

## Phenomenology and Natural Science

At a time where sensory experience is largely removed from physics, subjective reality and phenomenology seem to re-enter natural science through the back door. This is what is happening in the relatively new discipline of neuroscience. In neuroscience, concepts like depth, movement, contrast, and colour, for instance, are no longer attached exclusively to the physical world, but have also become realities of neural activities, mental images and perception. For many of us, humanists and natural scientists alike, this change of focus has become an eye-opener rather late in life. Torger Holtsmark, however, was occupied early on with the observer's role in natural science. What belongs to our conscious experience of nature and what belongs to nature itself? Is there a difference? Torger's early attempts to make students aware of this duality, was not always met with understanding; it probably took root only in a few of his closest friends and collaborators.

Since he became a teacher in 1957 at the University of Oslo, Torger's subject always seems to have been »Science as Culture«. As a physics teacher, he inspired us by his curiosity and philosophical insight. This is not common in a discipline that deals with quantifiable entities and orders them in formal structures that are remote from immediate perception and experience. Evidently, this point of departure evoked a latent desire for further knowledge in many a young person. Through his patient guidance the realization became established that if you search along the right path, you will learn something about yourself.

Holtsmark's original work about the historical and cultural background for natural science is little known outside the inner circles of academia. The more solitary and basic questions about our understanding of reality have a tendency to become overshadowed by the flashlights and the noise of the media. In another country, with a more nuanced cultural consciousness and better founded scientific traditions, Torger Holtsmark's ideas would have reached a much broader public. Only Torger's own international contacts compensate somewhat for discussions missing at home.

We therefore welcome this publication of a collection of the most important work from Torger's hand. As the titles of the contributions to this book indicate, he has felt at home in a broad European tradition. This is also clearly reflected in the tremendous effort behind obtaining possession of and editing the Norwegian mathematician Sophus Lies's correspondence with Felix Klein.

All who know Torger have come into contact with his interest for colours, particularly in the theories of Isaac Newton and Johann Wolfgang von Goethe. The phenomenon of colour has led many a scientist to enquire about the deep layers of nature. For Torger, the observations of colours are essential to his thinking. This early interest led to what must have been among the most fascinating seminars in the history of the University of Oslo, together with the Norwegian author André Bjerke and the well known physics professor Sven Oluf Sørensen. A most concrete product evolved out of these meetings, namely a set of fundamental optical demonstrations in colour science. Since then Torger's popular lectures on this topic have become widely appreciated abroad.

If I were to try to characterize his affinity to colour, it is probably fair to say that he would agree with the notion that colours cannot be explained in a scientific language. All we can achieve, as Newton himself was aware, is to describe the circumstances – the physical conditions – under which colours »reveal themselves«. Goethe classified the conditions under which colours arise, and he tried to trace the phenomena of colours to their fundamental sources, »to the circumstances under which they simply appear and are, and beyond which no further explanation respecting them is possible« (Goethe, *Introduction to Theory of Colours*, M.I.T. Press, 1970).

Torger's engagement as a teacher at the University of Oslo has left lasting impressions in his students. He is a wise man: a philosopher who encouraged and guided his students to critical thinking, always open and helpful. Under his guidance, several master students worked on topics within Colour Science, Physiological Optics, and History of Science. Many of them became close friends. In his work as a teacher, he continued to communicate ideas about »Science and Culture«. This has not been an easy task, in a time where scientists have become more and more technologically orientated, and where the desire for truth has been replaced and confronted with »Research and Technology«.

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