

Explaining Photosynthesis

History, Philosophy and Theory of the Life Sciences

Volume 8

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Preface

This book is a study of ‘light and darkness’—as was the title of the habilitation thesis on which it is based: metaphorically speaking, in terms of dark failures and bright successes in the middle of conceptual fog; and in a very literal sense, referring to the chemical effects of light and darkness on the green parts of plants. It deals with the elucidation of the photosynthetic mechanism, which has not been the subject of a book-length study before. This means that a lot of primary material had to be analysed, processed and brought into a sensible arrangement.

At the same time, the book aims to contribute to the longstanding philosophical question of how knowledge is generated in science. It has repeatedly been argued, by historians of science, by philosophers of science and in particular by those who consider themselves affiliated to the ‘History and Philosophy of Science’ (HPS) that this question can only be answered by scrutinising actual cases and trying to understand from these some characteristic features of scientific research.¹ This is what I am attempting to do in this study. The result is richer in historical detail than many philosophers of science might wish to engage with; at the same time, its core questions are more philosophically oriented than many historians of science might expect. The main issue is of a methodological nature: How and for what reasons do scientists do what they do, while they are investigating a problem, such as the mechanism of photosynthesis? How do they set their priorities when preferring one option to another? According to which conventions, habits and expectations do they organise and (re-)direct their work? It is, to sum it up, a study in the heuristics of scientific research.

Before I explain these thoughts in more detail, I shall spend the rest of this preface on some highly appropriate words of acknowledgement and gratitude. First and foremost, I would like to thank Gerd Graßhoff and all the members and students of the History and Philosophy of Science Division of the University of Bern’s Institute of Philosophy. The particular research profile of this division—which, unfortunately,

¹ Cf., e.g., Schickore and Steinle (2006); arguments along these lines can also be found in Mauskopf and Schmaltz (2011), which is the outcome of one of the recently instituted conferences on &HPS, that is, ‘Integrated History and Philosophy of Science’.

has been abolished since—strongly influenced my work. The project not only benefited from stimulating discussions with Gerd Graßhoff and others but also from the sabbatical leave that I was generously permitted to take in the autumn of 2008. I spent this leave at the Max Planck Institute for the History of Science in Berlin, and I am particularly grateful to Lorraine Daston for her tremendous hospitality during my stay there. This study also profited enormously from my acquaintance with Govindjee (no first name) of the University of Illinois at Urbana–Champaign, who so generously shared his immense knowledge of, and his contagious enthusiasm for, the history of photosynthesis research with me, and who meticulously went through the details of this book’s manuscript. My extended research stay at Urbana–Champaign proved exceedingly fruitful and pleasurable, thanks largely to the hospitality and practical help given to me by Govindjee and his wife, Rajni Govindjee. I am also grateful to have participated in the DFG-funded network ‘Philosophy of the Life Sciences’, organised by Maria Kronfeldner, which has provided a valuable source of inspiration over the past years.

Furthermore, I am grateful to a large number of friends and colleagues for discussions at various occasions, useful hints and valuable material; (in alphabetical order) Christina Brandt, Angela Creager, Petra Gentz-Werner, Mathias Grote, Ekkehard Höxtermann, Jeremiah James, Christian Joas, Fabian Krämer, Gianna Pomata, Tilman Sauer, Raphael Scholl, Phillip Sloan, Richard Staley, Friedrich Steinle, Gerhard Wagenitz, Marcel Weber, Volker Wissemann and Adrian Wüthrich. The same holds true for the enormously helpful staff at the various archives that I consulted, namely the archive departments of: the ETH Zurich; the Max Planck Society; the Berlin-Brandenburg Academy of Sciences and Humanities; the Berlin State Library; the University of Illinois at Urbana–Champaign; the University of Chicago; the University of Cambridge, UK; and the Braunschweig/Berlin-based Physikalisch-Technische Bundesanstalt. Besides the University of Bern’s Institute of Philosophy, I would also like to thank the following institutions for their generous financial support: The Young Academy at the Berlin-Brandenburg Academy of Sciences and Humanities and the German Academy of Sciences Leopoldina; the Hochschulstiftung of the Burgergemeinde Bern; and the Mittelbaufonds of the University of Bern. I also would like to thank Margareta Simons, who carefully edited the book; Basil Marti, who managed the archival data bases, straightened out the chemistry and gave the habilitation a final read; Josephine Musil-Gutsch and Claus Spenninger, who were of enormous practical help; and, in particular, Caterina Schürch, who greatly improved the graphs, went through the bibliography and proofread the whole manuscript to its enormous benefit.

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