USE OF COLOR IN RESIDENTIAL BUILDINGS: A CASE STUDY ON
FACADES OF APARTMENT BLOCKS IN ANKARA

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PELİN YURT

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ABSTRACT

USE OF COLOR IN RESIDENTIAL BUILDINGS: A CASE STUDY ON
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Color is a significant architectural element, which is open to become a major representative element in the process of design. This study aims to understand the limits of using color as an architectural element and discuss the transformative effects of the use of color with respect to meaning and design levels of buildings.

The study is composed of two main parts. In the first part limits of using color as a complementary and consequential part of design are discussed. The architectural understanding of color in the 20th century is utilized as the main ground for a contemporary case study. The case study in the second part uses residential buildings in Ankara as the main domain to understand the continuities and discontinuities between color preferences and architectural meaning.

The method of the study is based on comparison of the facades of residential buildings of various contexts, scales, languages and typologies in five different categories. The first category is "The Figural Use of Color" which is constituted by decorated facades. "The Elemental Use of Color" is the second category based upon

the continuity between tectonic elements of facade and color. The third is the "Material Color and Painting," which is based upon the color representations of the natural material preferences supported by additional painting. "Tectonic Use of Color" as the fourth frame implies color brought by the nature of the material. The last category is "Monochromatic Use of Color" in which the facades are colored in a single hue or different lightness of the same hue.

Keywords: Color in Architecture, Color in Residential Buildings

ÖZ

KONUT YAPILARINDA RENK KULLANIMI: ANKARA'DA APARTMAN BLOKLARI CEPHELERİ ÜZERİNDE BİR ÇALIŞMA

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Tez Yöneticisi: Doç. Dr. C. Abdi Güzer

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Renk, tasarım sürecinde, başlıca temsili eleman olmaya açık, önemli bir mimari elemandır. Bu çalışma yapıların anlam ve tasarım düzeyleri içinde, rengin sınırlarını anlamayı ve renk kullanımının dönüştürücü etkilerini tartışmayı amaçlamaktadır.

Çalışma iki ana bölümden oluşmaktadır. Birinci bölümde rengin tasarımı tamamlayıcı ve önemli bir unsuru olarak kullanım sınırları tartışılmaktadır. 20'nci Yüzyıl'da mimari renk anlayışının, güncel bir örnek inceleme için zemin oluşturmasından yararlanılmaktadır. İkinci bölümdeki örnek inceleme, renk tercihleri ve mimari anlam arasındaki süreklilik ve süreksizlikleri anlamak için Ankara'daki konut yapılarını başlıca alan olarak kullanır.

Çalışmanın yöntemi farklı konum, ölçek, dil ve tipolojilere ait konut yapılarının cephelerinin beş farklı kategoride karşılaştırılmasına dayanmaktadır. İlk kategori bezemeli cephelerden oluşan "Rengin Figürsel Kullanımı"dır. "Rengin Elemansal Kullanımı" cephenin tektonik elemanları ve renk arasındaki süreklilik üzerine kurulmuş olan ikinci kategoridir. Üçüncü kategori, doğal malzeme tercihlerinin

boya ile desteklenmiş renk temsiliyeti üzerine kurulmuş olan "Malzeme Rengi ve Boya"dır. Dördüncü çerçeve olarak "Rengin Tektonik Kullanımı" malzemenin doğasından gelen rengi belirtmektedir. Son kategori ise cephelerin tek renk ya da aynı rengin farklı açıklıklarda kullanıldığı "Rengin Monokromatik Kullanımı"dır.

Anahtar Sözcükler: Mimarlıkta Renk, Konut Yapılarında Renk

To My Father

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

The relationship between color and form has long been discussed by both architects and painters. Ozenfant and Le Corbusier maintained the idea of form preceding the idea of color in their first publications (Braham, 2002, p.6). They stated that "Form is preeminent, color is only one of its accessories. Colour depends entirely on the material form: the concept of a sphere, for example, precedes the concept of color" (cited in Braham, 2002, p.6). However, in the middle of 1930s, Ozenfant declared the reverse of this statement, "colour sensation precedes that of form," within the same idea with Signac, who is a Neo-impressionist painter (cited in Braham, 2002, p.6). He concluded that "colour is an essential element of architecture" as cited in Braham (2002, p.6).

Ozenfant (1937, quoted in Braham, 2002, p.105) states that:

> The architect is a poet. He must be a poet. Poet in
> form, colour and light. The three in one: the architect.

There has always been the search for beauty in the use of color in man-made environments which dates back to 15th Century. Leon Battista Alberti, in the Book Two of *Della Pittura*, says that, "...the clear colours are always near other different darker colours. This contrast will be beautiful where the colours are clear and bright" (Spencer, 1966, p.84).

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Semper (1989, p.197) describes beauty as "the magic by which art in its most varied forms and manifestations makes an impression on the soul, so that it is completely possessed by the work of art." He also declares that "delight in color was developed earlier than delight of form."(p.234). Forms exist with color in man-made environments and in nature. As Semper (p.234) states "… primitive man nowhere saw coatings of color in nature, but anywhere color was inseparable from form, penetrating it."

Color forms itself. It is nearly a tactile element of architecture. Swirnoff (2009, quoted in Porter and Mikellides, 2009, p.83) describes the formation of color as follows:

> How does color form? There are strategies of design,
> basic to three-dimensional contexts, which we have
> identified and expressed. Challenging the ingrained
> habit of totally separating the formal constituents,
> form and color – even form contra color – inculcated
> in Design education, I developed the theory that color
> is a dimension, by addressing both simultaneously.

Faulkner (1972, p.1) describes the basic elements of design in visual arts: color in painting, form in sculpture and line in architecture. He adds that they are not of rigid divisions. He maintains that architecture cannot be thought without color. The color use in buildings serves in many ways as Faulkner (1972, pp.5-6) summarizes:

> 1. It creates an atmosphere. A bright color scheme for
> a building tends to express gaiety and excitement; a
> quiet scheme may express dignity and repose.

> 2. It suggests either unity or diversity. A uniform
> color scheme contributes a sense of unity, while a
> varied color scheme gives a feeling of diversity.

> 3. It expresses the character of materials. If a building
> has a red tile roof, grey stone walls, and brown wood

trim, the essential character of each material is clearly stated. If these have the same color, the building looks like a clay model.

4. It defines form. A line, a two-dimensional surface, or a three-dimensional volume is defined if its color contrasts with its surroundings.

5. It affects proportions. Materials with contrasting colors laid in horizontal lines tend to emphasize a feeling of breadth. If laid in vertical lines, they promote the sense of height.

6. It brings out scale. A building made up of elements of uniform color looks like a monolith. Its scale is difficult to judge at a distance. If, however, its elements (including openings) are of contrasting colors, the scale of the building is more easily conveyed.

7. It gives a sense of weight. Elements in dark colors look heavy; those in light colors look light in weight. For this reason the color of tall structures is sometimes graduated from dark at the bottom to light at the top.

Faulkner's color argument about unity, proportion, scale and weight coincides with contemporary understanding of color in architecture. Actually it is highly associated with universal characteristics of color due to its relevance with perception.

Color has been an attractive phenomenon for science and philosophy. Newton had established an objective theory on color, while Goethe had founded his Theory of Color on a subjective thinking. Whether it is an objective or a subjective phenomenon, the architect always searched for logic to compose his forms, as underlined by Braham (2002, p.6):

> What architects really require is a logic of the color concepts that influence and organize their work rather than any unified theory of color physics, perception or psychology.

Braham describes 'modern architectural color' in his diagram working on two axes: one is corporeal and the other one is linguistic (Figure 1.1). Each axis is made up of two polar concepts. As accepted by Braham (2002, p.93), color arises on both axes simultaneously; due to the "simultaneous interaction of perceptual and cultural forces; it is already "linguistically corporeal and corporeally linguistic."
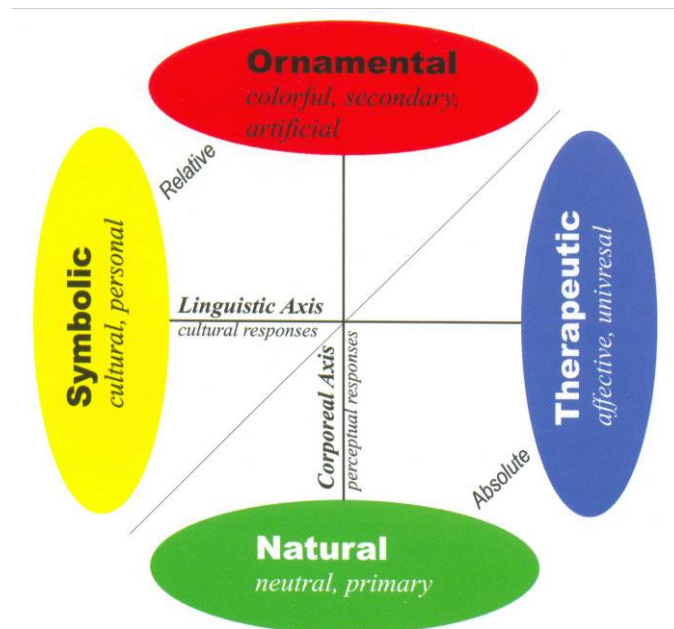
Figure 1.1 Braham's "Coordinates and concepts of modern architectural color" (2002)

This thesis aims to search where the color phenomenon states itself in contemporary built environment. The research aims to understand contemporary situation over the residential buildings in Ankara. Reading on residential buildings will not be misleading due to their large quantity in the urban environment.

Architecture results in the final expression composed of many structural parts. The meaning can be read trough the whole and the parts of the building. Building's proportions, balance between mass and void, materials used and references included are the main elements through which the meaning is read. Except from these, color is an important input brought by the material's tectonic or applied as painting. Color is sometimes the part of the design in a conscious way, or is the direct outcome due to the material or some other factors representing personal views that are inconsequential. Especially for the buildings that design is not much elaborated, color becomes dominant to produce and express the meaning. This study aims to understand limits of color with respect to meaning and design levels of buildings. Color could be the main idea of the design, being in harmony and continuity with the priorities of the building and environmental values; or, vice versa, it could be in opposition and discontinuity with its environment. With this approach, color can be a supporting element of basic thinking in design, uncovering the meaning and the expression of the building within a more prominent continuity, or, on the contrary, it can be the media representation causing incongruous and even competing meanings, by weakening the relations between the building and design. This problem is prominently perceived on residential buildings of large quantities in the countries like Turkey which constructional budgets are minimized by reduced designs. This study focuses on two parallel and interpenetrated problem starting from this claim. The first one is the forms of feedback on the process of architectural design by the use of color as a direct part of design as reflections of continuities and discontinuities to architectural environment with respect to the main idea of design. The second frame is the form of uncovering the problem stated above and its limits of affecting and transforming design for low budget buildings which constitute the common expression of this problem in the urban context.

Starting from this problematic the thesis contains two main parts. In the first part limits of using color as a complementary element of design are opened to discussion. The architectural understanding of color in the 20th century is utilized as a main ground for a contemporary case study. In the second part, the projection of

the discussion stated above to the urban context is tried to be evaluated over the case Ankara with its residential buildings.

The method of the thesis is based on the comparison of the residential buildings of various contexts, scales and typologies. Here, form of color use within the design process or constructional applications is used as a frame to distinguish the relations of basic structural elements and traditional approaches of architecture; the classifications essential to the evaluation are carried out within this frame. This case study creates a background to discuss the use of color within the process and the forms of feedback in architectural design; and in the conclusion decisiveness of the use of color is opened to discussion with regard to the cases.

CHAPTER 2

COLOR IN 20TH CENTURY

2.1. Statements of Color in *Programs and manifestoes on 20th-century Architecture*

At the turn of the 20th century, architecture was in need to create its own sense in its contemporaneous meaning. Re-design of old styles with new techniques was not contributing to potentialities of new architectural elements. Architects began to announce 'artistic cultivation,' pointing out pure forms (Van de Velde, 1903, quoted in Conrads, 1994, p.13).

Henry van de Velde was one of preceding architects who declare the need to search for that new meaning. This Art Nouveau architect told in his *Programme* that it was "not easy nowadays to find the exact meaning and the exact form for the simplest things" (Van de Velde, 1903, p.13). After him, Hans Polzeig showed a mediating statement between the romantic-idealistic and radical-objective attitudes of the new architecture of his era. In his manifesto in 1906, *Fermentation in architecture*, he did not turn his back to the past, but refused the surface decoration (Polzeig, 1906, p.15):

> Above all, wallpapers, textiles, glass windows,
> surface decoration, and minor arts of all kinds at the
> German Exhibition of Applied Art show this clearly
> enough, and architecture too demonstrates the
> decorative skill of its creator. But both the successful
> and the unsuccessful solutions clearly reveal that a
> true architecture is not to be achieved with the
> armoury of decoration, that the problems of
> architecture cannot be mastered by purely external
> means.

> Flight from everything historical can no more bring salvation than a purely decorative return to forms from the past.

> We cannot do without the past in solving the architectural problems of our own day. We may dispense with the externals, but not with the work done in the past on the mastery of tectonic problems.

The first and the most radical purist approach is of Adolf Loos who stated that "Ornament is a crime."[1] He claimed that *The evolution of the culture is synonymous with the removal of the ornament from utilitarian objects*" (Loos, 1908, p.20). According to Loos (1908, p.22) Art Nouveau was of the modern ornamentalist whom he called "a straggler or a pathological phenomenon" referring to Otto Eckmann and Henry van de Velde.

Consequently, vanishing of the articulation and purification of the form are first steps in seeking for the identity of Modern Era in architectural discourse. Frank Lloyd Wright contributed to the statement with his *Organic Architecture* in 1910. He drew his architectural ideal over the dwelling.

It is not until 1914 that a clear statement with respect to color can be read. In their manifesto of Futurist architecture, Sant'Elia and Marinetti (1914, p.25) proposed 'original' use of colored material instead of decoration:

> That decoration, something imposed upon architecture, is an absurdity and that 'the decorative value of Futurist architecture depends solely upon the original

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[1] Crime analogy of Loos: "The Papuan kills his enemies and eats them. He is not a criminal. But when modern man kills someone and eats him he is either a criminal or a degenerate. Papuan tattoos his skin, his boat, his paddles, in short everything he can lay hands on. He is not a criminal. The modern man who tattoos himself is either a criminal or a degenerate. There are prisons in which eighty per cent of the inmates show tattoos." (Loos, 1908, quoted in Conrads, 1994, p.19)

use and arrangement of the raw or bare or violently
colored material'.

At the end of the First World War, the famous first manifesto of De Stijl, the group led by Theo van Doesburg, was introduced. 'Purity' was the keyword. They offered 'the organic combination of architecture, sculpture and painting in a lucid, elemental, unsentimental construction' (Conrads, 1994, p.39).

No exercise on color is seen in the first manifesto. But in 1923, De Stijl announced bold use of color in their 'Manifesto V: - □ + = R_4' (van Doesburg, van Eesteren and Rietveld, 1923, p.66). It was the time that color was regarded as producing a 'new dimension'. De Stijl declared that:

> We have examined the laws of colour in space and
> time and have established that the mutual
> harmonization of these elements produces a new and
> positive unity.

> We have examined the relationships between space
> and time and found that the process of rendering these
> two elements visible through the use of colour
> produces a new dimension.

De Stijl is one of the first statements that color represents itself as an architectural means. In 1920s, preceded by Le Corbusier, white washed walls were of collective interest in sake of 'purity.' While hygienic architecture of 'white' was in fashion, De Stijl exercised the primary colors –red, yellow, and blue- bravely, on architectural surfaces. Le Corbusier used color in 'dynamic' way while Doesburg's method was named 'neoplastic' (Braham, 2002, p.62). The Italian architect, Alberto Sartoris who dedicated himself colorist, described 'dynamic' and 'neoplastic' opposition. According to him, method of Le Corbusier was "'dynamic' because of the optical tension created by differently colored walls and stressed the preservation of the form, volume and purpose of each colored area from the destructiveness or

decorativeness of the coloring." But method of De Stijl was the opposite: "The areas of primary color cover the surface, crossing corners and boundaries. Le Corbusier had complained that they destroyed the unity of the walls, and though the rectilinear color areas do alter the appearance of the form, they still operate in a formal composition with the architecture" (Braham, 2002. pp.62-63). Figures 2.1 and 2.2 illustrate the use of color by Doesburg in 'neoplastic' method. 'Dynamic' use of color by Le Corbusier is shown by Figures 2.3 and 2.4.
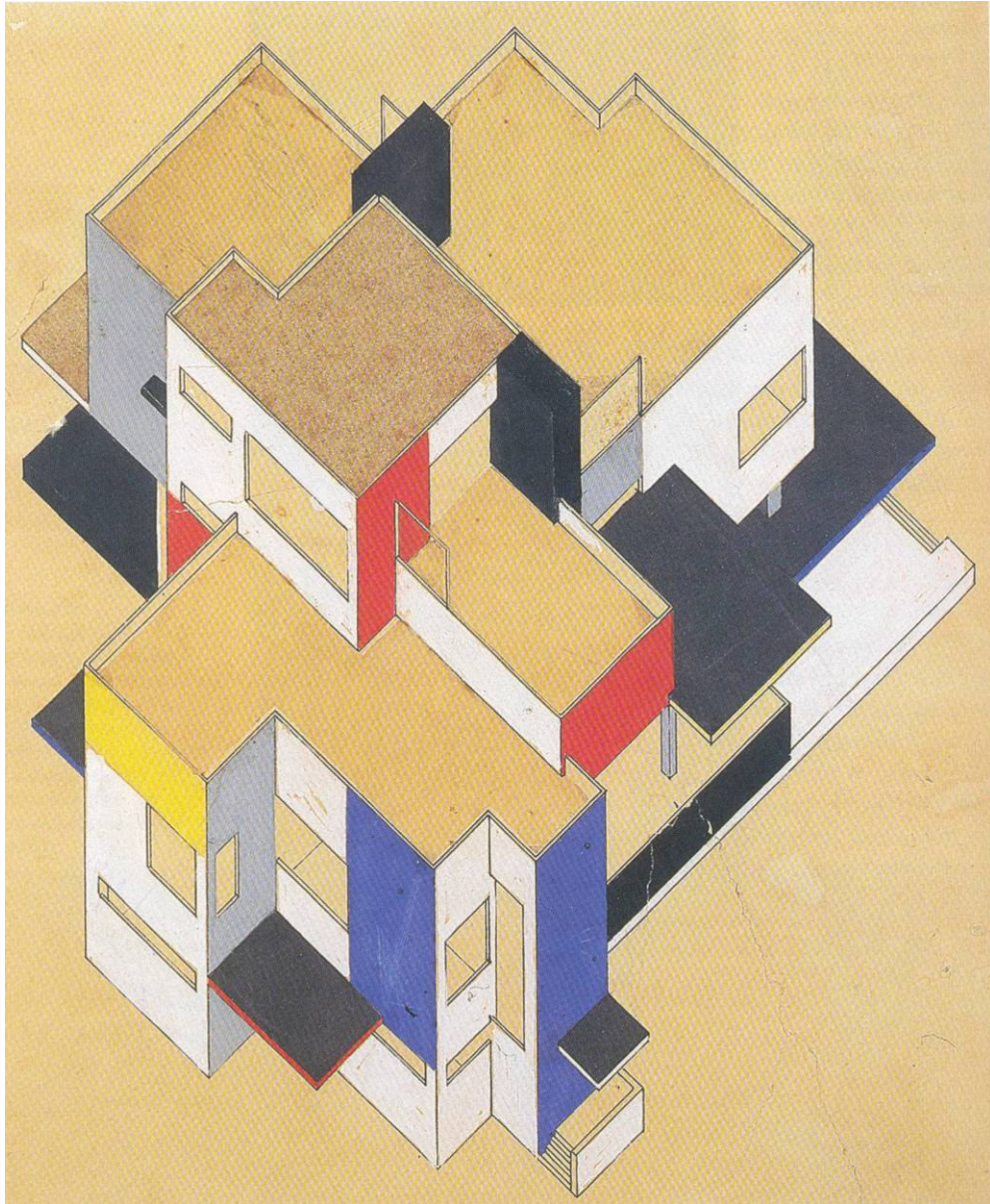
Figure 2.1 Axonometric drawing of Maison Particuliére, showing neo-plastic application of color, by Theo van Doesburg and Cornelis van Eesteren (1923, Colquhoun, 2002, p.116)
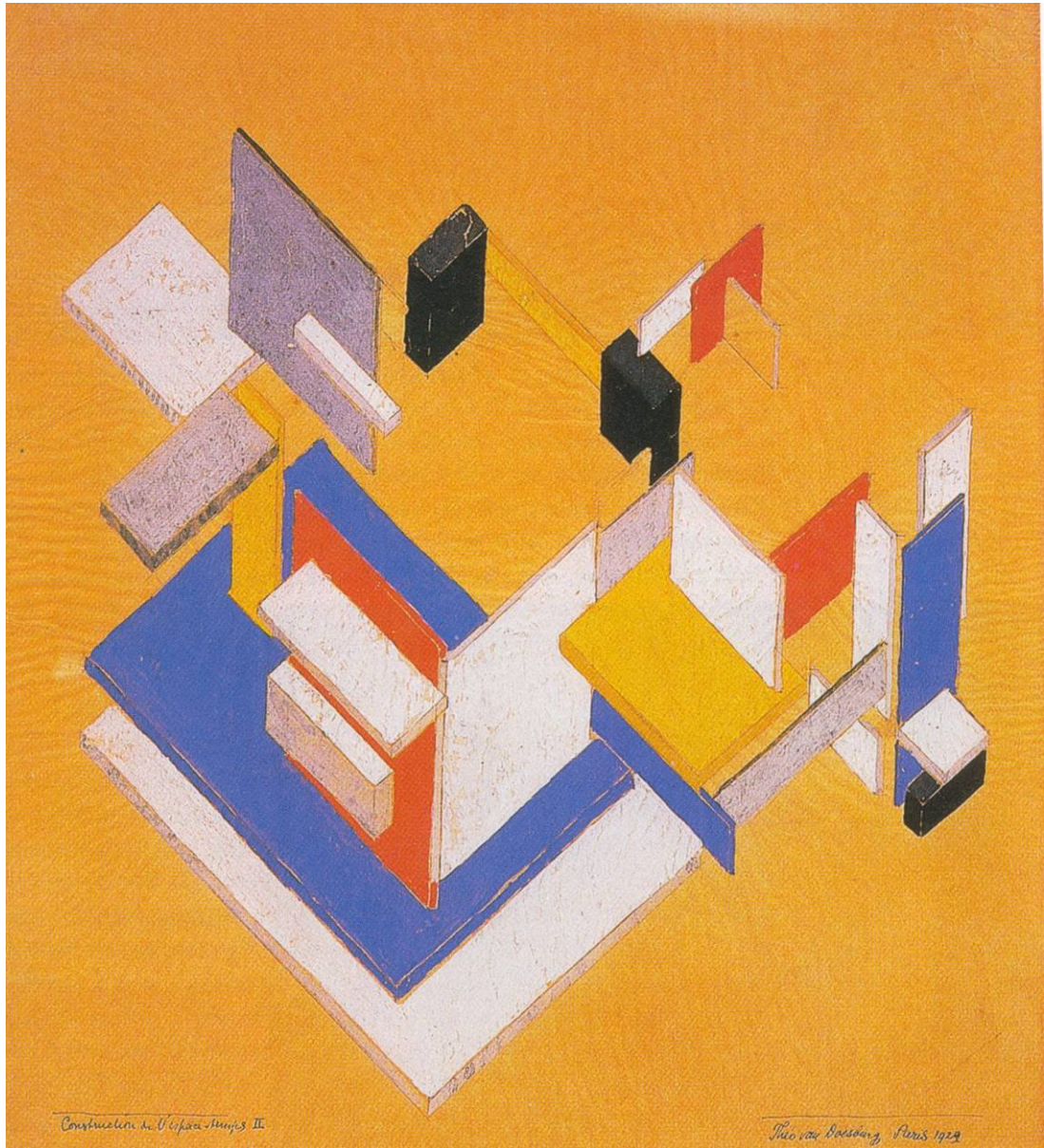
Figure 2.2 Counter-Construction (Construction de l'espace-Temps II), 1924, by Van Doesburg, showing form and color integration by means of surfaces (Colquhoun, 2002, p.117)
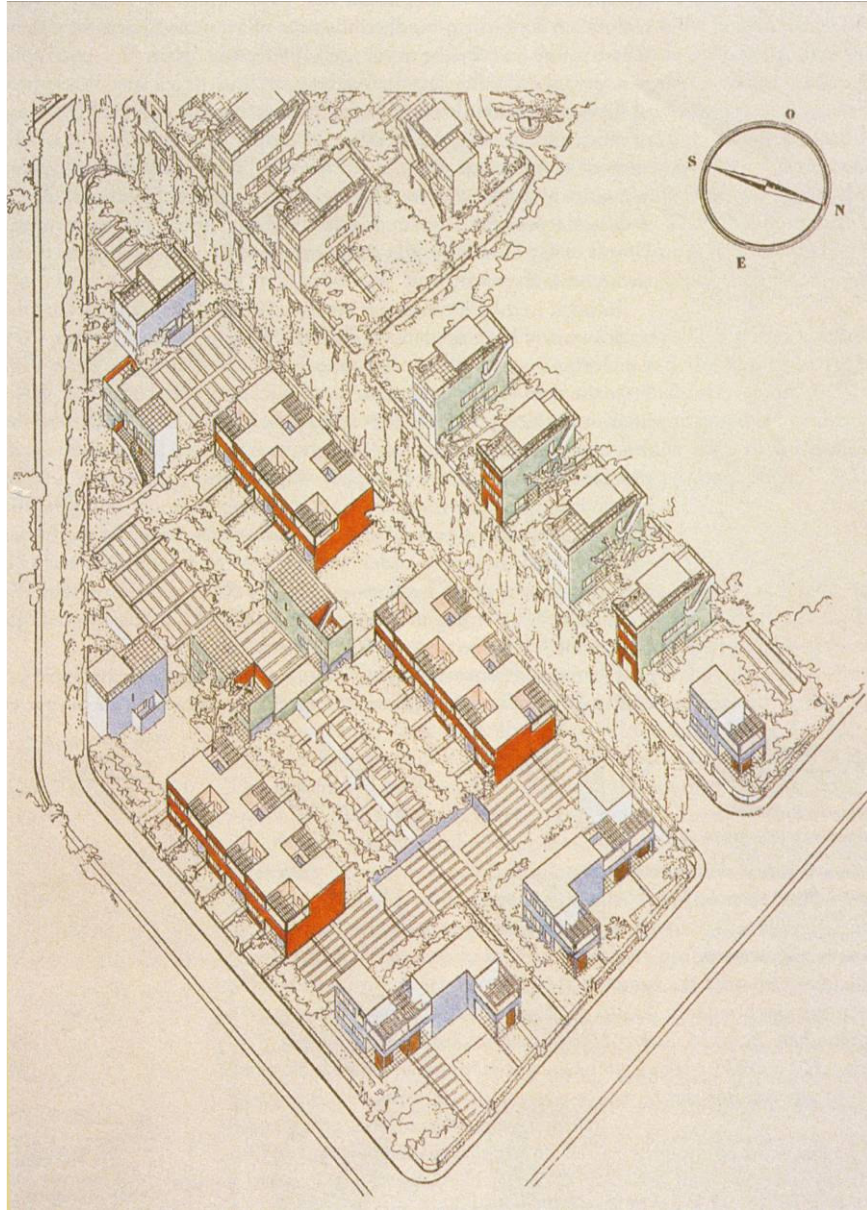
Figure 2.3 Le Corbusier's dynamic use of color (1920s, Colquhoun, 2002, p.147)
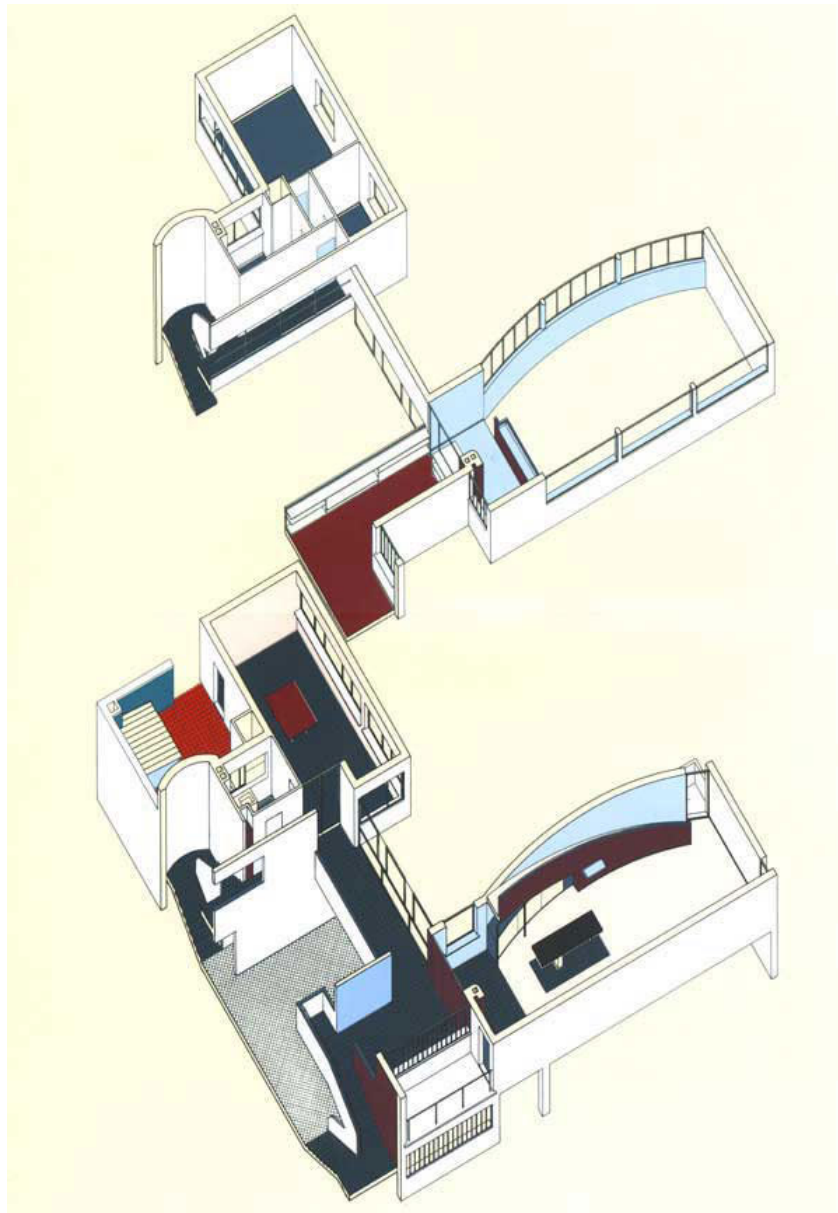
Theo van Doesburg has also generated the hierarchy of color use in architecture. Figure 2.5 illustrates the pyramid of architectural color. Braham states that (2002,

available at: http://mysite.verizon.net/~brahamp1/solidity/cs_gen1.htm [Accessed 10 April 2010]):

> Van Doesburg sought a purified and unified architecture, which would then become 'animé', offering something like the elusive vitality that Ozenfant had attributed to color contrasts. Also like the proposal for Colour Solidity, the nature of that vitality emerges more clearly in the discussion of the means by which such an aesthetic rapport could be achieved. According to van Doesburg's stages of architectural coloring, the lowest level was a neutral gray room, the 'blind' room of no differentiation at all, the basic condition of most interior painting. Sartoris rejected this condition as well, arguing that his 'theories oppose the monotony of monochrome interior architecture'. The second level was attained through the use of 'Intervals' or variation in brightness, while the third was accomplished through 'Contrasts' of complementary hues.
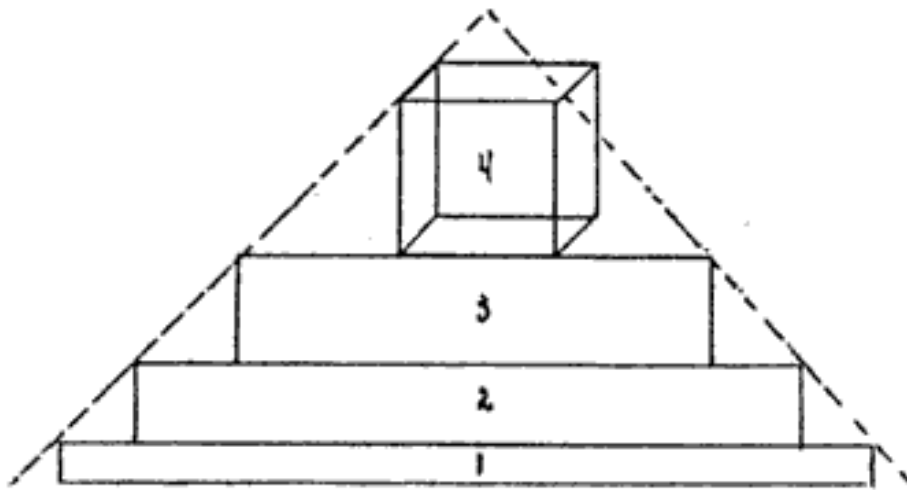
Figure 2.5 Theo van Doesburg, hierarchy of architectural color: 1 neutral or 'blind'; 2, decorative; 3, constructive; 4, creative. (Available at: http://mysite.verizon.net/~brahamp1/solidity/cs_gen1.htm [Accessed 10 April 2010])

After the big De Stijl exhibition at Galerie de l'Effort Moderne which brought young architects of Paris into contact with the movement, in 1924, Doesburg

organized a demonstration of the 'new domestic architecture'(1924, pp.78-80). He stated that:

> In contrast to frontalism, which had its origin in a rigid, static way of life, the new architecture offers the plastic richness of all-sided development in space and time.

> Colour. The new architecture has done away with painting as a separate and imaginary expression of harmony, secondarily as representation, primarily as coloured surface.

> The new architecture permits colour organically as a direct means expressing its relationships within space and time. Without colour these relationships are not real, but invisible. The balance of organic relationships acquires visible reality only by means of colour. The modern painter's task consists in creating with the aid of colour a harmonious whole in the new four-dimensional realm of space-time – not a surface in two-dimensions. In a further phase of development colour may also be replaced by a denaturalized material possessing its own specific colour (a problem for the chemist) – but only if practical needs demand this material.

> The new architecture is anti-decorative. Colour (this is something the colour-shy must try to grasp) is not a decorative part of architecture, but its organic medium of expression.

Figure 2.6 illustrates a poster work of facade of Café de Unie by Oud and
Doesburg. It is a typical example in De Stijl movement with respect to color use.
The original building was in Coolsingel and destroyed in World War II. It was
rebuilt in Mauritsweg, in a part of Rotterdam in 1986 (Available:
http://www.mimoa.eu/projects/Netherlands/Rotterdam/Cafe%20De%20Unie
[Accessed 14 May 2010]).

Beginning from the turn of the 20th-century, demand for universal coding in color
gave way to studies in color theory. A physical chemist, and an amateur painter,

Willhelm Ostwald, concentrated on color problems and established a mathematical approach to psychological aspects of color (Gage, 1993, p.247). He offered his systematic study, *Die Farbenfibel - The Color Primer* (1916, quoted in Gage, 1993, pp. 248-259) which seems to be central in De Stijl coloring. Figure 2.7 illustrates Ostwald's color system, suggesting a universal coding system. The Ostwald system creates a color space mapping the values of hue, saturation and brightness. Color circle is based on four hues, yellow, red, blue and green. Colors are identified as mixtures of hues with white and black (Braham, 2002, available at: http://mysite.verizon.net/~brahamp1/mcma/mcma_sys.htm [Accessed 10 April 2010]).
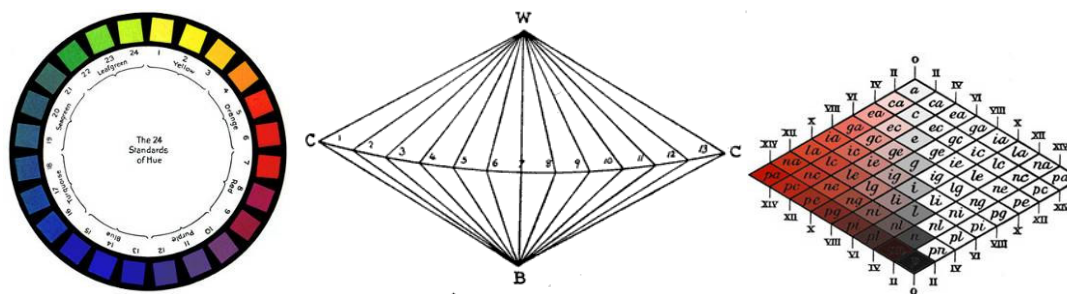
Figure 2.7 Ostwald's Color Circle, Color Solid and Color Section. (Available at: http://mysite.verizon.net/~brahamp1/mcma/mcma_sys.htm [Accessed 10 April 2010])

These systematic studies projected on design realm as well. The wallpaper company Salubra asked famous artists to design color palettes. "Le Corbusier designed two collections for Salubra: the «Claviers de couleurs» in 1931 with 43 shades, and the Salubra collection in 1959 with 20 colors. In both cases, various patterns were added (rhomboids, dots, marble, imitations, etc.)" (Available at: http://answers.google.com/answers/threadview/id/77952.html [Accessed10 May 2010]).

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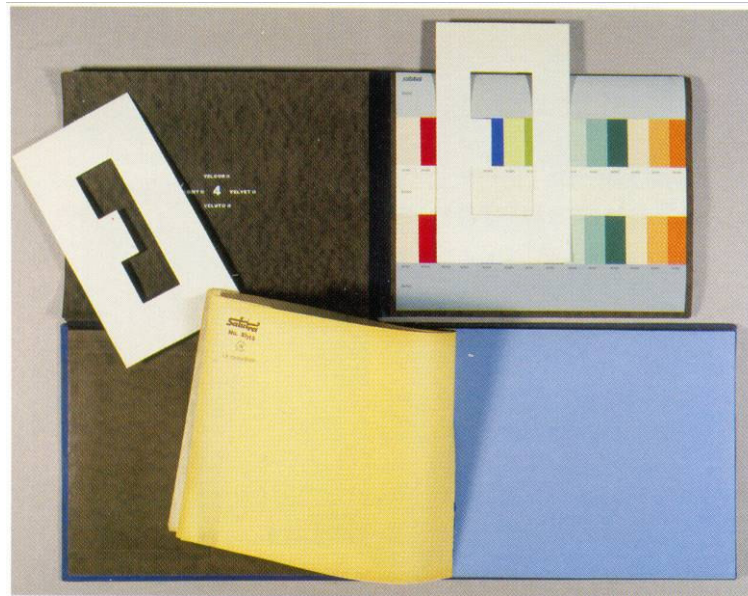
Figure 2.8 Color palette of Le Corbusier which he designed for Salubra Collection in 1931 (Braham, 2002, p.62)

In 1926 Walter Gropius declared the "Principles of Bauhaus production". He (1926, p.95) stated that "…to design it to function correctly – a container, a chair, or a house – one must first of all study its nature; for it must serve its purpose perfectly, that is, it must fulfil its function usefully, be durable, economical and 'beatiful'." On this basis, "to develop a new attitude toward design", Gropius (1926, p.95) offered "the limitation to characteristic, primary forms and colours, readily accessible to everyone; simplicity in multiplicity, economical utilization of space, material, time and money."

After 1926, architectural manifestoes concentrate on form. Ludwig Mies van der Rohe (p.102) declares "On form in Architecture" and Hugo Häring (p.103) "Formulations towards a reorientation in the applied arts" in 1927.

In the manifestoes, rejections and oppositions to 'Functional Architecture' can be read after the World War II. Frederick Kiesler (p.150) states "Magical Architecture" in 1947. There is not any statement on color until 1958.

In 1958, Hundertwasser opposed to rational architecture. He refused straight lines of architectural elements. Being a painter, Hundertwasser declared that functional architecture was in "a wrong road, just like painting with a ruler" (1958, p.158). He defended the freedom in painting one's own house:

> A man in an apartment house must have the
> possibility of leaning out of his window and scrapping
> of the masonry for as far as his hands reach. And he
> must be allowed to paint everything around the pink
> as far as he can reach with a long brush, so that
> people can see from far away, from the street: a man
> lives there who differs from his neighbours, the little
> people who accept what is given to them! And he
> must be able to saw up the walls and carry out all
> sorts of alterations, even if the architectonically
> harmonious picture of so-called masterpiece of
> architecture is thereby destroyed, and he must be able
> to fill his room with mud or plasticine.

He designed 'fairy-tale' buildings. His famous *Hundertwasserhaus* was built in many cities, in Vienna, 1986; in Plochingen, 1992; in Darmstadt in1999; in Magdeburg, 2004 (Available at: http://en.wikipedia.org/wiki/Hundertwasserhaus [Accessed 10 January 2007]). Figure 2.9 illustrates the most famous one, which is in Vienna built by architects Joseph Krawina and Peter Pelikan.

Figure 2.9 Hundertwasser House Vienna. (Available at:
http://en.wikipedia.org/wiki/Image:Hundertwasserhaus.jpg#file [Accessed 10 January 2007])

2.2. Ozenfant's Contribution to Modern Architectural Color: "Colour Solidity"

According to Willliam Braham, Ozenfant did not write to justify his practice but he examined color directly unlike other architects, such as Le Corbusier, Theo van Doesburg and Bruno Taut (Braham, 2002, p.3). In his article in *Architectural Review,* in 1937, Ozenfant (appendice in Braham, 2002, p.113) describes his 'color solidity' as: "meaning the effective solidity of color compositions based on the psychological properties of hues; not forgetting the material solidity of colors." According to him, architectural solidity was the "*effect* to be achived with the 'virtual' colors in the eye by simultaneous contrast" (Braham, 2002, p.4). He had studied his term solidity and found out three rules (Ozenfant, 1937, quoted in Braham, 2002, p.113):

> 1. Very bright hues are less solid chemically (and generally also appear less solid) than more neutral hues.

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2. In the same pigment the most intensely pigmented color is the most solid chemically (and psychologically). A pink obtained by adding red to white is less solid in 'feeling' and in duration than red.

3. Clear hues are generally more fragile than sombre ones.

It is needed to define color terms that are used in the declarations above. 'Hue' is one of the three definitive characteristics of color; the others are 'saturation' and 'brightness' generated from Ostwald Color System. Harold (2001, p.4) explains the three terms of color:

"Hue is the attribute that corresponds to whether the object is red, orange, yellow, green, blue, or violet.

A second attribute of color, and a readily appreciated one, is saturation. Saturation is determined by how far from the gray (lightness) axis toward the pure hue at the outer edge that a color is perceived to be. A pastel tint, for example, is said to have a low saturation while a pure color is said to have high saturation.

A third attribute or dimension of color is associated with an object's luminous intensity (usually lightreflecting or transmitting capacity).

This attribute is variously called lightness, value, and sometimes, although incorrectly, "brightness."

In color communication, particularly when discussing color differences, lightness, chroma and hue (LCH) are the most frequently used" (Harold, 2001, p.4).
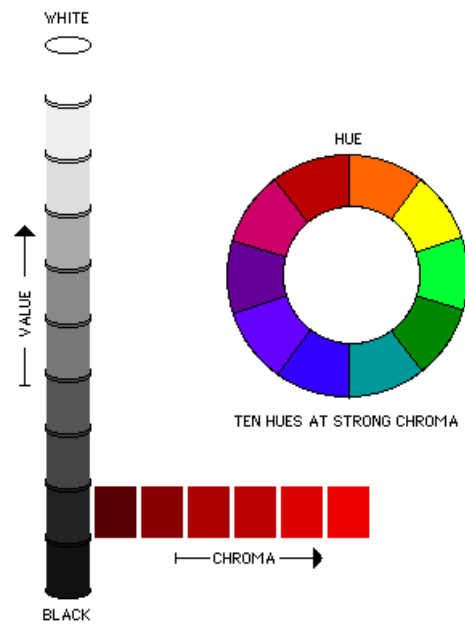
Figure 2.10 Hue, Chroma and Value (Adapted from online image. Available at:
http://personal.uncc.edu/lagaro/cwg/color/munsell1.gif [Accessed 5 May 2010])

Figure 2.10 shows the relations of hue, saturation (chroma) and lightness (value) in three dimensional system. 'Tint' is another color term implies the color approaching the white, e.g. pink is a tint of red. 'Shade' is used to define the color approaching black, e.g. navy is a shade of blue.

The 'pigment' is a substance, material that gives the color (Available at: http://en.wikipedia.org/wiki/Pigment [Accessed 20 February 2010]).

Ozenfant practiced his methods of color applications and published his articles in Architectural Review (1937, appendices in Braham, 2002). Figures 2.11 and 2.12 illustrate "a design for the colour-decoration of a flat in London based on the methods of colour selection and relationship already discussed by Ozenfant in his articles" (quoted in Braham, 2002, available at: http://mysite.verizon.net/~brahamp1/ozenfant/solid.htm [Accessed 5 March 2010]).
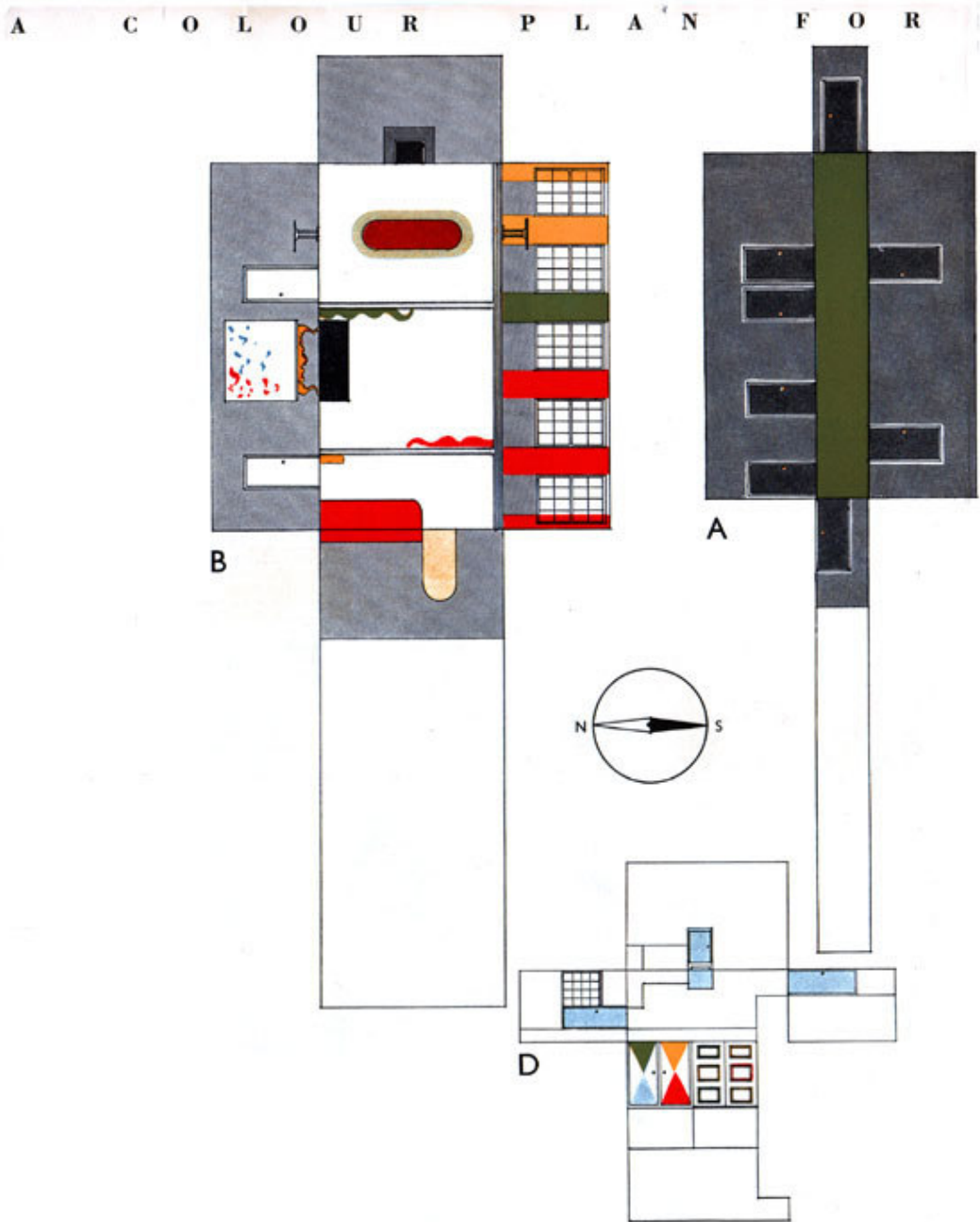
Figure 2.11 "A Color Plan for a Flat in London" (Available at:
http://mysite.verizon.net/~brahamp1/ozenfant/oz_solid/Solid2-1.jpg [Accessed 5 March 2010])
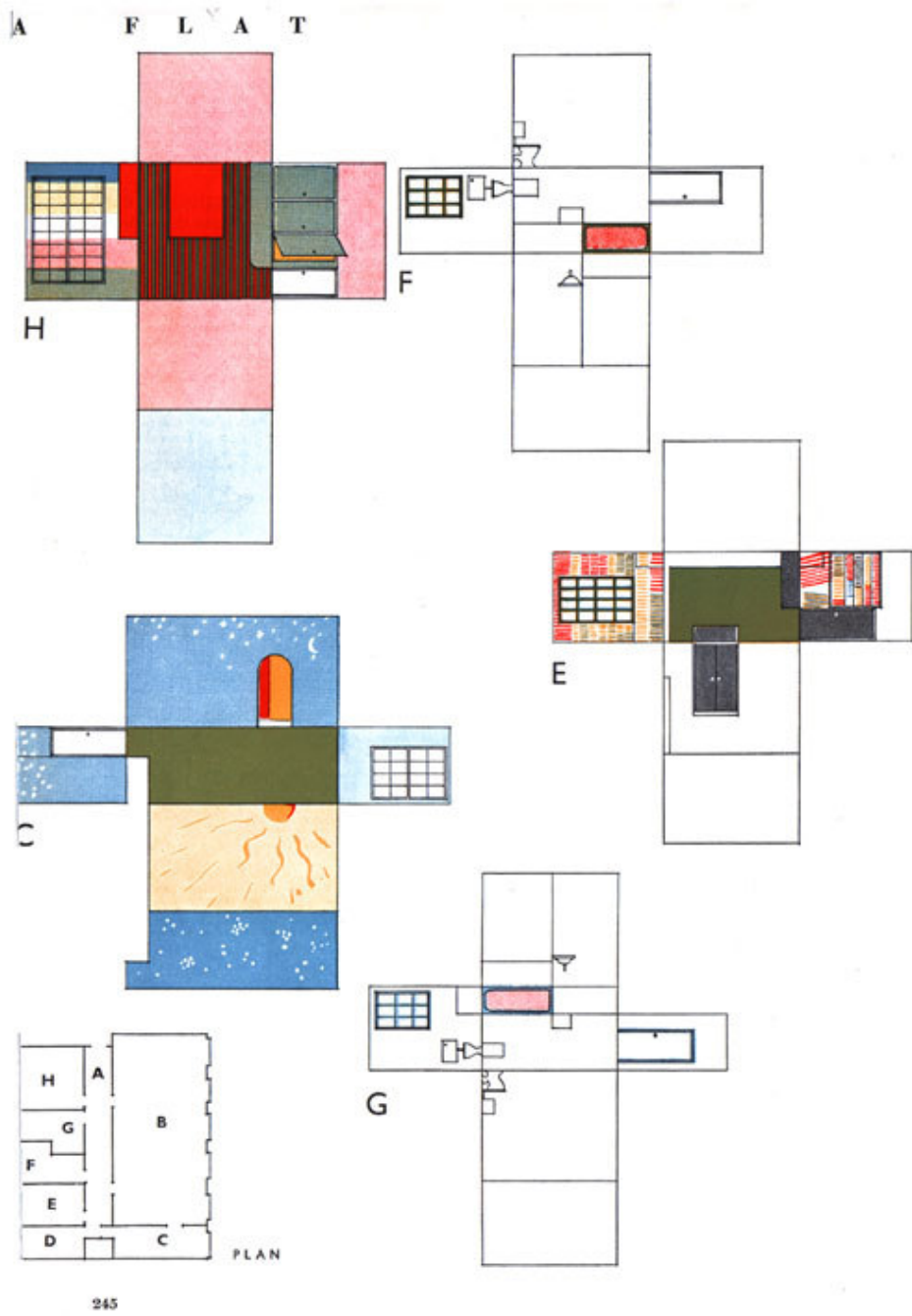
**Figure 2.12 "A Color Plan for a Flat in London" (Available at:
http://mysite.verizon.net/~brahamp1/ozenfant/oz_solid/Solid3-1.jpg [Accessed 5 March 2010])**

2.3. White walls of Modern Architecture and the Dress Code

Semper (1989, p.102) in his book *The Four Elements of Architecture* states that four elements are the *hearth (the moral element)*, the *roof*, the *enclosure* and the *mound (terrace)*. He continues (Semper, 1989, p.103):

> According to how different human societies developed under the varied influences of climate, natural surroundings, social relations, and different racial dispositions, the combinations in which the four elements of architecture were arranged also had to change, with some elements becoming more developed while others receded into the background. At the same time the different technical skills of man became organized according to these elements: ceramics and afterwards metal works around the hearth, water and masonry works around the mound, carpentry around the roof and its accessories.

> But what primitive technique evolved from the enclosure? None other than the art of the wall fitter (Wandbereiter), that is, the weaver of mats and carpets.

In addition, he enunciates that from the Nomadic Tent, to Tartar-Chinese way of building, the carpet, "as a *wall,* as a vertical means of protection" took a great role in the evolution of "certain architectural elements" (Semper, 1989, p.103). He claims that "wickerwork was the *essence of the wall"* (Semper, 1989, p.104). At this point, Semper implies a correlation between dressing and architecture. He states that the German word *Wand* (wall) and *Gewand* (dress) derives from the same root. He draws this correlation of costume with architecture more explicitly by this statement: "The principle of dressing has greatly influenced style in architecture and in other arts in all periods and in all nations" (Semper, 1989, p.246).

Similarly, the same analogy is rewoven by Wigley (1995) in his book *White Walls, Designer Dresses.* However he refuses the idea that architecture follows the

dressing fashion on which Semper established his "Principle of Dressing" (Wigley, 1995, p.12). As Wigley declares (1995, pp.12-13):

> But architecture does not follow or resemble clothing. On the contrary, clothing follows architecture. The definition of domestic interiority precedes the definition of the interiority of the body. The clothing of the individual follows the clothing of the family. The body is only defined by being covered in the face of language, the surrogate skin of the building. The evolution of skin, the surface with which spatiality is produced, is the evolution of the social. The social subject, like the body with which it is associated, is a product of decorative surfaces. The idea of the individual can only emerge within language. Interiority is not simply physical. It is a social effect marked on the newly constituted body of the individual.

Wigley (1995, p.15) also states that Semper's "Principle of Dressing" was followed by Adolf Loos with his "Law of Dressing" and that was also transformed to "Law of Ripolin" by Le Corbusier. Loos established his argument on the cladding which is the layer between the structure and the ornament. In this way, following Semper, he founded his discourse on a "coat of paint," although he rejects Semper's ideas (Wigley, 1995, p.14). Thus, Loos's law "to keep the naked-clothed distinction" is, in a way, the maintenance of Semper's "Principle of Dressing" (Wigley, 1995, p.15). Le Corbusier's "Law of Ripolin" offered to replace the layer of ornament with a coat of white paint:

> The rejection of decoration in favor of the cultivated eye is explicitly understood as a form of purification....Whitewash liberates visuality. It is a form of architectural hygiene. (Wigley, 1995, p.3)

> The identity of modern architecture seems inseparable from the whiteness of its surfaces. The very idea that there is such a thing as "modern architecture," a set of principles or practices that unite an otherwise heterogeneous group of architects and buildings,

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seems to turn on the white walls they share. Yet these walls are rarely discussed. (Wigley, 1995, p.xiv)

Clearly, Le Corbusier's argument has to be understood in terms of the central role of whiteness in the extended history of the concept of cleanliness. Modern architecture joins the doctor's white coat, the white tiles of the bathroom, the white walls of the hospital, and so on. Yet the argument is not about hygiene per se. It is about a certain look of cleanliness. Or, more precisely, a cleansing of the look, a hygiene of vision itself. Whitewash purifies the eye rather than the building. Indeed, it reveals the central role of vision in hygiene. After all, the "clean" white surface is not such a simple thing. (Wigley, 1995, p.5)

As well as colors of hues, the white is also needed to be designed. Foster, in some of his projects, has worked with a color designer. He is satisfied with the final products, as he declares (Foster, n.d., quoted in Arnoldi, 2007, p.7):

Too often, perhaps, as architects, we are hypnotised by white, silver and grey. Per has helped us to add a splash of colour to our palette. For me, the most successful collaborations with Per have also had a strategic component. In each case, adding colour has brought our thinking into sharper focus.

2.4. Color in Contemporary Architecture

Characteristics of Modern Architecture are still eminent in contemporary perspective. Kortan (n. d., in Exhibition Catalogue: *Uluslararası Yeni Yapı Sanatı 1927/2002,* 2006, p.21) provided an example: "It is obviously seen that Pritzker awarded architect Zaha Hadid has been inspired from De Stijl principles in designing Rosenthal Center for Contemporary Art." Not in the use of color, but, this affiliation was in the plasticity of the forms, as seen in the Figure 2.13.

Figure 2.13 Rosenthal Center for Contemporary Art, Cincinnati (Available at: http://www.pritzkerprize.com/2004/pdf/Rosenthal.pdf [Accessed 14 January 2007])

As Lois Swirnoff (2009, p.83) implies 'identity and meaning are conferred by color.' Color's spatial contribution must not be disregarded. She declares that (Swirnoff, 2009, p.83):

> Color in contemporary architecture remains a new challenge.
> While color is highly expressive, and by association
> connotes affective states of feeling and meaning, to correlate
> its use solely with 'expression' leads to the incoherent,
> largely arbitrary use in the contemporary environment.

Color vigorously states itself in contemporary architectural environments. Hitherto color science and psychology promoted color as a means of communication. Color in its representation has found its place as a syntactic element in the architecture.

Michael Graves is the one who exemplifies this idea, making use of color in his architectural thinking. In terms of modern / postmodern duality, Graves's works 'oscillates' between the two. This architect of New York Five uses architectural elements metaphorically, with a modern conception of structure and plan. Colquhoun (1981, p.173) states that: "The most fundamental source of Graves's work (and it is this which links him with the other members of the so-called New York Five) is Le Corbusier." What is rejected is that the "rejection of functionalism" as a means of formal expression (Colquhoun, 1981, p.172). As Colquhoun (1981, p.172) designates:

> In the work of both Graves and Eisenman, this linear relation between content and form has been rejected. Function has been absorbed into form. "Functional" meanings still exists, but they no longer constitute a prior condition or derive their nourishment from a pragmatic level of operation. They are reconstructed on the basis of the building as a pure work of art, with its own internally consistent laws.

Within these "consistent laws," color states itself to reinforce the "elementarist"[2] and "figurative" (Norberg-Schulz, 1989,pp.7-14) language. Figure 2.14 illustrates Graves' design for a special education charter school which the color plays an important role for severely disabled children.

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[2] "Graves's elemantarism is related both to the architecture of the Modern Movement and to Modern art in general. It is tied to an elementarization and the disappearance of craft, and it stirves for the condition of the tabula rasa, the primal statement." (Colquhoun, 1981, p.173)

**Figure 2.14 St. Coletta School in Washington D.C., by Michael Graves, 2006 (Available at:
http://www.michaelgraves.com/files/arch/pdf/stcoletta.pdf [Accessed 15 January 2007])**

CHAPTER 3

PHENOMENAL CONCEPTION OF COLOR

Color researchers emphasize the conscious and subconscious effects of color in human life. Psychology, dealing with mental and emotional processes, studies effects of color with regard to human response to color, i.e. psychological reaction. By the term "phenomenal", the use of color is described within its form of perception, symbolism and connotation.

Wittgenstein (1977, p.13e) states that "Psychology describes what was observed." Based on a phenomenon of being perceived, color takes place as a subjective discourse being a striking subject for psychologists as well as philosophers.

3.1. Perception and Experience of Color

Psychologists and philosophers study on color, based on its perceptional feature. To illustrate, according to Wittgenstein (1977, p.13e) color-blindness has not the same meaning for a normal sighted person and a color-blind person. A color-blind person cannot establish the concept of color-blindness as a normal person does. He also declares that determining the color depends on the comparison, again, relying on its perceptional characteristics (Wittgenstein, 1977, p.50e):

> I give a colour name "F" and I say it is the color that I see there. Or perhaps I paint my visual image and then simply say "I see this". Now, what colour is at this spot in my image? How do I determine it? I introduce, say, the word "cobalt blue": How do I fix what 'C' is? I could take as the paradigm of this colour a paper or the dye in a pot.

How do I now determine that a surface (for example)
has this colour? Everything depends on the method of
comparison.

Color wheels are significant studies since color concept is highly based on
perception and it is hard to find a color's linguistic signifier. Wittgenstein says that
he could choose a colour described as 'reddish yellow' among several samples,
while the description of 'blueish yellow' has no sense for him (Wittgenstein, 1977,
p.20e). He specified '…ish' colours as "Language-games," emphasizing the
subjectivity of color concept (Wittgenstein, 1977, pp.20e-21e):

There is such a thing as perfect pitch and there are
people who don't have it; similarly we could suppose
that there could be a great range of different talents
with respect to seeing colours. Compare, for example,
the concept 'saturated colour' with 'warm colour'.
Must it be the case that everyone knows 'warm' and
'cool' colours? Apart from being taught to give this or
that name to a certain disjunction of colours.

Couldn't be a painter, for example, who had no
concept whatsoever of 'four pure colours' and who
even found it ridiculous to talk about such a thing?

Or in other words: are people for whom this concept
is not at all natural missing anything?

Ask this question: Do you know what "reddish"
means? And how do you show that you know it?

Language-games: "Point to a reddish yellow (white,
blue, brown)-"Point to an even more reddish one"-"A
less reddish one" etc. Now that you've mastered this
game you will be told "Point to a somewhat reddish
green." Assume there are two cases: Either you do
point to a colour (and always the same one), perhaps
to an olive-or you say, "I don't know what that
means," or "There is no such thing."

> We might be inclined to say that the one person had a
> different colour concept from the other; or a different
> concept of '…ish.'

If color is a perceived phenomenon, then it must lead to be experienced. Frank H. Mahnke[3] has analyzed and systematized this experience through a pyramid scheme. At top of his "Color Experience Pyramid", there is personal relationship to color that is "connected and *influenced by all the other levels*" (Mahnke, 1996, p.10). Figure 3.1 illustrates six levels in The "Color Experience Pyramid" structured by Mahnke.

Personal
Relationship

Influence of Trends,
Fashion, Styles

Cultural Influences and Mannerisms

Conscious Symbolism—Associations

Collective Unconscious

Biological Reactions to a Color Stimulus
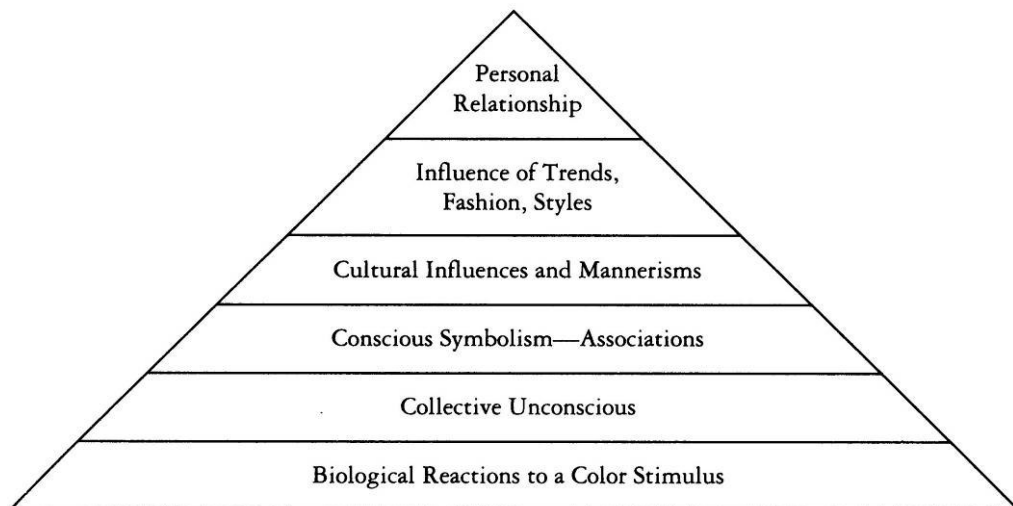
Copyright © Frank H. Mahnke 1990

Figure 3.1 The Color Experience Pyramid by Mahnke.(1996, p.11)

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[3] Mr. Mahnke is president of the International Association of Color Consultants/Designers. He is an enviromantal designer and the founder and director of the American Information Center for Color and Environment in San Diego, California.

3.2. Psychological Effects-Human Response

Psychologists say that certain colors act as a stimulus, causing emotional reactions. The effects of color, caused by psychological reactions, are due to symbolic references as well. Colors represent some abstract ideas, as in the red and the color of blood (Porter and Mikellides, 1976, p.15). As Porter and Mikellides (1976, p.15) declare, meaning of color, thus, psychological effects, may differ according to "social class, age, personal taste, historical symbolism and cultural background." However, as they admit, there are common agreements about certain colors, as in the red-blood symbolism (Porter and Mikellides, 1976, p.15):

> Red, for instance, is universally regarded as a warm and arousing color and is symbolically used to represent aggression and revolution. The obvious link between red and the color of blood is very strong, the word for 'red' can be traced back to the same origins as the word for 'blood' in many languages. In western countries white represents purity, while in many eastern countries purity is represented by yellow, hence the saffron robes of the Buddhist monks. Yellow (and pink) in some oriental cultures has same meaning as blue in the West, as in blue films and blue jokes. Similarly as in most Northern countries black or purple are the colours of grief and mourning but in some tropical areas white is worn.

3.3. Emotional Aspects of Color

While color affects the psychology, vice versa, psychology affects the color applications. A brief look at the color choices of dressing in the last century, as Sharpe (1975) announces, can explain this idea. She describes the Victorian Period as 'a time of hypocrisy,' which is most 'depressing in terms of individual expression' (Sharpe, 1975, p.113). She states that "The principal colors of that period were murky shades of brown, red, lavender and purple" (Sharpe, 1975, p.114). In the preceding period of World War I, there seems to be found 'a brief

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flash of color,' due to the 'rage of the Russian Ballet in Paris' and Imperial Russia: magenta, bright orange, violet was fashionable. During the World War I, people chose to wear khaki, tans, grayish and olive greens (Sharpe, 1975). In the 1920s, caused by the emotional letdown after the war, European preferred beige, gray and medium Nordic blue and Sharpe (1975, p.114) states that "There also existed a prejudice against the darker peoples at the time; consequently, the hot Mexican, Spanish and Italian colors were unthinkable, except in fancy dress costumes. The Nordic blues remained popular until 1950s." She describes the worldwide depression of 1929-1930 as 'insecure age' and people had the colors in dressing that 'fostered feelings of security': rich dark wines, bottle greens and chocolate browns. The period of World War II, was of depression in most countries and just as the postwar colors of World War I, beiges, tans and grays were predominant in 1946 (Sharpe, 1975, p.114). But towards the end, as Sharpe (1975, p.114) writes, in the United States there were extremely prosperous areas that bright colors can be seen. According to her, an introduction of color, especially pastel colors is seen in 1950s. She underlines that "These colors have generally been predominant in those periods when the female role, for better or for worse, has been strongest" (Sharpe, 1975, p.115). 1960s were the period of revolution for color "which paralleled the revolutions that were occurring in most other spheres of life." She states that new generation of designers, artists and colorists have given up old guidelines of color usage and color harmony. She names the movement in the 1960s 'psychedelic movement,' "a response to the stresses and pressures of society" (Sharpe, 1975, p.116). "It was in response to the pressures of an overly affluent, leisure oriented society in which traditions, values, and modes of life were in flux, a new political order flickered on the horizon, new nations were rising, the young were on the march-the world was energized" (Sharpe, 1975, p.116). In this period visual imagery, and thus, color took a vital part. Sharpe states (1975, p.116) that: "A kind of kaleidoscopic play of color is experienced in the psychedelic state. Sounds are often translated into colors and vice versa."

The interaction between psychology and color inspires the use of color in marketing. Especially in the realm of advertisement coloring acts as a communication means between the product or service and the costumer.

3.4. Color in the Context

There is fashioning of colors affecting color scalas of building materials and paint coatings. Color decisions within the trendy scalas of the day might result in degeneration of the context. If it is a residential district, it is the context that constitutes the identity and at the same time, it is the house, the residential building that represents that identity.

An experiment had shown that inherent colors and perceived ones may differ on the exterior of the buildings.

The Swedish architect Karin Fridel Anter (2009, p.60) had asked the observers "What colour do you see on the facade?" She had found out that perceived colors on the facades are much lighter and more chromatic when compared with inherent colors. On the figure 3.2, first column shows the exact colors on the facade, while the second column illustrates the perception of the same color from a distance. Hence, it shows that decision makers for the exterior of the buildings mostly choose the colors on sample catalogs but final product does not represent their intentions.
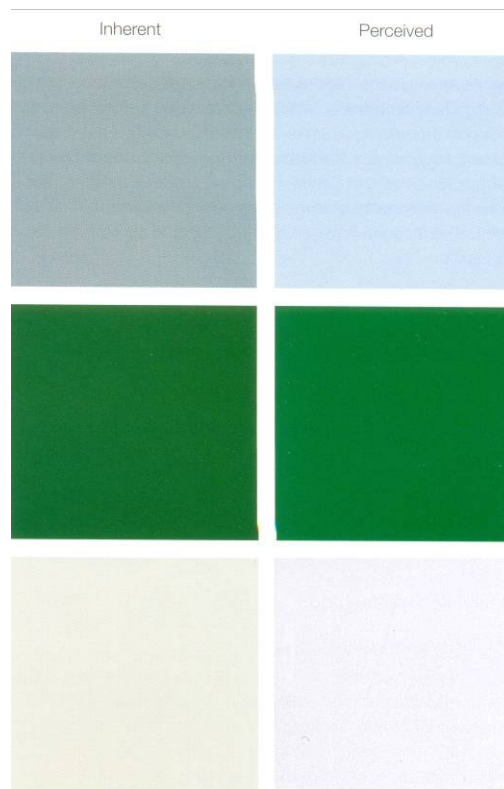
Figure 3.2 "Dramatic change of perceived and inherent colors" (Anter, 2009, p.62)

In the matter of using color in architecture, Mahnke (1996, p.18) offers a negotiation:

> Seen from the standpoint of architecture, I am hoping
> that we will stop fluctuating between the one extreme
> of using hardly any color and the other extreme of
> being too colorful. We must find the golden middle,
> which would not lead to stagnation. Quite the
> opposite would actually be the result.

On the other hand, if the context demands extremely strong chromatic hues, or, vice versa, hues of not any chroma, then, the building must be colored with these extremes. It must be the context which determines the color for design.

The perception of the color cannot be discrete from its context. The context, in its most tactile form, is the color of the city formed by the weather, the soil, the

greenery, the climate. When the building is evaluated individually in terms of color use on its facade, it might be in harmony and unity within its own design matter; but this might not be relevant with its context. Or, vice versa, disharmonious color composition on a building may be in balance with its environment.

CHAPTER 4

THE CASE OF ANKARA: USE OF COLOR IN RESIDENTIAL BUILDINGS

In her essay, Gülsüm Baydar searches for the link between the house and the city. Baydar (2003, p.27) states that "Sexualized metaphors of the house as the feminine, private realm and the city as the masculine, public realm proliferate in the modern period." Indeed, it may be the underlying reason for the denial of contribution of residential buildings in Ankara to the context in which they live. That is to say, a residential block is thought to be private and discrete existence from the public. That is why its architecture and then color is bound to personal tastes and preferences of its client or the constructors. Ankara is a city as the "masculine" and this city has residential buildings that are colored and decorated as the "feminine".

When the architectural environment is tried to be evaluated, what is faced with are *pseudo-architectonic* elements, that is, *pseudo-architectonic values* brought by the technology. Technology, that can be able to manufacture natural-looking stones made up of cement, offers readily designed masonry board composed of chip with cement admixture. Wood-looking or stone-looking precast panels are available to be painted in any color in the *scala* of a person's favorite ones. That technology also presents wooden textured cladding panels comprising plastic material, and, aluminum composite panels with wooden pattern printed films on them. Instead of real materials, there is now, market's material reality.

What is missing today is that search for meaning in architectural realm. It cannot be denied that high technology of our day achieves to manufacture vigorous and long lasting building materials.

Architects of the 20th-century were in an exciting journey. They tried to define the order of their work, to justify their architecture. Where can be found that justification in our postmodern world? To the architect who designs 'property' for the land-owner, the only justification comes from the municipality; building regulations.

Solon (1922, p.97) claims that the visual impression resulting from the color on any architectural member causes appearance of structural strength to be diminished to the degree of color elaboration. However he continues:

> On the contrary, color may accentuate the extremes of certain æsthetic qualities present in a work of art. It may contribute by contrast to the sense of statical force in the main conception, by augmenting the impression of lightness in members that are secondary or supported, thereby intensifying the structural integrity of those architectural items which are essentially sustaining.

The following examples belong to several districts of contemporary Ankara. The cases evaluated in this study are not "works of art" but compose the built environment. This architectural environment with its "degree of color elaboration" is typical to shape the contemporary cities. Most of the cases are newly constructed buildings, having their first coats of paintings on them (Figure 4.1).

Figure 4.1 An overview to the main street in Çukurambar

To understand the color use on facades of residential buildings, it is needed to analyze the formation of elements on them in terms of color applications. On this basis, a classification is composed of five main parts:

1. The Figural Use of Color
2. The Elemental Use of Color
    2.1.1. The Use of Color throughout the Compositional Elements
    2.1.2. The Use of Color throughout the Large Surfaces
3. Material Color and Painting
4. Tectonic Use of Color
5. Monochromatic Use of Color

The first one is "Figural use of Color" which is constituted by decorated facades with floral or geometrical figures. "Elemental Use of Color" is the second one containing two subframes which color is featured on members of the facade. The third class, "Material Color and Painting" is based upon the color representations of the natural material preferences supported by additional painting. "Tectonic Use of Color" as the forth frame implies color brought by the nature of material. The last class is "Monochromatic Use of Color" in which the facades are colored in single hue or different lightness of the same hue.

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The classification above was generated among the residential districts which mostly have newly constructed buildings. The sample buildings are mostly of anonymous architecture whose architects are not well-known.

In this research facades of buildings in terms of color are evaluated within their individual cases although the context which is not discussed here is of high importance.

Buildings are colored in two ways; one is the use of color as a design element in the architectural continuity. The color is an element consciously included in the process of architectural design. The other one is the application of color as an outcome of the constructional phase. In this way color decision is mostly set by the owner, the contractor, or the user of the building. It may even be decided by the designer, but not as an integral part of the design process. In this way, "personal relationship" (Mahnke, 1996, p.11) to color comes to the stage. "Hated colors" or "loved colors" act as elements of architectural language. Also trends and styles of the year are also influential on personal choices. These shape and color our architectural environment. The fashion, introduced by the paint manufacturers, is followed by the consumer _contractor, owner, and user of the building.

4.1. FIGURAL USE OF COLOR

In this category color is applied on the facade to decorate in two dimensions. Floral or geometrical figures are formed on the surfaces by means of paint coatings or other materials such as glass or ceramic mosaics. As if these buildings had been seen by Adolf Loos (1908, p.19) announcing "Ornament is a crime".

In Figure 4.2, the aim of coloring the facade is to decorate, ornament. Spontaneous ornaments were formed as columns, freezes and pediment in two-dimensional manner. The facade with its flower motives tends to be decorated with Anatolian

patterns but with antique-like depictions. These expensive facades have been worked with glass mosaics, brick and marble. All facades are mixture of these materials.

The buildings of Figures 4.2 to 4.7 (included) are open to discussion in terms of motives and ornaments on their facades as well. They take place within this classification because the decoration of this type is a form of color application on the facade.

Figure 4.2 A residential block in Beşevler

Figure 4.3 Detail of the pediments

In Figures 4.4, 4.5 a composition of figures made up of same materials as previous case. We see two dimensional arches, supported by planar columns, placed symmetrically on the facade. On the symmetry axis, a very similar flower motive appears as the previous figure. Thus, there exists a kind of *fashion* followed by these two buildings. Unlike the previous case this building has this ornamental work only on its front facade. The other three facades have been painted in plain color, determined in accordance with the material used on front.

Figure 4.4

Figure 4.5 Floral motive from the facade.

In the cases illustrated in Figures 4.6, and 4.7 many patterns have been used partially. These "ornaments" decorate the facade emphasizing sills of the windows, the pediment, intervals between the windows and balcony parapets.

Figure 4.6

Figure 4.7

The buildings seen in Figure 4.8 were actually colored in an elemental manner which will be discussed under "Elemental Use of Color" category. However diagonal painting of front facades shows a kind of personal preference.

Figure 4.8

4.2. ELEMENTAL USE OF COLOR

In this category architectural members of the facade or massive parts are featured by color divisions. This type of application of color has two subframes:

4.2.1. The Use of Color throughout the Compositional Elements,

4.2.2. The Use of Color throughout the Large Surfaces.

4.2.1. The Use of Color throughout the Compositional Elements

Each element of the facade is colored separately. Columns, pediments, frames, door and window sills, balconies and cantilevers are distinguished in different colors than its background. Elements of the facade are accentuated. Usually all the same elements of the facade are represented by the same color.

In Figure 4.9, the building has been painted in three colors. The top finishing line of the building surrounds all the facades turning into a pediment at the side walls. It

has been colored in green. Balconies had been painted in red, as figures against the light brown background. Except from windows, doors and exterior walls all elements of the facade are emphasized by color. The scale of the building is easily conveyed due to color application. As stated by Faulkner (1972, p.1) color "brings out scale." If the building has "contrasting colors", its "scale is more easily conveyed" (Faulkner, 1972, p.1).

Figure 4.9

Figures 4.10 to 4.14 show two neighbor residential blocks. The facades have been articulated with geometrical forms. Two to four windows were grouped. They compose some geometrical elements and emphasized by color. They were colored

by the material. Red color brought by the brick facing accentuates the facade members. Forms are defined by color. Use of color serves in the way Faulkner (1972, p.5) states: "It defines form. A line, a two-dimensional surface, or a three-dimensional volume is defined is its color contrasts with its surroundings."

Figure 4.10
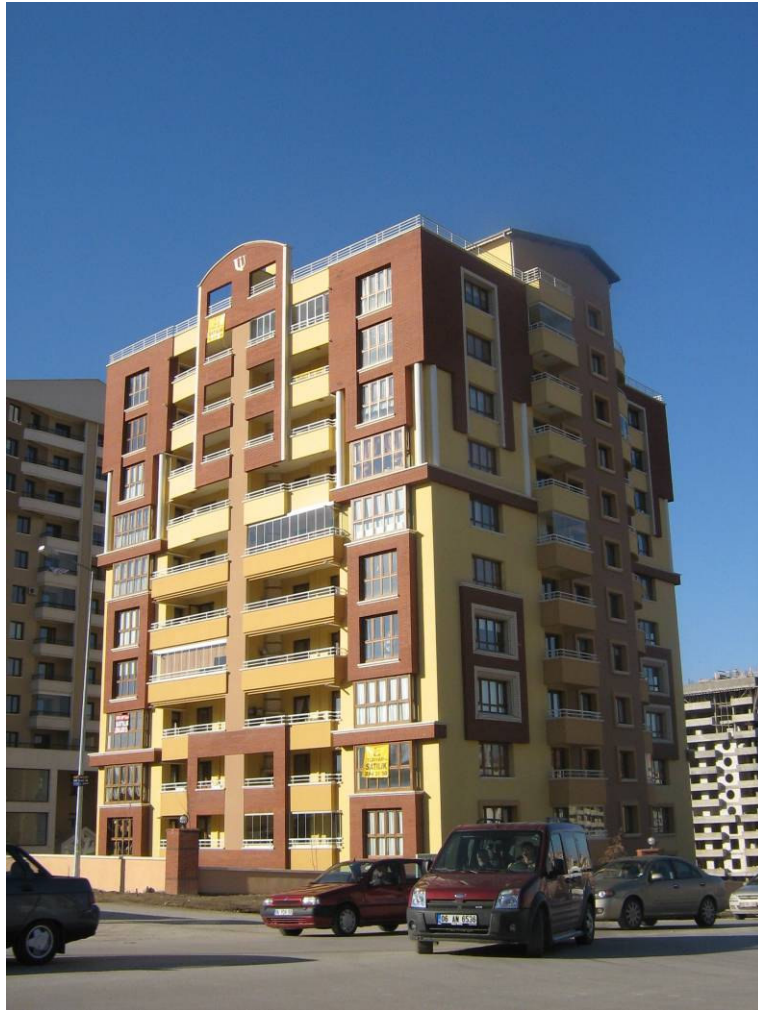
Figure 4.11

Figure 4.12

Figure 4.13

Figure 4.14

Two facade elements had been created on the symmetrical diagonal walls as seen in Figure 4.15. These elements with a break in the middle four storeys were differentiated in color. If they had been painted in same color with its background, they could not be noticed due to its lack of third dimension. Color was used to define surfaces as Faulkner (1972, p.5) summarized.

Another point with this case is different use of material at the base. The residential block was coated by plaster and colored by paint. However, more expensive material was applied on the facades of commercial part on the ground floor. It was clad by aluminum composite panels. This differentiation which is emphasized by color has separated the building as top and bottom.

Figure 4.15

Figure 4.16

Figure 4.16 might be included under the frame which is "use of color throughout the large surfaces". But the three geometric elements colored differently and lines and surfaces related with the roof are colored in red. Balconies have their own color.

In Figure 4.17, forms of balconies and corners are illustrated which were painted in a strong yellow hue. Bright scheme in the choice of paint "tends to express gaity and excitement" as stated by Faulkner (1972, p.5). However, it has unfolded the bad quality of stucco workmanship. It is a quite common wrong belief that paint, such a thin layer of coating, does hide the bad workmanship of under layers. In fact, the paint coating multiplies this due to its glossy nature with the help of light.

In Figure 4.18, moldings under the windows are noticeable in this formwork. What is remarkable in this case is that with such a high technological constructional technique than of the most examples, it was not ignored to have small size ornaments. In the final product, they were also colored in light hues; hence, the intention is lost within this scale of facade.

Figure 4.17
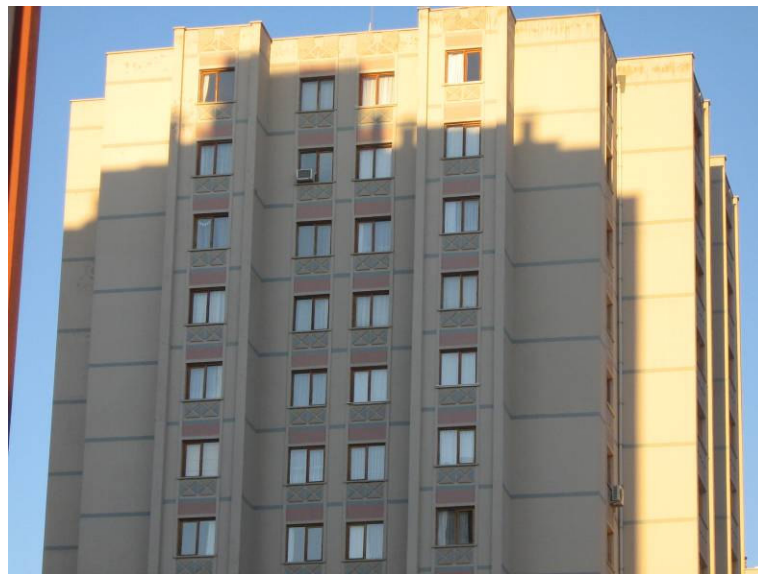
Figure 4.18

Figure 4.19 illustrates a large building in Çukurambar. Colors of the facade have been chosen from the natural scala; it has chromas of soil and rock. As Faulkner

(1972, p.5) highlighted, color serves in defining form. On the facade of this building color use provides two-dimensional forms.

Figure 4.19

4.2.2. The Use of Color throughout the Large Surfaces

In this case the apartment blocks are divided into large parts, horizontally or vertically in terms of color compositions. Buildings are colored as combinations of masses.

The apartment building in Figure 4.20, to extinguish the horizontality the building had been painted in different colors representing separate blocks. As well as affecting proportions, color suggests diversity (Faulkner, 1972, p.5).

Figure 4.20

Figure 4.21

Figure 4.21 displays the apartment blocks of two flats on a storey layout. This may easily be read on the facade. Facade has been formed by the repetition of the storeys. Red color of the balconies divides the facade into three parts. No color has been applied on the side blank walls.

In the following example which is illustrated in Figure 4.22, pure forms and making use of transparency of balconies at the corners are supported by the color use. The colors divide the building into vertical parts; dark color in the middle, light color at the corners, fragmenting the building form.

Decisions and forms in the use of color "creates an atmosphere" as Faulkner (1972, p.5) declares: "It creates an atmosphere…a quiet scheme may express dignity and repose."

Figure 4.22

Figures 4.23 and 4.24 indicate a large scale residential building. In this case curved balconies are emphasized with a hue of high value in lightness. Unlike horizontal elements, vertical elements _ linear walls have been painted in a shade hue. In the case, horizontality was accentuated by means of selecting different colors on the balconies and walls which recede.
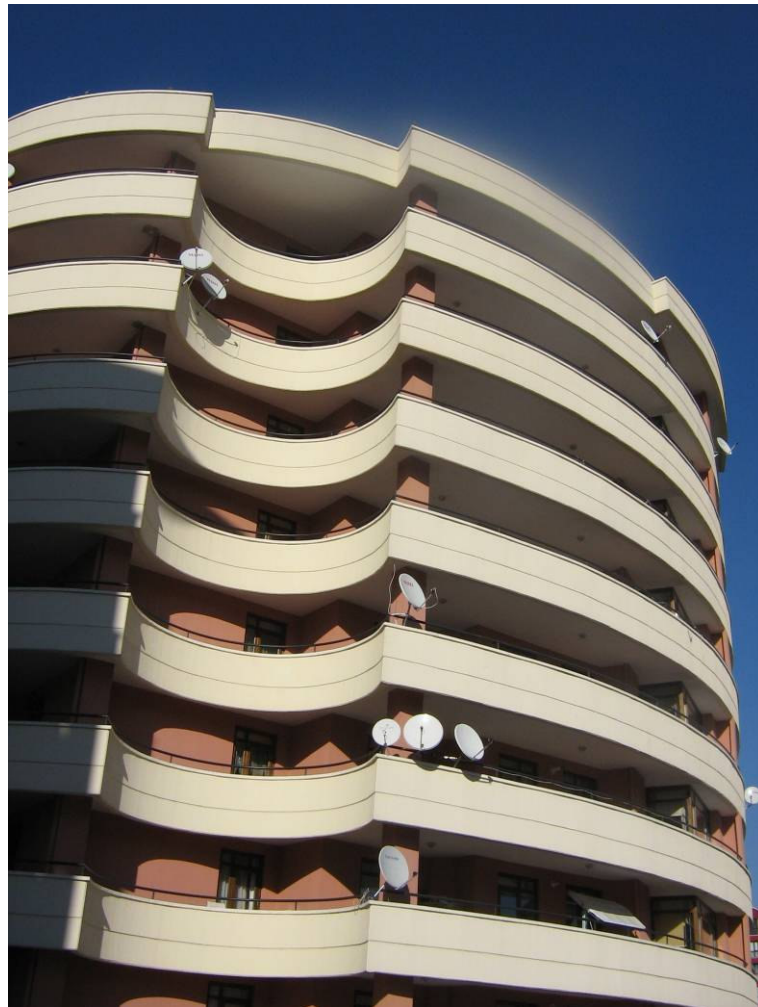
Figure 4.23

Figure 4.24

In the following case, which is shown by Figures 4.25 and and 4.26, three colors have been used on the facade; however, two shades are very close in their chromaticness. But one of them has been intended to seem like another material than painting. At the corners, we see white lines painted on surfaces as if these are composed of panels. Figure 4.26 shows lines painted on the surface that are not originated from the material. It seems to be expected to be formed by the material. Intention was achieved with a smaller budget by means of the paint coating, not by the cladding.

Figure 4.25

Figure 4.26

Mostly colors of natural scala are recognized in the examples. But in this case, Figure 4.27, facade includes three strong chromatic hues. Arbitrary composition of these colors does not provide an elaborate degree in color use.

Figure 4.27

The following example, Figure 4.28 reminds "neoplastic color use of De Stijl" because it has white and three hues on the same facade. Facade recalls "primary colors" of Doesburg. Use of color provides a dynamic expression despite the architectural design could not support this. The building composes its architectural expression by means of color, not by means of formal design.

Figure 4.28

Figure 4.29

Arbitrary square forms are hardly recognizable on the facade that is illustrated in Figure 4.29. It seems like the main design instrument is the color, degrading from bottom to top. Facade was colored by means of tints and shades of the same hue _ of different values of the same hue. The form of color application sets a kind of balance that is stated by Faulkner (1972, p.1): "It gives a sense of weight. Elements in dark colors look heavy; those in light colors look light in weight. For this reason the color of tall structures is sometimes graduated from dark at the bottom to light at the top."

Figure 4.30 illustrates that the site has been composed of repetition of multisorey residential blocks, which has a highly tedious silhouette. They were painted in dark red on the top five storeys, though in its individual evaluation, it is an uncommon composition of color. The form of color use applied on these facades is just the reverse of Faulkner's (1972, p.1) statement which is exemplified in the previous case (Figure 4.29). However this way of using color provided depth in the perspective through pedestrian eye view.

A similar form of coloring with the previous case was tried in Figure 4.31 but it could not provide depth. The color could not elaborate the perspective.

Figure 4.30

Figure 4.31

Figure 4.32

In the Figure 4.32, the building has the effect of a combination of multiple prisms. This bunch of prisms finishes with a line at the top. Verticality was accentuated by the form of color application. Faulkner (1972, p.6) declares color's effect on proportion: "…vertical lines, they promote the sense of height."

Figure 4.33

In the case of the Figure 4.33, color was differentiated on each massive part, so the building is perceived in separate parts. The building is fragmented by means of the form of color application. Color serves in defining form (Faulkner, 1972, p.5). Concurrently, "atmosphere" created by the chromatic choices of a "quiet scheme" express "dignity and repose" (Faulkner, 1972, p.5).

Figure 4.34

Balconies in Figure 4.34 act like figures spreading from the middle to the edges of the facade, providing emphasis in the middle part. The expression of the building was provided by color, not by the quality of design. Color sets a link between expression and the building. In other words, color helps establishing the continuity between the building and its architectural design.

Figure 4.35

At the front facade of the building in Figure 4.35, the color had been applied disregarding three-dimensionality. Because the line where two colors met has been formed on external corner of the balconies in an unfamiliar way. Form definition could not be provided. Color could not serve in "bringing out scale" (Faulkner, 1972, p.6).

Figures 4.36 and 4.37 illustrate an elaborate example of this category, a "Less is more" case. The site is very dense. Color supports the forms without any tiny details, or ornamental intentions on the facade. These buildings exemplify the use of color as the integral part of the architectural design. Like in the "dynamic" method of color use of Le Corbusier, plain colors were used without harming the unity of the walls and forms.

Figure 4.36

Figure 4.37

4.3. MATERIAL COLOR AND PAINTING

In this class, as well as paint coatings, some other materials are used partially. This affects color decisions on the facades.

In the example which Figure 4.38 illustrates, color preferences have been dominated by the brick facing of ground floor's facade. With this manner coloring of the buildings had been supported by the material. The shade color of the facade was determined with regard to color of the brick facing. Faulkner (1972, p.5) states that "It (color) expresses the character of materials. On the contrary, in this figure, color can not "express the character of materials." In the case, using a close chroma to the color of brick causes them to compete with each other.

Figure 4.38

Following examples are two neighbor buildings. Natural stone cladding oriented the choice of color applied on the facade. Marble gives its color to vertical surfaces while horizontality was featured by means of paint coating. The grey chromas of the

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stone are very peculiar to its nature. This supports Faulkner's (1972, p.5) statement: "It (color) expresses the character of materials.

Figure 4.39

Figure 4.40

With a similar manner, Figure 4.41 designates a residential block with shops at its ground level. It is a clear example of material's decisiveness on color choices_ the pink marble of the facade and paint coating of pink and white colors. Using similar values (lightnesses) of the same hue provides a monochromatic expression which tends to lose the "expression of the character of the material" as signified by Faulkner (1972, p.5): "If these have the same color, the building looks like a clay model."

Figure 4.41

4.4. TECTONIC USE OF COLOR

In this frame the color of the facade comes from the tectonics of the materials used. Rasmussen (1962, p.216) states that:

> "It is obvious that there is an inexplicable connection between material and color. We do not experience color independently but only as one of several characteristics of a certain material."

Structural elements can be distinguished on the facade. Usually in this type, beams and columns are expressed by concrete and walls by brick. Color is highly

expressive due to the materials which are not hidden under paint coatings (Figure 4.42).

Figure 4.42

The following examples are illustrations of two neighbor buildings. Although they have commercial usage at their ground floors, they are residential buildings. The building shown in Figure 4.43 represents this tectonic use of color on its only one facade which is facing the main street.

What is noticeable about the building next to this building, which Figure 4.44 illustrates, is that the concrete had been painted with a grey hue. The color of the paint still expresses the concrete. Continuous concrete lines emphasize horizontality as Faulkner (1972, p.5) states: "Materials with contrasting colors laid in horizontal lines tend to emphasize a feeling of breadth."

Figure 4.43

Figure 4.44

Figure 4.45

4.5. MONOCHROMATIC USE OF COLOR

Facades are colored in single hue or different values of the same hue. If the building does not have a high level of quality in architectural design, monochromatic building confronts with the problematics in terms of scale, proportion, weight and expression.

The building in the Figure 4.46 does not express its typological characteristic. Color could not provide continuity between the building and architectural expression. This discontinuity is caused by the degree of elaboration in architectural design and material decisions.
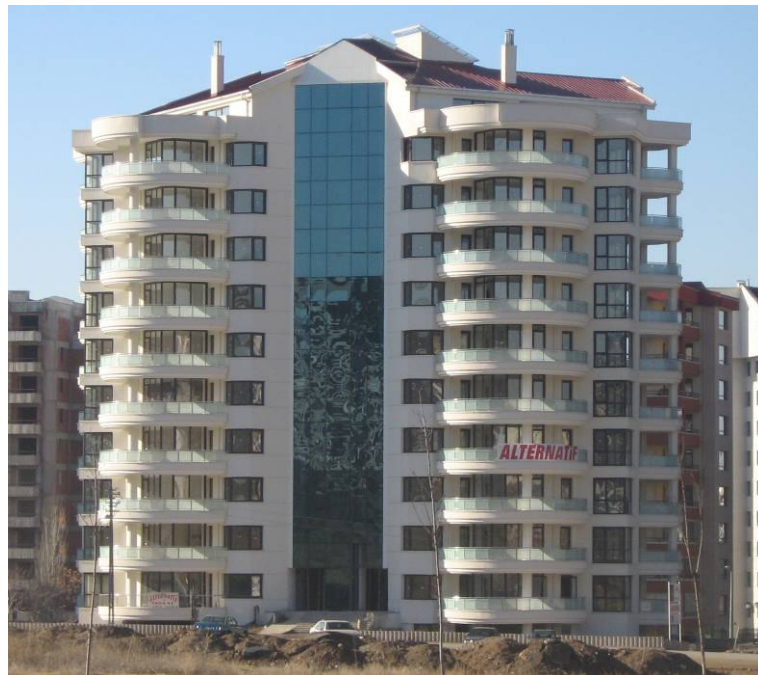
Figure 4.46

Figure 4.47

The building in Figure 4.47 "looks like monolith" (Faulkner, 1972, p. 6). The scale of the building can be conveyed with the contribution of voids and glass surfaces. Faulkner (1972, p. 6) states that "It brings out scale… If, however, its elements (including openings) are of contrasting colors, the scale of the building is more easily conveyed."

Figure 4.48

Elaboration in the architectural design of the building in Figure 4.48 does not require any polychromatic scheme. The expression of the building does not depend on color use.

In the example, Figure 4.49, facade was colored in same color, but with shade and tint of the same chroma. The use of shade as second color does not serve in affecting proportions and suggesting diversity as in Faulkner's statements (1972, pp.5-6). This building in the figure supports Faulkner (1972, p.5) declaring "A building made up of elements of uniform color looks like a monolith."

Similar form of color use was applied on the building in Figure 4.50. Tint and shade values of the same hue are far from each other, so they act like two different colors. This provides emphasis on the elements colored by the shade.

In Figure 4.51, buildings have four colors of paint including white. Because they are of close values overall expression is monochromatic.

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Figure 4.49

Figure 4.50

Figure 4.51

CHAPTER 5

CONCLUSION

This study considers the benefits of using color as an architectural design element and opens a discussion in regards to the transformative effects of color use and its relationship in the design of buildings based on a case study. The case study used is limited to residential buildings in the Ankara metropolitan area and analyzes the limits and benefits of color use in terms of transformative effect. Also examined is the perceived overall impact associated with color in relationship to architectural design.

One of the results discovered in the case study is manifested in the limited impact that color use has in the actual execution of the building's design in comparison to the overall architectural design. Buildings in this case study that demonstrate this reveal that the actual colors used have a modest inconsequential effect in the architectural meaning as shown in figures 4.22, 4.33, 4.36 and 4.37. In these buildings color tends to accentuate the higher level architectural design elements rather than color itself serving as a primary design element. As a result the use of color in intricate architectural design requires a lesser degree of elaboration. These case studies may offer a basis for a further research which could study architectural elements and color relations of materials as included in the overall design processes.

Transversely, as architecturally high level designs are less reliant on color as a transforming design element, for less costly buildings with limited architectural detail color is used as the most common design expression in the urban context. In the other examples, except from the cases stated above, color performs a vital role in terms of the realization of the desired architectural aesthetic. Most cases illustrate that the building and finishing techniques applied in the construction of the

buildings help realized the design intent within budget limitation and therefore color becomes a major element to achieve architectural goals. Architectural design is primarily transformed to include a heightened focus on facade decoration. Consequently, color and materials on the facade are used to make up for the low quality of architectural design.

When color and material are not included within the process of architectural design, buildings can be exposed to the problem of overall aesthetic continuity. The random selection of the facades finishing are modified by the independent material and color preferences which can be in discontinuity with the overall desired architectural value of the building. Therefore the built environment is embodied without architectural values, diminished values or with values that are unintended. Hence, the city is faced with the problem of identity, that is to say, city lacks identity due to design inconsistency.

Paint, which is the major material to color facades, is an easily attainable material that is almost always within limited budgets. Paint is also one of the easiest materials to apply and as a result has widespread use as an inexpensive building material.

When the facade is colored only by means of paint and not supported by any other architectural materials, the densities of the facade's elements are squeezed within two dimensions. The notion of color in a third dimension is denied in color only applications on facades. This results in a scenographic facade that causes architectural expression to be represented in two-dimensional planes alone rather than in three dimensional forms. This over reliance on color only breaks the relationship of aesthetic form with other possible architectural elements. Color becomes an element to raise the popularity and sales value of the building rather than being a consequence of a design process. Therefore color might not represent architectural continuity of the facade and it might be in contradiction with the overall architectural design.

In the cases of "The Figural Use of Color" which, is the first category, the use of paint with other material allow for more diverse elements which can be better distinguished. As reality construction is often bound to the expertise of the workmen and therefore scenographic facades at times are unavoidable. Two-dimensional decorative applications of color on the facades due to the skill limitation of tradesmen in some cases can fail to accurately represent the architect's intentions. Scenographic painting weakens the relationship between the three-dimensional form and architectural expression as evaluated in the case studies.

As a result of the case study, it is evaluated that color is used to accentuate the formal architectural elements of the facades. Except for the examples in "Monochromatic Color Use" compositional or formal elements of architectural language are emphasized or represented by color. In this way color is highly open to express the meaning of the building individually and might yield continuity / discontinuity with architectural language. Hence color becomes effective in transforming a building's visual impact.

In the case study there are individual buildings as well as housing sites. Evaluation of single buildings in their color context might be studied in a further research. However sites of multiple residential blocks create their own context and are needed to be evaluated within the frame of this study. Housing sites as the cases in figures 4.8, 4.20, 4.21, 4.30, 4.31, 4.36, 4.38, 4.50 and 4.51 are composed of repetition of blocks. Design process of such examples should benefit the transformative effects of color in order to break the monotonous language caused by the repetition. Color design should be considered as consequentially as the formal design in architectural process. For example the figures 4.36 and 4.37 demonstrate a balanced environment provided by color design.

Most of the color schemes preferred in the cases exhibit a scala of nature such as various chromatic hues of soil, rock, sky and clay, i.e. brick. Chromatically strong

hues should be considered carefully in the design process owing to their highly expressive individuality within the natural color scheme of the context of the case study. Since these hues stand out with their expressive effect they tend not to be in continuity with architectural meaning. In other words chromatically strong hues should unquestionably be taken into consideration within the architectural design process if they represent architectural meaning in the built environment.

Mostly, the colors that compose the architectural environment are chosen by the contractor, owner or the building occupant. Therefore at times the use of color on the building facade may be based upon personal preferences alone. Decisions for the color scheme of a building should be directly related with architectural expression. The designer who handles this expression might be the architect of the building or the *color consultant.* Color consultancy is a new profession coming to prominence in the last couple of decades in Europe and United States. A color consultant serves the architect by selecting the color scheme for a building that offers the best design aesthetics to accentuate the existing or planned architectural design elements while taking into consideration harmony with adjacent buildings. Color consultant studies and color designs when properly executed can become a major element of the entire projects architectural environment.

Color contributes to architectural design as an instrument in continuity of architectural expression. There might be no color recipes as clearly stated by Rasmussen (1962, p.219):

> "Despite all theories we can say of color, as of all other elements of architecture, that there are no definite rules, no directives which, if followed closely, guarantee good architecture. Color can be a powerful means of expression for the architect who has something to say."

As cited by Gülsüm Baydar (2003, p.27) Le Corbusier signifies that "A detail in a city means a house multiplied a hundred thousand times; therefore it is the city."

The residential building, the apartment block dominates the context: it shapes the city. The building exists in form and color, both represent identity. As color plays a remarkable role in this context color itself becomes a consequential part of architectural design.

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