

GOETHE AGAINST NEWTON:
TOWARDS SAVING THE PHENOMENON¹

Wer ein Phänomen vor Augen hat, denkt
schon oft drüber hinaus; wer nur davon
erzählen hört, denkt gar nicht.

(Goethe, *Maximen*, No. 1227)

In all the scientific work of Johann Wolfgang von Goethe nothing is more notorious than his polemic against Isaac Newton's theory of white light and colors. This "great error" has been a constant source of embarrassment to reverers of Goethe that seemingly can be explained only by analyzing his psyche or his poetic metaphysics. Not a few, including Hermann von Helmholtz, thought that precisely Goethe's poetic talent prevented him from understanding modern natural science. His advocacy of direct and immediate experience, it is said, made possible his contributions to descriptive sciences like plant and animal morphology but also kept him from real insight into the abstract techniques and power of mathematico-physical science (1971, pp. 21–44). His polemics against Newton are taken to be the clearest testimony of Goethe's one-sidedness; the most one can say in his defense, it seems, is that in the struggle to assert the rights of the world of appearances he sinned against a truth that can only be uncovered by methods that go behind and beyond the phenomena. Of course in the twentieth century there has been a partial rehabilitation of the *Farbenlehre*, especially in its treatment of physiological and psychological aspects of color, and a greater readiness to acknowledge its virtues (e.g. concreteness) *vis-à-vis* modern theoretical physics. Yet we still tend by and large to construe Goethe's undertaking as directed *against* modern physics, not least because of the polemic against Newton.

Is Goethe an opponent of modern physics? He opposed Newton's optics; but few realize that he spoke approvingly of the wave-theory of light, which was formulated in a much more sophisticated mathematics than was Newton's.² I do not propose to give an unambiguous yes or no to the question of Goethe's attitude towards modern physics here;

rather, I wish to reopen it by arguing that Goethe's theory of color and in particular his polemic against Newton's theory have been largely misconceived, even by Goetheans, as the result of ahistorical presuppositions about the character and extent of Newton's achievement and the principal aims of Goethe's science. To put things as succinctly as possible: Goethe was not a poet who blundered into the alien territory of physics, but rather someone who actually *looked* at the phenomena and compared them with what the prevailing theory said; someone who knew Newton's writings on optics and colors far better than anyone except perhaps Newton himself; someone who knew the history of chromatics and not just the history of optics; someone who gave prolonged thought to the methodological and philosophical problems implicit in experimental science, especially those of claiming factuality, of proving theory by experiment, and of mathematizing phenomenal description. Goethe made his initial foray into the sciences of optics and color because he noted a condition that had been overlooked in most eighteenth-century statements of the theory and that led to certain inconsistencies between what was expected and what actually happened. He went about this work with the intention of creating a rigorously and comprehensively inductive science that kept facts or phenomena strictly separated from hypotheses. Through research that was historical as well as experimental, he became ever more aware how theory and fact are intertwined, how every attentive look at the world already involves theorizing.³ Yet he did not abandon the distinction between theory and phenomenon as a result, for especially from the example of Newton's theory he realized that the more one puts hypotheses and abstractly theoretical statements (and their proof) at the focal point of science the harder it becomes to look at the phenomena with an unprejudiced eye; indeed, abstractly theoretical seeing distorts actual seeing. In opposition to the theory-centered approach of Newtonian chromatics Goethe proposed to make phenomena and their ways of appearing the heart of science. Concomitantly he explored and tried to incorporate into science the variety of ways in which phenomena can be experienced and conceived (what he called the *Vorstellungsarten* — 'modes of conceptualization'). Accordingly the major aim of natural science could no longer be to establish the truth of an hypothesis, e.g. by showing there is an (approximately) exact fit between prediction and experimental result in a few "crucial" cases, but rather to strive for overall fidelity in one's way of seeing (*theoria*) to the variety