

Paul Griffiths and Karola Stotz: *Genetics and Philosophy: An Introduction*

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I was very eager to review this book by two of the world's leading philosophers on the subject. As the back cover says, the book is indeed a "rich" treatment of the subject; it is much more than just "An Introduction" to the field. I am always amazed at the depth of knowledge that experts in this field must have, not only in philosophy but also in biology. The biology content here is just as thorough and up-to-date as the philosophy. In fact, even though I have taught genetics and development at the medical school level for almost 30 years, there were still things I learned! In some ways, the book reminds me of a seminar for doctoral students in genetics. There are a few genetics errors, but they are of small consequence in this setting.

Depth is also a shortcoming of the book because it would be easy for the non-biologist to get lost in the detail. Thus, although the back cover also claims that the book is "accessible", I must disagree. Yes, the treatment of the philosophical issues is quite accessible (which is often not true of philosophical writing), but the biology can be tough slogging. I must wonder who the audience for this book is. Obviously, the text would be invaluable for a doctoral seminar in the philosophy of science. Some researchers will have enough background and interest to work through the details, but this seems to be a very limited market. Readers would do well to pay particular attention to the Introduction, which gives an extended summary of each chapter's content.

As is obvious from the chapter titles (each of which includes the word "gene"), the theme of the book is the concept of the gene and how it has changed over time. The last chapter presents implications of the work in the preceding chapters for understanding the mechanism of evolution. As with so much writing in this field, the history and the philosophy necessarily go hand in hand. Perhaps a more accurate title would be something like: "History and Philosophy of the Gene". The philosophical touchstone of the text is reductionism and the question of whether early genetic understandings can be seen as a being reduced into more recent understandings (especially molecular constructions) or whether Mendelian genetics should be seen as being integrated into modern genetics.

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Many readers who are not geneticists will not know that the gene concept has undergone major revisions since Mendel and his re-discoverers, such that scientists are now in a quandary about how to define the term. Some scientists are even adopting the view that it is impossible to arrive at a single definition because of all the exceptions that have been found in the living world. These exceptions have arisen from the Human Genome Project, the ENCODE Project, and their descendants, including genomics, epigenetics, proteomics, systems biology, etc., with the increasing recognition of the environment and all post-transcriptional control. For example, one interesting definition of “genes” is that they “are things an organism can do with its genome” (p. 75). The concept of the gene has indeed become a “moving target” (p. 1), “a set of contextually activated representations” (p. 6); not only is the definition trying to keep up with the literature, but different understandings of the “gene” apply in different contexts.

In terms of overall structure and content, one interesting authorial decision was to exclude any discussion of population genetics. This is regrettable, but understandable, due presumably to space limitations. Suggestions about where the reader might pursue that topic would have been useful. The inclusion of a list of further readings at the end of each chapter is a particularly valuable contribution.

I have only one major philosophical quibble with the authors, which is that their use of the term “genetic” is so much broader than mine and that of most geneticists. The authors rightly expand the meaning to include epigenetic effects such as imprinting as a “parental effect”, but I think it is injudicious to also consider nutritional provisioning, social status, language, etc. as genetic effects as well (see Chapter 5).

Therefore, I am happy to recommend this book as an in-depth treatment of the current intersection of philosophy and genetics. The effort required on the part of the reader will be well rewarded.