Drawing as an Investigation of Space

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Abstract

This article discloses part of an ongoing Doctorate investigation which analyses non-formal variations in space through drawing, while simultaneously exploring the drawing process itself. The type of space chosen for this investigation is isolated to a minimum, or better still, an architectural space in its' most basic reduction.

In this article we chose some series of drawings developed specifically for this investigation, which address the theme of variations in light, shadow and textures, that is, of factors that don't alter the physical configuration of space, but which completely change the way in which space is felt and perceived. Drawing was used to study these non-formal alterations, taking as a basis an archetypical space, the reduced minimal space of the inside of a box, similar to spaces we live in. We present the drawings themselves, as part of the methodology applied to spatial analysis, followed by thoughts on the purpose and the process itself, inserted into a theoretical framework, and finally, analyzing the end results. Our methodology favored direct spatial analyses, through the use of drawing from direct visual observation. Variations were subsequently introduced, methodically and deliberately, so as to be observed and analyzed in order to reach some conclusions.

Keywords: Drawing, Space, Light, Shadow, Textures

In this article we shall discuss some investigation drawings developed in two series of drawings. The first series of drawings deals with the variations of direct and indirect light in space, and the second series of drawings deals with the variations of tactile textures in space.

1. Light and Shadow

1.1. Methodology

This series of drawings attempt to investigate, in the minimal space of a box, the variations in the interaction of natural sunlight, applied directly and indirectly, from two different points (openings to the outside), seeking to systematize this information through drawings.

Our method consisted of drawing from direct visual observation, recording the variations introduced by direct and indirect sunlight, moving the position of the light source, without moving the position of the observer (position of the box in relation to the observer who draws. As a methodology, it is important to mention that we deliberately

restricted the tonalities, as an abstraction and simplification of vision as it perceives light and shadow (instead of drawing the light/shadow continuum closer to observed reality). In these drawings, the simplification constraint applied to shades of light, used part of the Fibonacci sequence: 2, 3 and 5 shades.

This methodology sought to speed up the registration process in drawing. This speed is very important when we are dealing with something as elusive as natural sunlight. Sunlight, and the shadows it produces, are constantly moving, forcing the registration process to be almost instantaneous, especially if one is drawing under direct sunlight. As we are told by Robert Cassati:

> Outdoors, all you have to do is trace an outline and then come back to it a few minutes later to see the movement of shadows. (Casati, 2003; p.14).

We should however clarify that, in any drawing, intentionally or not, there is always a restriction in the registration of shades and tonalities, given that reality supersedes in its complexity our capacity of registration and understanding. As is stated by Betty Edwards:

> Shading is based on perception of changes in tones of light and dark. These tonal changes are called values. A complete value scale goes from pure white to black, with literally thousands of minute gradations between the two ends of the scale. (Edwards, 1986; p. 180).

We should also point out some characteristics of the referent used for these series of drawings: the box which served as a model. This box had two openings to the outside, allowing natural light to enter from different directions, bringing us back to a situation that we can normally observe in a building and not in nature:

> A large quantity of doors and windows results in a quality of light, from different origins, which we do not find in nature. (Sedlmayr, 2011; p. 17).

As we are also told by Hans Sedlmayr:

> (...) it is the task of architecture to modify and direct natural light using all kinds of resources. Almost all the works of architecture conduct light in their own intentional way. (Sedlmayr, 2011; p. 17).

It is also important to mention that, in this box, the surfaces have a matte finish, which is normally the case in most surfaces we observe in the world (Palmer, 1999). A surface with a matte finish reflects light in every direction (Palmer, 1999), something which allows for observation of light from every direction, inside the box. The question of all surfaces producing an emission of light beams has already been addressed by Leonardo da Vinci (1452-1519), in his different writings, scattered in innumerable manuscripts, some of which have been posthumously compiled, as in the "Trattato della Pittura", compiled by Francesco Melzi.

1.2. Results

From our series of drawings, we can conclude that drawings produced with indirect natural sunlight present forms of light and shadow far more complex than ones produced with direct natural sunlight, regardless of having registered light with more or less shades (2,3 or 5). Reflections from indirect sunlight disseminate themselves, producing light beams in almost every surface, as is often the case in reality. As mentioned

by Stephan Palmer:

> In many real situations, light comes from diffuse illumination, in which light radiates from a relatively large region of space." (Palmer, 1999; p.16).

In this respect it is interesting to mention that in the Far East, the ideal of beauty is to have indirect light in the spaces we inhabit, as described by the writer Jun ' ichirō Tanizaki:

> We like this frail clarity, made of exterior light and uncertain appearance (...) For us, this clarity on a wall, or better still, this twilight, is worth all the riches in the world and its contemplation will never tire us. (Tanizaki, 1994; p. 72)

Direct sunlight on entering an interior space through any opening will cast a precise form of light inside the space (projected planimetrically and distorted by perspective), normally associated to the opening through which light entered. Sometimes, due to the angle at which the light enters, the resulting form can be quite unexpected and become quite dissociated from the opening (this phenomenon was observed in a drawing).

The form created in space by direct sunlight passing through an opening, has the characteristic of molding itself to the different surfaces of space, much like what happens to the shape produced by a shadow. However, unlike a shadow, and as we can see in these drawings, this form of light is responsible for strongly emitting light to the penumbra around itself. To our eyes, this form of light, this glare, provokes a certain simplification of the forms of light and shadow, reflected in the space around. Solar light causes a photographer's light "flash" effect, taking such a leading role in the space, that the delicate nuances of shadow around are made less visible.

The black and white drawings in this series (with just two tonalities), make the abstract forms of light and shadow stand out, towards the most reduced form of representation. However, the whole drawing series tells us of how shadows and lights can be seen as forms in themselves, dancing in space. Like Betty Edwards tells us " (...) shadows (and lighted areas), (...) can be seen as shapes in themselves (...)."(Edwards, 1986; p.180).

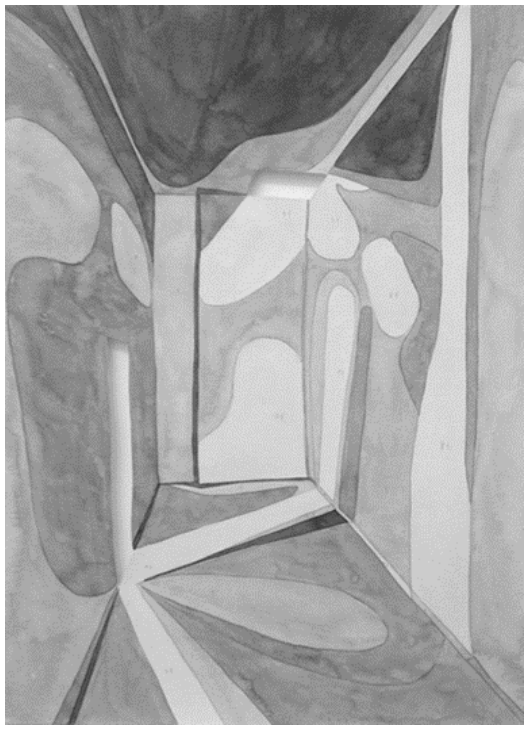

Fig. 1: Light and Shadow. Drawing with 5 tonalities of light and shadow. Space with indirect Sun light.

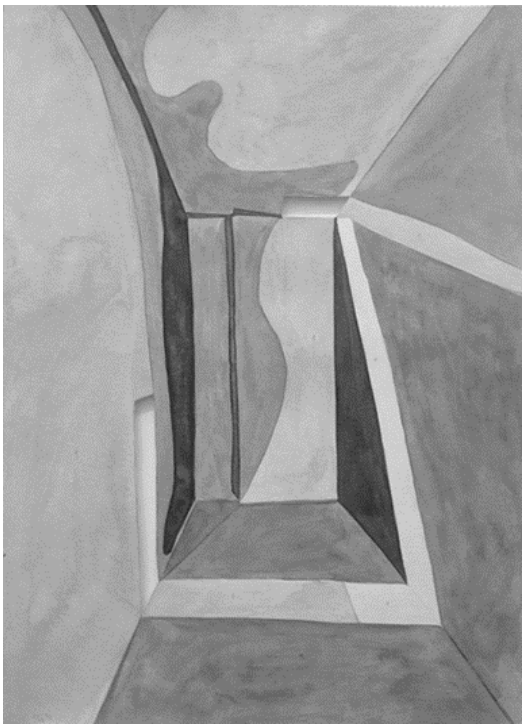

Fig. 2: Light and shadow. Drawing with 5 tonalities of light and shadow. Space with direct Sun light.

Fig. 3: Light and Shadow. Drawing with 2 tonalities of light and shadow. Space with indirect Sun light.

1.3. Aditional information about the drawings

Finally, we added some information on the drawings in this series. In total, 18 drawings were made, half of which with direct sunlight and the other half with indirect sunlight, with three drawings in each sequence of shades. The drawings were made with graphite, china ink and china ink water colours, on 300gr/m2 paper, with a dimension of 420x297mm each.

2. Texture

2.1. Methodology

This series of drawings took as a starting point six boxes with different textures, three series exploring textures reduced to just black and white, one which explored textures in black and red, and two others with textures in three colours: yellow, blue and red. In these boxes we explore non regular textures, with curved forms, circular or oval, and others with straight shapes.

These small paper boxes, are really three dimensional drawings, inside which, after being folded, we can observe a space we created, together with the interaction of the different textures. In our method we privileged drawing itself throughout the entire process. Beginning with the drawing of the textures in themselves, the development of the boxes, but ultimately in the drawing from real life observation, with indirect natural light, from the inside of these spaces.

Two different techniques were used, that correspond to two different series of observation drawings. The first is almost a cavalier perspective of the spaces. In these drawings we tried to

emphasize the interaction of the textures in the different surfaces, the way they continue, fold and adapt to the different surfaces defining the limits of the inner space.

The second series explores a view towards the inside of the box, and it aims to understand what changes spatially with these non-regular, somewhat chaotic textures we are observing, and how they extend across the various surfaces of space. Here we can see how textures elude the limits of the space in which they are confined.

In general, we can affirm that the aim of these series of drawings is to understand which type of texture, in form or color, interferes more with the perception of the space. In the extreme, the limits of the space will cease to be perceived.

2.2. Results

We can conclude that the strongest effects are obtained from the more complex black and white textures, which interfere immensely with the perception of space. We can also conclude that when these textures are non-regular, they will not supply the usual spatial information that are supplied by gradients in texture. According to Stephan E. Palmer: "In addition to providing information about depth, texture gradients also can inform observers about the orientation of a surface in depth and about its curvature." (Palmer, 1999; p. 234).

In these slightly chaotic textures, information on depth and distance, which normally is given to us by regular textures, isn´t clear. When we observe this space, it becomes confused, sometimes quite indefinite. Some forms seem to float in space, or lose their three-dimensionality altogether. This three-dimensionality in the forms is more noticeable in the black shapes that simultaneously occupy different surfaces, or that are present in large quantities. Strange as it may seem, instead of these black forms being perceived as holes, they seem to have volume, gaining mass, giving us an illusion of dense matter which floats inside the box.

We would like to point out that these drawings can easily be associated with Dazzle Camouflage, a technique widely used, mainly in World War I, in several warships, to confuse the enemy. These ships were painted with various complex textures of high contrasting colors, usually black and white, which generated difficulties in perceiving the underlying forms and their limits, creating an effect of visual confusion.

We would also like to refer to the strong effect we can observe in the presence of black and red textures, as observed in one of the series of drawings we elaborated. The intense contrast between these two colors, explains why, since the earliest of times, in the East, the colour red was considered opposite to the colour black, as described by Michel Pastoureau, alluding to the history of the game of chess. (Pastoureau, 2014).

Textures with colors (yellow, blue and red), regardless of shape or size, appear to be less confusing for the three-dimensionality of the space in which they are inserted than black and white textures. This extreme contrast between black and white, and, black and red, causes a greater interference between the textures and the perception of space.

Concerning the forms found in the visual textures we studied, we can conclude that, more than the form in itself, it is the size of the form that greatly interferes with the visual

perception of space. Bigger forms attain a bigger effect of confusion and disturbance in a given space. When these large forms occupy more than one surface in space, they are submitted to several distortions in perspective, depending on the surface on which they are projected.

Textures with small shapes scattered across the different surfaces, even if hard to perceive clearly, are much less likely to cause a strong disturbance in the perception of the space itself. However, we should point out that these textures with small circular forms, when present in all surfaces of a space, in great amounts, make the surfaces vibrant and striking, both in black and white as with other colours (yellow, blue and red). We can add that these small shapes seem to float in space, providing an extra three-dimensionality to a surface.

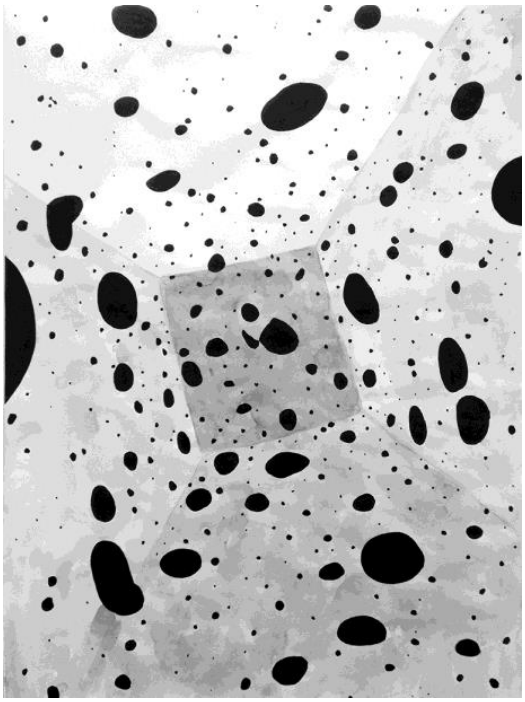

Fig. 5: Texture. Drawing of an interior space with textures with small circular forms, in black and white.

Fig. 4: Texture. Drawing perspective (resembling a cavalier projection). Texture with large straight forms, in black and white.

Fig. 6: Texture. Drawing of an interior space with texture with large straight forms, in black and white.

2.3. Aditional information about the drawings

Finally, we would like to add the following information about the drawings in these series: The drawings of the Boxes (6 units), are in graphite, china ink, china ink watercolour and pens, on 80gr/m2 sheets of paper, and have a maximum dimension of 45 x 66cms (each). Twelve drawings drawing from real life observation were made, six resembling a cavalier projection and the other six, a perspective view of the inside of the box. The drawings are in graphite, china ink, china ink watercolour and pens, on 80gr/m2 sheets of paper, and have a maximum dimension of 45 x 33cms (each).

3. Conclusions

In the series of drawings presented in this article, we addressed some themes of our investigation: light and shadow, visual textures. However, we know these themes cannot be considered separately, and that they are all somehow present when we look at a real three-dimensional space. However, in these drawings, through abstraction, we chose to increase the importance of certain factors, decreasing the importance of others, so as to reach conclusions. These drawings also show that our vision of reality always involves an act of choice and creativity (Arnheim, 1984; Palmer, 1999). Nonetheless, we believe it to be possible, by these series of drawings, to illustrate the hypothesis of this investigation: drawing is a simple form of exploring and transmitting complex spatial ideas.

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