

THE DESIGNS OF NATURE:  
WHAT CAN MEDIEVAL PHILOSOPHERS TELL US ABOUT CONTEMPROARY BIOLOGICAL RESEARCH?

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In his book *River Out of Eden*, Richard Dawkins wrote that modern scientific research reveals that the universe “has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil, and no good, nothing but blind, pitiless indifference.” A careful look at some of the standard explanatory strategies used by biologists, however, reveals something quite different: the forms of organisms exhibit patterns of design, organic development has a kind of purposefulness, and certain organic forms and behaviors are more beneficial than others.

Plant and animal adaptation studies provide a good example. A popular explanatory strategy among biologists involves the construction of an “engineering” model of the optimal adaptive development or behavior for an organism’s flourishing in a specified environment. The organism’s optimal design provides the explanation for its fitness. Canadian entomologist Crawford Holling, for example, used this kind of modeling to explain the predatory behavior of the praying mantis (*mantis religiosa*). Using a geometrical analysis of mantis foreleg anatomy, Professor Holling determined the largest prey fragment that could be locked into the mantis’ grasp. He then reasoned that the capture of prey that approached this maximal size was optimal hunting behavior in terms of energy efficiency.

Back in the early days of experimental science, this kind of optimal design explanation was recognized by medieval natural philosophers. They realized that natural processes are of two kinds. Some natural phenomena tend to an end result by necessity of their nature. A river is a process like this, because it flows in a certain direction to a place where the water can collect. Radioactive decay, to use a modern example, is also this kind of natural tending toward an end. There are also those natural processes that are for the sake of the realization of some goal. These processes are goal-directed insofar as the goal is “programmed” in the process from the beginning. Organic growth is like this as are animal behaviors such as feeding, migration, and reproductive behaviors.

Medieval naturalists argued that nature is purposeful in the sense that she has processes that are goal-oriented. Such processes are not simply end-oriented motions, like the flow of a river, but exist in nature as a program or guide for how the process is to proceed toward its end. Modern biologists articulate such goal-oriented processes by means of models that describe the goal as optimally beneficial for the organism. Looking at the results of such research, medieval philosophers would conclude that nature contains design, purpose, and benefit. Organic form and behavior has an ordered design or pattern. Organic development and behaviors have a kind of purpose insofar as they are aimed at a goal. The goal of organic development and behavior is beneficial insofar as it allows the survival and flourishing of the organism in its environment. Medieval thinkers would add that the natural design, purpose, and benefit studied by biologists is not, of course, consciously intended by nature. It is nonetheless real and our scientific research shows that nature is not quite as empty of purpose and good as Professor Dawkins’ remark implies.