

THE “OTHERNESS” OF WHITE

Elements for a Better Understanding and Use of the Colour White in Architecture

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ABSTRACT

This paper underlines the importance of a deep awareness of the use of the colour white in architecture. White is commonly used by architects as a non-colour, a neutral ground, a blank sheet of paper through which architecture achieves its conceptual rationale.

However, since architecture is experienced by the senses and the intellect, white cannot be considered neutral, neither in aesthetic or perceptual terms nor in its ergonomic and psycho-physiological concerns for human comfort and well being.

The irreplaceable chameleonic role of white in space and time perception, its aesthetic ability to otherness, as defined by Adrian Stokes [1], has to be balanced with its potentially disastrous results in our visual comfort due to its unique capability of light reflection, i.e. the highest luminous reflectance factor of all.

White must be understood as an exceptional colour with its inherent property of transcending material perception and never used as a result of a lack of conviction or knowledge when choosing the appearance of architectural materiality.

Keywords: Aesthetics, Architecture, Colour Perception, Human Comfort, White.

1. INTRODUCTION

The idea for this paper was triggered by the concept of *otherness of colour* stated by Stokes [1] in his text *Colour and Form*, meaning the inherent property of colour to catch properties of the surrounding environment and transmitting to us something that is beyond the surface. This concept of *otherness* locates colour in an oneiric and symbolic level; it can refer to the unconscious since we can say that the unconscious is structured as a language separated from the language of the materiality. This aesthetical concept of surface transcendence through colour seemed to us an important issue bridging architecture and colour. No other colour could be more adequate to embrace this concept than white, the cause, the receiver and receptacle for all colours as described by Leonardo da Vinci [2]. Its unique attributes are also described in Melville's [3] *Moby Dick* in the thoughts of Captain Ahab: “*not yet have we solved the incantation of this whiteness, and learn why it appeals with such power to the soul.*” On the other hand what other colour has been so trivialized and used with such a lack of knowledge and believe as white in architecture? Architects have long lost the reason why they should use this special colour, and they keep on using it because they think it is a

safe and neutral colour. Well, it is not. The aim of this text is to contribute to a more aware, sensible and informed use of this colour in architecture because it is far too aesthetically important and ergonomically perilous to be use without a strong intention and conviction.

2. WHITE IS NOT A NEUTRAL COLOUR

2.1 Symbolism

Among the eleven basic colour categories stated by Berlin and Kay [4], white and black are the first two to be verbalized in all cultures and civilizations. This obviously has to do with the powerful connection with the circadian cycle: the light-dark, day-night opposition that rules human existence. It is also commonly associated with innocence, peace, purity and truth. But the symbolic meanings of this colour are particularly ambiguous because it is also connoted with coldness (snow, ice), bloodless, colourless, emptiness and death. This lack of consistency and even conflicting connotations of the colour white is representative of the reason why we chose this theme: no other colour has so much disparate meanings, no further colour depends so much on its context for its negative or positive appraisal. According to this idea of dualism, Melville [3] after describing the good things associated with white state: *"... yet for all these accumulated associations, with whatever is sweet, and honourable, and sublime, there yet lurks an elusive something in the innermost idea of this hue, which strikes more of panic to the soul than the redness which affrights in blood"*. White is definitely not a neutral colour concerning symbolism.

2.2 Ergonomy

White should not be choose as the main colour in an environment where people will remain for long periods, for instance classrooms, offices, etc. It is not a question of aesthetics but just ergonomic concerns, and that should not be questionable. Birren [5] and also Mahnke [6] are good examples of authors who have addressed this issue. Their concern on this subject leads them to assert that white, having the highest luminous reflectance factor of all colours, when accompanied by high levels of natural or artificial light easily produces glare and that is inimical not only to clear vision but to physical, mental, and emotional comfort. Physiologically, these environments could be damaging to the human eye, demanding fatiguing action of the eye muscles by severely constricting the pupil opening. All this negative effects could be amplified by the use of gloss or semi-gloss finishes in the visual field, as well as the incorrect layout of the light sources. Remember that we don't have this colour in nature in large areas, and when it happens, we have do defend ourselves from it wearing sunglasses, as in snowy environments.

2.3 Pshychology

On a psychological basis, in abstract terms, we can say that white is sterile, cold, empty, and mostly of the times it causes a boring disinterest. We agree with Mahnke [6] when he states that people need sensory variety, and this includes colour, and that monotony only induces anxiety, tension, fear, and distress. In fact, the most stressing environments, unfortunately used in some extreme police and military interrogatories, are white painted in all surfaces and with high levels of illumination.

2.4 Fashion Trend and Preconception

We must ask ourselves how we evolve from a reaction to over-ornamentation and over-use of colour to our common and banal sterile white environments. The high-tech image is often connoted with shiny, metallic achromatic environments due to the idea that it will reflect the clean, efficient and somehow impersonal way of living in the future. These environments are actually better suited to machines and defy ergonomic explanation. There's a general *Chromofobia*, as Batchelor [7] names it, in some contemporary architectural trends. The misunderstood meaning of Minimalism led some architects to design bright white unemotional and cold spaces completely inadequate to the normal organic and ergonomic acts of human quotidian life. The problem is not white, but generalized white, because generalized white – whiteness – is abstract.

3. WHITE IS NOT A SAFE CHOICE IN ARCHITECTURE

White is considered a safe choice between architects. If you use it no one would ever question your choice (or notice any choice in colour). On the contrary if you design a colour palette for an architectural environment you'll have to justify yourself and answer for it. But paradoxically, to achieved a balanced environment in terms of aesthetics and human comfort using white as a dominant you have to be a very good architect, a fine sculptor, someone that really understands the correct, and magnificent play of volumes gathered under the light, following Le Corbusier [8] definition of good architecture. And that is rare. White is not a safe choice, it could be aggressive to our comfort and difficult to relate with other elements of space that will always deal with it through contrast. There's another preconception about white making interiors brighter, because it all depends upon the mastering of natural and artificial lighting. On the other hand as Mahnke [6] state, white will be greyish and without life in an overcast day or in shadow instead of colours of certain saturation that always bring with them their own luminosity and joy.

4. WHITE IS A REFERENCE

White is the colour where the reflections from all other colours in the environment are best received and revealed. The result for this unique characteristic is that when surrounded by other colours white will be tinged by them and would never be white. This effect is easily observed when a white wall capture the greenness of the vegetation nearby or when it is tinged by blue when near a swimming pool, or when it becomes reddish by the presence of ceramic tiles. If carefully designed, a white environment can be *painted* by colour reflections in a dynamic journey during daylight, giving us time awareness. The *otherness* of this colour and its ambiguity remind us of the works of James Turrell where he deals exactly with these concepts to affect our perception of space.

White is also like an anchor, a reference for the other colours to present themselves, to be compared with. Stokes [1] states a wonderful understanding of white as a reference in landscape: *"I have in mind the lighthouse at Godrevy point on the North coast of Cornwall. The lighthouse cylinder stands among a group of white-washed buildings with black barrel roofs seemingly all of one piece. These white buildings are founded in grey rock. On some days the circumventing sea has blue, yellow, green, maroon, and even orange colours crested with evanescent foam as epitome. From the point in a tearing wind we look down at the island growing into firm white buildings with black roofs: the central cylinder of white outlined against the grey sky is a monument to every form and colour in sea, sky and rock."*

5. FOR A BETTER USE OF WHITE COLOUR IN ARCHITECTURE

5.1 Architectural and Non-Architectural Colours

There are colours that when applied in main architectural surfaces like floors, walls and ceilings seem to us correct, adequate, constituent of the mass and materiality of architecture, and others that will never embody those characteristics. Those should be used to accentuate some surfaces or elements, making an aesthetical statement, detaching from the architectural mass. Accordingly to this notion, Le Corbusier [9] defines *architectural colours* and *non-architectural colours* saying that some colours by a kind of vibration should not come to disqualify the wall that constitute the architectural game.

In this sense, we do not consider pure white as an architectural colour; pure white is an aesthetical myth, not an earthly element. Only high-sophisticated chemical pigments applied in special surfaces could grasp that aim. We think this is the field for object and hand scale design. If architectural mass-effect is to be achieved we need to use for instance mineral pigments, as they would secure an archetypal relationship with natural environment and therefore to our sense of materiality and density.

5.2 A Synchronical and Diachronical Choice of Colours

A colour plan should be created both in synchrony and in diachrony. This issue is addressed by Le Corbusier [9] that stated the necessity of thinking in colour not successively but synchronically, not colour-by-colour, material after material, but all together in one unified gesture. For this aim we have to consider also that our perceptions are built in a holistic and diachronic way according with Tom Porter [10] definition of *perceptual space*: a result of a continuous movement through our visual environment with our body, head and eye movement. It is common to observe a complete disparity between inside and outside in contemporary architecture, interrupting the continuity of perception: the aseptic white exterior is often betrayed by a colourful interior where an array of colours and textures find their place. Often this is not the result of a conceptual statement but rather the recognition of a prejudice that results in a greater freedom in interior design. The result is a loss of unity, and unity (not uniformity) is one of the goals of good architecture.

5.3 A Less Luminous Reflectance is Needed

To counteract the excessive glare of white painted walls in working areas we must reduce the lightness of those surfaces. The luminous reflectance factor recommended for those environments should be about 40% to 60% according to Mahrke [6]; this can be stretched, depending on lighting conditions, to 70%. White commonly used in wall paintings (not pure white) have around 5% of blackness that corresponds to a luminous reflectance factor of 86%. This value is far from the desired visual comfort needed in these situations. The medium desirable factor of 50% is achieved with a hue with 25% of blackness (Table 1).

Luminous Reflectance Factor	NCS notation (achromatic) aprox.	Lightness Value	Sample	
40%	NCS S 3500-N	0,65		
50%	NCS S 2500-N	0,75		
60%	NCS S 2000-N	0,80		
70%	NCS S 1000-N /NCS S 1500-N	0,90/0,85		

Table 1. Recommended luminous reflectance factors in NCS (Natural Colour System) notations.

Adopting these recommendations and thus removing the glare of walls can correct many situations of lack of concentration and eyestrain complaints in work environments. Other aspects to be corrected in relation with the above are the abolition of high-gloss or gloss surfaces in those areas and a correct designed illumination, since they greatly contribute to improve working conditions and well-being.

5.4 Using White

White is at the very realm of the difficult balance between unity and complexity.

White should be used for the sake of unity when architecture deal with complex masses strongly sculpted, and never in large continuous surfaces. Le Corbusier [9] assert that all confusion is tiresome and that we must not use polychromy in those situations because they predominantly live by the effect of shadow, of half-tone and of light. On the other hand he also states that *nothing is more demoralising than uniformity, a sign of stupidity*. And white can easily fall into it.

White should be used as a reference, as an accentuation, as a special light receiver, a door to the oneiric. Using an image, instead of the usual conceptual architectural drawings in black ink on white paper that could be connoted with the way white is commonly imagined, imagine the way the white pencil was used on old yellow sketching paper: to accentuate certain surfaces or the incidence of the light. This is how white should be used: with an aesthetical intent. White could be a fundamental element in the dynamic of space design, being capable of dramatic perceptual contrasts. John Gage [11] states, referring to Malevitch's white on white paintings that they explored both the capacity of white to convey infinity, and factura (texture). This duality is the soul of this hue, often killed by its over abundant use in architectural surfaces. The appeal to the sense of touch of materials like rough stone, connoted with solidity and density, could be enhanced by the presence and contrast of the immateriality of a white surface.

CONCLUSIONS

White is not a neutral colour in terms of perception, it is a strong statement in space with ergonomical, physiological, historical, cultural and symbolic meanings, and therefore should not be used in a generalized and uneducated way.

This awareness and the information described here concerning a better application of this colour could enhance its use in a more meaningful way.

The substance of architecture should bring to the inhabitants both the sense of otherness and transcendence of things but also a sense of comfort, of materiality, of belonging. White colour could be used to transmit that balance between spirituality and materiality that is in the realm of the discipline of architecture. And obviously we can only conceive *buildings that sing*, according to Paul Valéry [12] if we can reconcile these two dimensions of the human being. These buildings will *have qualities that we cannot grasp by simple phrases. As with the fragrance of the rose, we can only understand with our senses.*

There are reasons and rules for the use of white and the other colours in architecture, reasons that cross several fields of knowledge. But after giving some rational leads on how to make a good colour plan he ends with a striking advice: *the eye has to be like an agile tool in the service of a deep instinct*. Instinct. For this there are no rules. Accordingly the philosopher Julia Kristeva, cited by Batchelor [7] states that *to fall into colour is to run out of words*. This is to say that apart all this rationale behind the colour use in architecture, there are things that belong to the aesthetical field that could never be fully transmitted, but those should never overlap nor put in question the comfort of the human being for which it was conceived.

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