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978-0-521-12126-2 - Goethe's History of Science
Karl J. Fink
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Being familiar with Goethe's Faust story, students of Western thought will not be surprised to learn that Goethe was also a scientist, philosopher, and historian. This book is about the interdisciplinary activities of his mid-life (1790–1810) when he researched optics, color theory, and plant morphology, and at the same time contributed to the growing literature in the history and philosophy of science.

In Goethe's writings, Karl J. Fink finds a scientist examining the junctures of nature, the boundary conditions where growth and change occur. These topics of transition also define his approach to the history of science, where the gaps between visible states challenge the historian to search for metaphors that bridge discontinuities. Written in the idiom of Thomas Kuhn, Fink discovers how this pioneer in the historiography of science investigated the shared exemplars, common metaphors, and topoi of thought that shape scientific traditions.

In *Goethe's History of Science* Fink examines the birth of a discipline. He describes how Goethe distinguished science from the history of science; how, in dialogue with Friedrich Schiller, Goethe applied Kantian categories of the mind to his project on color theory; how Goethe confronted Newtonian science with the strategies of polemics; how he organized science from antiquity to the Enlightenment into epochs of authority and canonicity; and how, as poet and critic, he linked the scientist's language, style, and personality to the development of schools of thought. Fink concludes his study with Goethe's views on the possibility of a teleology of science, looking at those writings in which Goethe explores how the scientist of today projects and directs the science of tomorrow.

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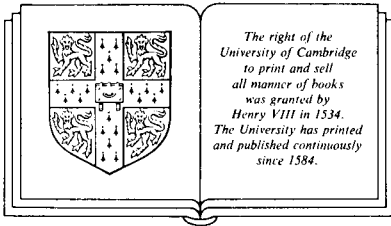


Chalk drawing of Johann Wolfgang von Goethe (1749–1832) at age fifty-one, by Friedrich Bury, Weimar, 1800. From the Nationale Forschungs- und Gedenkstätten, Weimar.

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*For Alene
Charles, Brian, and Melissa*

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We would rather confess our
moral mistakes, errors, and defects,
than our scientific ones.

(Wir gestehen lieber unsre
moralischen Irrtümer, Fehler, und Gebrechen,
als unsre Wissenschaftlichen. LA, I, 11, 341)

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Preface

Many people have drawn inspiration from Goethe's writings on science and history, including some of the greatest minds of the nineteenth and twentieth centuries. Two early responses came from Friedrich Nietzsche (1844–1900) and Oswald Spengler (1880–1936), both of whom struggled with the conflict of Goethe's organic optimism and their own existential pessimism. A different temperament, Thomas Mann (1875–1955), drew from the symbolic potential of Goethe's life and works, referring to the centerpiece of the present study, Goethe's *Geschichte der Farbenlehre* (1810), as “a novel in European thought” (*The Permanent Goethe*, 1948, xxvii). From James Gleick's account, *Chaos: Making a New Science* (1987), we learn that some of our most creative minds continue to look to Goethe's works for inspiration in the study of life's mysteries, and in Gleick's book for clues to understanding patterns of disorder.

Goethe spent most of his adult life in search of ways to shape the amorphous states of nature. Thus, this book begins with Goethe's science, first as represented in his poetry, and then as found in essays ranging from formal scientific treatises to aphoristic fragments on natural philosophy. From a study of his scientific writings we learn that in content and composition he focused on the transitions in life processes, on the fluid and ambiguous junctures between form and function. From his study of nature, Goethe learned that dynamic processes are not to be discovered in the obvious features of structure, but at the borders between states of order, at the threshold of change. Goethe established this theme early in life, and by the time he began serious writing in historiography, the border-experience had become a way of life, a way of life in his search for the patterns of organic process, in his style of scientific composition, and in his interdisciplinary relationship to professional colleagues.

The book is focused on the two decades of his mid-life during 1790–1810, the period of his most intense research in science and history. In these years he learned the ways in which science develops. He came to understand the power of science, the communities and schools of theory, the authority of the scien-

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tist, and the process by which a document takes shape and becomes a canon of culture. Goethe advanced the view that, properly understood, the study of science is a study of language, for it is in the idiom of the text where we find the patterns of change that shape history. Goethe's history of color theory is a "novel"; it comes closer to literature than to science; but so does science, for in the final analysis science is embedded in language, and, in Goethe's view, all language is tropological.

Acknowledgments

Study and writing for this book was concentrated in three periods, one in Weimar during 1981, supported jointly by the American Philosophical Society and the Research Center for Classical Studies in Weimar, the Nationale Forschungs- und Gedenkstätten (NFG), and another in 1986, with additional support from the American Philosophical Society. The last phase of the project began in 1988 on an ACM Visiting Professorship at the University of Chicago, and ended during the summer of 1990 at the Research Center in Weimar on a grant from the International Research and Exchange Board (IREX), with funds provided by the Andrew W. Mellon Foundation, the National Endowment for the Humanities, and the U. S. Department of State. I wish to extend special appreciation to these institutions for their support, and to St. Olaf College for financial assistance from the Faculty Development Program for summer research from 1983 to 1987.

Special thanks also go to Professors Harry G. Haile, who introduced me to Goethe's writings in science and history, James W. Marchand for his attention to questions on the philosophy of language and science, and Hans Henning for supporting research in Weimar. It has been a privilege to work with these scholars, for their interest and insights have kept alive my own enthusiasm for research on Goethe as an historian of science.

Although the project could not have been completed without the support and encouragement of these individuals and organizations, none of them is responsible for the views expressed in this book.

Abbreviations used in text and endnotes

- Akad. Immanuel Kant. *Kant's Gesammelte Schriften*. Published by the preussische Akademie der Wissenschaften. 29 vols. Berlin: Reimer and de Gruyter, 1910–.
- BA Johann Wolfgang Goethe. *Goethe. Poetische Werke*. 22 vols. Berlin: Aufbau-Verlag, 1961–.
- GA Johann Wolfgang Goethe. *Gedenkausgabe der Werke, Briefe und Gespräche*. 24 vols. Ed. E. Beutler. Zurich: Artemis-Verlag, 1949.
- LA Johann Wolfgang Goethe. *Die Schriften zur Naturwissenschaft*. Vollständige mit Erläuterungen versehene Ausgabe herausgegeben im Auftrage der Deutschen Akademie der Naturforscher Leopoldina. 2 pts., 11 vols. Ed. Rupprecht Matthaei, Wilhelm Troll and K. Lothar Wolf. Weimar: Böhlau, 1947–. Pt. I, Texte; pt. II, Ergänzungen und Erläuterungen.
- NA Friedrich Schiller. *Schillers Werke*. Nationalausgabe. 42 vols. Ed. K. H. Hahn. Weimar: Böhlau, 1943–.
- SA Johann G. Herder. *Sämtliche Werke*. Suphan-Ausgabe. 33 vols. Ed. B. Suphan. Hildesheim: Georg Olm, 1967. Repr., 1877–1913.
- WA Johann Wolfgang von Goethe. *Goethes Werke*. Herausgegeben im Auftrag der Grossherzogin Sophie von Sachsen. 4 pts., 133 vols. in 143. Weimar: Böhlau, 1887–1919. Pt. I, Werke; pt. II, Naturwissenschaftliche Schriften; pt. III, Tagebücher; pt. IV, Briefe.