

Preface

As biomathematicians, we work in the borderland between different sciences. Not only between mathematics and biology, but we have also discussed scientific problems with chemists, physicists, computer scientists and medical doctors. During such discussions on scientific questions, methods and conclusions, we have on several occasions been struck by the difficulty of establishing a connection with scientists from other disciplines. An obstacle in this interdisciplinary dialogue has often been our diverging views on the concept of “scientific models”. The problem was in some cases made worse by the fact that we did not recognise our differing views, and therefore did not even discuss what each participant in the project actually meant by a “model”.

The purpose of this book is to avoid such confusion and to facilitate interdisciplinary communication, which these days is becoming more and more common. Our aim is not to convey and advocate a typical or consensus model within the natural sciences, but rather to show the diversity of models that exist within science. Each discipline has its own methods and tools, and since modelling (often tacitly) is central to research, it is necessary to have a comprehensive understanding of the topic if interdisciplinary work is to be successful.

Another intention with this book is to provide a basic and broad introduction to modelling and to describe how it fits into contemporary scientific practice. As such it is intended for students in all fields of natural science. We were never during our education offered this kind of comprehensive introduction to models and modelling. Instead it is something that we, like many others, have picked up in a piecemeal fashion, during courses and by reading the scientific literature. Our hope is that by offering the reader a solid introduction to the topic they will have a head start that will benefit them in the future.

Since modelling spans all areas of science it is impractical to provide an exhaustive description of the topic. Our intention is not to provide a complete philosophical analysis of the topic or to carry out an in depth historical analysis of the concept, but rather to make it accessible to researchers, students and the general public.

During the course of writing this book, we have been helped by a number of knowledgeable and generous people: Martin Nilsson-Jacobi, Helena Samuelsson, Edvin Linge, Johanna Johansson, Henrik Thorén, Bengt Hansson, and Jonatan Vasilis och Staffan Frid. Lastly, we would like to thank our editors Eva Hirpi and Olga Chiarcos, and all the scientists that we have interviewed.

Gothenburg
Stanford
14 March 2016

Philip Gerlee
Torbjörn Lundh

Scientific Models

Red Atoms, White Lies and Black Boxes in a Yellow Book

Gerlee, P.; Lundh, T.

2016, X, 96 p. 28 illus., 8 illus. in color., Hardcover

ISBN: 978-3-319-27079-1