

Colour in relation – Relations between the perception and design of architectural surface and its context

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ABSTRACT

The exploration of design relevant questions about the colour quality of architectural surfaces in complex interaction with their correlating context forms the heart of this paper. Colour is considered in its material qualities and therefore as interacting with and being influenced by the material world. Different colour appearances are elaborated as variables in the application processes, in the lifecycle process and in the perception of the building and its environment. Based on an applied research project, we draw a comparison with a field chapel built between 2005 and 2007 in Wachendorf Germany by the architect Peter Zumthor to expose relations of colour and its context from a design-driven perspective. The aim is to understand the qualitative aspects of coloured surfaces in order to cultivate diversity in the built environment. Aspects of the atmosphere, which are scientifically difficult to evaluate are discussed in the awareness of their complexity depending on the viewers reception.

Keywords: *architectural surface, colour, diversity, embodied knowledge, atmosphere*

INTRODUCTION

Colour is material: granular, mineral, finely pulverized, rubbed into the binder, synthetic, glossy, pasty or translucent has an origin, history, requires specific processing and it ages. In these temporal sequences, colour is shaped by various changes and transformations, which we all define as part of the context. The context in a non-dynamic sense, but in the current time segment ranges from the user's embodied experience of the surface effect, the architecture and the landscape. Relations between colour and context on facades were first examined in the applied research project "EVDH - Extended processes for plaster surfaces: synergies between digitality & craft" (EVDH).

Material samples resulting from a series of experiments flank the observations on material qualities in different light situations and different viewpoints, changes caused by environmental influences and the diversity of different application processes. The research project was experiment-driven and based on three research fields: material, tool and craftsmanship. The focus of the project

was on the research and evaluation of digital hand tools for structuring plaster surfaces with the aim of generating diversity in the surface but also in the built environment out of a novel production process. It became clear that colour was an inseparable part of this research field. The theory derived from the project already contains partial aspects on colour and its relations and is more precisely outlined by Peter Zumthor based on the finished project in Wachendorf and thus leads to the desired holistic discussion.

Due to the methodological approach, which was strongly influenced by hands-on experiments, design relevant observations could be made which would not have been possible by pure conception. In other words, the insights are not only based on distancing reflections but also on embodied knowledge. An essential question accompanied us and led us to this theoretical discussion: Which aspects are relevant for the embodied experience of architectural surface in a relational, atmosphere - orientated design? The insights pertaining to design and the relations between colour and context are discussed and elaborated by means of a case study on the field chapel by Peter Zumthor, dedicated to Saint Niklaus von Flüe, paying special attention to colour as a material and its context.

The building serves as a best case for an implementation as it demonstrates how design solutions are able to embrace and incorporate traces from the building process and the material surroundings of a building. From the observations of the art historian Monika Wagner, it becomes apparent that colour material was repeatedly reduced to the tone of colour. Its body, materiality, own dynamics within a relational whole were pushed into the background to imitate and illude other materials, but also to strengthen a symbolic, ideal form (cf. Wagner 2002: 17-55). This abstraction of colour is to be countered by reflections on a relational design attitude as described by Witzgall and, based on Gernot Böhme, Juhani Pallasmaa and Peter Zumthor himself, enriched with aspects of an atmosphere - oriented design. This paper elaborates theoretical aspects for relational design and provides a glimpse into how to modulate and cultivate a colour design in a complex way forming a complete spectrum.

DISCUSSION

The paper attempts to show that the whole is more than the sum of its parts and therefore focuses on the relations. Placing relations in the centre of an argumentation can be observed in currents of the New Materialism. Susanne Witzgall, who vividly discusses the various currents of new materialism, cites theories by Brian Massumi or Karen Barad as convincing, because they both refer to the *in-between* and *relations* between entities. A paradigm shift takes place, where thinking in isolated categories and concepts is overcome and “relations are understood as the primordial cause of existence” (Witzgall 2016: 101; translation from German by the authors). Witzgall establishes *relational design* as an open design attitude in which the designer consciously pays attention to the participation and power of (human and non-human) entities in the design process (Witzgall 2016: 115). The participation of dirt as an exemplary non-human entity was experimentally simulated in the project EVDH. The self-dynamic and natural deposition of dirt over time leaves different colour intensities on the sample and accentuates the vertical lines of the structure (Figure 1). This leads us first to insights into the design power of non-human entities, followed by a user-centered perspective in which the user as a human entity and processual perception are in focus.

Perspective of the context (non-human entities)

Light continuously changes the colour effect during the course of the day. It leaves the colour in the shade or illuminates it completely, even lets it fade over time or makes the materiality stand out in the oblique light. This self-dynamic moments or aspects of «brainless regulations» are defining elements of the design and can be consciously considered and involved as designing actors.

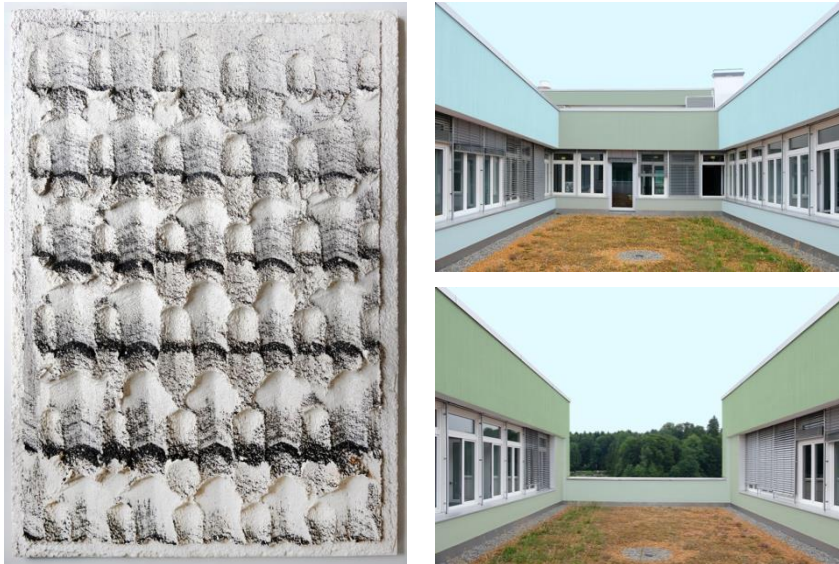


Figure 1: Material sample for simulation of dirt deposit.

Figures 2, 3: Visualization direction-dependent colour effect.

Brainless Regulations short BR is a term formed by us, which summarizes the following contents: BR is a principle that stands for undetermined aspects within planned structures. This means that a part of a design process is not subject to planning, but to chance, to aspects of material or time to self-regulation or to a partly opened production processes. As mentioned above also the deposition of dirt is not regulated or determined and is deliberately left to the complex laws and interactions of nature and thus stores time aspects of the change in the surface. BR independently generate small deviations, imprecisions and variables in the colour composition. They lead to a higher diversity and liveliness supporting the readability of material and storing production processes. Elizabeth Shotton made interesting trains of thought on material imprecisions, saying that a “relinquishing of control as it relates to processes and the abandoning of influence over final interpretations, could be the means to create this quality of transient fragility, by placing the reading of the artifact beyond the simplicity of the narrative - imbuing it instead with an evocative ambiguity in terms of both material rendering and its ultimate meaning” (Shotton 2007: 93). In contrast to a controlled or reduced surface, BR lead to a quality of colour and texture with not only a high diversity and complexity but also ambiguity for the observer. They increase the openness in the interpretation with all aspects that are a basis for the creation of atmosphere and which are described later along Peter Zumthor’s project in Wachendorf.

Perspective of the user (human entities)

From a distance, the shadows and lights of a surface structure become mixed to an almost uniform colour shade and as described in the section above, this colour shade is depending on the position of the sun and becomes brighter or darker. The closer one comes, the differentiations in shadows and

lights can be more and more perceived. This increases diversity in the process of perception of the facade. Regarding the design of surfaces, the term «diversity» originally refers to David Pye.

In his sense it describes a quality that derives from craftsmanship: the fine pattern of tool marks and the deviation from a smooth surface or a straight edge (Pye 1968: 35). The architect Uli Herres adds that diversity can be understood as a formal property of an object, which describes the sum of visual details as they are created by traces of craftsmanship, but also by ageing and by material properties such as wood grain (Herres 2016: 202). In other words, it describes the presence of differences and material based microstructures. Diversity in our expanded sense also means solutions whose interpretation includes and cultivates a multi-layered perception as in the example of proximity/distance mentioned above. For years, the architectural historian Walfried Pohl has been committed to ensuring that microstructures and ornaments that become interesting at second glance, must be increasingly cultivated in architecture. Through modern reduction or even the avoidance of microstructures, a monotony arises that no longer corresponds to the human being and his need for stimuli (cf. Pohl 2010: 150).

On another exemplary facade sample, there is a structure drawn through the plaster with a template with triangular peaks (see Figures 2, 3). In one direction, the structure is sprayed in a blue colour that correlates with the blue sky. And in the other direction with a colour related to the forest. A direction-dependent colour effect is created. As you walk by, you can see from one side above all the blue hue and from the other side a colour nuance of the forest. But not only by physically moving towards a building or walking by, a change of perspective can happen.

It might be that we realize, that the facade and the tree in autumn have a related colour and suddenly an association is formed. The colour and surface as such enable the viewer to establish a relation in the process of perception. This creation of relations and, in a certain sense, of an identity forming order is to be understood not only as conscious perception, but also as an unconscious stimulation of the senses. Humans experience the built environment with all their senses and their embodied knowledge (cf. Pallasmaa 2013). Zumthor describes it quite simply: “People interact with objects. As an architect that is what I deal with all the time” (Zumthor 2006: 11). And Böhme describes the human as “the sounding board for architectural quality” and then provides a definition of what atmosphere is: “And what between both (namely corporeal state and the qualities of the space I am in) is acting as an intermediary – that is the atmosphere” (Böhme 2014). Zumthor and Pallasmaa in particular deal intensively with the topic of *embodied knowledge*. What does architecture and landscape show through the body or all our senses?

How is the interaction of the partial aspects to be designed and how does atmosphere arise from it? Colour, material, light, space in the overall sensitive perception of the interacting human being. “It is this haptic sense of being in the world, and in a specific place and moment, the actuality of existence, that is the essence of atmosphere” (Pallasmaa, in Böhme 2014).

The Bruder Klaus field chapel can be cited as a best case of a built implementation to discuss the evolved contents. The chapel allows to reflect, how Peter Zumthor composed colour and material or light and shadow within spatial structures into a relational whole. One aspect he mentions in his publication *Atmospheres* is *material compatibility*: “I take a certain amount of oak and a different amount of tufa, and then add something else: three grams of silver, a key – anything else you’d like? [...] And we would look and see how these things react together. And we all know there would be a reaction. Materials react with one another and have their radiance, so that the material composition gives rise to something unique” (Zumthor 2006: 23-24).



Figure 4: Bruder Klaus field chapel from outside.



Figure 5: Beewax candle in front of the soot coloured surface.

He designs out of a relational understanding, knowing that only through a specifically modulated entanglement of the different aspects the whole can be brought to sound and thus have a harmonious effect on the viewer touching him emotionally.

The elementary dimensions of fire and water, earth and sky are each called upon and made present in their own way. [...] In any case, the fire remains permanently present in the burnt-out, sooty hollow form of the building. The humidity of the water standing in the ground puddle, the noises of the dripping rain, the crunching of the foot on the ground and the wind that sweeps across the opening of the chapel and continuously fills the room with a slight noise are just as much part of the physical-haptic experience that Zumthor offers visitors with his holistically designed building as the metaphorically understood “warmth” and “sound of the room” that feeds on the materials that come to bear in it. (Hubert 2016: 62; translation from German by the authors)

In the design of the Bruder Klaus field chapel it seems clear that Zumthor worked with "Material Compatibility" and created specific colour material qualities with the intention of cultivating atmospheres. As formwork for the interior, he used local spruce trunks which he built up into a tent-like structure and burned out after the tamped concrete set. From this processual act the dark colour, rich in nuances emerges. You see the layers of tamped concrete and the surface texture of the trees (Figure 5). The traces of the production processes show “a condition captured in stasis as an embodiment of experience and a memory of its other nature” (Shotton 2007: 92). Due to the implementation of BR the diversity increases in a natural, uncontrolled way. The colour is not symbolic, but functions in a multi-layered superimposition. It enables a multi-layered legibility and an open scope of interpretation for the visitor.

The interior of the chapel is illuminated with daylight through a small opening in the ceiling and supplemented with beeswax candles. It is not only stimulating the virtual sense, but brings the scents of the weather together with the scent of the beeswax and blends with the scent of the colour giving soot. From outside, the tamped concrete, which is mixed with the local soil of the field, acts as an identity-forming connection with the colour of the surroundings. These individual impressions of the chapel weave themselves into an atmosphere that enables an emotional and embodied experience.

CONCLUSION

Our discussion in the research project EDVH led us to distinguish our views and extend our perceptions. These coherences will be further developed in our theory in the future. Zumthor's chapel was then portrayed as man-made, experienceable architecture with all its nuances.

These are our insights:

Synergy between human and non-human entities - BR in processes - is the basis to create complex aspects and to increase the openness of the user's interpretation. Diversity or complexity in design that appeals to all senses is the prerequisite for the integration of embodied knowledge and thus the roots to generate atmospheric mood.

The main issues from the discussion are summarized:

- Composition of the aspects regarding to atmospheres: the whole is more than the sum of its parts
- Creating diversity and complexity: generate ambiguity
- Inclusion of «non-human entities»: brainless regulations
- Inclusion of non-visual aspects: embodied experience
- Interweaving with the context: relational design

It becomes clear that colour only unfolds its full atmospheric potential in relation and resonance, as a complex composition. In this way, the colour design cannot be argued outside the system as pure abstraction. What can be added in terms of our perception here is that the materiality and quality of colour in its complex wholeness must be placed and designed on the same level as the space. The space is transformed from a geometric to a complex, frayed space through the processing and interaction with materiality, i.e. from the point of perspective of the space, the transitions are not euclidean and smooth but rough in their aspects. The recent aspects of emotions are not flat, its complexity and non-human entities forms the dreams of atmospheres.

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<https://www.hslu.ch/en/lucerne-school-of-art-and-design/research/labor-materialitaet-und-ressourcen/>

REFERENCES

Böhme, G. 2014. *Encountering Atmospheres*: Online:

<https://www.archined.nl/2014/04/encountering-atmospheres-a-reflection-on-the-concept-of-atmosphere-in-the-work-of-juhani-pallasmaa-and-peter-zumthor/>

Herres, U. (2016). *Spuren des Handwerks - Der Einfluss handwerklicher Herstellung auf die Architektur*. ETH Zürich.

Hubert, H. W. (2016). *Annäherung an einen Muße-Ort: Die Feldkapelle Bruder-Klaus von Peter Zumthor*. Online: <https://doi.org/10.6094/musse-magazin/2.2016.57>

Pallasmaa, J., Wutz, A., & Holl, S. (2013). *Die Augen der Haut: Architektur und die Sinne* (2. überarb. Aufl). Los Angeles: Atara Press.

Pohl, W. (2010). *Der zweite Blick - wann ist er wichtiger als der erste? Gliederungsprobleme in Architektur und Design* (1. Aufl.). Essen: Klartext.

Pye, D. (1968). *The Nature and Art of Workmanship*. Cambridge: Cambridge University Press.

Wagner, M. (2002). *Das Material der Kunst: eine andere Geschichte der Moderne* (Brosch. Sonderausg.). München: Beck.

****Witzgall, S. 2016**

Shotton, E. (2007) *Material Imprecision*. In: Lloyd Thomas, K. (Hrsg.). (2007). *Material matters: architecture and material practice*. London; New York: Routledge.

Zumthor, P. (2006, A). *Atmospheres: architectural environments - surrounding objects*. Basel: Birkhäuser.