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Book Review

Darwin and Design: Does Evolution Have A Purpose? by Michael Ruse. Cambridge (Mass.): Harvard University Press, 2003.

Reviewed by Thomas Reydon

After *Monad to Man* (1996) and *Mystery of Mysteries* (1999), *Darwin and Design* is the third volume in Michael Ruse's trilogy on the interaction between science, in particular Darwinian evolutionary biology, and the cultural environment in which it develops. Ruse's bigger project throughout the three volumes is "(…) to bring our understanding from several disciplines – philosophy, history, religion – to answer questions about the nature of science, and conversely to use science to answer questions in the subjects I use as my probes." (p. ix). This is, of course, a very wide-ranging project and any book of a manageable size will be able to treat only a small part of it.

The part of his project that Ruse addresses in *Darwin and Design* is the following issue: "Darwin seems to have expelled design from biology, and yet we still go on using and seemingly needing this way of thinking. We still talk in terms appropriate to conscious intention (…). In biology, we still use forward-looking language of a kind that would not be deemed appropriate in physics or chemistry. Why is this?" (p. 8). His answer comes on p. 276: "Organisms, produced by natural selection, have adaptations, and these give the appearance of being designed. (…) If organisms did not seem to be designed, they would not work and hence would not survive and reproduce. But organisms do work, they do seem to be designed, and hence the design metaphor, with all the values and forward-looking, causal perspective it entails, seems appropriate." In other words, design talk in biological science is important because it captures important phenomena in the organismal realm, but it is to be taken metaphorically rather than literally. According to Ruse, the design metaphor as it features in contemporary biological science constitutes a powerful and indispensable heuristic tool for biological investigation, one that is able to raise questions that would not have been asked without thinking of organisms *as if* they were designed to function well in their environments.

To be able to evaluate the status of the notion of design as a heuristic metaphor for biological science, we need to know its history and its position with respect to other currently advocated notions of organismal design. According to these two topics, *Darwin and Design* can be divided into two parts with Chapter 11 as a pivotal chapter standing with one leg in each part. (This is my perception of the book's struc-

ture; it is not formally divided as such.) The first and largest part of the book, covering about three quarters of its length, discusses the history of thought on organismal design guided by an idea that occupies a central position in the book: the distinction between the argument to complexity and the argument to design, which together constitute the ancient argument from design (see below). Throughout this historical exposé Ruse shows clearly how cultural factors shaped thought on organismal design and how this in turn shaped culture.

The argument from design is perhaps best known in the form of William Paley's famous 'watch parable' (quoted by Ruse on pp. 41-42). Suppose you find a watch. Given the purposeful design of this watch to perform a particular function, you must conclude that it has been purposefully designed and fabricated by a watchmaker. Similarly, given the intricate nature of the organic beings that we find everywhere around us and their well-adaptedness to their surroundings, we must conclude that organic beings are the product of an intelligent designer, i.e., a deity who has purposefully designed the organismal world. Ruse observes that this argument can be divided into two parts: the argument to complexity and the argument to design (p. 19). The argument to complexity consists in the observation that organisms exhibit some level of complexity or ordered structure that is in need of an explanation. The argument to design states that this organismal complexity can only be explained by invoking the notion of design in some way or another and searching for the causal factor behind organismal design. To illustrate why this distinction is important to our understanding of history, consider Paley's and Darwin's approaches to the issue of organismal design. While both Paley and Darwin accepted the argument to complexity, they took different views on the argument to design. Whereas Paley (who was, after all, the Anglican Archdeacon of Carlisle) argued from observed organismal complexity to the existence of a deity responsible for organismal design, Darwin wanted "(…) to come up with a scientific explanation that could substitute for the argument to design, the argument to a creative intelligence." (p. 112). This scientific explanation of course was natural selection.

The historical discussion in the first part of the book takes us from the origins of the argument from design and the notion of final causes in classical Greek thought, most prominently the works of Plato and Aristotle, to the present day. Along the way we see how the argument from design and the notion of final cause was readily absorbed by Christian thought until it found an end in the 18th century by the hands of David Hume. We then see how thinking in terms of final causes was revived in the works of Immanuel Kant and William Paley, but now found itself faced with the problem of accommodating progressionist and evolutionist thinking. And we see how time became ripe for Darwin's revolution when the anomalies facing the paradigm of Natural Theology became too large to avoid (cf. p. 87).

Charles Darwin, to whom two chapters are devoted, was a product of his time. He did not revolt against the dominant worldviews, but "(…) took the parts given to him and accepted by him and rearranged them into an altogether new picture." (p. 92). What did Darwin's work mean for the argument from design? It is interesting in this context to see the differences in reception of Darwin's work by his contemporaries. Whereas for instance Thomas Henry Huxley held that "(…) Teleology, as commonly understood, had received its deathblow at Mr Darwin's hands", Asa Gray spoke of "Darwin's great service to Natural Science in bringing it back to Teleology" (both quoted on p. 91). To get a clear picture, Ruse discusses the early influences on Darwin's thought in Chapter 5 (the familiar story of Darwin's reading of Charles Lyell's *Principles of Geology* while traveling aboard the *Beagle*, his visit to the Galápagos islands, and his reading of Thomas Malthus' *Essay on the Principle of Population* after hav-

ing returned from his voyage), followed in Chapter 6 by the story of the development of Darwin's thought in the period between the writing of the *Essay* of 1844 to the last, sixth edition of the *Origin of Species* of 1872. The picture that emerges from this, as mentioned above, is that Darwin's thought was explicitly teleological only in accepting the argument to complexity. With respect to the argument to design, Darwin's position should be understood as implicitly teleological in attributing organismal design to the blind natural law of natural selection rather than to the actions and intentions of an intelligent designer (p. 126).

The discussion is continued (in Chapter 7) by focusing on the acceptance of the idea of evolution after the publication of the *Origin of Species* as a social and moral factor rather than as the core of a scientific research program, as Darwin had hoped. According to Ruse, this explains why the argument to design was able to survive the Darwinian revolution: had the Darwinian research program developed promptly after the publication of the *Origin of Species*, most scientists would have followed Darwin in discarding the theological argument to design and focusing on explaining organismal complexity by means of natural selection (p. 135). But as it happened, the Darwinian research program developed only slowly over the period following the publication of the *Origin of Species*, thus being unable to remove the argument to design from the scientific world picture. Chapter 8 tells how through the work of among others R. A. Fisher, Sewall Wright, Theodosius Dobzhansky and Ernst Mayr, a biological research program developed in which "The problem of organized complexity was recognized as the key question that needed to be tackled, and the Darwinian approach was understood to hold the key." (p. 169). Chapters 9 – 11 turn to the contemporary state of affairs in the Darwinian research program itself and in research programs that are critical of the Darwinian tradition.

The part of the book discussed above provides an informative overview of the development of thought on organismal design, evolution and final causes. Although the overview is broad and peppered with many factual details, the treatment of the main figures and groups is on most occasions too brief to be insightful to readers not yet familiar with them. Thus, where philosophers will not find much new material in the discussions of Hume, Kant and Whewell, they may find the discussions of contemporary biological science in action too brief to provide a good understanding of what is at stake. And for scientists well-versed in evolutionary biology, the opposite may well hold. While wondering at which audience *Darwin and Design* is in fact addressed, I feel that this first part of the book could well have been shorter, allowing more space to be devoted to the ideas that are discussed in the second part to which I turn now.

From a philosophical point of view the really interesting part of the book consists of Chapters 12 – 15. In Chapters 12 and 13 Ruse's own position comes to the fore: the fact that organisms exhibit adaptations, i.e., the fact that organisms seem as if they were designed to function properly in their environments, justifies the heuristic and metaphorical use of the notion of design in contemporary evolutionary biology (cf. p. 266). Although I can agree with Ruse on this matter, I think that his further conclusions regarding the position of the design metaphor in contemporary biology are too strong and, moreover, not supported by the arguments and examples provided in the book. After having discussed two extremes in the debate on whether the design metaphor should be central in the study of life, Ruse takes sides: "Working out the theory of forces has implications for so many fields in physics, and in a similar vein one might say that adaptation is just such an issue in biology. (…) Darwinism is a successful theory – our scientific examples show that – and at the moment (and for the foreseeable future, whatever the qualifications) it is the only game in town, on its own merits.

(…) It has earned the right to set the agenda." (p. 280). This amounts to squarely taking the side of one research program in a particular domain of investigation and turning a blind eye to any possible alternative. For a working scientist this attitude is often appropriate and may even be advisable, but a philosopher of science should not commit himself to any scientific research program but keep an open mind towards all possibilities.

At this point in the book the position of the notion of design in the conceptual framework of biological science is clear, the argument to complexity is fully accepted and the argument to design (taken in its literal theological sense) is rejected. The consequences of the rejection of the argument to design are drawn in the last two chapters in which attention is given to contemporary work on the argument to intelligent design, such as Michael Behe's *Darwin's Black Box* (1996) and William Dembski's *The Design Inference* (1998). These last chapters constitute a valuable contribution to the discussion on intelligent design in a world in which belief in the divine creation of life just won't go away.

All things considered, *Darwin and Design* is an insightful book, be it more so in the last four chapters than in the first eleven ones. It shows convincingly how we should conceive of design in contemporary biology and what is wrong with the arguments to intelligent design that are being presented today. But there still remains one question to be answered: does evolution have a purpose? Although this is the question posed in the book's subtitle, it is not the question that *Darwin and Design* addresses. Ruse's book is concerned not with the question whether any purpose can be attributed to the occurrence of evolution on our planet or anywhere else, but whether the idea of purpose (or, design) can be applied fruitfully to the observed properties of organisms. To me, the latter seems indeed the more important question and *Darwin and Design* provides a stimulus to think it over once again.

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