Optical Transparency vs. Institutional Transparency: The Discussion on the Origins of Architectural Honesty in Glass Application

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Transparency has become a new division of architectural theory and practice and has created a new kind of aesthetic sensibility, opening up a wealth of possibilities for visual expression The growing importance of the visual aspects in architecture is obvious, especially with respect to façades. Transparency is no longer limited to specific functional purposes (e.g. illumination of the building's interior), but becomes a tool of formal expression itself. This raises questions regarding the theoretical/ideal/institutional background for the application of architectural glass and impacts the perception of architecture by observers. The paper presents a general outline of ideological/institutional inspiration for architectural practice in the perspective of new types of architectural transparency.

Keywords: Glass, Transparency, Theory of Transparency

1. Introduction

The transparent trend that has been developing in architecture for more than 120 years is now in the stage of dynamic prosperity, although a distinct change can be seen. The "ideal" transparency that can currently be achieved in architecture is the result of a long process involving the development of material production technology and the methods of its installation (mounting and fastening). Contemporary architectural transparency (understood as the optical property of the material) is constantly being redefined, and over the last decade, new trends have begun to emerge. These tends originate in dynamic technological development and progress in the field of materials science. Currently, architects focus not only on the creation of space and formation of buildings' volume, but but also have "particular interest in surface design, in tactile properties, color and texture" (Kaltenbach 2004). Originally, light-permeable materials were used to introduce daylight and thus properly illuminate an interior but recently there has been an important change. Glass is no longer chosen only for its basic function of transmitting light, but also for its other qualities, such as durability, weather resistance and relative affordability.

A question arises whether there is any connection between the formal, imaginative, and visual change in transparency and the institutional meaning of the term *transparency*, which is usually associated with government policies and corporation governance. In this paper I shall demonstrate that despite the recent shift towards picturesque surroundings, it is the optical properties of transparent materials which have "suffered" the most. This process, as I plan to illustrate, comes along with the gradual erosion of the optical sense of the notion of transparency, which has been ongoing for nearly 70 years now. What might seem as merely a linguistic/semantic trick of modifying the meaning of the word is in fact greatly affecting the real architecture, its relationship with people, and the way society perceives it.

2. Convoluted paths of transparency

Since glass was first developed, its optical parameters have changed considerably. The manufacturing technology has greatly improved and what once was a foggy bulb of glass mass is now a smooth and flawless pane. Originally, the modernist glass was supposed to flood the interiors with fluxes of light and free the people from the sad and dull reality of 19th century architecture, as "…modernist architecture used the agency of transparent glass to erode the distinction between interior and exterior space" (Shimmel 2013). I believe this – in those days – innovative attitude (for those times) can be labeled as *honest* use of glass, despite the naivety of the predecessors of the modern movement. The idea was deeply rooted in the ideology of massive transformation of people's lives, and the humanization and improvement of healthcare. In spite of the legitimate criticism, this ideology did achieve its goal. A changeable quality of smooth glazed surfaces has always been considered especially valuable. Visually, glass makes a building more volatile than a solid masonry wall with sculpted details. The application of glass, especially in the form of flat sheets, creates a deliberate optical effect, which results from the physical properties of all smooth surfaces. A pane that is smooth enough to transmit light without scattering can also create a virtual image (i.e. the reflection in the glass pane). This is the reason why the first phase of development of the so-called "glass architecture" abounded with basic research. In his garden, Mies van der Rohe photographed a model of a famous glass skyscraper (Colomina 2007) to judge the prevailing optical effects that would create the image of the building.

In his very early text from 1928, Mohly-Nagy associated the optical property of this material with "transparency of the content", supposedly meaning the clarity of both: the message and the idea (Mohly-Nagy 1946).

With time the theory built upon the use of glass grew substantially. The fairly simple initial idea of using light-transmitting material to introduce light into the living space was first "blurred", then "distorted" and finally became completely "vague". The original *honest* transparency became a subject of theoretical considerations. Changes came in the 1940s and 1950s and culminated in the famous essay by Rowe and Slutzky titled "Transparency: literal and phenomenal". The public found out that apart from literal (or "material" as some call it, where I stubbornly keep calling it "optical") transparency, there also exists "phenomenal" transparency (Rowe, Slutzky 1963). When the "phenomenal" term was coined in 1963 with reference to cubist paintings, its definition was not very clear but it became the subject of numerous speculations, and even – as some authors would like to see it – it materialized in architectural practice in the form of "shallow space" (Rowe, Slutzky 1963). The phenomenal transparency – as authors explained – is much more metaphorical, it emerges from the structure of planes, it can be found in the way space is stratified.
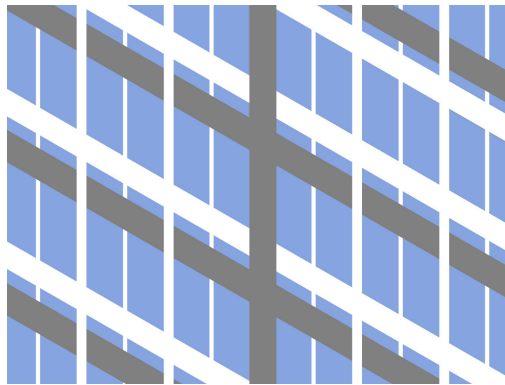

Fig. 1. Arrangement of blue (reflected sky), white and gray figures gives the impression of two interweaving threads – as in a textile cloth. Image inspired by the patterned facade of the Mile High Center building in Denver (arch. I. M. Pei, 1959). A clear declaration of the phenomenal transparency by Rowe and Slutzky. Fig. by author.

As the number of interpretations grew exponentially, the authors of the original essay decided to release the second part of the essay (Rowe, Slutzky, 1972) to precisely explain the term they had previously defined so vaguely. The second part of the essay was so revolutionary that some preferred not to have read it at all. The "phenomenal" transparency was brutally stripped off of all its metaphorical mystery and it was suggested that it should be considered "a pattern" [sic] (Rowe, Slutzky 1972), and experienced as a simple flat figure-ground phenomenon of interweaving ribbons (see Fig. 1). Although the paper did describe this interesting phenomenon it did not contribute anything new to the field of optical transparency of light-transmitting materials, but instead caused some confusion and ambiguity to the term, which was multiplied by numerous interpretations by other authors. As Hagg-Blatter concludes her critique "literal and phenomenal transparency in no way provide us with a new general definition" (Hagg-Blatter, 1978).

The first part of the paper by Rowe and Slutzky became very sound and started the career of the notion of "transparency", which is disassociated from its original optical meaning. As Shimmer writes, the papers by Rowe and Slutzky were "…influential in shifting the interpretation of transparency away from the glass architecture of 30's, 40's and 50's…" (Shimmel 2013), towards new post-modern meanings of blurred translucency and vagueness. This also undermined the previous modernist approach to justify the use of transparent panes by the "fresh air and hygiene cult" (Shimmel 2013) and, obviously, moved the *new* meaning towards more metaphorical, but still deeply thought-through visual design proposals. This happened to coincide with the development of material technology that allowed for new types of transparency.

3. Does smooth always mean transparent?
Even early modernists knew that the light-transmitting envelope is optically transparent only in certain lighting conditions (this was "the" feature that Mies van der Rohe tested), while in the other conditions, the virtual image dominates over the real (transmitted) one. Optical transparency is a fragile property that is determined by many aspects of the surrounding environment, such as the lighting conditions, the time of day, the season of the year. Upon critical inspection of amateur photographs of buildings with large glass surfaces, the light-transmission property is often lost in favor of its light-reflecting property. Basic glass simply does not guarantee optical transparency for all viewing angles and lighting conditions. This phenomenon of "overlapping images" was initially considered valuable, as new visual qualities were discovered, but soon – with the increased use of glass – the phenomenon became ubiquitous and common. The transmissive qualities of glass, apart from the visually pleasing appeal, had a negative impact on the microclimate due to the greenhouse effect. The ideology that was born out of

the need for illuminated interiors suddenly turned to advanced technologies which are designed to reduce this illumination. At the time, one of the high-tech ways of dealing with the problem of excessive heat gain was by placing a microscopic layer of metal on the glass pane (i.e. a thin coating). It did temporarily solve the problem of overheating but it also permanently blocked the view into the building. Mirrored glass became eminent, especially in corporate architecture, where efficiency counts.

The best summary of the new, mirrored transparency is given by Frederic Jameson, the author of the famous "Postmodernism or the Cultural Logic of Late Capitalism". He describes the mirrored envelope of the Bonaventure Hotel in Los Angeles as follows: "…the glass skin repels the city outside, a repulsion for which we have analogies in those reflector sunglasses which make it impossible for your interlocutor to see your own eyes and thereby achieve a certain aggressivity…" (Jameson 1983; reported by Teckert 2006). Jameson's feeling is commonly shared by people who feel that they cannot look deep into the building and thus feel rejected, while the events taking place inside are considered hidden and insincere. This attitude notably moves the public attention from utilitarian usage of transparent material to a more metaphorical and formal application of glass and other light-permeable materials. The public questions the *honesty* of the application of architectural glass in buildings and its semantic meaning. The first associations are obvious and simple: optical transparency means that the building has nothing to hide, just as the company/agency/government/enterprise that occupies it. Transparency was a handy feature to consider: it was visually appealing and politically very sound. Smart PR managers quickly realized that companies do not need to create a *bona fide* institutional *transparency* if they can simply give people the *mere* optical transparency to serve as a symbol (which was much cheaper, and "safer"). As Vidler rightly points "…the politics of the moment insisted, and still insist, on the illusion that light and enlightenment, transparency and openness, permeability and social democracy are not only symbolized but also effected by glass" (Vidler 1993). This strong yet unfortunate misconception is confirmed in many completed buildings, particularly those that relate to democratic or legal institutions. To name the two: the Foster's renovation of the Reichstag's Building (Fig. 2a) and Petzinka, Pink and Partner's CDU political party headquarters (Fig. 2b). The fist building is topped with a transparent dome, containing a glazed transparent skylight, allowing the light not only to penetrate the debating chamber, but also for the public to gaze (do they really gaze?), but: "the chamber may be on view, literally, but what transparency promises security prevents (…) some of the politicians can be seen, but not heard, and this has some interesting connotations, but, in the end, the chamber – the democratic heart – remains detached" (Whiteley 2003). Similar impressions are experienced in the CDU building, which is encased in a transparent envelope that allows people to see the glazed hall, but not to penetrate into the office rooms, where the real politics happens.

a) b)

Fig. 2a) Reichstag's Building (Architect: Foster and Partners, 1999), b) CDU headquarters in Berlin
(Architect: Petzinka, Pink and Partners, 2000). Photos by author.

The strive to achieve institutional transparency (if at all possible) turns out to be a very dangerous path, as it allows the public to scrutinize the processes that were previously hidden. It might be speculated here that as contemporary institutions and corporations are becoming more and more *transparent* visually, they still remain inaccessible and vague as far as institutional *transparency* is concerned. Buildings seem to simply replicate this attitude: they are formally *transparent* and glazed but simultaneously are becoming inaccessible and guarded in terms of practical use. This direct and simple *glass equals honesty* attitude to transparency was thoughtfully criticized and questioned. The extensive use of glass does not improve democracy, it rather raises more the questions than it actually answers: "…the ambition to architect democracy has been further demoralized by growing cynicism with politics and eroding public trust…" (Zinnbauer, 2015) and transparency is considered "… a convenient marketing gimmick in sales pitches rather than a thought-through functional concept to be taken seriously" (Zinnbauer, 2015).

I am determined to advocate here that the term "transparency" used in a political context might be an unintended misuse. Whereas the political debate is supposed to represent clarity of intentions and *honesty*, the use of smooth glass in architecture is rarely associated with the visual contact with the items/things/reality on the other side of the envelope – the obvious condition of transparency. This is caused by the optical properties of smooth surfaces that simultaneously transmit light without distortion and reflect it, creating virtual images. The virtual image dominates the visual appearance of the building experienced by the outer/outside viewers. Or, what might also be the case, the usage of the term „transparency" is deliberate (a Freudian slip?), and the term is used consciously with the awareness of real optical properties of glass; intending to represent not-so-clear and not-so-honest intentions. I dare to state that we have come to a paradox where the term "transparency" – rarely seen as its visual manifestation in reality, has gained an additional meaning associated with "legitimacy, policy efficiency, and good governance, as well as a universal remedy against corruption" (Forssbaeck, Oxelheim 2014). This meaning was then simply translated into architectural practice as the extensive usage of glass on facades.

4. Even less transparent transparency

Gradually shallower ideological convictions have replaced the original *honest* meaning of transparent architecture. The visual aspect of architecture has a new interpretation. It is not that glazed architecture was not visual before, but the pressures are distributed a bit differently – one could say that the picture has become bit *blurred*. In 1995 Terence Riley in a catalogue of famous "Light Construction" exhibition claimed that "the facade becomes an interposed veil (…) distancing the viewer of the building from the space or forms within and isolating the viewer within from the outside world." (Riley 1995). This trend of gradual erosion of transparency is widely seen, especially in the way the glazing technology develops towards the obscuring of transparency: the technologies of printing, fritting, tinting the glass. This results in interesting formal and visual effects, where glass ceases to be a "mediator" which connects the interior and exterior space, but becomes a bearer of a completely new content. Transparency is deliberately interrupted. Previously, the obstruction of transparency resulted from the unfavorable lighting conditions (which changed the walls of a building into mirrors depicting a virtual image) or because of the imperfections in the material itself or poorly performed installation job. Nowadays transparency is deliberately questioned with the designer fully aware and with the obvious reference to the ideas of the Popea's veil covering the face of the Neron's lover or lace lingerie. Architecture is teasing the viewer by only promising to show something, without actually showing it. This specific relation between "closeness and inaccessibility" was noted by Starobinsky as early as 1961 (Starobinsky 1961).

This haziness and blur go together with the more imaginative and picturesque character of the surrounding world, which is added to the image that can be seen *in the front*, but not the image that *is behind*. A surprisingly smooth transition from transparency to translucency comes at the end of 1980's with the famous Très Grande Bibliothèque in Paris competition entry by Rem Koolhaas of the Office for Metropolitan Architecture (OMA). Perrault's transparent and Koolhass'es translucent proposal clearly discriminate the separation of new trends. New postmodern transparency becomes *translucency*. It included the experiments with blur by Herzog and de Meuron. In SUVA's Headquarters, where additional translucent cladding was applied, the "enclosure system consists of horizontal glass strips of different optical and physical qualities" (HdM webpage, 050) (Fig. 3a) or in Ricola's warehouse, where "light filtering occurs through printed translucent polycarbonate façade panels" (HdM webpage, 094) (Fig. 3b). This change in optical properties of the architectural envelope results from the intention to invite the observer of architecture to participate in the "game of guessing" what is hidden behind a translucent wall. The visual information reaching the observer is only partial, leaving a great scope for individual interpretation. This visual change occurred coincided with the change initiated in philosophy by deconstructivism.

The connection between *translucency* and institutional transparency is less obvious, but still can be observed. While the original optically *honest* transparent architecture is still in fashion (obviously not always used with clean intentions), I perceive its blurred type/to be much more *honest*. I base my view on the fact that blurred transmission in many cases is conditioned by the functional need of scattered illumination in the building, to name only the Bloch building, Nelson-Atkins Museum of Art in Kansas (arch. S. Holl, 2007), Kunstmuseum Dieselkraftwerk in Cottbus (arch. Anderhalten Architekten, 2007) or Kunsthaus in Bregenz (arch. P. Zumthor, 1997). In the latter case, light-scattering properties of the glazed external envelope are used to modify the light entering the plenum above the suspended glazed ceiling which illuminates the exhibition halls.

The postmodern *translucency* introduces not only a less *literal*, but a more *phenomenal* approach to material. A new relation to the democracy, governance and public scrutiny can also be established/observed. Paradoxically, this new contemporary blurred *transparency* corresponds to the condition and the social and political structure of the world much more accurately than before: the lack of rules, the vagueness of ideas, the out-of-focus human perspectives. Architecture is slowly becoming undefined, hidden in a haze, more difficult to "read" and understand.
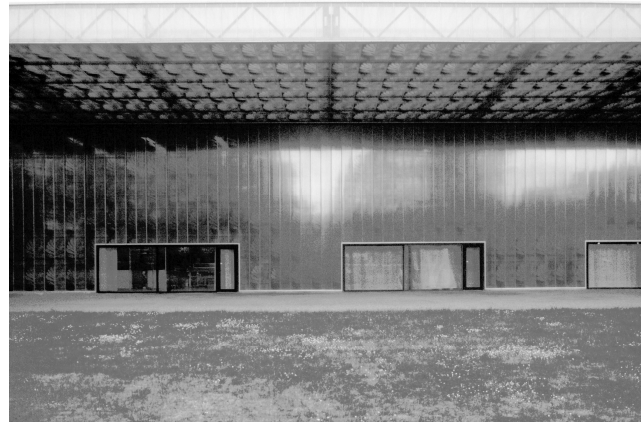
Fig. 3a) The external glazed cladding of the facade of the SUVA building in Basel, Switzerland (Architect: Herzog and de Meuron, 1989, source: Photo by U. Wisniewska. Used with permission.), b) Ricola's warehouse and production facility (Architect: Herzog and de Meuron, 1989, source: Photo by R. Rutkowski. Used with permission).

5. Illumination no longer required

Due to their high durability and resistance against climatic conditions, transparent materials (glass and polycarbonates) are becoming a popular cladding material, not only designed to illuminate the building's interior, but also because of their ability to change the appearance of the building depending on the lighting conditions. This unique feature of glazed envelopes pushed architects and designers towards extensive use of glass, not only on light-permitting/illuminating sections of the façade (also called visual regions of a curtain wall), but on the whole surface. The spandrel, slab and ceiling of the façade were also covered with transparent glass, showing the relatively shallow blind space behind (approx. 40-120 mm). In these regions, light-permeable envelopes functioned more as a cover than a fenestration. Thus, light-permeable materials, which were still considered the necessary method of illuminating interiors, are also used as elements contributing to the overall formal expression of the building by light-activating those parts of the façade that were previously neglected. This *shadow box* technique has gained popularity and uses the spatial potential of the thickness of the previously flat façade which lacked detail and window recesses. This approach is one of the many developed to achieve the impression of depth by means of glazed but non-illuminated regions of the curtain wall.
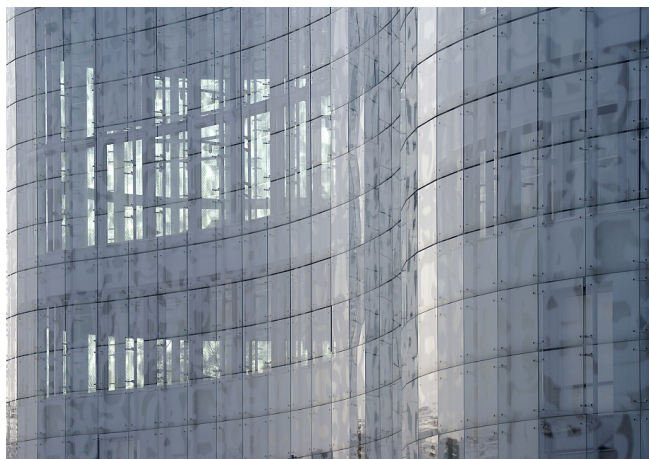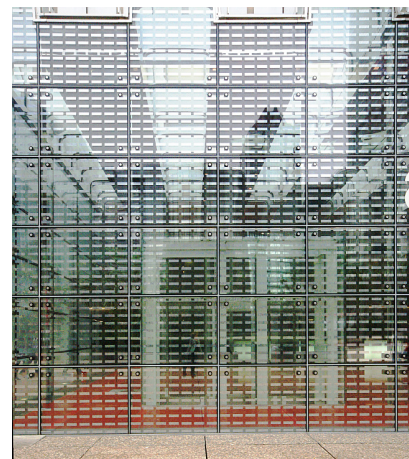
Fig. 4. Interrupted transparency: a) IKMZ Library, Cottbus (arch. Herzog & de Meuron, 2004), b) Ariane Office Tower, La Défense, Paris (arch. Robert Zammit, Jean de Mailly, 1975). Photos by author.

This new type of transparency in buildings is easer to achieve and also more affordable from the point of view of the initial investment. Transparency thus became "a redundant feature of the material" and light-permeable materials were "used for their chemical and climatic durability, rather than for their optical properties" (Brzezicki 2014). The image-transmitting quality of the fenestration diminishes, becomes a blurred see-though cladding, or even a redundant feature of the light-permeable envelope (Brzezicki 2014).

6. New transparency – the conclusion

The current discourse on transparency in architecture distinguishes different views and different trends. The two trends that I labeled *transparent* and *translucent/blurred/interrupted* are now coexisting. Optically transparent architecture is build/raised to convince the public of the investors' clean intentions (regardless of their actual goals), but "…the celebration of glass, visibility and transparency sits uneasily beside the reality of competitive secrecy, arcane organizational structures and inaccessible organizational elites" (Zyglidopoulos Fleming, 2010). A reflection – an immanent feature of the smooth glazed envelope – is perceived as a tool of creating "… a state of ambivalence, neither fully transparent nor opaque (…) thereby destabilizing a picture of oneself and the space" (Teckert, 2006). While *transparent* architecture is facing a wave of criticism, the same objections could be raised against *translucent* envelopes, which are designed to achieve numerous visual effects: e.g interrupted transparency is also used to soften boundaries between the inside and outside (Fig. 4a, 4b). Thus the building is gradually dissolved in the surrounding landscape. The resulting visual effects are undoubtedly interesting, but the view into the building is usually successfully blocked, with all the *political* consequences of limited visual access. As Diller and Scofidio point out, "glass is now understood as a surface to look at, not only through. Transparent glass is no longer invisible, rather, it is a display surface that modifies human behavior on either side" (Diller, Scofidio 2002).

The process of gradual erosion of transparency has led not only to the devaluation of the initial meaning of the term on the semantic level (both optical or institutional), but also to a real loss of transparency for the sake of other optical phenomena. The playful nature of optical phenomena which scatter, hide and block the light wins over a message that directly communicates the intentions to the viewer – the clear glass and its *honesty*. Instead of facades, architects create multilayered envelope structures designed to obstruct the view in both directions and to allow view only to a certain predefined depth of the envelope. As a result, despite the extensive use of glass, it is the optical transparency, the visual connection and the spatial continuity, that has suffered the most.

Acknowledgements

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