

GOETHE'S ZUR FARBENLEHRE (1810) AND ARTHUR SEGAL'S DAS LICHTPROBLEM IN DER MALEREI (1925)

ERWIN KESSLER

Constantin Rădulescu-Motru Institute of Philosophy and Psychology, Romanian Academy

Abstract: Goethe's *Zur Farbenlehre* (1810) and Arthur Segal's *Das Lichtproblem in der Malerei* (1925) deal with the various assessments, considerations and usages of Goethe's *Theory of Colours* on the background of the aesthetics of the nineteenth and the early twentieth centuries. The paper follows Goethe's appreciation of his own research and theory of colours throughout his lifetime, as it emerges from his *Conversations* with Eckermann. This contribution frames Goethe's artistic activities as an interpretative context of his theories of the colour spectrum. A special attention is paid to the relationship between Goethe and the painter Philip Otto Runge, with whom he had an exchange of letters and conversations about the chromatic spectrum. The relevance of Goethe's work is further examined from the point of view of early modernist artists such as John Mallord William Turner, but also from the point of view of later theories of colour such as the one of the French chemist Michel Eugène Chevreul, who strongly influenced the emergence of Impressionism and Neo-Impressionism. After presenting the protracted criticism of Goethe's colour theory by Wittgenstein, who doubted the factual truth that Goethe's theory was influential upon artists, the paper addresses the way in which the *Theory of Colours* was assimilated and distorted in Kandinsky and especially in the theory of the Romanian-born painter Arthur Segal. The latter published in 1925 *Das Lichtproblem in der Malerei* and invoked both Newton and Goethe in order to articulate a theory of the utopian, optical equilibrium in painting, a theory based on the Goethean ideal of a world of perfect colour harmony, possibly emerging only in painting.

Keywords: colour theory; early modernism; utopia; avant-garde; aesthetics.

It might be commonplace, but one must not underestimate the huge importance given by Goethe to his research on colour. His experiments, observations and remarks on this issue unfolded throughout his lifetime, even until his very last days¹. This lasted long after the first publication of his substantial *Zur Farbenlehre*,

¹ Johann Peter Eckermann, *Convorbiri cu Goethe (Conversations with Goethe)*, Romanian translation by Lazar Iliescu (Bucharest: E.L.U., 1965). The references are translated by the present author into English. On 21st December 1831 (the notations were actually retrospective, inserted right after the death of Goethe, on 22 March 1832), Eckermann wrote: "By the end of this year and at the beginning of the next year, Goethe dedicated himself, again, entirely to his preferred studies, the natural sciences, trying to penetrate the laws of the rainbow [...] Except this, he edited with me the historical part of the Theory of Colours and he closely surveyed the chapter on the mixing of the colours, a chapter which I was working on to integrate it in the volume dedicated to the theoretical part.", 481–482. (Hereafter cited as *Conversations*).

in 1810² - a major scientific and philosophical contribution from his part, generally neglected by the physicists, the scientists and the philosophers of his time. However, his views were highly esteemed by some of the leading contemporary artists such as the prominent Romantic painter and thinker Philip Otto Runge.³

Goethe's permanent interest and focus on the research on colours is visible in one of the apparently most innocuous but actually very significant notations of Johann Peter Eckermann, dated Sunday, October 19, 1823. Then, Eckermann noted a crucial and consequential event in his life: "For the first time I had lunch at Goethe's. [...] After lunch, Goethe showed me some experiments related to colour theory. However, the object was completely foreign to me, so I did not understand either the phenomenon or what he was explaining to me; I still hoped that in the future I would find enough respite and opportunities to initiate myself somewhat in this science" (*Conversations*, 63).

Remarkably, this was not only the first time Goethe invited Eckermann for lunch in Weimar, but it was the first time they had a serious talk. That talk opened the way for Eckermann's full adhesion to Goethe's lifetime achievements. It was also the moment in which Goethe started to build his trust in Eckermann as not only a confidant, but a future editor and caretaker of his entire oeuvre, including his teachings on colour. The fact that Goethe, without a proper, prior knowledge of Eckermann's thoughts and intellectual expectations plunged him directly into his scientific approach to the *Theory of Colours*, rather than into his poetry or drama is telling, especially because Eckermann himself was a would-be poet not a would-be scientist.

Although Eckermann confessed in his daily entry that he was literally out of clue with everything Goethe communicated about colours and his own theories (and one cannot doubt the fact that he directly and immediately told Goethe about his incompetence in following his teachings on colours—Eckermann frequently would put his doubts and inquiries right in the face of Goethe and this was perhaps one of the reasons why Goethe picked him up as a confidant and collaborator), the unawareness of his interlocutor about the subject matter of the colour theory did not impede Goethe from exposing Eckermann to it, right during their first meeting.

² Johann Wolfgang von Goethe, *Zur Farbenlehre* (Tübingen: J.G. Cotta Buchhandlung, 1810). The references in the following pages will be made to the English translation, *Goethe's Theory of Colours*. Translated with Notes by Charles Lock Eastlake (London: John Murray, 1840). (Hereafter cited as *Goethe's Theory of Colours*).

³ For more on the rich, contorted and long relationship between Runge and Goethe, lasting until the death of the former in 1810 (the very year of Goethe's first publication of *Zur Farbenlehre*), see Rolf G. Kuehni, *Philipp Otto Runge's Color Sphere. A translation, with related materials and an essay* (2008: <http://www.web3.lu/download/RungeFarben-Kugel.pdf>). Runge wrote a total of thirteen letters to Goethe. Beside the exchange of letters between Runge and Goethe, the manuscript of Runge's *Farben-Kugel*, published in March 1810 was sent to Goethe already in 1809, before the publication of his *Zur Farbenlehre*. Goethe showed a high consideration for the scientific work of Runge (but less for his work as a Romantic painter), and he published in the Addenda of *Zur Farbenlehre* a letter on the matter of colour theory he received from Runge in 1807. Mostly scientific issues related to colour theory were developed in the letters Goethe received from Runge, as "the key aspect of all being Runge's ideas about and experiments with disk mixture." (Kuehni, 84) The relationship between Goethe's colour disk and Runge's colour sphere (Kugel) is patent.

The reason for this apparent brutal act of cognitive confrontation is patent—for Goethe, his *Theory of Colour* was his most daring and significant contribution to the cognitive advancement of humanity. Eckermann was rapidly embracing the same opinion, as he soon entered in the framework of the Goethean colour experiments and advanced his own contributions to the Goethean *Theory of Colours*. At the very core of his adaptation and insertion in the Goethean colour theory was his increasing acquaintance with it and expanding appreciation of it, as it is obvious from the rendering of a typical discussion on this subject between him and Goethe:

“I do not think you regret having written *The Theory of Colours*; because in this way you have not only erected a lasting edifice for this admirable science, but you have also given birth to a model of scientific exposition, which those who deal with similar subjects can always use. – I don't even regret it, answered Goethe, even though I worked on it half of my life. I would have written, perhaps, during this time half a dozen more tragedies” (*Conversations*, 233).

Goethe wanted Eckermann to know the enormous consideration he gave to his *Theory of Colours* right from the start. Goethe would sometimes do the same with some of his visitors, with whom he would go into colour-theory experiments or discussions, as Eckermann himself would mention in the years to come, from his position as Goethe's closest collaborator. This almost routine place of Goethe's *Theory of Colours* in his daily life, and the many references to it during his last years shows that he was not only the author of a theory, but somehow lived it, devoting his time to experiments and observations derived from it or enhancing it throughout his life. The phenomenality of colours was a real phenomenon of his existence, an existential and phenomenological placing in his world, as an active subject.

Eckermann was aware of and analytically reflected himself on the creative context in which Goethe's colour theory was framed facing his poetic oeuvre:

“If it seems somewhat problematic that Goethe did not like to be contradicted in matters of colour theory, while in matters related to his poetic work, he was very lenient, gratefully receiving any reasonable objection, the enigma is easy to unravel. We must think that, as a poet, he received only praise from everywhere, while *Theory of Colours*, the most voluminous and difficult of his works, only brought him criticism and disapproval. Half of his life he had to hear the most absurd contradictions coming from all sides, so that it was natural for him to be always excited and ready to make war with everyone. Regarding the colour theory, it worked for him as well as a mother who loves the more her child, the less he is loved by others. – I am not proud of anything I wrote as a poet, he had the habit of repeating often. Many great poets have lived at the same time as myself, many more and more important ones have lived before me, and still others will come after me. But it is a fact that in our age and in such a difficult science as colour theory, I am the only one who knows the truth” (*Conversations*, 105).

In his further talks with Eckermann during the 1820s and early 1830s, Goethe consistently referred to his *Theory of Colours* as his greatest and ultimate intellectual achievement, and, as seen from the fragment quoted above, he never doubted the truth behind it, precisely because, as a self-conscious scientific

approach, his theory was literally about natural truth itself (*Wahrheit*), and not a poetic fantasy, a fictitious construction with a purely literary stake. To Goethe, the value of his colour theory was based mostly on its being related to the truth-bound research of the *primary phenomenon* (*Urphänomen*, his own concept), given through direct experiment, not to the creative-related, poetic activities. In this sense, his theory was truthful to him, despite his clear understanding of the doubts or even disapproval of the physicists or the philosophers of his time.

Apparently, the reception of *Zur Farbenlehre* following the initial publication in 1810 and subsequent reviews throughout the history of physical science during the nineteenth century, did not reflect this self-assessment, as Eckermann would notice few times, as for example on December 21, 1831:

“With Goethe, at the table. We wonder why his treatise on the *Theory of Colours* was so little circulated. – It is very difficult to understand, he said, because, as you know, it is not enough to study it, but the theory is required and applied, and this is more difficult. The laws of poetry and painting can also, to a certain degree, be transmitted, but to be a good poet and painter you need genius, and this is not transmissible. In order to receive a primary phenomenon, to understand its great significance and to make use of it, you need a productive spirit, able to abstract from some details, a very rare gift from nature, with which only some quite exceptional are endowed” (*Conversations*, 480).

On the other hand, beside the experimental research on the primary phenomenon focused on reaching objective truths, the *Zur Farbenlehre* were put by Goethe himself in a direct relationship with his own artistic activities, namely his work as a painter, as he confessed to Eckermann that: “If I had not occupied myself all my life with the plastic arts, replied Goethe, I could not possibly have had this” (*Conversations*, 480). Apparently, there is a conflict between his vision of the scientific research as a series of experiments on a certain subject matter and the invocation of his artistic (that is subjective, very particular, even idiosyncratic) take on the same subject.

But Goethe’s understanding of his painting activities as a favorable positioning for his research on colour points rather to his being accustomed with the artistic craft as such, with the understanding of how colours behave materially and visually when used by artists rather than with the creative side of using the colours. The painting trade and not the painter’s subjective expression is at stake here. Goethe insists on a somewhat phenomenological take on the *Theory of Colours*, making embodied experience and subjective experiments his main method of reaching the chromatic *Urphänomen*, comprised of light, darkness, and the outcome of their interaction—the colours:

“We observed that all nature manifests itself by means of colours to the sense of sight. We now assert, extraordinary as it may in some degree appear, that the eye sees no form, since light, shade, and colour together constitute that which to our vision distinguishes object from object, and the parts of an object from each other. From these three, light, shade, and colour, we construct the visible world, and thus, at the same time, make painting possible, an art which has the

power of producing on a flat surface a much more perfect visible world than the actual one can be" (*Goethe's Theory of Colours*, XXXIX).

The accent he puts on painting is special in this context—although the fragment from the "Introduction" to *Zur Farbenlehre* deals with the fundamental principles of perceiving, experimenting, and understanding the colour spectrum through the sense of sight, when approaching the conclusion, Goethe abruptly shifts attention to painting, as if painting instead of eyesight is the target of his reflections on "the visible world", precisely because painting has "the power of producing on a flat surface a much more perfect visible world than the actual one can be", which is a quintessential definition of idealistic classicism so characteristic of Goethe.

The conclusion of analysing Goethe's conclusion is that the research on the chromatic spectrum opens towards the ideal perfection—a superior world transcending the perceivable one down-here. And this world is, for Goethe, the world hypostatized by painting, which is not a space of subjectivity to him, but an instance where "a much more perfect visible world" occurs. The perfection of the ideal world of Goethe could only be circumscribed by the word harmony, which is especially striking in the colour harmony: "We shall subsequently endeavour to show how the theory of the harmony of colours may be deduced from these phenomena, and how, simply through these qualities, colours may be capable of being applied to æsthetic purposes" (*Goethe's Theory of Colours*, 28). Again, it is not by chance that, when talking about the theory of the harmony of colours (harmony was in fact the task of his entire research on the colour spectrum) Goethe reiterates its purpose—the aesthetic experience. The aesthetic experience is not the ordinary perceptual relationship of the normal eyesight in the common life experience, but its very opposite. Therefore, in Goethe's deeper view, the research on the colour harmony aimed towards the ideal harmony of a superior world, whose herald in the world below is the aesthetic experience of ideal, perfect works of art.

Goethe's research in and reliance on the phenomenality of colours could theoretically have strongly influenced the artistic practice of the twentieth century, which very much was focused on the way the artist behaved in and related to the immediate world. At the same time, Goethe's interest in the experimental side of science, indeed his infatuation with subjective experiments, was also convergent with the avant-garde's infatuation with experiments, as one can easily claim that the avant-garde could be defined precisely by its experimentalism.

Despite these expectations, as the theoretical works of Wassily Kandinsky and Arthur Segal reveal in the following pages, the more spiritual exhortations of Goethe were much more influential on the artistic practice of the avant-garde than his incursions into the phenomenality of colours and into the experimental side of art and science. Goethe's trust in the spiritual way in which the (Kantian) genius of the artist is invested in a theory of colour was the main vector that impacted the development of modern and especially of avant-garde art, and not the proper epistemological content of his *Theory of Colours*, which, in its turn, was very much put into doubt by Wittgenstein, among others. Notably, Wittgenstein would bluntly claim that: "I cannot imagine that Goethe's remarks about the characters of the

colours and colour combinations could be of any use to a painter; they could be of hardly any to a decorator.”⁴

Although addressing the fundamentals of Goethe’s *Theory of Colours*, Wittgenstein’s *Remarks on Colour* should be situated historically—his fragmentary thoughts about colour are practically his last theoretical writings. They date from 1950, just before he died. The proximity of his thoughts to his death is less significant than the distance from his reflections and the proper influence of Goethe on the emerging avant-garde, at the beginning of the twentieth century, almost 50 years earlier. The total delegitimization by Wittgenstein of the possible influence of Goethe’s thinking on colours on any artist was historically inaccurate, as Goethe was substantially invoked by many major avant-garde artists, from Wassily Kandinsky to Paul Klee and Josef Albers, that is especially by those who placed colours at the core of their abstract works.

Historically, by the time of Wittgenstein’s writing of his *Remarks on Colour*, the influence exerted by Goethe already happened, was assimilated and somehow forgotten. It might be possible that Wittgenstein’s dismissal of it was justified either by his ignorance of the theoretical writings of avant-garde artists and Goethe’s influence on them, or by the long-time elapsed references to Goethe by avant-garde artists. However, one should note that in the case of the avant-garde it was about the influence of a certain speculative and spiritualist Goethe, extracted from his *Theory of Colours*, and it was almost never about the colour-experimenting Goethe, that is, in Wittgenstein’s terms, the one preoccupied by the “the characters of the colours and colour combinations”.

In this sense, Wittgenstein was right in asserting that “Goethe’s theory of the constitution of the colours of the spectrum has not proved to be an unsatisfactory theory, rather it really isn’t a theory at all. Nothing can be predicted with it. It is, rather, a vague schematic outline of the sort we find in James’s psychology. Nor is there any *experimentum crucis* which could decide for or against the theory” (*Remarks on Colour*, I, fragment 70).

Indeed, as proven by *Zur Farbenlehre* but also by the references to colour-experiments in the conversations with Eckermann, Goethe’s *Theory of Colours* is an intuitive mix of theoretical statements extracted from subjective experiments, frequently having Goethe himself as a subject. Wittgenstein is also right in considering that “Someone who agrees with Goethe believes that Goethe correctly recognized the nature of colour. And nature here is not what results from experiments, but it lies in the concept of colour” (*Remarks on Colour*, I, fragment 71). Indeed, the descending towards the concept of colour through the subjective experiments of the interaction between the sight and the refracted light lies at the core of Goethe’s *Theory of Colours*.

⁴ Ludwig Wittgenstein, *Remarks on Colour*, edited by G.E.M. Anscombe (Berkeley: University of California Press, 1977), fragment 73, 12. In order to better perceive Wittgenstein’s chain of thoughts about Goethe’s theory of colours, and especially the recurrence of his preoccupation with Goethe, in the following pages the references will be made to the number of Wittgenstein’s fragments, not to the page numbers of the publication edited by G.E.M. Anscombe.

Although Wittgenstein considered that “There is no such thing as phenomenology, but there are indeed phenomenological problems” (*Remarks on Colour*, I, fragment 53), he was partially right in defining Goethe's endeavour as a phenomenological one: “Phenomenological analysis (as e.g. Goethe would have it) is analysis of concepts and can neither agree with nor contradict physics” (*Remarks on Colour*, II, fragment 16). From this point of view, Goethe's *Theory of Colours* was indeed addressing phenomenological problems, concluding in an analysis of (our) concepts of colour and it did not contradict the physical, Newtonian understanding of colours.

Focusing mainly on the phenomenon of refraction and the colour harmony ensuing from it, and on the relationship between light and darkness in the emergence of chromatic spectrum, Goethe's *Theory of Colours* was not only closely related to his practice as a painter but was assimilated by other theorists who were also critical of Newton's, purely physical Theory of Colour spectrum. Newton's theory was not influential upon artists—a case in point being the Romantic, fellow English painter J.M.W. Turner. Although deepening into the matter of colour as a main resource of painting—in comparison to form, perspective and drawing—, Turner, whose mark onto the future development of Impressionism is indelible, was never interested in the Newtonian approach to colour. Instead, he was interested in Goethe's *Theory of Colours*. One of the most famous works by Turner, *Light and Colour (Goethe's Theory) – The Morning after the Deluge – Moses Writing the Book of Genesis* (1843) is avowedly indebted to Goethe. The key points of Turner's very influential work are taken from his understanding of Goethe's theory, especially through the usage of a perfectly harmonious palette derived from Goethe's three primary colours (red, yellow and blue) and from the conception that every colour is a specific combination of light and darkness—like Goethe, Turner believed that darkness is not a passive, colourless medium characterized by the lack of colour, but an active ingredient of colour.

Like Goethe and his German Neo-classical artists friends Anton Mengs and Angelika Kaufmann, with whom Goethe discussed his colour theory, Turner was a tacit adept of the traditional, Aristotelian belief that colour appears when light combines with darkness, a pre-scientific theory with deep moral and religious connotations which was refuted by Newton's discovery of the chromatic spectrum of light seen through a prism. For Goethe as well as for Turner, the sunlight is a primary phenomenon—*Urlicht* in Goethe's terms, a homogenous, original, self-identical medium with deep religious, Christian roots. It hints to the light of revelation—this is the sense given by Turner to his own, almost mystical work: in the shimmering, barely coloured light emerging out of the darkness after the Flood, Moses appears as an almost indistinguishable silhouette up in the skies, as if dissolving in the original, golden light where he seems to be receiving the teachings he put in the Book of Genesis. The sheer mystical and spiritual understanding of light and colour by Turner, the connection of light and darkness to life and resurrection is expressly put under the name of Goethe's colour theory, but it hints back to old, medieval and Aristotelian beliefs.

Decades later, Gustav Mahler inserted the vocal poem *Urlicht* (based on the lied with the same title from his previous collection *Das Knaben Wunderhorn*) as the fourth movement of his 2nd Symphony (subtitled *The Resurrection*), firstly performed in 1895. The last verses of the lied reveal the same mystical-transcendental thread of an aesthetic take on light by artists, notwithstanding whether they are painters or composers: “I am from God and shall return to God! The loving God will grant me a little light / Which will light me into that eternal blissful life! (*Ich bin von Gott und will wieder zu Gott! Der liebe Gott wird mir ein Lichtchen geben, / wird leuchten mir bis in das ewig selige Leben!*)”

Turner is a telling case that illustrates how Goethe’s *Theory of Colours* influenced early modern artists through its practical-artistic and spiritual understanding of colour, prior to the avant-garde’s mainly spiritual take on Goethe’s *Theory of Colours*. Turner also constitutes a sensible refutation of Wittgenstein’s view quoted above, that “I cannot imagine that Goethe’s remarks about the characters of the colours and colour combinations could be of any use to a painter.” Wittgenstein’s reflection was based on an objectivistic understanding of the use of (any) colour theory, while in fact, for an artist, its use could be a purely subjective understanding of a seemingly objective law which does not need to be scientifically corroborated in order to be artistically fruitful.

Goethe’s focus on the contrasts of colours, to which Newton did not pay attention—although it can be perceived everywhere by everybody, in daily experience—is crucial for the painterly rendering of the harmonious, phenomenal character of the natural world in its direct impact on the eyesight. This impact was (and still is) re-created by artists, based on a similar understanding of the (ultimately less scientific) colour theories like the Goethean one. Goethe’s theory searched for the universal essence of the objective world in the particular way of a subjective worldview, and this was what artists were seeking too. For Goethe, it was the way of seeing, and seeing in a very particular way, that organized the features of the objective experience of nature.

The seminal work by Michel Eugène Chevreul⁵, *De la loi du contraste simultané des couleurs* (*On the Law of Simultaneous Contrast of Colours*) published in 1839 was partially influenced by Goethe’s *Theory of Colours* and his criticism of Newton. As Chevreul was the chief chemist of the Gobelins carpet manufacture, his focus was related to issues raised by that industry, and in this context he focused on the simultaneous contrast of colours, that is the way in which the perception by the human eye of a colour can be enhanced or diminished by the presence of other colours around it: “The work I now publish is the result of my researches on Simultaneous Contrast of Colours” (*On the Law of Simultaneous Contrast of Colours*, XII).

Chevreul had a huge impact on many generations of artists, especially on early moderns such as Turner, and on Impressionists such as Pissarro, but especially on Neo-Impressionists such as Signac and Seurat, who developed—in the shadow of Chevreul’s theory—their specific technique of painting called divisionism, which

⁵ The following pages refer to the English translation, Michel Eugène Chevreul, *The Principles of Harmony and Contrast of Colours, and Their Application to the Arts* (London: Longman, Brown, Green, and Longmans, 1855). (Hereafter cited as *On the Law of Simultaneous Contrast of Colours*).

influenced many modern and early avant-garde artists, ranging from Van Gogh to the Romanian-born Arthur Segal. Their understanding relied on the distinction between the optical spectrum, as observed by Newton, and the phenomenon of human colour perception, the "physiological colour" as Goethe calls it, responsible for the perception of the main subject of Chevreul's research, the simultaneous contrast.

Even the typical experiments of Chevreul echo the methodology of Goethe, his intuitive, sensory contemplation, called by Chevreul the *a posteriori* method:

"this work is really the fruit of the method *a posteriori*: facts are observed, defined, described, then they become generalised in a simple expression which has all the characters of a law of nature. This law, once demonstrated, becomes an *a priori* means of assorting coloured objects so as to obtain the best possible effect from them, according to the taste of the person who combines them; of estimating if the eyes are well organised for seeing and judging of colours, or if painters have exactly copied objects of known colours" (*On the Law of Simultaneous Contrast of Colours*, XIII).

Unsurprisingly, Chevreul relies upon the same non-Newtonian and Aristotelian-Goethean correspondence between the human eyesight and the phenomenality of colours. Like in the case of Goethe, the ultimate focus and explicit purpose of his research on colour is on its use by painters.

Similar to Goethe, Chevreul made numerous experiments of contrasting coloured stripes of paper on variously lit backgrounds, and theoretically concluded upon the data he collected from his own perception: "Finally, I conclude from my observations, that whenever the eye sees two differently coloured objects simultaneously, the analogous character of the sensation of the two colours undergoes such a diminution, that the difference existing between them is rendered proportionably more sensible in the simultaneous impression of these two colours upon the retina" (*On the Law of Simultaneous Contrast of Colours*, 44).

Chevreul's observations were preceded by Goethe's reflections on the observable chromatic contrast between background and object, when exposed to light. Goethe observed that colour arises at the edges, and the spectrum occurs at the border, where these coloured edges overlap. This could be traced back to one of the typical experiments of Goethe, from *Zur Farbenlehre*:

"Let a room be made as dark as possible; let there be a circular opening in the window-shutter about three inches in diameter, which may be closed or not at pleasure. The sun being suffered to shine through this on a white surface, let the spectator from some little distance fix his eyes on the bright circle thus admitted. The hole being then closed, let him look towards the darkest part of the room; a circular image will now be seen to float before him. The middle of this circle will appear bright, colourless, or somewhat yellow, but the border will at the same moment appear red" (*Goethe's Theory of Colours*, 16-17).

He experimented frequently on this issue and found that contrast is the most important factor in creating the coloured edge, not the local colour. And this coloured edge remains the same regardless of the local colour.

Goethe observed that the prismatic colours appeared to the eye only at the edges, at the boundaries of white and black: “Although in the foregoing experiments we have found all unbroken surfaces, large or small, colourless, yet at the outlines or boundaries, where the surface is relieved upon a darker or lighter object, we observe a coloured appearance” (*Goethe’s Theory of Colours*, 81). Thus, he recognized that a colour theory rooted in the properties of light—like Newton’s—must be inadequate. He understood that there must be both light and darkness, as well as a proximally positioned eye, in order for colour to arise and figures or representations of objects to appear: “Outline, as well as surface, is necessary to constitute a figure or circumscribed object. We therefore express the leading fact thus: circumscribed objects must be displaced by refraction in order to the exhibition of an appearance of colour” (*Goethe’s Theory of Colours*, 81).

In Goethe’s view, darkness can weaken the light in its working power. Conversely, light can limit the energy of darkness. Colours are the outcome of these interactions. One can easily recognize here the older, Aristotelian and medieval understanding of colour, light and darkness: “Colour in *On the Soul* is what acts on the light in the medium intervening between itself and the observer. More exactly, it acts on the transparency of the medium, when that transparency is in its illuminated state of being actually seeable through.”⁶

To Goethe, light and darkness harmoniously relate to each other producing colours, like the north and south poles of a magnet: this is less an experimental result of his observations, but more an extension of his fundamental epistemological standpoint of comprehending the harmonious feature of reality through polarities, as “the main goal of Goethe’s *Farbenlehre* was indeed to expose symmetries between light and darkness.”⁷

Moreover, the substantial (and almost mystical) correspondence between the eye, the sight, the light and the colours, so typical of late Aristotelian colour theory, was crucial to Goethe: “The eye may be said to owe its existence to light, which calls forth, as it were, a sense that is akin to itself; the eye, in short, is formed with reference to light, to be fit for the action of light; the light it contains corresponding with the light without” (*Goethe’s Theory of Colours*, Introduction, XXXIX).

The avant-garde of the early twentieth century took over the non-Newtonian colour theory of Chevreul, the simultaneous contrast of colours, and added to it a rediscovered interest in the anti-Newtonian colour theory of Goethe, focused on chromatic harmony. This was especially of a heightened relevance for the emerging abstract art. In *Über das Geistige in der Kunst (Concerning the Spiritual in Art)*, which appeared 100 years after *Zur Farbenlehre*, Kandinsky mentions Goethe as a sibylline voice advocating for ... abstract art: “Goethe expressed the thought that

⁶ Richard Sorabji, “Aristotle on colour, light and imperceptibles”, in: *Bulletin of the Institute of Classical Studies*, vol. 47 (Oxford: Oxford University Press, 2004), 129.

⁷ Olaf L. Müller, “Goethe’s Polarity of Light and Darkness”, in: *Journal for General Philosophy of Science / Zeitschrift für allgemeine Wissenschaftstheorie*, vol. 49, no. 4, Special Issue, *Goethe and Newton on the Theory of Colours* (Berlin: Springer Nature, 2018), 581.

all painting must have one general foundation. This prophetic expression of Goethe's is a presentment concerning painting and the place it occupies today. It is the first stage on the road by which painting will, according to her own possibilities, grow in an abstract sense and, finally, reach a purely artistic composition."⁸

However, neither Goethe's artistic practice, nor his theoretical positions in *Zur Farbenlehre* suggest this attraction for abstraction. As Goethe's paintings prove, he was a child of his time: a happy landscape painter like so many other German or English travellers across Europe. Moreover, neither the artistic practice nor the colour theory of Goethe supported the newly emerging, modernist grammar of painting of which Kandinsky was an enthusiastic proponent, (correctly) thinking that abstraction is and will be at its very core, as he praised the: "qualities which are inherent to the artist, and which are increased through enthusiasm to ingenious revelation. This is the sense in which the fundamentals of painting, as foretold by Goethe, may be understood. Such a grammar of painting, at present, can be guessed at" (*Über das Geistige in der Kunst*, 59).

But Goethe as a painter and as a philosopher is the last possible authority to support such an artistic practice which rests upon a grammar, a fixed syntax, ultimately a recipe, which appears alien to the dedicated, subjective phenomenality of his research. At the same time, Kandinsky's own speculative inroads into colour theory are as far as possible from Goethe's, as he focuses on an entirely emotional and profoundly theosophic-mystical take on colours, far from both the experimental-phenomenal direction of Goethe's research and Chevreul's very pragmatic understanding of the colours: "Yellow easily becomes acute and cannot attain deep significance. It is difficult for blue to become acute, as it is incapable of rising to great intensity. An ideal balance in the mixture of these two diametrically and totally opposed colours is green" (*Über das Geistige in der Kunst*, 65). Sometimes, Kandinsky went so far in his over-interpretation of colours from a purely symbolic point of view that he asserted that "White is a symbol of a world from which all colour, as a material quality and substance, has disappeared" (*Über das Geistige in der Kunst*, 68).

One of the Kandinsky's exalted conclusions referenced to Goethe, is much more based on Kant's theory of genius than on Goethe's, much more restrained one:

"Goethe [...] says: "The artist with a free spirit stands above nature and can treat it according to his higher aims. He is its master and slave at the same time. He is its slave insofar as he has to operate with earthly means in order to be understood. It is his master, however, insofar as he subjects these earthly means to his higher intentions and utilizes them for this purpose. The artist wants to speak to the world through an entity: He does not find this entity in nature but rather as the fruit of his own spirit, or, if we wish to express it thus, in the breath born of divine power" (*Über das Geistige in der Kunst*, 89).

⁸ Wassily Kandinsky, *Über das Geistige in der Kunst*, ed. Hilla Rebay (New York: The Solomon R. Guggenheim Foundation, 1946), 45.

Kandinsky's take on Goethe rather than Goethe's *Zur Farbenlehre* influenced other avant-garde artists in their understanding and assimilation of Goethe. It was a very partial, controversial and distorted assimilation of Goethe as a philosopher and researcher, like the distorted and partial understanding of the chemist Chevreul by the Neo-Impressionists. But those partial and distorted understandings proved extremely fruitful for the artists. This is also perceivable in the much later theoretical tract of Arthur Segal who, at the same time, was paradoxically much more akin to Goethe than Kandinsky, as the following pages will prove.

Arthur Segal (Aron Sigalu, 1875–1944) was a Romanian-born avant-garde artist, who studied in Munich and later in Paris until the end of the nineteenth century, and was active in Berlin from 1904 onwards, where he co-founded *Neue Sezession* in 1910. During WW1 he moved to Ascona, Switzerland, where he lived from 1914 until 1920. Back in Berlin in 1920, he became a co-director of the influential, left-wing revolutionary artists group *Novembergruppe*. He was offered a teaching position at Bauhaus in Dessau but declined it. Later on, during the Nazi ascension in Germany he emigrated first to Spain and then to the United Kingdom, where he died during a German air raid in 1944.

Segal's *Das Lichtproblem in der Malerei (The Problem of Light in Painting)*⁹ is his contribution to a book co-authored with Nikolaus Braun (Miklos Barna), who contributed with his own theoretical tract, *Konkretes Licht (Concrete Light)* to the small book published in 1925 in Berlin, on their own expenses (with no editing house or page numbers).

One may connect the publication of the book by Arthur Segal to his interest in and invitation to be a professor at Bauhaus in Dessau. His contribution consists in a theoretical text and four coloured plates reproducing his works that loosely illustrate his theory. From Walter Gropius to Paul Klee, most of the professors at Bauhaus considered *de rigueur* to have an original theoretical tract published to back their artistic practice not only as a subjective expression but also as a self-conscious, rational contribution with an epistemic and didactic touch. The main theme of Segal's theoretical considerations is light. But as his argument focuses on painting and its means to render the light, the colours emerge automatically as a subject matter.

Segal's definition of painting as a practice is rooted in a Neo-Impressionist, technical-scientific understanding—it is not a practice expressing the subjectivity of an artist, nor an objective rendering of various subjects taken from nature, but: "Painting is the expression of the optical perceptions of the differences in the world of appearance—the optical identification."

Segal's insistence on the optical factor differs from Kandinsky, in whose book the opticality as such does not figure. Kandinsky is more interested in the subjective contribution of the artist's eye as a genius-led, ultimate creative instance. Segal's terminological focus on the optics and an optically driven perspective on

⁹Arthur Segal, *Das Lichtproblem in der Malerei (The Problem of Light in Painting)*, a self-published book, with no publishing house mentioned (Berlin: 1925). The book has no page numbering printed, therefore the page numbers given here follow the succession of the text by Segal, taking apart his illustrations, which break the original text. The present author translated the following English versions of the quotations. German original was added whenever necessary.

colours is a key-element that defines his wished-for status as an objective, scientific authority, opposing the mystical, hyper-subjective, emotional stance of Kandinsky.

Through referencing as a headline the optics and not the spirit, Segal inserts himself into a revered chain of researchers on optics, starting with Descartes' *Dioptrics* and Newton's *Opticks*. But it also hints to a light-focused theory of colours based on sensory, subjective experiments, as it appears in Goethe's *Zur Farbenlehre* and in Chevreul's *De la loi du contraste simultané des couleurs*, which focused on optics and has heavily influenced the emergence and the theories of Impressionism. Thus, Segal entered a more scientific sphere as opposed to Kandinsky's mystical-subjectivistic vision.

However, some of Segal's presuppositions were entirely speculative and mystical themselves, with less or no scientific, experimental ground: "Every difference radiates the indifferent light of perception, whereby it can be perceived as a difference. The sun, this body is the possibility of perception that connects with the body to be perceived and the latter with it, so that the body to be perceived can be perceived. If the sunlight falls on a stone, the stone radiates its inner stone light back and thus appears—it is perceived. The sunlight brings the stone light out of the stone" (*Das Lichtproblem in der Malerei*, 1).

Unsurprisingly, this theoretical echo to the old, medieval epistemic injunction that knowledge proceeds according to the *similia per similia* or *similia similibus* method was inspired by Goethe: "The eye may be said to owe its existence to light, which calls forth, as it were, a sense that is akin to itself; the eye, in short, is formed with reference to light, to be fit for the action of light; the light it contains corresponding with the light without" (*Goethe's Theory of Colours*, XXXIX). This rather mystical understanding of the functioning of the sense of sight which opposes Segal's avowedly scientific starting point shows his profound indebtedness to Goethe and brings him closer (but from another standpoint) to the spiritualist understanding of Goethe by Kandinsky.

Segal's subsequent short historical incursion in the genealogy of the representation (or rather the non-representation or misrepresentation, according to him) of light in the history of painting starts from the basic assumption that: "Painting did not pay attention to the light itself at first. It just illuminated the picture so you can see it. There was no awareness that it can also be expressed in the picture like the form and the colour" (*Das Lichtproblem in der Malerei*, 1).

This positioning could be seen as contrasting to—yet concomitantly emerging from—Goethe's own declarative preference for the study of colours instead of the study of light. In his work, Goethe claimed that the study of the light already received a lot of attention—here Goethe referenced the experimental attention paid not only by Newton but also the philosophical attention paid by Medieval Aristotelian philosophers, and also by the Neo-Platonists, with their noticeable mystical mark:

"It may naturally be asked whether, in proposing to treat of colours, light itself should not first engage our attention: to this we briefly and frankly answer that since so much has already been said on the subject of light, it can hardly be desirable to multiply repetitions by again going over the same ground. The colours are acts of light; its active and passive modifications: thus considered,

we may expect from them some explanation respecting light itself. Colours and light, it is true, stand in the most intimate relation to each other" (*Goethe's Theory of Colours*, XVIII).

If Goethe evokes light only to switch to colours as a subject matter, Segal evokes colours to switch to light as a subject matter. At this point Segal shows another crucial reminiscence from Goethe, as he claims that: "Not even the light and dark, the basic elements of the function of light, were perceived, but only the contrasts of the light and dark colours and tones, which were lightless placed next to each other. A head e.g., which was half in the light and half in the shadow, was rendered only in the contrast of the light and dark colours and tones, so that the feeling that the head receives light was missing" (*Das Lichtproblem in der Malerei*, 2).

This recalls Goethe's introductory arguments from his Preface to the first edition of *Zur Farbenlehre*, where he posited that light and shade, lightness and darkness are the backgrounds onto which the colours act:

"We observed that all nature manifests itself by means of colours to the sense of sight. We now assert, extraordinary as it may in some degree appear, that the eye sees no form, since light, shade, and colour together constitute that which to our vision distinguishes object from object, and the parts of an object from each other. From these three, light, shade, and colour, we construct the visible world, and thus, at the same time, make painting possible..." (*Goethe's Theory of Colours*, XXXIX).

It is not by chance that Goethe introduced a final, conclusive reference to painting, in this paragraph. The paragraph is concerned with the much larger and meaningful phenomenon of the colour reception—Goethe was himself a painter, and his interest in painting was formatting his understanding of colours as well as his interest in philosophy.

Almost following the thinking thread launched by Goethe in his Preface, Segal passes to the opposition of light and darkness in painting, as the starting point of his considerations. And in the history of the art theories and art practices, the relationship of darkness and brightness, of light and its absence has a well-established understanding and a fixed terminology: the *chiaroscuro*. Segal then maintains that:

"It is known that with Rembrandt the *chiaroscuro* appears as a light function. It is no longer just the contrast of lightless, light and dark colours and tones, but for the first time these colours seem to express the light, albeit colourless light, which the given forms receive. The colour in Rembrandt is not yet a function of the coloured rays of light, but it serves for the contrasting colouring of the light function of brightness and darkness" (*Das Lichtproblem in der Malerei*, 2).

But from that point onwards, the development of Segal's theory breaks with Goethe's proceedings. There are no proper colour experiments invoked by Segal in his reflections. There is no surprise in this change, because Segal advances from Rembrandt's *chiaroscuro* to the full-blown colours of Impressionism, that is to modernity. Compared to Kandinsky, his need for Goethe as a theoretical support (even through distortion) stops short before modernity. Like in the case of

Kandinsky though, Segal needs Goethe as a foundation of the artist's status, rooted in spiritual and sometimes mystical suppositions.

Like most of his contemporaries, Segal sees that "Pleinairism or Impressionism and finally Neo-Impressionism discovered the light function of colour, i.e., the coloured rays of light, so that the colour no longer served as a lightless contrast of the lightless light and dark tones as before Rembrandt..." (*Das Lichtproblem in der Malerei*, 2).

The condition of the artist as a preferred and special agent of rendering the perception of light and darkness and of colour is understood as a continuous one, until the Impressionist revolution. This "until" applies to the time of Goethe too. Contrary to Kandinsky, for Segal, Goethe simply did not open towards the Impressionist revolution of colour. As he put forth this historical becoming:

"Before Rembrandt, the artists preferred the form, Rembrandt the colourless chiaroscuro and the neo-impressionists the coloured light. The colour itself was only later superordinated, i.e., treated for self-purpose purposes, when it had been discovered by neo-impressionism, which decomposed the coloured light rays into their components. Since then, colour is no longer a secondary property of the form or of the light, but these become secondary properties of the colour" (*Das Lichtproblem in der Malerei*, 3).

Thus, the fullness of colour in art is a contribution, a discovery of Impressionism, a marker of modernity.

To better relate to this revolution, Segal links back to Newton, the arch-enemy of Goethe, and this is reasonable precisely because he wants to link his theory to a scientific take on light and colour, and therefore to imbue a more technical view on his own theory, as he saw himself—like many of the Bauhaus-related artists-cum-theorists—as a kind of technocrat of the new, universal order of modern times:

"The basis of progress was Newton's theory that white light contains the three primary colours: Red, yellow and blue, and that from the different reaction of things to these coloured rays of light their different coloration or their coloured difference arises... The form was pushed so far into the background that it was only possible not to lose any last possibility of differentiation of the objects. In contrast, the reaction of the objects to the coloured light rays of the white light was analysed in detail and disassembled. The objects accordingly reacted to the basic rays of the light. So, you could see the proportions of these reactions on the pictures of the neo-impressionists. The technical structure of these colour proportions is well known: the divisionist technique" (*Das Lichtproblem in der Malerei*, 4).

In his modernist beginnings, Segal himself was a divisionist. But he increasingly grew to become a critical one, as he conceded that: "In Impressionism as well as in Neo-Impressionism, things are only externally connected to each other. They are probably in the same light atmosphere, but in contradictory relationship to each other by reacting differently to this light. The same light is in a way the despotic power which forces together in the same-light law but does not freely order them in it and deprives them of the inner relationship to one another" (*Das Lichtproblem in der Malerei*, 4).

His critical view made him understand that “colour-formal sense was completely lost among the Impressionists and Neo-Impressionists. In the case of the former, a formal-compositional chaos, in the latter a light-compositional chaos. Both the order of light in the former and the formal order in the latter are therefore coercive orders of superior power factors, arising from the arbitrariness of their despotism” (*Das Lichtproblem in der Malerei*, 4). Here bursts onto the scene the leftist, Marxist leaning of Segal, who considered that: “The ‘piece of nature’ of the Impressionist or Neo-Impressionist is a formal-compositional arbitrariness. The formal composition or construction of the Cubist or Constructivist is a light compositional arbitrariness. Any over- or subordinatedness leads to arbitrariness” (*Das Lichtproblem in der Malerei*, 5).

Segal was actively working to find a solution to the subjective arbitrariness instilled by the Impressionist revolution into modernism. His solution was a plastic, artistic, and primarily colour-light based theory and practice called *Optische Gleichwertigkeit* (optical equilibrium) aiming to struck an optimal equivalence of shapes and colours on the canvas, which, through the perfectly balanced compositions aimed to become an instance of (and a symbol of, an effigy, a model or a slogan) of the perfect social balancing of society, able to infuse balance into the body politic too:

“But if form, colour and light are expressed in an equivalent relationship to each other through the work of art, then all three come to the strongest, free and individual appearance and are organically connected. No individual part imposes its particularities to other parts, to change it. The form must be formed in the light without being changed as such, the light lighting from inside the form without losing neither its particularity, nor colour. If we see through a prism, we have the hint in that sense, but only the hint. Strongly outlined forms must be formal-constructively organically related to each other” (*Das Lichtproblem in der Malerei*, 5).

The perfect balance searched for by Segal was, in fact, a modernist equivalent of Goethe’s harmony. Like Goethe, Segal was looking for an ideal world of perfectly harmonious relationships—a better world, in Goethe’s words, one which, as Goethe predicted, was to be searched for in painting. Segal’s paintings of the 1920s displayed precisely this fixation on the perfect, ideal balancing of colours in the painting, to proper models of aesthetic/social equilibrium, in which the balanced relationship of colours suggested and/or induced an ideal and perfect, social balancing of the individuals in their social interactions. His solution trespasses by far the purely formal, artistic, optical or spiritual tasks he assigned to his theory, and opens towards a (or another) aesthetic utopia, where colours and shapes became subjects and forces, like the social subjects and social forces. In the ideal cases of his compositions:

“Formal and locally coloured individual difference remains untouched and comes to the strongest effect; their same and similar light radiation proves their identity despite their differences and places them equally in the cosmic law; each over-ordinate or subordinate, thereby turning off any arbitrariness. If here

the things in their formal and locally coloured difference are harmonised as free sub-organisms to a free whole, then they are freely identified in the whole by their similar light radiation. The light here is in the Goethean sense an undivided, uncomposed, homogeneous. The colours are a property of things, that is, of the forms: their local colours" (*"Das Licht ist hier im Goetheschen Sinne ein Ungeteiltes, Unzusammengesetztes, Homogenes"*, *Das Lichtproblem in der Malerei*, 5).

The fact that Goethe is invoked one more time, right at the end, is highly significant, as the perfect, ideal utopian and universal understanding and perfect accord is a reflection of the Goethean Olympian, classical understanding of culture and society. Once again, the proper Goethe's *Zur Farbenlehre* is lost as an actual reference. But the deeper Goethean impulse lives further through utopia.

BIBLIOGRAPHY

- Chevreul, Michel Eugène. *The Principles of Harmony and Contrast of Colours, and Their Application to the Arts*. London: Longman, Brown, Green, and Longmans, 1855.
- Eckermann, Johann Peter. *Convorbiri cu Goethe*, Romanian translation by Lazar Iliescu. Bucharest: E.L.U, 1965.
- Goethe's Theory of Colours*, translated with Notes by Charles Lock Eastlake. London: John Murray, 1840.
- Kandinsky, Wassily. *Über das Geistige in der Kunst*, edited by Hilla Rebay. New York: The Solomon R. Guggenheim Foundation, 1946.
- Kuehni, Rolf G. *Philipp Otto Runge's Color Sphere. A translation, with related materials and an essay* (2008: <http://www.web3.lu/download/RungeFarben-Kugel.pdf>).
- Müller, Olaf L. "Goethe's Polarity of Light and Darkness", in *Journal for General Philosophy of Science / Zeitschrift für allgemeine Wissenschaftstheorie*, vol. 49, no. 4, Special Issue, *Goethe and Newton on the Theory of Colours*. Berlin: Springer Nature, 2018.
- Segal, Arthur. *Das Lichtproblem in der Malerei*, a self-published book, with no publishing house mentioned. Berlin, 1925.
- Sorabji, Richard. "Aristotle on colour, light and imperceptibles", *Bulletin of the Institute of Classical Studies*, vol. 47. Oxford: Oxford University Press, 2004.
- Wittgenstein, Ludwig. *Remarks on Colour*, edited by G.E.M. Anscombe. Berkeley: University of California Press, 1977.

