

From Mondrian's *Diamonds* to Hejduk's *Diamonds*: Paintings as Means and Ends for Spatial Construction

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Abstract

Painting is a literal compression of space. However, using painting as the departure point to design architectural space is more than merely introducing a third dimension to a two-dimensional picture plane. In this paper, John Hejduk's *Diamond Series* will be discussed in relation to Piet Mondrian's *Diamond Composition*. In some ways, the latter serves as both a design means and a design end of the former. While several aspects of painting may be intentionally registered in architecture, only a few aspects will be discussed in the designs. This study will examine how Mondrian's paintings denote concepts of space rather than provide illusionary images of space, and how similar concepts are articulated in Hejduk's architectural space with or without adopting similar percepts from Mondrian's paintings.

Painting was weaved in the architecture of Hejduk. As an illustration, Piet Mondrian's *Diamond Composition* inspired Hejduk's *Diamond Series*; and George Braque's *Still Life Series* and Jean Auguste Dominique Ingres' *Comtesse d'Haussonville*, inspired his *Wall House Series*. Later, after Hejduk moved to the Cooper Union, both painting and music continued to be themes in Hejduk's teaching of architecture students.

Regarding painting and architecture side by side has the following implications. Most obviously, it leads to a multi-layered reading of painting. Any aspects of a painting, such as the composition of shapes, colors, or even narratives, may be introduced intentionally into the design of a work of architecture. Thus, paintings become an open-ended program set up for the designer.

Furthermore, a painting can be used as either a design means or a design end. By a design end, we refer to the properties or the attributes that a design possesses. By design means, we refer to the actual ways in which a property or an attribute is exemplified or expressed in the design. For example, the following cases of how a painting is referred to in a piece of architecture differ. The first is the interesting interplay of shapes in a painting articulated as a similar interplay of visual elements in an architecture design. The second is the feelings arising from a painting introduced into an architectural design. They differ in that the first case suggests, in the medium of painting, not only "what" to achieve but also "how" to achieve it in the medium of architecture, while the second case only indicates the "what" without indicating the "how." In other words, in the first case, painting and architecture exemplify similar percepts, while in the second case, painting and architecture express similar ideas in a metaphorical way. Thus, thinking across painting and architecture is not for the purpose of creating links between these two media. Instead, it is a constructive framework of exploring the interplay between design means and design ends. This framework will be a lens through which our reading of Hejduk's architecture in relation to paintings will proceed.

1. THE TWO DIAMOND SERIES

Mondrian's *Diamond Series* composition is regarded as the most interesting as well as the most problematic series. The names and corresponding years of the sixteen known paintings in this format follow (Fig.1):

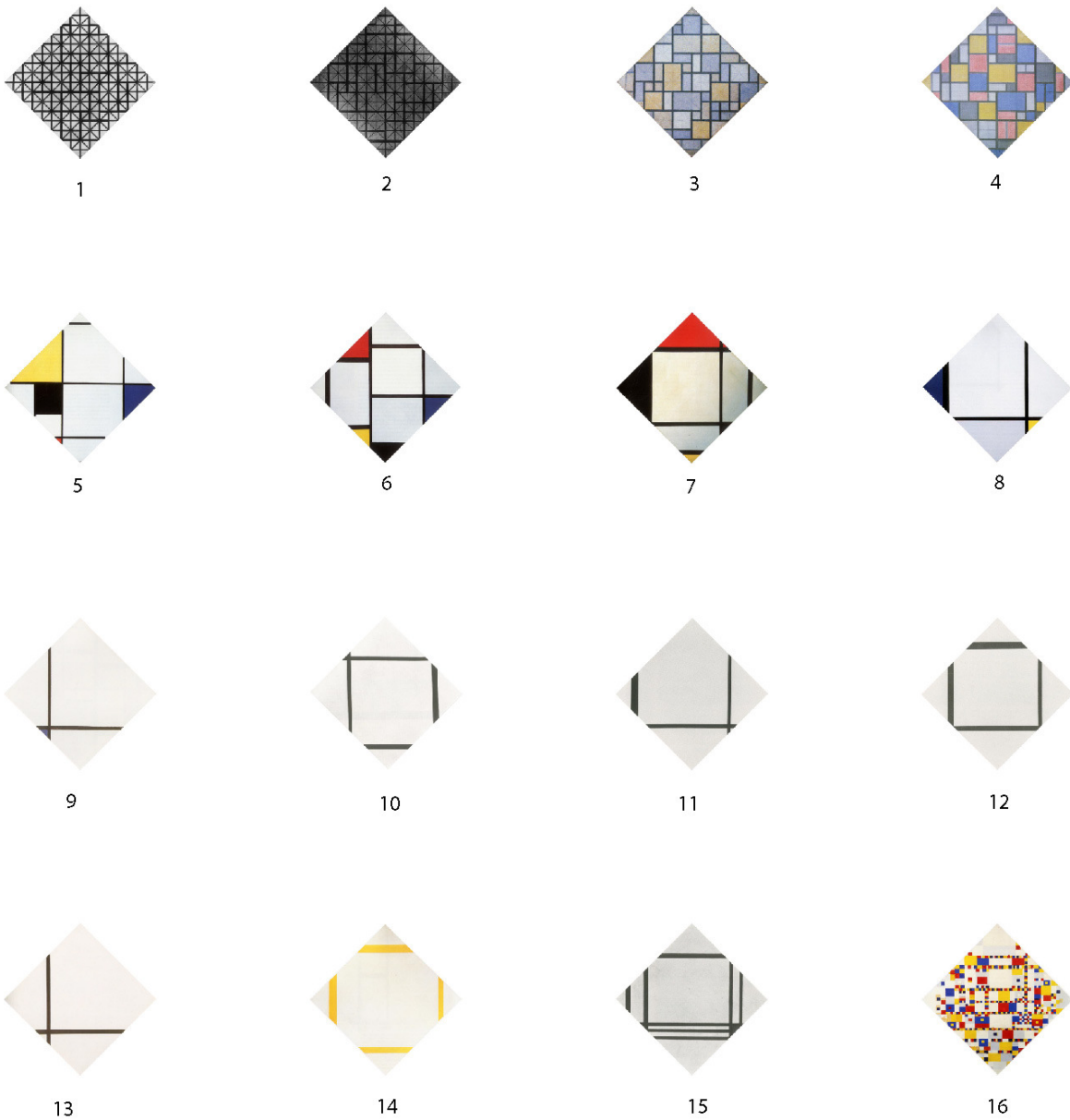
1. Composition with Grey Lines, 1918
2. Composition in Black and Grey, 1919
3. Composition: Bright Color Planes with Grey Lines, 1919
4. Composition in Diamond Shape, 1919

5. Diagonal Composition, 1921
6. Diamond Painting in Red, Yellow and Blue, 1921-1925
7. Composition in a Square, 1925
8. Composition with Blue and Yellow, 1925
9. Composition with Blue, 1926
10. Painting I, 1926
11. Fox Trot A, 1930
12. Composition I-A, 1930

13. Composition with Two Lines, 1931
14. Composition with Two Yellow Lines, 1933
15. Composition in a Square with Red Corner, 1937-1938
16. Victory Boodie-Woogie, 1942-1944

The first appearances of the diamond-shape composition in Mondrian's paintings occur in a series of four paintings based on a modular

Figure 1.



system of squares set within a tipped canvas. Among them, the first two diamond compositions consist of grids although a closer look reveals different line weights of the grids. Each work is divided diagonally into a grid pattern of eight units, forming sixty-four smaller diamonds. The diamond units are further divided by horizontal and vertical lines, as if the two orthogonal grids overlap. The third diamond composition, although filled with colored areas, is based on the same eight by eight underlying grids. A comparison of the thick lines in the first two compositions reveals that they are surprisingly almost the same except for one line that is missing in composition No. 2. Another difference between these two compositions is that No. 2 has a stronger contrast in line weight than No. 1. However, No. 3 remains almost the same as No. 2 except for four missing lines. Composition No. 4 also consists of lines, the pattern of which is derived from partitioning the colored areas and deleting the existing lines in the third composition, except that the square on the up-right side is the only shape that remains the same (Fig. 2).

In Nos. 5 through 15, the linear language becomes

more and more parsimonious, or in a zooming-in fashion of the previous four. For example, the composition No. 5 can be seen in the linear scheme shared by compositions Nos. 1 through 3 (Fig. 3), which could be coincidental. The effect of zooming-in on a linear scheme is that some lines are more dominant in the structure than others, unlike in the first four compositions, in which segments of lines are of similar lengths. Inscribing a square inside the diamond boundary of the painting shows how the major lines are located in relation to the center of the diamond (Fig. 4). Interestingly, the number of major lines progressively decreases. No. 5 has two lines, one horizontal and one vertical; No. 6 has only a vertical line; in No. 7, all the lines move toward the outside of the center square. In Nos. 5 through 8, the number of colored areas decreases. Not until one sees compositions of here lines in Nos. 9 through 15 does he/she realize Mondrian's conscious play on the orthogonal structure within the diagonal periphery in a minimalistic manner. The last diagonal composition, *Victory Boodie-Woogie*, completely differs from the group of sixteen diamond compositions in which Mondrian was clearly trying out new ideas. However, his

Figure 2.

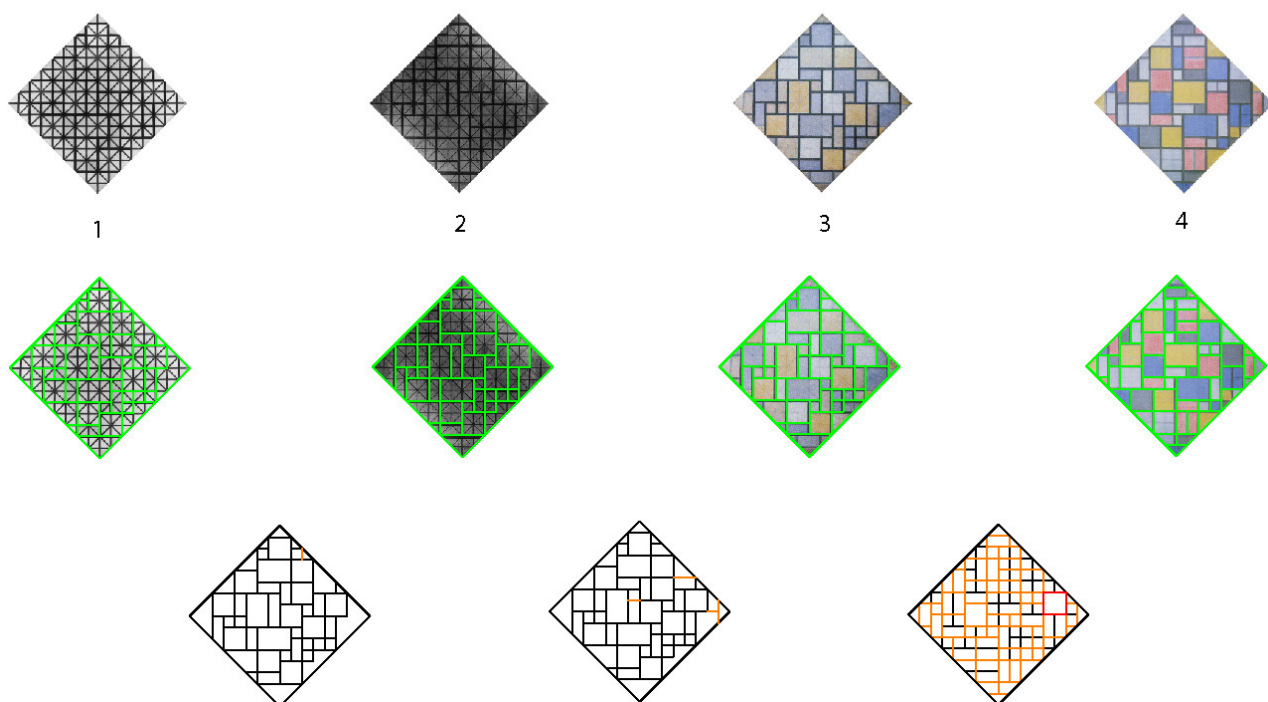
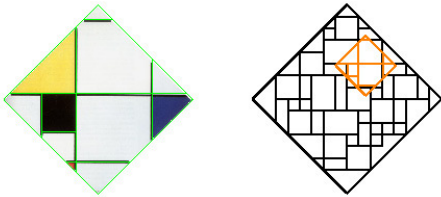


Figure 3.



1. Diamond House A (Fig.5)
2. Diamond House B (Fig.6)
3. Diamond Museum C (Fig.7)

Hejduk's *Diamond Series* can be seen as an attempt to try different structure systems. In *Diamond House A*, columns and beams support the structure; in *Diamond House B*, walls and beams support the structure; and in *Diamond Museum C*, the column-beam structure is built on a much larger scale than in the previous two. Compositionally, Hejduk's *Diamonds* did not explore all the possibilities implied in Mondrian's *Diamonds*. Instead, only a few key ideas were taken into account.

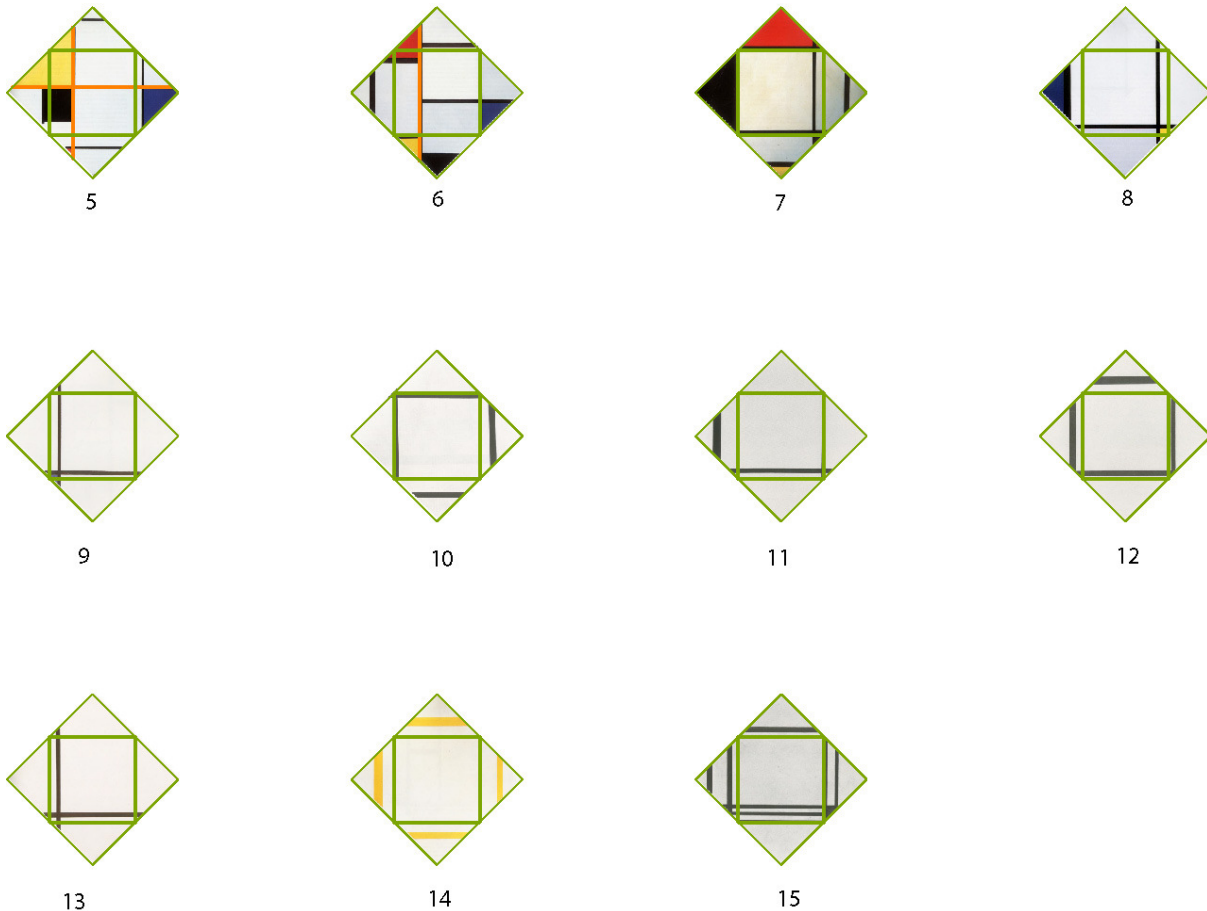
ideas were not fully realized, as he abandoned *Victory Boogie Woogie* unfinished on his easel.

Hejduk's *Diamond Series* is "a first attempt to invest the formal possibilities"¹ of Mondrian's *Diamond Compositions*, rotating the inner grid by 45 degrees within the square boundary, which destroys the consistency between the inner grid and the boundary. Between 1963 and 1967, Hejduk designed three projects in the *Diamond Series*:

2. ELEMENTS

Mondrian's *Diamonds* work, as a means and an end of Hejduk's *Diamonds*, contains a clear definition of elements. Within the diamond

Figure 4.



periphery, lines and planes are the two compositional components of this work. In compositions Nos. 1 and 2, lines emerge from a grid. In Nos. 3 through 9, lines enclose colored areas and tend to play more and more active roles.

Figure 5.

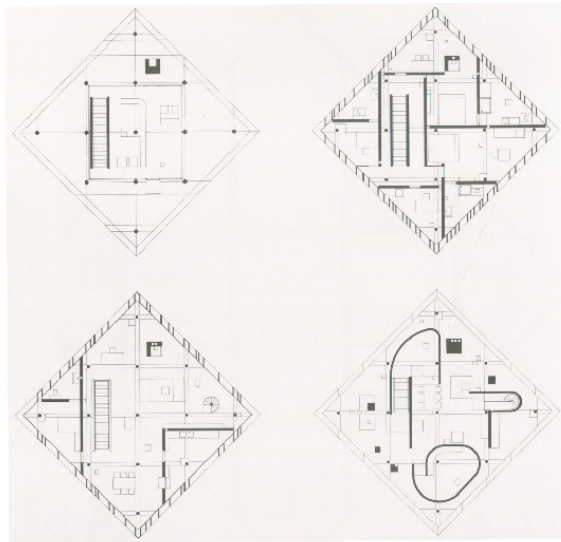
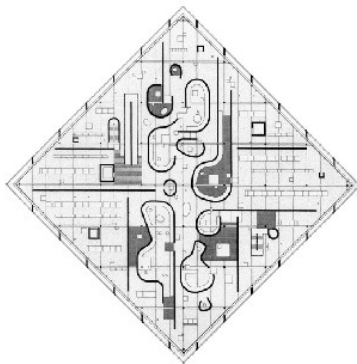


Figure 7.



No. 9 marks a turning point in the whole diamond series in that its colored area is the smallest among all the compositions. It records the moment when the role played by lines dominates the role played by colored planes. This active role of lines is further articulated in Mondrian's paintings from compositions Nos. 10 through 15, in which the lines do not enclose areas of colors. The statement of these diamond compositions lies in the stark opposition of horizontal and vertical.

The width, the position, and the intersections of the lines become important. In No.13, which echoes the constellation of lines of lines in No. 9, all colors have been deleted, so the lines lead to less impression of the enclosed areas. At the end

Figure 6.

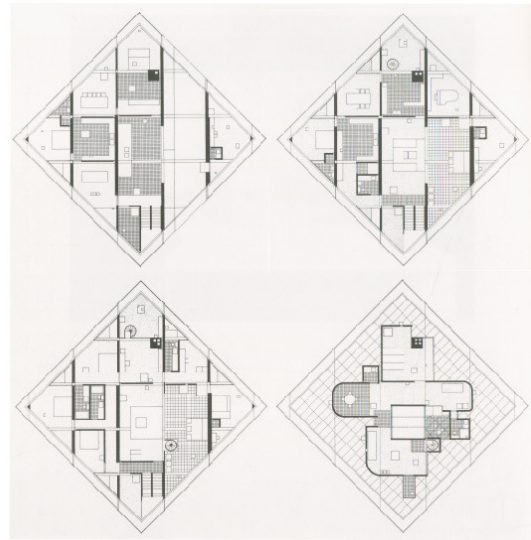
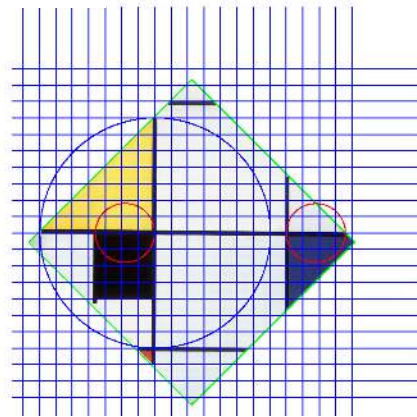


Figure 8.



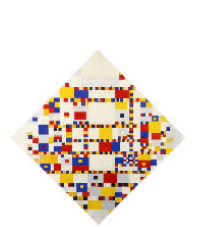
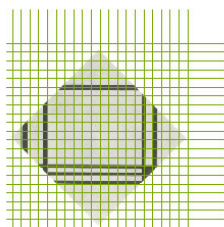
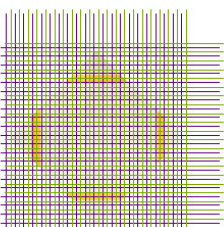
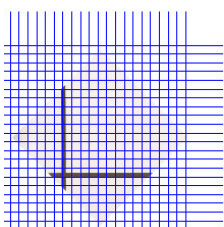
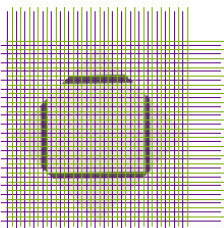
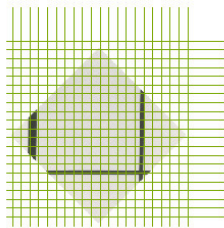
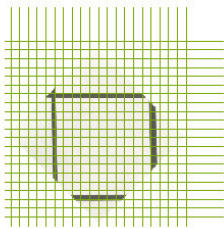
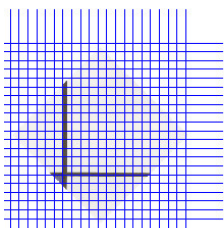
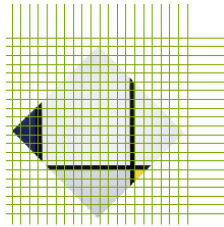
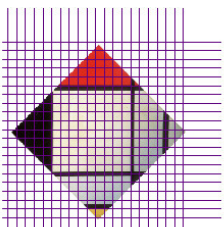
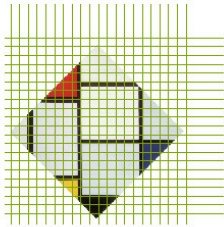
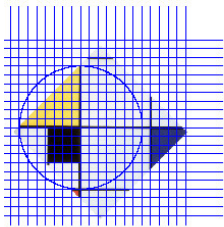
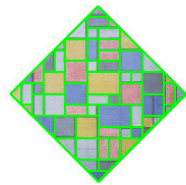
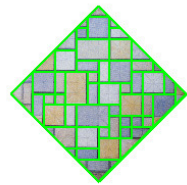
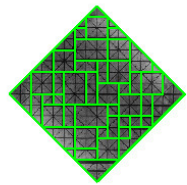
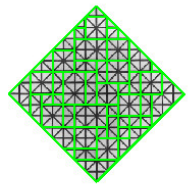
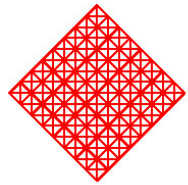
of the series, the lines and the colored areas are defined in such a way that they reflect each other. In composition No. 14, the "lines" can be interpreted in two different ways, as they are so thick that they can almost be seen as planes. In composition No. 16, lines are not explicit but implied along the colored rectangles.

The diamond in Hejduk's architecture is in fact a diamond plan. Walls and plan boundaries are

arranged in such a way that they pick up certain attributes that Mondrian's paintings exemplify. The

major element in Hejduk's *Diamonds* is a wall that appears as a linear element in the plan. In

Figure 9.



Diamond House A, it is free-standing wall; in *Diamond House B*, it is structural wall; in *Diamond Museum C*, it is a combination of a free-standing linear wall and a curvilinear wall. Meanwhile, the columns as well as floor pattern are important elements that suggest a modular logic of the plan.

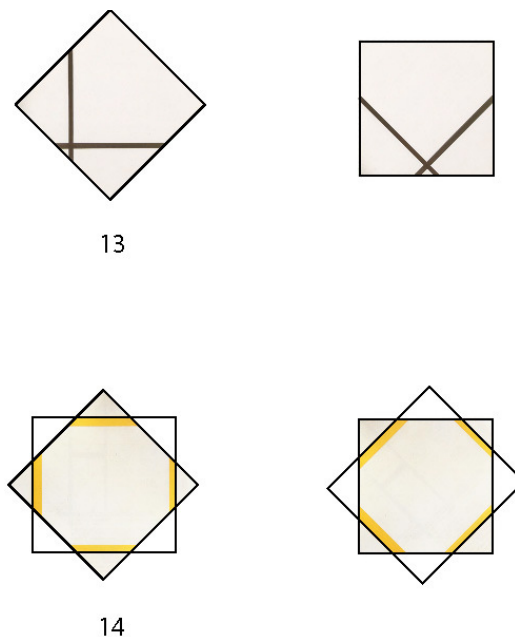
3. GRID AND ROTATION

In all cases, lines can be settled onto a grid in Mondrian's *Diamonds*. The first four compositions share the same grid derived from an eight-by-eight division of the diamond boundary. In composition No. 5, a grid can be retrieved from the line pattern in a much more complex way by taking the edge length of the diamond canvas and dividing it into fourteen equal segments, which become the units of the grid. All lines, except for the long edge of the black rectangle, lie within the grid. However, the position of the long edge can be determined by measuring the same dimension from a determined segment (Fig.8). The drastic change between the grid of compositions Nos. 1 through 4 and the grid of composition No. 5 is not a change in the grid unit size but in the relationship between the inner grid and the outside boundary (the canvas). As mentioned, the grid of the first four diamonds is generated by dissecting the boundary so that the grid and the boundary are inter-dependant. In the fifth composition, the relationship between the boundary and the grid is not as strict. It almost can be assumed that the lines of the compositions are determined first on a grid paper, and then the diamond boundary is placed later on in order to crop the composition in an interesting way. If one fits the same grid onto Nos.6 through 15, the boundary has three different locations (Fig. 9). Nos.5, 9, and 13 share the same location. No.7 defines its own location that can also be applied to Nos. 12 and 14. The rest of the compositions, including Nos.12 and 14, share a third location of the boundary. Thus, No. 12 and 14 are the two that fit the two grids. Interestingly enough, these two shared grids bisect each other. In all three cases, the boundary is carefully shifted from the grid, which demonstrates the freedom of the boundary to the grid, or vice versa.

The *Diamonds* represent a radical move of the composition of painting in that they highlight the relationship between the boundary of the painting and what is inside the boundary. In a letter that Mondrian wrote to Theo van Doesburg in early

February 1919, he noted the interesting visual effects that the diamond composition evokes. In his letter, he said, "I wanted to let you know that I am now hanging various things like this \diamond ; so that the composition looks like this +; whereas hung like this \square the composition looks like this \times ."² This idea of "changeability" is later adopted by other painters.³ It is obvious that the diamond composition, overtly exemplified by the changeable visual effects, is about rotation. Furthermore, the spin-wheel structures detected in the first four diamond compositions represent another level of rotation indicated by the structure of local elements. No.14, *Composition with Yellow Lines*, completed in 1933, is a radical restatement of the diamond composition. The four yellow lines suggest a square overlapping with the diamond-shape picture plane. The square is almost of the same size as the diamond itself, so the rotation between \diamond and \square is illustrated instead of the rotation between \diamond and +, or between \square and \times . (Fig.10)

Figure 10.



Hejduk creates a number of grids. In *Diamond House A*, the grid is indicated by the column system. Interestingly enough, the column system suggests a square inscribed in another square by a 45-degree rotation (Fig.11-a). Thus, the rotation of the diamond composition is not only shown

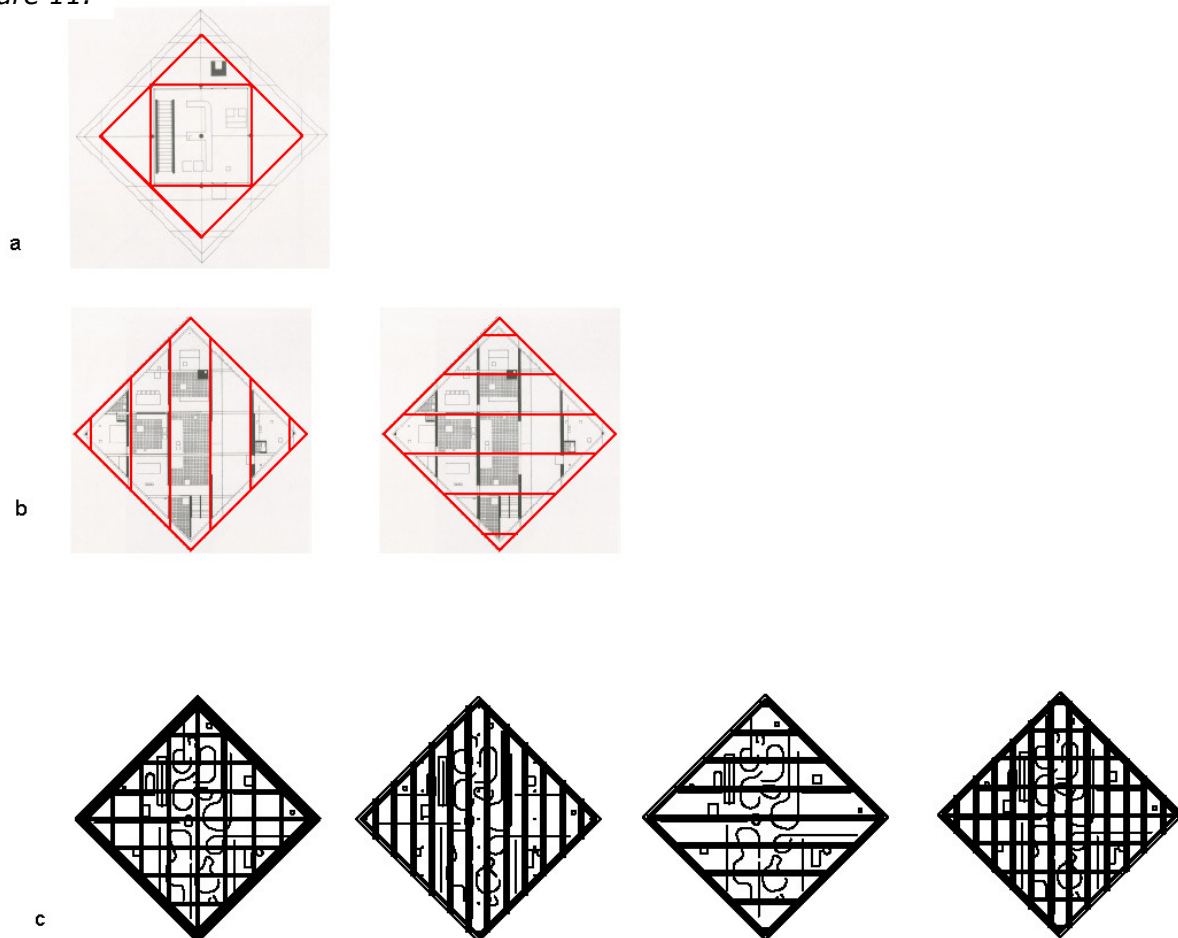
between the grid and the periphery but also inside the grid. In *Diamond House B*, the grid is embedded in the structural wall system and the floor pattern. Unlike the grid in *Diamond House A*, this grid indicates directions. In floor plans except for the fourth floor, the wall system falls in a south-north direction while the floor pattern falls in an east-west direction. (Fig.11-b) Moreover, the grid lines do not run through the corners of the diamond. In *Diamond Museum C*, the grids are of more complexity. The internal columns imply a four-by-four square grid (Fig.11-c). The columnar peripheral elements create a dense series of thirteen layers in one direction. The beams suggest a sparser series slicing the object in a perpendicular direction, picking up the column intervals. If the latter two patterns are superimposed, we can see, from a perceptual point of view, that Hejduk creates a tension between a neutral structural grid and superimposed grids, whose effect is to

differentiate the two diagonal directions. Regardless of how much the grids in different projects differ from each other, they are not free from the boundary of the plan. As mentioned, the grid of Mondrian's *Diamonds* falls into two categories, those that are dependant on the boundary (as shown in Nos.1 to 4) and those that are free from the boundary (as shown in Nos. 5 to 15). In this sense, Hejduk's grids are closer to the first group of Mondrian's paintings.

4. EXPANSION

Mondrian's diamond compositions not only suggest a rotation between the inner grid and the outer boundary but also imply an extension from the inner grid towards the outside of the boundary. In answering Theo Van Doesburg, Mondrian wrote that by tipping the square boundary, "the formal ramifications of this action were shattering: the

Figure 11.



peripheric tensions of the edges and contours were heightened and the extension of field was implied beyond the canvas."⁴ Indeed, irregular shapes always suggest complete ones that are cut off by the periphery of the diamond. The expansion is more obvious in compositions with a smaller number of lines. For example, in the fifth diamond composition, the upper white area is in an odd-shaped polygon with six unequal sides, suggesting that it was cut off from a rectangle. Thus, one who views the painting not only sees the shapes within the diamond but also imagines the un-shown parts that form another layer of the painting (Fig.12).

Figure 12.

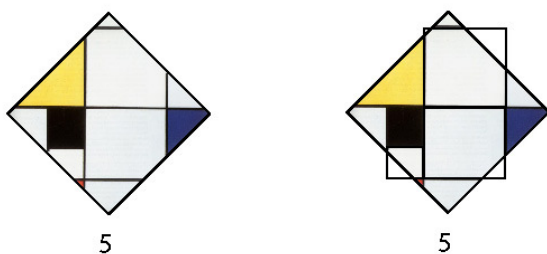
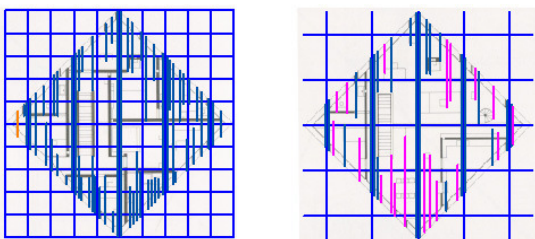


Figure 13.



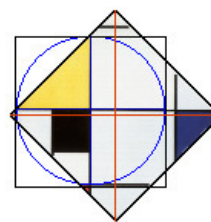
The four-way expansion in Mondrian's *Diamonds* turns into a two-way extension in Hejduk's *Diamonds*. The extension is expressed intensively in the columnar elements on the periphery of *Diamond House A*. In fact, the locations of the mullions are extensions of key points of the objects or wall ends within the diamond boundary (Fig.13). The inside is then registered on the periphery. However, this registration suggests a dominant direction. The boundary of the diamond can be somewhat transparent if seen from the south-north direction or completely opaque if seen from the east-west direction. The equal grid of the

interior is set within an unequal boundary. Moreover, the details of the wall end as the periphery coincides with the direction shown in the columnar elements. In the east-west direction, the walls end in rectangular heads, similar to those in Mondrian's *Composition with Red, Yellow and Blue* of 1921. However, in the south-north direction, the walls extend until they reach the periphery completely in wedge heads, similar to those in Mondrian's later compositions.

5. CHALLENGE OF CENTRALITY AND TENSION OF THE PERIPHERY

In compositions Nos.7 to 15, the two heads of each line both touch the edge of the canvas. Because of this attribute, each line is symmetrical to one axis of the diamond and thus defines a center. However, the whole composition of the lines is non-symmetrical, and the center is denied. Furthermore, going back to Figure 4, we realize that these lines also avoid the central area defined by the inscribed square. No line runs through the center of the canvas. Composition No. 5 illustrates another layer of the challenge of centrality (Fig.14).

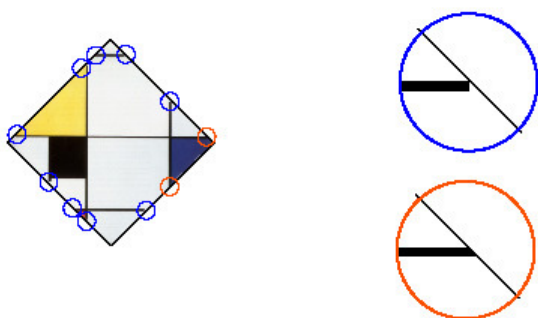
Figure 14.



The two dominant lines intersect at the left, off center of the diamond. Centered at this intersection, one can draw a circle whose diameter is equal to the length of the canvas edge. Both the yellow triangle and the black rectangle reinforce the center of this circle. Thus, two centers are formulated to challenge each other: the center naturally defined by the shape of the diamond canvas, and the center emerging in the constructed pattern of lines and colored areas. The off center and the center create the dynamics of the composition.

Because of the rotation of the inner grid, the lines of the paintings are no longer perpendicular to the periphery. This non-perpendicular condition creates an unavoidable tension on the periphery of the diagonal composition on different levels, which Mondrian was conscious of. The details show that Mondrian was apparently cautious about choosing the treatment of the line heads as well as the framing strip. Beginning with the first four diamonds, Mondrian set the framing strip back from the face of the canvas so that graphic power is given to the exposed edge. In composition No. 5, the colored planes end at the edge while the black lines end where they are tangent. Except for the line heads, which are adjacent to the blue triangle, lines maintain their rectangular heads while touching the periphery but do not extend towards the edge completely. As we can see, the reason for the exception at the blue triangle is to enclose the colored area (Fig.15).

Figure 15.



In 1925 and 1926, Mondrian's diamond composition evolves again. The lines no longer terminate before they reach the edge, as in the 1921 painting. In composition No. 8, the black lines cross the edge of the surface and continue down on the sides, ending near the line of the setback framing strip. This illustrates the black structure as a different system from the plane structure. In composition No. 9, this extension of the black structure is also present.

Structurally speaking, two groups in the diamond series illustrate two extremes of forming tension on the periphery. Compositions Nos. 1 through 4, the first group, are characterized as having the largest number of lines. Compositions Nos. 8 through 14, the second group, have the smallest number of lines. Because of the even distribution

of segments of similar lengths, the early four diamond paintings illustrate an increasing density of lines towards the center. The tension between the center of the diamond and the periphery is also picked up by axial analysis (Fig.16).⁵ When the diamond edge is not considered, the integration core resides in the center of the system. However, when the diamond edge is added to the system, it becomes the integration ring surrounding the system. In compositions Nos.8 through 14, because of the large scale of each line, the tension on the periphery is always registered as the crucial condition of how each line, in relation to others, ends at the periphery. Since the number of lines is a maximum of four, four conditions occur (Fig.17). *Condition 0* occurs when a line head has no perpendicular relationship with any other line heads. *Conditions 1, 2, and 3* occur when a line head has a "neighbor" and the two "neighbors" belong to two perpendicular lines. Specifically, *Condition 1* occurs when the two lines do not intersect (or the extensions of the two lines intersect outside the periphery of the diamond shape). *Condition 2* occurs when the two lines intersect right on the periphery of the diamond shape. *Condition 3* occurs when the two lines intersect within the periphery of the diamond shape. In of Mondrian's compositions, the intersections are all close to the periphery, which injects stronger graphic energy into the created composition than it would if the intersection were located closer to the center of the diamond.

In Hejduk's *Diamonds*, the tension between the center and the periphery is generated within the contrast between the equality and the dominance of planar directions. As was mentioned before, *Diamond House A* strongly indicates one dominant direction on a supposedly equal diamond periphery, as does *Diamond House B*. However, it is a simpler example than *House A*. The structural wall system already shows the direction, and what happens on the periphery is an extension of that.

Figure 16.

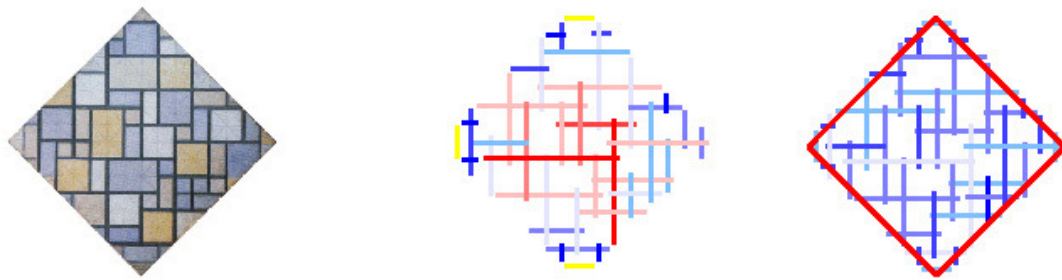
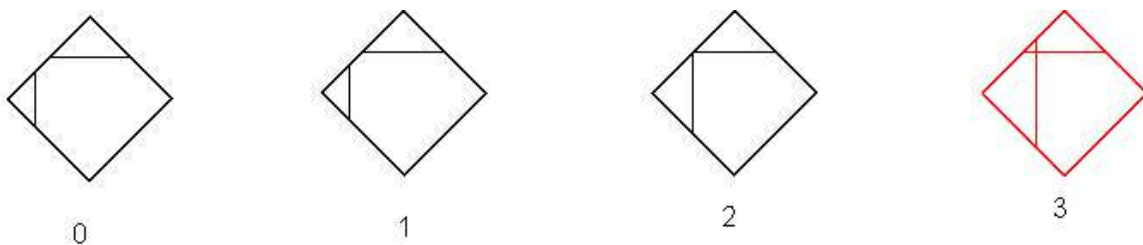


Figure 17.



In the *Diamond Museum C*, the tension between the center and the periphery involves different kinds of wall elements rather than merely their arrangement. Three types of walls are free standing walls offset from all major grids in the manner of Mies (Fig.18a – thickest lines), free standing walls that extend into curvilinear enclosures (Fig.18a – medium lines), and walls that have been bent around to define enclosures. The latter appear as objects placed in a spatial field (Fig.18b). They dissemble from the painting by Mondrian: they stand unambiguously as figures; and they do not replicate the underlying square shape or any derived shape. Thus, they raise a question as to their formal logic and whether we can reconstruct it in a manner that makes sense of the relationship between the painting and the plan. A sketch by Hejduk of the diamond museum shows a different arrangement of the elements; however, the idea of distinguishing the center from the periphery remains the same (Fig.18c).

Freestanding walls are simple boundaries which,

a

b

0

1

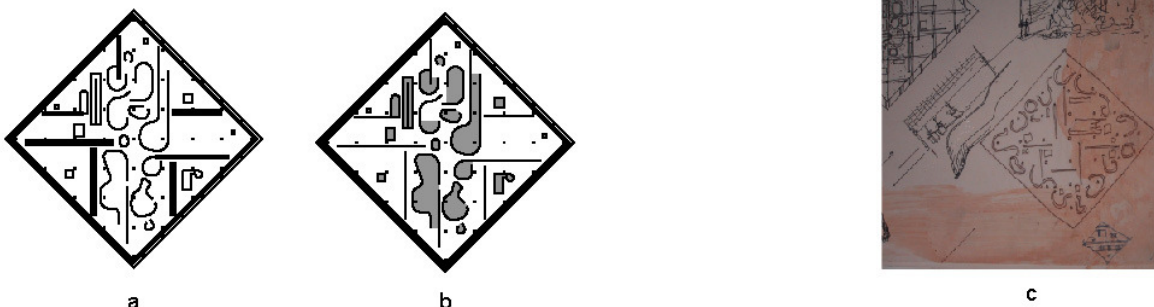
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from a topological point of view, imply an even division of the surrounding plane. Curvilinear boundaries, on the other hand, also have the potential to generate a distinction between interiority and exteriority, depending on whether they define convex or concave regions in their neighborhood. As the curvilinear walls form enclosures, and as these appear as freestanding objects, irregular regions of space between them, especially at the center of the composition, are defined. A situated observer occupying these regions would perceive him or herself as standing outside the surrounding objects as well as between them, with no other frame of reference or orientation other than the unfolding of surrounding curves. This is picked up by the isovist areas.⁶ As the observer moves outwards, the outer perimeter becomes visible, minimally at first, and substantially thereafter (Fig.19). As the observer approaches the perimeter, the visual integrity of the outer shape is revealed.

Thus, Hejduk's plan takes subjects across, inside,

Figure 18.



a

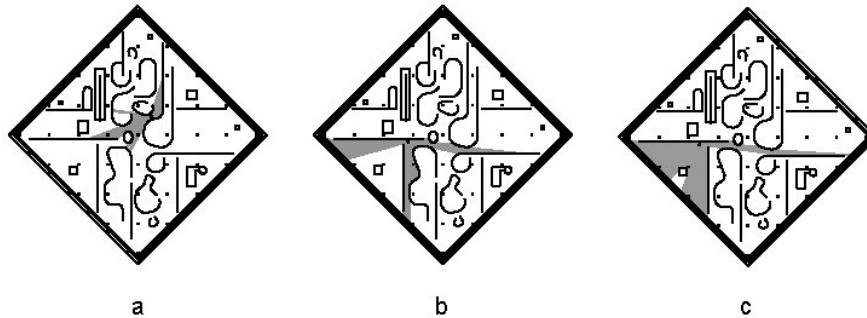
b

c

and between boundaries while at the same time engendering a tension between a regular outer

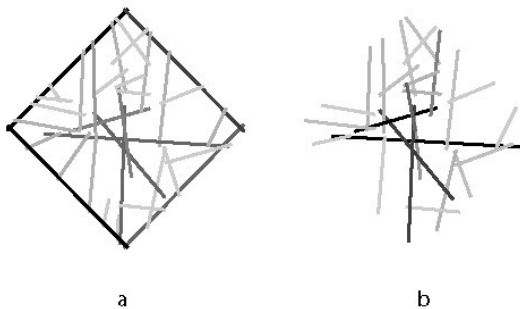
space indicated in Mondrian's paintings is not illusory but conceptual. By illusory space, we

Figure 19.



boundary to which a peripheral ring of space is attached, and an internal irregular region meandering between curvilinear objects. The integration structure of the plan balances these two poles: while the outer ring of space has the highest integration, several strongly integrating lines penetrate towards the center and almost traverse the plan in two directions. Of course, if the perimeter is eliminated, the core firmly radiates from a position offset from the geometrical center of the plan (Fig.20). Overall, the balance between interior and peripheral integration is better maintained in Hejduk's plan than in the Mondrian's painting.

Figure 20.



6. DISCUSSION

In this paper, we examined Mondrian's *Diamonds*, which are abstract paintings, as a design means and a design end of Hejduk's *Diamonds*. The

mean that the visual effects that are approximated in the perspective systems of the paintings generate illusory depth as if the viewer sees the physical space. Conceptual space is a denial of this illusion, so the viewer does not receive similar percepts of the space. Instead, the viewer understands the space through observing specific relationships among objects. These spatial relationships bring certain concepts to the foreground. The *Diamonds* paintings articulate geometric tensions in pure form and pure color. The viewer perceives and understands the space from clarified angles, as these paintings are not literal depictions of the space in which intended attributes merge with unintended ones. On the contrary, they are exemplifications of attributes of space in the painters' specific devices. In the case of Mondrian, the devices are the compositional elements, such as rotation, expansion and tension. These devices are normally unusual, so they demand the viewer's attention.

We focus on the concepts and the percepts of a painting and of architecture. The point is not what the concepts are but how the concepts are embodied into specific percepts of the paintings. The percepts of Mondrian's *Diamonds* compel the viewer to understand the painting intellectually. What is even more interesting is how the concepts are embodied in Hejduk's architecture. In the case of the *Diamond Series*, the concepts are inherited while the percepts of the paintings are literally taken in the plans of the architecture. The language of architecture derives itself from the language of the painting. The tensions exemplified in the *Diamonds* of Mondrian are naturally

inherited in Hejduk's architecture simply because of the adaptation of the diamond composition in the plan. However, since the media of these two diamond compositions are different, tensions are achieved in different ways.

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NOTES

¹ Mask of Medusa, p.48

² Mondrian, p.122

³ For example, Cezar Domela exhibited a diamond-shaped painting in Brooklyn, 1926. The title of the painting is "Tableau Labile" indicating the possibility of an alternative orientation.

⁴ Mask of Medusa, p.48

⁵ Detailed theory and method of axial analysis can be found in *The Social Logic of Space* by Bill Hillier and Julienne Hanson. The reason to use this method here is to catch the syntactical relationships among the lines in Mondrian's diamond compositions. That is, to look at lines in Mondrian's compositions as patterns of intersection.

⁶ The Isovist is the space that is visible for an observer from a given point. The mechanism to define an Isovist is by "projecting" lines of view from the position of the observer.