torted such values. Universities have become more complicated, but the administration, faculty, and students have been aware of the need for vigilance and have exercised it. Not to say that there have not been people taking advantage of the generally permissive atmosphere of universities—that has certainly happened. But it is the exception, not the rule.

Universities in the Marketplace is well written, even eloquent at times. It presents interesting history as well as contemporary analysis. However, the book is short on data and misses the chance to put the issues within the context of the overall picture of university finances. It also does not give a wide view of the diversity of universities and colleges that exist in the United States. I would recommend the book for laying out important issues, but I wish Bok had given them deeper consideration. He has lived with many of these issues at Harvard, notably in the early days of biotechnology, and he could have drawn more on his personal experiences.

The Macey decision and Bok's book together remind us that our vaunted higher educational system sits within the same capitalistic framework as the rest of American life. It serves a high ideal—the discovery and dissemination of understanding and skill—but it does so facing the same strains as any business striving to stay solvent.

PHILOSOPHY AND BIOLOGY

A Bridgewater Treatise for the 21st Century

Robert T. Pennock

Why do certain features of nature, particularly the complex adaptations of the biological world, seem to call for explanations in terms of purposes? Why is it common to speak of biological objects using functional language, as though they were artifacts? Some have tried to turn such apparent design into an argument for the existence of God. William Paley's watchmaker analogy is probably the most famous example. Though attempts to rationally ground theistic belief are not particularly important for most religions, in some places and periods natural theology took on a special import.

An early 19th-century expression of this religious argument is found in the Bridge water Treatises, a series of books endowed by the Reverend Francis Henry, earl of Bridge water. He set aside £8000 for the project, a sum that translates to about $650,000 today. The endowment funded selected scholars to show how the wise and benevolent design of God was revealed in the complexities of the natural world. Peter Roget, Secretary of the Royal Society, approached the topic through animal and vegetable physiology. William Whewell wrote on astronomy and physics. William Buckland found Genesis supported in geology. Others saw evidence of God in their own sciences.

Now at the beginning of the 21st century a similar series, though with slightly more ecumenical elbowroom, has been endowed for a comparable figure—$700,000 for seven books on science and religion—by the Templeton Foundation. Philosopher of science Michael Ruse was one of seven recipients of this award, and his Darwin and Design is the happy result.

The book takes as its question: Does evolution have a purpose? One could ask for no better guide for an excursion through the conceptual history of the ideas of design and purpose as they relate to biological adaptation. Ruse has been exploring the back roads of this terrain for most of his career. He has covered much of this material in previous writings, but in Darwin and Design he brings all the relevant pieces together and considers them afresh. This has to be the best of Ruse's many books, and it is hard to imagine how a better one could be written on this subject. With an understated erudition spiced with good-natured wit and occasional sly ribaldry, Ruse moves easily and assuredly among biology, philosophy, history, and theology. He misses neither the forest nor the trees, capturing the broad sweep of ideas, and periodically honing in on a telling detail from the personal correspondence of an important historical figure.

This is a lot of territory to cover, and readers with different disciplinary backgrounds may find some chapters rough going. Scientists' eyes may start to glaze at some of the philosophy, as when reading Immanuel Kant's take on design: "Strictly speaking, we do not observe the ends in nature as designed. We only read this conception into the facts as a guide to judgment in some reflection upon the products of nature. Hence these ends are not given to us by the Object." Nonscientists may balk as Ruse marches through the work of Bates, Morgan, Fisher, Ford, Wright, Dobzhansky, Mayr, Simpson, Wynne-Edwards, McDonald, Reznick, Hamilton, Smith, Lewontin, Trivers, Wilson, Gould, Dawkins, and Kauffman with mention of a couple of dozen lesser-known names along the way. (Thank goodness that the sex lives of Davies's dunnocks enliven things in the middle.) Many will find the fine points of Catholic or Calvinist theology too esoteric for their tastes. However, it is worth following the tale through in its entirety. All these threads serve to fill in a complete picture, and Ruse nicely ties them all together by the end of the book.

He also has a helpful way of organizing the conceptual analysis of the design argument, separating the argument to adaptive complexity from the move to a designing mind. Ruse clearly explains how Darwinian evolution blocked that second move, by providing the answer to the question of biological purpose: "Natural selection produces artifact-like features, not by chance but because if they were not artifact-like they would not work and serve their possessors' needs." The language of intentional design now serves only as a handy metaphor.

Ruse quickly dismisses the recent attempt to resurrect Paley's argument by Intelligent Design creationists such as Phillip Johnson, Michael Behe, and William Dembski; they warrant only a brief discussion in the final chapter. Ruse reviews and extends some of the many arguments that have been given against Behe's "irreducible complexity," Dembski's explanatory filter, and appeals to the purported problems of "complex specified information" and the no-free-lunch theorem. Behe's view, he concludes, is "pure and simple fantasy"; Dembski is "just plain wrong"; and their Intelligent Design movement is already regarded, even by theologians, as an "embarrassment."

We have learned much in the two centuries since Bridgewater, and Ruse shows that natural theology is no longer viable. However, he does not disparage the impulse that led to it. There is indeed ake to be found in biological adaptations, which might be expressed in a new "theology of nature" that "appreciates the complex, adaptive glory of the living world, rejoices in it, and trembles before it." He quotes Mayr, who once told him, "People forget that it is possible to be intensely religious in the entire absence of theological belief."

As the first of what may become known as the Templeton Treatises, Ruse's volume has set a standard that will be tough to match.