

## Reviews

*Science and Religion, 400 B.C. to A.D. 1500: From Aristotle to Copernicus.*

By Edward Grant. Baltimore: Johns Hopkins Univ. Press, 2006. xvii + 307 pages. \$22.00.

Interpretations of the scientific revolution of the seventeenth century continue to play important roles in the master narrative of modernity, a narrative that sees the modern world as being in large part the result of the rejection by Galileo, Newton, and others of the thought of Aristotle. Accordingly, it has been easy to see the understanding of nature so characteristic of the mediaeval Latin West as having been rendered false by the rise of modern science. Furthermore, it has been easy to conclude that in the Latin Middle Ages, reason and science, shackled as they were to what was written in the texts of Aristotle, made few if any contributions to our understanding of nature. Even more, the domination of science by theology, especially as that theology was tied to an authoritarian ecclesiastical institution, the Roman Catholic Church, left no opportunity for the kind of freedom of investigation that is necessary for scientific advance.

In his many books and articles, Edward Grant, a distinguished historian of mediaeval science, has called into question such a pejorative judgment of mediaeval science. As he remarks in this book, “the Middle Ages, for the first time in the history of civilization, became a society in which innumerable questions about nature were raised and then resolved almost exclusively by the use of reason. That extraordinary achievement laid the foundation for the advancement of science” (p. 13). In the Middle Ages, according to Grant, it was the Latin West far more than the Greek East or Islamic culture that prepared the way for the “uninterrupted advances” in science over the next five hundred years.

Although there are discussions of scientific developments in antiquity and a chronicle of the attitudes of Greek and Latin patristic authors toward science, the focus—and indeed the strength—of the book concerns mediaeval natural philosophers and theologians of the thirteenth and fourteenth centuries. In the introductory chapter, after debunking the myth that the Middle Ages was an intellectual desert, the author provides a systematic summary of each of the following chapters. There is a separate chronology of events, an appendix with selected primary texts emphasizing Grant’s main themes, and an annotated bibliography.

The Church Fathers, according to Grant, are representative of the “handmaiden tradition,” according to which the scientific and literary heritage of the Greeks serves only as an aid to biblical analysis or theological reflection. This is especially evident in the hexaemeral writings of authors such as Basil the Great. Grant thinks

that beginning with thinkers such as John Scotus Eriugena in the ninth century we can detect a new emphasis on the importance of reason and ultimately on the role of reason and science in theological analyses. By the twelfth century Latin theologians were regularly using philosophical analysis to explore the whole range of revealed doctrines; also, reflections in natural philosophy were coming to have an autonomy of their own, even if limited by the requirements of revealed truth.

The rise of universities and introduction of Aristotelian natural philosophy provided the occasion for a wide-ranging intellectual revolution. Grant examines the impact of the Condemnations of Paris of 1270 and 1277 on the development of natural philosophy, especially emphasizing debates about the possibilities of other worlds and the existence of a void. He is critical of those (Andrew Cunningham, for example) who argue that natural philosophy in the Middle Ages was *exclusively* “about God and God’s universe.”

Grant thinks that, by arguing that theology is a science, independent of and distinct from other sciences, Thomas Aquinas and other scholastics “inadvertently conferred autonomy on natural philosophy” and that, as a result, masters of arts “could now view natural philosophy as a scientific discipline completely independent of theology” (p. 187). The issue is more complex, however. When Aquinas writes of *sacra doctrina*’s being a science, he does not mean simply theology but rather the whole of Christian revelation. The relative autonomy that Aquinas and Albert the Great grant to natural philosophy is not so much inadvertent as it is the result of the recognition that God’s creative act is such that God causes creatures to be real causes in the natural order, causes appropriately studied not in theology but in natural philosophy. All that is depends upon God’s causality. That creatures are causes in their own right and that reason allows us to discover these causes are not challenges to divine omnipotence but recognition of that omnipotence.

It would have been useful were Grant to have discussed the relationship—at least in Aquinas—between the explanatory domains of natural philosophy and metaphysics. Aquinas thought that reason alone, in the discipline of metaphysics, could demonstrate that the universe is created. Aquinas was heavily influenced by the metaphysical analysis of Avicenna in making the distinction between creation (as the giving of being) and change. Although in the final chapter of the book Grant turns to mediaeval Islamic thinkers, he does not emphasize enough the importance of their analyses in the development of both natural philosophy and metaphysics in the Latin West. There is only one brief reference to Maimonides. Grant’s text and bibliography do not reveal many of the more recent works on Islamic philosophy and science.

Grant’s admirable account of developments in natural philosophy in the thirteenth and fourteenth centuries, especially concerning mathematics (for example, Gregory of Rimini’s discussion of relations among different infinities), shows how especially sophisticated these developments were. Grant suggests, albeit briefly, that the ways in which some mediaeval thinkers argued for the importance of the application of mathematics to the study of nature are anticipations of developments in the seventeenth century. This suggestion, if expanded, could have provided the justification Grant needs to support his claim that developments in science in the Middle Ages provided the foundations for the rise of modern science. In this respect, the work of William Wallace (who is not listed in the bibliography) has been of considerable importance.

Probably the most controversial part of the book is the final chapter in which Grant turns to developments in natural philosophy in the Byzantine Empire and in the Islamic world. He argues that "Byzantine theocracy" (especially evident in the "lack of separation of church and state") "proved an obstacle to the study of science and natural philosophy" (p. 227). At best, in the Christian East, natural philosophy remained only a handmaiden to theology, whereas in the Latin West, "because theologians embraced the study of natural philosophy as essential for theology," natural philosophy was institutionalized in the universities, where generations of students came to study it. Grant argues that in the Islamic world there was never the same respect for the relative autonomy of reason that one found in the Latin West: "Natural philosophy always remained a peripheral discipline in the lands of Islam and was never institutionalized within the educational system, as it was in Latin Christendom" (p. 243). Here is a key reason, according to Grant, for the failure of Islamic science, despite its initial "great promise," to develop. In previous chapters Grant shows how theologians in the West came to embrace natural philosophy. These theologians not only encouraged natural philosophy to develop as it did but also contributed to that development. "There was nothing like this among the theologians and clerics of medieval Byzantium and Islam. Indeed, it is very likely their basic hostility toward the claims of natural philosophy that made it, at best, a peripheral activity" (p. 245). As we have seen, Grant thinks that modern science arose out of mediaeval natural philosophy (contrary to the views of those who see a fundamental rupture between scholastic natural philosophy and modern science) and that natural philosophy did not flourish in either Byzantium or the Islamic world, which helps to explain why modern science is so much a Western phenomenon.

What for Grant is the most significant difference among the three great Mediterranean civilizations (in explaining different relationships between science and religion) is, for me, the least persuasive: what he calls the separation of church and state. According to Grant, such a distinction prevented the establishment of a theocracy in the West, whereas "the Byzantine Empire and Islam paid a heavy price for failing to separate church and state" (p. 246). In the Latin West, this separation "made numerous institutional developments feasible." In particular, Grant argues that

the very separation of natural philosophy into the faculty of arts [in the university] and the location of theology in a separate faculty of theology reveals an understanding that these are different subject areas that require very different treatment. . . . The separation of church and state, and the analogous disciplinary distinction between theology and natural philosophy, made possible the independent development of each of these two fundamental disciplines. (p. 247)

It seems to me a bit anachronistic to speak of the separation of church and state in the Latin Middle Ages. The distinction between natural philosophy and theology, recognized by many scholastic thinkers, depends more upon the idea of reason as a reliable source of truth, with an autonomy properly its own, than on an analogy to distinctions between church and state.

WILLIAM E. CARROLL  
 Blackfriars Hall, University of Oxford  
 64 St. Giles  
 Oxford OX1 3LY, England