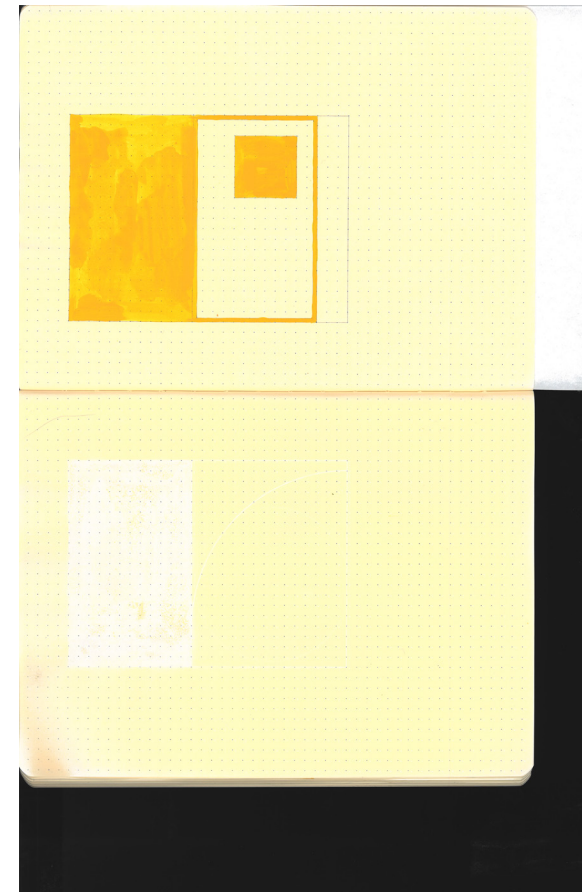
» **Fig 159** Gauche paints, compass, pencil, eraser, ruler, notebook and tea at home studio.



5. Scanned

The notebook sketches are scanned and traced in Autocad to prepare them to be laser cut into stencils.

» Fig 160 A scanned notebook page.





6. Stencil is cut.

The stencil is cut out of translucent, durable paper using the laser cutter.

» Fig 161 A cut stencil.

7. Blanks are pulled.

The spatial concepts are two colours. The first colour, or the background, is pulled over the entire surface of the water colour paper. The appropriate areas of the screen are blocked out using durable tape and plastic sheets. The blank prints are left with a 0.5" border around the edge of the watercolour paper. They are left to dry for three days.

» Fig 162 A series of background blank prints drying.



8. The second colour is applied.

The second colour of the pair is applied using the cut stencil. The stencil is positioned on the coloured blank. A test pull is made on scrap cartridge paper. This adheres the stencil to the mesh of the screen. The finished prints are left to dry for three days.

» **Fig 163** Positioning a stencil to pull the second colour.



8.1 Figure Ground

It took a month to decide the six colours, the three pairs, for the screen prints: Unbleached Titanium White, Burnt Sienna, Napelsgeel Light, Light Green, Yellow Ochre and Phthalocyanine Blue.

Within this colour set, certain colours recede to become the background and other come forwards to the foreground. What is the figure and what is the ground? Warm colours tend to come forward into the foreground while cool colours tend to recede into the background. Dark colours tend to become the figure while light colours become the ground. Colour affects how the spatial concept is perceived architecturally. Positive and negative spaces change what is read as solids and voids, or shadows and light.

Within *Carved Earth*, the decision to make one portion unbleached titanium and one portion burnt sienna, affects what is read as figure and what is read as the ground. This affects how the painting is read spatially. In the first instance, shape is painted as burnt sienna and the background is left as unbleached titanium. This causes the spatial concept to be read as a curved shape existing in the positive space, a building floating on the ground. In the second instance, the opposite is painted. The space between the shape and the border is read as the positive space while the curved shape reads as the negative. Spatially, in a personal reflexive reading, the curved shape reads as a portion of the earth that is removed.



» Fig 164 The pin-up wall at home studio.

9. Prints are flattened.

The prints are warped once they finish drying. The back of the prints are re-wet and set between two sheets of watercolour paper. A large stack of thick architecture texts are placed on top. At this point, one becomes quite fond of their perpetual book buying habit

» **Fig 165** Piles of books, stacked on re-wet prints to flatten.





10. Trimmed, signed, mounted.

The prints are trimmed, signed and mounted to acid free mill board using archival hinges. The glass is put in place, millboard spacers and print along with the foam core are slotted. The frames are screwed shut.

» **Fig 166** Framing supplies: maple frames, UV glass, acid free millboard, foam core, archival hinges, finished prints, exacto knife, cutting mat, pencil, rulers, alumni cutter, two friends, three americanos.



ON THE PERSISTENCE OF MODERNISM

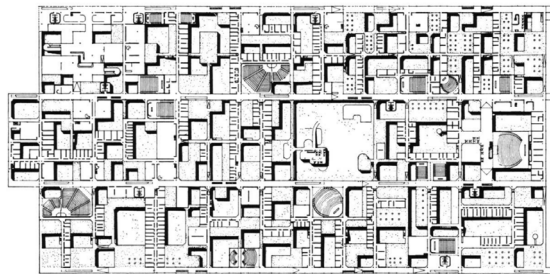
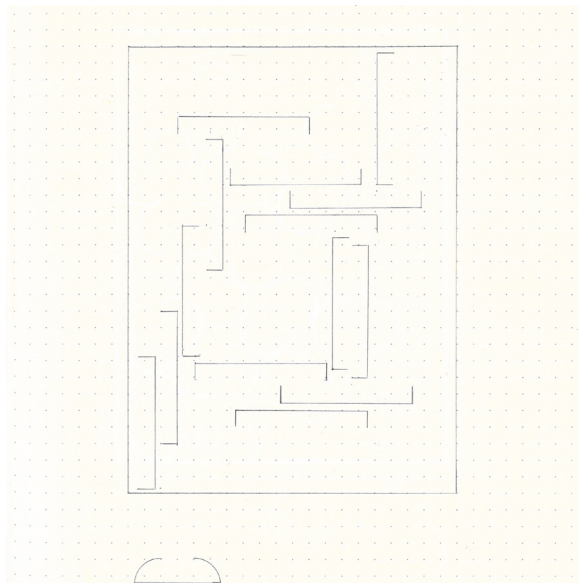
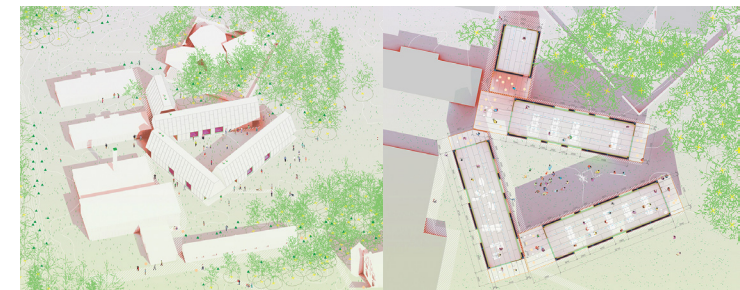
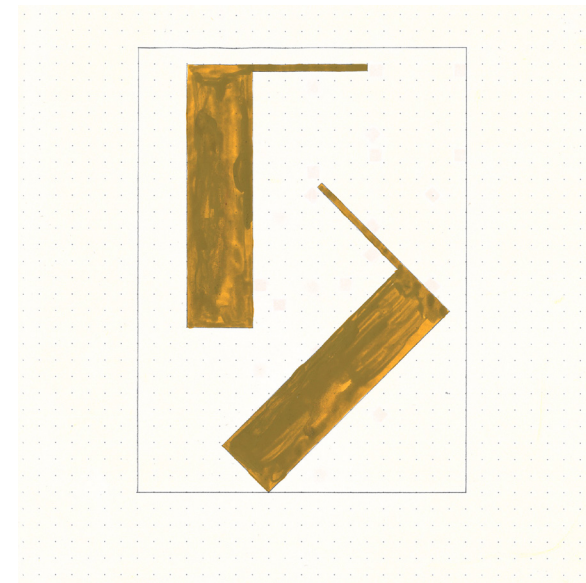
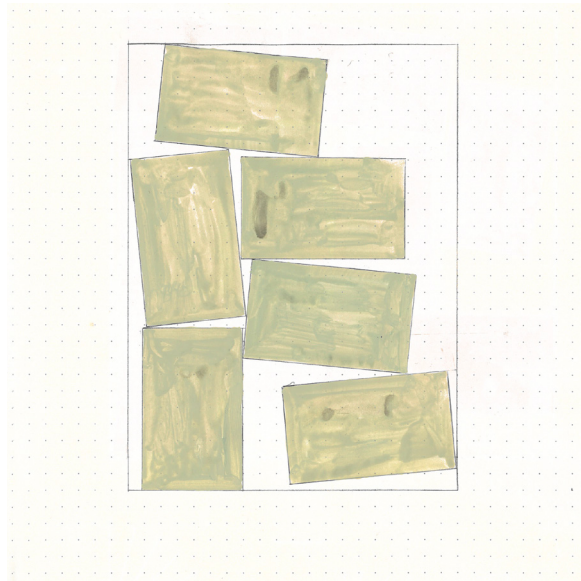


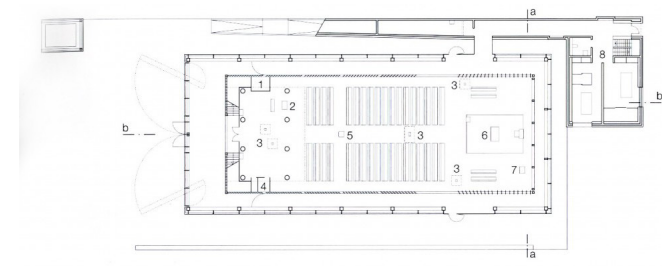
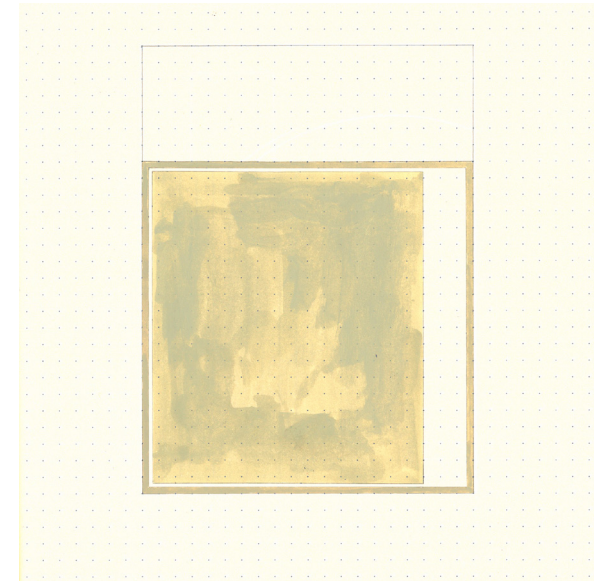
Fig 167 (previous) A finished print drying.
 Fig 168 (previous) The home studio.
 ^ Fig 169 *Repeated, Long and Skinny* (2018).
 ^ Fig 170 George Candilis, Alexis Josic, Shadrach Woods, Berlin Freie Universitat (1963).



^ Fig 171 *Two Ls* (2018).
 ^ Fig 172 MOS Architects, Krabbesholm Højskole (2012).

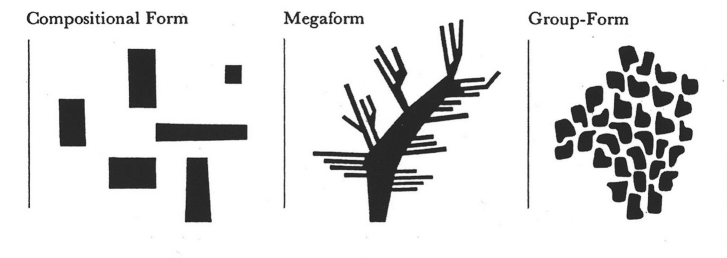


[^] **Fig 173** *Tiled Rectangles* (2019).
[^] **Fig 174** Peter Zumthor, *Therme Vals* process sketch and detail photograph (1996).



[^] **Fig 175** *Framed Rectangle* (2019).
[^] **Fig 176** Allmann Sattler Wappner, *Church of the Sacred Heart* (2000).

With time, the static, formal, geometric method for architectural composition, within Modernism and the teachings of the Bauhaus is eventually contested by the architectural community and switched for new ideals as time progressed. The shift to new compositional methods is slow, but becomes most clear as the ideals for megaform architecture become fashionable as a method for architectural form finding during the 1950s and 1960s. Among the architects aligned within this spatial thinking are Peter and Alison Smithson. They become advocates for the rejection of composition entirely, championing painters such as Jackson Pollock and the term anti-composition.³³ As architecture progresses through the later portion of the twentieth century, through Deconstructivism and Post-Modernism, prominent architects such as Rem Koolhaas equally distance themselves from the idea of composition within architecture, using different theoretical methodologies for architectural form finding.³⁴



³³ Lucan, Jacques. *Composition, Non-Composition: Architecture and Theory in the Nineteenth and Twentieth Centuries*. EPFL Press, 2012, p. 467.

³⁴ Ibid, p. 544..

» **Fig 177** Fumihiko Maki and Masato Ohtaka, "Collective Form, Three Paradigms", *Structure in Art and Science* (1965).

“Composition is the sole definition of art. Composition is aesthetic and what is not composed is not a work of art. However, technical composition, the work of a material that often calls on science (mathematics, physics, chemistry, anatomy) is not to be confused with aesthetic composition, which is the work of sensation.”³⁵

If an architectural project wishes to have a sense of sensation, composition needs to exist within its drawings. According to Robin Evans “to translate is to convey”, meaning, to translate is to move something without altering it.³⁶ He claims the intended meaning of the architectural drawing, the intention of the line, will inevitably change as it is realized in reality, within final built work.³⁷ As these *48 Spatial Speculations* are translated into buildings, the quality of sensation is translated also. The exact resemblance will be altered but the pure sensation of the work will remain intact; the gravity, heaviness, rotation, vortex, explosion, expansion, germination and time.

Methods for architectural form finding are set forth and circulated through out the discipline through published books and articles and by teaching in architecture schools. As architecture has distanced itself from composition, I personally felt that I lacked a foundational grounding in composition; an absence I assume is attributed to the teaching

³⁵ Deleuze, Gilles and Guattari, Felix. *What is Philosophy? Centuries*. Columbia University Press, 1994, p. 192.

³⁶ Evans, Robin. *Translation from Drawing to Building and Other Essays*. Architectural Association, 1997, p.4.

³⁷ Ibid, p. 4.

and books I experienced as an architectural student, as architecture shifted from Modernism and the Bauhaus’ compositional methods.

For Every Line Casts a Shadow is an attempt to better understand the principles in which composition is rooted, and to position myself to achieve the spaces and compositional lucubrations they can open. Our present day is still seeped in Modernity. Modernism’s methods for spatial composition are still viable. We need composition to keep us attentive to the things around us and how they can come together to inform architecture. The architect still needs to compose the line on the page; lines that will catch sun and cast a shadow.

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