

Transparency

1

Transparency belongs to the connate notions of the Bauhaus. It can be found already in Lyonel Feininger's (1871–1956) frontispiece for the Bauhaus manifesto,¹ the *Kathedrale (Cathedral)*, printed in April 1919. The woodcut shows the front view of a Gothic cathedral, which can be identified reliably by its flying buttresses. The three spires are crowned by three stars, which are interconnected by light beams. These light beams are interwoven with a second group of prismatic (light) beams rising immediately from behind the cathedral and covering the whole background of the woodcut. The vertical wake induced by the prismatic light beams and the steeples is further supported by the hilltop site. The portal's tympanum, which seems to be identical to the nave's roof, has the outline of a perfect triangle; it displays the somehow cubist depiction of a cube.

Feininger's woodcut was a commissioned work. It was supposed to be the artistic equivalent of the ideas put down in Walter Gropius's (1883–1969) Bauhaus manifesto and therefore had to correspond with them to a certain degree.² The manifesto is opened by the famous dictum, "*Das Endziel aller bildnerischen Tätigkeit ist der Bau!*"³ ("The ultimate purpose of all artistic activity is the building!") Gropius explains that architects, painters, and sculptors should work together again, in order to achieve the "unified work of art," which is the great—or big?—building ("Das letzte, wenn auch ferne Ziel des Bauhauses ist *das Einheitskunstwerk—der große Bau*").⁴

Feininger's frontispiece appears as a somewhat literal implementation of Gropius's evoking words: "Wollen, erdenken, erschaffen wir gemeinsam den neuen Bau der Zukunft, der alles *in einer Gestalt* sein wird: Architektur und Plastik und Malerei, der aus Millionen Händen der Handwerker einst gen Himmel steigen wird als kristallenes Sinnbild eines neuen kommenden Glaubens."⁵ ("Let us together will, devise, create the new building of the future, that will be everything in one appearance: architecture and sculpture and painting, that will rise heavenwards one day from millions of hands of the craftsmen as the crystal symbol of a new belief to come.") Mindful of these words, the cube depicted in the tympanum could be understood as the basic element of building.

¹ For a reproduction of the four-page leaflet, see Wingler 1962: 38–41.

² Cf. for example Weber 2006: 113 f. Weber writes: "Nicht allein aufgrund dieses Symbolcharakters, sondern auch in seiner hieratischen Strenge, seiner Frontalität und Symmetrie ist der Holzschnitt für das Bauhaus-Manifest ohne Parallele unter allen anderen Kirchendarstellungen Feiningers." (Weber 2006: 113). English translation at the end of the essay.

³ Cf. Wingler 1962: 39.

⁴ Cf. Wingler 1962: 40.

⁵ Cf. Wingler 1962: 39.

Gropius's talk of the new building as a "crystal symbol," and Feininger's corresponding light beams, which dominate the frontispiece, are not sudden ideas that emerged first in April 1919. We should recollect the situation at that time. Gropius and Feininger were based in postwar Berlin, like so many other protagonists of the modern movement, which was still in its infancy. In this stirred environment, many activities were coming into being. These included the foundation of the *Novembergruppe* and the *Arbeitsrat für Kunst* in 1918, both preceding the opening of the Bauhaus. In 1919, the *Gläserne Kette* was to follow.

In December 1918, Gropius and Feininger both belonged to the founding members of the *Novembergruppe* as well as the *Arbeitsrat für Kunst*, the latter initially headed by Bruno Taut (1880–1938). When Taut resigned in February 1919, Gropius became his successor. The ideas expressed in the Bauhaus manifesto were present already in the *Arbeitsrat*. The architect Taut was still the leading figure within a third coalition, the *Gläserne Kette*, founded in November 1919, essentially representing a utopian professional correspondence. Gropius became a member of the *Gläserne Kette*, too.

One person who had some influence on the expressionist architectural ideas not only of Taut was the writer Paul Scheerbart (1863–1915). His book *Glasarchitektur (Glass Architecture)*, published in 1914 in the Berlin-based *Verlag der Sturm* and dedicated to Taut, intimated how the future architecture that Taut, Gropius, and the others were aiming at could look. Under the rubric "Die Schönheit der Erde, wenn die Glasarchitektur überall da ist" ("The beauty of the Earth, when glass architecture is everywhere," chapter XVIII) Scheerbart declares:

Die Erdoberfläche würde sich sehr verändern, wenn überall die Backsteinarchitektur von der Glasarchitektur verdrängt würde. Es wäre so, als umkleidete sich die Erde mit einem Brillanten- und Emailsckmuck. Die Herrlichkeit ist gar nicht auszudenken. Und wir hätten dann auf der Erde überall Köstlicheres als die Gärten aus tausend und einer Nacht. Wir hätten dann ein Paradies auf der Erde und brauchten nicht sehnsüchtig nach dem Paradiese im Himmel auszuschaun.⁶

⁶ Scheerbart 1914: 29. English translation at the end of the essay.

This passage basically appears as a parallel to the intentions of the later Bauhaus manifesto. The following chapter XIX is entitled "Die gotischen Dome und Burgen" ("Gothic cathedrals and castles"). Within this chapter, Scheerbart explicates:

Die Glasarchitektur ist nicht ohne die Gotik zu denken. Damals, als die gotischen Dome und Burgen entstanden, hatte man auch eine Glasarchitektur gewollt. Sie kam nur nicht ganz zur Ausführung, weil man noch nicht das unerläßliche Eisenmaterial zur Verfügung hatte. Dieses erst gestattet, den ganzen Glastraum zu realisieren.⁷

⁷ Scheerbart 1914: 30. English translation at the end of the essay.

This passage of 1914 conjoins avant la lettre the idea of a “new building of the future” (Gropius 1919) with the cathedral and the light beams in the frontispiece (Feininger 1919). Altogether, this might provide us with a provisional idea of the circumstances in which the Bauhaus came into existence. Additionally, in order to realize the multiplicity of personal points of contact, it is noteworthy that Feininger’s first solo exhibition was held in 1917 in Herwarth Walden’s (1878–1941) *Sturm* gallery in Berlin.

If the Bauhaus is viewed as striving for a cultural fresh start after the disaster of the World War, then we can recognize that Gropius could discover an analogous endeavor already in *Glasarchitektur*. This becomes apparent in the following passage taken from the first paragraph of Scheerbart’s book:

Unsre Kultur ist gewissermaßen ein Produkt unsrer Architektur. Wollen wir unsre Kultur auf ein höheres Niveau bringen, so sind wir wohl oder übel gezwungen, unsre Architektur umzuwandeln. Und dieses wird uns nur dann möglich sein, wenn wir den Räumen, in denen wir leben, das Geschlossene nehmen. Das aber können wir nur durch Einführung der Glasarchitektur, die das Sonnenlicht und das Licht des Mondes und der Sterne nicht nur durch ein paar Fenster in die Räume läßt—sondern gleich durch möglichst viele Wände, die ganz aus Glas sind—aus farbigen Gläsern. Das neue Milieu, das wir uns dadurch schaffen, muß uns eine neue Kultur bringen.⁸

This passage parallels the intentions of the Bauhaus, and the walls “made entirely of glass” anticipate, among others, particularly the workshop wing of the Bauhaus building in Dessau (1925–1926)—with the exception of the “coloured glass,” which can be attributed to the sphere belonging to Taut, not to Gropius. And, to be exact, Scheerbart was writing about translucent glass walls, not of transparent ones.⁹ Nevertheless, the example of Scheerbart reveals the close connection Bauhaus had with the (somewhat expressionist, somewhat utopian) idea of glass architecture, and therefore, transparency.¹⁰

2

Sigfried Giedion (1888–1968) was a Swiss art historian who had obtained his doctorate in Munich with Heinrich Wölfflin (1864–1945) in 1922. In 1918, Giedion’s play *Arbeit* (*Work*, Berlin 1917) about different ideas of architecture had been put on stage in Berlin by Max Reinhardt (1873–1943; alongside productions in Vienna, Leipzig, and Basel).¹¹ Shortly after his doctorate, Giedion developed a lifetime connection with the Bauhaus when he visited its 1923 exhibition in Weimar.¹² In the course of time, he became not only an influential promoter of Gropius and the Bauhaus, but also a powerful disseminator of the notion of transparency within the modern movement. The slogan “Licht, Luft, Oeffnung” (“light, air, opening”) underlying Giedion’s book *Befreites Wohnen* (1929) formed an essential part of that notion.¹³

⁸ Scheerbart 1914: 11. English translation at the end of the essay.

⁹ Cf. this passage, among others: “Wenn ich in meinem Glassaal bin, will ich von der Außenwelt nichts hören und sehen. Hab’ ich Sehnsucht nach Himmel, Wolken, Wald und Wiese – so kann ich ja hinausgehen oder mich in eine Extra-Veranda mit ‘durchsichtigen’ Glasscheiben begeben.” (Scheerbart 1914: 47). English translation at the end of the essay.

¹⁰ Still Winfried Nerdinger stated about the Bauhaus building that “[e]specially the glass wall in the workshop wing illustrated Gropius’ old desire to create a point of crystallization for the new era. [...] The glass body is the last symbol of the expressionist reform movement and as such is not to judge from a functional point of view” (Nerdinger 1996: 74). Cf. also Wilhelm 1998: 21.

¹¹ Cf. Georgiadis 1989: 16–22. Additionally, Georgiadis provides further insight into the link between the Gothic style, the cathedral, and the architectural conception of that time, cf. Georgiadis 1989: 22–24.

¹² Cf. his report: Giedion 1923.

¹³ Giedion 1929; English edition: Giedion 2019. The idea of “Licht, Luft und Sonne” (“light, air, and sun”) was a principal theme accompanying the formation of the modern movement in general, and the field of housing construction in particular. Already in 1904 we read in the *Schweizerische Bauzeitung*: “Den Forderungen der Hygiene [!] sucht man immer mehr gerecht zu werden. Die Wohnung erhält Licht, Luft und Sonne.” (“More and more they aim at the fulfilment of sanitary demands. Dwellings are invested with light, air, and sun.”)—St. (1904): 113.

14 English edition: Giedion 1995. Giedion's book was published when the Congrès International d'Architecture Moderne (CIAM) was founded in order to help modern architecture on the final road to success. Jos Bosman has pointed to the fact that *Bauen in Frankreich* was published shortly before the founding congress at La Sarraz and was sent to the invited architects in advance. – Cf. B.[osman] 1998: 66. Cf. also Bosman 1989: 129.

15 Giedion [1928]: 17. English translation at the end of the essay.

16 Giedion [1928]: 18. English translation at the end of the essay.

17 Jobard 1849: column 30. By the way, a mistranslation seems to have occurred from “verres [...] diaphanes ou dépolis” to “mattem oder durchsichtigem Glas” to “glass panes, either frosted or transparent”. Rather it should be something like “diaphanous or frosted glass”, since verre dépoli is the term for frosted glass. Actually the French original passage does not talk about transparent glass. The history of this misreading could be of some interest with respect to the transparent curtain wall of the Bauhaus building in Dessau.

Even more illuminating with respect to the notion of transparency is Giedion's book *Bauen in Frankreich, Bauen in Eisen, Bauen in Eisenbeton* of 1928,¹⁴ for it substantiates the insight that the source of Giedion's idea of transparency, at least at that time, had been the large structures of the nineteenth century made of iron (and glass), rather than cubist and expressionist art and literature from after the turn of the century. This earlier origin might explain why Giedion's idea of transparency lacks the artistic refinement and ambiguities to be found, for example, in Feininger's *Kathedrale*.

While Scheerbart's job was basically to help prepare the advent of modern architecture, by 1928 Giedion could already choose from a large variety of projects and recently realized buildings. Apparently taking up the ideas already present in *Glasarchitektur*, Giedion wrote about iron as a building material: “Eisen öffnet die Räume. Die Wand kann zur durchsichtigen Glashaut werden. [...] Dies führt zu neuen Gesetzen der Gestaltung.”¹⁵

This statement is followed shortly after by a quotation of 1849, taken from an article on “Architecture de l'avenir” (“Coming Architecture”). Giedion translates the quotation from French to German as follows:

Das Glas ist bestimmt in der METALLARCHITEKTUR eine große Rolle zu spielen. An Stelle dicker Mauern, deren Festigkeit und Sicherheit durch eine große Anzahl von Löchern vermindert wird, werden unsere Häuser so von Öffnungen durchsetzt werden, daß sie *lichtdurchlässig* erscheinen. Diese weiten Öffnungen aus dickem, einfachem oder doppeltem, mattem oder durchsichtigem Glas, werden während des Tages im Innern und nachts nach Außen einen *magischen Glanz* ausströmen.¹⁶

while the original passage from 1849 reads as follows:

[...] le verre est appelé à jouer un grand rôle dans l'architecture sidérurgique; au lieu de ces épaisses murailles percées de grands trous qui en diminuent la solidité et la sûreté, nos maisons seront émaillées d'élégantes et nombreuses ouvertures qui les rendront complètement perméables à la lumière. Ces ouvertures omniformes, garnies de verres épais, simples ou doubles, diaphanes ou dépolis, blancs ou colorés à volonté, seront d'un effet magique le jour à l'intérieur, et la nuit à l'extérieur par le jeu des lumières.¹⁷

Typically enough, Giedion in his translation omits the phrase “blancs ou colorés à volonté” (“white or colored [glass] at pleasure”): In 1928 the mainstream of modern architecture had already left behind its expressionist tendencies and had advanced to rationalism and white modernism, which go without colored glass. Yet the 1849 quotation still mentions a number of other ideas and possibilities taken up by Scheerbart in *Glasarchitektur*, as for example houses completely permeable to light, double glazing, diaphanous, and frosted glass (*verre dépoli*), and the “magical splendor” (or “magic effect”)

during the daytime and the nighttime created by the play of lights. As we see, the expressionist and the rationalist tendencies of modern architecture can be ascribed to the same origins.

Having identified Giedion's prosaic approach to modern architecture, we should now consider his comments on transparency in *Bauen in Frankreich*. Giedion understands "Transparenz," "transparent," and "durchsichtig" essentially in terms of dematerialization. Accordingly, when describing the *Galerie des machines* built by Henri de Dion (1828–1878) for the Paris World's Fair of 1878, he declares: "*Die Verbindung von Glas und Eisen verlangt ihrer Natur nach eine weitgehende Entmaterialisierung des Baues.*"¹⁸ Furthermore, Giedion's idea of transparency is fundamentally connected with the notion of "Durchdringung" (interpenetration). With the help of this notion, Giedion binds together the works of civil engineering dating from the nineteenth century with the completely different houses of white modernism built during the 1920s. The following passage is typical of that mindset:

In den luftumspülten Stiegen des Eiffelturms [...] stößt man auf das ästhetische Grunderlebnis des heutigen Bauens: Durch das dünne Eisennetz [...] strömen die Dinge [...] Verlieren ihre abgegrenzte Gestalt: kreisen im Abwärtsschreiten ineinander, vermischen sich *simultan*. [...] *Es gibt nur einen großen, unteilbaren Raum, in dem Beziehungen und Durchdringungen herrschen, an Stelle von Abgrenzungen.*¹⁹

¹⁸ Giedion [1928]: 50. English translation at the end of the essay.

¹⁹ Giedion [1928]: 7, 9. English translation at the end of the essay.

Accordingly, Sokratis Georgiadis has lucidly remarked:

Ob an den Eisenkonstruktionen der Ingenieure oder den Betonhäusern der Architekten des neuen Bauens, stets wurden [von Giedion] die gleichen Dinge geahnt oder gesehen—Linien, Flächen, Luftvolumen—und ebenso wurden sie mithilfe eines einzigen Begriffsapparats beschrieben: Beziehung, Durchdringung—hinzu gesellten sich Simultaneität, Transparenz, Leichtigkeit, Entmaterialisierung usw.²⁰

²⁰ Georgiadis 2000: 13. English translation at the end of the essay.

We understand that Giedion's idea of transparency was not a sharply defined term but rather a word expressing a certain mood or simply enthusiasm. Especially instructive for Giedion's conception of transparency is the chapter on Le Corbusier (1887–1965), where he praises the "Luftkuben" ("cubes of air") penetrating into Le Corbusier's houses.²¹ In this context, Giedion puts his idea of transparency into more concrete terms:

Luft weht durch [die Häuser Corbusiers]! Luft wird konstituierender Faktor! Es gilt dafür [...] nur BEZIEHUNG und DURCHDRINGUNG! [...] Zwischen Innen und Außen fallen die Schalen. Ja, die Häuser Corbusiers erscheinen dünn wie Papier. Wenn man will, erinnern sie an die fragilen Wandgebilde pompejanischer Malerei. In Wirklichkeit aber fällt ihr Ausdruck mit dem Willen zusammen, der sich in der ganzen abstrakten

²¹ Cf. Giedion [1928]: 84 f., 92; cf. Giedion 1995: 168 f., 176.

Malerei äußert. Nicht mit Papier und nicht mit Pompeji haben wir zu vergleichen, sondern auf die Bilder der Kubisten hinzuweisen, die die Dinge in schwebender *Transparenz* sehen und hier auf den *Puristen* Jeanneret selbst, der als Architekt den Namen Le Corbusier angenommen hat. Er mag in seiner “Peinture moderne” [...] gern versichern, nur deshalb gewöhnliche Flaschen und Gläser, also möglichst uninteressante Dinge, für seine Bilder genommen zu haben, um die Aufmerksamkeit nicht von der Malerei abzulenken. Der Historiker [Giedion] aber sieht die Wahl nicht als zufällig. Für ihn besteht der Sinn dieser Wahl in der Bevorzugung schwebend-durchsichtiger Dinge, deren Konturen ohne Schwere ineinander übergehen. Er weist von den Bildern zur Architektur. Nicht nur auf Photos, auch in Wirklichkeit verschwimmen die Kanten der Häuser ineinander. Es entsteht [...] jene *Entmaterialisation* des Festumgrenzten, die [...] im Schreitenden das Gefühl erzeugt, als ginge er in Wolken.²²

22 Giedion [1928]: 85. English translation at the end of the essay.

23 Cf. Giedion [1928]: 94, 96; cf. Giedion 1995: 178, 180.

24 Cf. the exhaustive publication: Schmidt and Fischer (eds., 1998).

25 Cf. especially Giedion [1928]: 94, fig. 107; cf. Giedion 1995: 178, fig. 107.

26 Cf. Giedion [1928]: 96–105; cf. Giedion 1995: 180–189.

27 Cf. Giedion 1941: 398–405.

28 For that reason, the image pair has also been used as the cover picture on the dust jacket of Georgiadis’s Giedion biography (cf. Georgiadis 1989). It should be mentioned that, at first, Picasso’s *L’Arlésienne* and the photograph of the Bauhaus building had *not* been presented so convincingly on one double page. Rather both images were to follow one another on two right pages (first printing: March 1941; available to me: second printing of August 1941). In the later editions, the persuasive power of Giedion’s comparison was improved by the well-known double page layout of the two images (since at least the sixth printing of June 1946: 402 f.).

This comparison between modern art and architecture becomes most convincing when Giedion makes reference to the Maison La Roche (1923–1925),²³ which was built by Le Corbusier for the presentation of Raoul La Roche’s (1889–1965) collection of cubist art.²⁴ Even if the Maison La Roche cannot be described as a three-dimensional realization of a cubist painting—after all, the precise edges of that building do not “blur” in any way—, Le Corbusier aimed at creating a harmony between the building and the paintings. Surely it is not untrue to state that the building originates in the same attitude as his paintings. Moreover, the “Raumdurchdringungen” (interpenetration of spaces) that are so central to Giedion’s argumentation become obvious in the interior space of the Maison La Roche.²⁵ Much the same can be said about the other buildings by Le Corbusier presented in *Bauen in Frankreich*, especially his Villa Stein-de Monzie in Garches (1927–1928) and his project for the Palace of Nations in Geneva (1926–1927).²⁶

3

While Giedion’s comparison between Le Corbusier’s buildings and his purist paintings appears to be almost self-suggesting, he presented a similar but rather astonishing comparison 13 years later in his book *Space, Time and Architecture*. It is the comparison between the analytical cubism in Pablo Picasso’s (1881–1973) *L’Arlésienne* (1911–1912) and Lucia Moholy’s (1894–1989) well-known photograph showing the corner of the Bauhaus Dessau workshop wing (1927).²⁷ This image pair has become so famous and much-cited that it remains emblematic for Giedion’s understanding of modern architecture until today.²⁸

However, the transparency to be found in Lucia Moholy’s photograph does not correspond so much with cubist painting as with the transparency of materials in László Moholy-Nagy’s (1895–1946) designs. Therefore, I would propose to adjust the image pair in the following way: Picasso’s *L’Arlésienne* should be replaced by something like Moholy-Nagy’s design for the dust jacket of *von material zu architektur* (1929), volume 14 in the *bauhausbücher* series.

In so doing, the two images of Giedion's comparison would finally arrive at the same level. And, moreover, it would become clear that cubist and purist painting *does* stand in relation to Le Corbusier's architecture, but *not* to Gropius's.²⁹ As we have seen before, Giedion's mistake is present already in *Bauen in Frankreich*, where he treats as equivalent the transparency of iron latticework, the composition of cubist, respectively purist, paintings, and the spatial expression of Le Corbusier's architecture. In actual fact, the Bauhaus Dessau workshop wing is not equivalent to Le Corbusier's architecture, but rather to the Eiffel tower, and so Giedion compares the composition of a cubist painting to the transparency of an iron latticework. This is his fundamental mistake.

On a side note, the teleological sequence of images in Moholy-Nagy's book *von material zu architektur (from material to architecture)* concludes with a symptomatic double exposure of buildings subtitled "architektur" ("Architecture").³⁰ In the caption, Moholy-Nagy takes up the idea of spatial interpenetration ("räumliche Durchdringung") figuring so prominently in Giedion's book published the year before. In addition, he amalgamates it with Scheerbar's term "Glasarchitektur" ("glass architecture"). The image caption reads as follows: "aus zwei übereinanderkopierten fotos (negativ) entsteht die illusion räumlicher durchdringung, wie die nächste generation sie erst—als glasarchitektur—in der wirklichkeit vielleicht erleben wird."³¹

4

Two persons who were particularly annoyed at the inaccuracy of Giedion's comparison were the scholar Colin Rowe (1920–1999) and the young painter Robert Slutzky (1929–2005), who composed their well-known two-part essay *Transparency* in response.³² The two had met in 1954, while teaching in Austin, Texas. Slutzky recounts in 1989 the essay's genesis:

"Transparency: Literal and Phenomenal" was written [...] in 1955 when we were both teaching at the University of Texas School of Architecture in Austin. It was published in *Perspecta* 8 [...] in 1963 and was almost immediately accorded a wide reception in America, and later in Europe. The less well known "Transparency: Literal and Phenomenal ... Part 2" was written at the same time, but not published until 1971.³³

Slutzky also reports that the essay was triggered by Giedion's twisted image pair:

[The origin of the "Transparency" essays] was basically a semantic dispute with Giedion's *Space, Time and Architecture*, wherein the syllogistic pairing of Picasso's *L'Arlésienne* and the intersecting glass walls of the Bauhaus led us to a more careful reading of certain modernist icons. In setting up two hitherto unarticulated categories of spatial perception and configuration, we made some inroads in educating the eye to make more rigorous, nuanced and intellectual demands on the domain of form.³⁴

²⁹ As is generally known, the attribution of the Bauhaus building in Dessau (solely) to Gropius is not quite accurate. Rather its design and implementation seem to have been the work of Gropius together with Carl Fieger (1883–1960) and Ernst Neufert (1900–1986), both of whom were employees of the *Bauatelier Gropius*. Also, the immediately preceding project for an international academy of philosophy in Erlangen (1924), which Gropius and Adolf Meyer (1881–1929) had been in charge of, needs to be taken into account. As has been pointed out by several scholars, Gropius was unable to draw architectural plans, and therefore developed a "dialogical" way of designing. – Cf. Isaacs 1983: 91; Wilhelm 1983: 284; Jaeggi 1994: 60–68; Nerdinger 1996: 6–7, 29–32, 70, 74; Thöner and Perren (eds.), Schmitt (2018): 62 f. Meyer, who hitherto had played an important role as Gropius's chief designer, stayed in Weimar when the Bauhaus moved to Dessau and therefore was not involved in the project for the Bauhaus building. This might be a reason why the office building of the Fagus-Werk in Alfeld/Leine (1911–1914, designed by Gropius and Meyer) does exhibit qualities that the Bauhaus building lacks. In other words, if Rowe and Slutzky would have taken into account the Fagus-Werk instead of the Bauhaus building, their criticism of Gropius might have been less harsh.

³⁰ Cf. moholy-nagy 1929: 236, fig. 209.

³¹ Ibid. English translation at the end of the essay.

³² Rowe and Slutzky 1963; Rowe and Slutzky 1971.

³³ Slutzky 1989: 106. As Rowe frankly reported in 1996, Slutzky had played a decisive role in conceiving *Transparency*: "I can only say that, though the words must be mostly mine, the leading ideas must mostly have been Robert's. [...] As a Fernand Léger and a Piet Mondrian man he insisted upon the assertive contributions of frontality and upon the supremacy of the picture plane. Or, in other words, he insisted upon statements of flatness as being provocative of arguments about depth." – Rowe 1996: 73 f.

³⁴ Slutzky 1989: 109.

35 Cf. paragraph *Transparency, interpenetration*, in: Kepes 1947: 77–85, here: 77. It is noteworthy that Giedion wrote the foreword of Kepes's book (ibid.: 6 f.). More over, it is easy to read from the paragraph the close relationship between Kepes and Moholy-Nagy. Kepes had come to Berlin in 1930 on Moholy-Nagy's request, becoming acquainted not only with the Bauhaus representatives but also with the Gestalt representative Rudolf Arnheim, designing the dust jacket for his *Film als Kunst* (Berlin 1932).

36 Cf. Kepes 1947: 79. As Rowe and Slutzky were quite aware of, their understanding of phenomenal transparency is rooted in Gestalt psychology and its forerunners. A comprehensive account of their *Transparency* in the context of Gestalt psychology has been published in Steinert 2014: 192–237.

37 On the importance of spatial interpenetration—which is closely connected with transparency—light, and shadow for the Bauhaus cf. Rehm (2005): 100–104. With the help of a quotation by Moholy-Nagy, Rehm substantiates the observation that "durch die Spiegelung der Begriff der Durchdringung eine erhebliche Erweiterung erfahren hat" (ibid.: 102; "by reflection the notion of interpenetration has been widened considerably"): "innen und außen durchdringen einander in der Spiegelung der fenster. das auseinanderhalten der beiden ist nicht mehr möglich. die masse der wand, woran alles 'außen' bisher zerbrach, hat sich aufgelöst und läßt die umgebung in das gebäude fließen." (Moholy-Nagy 1929: 221). (English translation at the end of the essay.) Rehm demonstrates the paramount importance attributed by the Bauhaus representatives to such randomly emerging complex visual arrangements also on the scale of the tubular steel furniture. He states: "Die durch die glatte Oberfläche des Stahlrohrs hervorgerufenen Spiegelungen, Farbbrechungen, Lichtreflexionen und Schattenfiguren stellen eine entscheidende visuelle Bereicherung eines Interieurs dar." (Rehm 2005: 126.) (English translation at the end of the essay.) By the way, this passage describes exactly the purpose of the *Licht-Raum-Modulator*.

Hal Foster, in turn, has remarked on Moholy-Nagy's idea of transparency: "Transposed from photography, transparency becomes the 'new medium of spatial relationship' in general, the shared principle that transforms all the disciplines. Indeed, for Moholy transparency is the very *Kunstwollen* (or artistic will) of modernist culture." (Foster 2006: 94). The notion of "Kunstwollen" is adopted from art history (Alois Riegl, 1858–1905).

38 On the different conceptions of transparency by Moholy-Nagy and Albers cf. also Foster 2006: 99: "In many ways coloured light was to Albers what photographic transparency was to Moholy—a phenomenon to explore in various mediums and formats [...] However, if Moholy transposed the general principle of transparency from medium to medium, Albers concentrated on the specific relationships of coloured light within each format."

39 Cf. Rowe and Slutzky 1963: 48.

The starting point of Rowe/Slutzky's essay is the definition of transparency given by György Kepes (1906–2001) in his 1944 book *language of vision*.³⁵ To be precise, they refer only to the first, Gestalt-oriented part of the corresponding paragraph, while they leave out another passage on transparent materials in contemporary architecture.³⁶ In a nutshell, Rowe and Slutzky contrast the literal transparency in the works of Moholy-Nagy and Gropius with the phenomenal transparency to be found in the works of cubism and Le Corbusier.

In the case of literal transparency, we are overwhelmed by the perception of a somehow complex visual arrangement emerging from the superposition of factually transparent materials and objects, light effects and shadows. Randomness is an inherent quality typical of this kind of transparency. The prototype of an apparatus invented for the production of such an ever-changing perception of literal transparency is the *Licht-Raum-Modulator* (*Light Display Machine/Light Prop*, 1922–1930) by Moholy-Nagy.³⁷ The steady motion of this object underlines the randomness of the visual effects created by it. In such terms, Lucia Moholy's photograph of the corner of the Bauhaus Dessau workshop wing can also be understood as an accidentally objectified snapshot representing a whole variety of possible views.

In contrast to this, phenomenal transparency refers to the perception of factually nontransparent materials and objects as being transparent. This can be achieved by the intentional arrangement of forms or objects having a given shape and color. The artwork by the Bauhaus representative Josef Albers (1888–1976) is especially full of such compositions presenting phenomenal transparency.³⁸ Instead of randomness, in this case we find transparency functioning as a principle of order. As Rowe and Slutzky demonstrate, this principle can be read into Le Corbusier's building designs. Since phenomenal transparency is a quality inherent in the disposition of the ground plan or the arrangement of elements in the façade, in principle it is independent of the position of the observer. This kind of transparency does not change with every move, as literal transparency does. Moreover, unlike literal transparency, phenomenal transparency is associated not with a deep, naturalistic space, but with a shallow, abstracted space.³⁹ Various concurrent spatial interpretations arise from the accompanying ambiguity of depth levels. The demonstration of this effect is a favorite subject in Albers's artistic creations.

5 Albers was aware of the findings of perceptual psychology since his time at the Bauhaus. Having studied there from 1920 to 1923, he subsequently became a Bauhaus lecturer, remaining until its closure in 1933. Different scholars have pointed out that the notions of the evolving Gestalt psychology were present at the Bauhaus.⁴⁰ But also the forerunners of Gestalt psychology were exercising considerable influence on several Bauhaus masters.⁴¹ Evidence has been provided that Paul Klee's (1879–1940) experiments with overlapping and transparent figures were induced by his reading of Gestalt psychologists.⁴²

Such experiments on overlapping planes also fascinated Josef Albers [...] After he came to the United States in 1933, he developed these ideas further and passed them on to his students. In *Interaction of Color* (1963) Albers describes effects of perceptual transparency or the ‘illusion of transparency,’ as he calls it. [...] Whereas Klee preferred the use of real transparency in his superimposed water colors and in his drawings, Albers stressed that transparency can come about with nontransparent materials.⁴³

Albers’s preoccupation in color perception clearly intensified after his emigration, when he took up a position at the newly founded Black Mountain College. In this new setting, color became his main interest, while at the Bauhaus he was rather engaged in experiments on form. In 1950, Albers moved on to Yale University, where Slutzky was enrolled as a student from 1951 to 1954. Albers’s color courses have been described as real investigations in color perception conducted together with his students. He published the findings of those decades in two sumptuous, screen-printed editions: *Interaction of Color* (1963) and *Formulation: Articulation* (1972).⁴⁴ One of the major concerns of these two masterpieces is the exploration of the relativity of color perception. In a word, colors are not seen with their absolute values but instead constantly interact in our perception. In the commentary accompanying those works, there are passages included in which Albers talks about the emergence of phenomenal transparency in a way that most probably directly influenced Slutzky when he had studied with Albers.⁴⁵ The series of arguments including perceptual psychology, the Gestalt forerunners, Gestalt psychology, and the notion of phenomenal transparency brought to the Yale student Slutzky by the former Bauhaus master Albers has been summarized by Alexander Caragonne as follows:

As a painter, Slutzky had studied color under Josef Albers at Yale, and he remained permanently fascinated with the relationship between architecture and painting. Although untrained as an architect, Slutzky had had an interest in the connection between cubism, the De Stijl movement, and modern architecture. Significantly, he had also completed a thesis at Yale inspired by the relationship of twentieth-century art to Gestalt perception psychology. The classical Gestaltists Kohler, Koffka, Arnheim, Wertheimer, et al. were therefore all quite familiar to him. As he says, “I came to Texas thoroughly imbued with an understanding of Gestalt psychology as critical to an understanding of twentieth-century painting.”⁴⁶

Rowe/Slutzky’s *Transparency* has been one of the most brilliant and influential essays in the field of architectural theory for more than half a century now. It remains a paradox of history that the Bauhaus provided Rowe and Slutzky with the negative example of the Bauhaus building in Dessau, and at the same time, via Albers, with the critical toolkit enabling them to differentiate between real and phenomenal transparency.

40 “Karl Duncker, from Wolfgang Köhler’s Psychological Institute of the University of Berlin, gave a lecture and demonstration at the Bauhaus in 1929. Count Karlfried von Dürckheim, from the University of Leipzig, presented a series of lectures on Gestalt in 1930–31. Albers informed art historian Marianne L. Teuber that he’d attended most of Dürckheim’s lectures. Marianne L. Teuber, telephone interview by the author, 31 July 1998.” (Horowitz 2006: 262, note 13).

41 Most illuminating for that topic are two essays by Marianne L. Teuber (1916–2006), who has worked on the intersection of the visual arts and Gestalt psychology: Teuber 1976; Teuber [1979]. In those essays, Teuber notices that Klee had been considerably influenced by Ernst Mach (1838–1916) and Friedrich Schumann (1863–1940), two 19th-century forerunners of Gestalt psychology, as well as by Gestalt psychology itself. Teuber states that Klee’s “teaching during the Weimar period [...] reflected primarily the perceptual analyses of the immediate forerunners of the Gestalt school” (Teuber 1976: 143). In this context, she also mentions Wassily Kandinsky (1866–1944), summing up: “The lasting influence of pre-Gestalt theories and experiments on Klee and Kandinsky cannot be overrated.” (ibid.).

42 Cf. paragraph *Experiments on Transparency at the Dessau Bauhaus*, in: Teuber 1976: 137–142.

43 Teuber 1976: 140.

44 Albers 1963; Albers 1972. By the way, *Interaction of Color* was published by Yale University Press the same year as the first part of Rowe/Slutzky’s *Transparency* was printed in *Perspecta*, “The Yale Architectural Journal.” One of the advisors of *Perspecta* at that time was Norman Ives (1923–1978). Together with another fellow student of Slutzky, and disciple of Albers, Sewell Sillman (1924–1992), Ives was in charge of the technically accomplished printing of *Interaction of Color* and *Formulation: Articulation*. This might further hint at the manifold personal interrelationships being in effect. Rowe later recounted on the intricate publication history of *Transparency*: “It was a dangerous and explosive little essay. It attacked the priority of sacred cows—most visibly that of Walter Gropius; and, being apparently insufferable, it also became unpublishable. Written in the fall of 1955 and sent to the *Architectural Review* in London, it was not considered acceptable—by, I can only suppose, Nikolaus Pevsner; [...] as a result, ‘Transparency I’ languished in obscurity only to be published nine [!] years later through the good offices of Yale University in *Perspecta 8*” (Rowe 1996: 74).

45 Cf. Albers 1963, chapters IX and XI of the commentary: *Color Mixture in Paper. Illusion of Transparency* (pp. 32 f.); *Transparency and Space-Illusion. Color Boundaries and Plastic Action* (pp. 36–38). Portions of those chapters read like a paraphrase of Rowe/Slutzky’s *Transparency* essay.

Even if Giedion's twisted image pair and Albers's teaching of color have been the basis for Rowe/Slutzky's *Transparency*, there are a number of other influences to be taken into consideration. With respect to the intersection of Gestalt psychology and the visual arts, there is still a third starting point with significance for Rowe and Slutzky, apart from Kepes and Albers. Rudolf Arnheim's (1904–2007) standard work *Art and Visual Perception* was published in 1954, only a few months before they devised their *Transparency* essay. By just glancing through the extensive bibliography contained in Arnheim's book, one cannot ignore that he had been a graduate of the Berlin school of Gestalt psychology before his emigration. Especially Arnheim's paragraph on *Depth Levels*⁴⁷ seems to have had great effect on the examination method employed by Rowe and Slutzky in *Transparency*.⁴⁸ Moreover, there is a passage included in *Art and Visual Perception* that could have been understood by Rowe and Slutzky as a quite direct work order; having examined the ambiguous readings of a non-figurative woodcut by Hans Arp (1886–1966) with the help of a series of sectional diagrams, Arnheim declares:

In Arp's woodcut the powers of [the perceptual factors] are proportioned in such a way that the result is fluctuating and ambiguous. This effect is welcomed by some modern artists—for example, by Picasso and Braque in their cubist pictures [...] It would be tempting to chart, with the section method [...], the spatial structure of paintings, sculptural reliefs, round sculpture, or buildings belonging to different style periods. [...] Such an analysis is likely to yield significant results even though it neglects the volume of objects and the slant of surfaces, which must be considered in any more comprehensive study of space.⁴⁹

This passage outlines pretty exactly the work scheme underlying Rowe/Slutzky's *Transparency*. To further demonstrate the intricacies of the notion of transparency as well as the entanglements of its transfer and adaptations, a final remark on Giedion is in order. In 1952—eleven years after *Space, Time and Architecture*—Giedion published an essay whose title anticipated the diction employed three years later by Rowe and Slutzky: *Transparency. Primitive and Modern*. This essay intimates an understanding of transparency less in terms of real transparency but instead as a superposition of forms. When Giedion cites a passage from Georges-Henri Luquet, *L'art primitif* (Paris 1930), he seems to be somewhat near to Rowe/Slutzky's intellectual conception of phenomenal transparency: “The child's drawing does not reproduce the actual object [...], but it gives a representation of the object as he sees it in his mind [...] The finished work [of an artist] may contain aspects of the model which cannot be seen, while others that leap to the eye may be entirely neglected.”⁵⁰

46 Caragonne 1995: 11 f. In addition to that, Caragonne remarks that “it was Rowe who, having come to Yale to study under Henry-Russell Hitchcock in 1951–1952 and mightily impressed with the work of Josef Albers's students, suggested Yale appointees [Robert Slutzky and Lee Hirsche] for the new freshman drawing classes [at Austin].” (ibid.: 11). On Albers's influence on Slutzky, and Slutzky's influence on Rowe cf. more detailed ibid.: 164, note 18.

47 Arnheim 1954: 185–189.

48 Cf. Steinert 2014: 232–234.

49 Arnheim 1954: 187, 189. Cf. also Slutzky's late recollection: “The resemblance of our [Rowe/Slutzky's] approach to a passage in *Art and Visual Perception* in which Arnheim uses five diagrammatic architectural sections to reveal the multiple layering of an apparently simple woodcut by Arp is striking” (Slutzky 1997: 73). Surprisingly, Slutzky states: “I first read *Art and Visual Perception* in the late 1950s after returning [...] from my teaching stint in Austin. It was then that I realized the affinities between Arnheim's ideas of figure/ground and some of my own. I had formulated the latter in 1955–56 in concert with Colin Rowe [...] in two articles entitled ‘Transparency: Literal and Phenomenal.’” (ibid.) Consequently it must remain undecided if Rowe alone had read Arnheim's book in 1954 or 1955, or neither, with the similar approaches of Arnheim and Rowe/Slutzky suggesting themselves, or if Slutzky's memory simply played tricks on him after a period of forty years.

50 Giedion 1952: 50, 92. Giedion's essay was published during Slutzky's time at Yale University. Slutzky's recollection of the few art publications available during his student days suggests that he probably had noticed Giedion's essay: “I remember *Art News* being so thin, you could almost see right through it. And there was hardly any other magazine around.” (Slutzky 1996: 18). By the way, a reworked and enlarged version of Giedion's essay was incorporated into his book *The Beginnings of Art* published the year before the publication of the first part of Rowe/Slutzky's *Transparency*. Cf. Giedion 1962: 46–75 (chapter *Transparency, Simultaneity, Movement*).

In summary, we have recognized that different competing conceptions of transparency have been effective at the Bauhaus. The representatives of a principally real (material) transparency, like Gropius and Moholy-Nagy, can be opposed to the representatives of a more phenomenal (perceptual) transparency, like Albers and Klee. If we once again take a good look at Feininger's *Kathedrale* of 1919, we might conclude that this woodcut also exhibits the prerequisites of phenomenal transparency, as for example a shallow and abstracted space, the activation of the whole picture area (both of which are major criteria for the difference between Albers and Moholy-Nagy),⁵¹ frontality, and, in parts, ambiguity with respect to the position of the interwoven and prismatic light beams. Enough might have been said to demonstrate that the entanglements released by the divergent conceptions of transparency within the Bauhaus are strong, and ambiguous. Only after the emigration of some leading Bauhaus representatives to the United States (Gropius, Moholy-Nagy, Albers) did the *Transparency* essay become possible, completely transforming the initial notion of "Glasarchitektur" and remaining predominant within the discourse of architectural theory for more than fifty years now. It seems that, transparency has become a really successful Bauhaus transfer.

⁵¹ The activation of the whole picture area was put into words by Albers already during his Bauhaus years. In 1928, he writes in an article: "die aktivierung der *negativa* (der rest-, zwischen- und minus-werte) ist vielleicht das einzige ganz neue, vielleicht das wichtigste moment der heutigen formabsichten. [...] gleiche berücksichtigung und bewertung der positiva und negativa läßt nichts übrig." (albers 1928: 4 f.). English translation at the end of the essay.

Translations of Longer Quotes

Weber 2006: 113 (footnote 2). The English translation reads as follows: "It is not only because of this symbolic nature, but also its hieratic strictness, its frontality, and symmetry that the woodcut for the Bauhaus manifesto remained without a parallel within all the other church pictures by Feininger." (translation T. St.).

Scheerbart 1914: 29 (footnote 6). The English translation reads as follows: "The face of the earth would be much altered if brick architecture were ousted everywhere by glass architecture. It would be as if the earth were adorned with sparkling jewels and enamels. Such glory is unimaginable. All over the world it would be as splendid as in the gardens of the Arabian Nights. We should then have a paradise on earth, and no need to watch in longing expectation for the paradise in heaven." (Scheerbart 1972: 46).

Scheerbart 1914: 30 (footnote 7). The English translation reads as follows: "Glass architecture is unthinkable without Gothic. In the days when Gothic cathedrals and castles were rising, an architecture of glass was also tried [or: wanted]. It was not completely realised, because iron, the indispensable material, was not yet available, and this alone enables the totally glass room to be constructed [recte: the whole glass dream to be realized]." (Scheerbart 1972: 46 f.).

Scheerbart 1914: 11 (footnote 8). The English translation reads as follows: "Our culture is to a certain extent the product of our architecture. If we want our culture to rise to a higher level, we are obliged, for better or for worse, to change our architecture. And this only becomes possible if we take away the closed character from the rooms in which we live. We can only do that by introducing glass architecture, which lets in the light of the sun, the moon, and the stars, not merely through a few windows, but through every possible wall, which will be made entirely of glass—of coloured glass. The new environment, which we thus create, must bring us a new culture." (Scheerbart 1972: 41).

Scheerbart 1914: 47 (footnote 9). The English translation reads as follows: "When I am in my glass room, I shall hear and see nothing of the outside world. If I long for the sky, the

clouds, woods and meadows, I can go out or repair to an extra-veranda with transparent glass panes.” (Scheerbart 1972: 52).

Giedion [1928]: 17 (footnote 15). The English translation reads as follows: “Iron *opens* the spaces. The wall can become a transparent glass skin. [...] This leads to new laws of design.” (Giedion 1995: 101). The Bauhaus building in Dessau is present in this book on French architecture, too, but only with one photograph and a short note, while Giedion’s compatriot Le Corbusier was given the longest chapter.

Giedion [1928]: 18 (footnote 16). The English translation of Giedion’s German translation from the original French reads as follows: “Glass is destined to play an important role in METAL ARCHITECTURE. Instead of thick walls, whose strength and solidity are diminished by a great number of openings, our *houses* will be so permeated with openings that they will appear *translucent*. These wide openings of thick, single- or double-glazed glass panes, either frosted or transparent, will allow a *magical splendor* to stream in during the daytime, stream out at night.” (Giedion 1995: 102).

Giedion [1928]: 50 (footnote 18). The English translation reads as follows: “*Such a union of glass and iron, by its nature, demands an extensive dematerialization of the building*” (Giedion 1995: 134).

Giedion [1928]: 7, 9 (footnote 19). The English translation reads as follows: “In the air-flooded stairs of the Eiffel Tower [...] we confront the basic aesthetic experience of today’s building: through the delicate iron net [...] stream things [...] They lose their delimited form: as one descends, they circle into each other and intermingle *simultaneously*. [...] *there is only a great, indivisible space in which relations and interpenetrations, rather than boundaries, reign.*” (Giedion 1995: 91, 93).

Georgiadis 2000: 13 (footnote 20). The English translation reads as follows: “Whether in the iron structures by the engineers or the concrete homes by the architects of the New Building, always the same things were presumed or seen [by Giedion]—lines, planes, volumes of air—, and likewise they have been described with the help of one and the same terminology: relation, interpenetration—accompanied by simultaneity, transparency, lightness, dematerialization, etc.” (translation T. St.). Cf. also the roughly corresponding passage in the English edition: Georgiadis 1995: 42 f.

Giedion [1928]: 85 (footnote 22). The English translation reads as follows: “Air flows through [Corbusier’s houses]! Air becomes a constituent factor! [...] only RELATION and INTERPENETRATION [counts]! [...] The shells fall away between interior and exterior. Yes, Corbusier’s houses seem thin as paper. They remind us, if you will, of the fragile wall paintings of Pompeii. What they express in reality, however, coincides completely with the will expressed in all of *abstract* painting. We should not compare them to paper and to Pompeii but point to Cubist paintings, in which things are seen in a floating *transparency*, and to the *Purist* [...] Jeanneret himself, who as architect has assumed the name Le Corbusier. In his *Peinture moderne* [...] he likes to assure us that he has deliberately chosen only the most ordinary bottles and glasses, that is, the most uninteresting objects, for his pictures so as not to detract attention from the painting. But the historian [Giedion] does not see this choice as accidental. For him the significance of this choice lies in the preference for floating, transparent objects whose contours flow weightlessly into each other. He points from the pictures to the architecture. Not only in photos but also in reality do the edges of houses blur. There arises [...] that *dematerialization* of solid demarcation [...] that gradually produces the feeling of walking in clouds.” (Giedion 1995: 169).

Moholy-Nagy 1929: 236 (footnote 31). The English translation reads as follows: “The illusion of spatial interpenetration emerges from the superposition of two photographs (negatives), and only the next generation will perhaps experience it in reality – as glass architecture” (translation T. St.). There is also a somewhat loose translation in the 1938 English edition, cf. Moholy-Nagy 1938: 204: “The illusion of spatial interpenetration is secured by super-

imposing two photographic negatives. The next generation will perhaps really see buildings like this, when glass architecture develops.” First English edition: moholy-nagy 1932.

Moholy-Nagy 1929: 221 (footnote 37). The English translation of the caption reads as follows: “Penetrations inward and outward secured in the reflections of the windows. It is no longer possible to keep apart the inside and outside. The mass of the wall, at which all the ‘outside’ previously stopped, is now dissolved and lets the surroundings flow into the building.” (Moholy-Nagy 1938: 191).

Rehm 2005: 126 (footnote 37). “The mirrorings, colour refractions, light reflections, and shadow shapes caused by the smooth surfaces of the steel tubes mean a vital visual enrichment of an interior space.”. (translation T. St.).

Albers 1928: 4 f. (footnote 51). The English translation reads as follows: “The activation of *negativa* (of remainders, intermediate, and negative values) is perhaps the only entirely new, perhaps the most important aspect of contemporary interest in forms. [...] If one gives equal consideration and weight to positive and negative values, then there is no *remainder*.” (Albers 2019: 38).

Author

Tom Steinert holds a diploma (2003), and a doctorate (2012) in Architecture from Bauhaus-Universität Weimar. From 2004 to 2012, he worked there as a research assistant, afterwards from 2013 to 2018 at the Technische Universität Berlin, and currently at the University of Kassel. He has held several lectureships. He was accorded the Wolfgang Metzger Award and the Theodor Fischer Award. His research explores the intersection between architecture, urban design, art history, psychology of perception, artistic positions, and the history of science and ideas.

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