

# A Surveillance of contemporary Reactions to Goethe's Theory of Color

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## ABSTRACT

*Johann Wolfgang von Goethe (1749-1832) gave some noteworthy accounts of color in his book on color "Zur Farbenlehre" (1810), which plays undoubtedly a prominent part in the history of color science and art. But they are, even today, exposed to merciless criticism from innumerable scientists and physicians. Nevertheless, Goethe's thought attracts intellectual interests and becomes occasionally a big focus of attention, especially in the context of study of aesthetics and art. The present paper will give an outlook for modernist receptions of Goethe's idea of color.*

### 1. Goethe and Heisenberg

Werner Karl Heisenberg (1901-1976), a German theoretical physicist, who won Nobel Prize in Physics for 1932 for "the creation of quantum mechanics, the application of which has, inter alia, led to the discovery of the allotropic forms of hydrogen", had lifelong an interest in Goethe's study of nature, particularly the "Farbenlehre". On 5. May 1941 in Budapest, Heisenberg gave a lecture concerning Goethe's ideas of color and made a few remarks on the color scientific inconsistency between Newton and Goethe in respect to modern physics [1]. Heisenberg examined a remarkable episode of Goethe's personal history, that he was fully aware of the contradiction to Newton's analytical approach to the essence of color when he tested out Newton's theory of color by experiment using a prism in the spring of 1791. Goethe wrote then, "a limit [eine Grenze] is indispensable for production of color" [2]. His conviction, light originate not only from light but develops from connection of light and darkness, was confirmed at that time. Heisenberg did not carelessly criticize Goethe's opposition to Newton's theory of color and his unscientific way of research, instead offered a very suggestive comment as following: "Goethe's doctrine of color and Newton's theory of color, they deal with two fundamentally different aspects of reality" [3].

Heisenberg had an opportunity in later years to grapple with the Goethe and Newton problem again. In the yearly general meeting of the Goethe Gesellschaft zu Weimar, 21. May 1967, he gave a lecture under the title of "Goethe's view of nature and natural science and technology" [4]. He made in the lecture mention of Goethe's criticism to analytical way of thinking of modern science, referring to the following words of Goethe: "the possible abuse of this abstract view" [Abstraktion, vor der

wir uns fürchten] [5]. Although Heisenberg stresses the importance of modern scientific methodology accompanied with experiments and observations and analytics, which should lead to the mathematic formulation in the end, he shows obviously his sympathy with Goethe's view of nature and theory of color.

### 2. Weizsäcker's critical assessments

Carl Friedrich von Weizsäcker (1912-2007), a German physicist, gives some important comments on Goethe's theory of color. He studied physics working with Heisenberg and Bohr in pre-World War II period. It is significant comparison of his commentary on Goethe with Heisenberg's accounts in consideration of their academic relationship of teacher and student. Weizsäcker's essay "some concepts from Goethe's natural scientific research" was written originally 1954 as a contribution to a commemorative volume for a German poet and industrialist Robert Boehringer (1884-1974) [6]. He checks out carefully Goethe's scientific works in the historical development of observation of nature from Platon to the present day and, especially in connection with Goethe's some scientific errors, give a comment as it follows: "he[=Goethe] made a mistake, because he wanted to make a mistake." [7] Weizsäcker's criticism to Goethe's natural scientific works is much more severe than Heisenberg's judgements, but on the other hand there is also a sympathy to the poet in the above mentioned comment. As he explains, Goethe's theory of color rooted in his individual, "not replaceable" [unersetzlich] experience of sensibility [8].

### 3. Wittgenstein as a reader of Goethe's "Farbenlehre"

Ludwig Josef Johann Wittgenstein (1889-1951), an Austrian-British philosopher, made one of the most important contributions of 20th-century philosophy. His philosophical writings in every period from early days to final years contain several mentions of color. Among them, his manuscripts "Remarks on Colour", which are written in the last two years of his lifetime, take rank as the most significant work on Color [9]. The editor's preface of "Remarks on Colour" brings us some information of the formation of Wittgenstein's manuscripts on color. The most important trigger of Wittgenstein's "Remarks on Colour" was his reading of Goethe's "Farbenlehre" in the years of fighting against his illness caused by the cancer of the prostate. In early spring of 1950, inspired by Goethe's idea of color, he wrote several paragraphs on color, which

constituted probably “Part II” of the manuscripts on color. “Part III” was then written in Oxford in the spring of 1950, and “Part I” in Cambridge in March 1951 was noted down in the weeks just before his death on 29. April 1951.

It is one of the most interesting arguments in Wittgenstein’s “Remarks on Colour”, that the concept of identicalness of color is philosophically questioned, as he writes in connection with Goethe’s theory of color as it follows. “The difficulties we encounter when we contemplate the essence of colors (these which Goethe wanted to get sorted out in his theory of colors) are embedded in the indeterminateness of the concept of identicalness of color”(I. §56) [10]. The “indeterminateness [die Unbestimmtheit]” in the concept of color and of identicalness of color is a basic topic which run throughout in “Remarks on Colour”. Further he writes, “it is not at all clear a priori, which are the basic color concepts” (III. §69) or “there is no such thing as the pure concept of color” (III. §73) [11]. These statements contain undoubtedly his self-criticism, because he criticizes his own former opinion that there should be the simple and basic color. After all he writes admittedly as it follows, “the logic of the concept of color is just much more complicated than it might seem” (III. §106) [12]. Wittgenstein’s philosophical denial of general idea of color is also correlated with the ambiguity and multiplicity of the concept of color. It is tightly bound up with the theme of certainty in philosophy, on which he worked in the last days of his lifetime.

#### 4. Concluding remarks

Wittgenstein left in his “Remarks on Colour” some words concerning the opposition of Goethe and Newton, “phenomenological analysis (as e. g. Goethe would have it) is analysis of concepts and can neither agree with nor contradict physics”. (II. §16) [13] This comment is comparable with Heisenberg’s following remarks as well, “ultimately both Goethe’s doctrine and Newton’s theory of color handle their proper, fundamentally different phenomenon. There remains yet a question, why can be combined so different objects in one single concept of color.” [14] Their comments suggest us the possible plurality of concept of color and the further development of investigation of color in various fields of science and art.

#### 5. REFERENCES

- [1] Werner Heisenberg “Die Goethesche und die Newtonsche Farbenlehre im Lichte der modernen Physik” [In: Geist der Zeit, 19 (1941), ab S. 261. (In: Werner Heisenberg “Wandlungen in den Grundlagen der Naturwissenschaft” Hirzel, Stuttgart 1959)]
- [2] “Es durfte keiner langen Zeit Überlegung, so erkannte ich, daß eine Grenze notwendig sei, um Farben hervorzubringen, und ich sprach wie durch einen Instinkt sogleich vor mich laut aus, daß die Newtonische Lehre falsch sei.” Goethe Werke Hamburger Ausgabe in 14 Bänden hrsg. v. Erich Trunz. Bd.14, p.259.
- [3] “Am richtigsten kann man vielleicht den Unterschied

der Goetheschen und der Newtonschen Farbenlehre bezeichnen, wenn man sagt, dass sie von zwei ganz verschiedenen Schichten der Wirklichkeit handelten.” (In: Werner Heisenberg “Wandlungen in den Grundlagen der Naturwissenschaft” Hirzel, Stuttgart 1959)]

- [4] Werner Heisenberg “Das Naturbild Goethes und die technisch-naturwissenschaftliche Welt” [in: Jahresgabe der Goethe-Gesellschaft Kassel auf das Jahr 1968, pp.7-26.]
- [5] Goethe Werke Hamburger Ausgabe in 14 Bänden hrsg. v. Erich Trunz. Bd.13, p.317.
- [6] Carl Friedrich von Weizsäcker “Einige Begriffe aus Goethes Naturwissenschaft”. (In: Goethe Werke Hamburger Ausgabe in 14 Bänden hrsg. v. Erich Trunz. Bd.13, Naturwissenschaftliche Schriften I. Mit einem Essay von Carl Friedrich von Weizsäcker. “Nachwort”, pp.539-555 )
- [7] “Wie konnte ein so großer, so umfassender Geist so irren? Ich weiß nur eine Antwort: er irrte, weil er irren wollte. Er wollte irren, weil er eine entscheidende Wahrheit nur durch Zorn zu verteidigen vermochte, dessen Ausdruck dieser Irrtum war.” (In: Goethe Werke Hamburger Ausgabe in 14 Bänden hrsg. v. Erich Trunz. Bd.13, p.539)
- [8] “Die Sinneserfahrung, in der Goethes Wissenschaft wurzelt, ist seine eigene, ist unersetzlich.” (In: Goethe Werke Hamburger Ausgabe in 14 Bänden hrsg. v. Erich Trunz. Bd.13, p.541)
- [9] Ludwig Wittgenstein “Bemerkungen über die Farben” herausgegeben von G. E. M. Anscombe, Blackwell Publishing 1977 (Ludwig Wittgenstein “Remarks on Colour” edited by G. E. M. Anscombe, translated in English by Linda Schättle, Blackwell Publishing 1977)
- [10] Ludwig Wittgenstein “Remarks on Colour” p.9e
- [11] ibd. p.26e
- [12] ibd. p.29e
- [13] ibd. p.16e
- [14] Werner Heisenberg “Die Goethe’sche und die Newton’sche Farbenlehre im Lichte der modernen Physik” [in: Werner Heisenberg “Die Wandlungen in den Grundlagen der Naturwissenschaft. Zehn Vorträge.” 12. Aufl. Hirzel Verlag 2005] p.77