

21–23 September 2018  
Glasshouse, Stourbridge, UK

# On the Shoulders of Giants

The Legacy of Newton, Goethe and Turner

## Abstracts

### **Practice and Theory in Art: Turner and Goethe's Theory of Colours**

*Anastasia Fourel (Humboldt University of Berlin)*

The question of the relation between theory and practice in art is often misunderstood, especially concerning colors. The example of Turner and his lecture on Goethe's Theory of Colours can help us to conceive the nature of the problem in a more suitable way. It is often said that Goethe's theory is, compared to Newton's, more useful for painters (or dyers and other colour artists), or at least more relevant. Yet, neither Goethe's nor Newton's colour theory can be simply applied in the way a cooking recipe can, or analogous to behaving according to moral principles, or solving a scientific problem according to a certain methodology. Art has its own logic, and scientific theories have never been produced to provide a basis to aesthetical conceptions, yet alone concrete pieces of art. Nevertheless, artists can find inspiration in scientific theories, discuss them, or even challenge them. Turner nourished his thinking and therefore his art with both Newton's and Goethe's theories. What good artists and good scientists have in common is a particular sense of observation: in this case, the shared object of observation for Turner, Newton and Goethe is light, and the way colors arise from it.

### **Newton's Experimental Proof of the Heterogeneity of Sunlight: An Iconic Proof**

*Timm Lampert (Humboldt University of Berlin)*

Newton's claim to have proven the heterogeneity of sunlight by his experimentum crucis is often criticized. It is argued that his proof is based on hypotheses and not inferred from the experiment alone. This criticism, however, applies a hypothetico-deductive analysis of experimental reasoning to Newton's argument. Such an analysis is not consistent with Newton's own understanding of his proof method. I will present a reconstruction of Newton's proof that is intended to do justice to his understanding by analyzing his experimental proof as an iconic proof. The main purpose of this analysis is to explain Newton's dictum that the experiment alone serves as the source of evidence from which his theorems are derived.

### **On the Grammar of Nature: Looking at Goethe's Method through Wittgenstein's Eyes**

*Marc Müller (Wuppertal University)*

Throughout his life Wittgenstein was a great admirer of Goethe's work. He grew up with Goethe's prose and poetry and later appreciated his ideas on morphology. During his final months he wrote his famous Remarks on Colour in which Goethe's Farbenlehre plays a central role. Thus, it is certainly true to say that there is much to learn about Wittgenstein's thinking from studying Goethe. However, in this presentation I will argue that the opposite is also true.

Indeed, ignoring the chronology, I'll attempt to show that there is more to be learnt from Wittgenstein about Goethe than vice versa. The reason is, roughly speaking, that Goethe never finished developing his method whereas Wittgenstein did, which is conspicuous when we regard Goethe from Wittgenstein's position. Fortunately, with their thoughts about nature on one hand and the philosophy of language on the other they both trod the same path, so in the end we can assume where Goethe and his method about nature lead.

### **Goethe and Ritter**

*Olaf Müller (Humboldt University of Berlin)*

Critics of Goethe's *Farbenlehre* frequently use the "Polemic Part" and its furious attacks on Newton's *Opticks* to argue for Goethe's incompetence in scientific matters – often, however, without having studied this part of the *Farbenlehre*. For example, Michael Duck, one of the two translators, claims in the introduction that "The general consensus has always been that Newton succeeded brilliantly [...] and the scientific world was unanimous in its rejection of *A Theory of Colours* – particularly in Germany". Contrary to Duck's claim, scientists in Goethe's day were not unanimous in their rejection. One example is the case of Johann Wilhelm Ritter (1776–1810), which I will focus on. As I will argue, Ritter knew Goethe's criticism of Newton well. He approved of it and developed it further – with great success: Goethe's ideas led Ritter to discover what is nowadays known as ultraviolet radiation; an epoch-making discovery.

### **Demonstration of Coloured Shadow**

*Diana Pauli (Sunfields, Stourbridge)*

This presentation is based on practical demonstrations of the phenomenon of coloured shadows (simultaneous colour contrast), described by Goethe's in his *Farbenlehre*. The effect of coloured light on coloured materials will first be demonstrated which will serve to help to understand the phenomenon of coloured shadows. Various examples of coloured shadows will be shown including some of Michael Wilson's original demonstrations and slides, followed by an explanation of why we see them. Lastly there will be a participative exercise to find out to what extent we are able to control our perception of them.

### **From Ontology to Description: Experiments and their Interpretation from Newton to Goethe**

*Matthias Rang (Goetheanum, Dornach)*

Isaac Newton never believed he had proven his theory of light corpuscles. Indeed, he was more aware of the difficulties of deriving a theory from experiments than most of his contemporaries. Yet in his treatment he was not careful enough for Goethe; what Newton claimed to have proven by his experiments was for Goethe still a deficient theory. I examine from a physicist's point of view how Newton prepared the ground for a modern, operational interpretation of experiments which was carried further by Goethe and leads from ontological to descriptive statements. This investigation allows an understanding of spectral phenomena which does not simply pass on Newton's historical interpretation but combines his innovations with Goethe's in the context of recent optics.

### **Wittgenstein, Goethe, and Romanticism**

*Mark Rowe (University of East Anglia)*

Wittgenstein once hinted that his "cultural ideal" derived from "the time of Schumann" [*Culture and Value*:4e], and in this talk I attempt to show that many aspects of the

philosopher's writing which seem opaque, wilful or eccentric, become entirely comprehensible - indeed natural - when seen against the background of early Romanticism. In the main body of the talk I look at two contexts in particular: Goethe's philosophy of scientific explanation; and the literary form of Goethe's great novel, *Wilhelm Meister*, which finds its origins in the Christian historical and autobiographical tradition. I end with some reflections on the preface to Wittgenstein's *Philosophical Investigations*, arguing that it shares important affinities with prefaces written by Wordsworth and Coleridge.

### **Goethe, Philosophizing Science**

*Dennis Sepper (University of Dallas)*

Johann Wolfgang von Goethe (1749-1832) appeared to settle the question of his relationship to philosophy when he remarked that he did not possess a 'philosophical organ'. Nevertheless, he clearly had an indebtedness to at least a few philosophical predecessors (most clearly evidenced in his reflections on science and its methods). He also had important relationships and even friendships with his philosophical contemporaries. In Goethe studies it has not been uncommon to try to tease out these relationships with and possible influences of/on philosophers and philosophical movements in articles and books titled on the model 'Goethe and X'. The presentation will critically regard this philosophico-historiographical approach to Goethe and attempt to determine whether Goethe did not after all possess some at least minimal philosophical organ, most clearly activated by and at work in his studies of science.

### **Broken World Epistemology: Aggregate, Totality, and Experiment**

*Daniel Steuer (University of Brighton)*

For Goethe, a phenomenon was "not detached from the observer". It was "caught up and entangled in his individuality". What his essay on the experiment as mediator between object and subject describes is the process of disentangling this relation, and the obstacles to this disentanglement. Goethe's reflections on scientific methodology are therefore not just conventional epistemology, they have an inseparable moral dimension to them. This may help to explain why Goethe called it the greatest evil in recent physics that the experiments have been separated off from the human body, and nature is equated with what can be measured by instruments. Goethe's warnings, this paper argues, are highly relevant at time in which the digital paradigm increasingly obfuscates the subject-object relation. Goethe's warnings, this paper argues, are highly relevant at a time in which the digital paradigm increasingly obfuscates the subject-object relation

### **Can Goethe's *Farbenlehre* Contradict Physics?**

*Troy Vine (Humboldt University of Berlin)*

In his *Remarks on Colour*, Wittgenstein claims that Goethe's *Farbenlehre* is "analysis of concepts and can neither agree with nor contradict physics". Philosophers supportive of Goethe's polemic against Newton have claimed that the *Farbenlehre* is not conceptual analysis but rather empirical science and that its attack on Newton is therefore justified (irrespective of whether it was successful). Philosophers who follow Wittgenstein in claiming that the *Farbenlehre* is conceptual analysis have rejected Goethe's polemic as unjustified. In my presentation I will argue that even if Goethe's *Farbenlehre* is conceptual analysis, it does not follow that the *Farbenlehre* cannot contradict physics. In particular, I will attempt to show that if the relations between colours that are explained via an empirical theory are actually

conceptual (e.g. the order of the spectral colours), then an empirical theory is redundant and Goethe was right to think that his investigation can replace parts of Newton's *Opticks*.

### **A Question about Green**

*Jonathan Westphal (Northampton, MA)*

There is a well-known difficulty about Goethe's explanation of the presence of green in the spectrum. The explanation that Goethe gives is that the green derives from the optical mixing of the two edge-spectra that are undoubtedly present at the light-dark and dark-light borders, which are transposed images of the aperture. Some commentators have taken this to be an error on Goethe's part, since the optical mixing of the blue and the yellow in fact yields white. (This is of course true only if the projection is onto a white screen.) Michael Wilson himself took the phenomenon of green to be observationally validated, which it is. The question I wish to consider is what the explanation is. I offer a remark from Wilson himself and an experiment to expand the range of possibilities of the phenomenon.

### **Pursuing Colours and Newton's and Goethe's trajectories of research**

*Gábor Zemlén (Budapest University of Science and Technology)*

The presentation will investigate how Newton and Goethe went through various phases of research in their quest to bring order into the dynamic world of colours. For Newton some of the early unpublished diagrams and later developments of prism-drawings will be discussed, and for Goethe the different ways of ordering colours, among them polarity (duality), threefold and fourfold groupings of basic colours, and the sixfold partitioning of Goethe's colour wheel. The talk will address the question of the alternatives in understanding the various – often polarized – views of the history of the reception of their views on light and colours.