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Inverted Cubism or the Spatial Painting: Adolf Rading's House Dr. Rabe

“The new spirit...fights for the reestablishment of the spirit of initiative, for the clear understanding of its time, and for the opening of new vistas on the exterior and interior universes which are not inferior to those which scientists of all categories discover every day and from which they extract endless marvels.”

--Apollinaire¹

In 2016, the mayor of Zwenkau, Germany, Holger Schulz announced ambitious plans for the transformation of a small 1920s architectural jewel, the Dr. Rabe House by Adolf Rading, into a tourist destination. (Fig. 1) Zwenkau lies south of Leipzig amidst several inland seas that are popular swimming holes. Schulz envisioned the newly renovated masterpiece as a magnet with which to attract out-of-town visitors headed for the seas and architecture students, especially with the approaching 100th anniversary of the founding of the Bauhaus.² Paradoxically, while Rading was an important pioneer of Neues Bauen, he had nothing to do with the Bauhaus. However, his friend and collaborator at the Dr. Rabe House, the artist Oskar Schlemmer, had taught there and simply having work by Schlemmer in the house was enough to make it a potential tourist draw.³ The story shows the enduring power of the Bauhaus mystique and its

¹ Guillaume Apollinaire, “The New Spirit and the Poets,” *Apollinaire on Art: Essays and Reviews, 1902-1908*, trans. Susan Suleiman (New York: Viking, 1928), 237.

² Ulrike Witt, “Haus Rabe: Klassische Moderne soll junge Elite-Architekten nach Zwenkau locken,” *Leipziger Volkszeitung*, 30 April, 2016 and Ulrike Witt, “Bauhaus-Original ungewiss,” *Leipziger Zeitung*, 27 July, 2017.

³ Erich Rabe was a Dr. med., which means that he held a doctorate in medicine. His daughter became a surgeon and continued to use the practice rooms until the 1990s.

ability to generate public interest in any project touched by former teachers and students. Indeed, recent scholarship on the house focuses more on Schlemmer's contribution than Rading's. Yet the overall design and interiors were all Rading's work and it is just as radical as Schlemmer's – inside the “simple and almost puritanical outer” cubic volume, with its unadorned white stucco facades and flat roof is a surprising interior composed of richly colored surfaces, that cover floor, walls, and ceiling, to create a unique spatial experience.⁴ By synthesizing contemporary color theory with new spatial theories borrowed from popular science, Cubist and De Stijl painting, Rading was able to construct a revolutionary project.

Other architects in the 1920s, like members of Dutch De Stijl Gerrit Rietveld and Theo van Doesburg, and Germans Bruno Taut and Walter Gropius, had similarly experimented with applying color to every interior surface. Like them, Rading chose a palette of subtractive primary colors, red, yellow and blue, together with the shades, black, white and grey, but Rading's approach was subtly different. In projects like the interiors of the Berlin Hufeisensiedlung (Horseshoe Housing), Taut used color to make immersive environments; he typically applied the same color to all four walls, painting a different color on floor and ceiling, with the aim of imbuing the space with a particular emotion. At the Bauhaus, Gropius collaborated with painter Hinnerk Scheper to apply primary colors as architectural accents – they serve as way-finding devices and replace traditional ornament.

⁴ Edith Nowak-Richowski, “Das Wohnhaus eines Arztes,” *Innen-Dekoration*, XLIII (1932) 199; Durth, *Rading trifft Schlemmer*, 54-59.

Rading's approach was closer to that of the De Stijl practitioners who used abstract arrangements of elemental orthogonal forms and lines, tinted with primary colors in an attempt to "dissolve the closed nature of architecture."⁵ The application of colored form in De Stijl projects like the painter Piet Mondrian's studio in Paris ignored the usual distinctions between floor, walls, and ceiling to engulf the space with colored abstract forms. This might be described as the formation of endless, or boundless, and undifferentiated space, or the opening up of a higher spatial dimension, what in the early years of the twentieth century was called the fourth dimension.⁶ If De Stijl architects attempted to conjure the fourth dimension by dissolving perceptible spatial boundaries, homogenizing surfaces, and thereby eliminating the privileged viewpoint of traditional space, Rading used a different formal tactic. De Stijl space was abstract and undifferentiated whereas Rading's space was abstract yet differentiated. He worked with colored fields and shapes of a less structured nature to overlap and blur spatial boundaries yet still kept the surfaces distinct; he used colored forms to animate enclosure in a way that defied conventional distinctions between floor, wall, and ceiling and denied the single privileged viewpoint of traditional perspectival space; and he sometimes placed those forms to indicate potential directions of movement in the space. By creating multiple, ever shifting viewpoints for the moving observer to experience, he fashioned a new kind of spatial experience. Rading's architecture was therefore a synthesis of contemporary color theory championed by Adolf Hölzl, Wassily Kandinsky, and Bruno Taut, to name a few, and new ideas about space explored in De Stijl and especially in Cubist paintings.

⁵ Allan Doig, *Theo van Doesburg: Painting into architecture, theory into practice* (Cambridge: Cambridge U. Press, 1986), 80.

⁶ On van Doesburg and his intentions see

In spite of his status as an important proponent of the Neues Bauen in the 1920s and 1930s, neither Rading, nor his groundbreaking design, have received much recent scholarly attention.⁷ Rading is best known for his project at the 1927 *Weissenhofsiedlung* in Stuttgart, a fairly conventional *Neues Bauen* project of orthogonal forms, white stucco, and tubular steel details. One aspect of Rading that distinguishes him from other contemporaries was the way that he adopted much of the formal expression associated with the avant-garde of the 1920s while remaining highly suspicious of architectural fashion, and authored several articles articulating this including one called “Fanal (Signal)” in which he warns his readers about totally abandoning traditional forms in favor of fashionable new ones.⁸ His work was situated in the middle ground between the often-oppositional positions in Weimar art debates. He was extremely well read, wrote and published a good deal in contemporary professional journals like the Deutsche Werkbund’s *Die Form (Form)* and engaged repeatedly with contemporary art issues. Although he does not seem to have written about Cubism, or even about painting, the scope of his other writings supports the notion that he would have been well versed in the new approach to painting. He was also close friends with numerous artists like Otto Mueller, Oskar Moll, and Johannes Molzahn, and collaborated with Oskar Schlemmer at the Dr. Rabe House.

Rading spent the last twenty-four years of his life overseas, in France, Israel and England, where he consistently worked but never achieved the stature he had enjoyed in interwar Germany. The Dr. Rabe House likely has been overlooked because it is

⁷ The Akademie der Künste, Berlin did publish a monograph on Rading in 1970; Regine Göckede wrote her dissertation on Rading, then published it as, *Adolf Rading: Exodus des Neuen Bauens und Überschreitungen des Exils* in 2002. Vladimir Slapeta wrote an article about the House Dr. Rabe for *Domus* in 1989.

⁸ Adolf Rading, “Fanal,” Rading Archiv, AdK Berlin. Unpublished.

located in a small town in part of the former East Germany where it was inaccessible to many scholars until quite recently and because it remained in private hands through the 1990s. Only recently did the Hamburg entrepreneur and arts patron Horst Schmitter decide to invest in restoring the house to its original condition. German architectural historian Werner Durth authored a history of the creation of the house to celebrate the restoration, with a special focus on the confluence of Rading's painted surfaces with the metal installations and frescoes custom designed for the house by Bauhaus artist Oskar Schlemmer.⁹ He does not probe the theoretical antecedents to the project however. In her essay, "Theatrical Doubles: The Affecting Presence of Oskar Schlemmer's Wall Designs" (2013), American architectural historian Marcia Feuerstein uncovers the performative aspects of the house's design, focusing on Schlemmer's work over Rading's.¹⁰ Schlemmer's metallic pieces, and the figurative frescoes, are masterpieces but they are artistic additions to the architectural composition. This essay shifts the discussion to Rading's idiosyncratic combinations of color, colored forms, and spatial form, that were influenced by developments in color theory and Cubist painting, to uncover the ways in which he created a novel spatial construct.

Color Theory in the 1920s

By the late 1920s, color had become a popular substitute for applied ornament in contemporary architecture particularly amongst the European avant-garde. In Germany, new approaches to color application were championed foremost by Bruno Taut who, in 1919, authored "Ruf zum farbigen Bau" (Call to Colored Architecture), a

⁹ Werner Durth, *Rading Trifft Schlemmer: Bau Haus Kunst* (Walther König: 2014).

¹⁰ Marcia Feuerstein, "Theatrical Doubles: The Affecting Presence of Oskar Schlemmer's Wall Designs," *Architecture as a Performing Art* eds. Marcia Feuerstein and Gray Read (London: Ashgate, 2013),

polemical call to arms for architects interested in color and its potential, which he reiterated in 1925 in “Wiederum die Farbe” (Again Color), and in 1930 in “Die Farbe” (Color). Taut’s call was undersigned by a host of well-known architects including Walter Gropius, Hans Poelzig, and Rading’s close collaborator, Hans Scharoun.¹¹ For Taut, color was the modern means with which architects could achieve “*optische Sinnfreude*” or “meaningful optical pleasure” in their work: by combining color with other architectonic elements he believed it was possible to create and enhance the emotional and psychological power of new space and form. At the Dr. Rabe House, Rading explored color as ornament as well as a space enhancing and perception altering element.

The interest in color during the 1920s had its antecedents in the preceding century when philosopher Johann von Goethe published his famous 1810 treatise *Zur Farbenlehre* (*The Theory of Color*). From this moment, color theory enjoyed a revival in Germany, and elsewhere, amongst philosophers, scientists, artists, and architects. The rest of the 19th and early 20th centuries witnessed a plethora of publications addressing every possible aspect of the subject. Although he was a philosopher, Goethe addressed an incredibly broad range of questions in his treatise, one reason it aroused interest in so many different disciplines. Goethe believed that color had to be a perceptual phenomenon since it is comprehended via sight. He realized that perception could only be properly understood if the nature of color was clear: he ultimately postulated three types of color, physiological, physical, and chemical. Goethe did not claim to actually write a theory of colors but, instead, laid out an extensive body of evidence on which a

¹¹ Bruno Taut, “Aufruf zum farbigen Bauen,” *Frühlicht*, (1921 Herbst), 28, reprint (Berlin: Gebr. Mann, 2000). Rading and Scharoun taught together at the Breslau Academy of Art and ran a joint practice in Berlin from 1926.

theory could be founded. One particularly prescient observation he made is that color is associated with what he termed, “emotions of the mind.”¹² In this section, Goethe anticipates future psychological color studies and concerns of many early 20th century artists like Wassily Kandinsky, who developed a theory of color and emotion (see below), and of architects like Bruno Taut who were fascinated with the emotional power of colored space.

Color scientists had a different set of interests that included the chemistry of color mixing, sources of illumination, and the physiology of color perception. The German chemist Wilhelm Ostwald, tackled the problem of color harmony in his *Farbenfibel* (*Color Primer*), the ways to achieve harmony between different hues by developing a mathematical logarithm to govern the color mix. Harmony in painting is the juxtaposition of colors that appear correct and pleasing to the eye. Artists and architects of the 1920s were well aware of Ostwald’s work, which was widely read: Ostwald corresponded with Bauhäusler Walter Gropius, Lazlo-Moholy-Nagy, and Herbert Bayer, among others, and gave several lectures on his color theories at the Bauhaus in 1927.¹³ Ostwald’s theory was discussed in the progressive architecture magazine *Die Form* in 1929, a magazine Rading had contributed to and presumably read regularly, just as Rading was designing the Dr. Rabe House.¹⁴

For architects, color was an appealing alternative to 19th century historicist ornament; it offered a way to adorn architectural space without applying traditional ornamentation

¹² Goethe, 304.

¹³ Philip Ball and Mario Ruben, “Color Theory in Science and Art: Ostwald and the Bauhaus,” *History of Science*, 43 (2004), 4845.

¹⁴ The way in which Ostwald’s theory was discussed in *Die Form*, 4 (1929), 92, shows that it was well-known. The author mentions its wide dissemination since 1921 and its controversial nature.

like moldings as well as a means with which to enhance spatial power. Conceiving of color as a type of abstract ornament emerged from nineteenth century German polychrome debates and disputes about the necessity of ornament and is a corollary to the development of non-representational language in the arts.¹⁵ For a generation of artists and architects interested in uncovering the basics of artistic expression, who hoped to move art towards abstraction, color seemed to be one of the essential elements – and the primaries were the fundamental colors. The questions of what constituted the primary colors and how color acted optically on the viewer’s psyche and emotions, were therefore of prime concern.¹⁶

Perhaps, the single most influential German-language publication treating color and emotion in the early 20th century was the 1912 book by Russian émigré painter, Wassily Kandinsky, *Über die Geistige in der Kunst: ins besondere in der Malerei* (On the Spiritual in Art: Especially in Painting). Kandinsky treated the definition and workings of color language, the psychological aspects of color affect, and proposed that form, color, and meaning were interrelated.¹⁷ Kandinsky was widely read and discussed in art circles; reviews of his book appeared in *Kunst und Künstler*, for instance, his ideas are discussed in other journals like *Innen-Dekoration* and *Deutsche Kunst und Dekoration* in relationship to all manner of art and design from painting to product design to architecture.¹⁸

¹⁵ David Morgan, “The Idea of Abstraction in German Theories of the Ornament from Kant to Kandinsky,” *The Journal of Aesthetics and Art Criticism*, 50/3 (Summer 1992), 231-242.

¹⁶ John Gage, *Colour and Meaning: Art, Science and Symbolism* (London: Thames and Hudson, 1999) 249 – 261.

¹⁷ Wassily Kandinsky, *On the Spiritual in Art* (New York: Guggenheim Foundation, 1946) 44 – 79.

¹⁸ Emil Waldmann, “Neue Bücher,” *Kunst und Künstler*, 10 (1912) 524; Theodor Volbehr, „Die Grüne Farbe,” *Innen-Dekoration*, (1920-1921), 177; Theodor Volbehr, „Die Farbe Grün, Goethe und Kandinsky,” *Deutsche Kunst und Dekoration* (1918-1919) 379.

Color theory was a standard part of an artist's education in the 1910s and 1920s: and while architects might not have been as universally well versed as painters, they would certainly have been familiar with Goethe's *Farbenlehre* of 1810, with its rejection of Newtonian theory. Rading frequently cited Goethe's philosophical writings, if not the *Farbenlehre*. Although he was not a signatory to Taut's *Ruf zum farbigen Bauen* Rading knew Taut fairly well: they were both active publishing in contemporary architecture journals and were members of the Ring. Rading's use of color at the Dr. Rabe House suggests that he was familiar with Kandinsky's and Ostwald's ideas as well. The 1930 review of the Dr. Rabe House in *Innen-Dekoration* is the strongest evidence of Rading's engagement with color theory. According to the reviewer, Edit Nowak-Richowski, "The feeling of spatial well-being, the livability of this house, is not realized with rich materials but with essential spiritual ones; with a fundamental concept, that arises from spatial creation rather than from floor plans, and with color as the form-giving and space-defining element."¹⁹

The Fourth Dimension in 1920s Art and Architecture

If color was an instrument of perception-altering design, probing new spatial possibilities was another goal of such experiments with color. Notions of other dimensions, whether a fourth, or *n*-dimensions, permeated scientific and lay literature between the 1870s and 1919, as art historian Linda Dalrymple Henderson and artist Tony Robbin have shown.²⁰ Higher dimension space was particularly prevalent in texts

¹⁹ Edith Nowak-Richowski, "Das Wohnhaus eines Arztes," *Innen-Dekoration*, 43 (1932), 199.

²⁰ Linda Dalrymple Henderson, *The fourth dimension and non-Euclidean geometry in modern art* (Cambridge, Mass: MIT Press, 2013); and Tony Robbin, *Shadows of Reality: The Fourth Dimension in Relativity, Cubism and Modern Thought* (New Haven: Yale University Press, 2006),

on mathematics, physics, and philosophy but also in popular fiction.²¹ Such notions had partly developed from new branches of mathematics that challenged Euclidean geometry. Called non-Euclidean geometry, the new math posited the possibility of a condition that would contradict Euclid's fifth postulate: namely, for any given line L and point A , there is only one line that can pass through A and be parallel to L . This holds true on a flat two-dimensional surface but if L and A are on the curved surface of a sphere, for instance, any line passing through A will intersect L . The discovery of non-Euclidean geometry revolutionized concepts of space since it suggested that our perception of space might not be accurate, that space might have dimensions that we cannot perceive with the naked eye, and that space might not be fully measurable using Euclidean tools.

Up until Albert Einstein's and Hermann Minkowski's publications on relativity in 1905 and 1907 respectively, the fourth dimension was considered to be a higher spatial dimension. Numerous mathematicians and philosophers had attempted to illustrate the concept in the 19th century in order to help make it visible and comprehensible; perhaps the easiest to understand were British mathematician and author Charles Howard Hinton's colored drawings, American architect Claude Bragdon's linear diagrams, and French mathematician Esprit Jouffret's three-dimensional projections. All three men drew geometric projections of figures that illustrated the existence of a fourth spatial dimension such as Hinton's and Bragdon's tesseracts, or tetra-hyper cubes, and Jouffret's poly-hydra in four dimensions.²² Although specialists in mathematics and

²¹ Linda Dalrymple Henderson, "The Image and Imagination of the Fourth Dimension in Twentieth-Century Art and Culture," *Mathematics and Imagination*, 17/1 (winter 2009), 131-160, 194; Henderson, *The fourth dimension in art*; and Robbin, *Shadows of Reality*, 1 – 19.

²² Claude Bragdon, *A Primer of Higher Space [The Fourth Dimension]* [Rochester, NY, 1913], pl. 1) and Esprit Jouffret, *Traité élémentaire de géométrie à quatre dimensions (Elementary Treatise on the Geometry of Four Dimensions)* (Paris: Gauthiers-Villar, 1903), figure 41.

physics disagreed about what constituted the fourth dimension, Minkowski and Einstein believed that the fourth dimension was time, rather than space, as many 19th century thinkers had proposed. German artists and architects engaged with both notions of a fourth dimension but after 1919, Minkowski and Einstein's theory of space-time increasingly dominated artistic thinking.²³

While it is impossible to rehearse the many ways in which fourth dimensional ideas permeated 1920s German artistic thought, a few examples illustrate how pervasive it was. Books treating the fourth dimension were published in Germany already in the 1870s and include Eugen Dreher's 1879 *Die Vierte Dimension des raumes* (The Fourth Dimension of Space), Leopold Pick's 1898 *Die vierte Dimension* (The Fourth Dimension), and Max Zerbst's 1909 *Die vierte Dimension: Skizze einer Theorie* (The Fourth Dimension: Sketch of an Idea), as well as several volumes probing the intersection of fourth dimensional thinking and occultism and Spiritism.²⁴ Both theosophy and anthroposophy explored notions of cosmic intelligence, one aspect of fourth dimensional thought -- Rudolf Steiner wrote a book on the fourth dimension -- and many architects were anthroposophists, or sympathetic to the movement. Rading's close friend and collaborator, Hans Scharoun, is one example. While it is unclear whether Rading was involved with anthroposophy, he did write copiously about philosophical and spiritual concerns and would certainly have been familiar with the movement's basic tenets. There were also many publications on Einstein's Theory examining it from every angle.²⁵ The fourth dimension in both its manifestations were

²³ Henderson,

²⁴ See for instance, Theodor Devaranne, *Geisterglaube, Spiritismus und vierte Dimension : Anleitung zur Beurteilung okkultur u. spiritischer Erscheinungen* (Berlin: Hutten, 1918); and Friedrich Zoellner, *Vierte Dimension und Okkultismus* (Leipzig: Mutze, 1922).

²⁵ See for instance, Hendrik Anton Lorentz, *Das Relativitätsprinzip: eine Sammlung von Abhandlungen* (Leipzig: Teubner, 1913) ; Albert Einstein, *Über die spezielle und die allgemeine Relativitätstheorie*

mentioned in contemporary specialist journals in a casual way, which suggests that such concepts were widely disseminated.²⁶ Significantly, Theo van Doesburg re-drew several of Hinton's diagrams in *De Stijl*, which was widely read in Germany, while other architects, like Erich Mendelsohn who designed the Einstein Tower beginning in 1917, were well versed in and discussed the Theory of Relativity.²⁷ For instance, Russian artist and architect El Lissitzky, who spent a great deal of time in Germany, researched the relationships between Einstein's space-time concept and the fourth dimension and probed his ideas in the Proun Room installation he made for the 1923 *Grosse Berliner Ausstellung*. Rading emphatically believed that, "Architecture is ethos, [which] means that architecture is the ethos of the times. Architecture is born of the thought of the times."²⁸ Holding such a conviction, he would have considered working with popular concepts like the fourth dimension in space and time as well as the mystical and spiritual manifestations of fourth dimensional thinking, essential to his practice.

Fourth dimensional thinking had a critical impact on the development of Cubism.²⁹ Invented by Pablo Picasso and Georges Braque between 1907 and 1912, with theoretical contributions by Albert Gleizes and Jean Metzinger, at its core, the Cubist

(Braunschweig: Vieweg, 1917); and Max Born, *Die Relativitätstheorie Einsteins und ihre physikalischen Grundlagen* (Berlin: Springer, 1920).

²⁶ Examples of articles mentioning the fourth dimension casually include: Julius Elias, "Die Grosse Berliner Kunstausstellung 1910," *Kunst und Künstler*, 8 (1910), 568; Harry Scheibe, "Die Atmosphäre der Neuen Architektur," *Die Form* (1925-1926), 329. Walter Riezler, "Die Atonale Welt," *Die Form*, 2 (1929) 26, "In das klare und feste Ordnungsgefüge des dreidimensionalen Raumes dringt seit Einstein die Zeit als vierte Dimension und bringt den Raum ins Gleiten." In English, "Since Einstein's time, the clear and firm ordering structure of three-dimensional space has invaded time as the fourth dimension and making space slide."

²⁷ Erich Mendelsohn letter to Luise Mendelsohn, dated 16 June, 1919, Mendelsohn Archive, Kunstbibliothek Berlin. Mendelsohn describes an argument over Einstein's theories he had had with Käthe and Erwin Findlay Freundlich, the astronomer and associate of Einstein's who had obtained the commission for the Einstein Tower for Mendelsohn.

²⁸ Adolf Rading, "Neues Bauen," Rading 21, Rading Archive, AdK, Berlin. 2.

²⁹ Henderson, *The Fourth Dimension*, 145-233.

approach rejected the notion that art should represent nature or reality. Cubism abandoned perspective attempts to replicate three-dimensional spatial reality on the picture plane in favor of a new way of picturing the world, what Metzinger called, “a new expression of reality.”³⁰ According to Cubist Theory, one aspect of rejecting traditional representational schemas was the fusion of time and space in the painting.³¹

The French poet and critic, Guillaume Apollinaire authored some of the clearest texts on Cubism and Cubist Theory. He claimed that, “new measures of space... in the language of the modern studios, are designated by the term fourth dimension...”³² In addition, Apollinaire described how the Cubists created a work, they

“... no longer painted an object viewed from one perspective, but rather layered views from many angles in order to capture the subject from all sides. They analysed the object and brought it to the canvas as a fragmented picture. Shape and space melted into one another in one composition of enmeshed, intersected and dissected surfaces. Instead of creating volume, the painters focused on revealing facets and constructing surfaces.”³³

According to Apollinaire, Cubist technique was to divide views of any three-dimensional object into distinct planes then simultaneously show the image views projected onto the flat surface of the painterly picture plane. In this way, certain Cubist painters collapsed multiple views, fragmented as well as whole, and the time it took to move around an object in order to see those views, into a single non-perspectival image.

³⁰ Cited in Henderson, *The Fourth Dimension*, 179, from Andre Amyvelde, “Contribution à l’histoire du cubisme,” *Gil Blas* (1912), 3.

³¹ Henderson, *The Fourth Dimension*, 187.

³² Cited in Henderson, 145; Guillaume Apollinaire, “La Peinture nouvelle: Notes d’art,” *Les Soirées de Paris*, No. 3 (April 1912), 90.

³³ Guillaume Apollinaire and Dorothea Eimert, “What is Cubism?” in *Cubism* (New York: Parkstone International, 2015), np.

Other artists painted the differing views as if they could see through the object, in a way that replicated some of the diagrams illustrating the fourth dimension. The result was a flattening and schematization of objects, which contributed to the development of abstraction. The art historian John Adkins Richardson argues that the more important Cubists like Picasso, Braque, and Gris, did not use the multiple viewpoint technique, but he admits that others like Marcel Duchamp, Albert Gleizes, and Jean Metzinger did.³⁴ Richardson sees only fragmented compositions, akin to collage, in Picasso, Braque and Gris' work, which may not suggest movement or time, but certainly challenge conventional perspective. The approach therefore defied conventional modes of visual, spatial, and chronological perception.

Herwarth Walden's Sturm gallery mounted an exhibit of Cubist paintings in 1913 in Berlin, where Rading had lived and worked since 1905. Walden included canvases by Picasso and Braque, whose work was already well known in Germany because of articles in art journals like *Kunst und Künstler*. While we do not know whether or not Rading saw the show, he certainly would have been aware of it.

Many architects practicing in the 1920s were inspired by new approaches to painting.³⁵ As Harry Scheibe writing in *Die Form* explained, "It was painting that made astonishing advances and much of painting became more and more abstract. The merits of abstract painting are great; but architecture has also been renewed by it [abstract painting]."³⁶ The shift to abstraction in painting is well known: it resulted in the

³⁴ John Adkins Richardson, "On the 'Multiple Viewpoint' Theory of Early Modern Art," in *the Journal of Aesthetics and Art Criticism*, 53/2 (Spring 1995), 129 – 137.

³⁵ Bruno Taut often wrote about the new art. See for instance, Bruno Taut Diary, AdK Berlin, reprinted in *Bruno Taut 1880-1938*, 33; and Bruno Taut Diary, AdK. Cited in Iain Boyd Whyte, *Bruno Taut and the Architecture of Activism* (Cambridge, Mass: MIT Press, 1982), 20.

³⁶ Harry Scheibe, "Die Atmosphäre der Neuen Architektur," *Die Form* (1925-1926), 329.

abandonment of realistic imitation of nature and the search for the fundamental elements of art to replace pictorial representation. Two of those fundamentals were color and elemental form, interpreted in various ways such as lines, squares and rectangles in De Stijl art and as squares, rectangles, triangles, and circles in Russian Constructivist art. Architectural corollaries to this shift are equally well known: they included the rejection of historical and classical forms and applied ornament in favor of simple, unadorned, flat roofed boxes. As mentioned above, the basic colors were understood to be either subtractive (red, yellow, blue) or additive (red, green, blue) primaries with black, white, and grey. Typically, architects experimented with applications of color in space as alternatives to applied ornament, as carriers of spiritual properties, and as a means to using architectural space to contribute to psychological and emotional wellbeing. Rading used two key aspects of abstraction in his compositional techniques at the Dr. Rabe House: elemental form and pure color.

Color-Space

Although color and space are very different attributes of painting and architecture, in fact the two are very tightly connected. Both fourth dimensional geometry and color theory are related to human perception of the physical world and representational schemas of that world. Historically, they intersected in the concept of color-space, abstract mathematical models that describe the range of colors and color relationships in a three-dimensional construct. German painter Philipp Otto Runge created what was perhaps the first color-space model, the *Farbenkugel* (color sphere) in 1807, in an early attempt to picture color relationships spatially. Runge's ideas were augmented in the mid-eighteenth century by German physician and physicist, Hermann von Helmholtz, who is known for his work on the mathematics of the eye, human vision, color vision,

and visual perception of space. Helmholtz pioneered the field of sensory physiology, or psychophysiology, when he sought to explain the mechanics of color perception in the eye. He proposed that the eye had three color photoreceptors for red, green and blue that combined in the brain as visible color. Helmholtz was also concerned with disproving the Kantian idea of a priori space in order to show that human knowledge of space derives directly from experience, from how space is perceived and understood.³⁷ A contemporary of von Helmholtz, German mathematician Hermann Grassmann first developed the idea of vector space, which gave algebraic representation of n -dimensional space using color to illustrate the vector relationships then in 1853, he followed with a theory of color mixing that used three-dimensional modelling. Numerous other color theorists into the present have created three-dimensional color models such as the orthogonal RGB color-space. As a concept, color-space is significant because it demonstrates the interconnection between color theory and new spatial models.

The Dr. Rabe House

Rading combined pure color and colored abstract form at the Dr. Rabe House to accomplish two goals: infuse the spaces with emotional power and alter perceptions of the architectural space from a single viewpoint experience to a multi-viewpoint one. Rading's design synthesized contemporary color theory with the spatial and compositional strategies of the Cubist painters, albeit in a very different medium – a three-dimensional construct -- which meant that his methods and results ultimately differed from those used on the Cubist canvases. In fact, in one fundamental way,

³⁷ Henderson 114; Hermann von Helmholtz. "On the Origin and Significance of Geometrical Axioms, *Popular Lectures on Scientific Subjects*, Trans. E. Atkinson (London: Longmans, Green & Co.; 1881) and "On the Relation of Optics to Painting," in the same issue.

Rading did exactly the opposite of the Cubists. The Cubists flattened space and form onto a two-dimensional planar surface, Rading inverted the process by folding the flat painted canvas in on itself in six sections thereby enclosing both the space and the viewer. In this way, not only did Rading invert the Cubist process but also, he drastically altered the conventional relationship between viewer and canvas from frontal and distanced engagement to an all-encompassing interior experience. That is, he spatialized the two-dimensional canvas. If Cubism fractured and merged time and space on a flat plane, then Rading's wall paintings did the opposite: they engulfed the viewer within pictorial space and attenuated time by stretching the time necessary for viewing the surrounding artwork and space.

(Fig. 2)

Rading selected the subtractive primary palette for the Dr. Rabe House, red, yellow, blue with black, white and grey, that was popular with contemporary painters and architects like Piet Mondrian and Theo van Doesburg of the De Stijl group in the Netherlands, Bruno Taut and Hans Scharoun in Germany, and Le Corbusier and Eileen Gray in France. Although the subtractive primaries were popular choices in 1920s architecture there was no consensus on which hues should be in the set therefore each architect chose a unique palette of hues. Rading selected a deeply saturated hue for most of the colors, with the notable exception of the yellows he used, that ranged from light, bright canary yellow to a rich ochre. For Rading, color was one of six fundamental aspects of architecture that included: "light, environment, landscape, work conditions, and material," which meant that selecting the optimal hue was important to him.³⁸ Rading tested several different methods of using color in the house. He used pure fields of color and stripes; he painted color in pure geometric forms, wavy asymmetrical

³⁸ Adolf Rading, "Lehrplan einer Bauakademie," 5 December 1932, 6. AdK, Rad 6.

shapes, and over entire surfaces. He applied color in ways that directed movement through the space, defined locations and discreet spaces within the architecture, activated particular spaces, and enhanced the perceptual effects of individual spaces. Apollinaire was describing Cubism when he wrote about how the new approach to painting caused “the opening of new vistas on the exterior and interior universes,” yet his words also describe what Rading achieved with the interaction between color and space at the Dr. Rabe House. Rading challenged both architectural and painterly conventions with his application of color, which differed from that of other contemporaries because he moved beyond the use of pure color and geometric form to marry color with abstract forms of many kinds, sometimes even using pattern and figure, to transform the traditional medium of painting from a flat surface to an engulfing three-dimensional space.

Rading designed the Dr. Rabe House to house two functions: the doctor’s medical practice and his private home. Three stories high, the house has the signature elements of classical modernism: it is a simple cubic block, with white stucco facades, and a flat roof with a barely articulated thin metal drip edge (see Fig. 1). Rading explained the necessity of using such a basic form, “But also the cube, until now not space in our sense, but actually only demarcation to the outside, assumes another meaning. The original primitive need for protection is transformed into oblivion and thus the beginnings of space are mentally indicated.”³⁹ The outer boundaries of the project define the thresholds between outer public world and the dynamic, private, inner domestic world. The contrast between the simplicity of outer form and complexity of inner space is part of what makes the dynamic interior experience possible; the

³⁹ Adolf Rading, “Neues Bauen,” Rading 21, AdK, Berlin, 3.

building's form therefore acts as an enormous encompassing threshold between exterior and interior worlds.

At first glance, the house appears to be an unremarkable example of *Neues Bauen* design. But on closer examination, Rading's quirky personalization becomes apparent as do the ways that the façade composition foregrounds what exists inside. Each façade has a unique aspect, and none are symmetrical, although they might appear to be so on a cursory look. Rading uses subtle asymmetry to keep the viewer and the viewer's eye in motion and give the sense that observing the house from multiple locations is necessary to comprehending its design. The main entrances are offset to one side of the front façade, marked by the thinnest of asymmetrically placed awnings that wraps around the corner of the house and is set upon slender square columns. There is a door to the practice that faces the street while the door to the private home lies under the same awning but around the corner, on the more private side of the house. A large glass window, topped by a thin horizontal one above, seems to mark the center of the façade -- except that the windows are slightly off-center. They also echo the rooms inside, which are an intimate sitting area below and the long, narrow children's bedroom above.

The façade to the right of the street face exemplifies Rading's compositional techniques. The chimney is expressed as a darkly painted volume that protrudes from one side of the house and wraps over the roof, echoing the wrapping of the entry awning. It is set to the left of the elevation, offsetting two banks of windows to the right, that is a group of four subtly different designs. The two windows closest to the chimney are rectangular ones divided into an almost square light and a long vertical

light to the right. The other two mirror these divisions; except that the upper window is long and thin, an anomaly in the group. A fifth, tiny window, floats to the left of the chimney acting as a visual accent and helping animate the façade composition. The only colors, other than white, used on the exterior are the dark gray on the chimney and a deep forest green, that is close to black, on the window frames, mullions, and doors. The glass surfaces mirror natural colors on the site.

Inside the house, the visitor discovers a rationally arranged, nearly square plan, with simple almost square and rectangular rooms organized around a central space. Similarly, Rading used a box within a box for the building's three-dimensional organization. He inserted a two-story void that connects the living room with the bedroom floor above through two windows. In plan, the living room also pushes horizontally at the spatial boundary between inside and outside to create a small protruding bay at one end, a small winter garden with a stair to the rear yard. In both plan and section, the arrangement resembles Hinton's and Bragdon's fourth dimensional figure, the tesseract, although it is most like the drawings Theo van Doesburg made of four-dimensional space. The pushing of spaces into other spaces activates the plan and section and, more importantly, connects rooms across the plan and section to set up opportunities for multiple viewpoints through the house.

Rading emphatically believed that architecture reflected the times and the ways in which people live.⁴⁰ While he does not articulate exactly what this means in spatial terms, his residential work from 1918 onwards tended to combine modern open planning in public spaces like the living and dining rooms with traditional planning in

⁴⁰ His many essays from the 1920s make this clear, for instance "Fanal" and "Neues Bauen."

private ones like the bedrooms.⁴¹ Rading understood the house to consist of two parts: the outer shell, which he called a “dead body,” and the interior, “the power” and “force” of the house; in other words, the exterior is meant to be silent and simple, which is supported by the House Dr. Rabe’s muted exterior while the interior is meant to be lively.⁴² He compared the house to the human body and its interior to the human nervous system without which the skeleton and muscles are dead. Materials, he asserted, activated the interiors to hold the spaces together; color was one perceptual quality of material that he worked with and light was another – the living room, for instance, is flooded with natural light because the garden-facing wall is floor-to-ceiling glass. Although Rading does not call out color per se, he indicates the importance of color and optical effects in many of his essays. “If there was a painter who could conjure up the glamor, color and crystal of marble on a wooden board so that the difference was imperceptible, why should I not let him deceive me?”⁴³ he once asked. Rading finished the essay by asserting that architectural beauty lies in the qualities of materials as perceived by living beings.

The interiors of the Dr. Rabe House, then are designed to activate human perception and experience. As Marcia Feuerstein points out, the German word for wall is *Wand*, which is also the root for *wandern*, to walk or wander.⁴⁴ This suggests a connection between enclosure and promenade through space. In addition, the very specific wall paintings signal the potential for the house to act as a performance space or as a space for a sequence of experiences. To this end, Rading assigns color several functions: to

⁴¹ Deborah Ascher Barnstone, “Modernism Reconsidered: the Kultur/Zivilisation Dichotomy in the work of Adolf Rading,” *New German Critique*, Fall 2009, No. 108; and Deborah Ascher Barnstone, *Beyond the Bauhaus: Cultural Modernity in Breslau, 1918 – 1933* (Ann Arbor: U. Mich. 2016).

⁴² Adolf Rading, “Vom Wesen des Bauwerks,” 1925, 1. AdK, Rad. 92.

⁴³ Adolf Rading, “Kosten und Schoenheit,” 2, Rading 103.

⁴⁴ Feuerstein, 182.

act as a way indicator, to demarcate specific spaces within the house, to create an emotional quality and to alter the way in which space is experienced.

(Fig. 2)

As an indicator, the use of color to mark paths through the architecture begins outside the house where the underside of the entry awning is painted in black and white curvilinear forms that turn the corner. A black swirl of color leads to the door to the practice while the band of white points to the private entrance on the side. Immediately inside the practice foyer, a strip of red ceiling points to the waiting room straight ahead. Upstairs in the living room, floors are color coded with strips that lead the visitor around the space and from one door to another. A red strip moves the visitor from the stairwell into the living room, where a blue strip makes the turn along the wall towards a greyish white strip that leads to the playroom door. The red also separates the double-height dining space from the single-height lounge and library. Rading also uses color on baseboards and overhead to direct movement. One example is on the stairwell, where one baseboard is red and the other blue, to make two bold lines connecting upstairs and down. The directional movement is reinforced by the ceiling above, which is painted ochre to match Oskar Schlemmer's frescoes. Rading wrote, "If we want to come to healthy conditions, it must first of all become clear that the function of life, the *dynamic* is primary, the building is secondary, not an end in itself in the sense of the architecture of yesterday. Thus, the architect is no longer the architect of yesterday, but artist, creator in that sense."⁴⁵ Rading's use of color is one way in which he generates dynamism.

(Fig. 3)

Colored patches also demarcate spaces where movement is supposed to pause for particular functions like the black square in the main living room on which the dining

⁴⁵ Adolf Rading, "Neues Bauen," Rading 21, AdK, Berlin, 5.

table and chairs are placed and the white square on which the bed is placed in the master bedroom. (Fig. 4) Rading used blue for the library space and black for the lounge next to the fireplace. While in each of these instances, Rading colored a section of the floor in order to indicate a location within a larger space that has a specific function, he also colored entire floors; the doctor's waiting room is blue, the kitchen is red, and the playroom is greyish white.

In order to create an emotional quality, in many instances, Rading uses color to generate an immersive environment, which enhances the emotional force of the space. His application of color to this end appears to be inspired by Kandinsky's color theory. The pale, yellow walls and ceiling in the main living space are warm and calming; while the bright red in the master bedroom is energetic. Kandinsky called both yellow and red "warm" colors but he makes a distinction between them. Red "may cause a spiritual vibration," and is "an endless typically warm color" that "has an inner, highly vivid, lively, restless appeal," which might explain its use in a bedroom.⁴⁶ Yellow, in contrast, is "earthly," which may explain its appeal in a space designed for larger group human interaction. According to Kandinsky, "Blue is the typical heavenly color. When very dark, blue develops an element of repose. When it sinks into black...it attains a serious, profound meaning sinking into the deep seriousness of all things where there is no end."⁴⁷ Rading uses blue and black for the library and lounge floors, areas that are meant to be contemplative and he uses blue for the doctor's consulting room, another room where deep thinking happens.

⁴⁶ Wassily Kandinsky, *On the Spiritual in Art*, 41,

⁴⁷ Kandinsky, *On the Spiritual in Art*, 65.

Finally, Rading alters the way in which space is experienced by designing the interior in such a way that it creates more than an informal backdrop for domestic dramas but a protected, self-contained other world.⁴⁸ In the theater, flats and drops sit behind the action, flattening the space and framing it on a two-dimensional picture plane located at the proscenium opening. At the Dr. Rabe House, the action is enfolded and enclosed by the painted surfaces so that it is totally immersed inside the decorated box. Rading embellished the void of the double-height living room and the rooms surrounding it as a multi-colored abstract three-dimensional art installation, with colored geometric shapes that wrap around corners, connect floors to walls, and walls to ceilings blurring the edges and boundaries between planes. He used a combination of colored geometric shapes with amorphous flows of color; doors, windows, and built-in furniture are all part of the overall schema. Kandinsky emphasized the critical importance of color and form relationships, “The unavoidable influence and mutual relation between form and color, causes us to observe the effect which form has on color. The form, even if entirely abstract and resembling a geometric figure, has its inner harmony and is a spiritual being...The value of certain colors is emphasized by certain forms, and dulled by others.”⁴⁹ In other words, the combination of form and color is a powerful tool for the production of visual, and spatial, effect – a fact demonstrated by the varying ways that Rading deployed color form in the house.

As mentioned above, parts of the floor in the main living space are bright red, cobalt blue, grey-white, and black rectangles; the ceiling is light yellow bisected by two white

⁴⁸ Marcia Feuerstein reads the space as “Architecture as performing art,” but in her reading, it is the architecture that is the main actor whereas the opposite is also true: the architecture is the background against which human drama is enacted. *Architecture as a Performing Art* eds. Marcia Feuerstein and Gray Read (London: Ashgate, 2013).

⁴⁹Kandinsky, *On the Spiritual in Art*, 46.

lines of differing widths; a section of the wall over the alcove features a semicircle that is part black and white stripes and part black situated off center between two black rectangles suspended just above; this figure wraps itself underneath into the library where it is composed of black and white sections; some black oozes down the wall near the bookshelves and another black section gestures towards the alcove; inside the most private part of the room one wall is bright red while a rounded red form oozes across the ceiling. A grey wall envelopes two sides of the alcove – a red wall makes up the third side. The way the color and forms bend and twist draws the eye over multiple surfaces but also denies any single, privileged viewpoint. Instead, every new point in space offers up a different vista. (Fig. 5)

In the kitchen, a red parallelogram and white triangle bisect the ceiling flanked by grey and black cabinetry on both sides and white end walls. A red step stool and red trim pick up the color as visual accents. The strong diagonal formed at the intersection between red and white accentuates the movement through the space while the white end walls frame any action in the room. The cabinetry is asymmetrically arranged around black cabinet door fronts and a white rectangular door front. Here, as in the living room, the distribution of colored form on all surfaces of the room animates the space. It is impossible to comprehend the space without changing viewpoint.

Upstairs, the parallel oozing red, white and black on the bedroom ceiling surge across the room and seep down the walls and onto the armoire while a black band, underscored by a longer thin red piece of trim, marks the bottom of the white wall and slides towards the heating elements. (Fig. 4) The radiators are colored white and red in a one-third to two-thirds proportion; which is echoed in the window sill above. The window frames

are red (on the left-hand side above the white sill) and white on the right-hand side (above the red sill). The custom-designed bed has a black frame with a thick black foot-rest and thin black head-rest, that turns the far corner to create a black accent against the red end-wall. The inner frame is bright white. Even the custom-*armoire* combines natural wood doors with red painted ones – emphasizing the relationship between materiality and color. The black accents, interwoven with the red, keep the eye moving over the room's surfaces, thereby establishing multiple vantage points from which to experience the space.

In the hallway, Rading used grey and ochre triangles to direct movement towards both the stairway and the bedrooms and to complement figural wall paintings executed by Oskar Schlemmer; the grey wall acts as the backdrop for the action. In fact, the ochre color first appears on a very large figure Schlemmer painted on the stair, then Rading used it on a vertical wall in the stairwell to the left of the large figure; the color then folds onto the ceiling above the stair, and spills over onto the landing, where it oozes into a white field. As in other spaces, the juxtaposition of colored forms makes the space dynamic to observe and experience. (Fig. 3)

The amorphous shapes Rading painted in much of the house recall forms used by his contemporaries Amedee Ozenfant and Le Corbusier in their Purist paintings as well as some of the elements in analytical cubism. The triangular, partially curved and rectangular forms echo the fractured sections of Cubist canvases. Several views through parts of the house share the fragmentary composition of Cubist work: the view through the upstairs hallway towards the top of Schlemmer's tall, ochre figure, with its partial head framed by skewed and incomplete yellow and black triangles, might be a section

from a Cubist painting, while the breaking up of geometric forms, like the black and white circle in the living space or the red, white and black ceiling in the bedroom, suggests both the fragmentary nature of the space and perception of it. In all these cases, either the eye or the viewer must move in order to perceive the different views – propelling the viewer through space is a way of engaging time while experiencing space.

(Fig. 6)

Conclusion

The illusion of occupying a painting that Rading creates in the Dr. Rabe House actualizes the sense of being in another world, one where the fourth dimension might be palpable. Several design moves reinforce this sensation; removing some of the traditional hierarchies of spatial enclosure; surrounding the body with largely undifferentiated surfaces; and introducing unfamiliar ornamental elements to the space. Coloring all the surfaces of a room in an abstract way emphasizes the fourth dimension, a goal articulated by Theo van Doesburg for his use of abstract colored forms on all surfaces of an enclosure.⁵⁰ In an article for *Die Form* published early in 1929 as the Dr. Rabe House was in design development, van Doesburg asserted that, “The solution of the colors in architecture is identical with the solution of the moment of time in painting,” which ties color in architectural form to Cubist, De Stijl, and Constructivist experiments with fractured time.⁵¹ Writing about the Dr. Rabe House for the journal *Innendekoration (Interior Decoration)*, Edith Nowak-Richowski asserts, “that the spatial effect [of the color] is astounding -- the simple floor plan starts to move,”⁵² He goes on to elaborate that when color is combined with space, and someone moves

⁵⁰ Theo van Doesburg, “Farben im Raum,” *Die Form* (1929) 35; Theo van Doesburg, “Towards a plastic architecture,” reprinted in Conrads, *Programs and Manifestos on 20th century architecture*.

⁵¹ Van Doesburg, “Farben im Raum,” 36.

⁵² Edith Nowak-Richowski, “Das Wohnhaus eines Artzes,” *Innen-Dekoration*, XLIII (1932) 203.

through the space, the result is a new sense of time. “Construction and composition, space and time, static and dynamic together in one.... The creative space-time painting of the twentieth century makes it possible for the artist to realize his great dream of putting man, not in front, but into the painting.”⁵³ This is precisely what Rading achieved at the Dr. Rabe House –he inserted the human being into the painting.

When abstract colored forms, lines, and surfaces envelope the viewer, the distinction between floor, wall, and ceiling disappears, or blurs, so that one literally does not know which “end is up.” One result is the sense of extension of space in all directions; of endless spatial possibilities. As Apollinaire said, “...the fourth dimension appears to spring from the three known dimensions: it represents the immensity of space eternalizing itself in all directions at a given moment.”⁵⁴ Another result is the dispersion of viewpoints across the space, thereby denying the primacy of single viewpoint perspective. The Cubist painting used the object to suggest spatial and temporal experience frontally; Rading uses the abstract form and color to illuminate spatial and temporal possibility in an immersive environment.

⁵³ Van Doesburg, “Farben im Raum,” 36.

⁵⁴ Guillaume Apollinaire, *The Cubist Painters: Aesthetic Meditations*. Trans. Lionel Abel. (New York: Wittenborn, 1949), 13-14 cited in Pamela A. Genova, “The Poetics of Visual Cubism: Guillaume Apollinaire on Pablo Picasso,” *Studies in 20th and 21st Century Literature*, Vol. 27, Iss. 1 (2003) 13.