

Review of M. A. Finocchiaro, *Defending Copernicus and Galileo: Critical Reasoning in the Two Affairs*

Jean H. M. Wagemans

Published online: 10 April 2011

© The Author(s) 2011. This article is published with open access at Springerlink.com

In the preface of *Defending Copernicus and Galileo*, Finocchiaro (2010) carefully explains how the book differs from the other books he has written on Galileo so far. Regarding the subject matter, the new book partially overlaps with *The Galileo Affair: A Documentary History* (1989) and *Retrying Galileo, 1633–1992* (2005). The former covers the original trial in the years 1613–1633, coined the ‘first Galileo affair’, whereas the latter is an introductory survey of the controversy that succeeded the original trial, coined the ‘second Galileo affair’. Regarding the conceptual orientation of critical reasoning, the new book partially overlaps with *Galileo and the Art of Reasoning* (1980), and with *Galileo on the World Systems* (1997). Finally, regarding the aim, there is an analogy with *Essential Galileo* (2008), an anthology of the documents relating to the original trial and Galileo’s writings in physics, astronomy, methodology, and epistemology. While *Essential Galileo* is aimed at providing an integration for Galileo’s legacy, life and works, *Defending Copernicus and Galileo* is aimed at developing a synthesis for historical interpretations and philosophical evaluations of them (pp. x–xi).

Summarizing the relations between *Defending Copernicus and Galileo* and Finocchiaro’s earlier work on Galileo, the book is aimed at presenting and defending a tentative interpretation and evaluation of the two Galileo affairs, drawing on the introductory surveys the author has carried out at an earlier stage of his extensive research on these affairs. The book is to be taken as a next stage in the realization of the author’s ultimate ambition to provide a “comprehensive, definitive, or final synthesis” (p. x), that he has already begun working on.

The tentative interpretation and evaluation of the two Galileo affairs takes the form of a defense of what the author calls a “particular and yet *overarching thesis*: that today in the context of the Galileo affair and the controversies over the relationship between science and religion and between institutional authority and

J. H. M. Wagemans (✉)
University of Amsterdam, Amsterdam, The Netherlands
e-mail: J.H.M.Wagemans@uva.nl

individual freedom, *the proper defense of Galileo should have the reasoned, critical, open-minded, and fair-minded character which his own defense of Copernicus had*" (p. x, original italics). The word 'should' indicates that the thesis is an incitive one, implying the claims that (1) Galileo's defense of Copernicus is indeed of a reasoned, critical, open-minded, and fair-minded nature, and (2) the defense of Galileo should have the same characteristics as Galileo's defense of Copernicus. In order to successfully defend the overarching thesis of the book, the author needs to substantiate these two claims.

The book consists of two parts. The first part, *Defending Copernicus*, comprises chapter 1–6 and is about the way in which Galileo defended Copernicus. The second part, *Defending Galileo*, comprises chapter 7–12 and consists of a defense of Galileo against a wide range of criticisms.

In chapter 1, *The Geostatic World View*, Finocchiaro provides an exposition of the world view accepted until the middle of the sixteenth century that the Copernican theory replaced. This world view contains the main theses that the earth does not move (the geostatic thesis) and that the earth is at the centre of the universe (the geocentric thesis). In order for the reader to understand the revolutionary character of the Copernican theory, the author carefully explains the Aristotelian and Ptolemaic beliefs regarding cosmology, the physics of the motion of terrestrial bodies, and astronomy, together constituting the 'pre-Copernican world view'—which would have been a more appropriate chapter title.

In chapter 2, *The Copernican Controversy*, the author gives an exposition of the controversy that arose when Copernicus published his *On the Revolutions of the Heavenly Spheres* in 1543. He provides a clear overview of the arguments in favor and the arguments against the Copernican theses that the earth moves by spinning around its axis (the geokinetic thesis) as well as around the sun (the heliocentric thesis), which by approximation count as arguments against and arguments in favor of the opposite theses that the earth stands still (the geostatic thesis) and that the celestial bodies revolve around the earth (the geocentric thesis).

Chapter 1–2 provide an excellent background for understanding Galileo's defense of Copernicus, which is the subject matter of chapter 3–6. In chapter 3, *Galileo's Stances Toward Copernican Astronomy*, Finocchiaro examines the evolution of Galileo's attitude toward the Copernican theses and some of the anti-Copernican arguments, especially those based on astronomical observations. In chapter 4, *Galilean Critiques of the Biblical Objection*, he examines Galileo's defense of the Copernican system from various theological objections, and in chapter 5, *Galileo on the Mathematical Physics of Terrestrial Extrusion*, he analyzes the way in which Galileo addressed the mechanical physical objections against the Copernican theses, especially those based on the extruding power of whirling.

In Chapter 6, *Galilean Rationality in the Copernican Revolution*, Finocchiaro draws a general conclusion from his analyses in the previous chapters. He interprets the way in which Galileo defended Copernicus from the various astronomical observational, theological, and mechanical physical objections as an exemplary contribution to the period in the history of science commonly referred to as the Copernican Revolution. According to Finocchiaro, "Galileo's defense [of the

Copernican system] was reasoned, critical, open-minded, fair-minded, and rational-minded; that is, it was focused on the critical examination of the arguments for and against Copernicus, guided by the concern to be aware of the opposite arguments, to appreciate them in their strength, but also to expose their flaws, and thus to select the conclusion justified by the better arguments” (p. 137).

In the second part of the book, *Defending Galileo*, the author provides an elaboration of his thesis that one should defend Galileo in the same way as Galileo defended Copernicus. In chapter 7, *The Trial of Galileo, 1613–1633*, he describes the original or first Galileo affair, which ends with the Inquisition’s condemnation in 1633. In chapter 8, *The Galileo Affair, 1633–1992*, he provides an historical overview of the second Galileo affair. This is a relatively long chapter, in which Finocchiaro describes the many objections that can and have been raised against Galileo’s defense of Copernicus during the subsequent four centuries. He concentrates on three aspects of the second affair: (1) the historical aftermath, which consists of an overview of actions taken by the Catholic Church and by non-ecclesiastic actors; (2) reflective commentary on the original trial, which is embedded in a framework of a well-defined taxonomy of accounts; (3) critical issues, some of which are particular (e.g., whether the earth’s motion contradicts Scripture) and others more general (e.g., how science and religion do or should interact).

Having interpreted the second Galileo affair as a controversy about whether or not the condemnation of Galileo in 1633 was right, Finocchiaro in chapters 9–12 consistently analyzes and evaluates the affair in terms of the arguments put forward in favor of the condemnation and the arguments put forward against it. In chapter 9, *Galileo Right for the Wrong Reasons?*, he carefully examines Galileo’s argumentation and comes to the conclusion that “it is not true that Galileo was right for the wrong reasons” (p. 249). According to the author, Galileo was not only ‘right’ in the sense that the earth indeed is in motion, but also ‘right’ in the sense that his reasoning justifying this position was correct. Also, he concludes that Galileo was not only ‘right’ in the sense that Scripture is not an astronomical authority, but also in the sense that his arguments in defense of this statement were acceptable.

In chapter 10, *Galileo as a Bad Theologian?*, Finocchiaro discusses an account of Galileo’s trial that claims that he was not condemned for arriving at the geokinetic thesis as an astronomical conclusion, but for supporting this thesis with biblical passages, thus acting as a bad theologian. Finocchiaro shows that this account is untenable, false, and perverse.

Further, in chapter 11, *Galileo as a Bad Epistemologist?*, Finocchiaro defends Galileo against Duhem’s accusation of having committed epistemological errors, and in chapter 12, he assesses the evaluations of Galileo’s contribution to the discussion of the relation between science and religion.

As mentioned before, the first claim implied in the book’s overarching thesis is that the nature of Galileo’s defense of Copernicus is indeed of a reasoned, critical, open-minded, and fair-minded nature. In the first part of *Defending Copernicus and Galileo*, the author provides many convincing arguments for this claim. The second claim implied in the overarching thesis is that a defense of Galileo should have the same characteristics as Galileo’s defense of Copernicus. As to this claim, the author

refers to the success of the latter defense: “The principal evaluative thesis is that just as Galileo’s defense of Copernicus owed its success to its being reasoned, critical, open-minded, and fair-minded, so our defense of Galileo can succeed if it possesses the same qualities” (p. xl). A standard objection against this type of argument is that from the success of a way of acting in a certain situation, it does not necessarily follow that the way of acting should be adopted in another situation. The present claim about the characteristics of a defense of Galileo can also be supported by a more principled argument, e.g., that the ethic of reciprocity applies. For the claim can easily be interpreted as an instantiation of the maxim that people should be treated in the same way as they treated others. In the case of the above mentioned ecclesiastic actors, this would even be an example of reasoning *ex concessis* in the sense that the maxim corresponds to the so-called ‘Golden Rule’ as it is formulated in *Matthew 7:12* and other biblical passages.

Leaving the normative dimension of the overarching thesis out of consideration, it can be concluded that the author demonstrates in a very convincing way that Galileo *can* be defended in the same way as Galileo defended Copernicus. The second part of the book consists of an extremely well-considered defense of Galileo against a wide range of scientific, theological, epistemological, and legal criticisms, thereby creating a “complete” (p. 138), be it a fairly abstract analogy between the two defenses. Both defenses are based on a critical examination of the arguments for and against the standpoint at issue. Moreover, they are characterized by awareness and appreciation of the strength of a great many counterarguments. Finally, they are successful in exposing the flaws of these counterarguments.

Finocchiaro’s *Defending Copernicus and Galileo* is an excellent piece of scholarship. Minor criticisms can be raised against the acceptability of the claim that Galileo *should* be defended in a similar way as Galileo defended Copernicus and against the abstract nature of the alleged analogy between the two defenses. Overall, the book is very well-written, very well-documented, and it consists of very lucid explanations of the many different positions, arguments and criticisms that can and have been put forward during the period of four hundred years in which the two Galileo affairs have developed so far. As such, it is a true *Fundgrube* for further research on the subject, which hopefully will include the above mentioned attempt of the author to develop a comprehensive, definitive, or final synthesis of the historical interpretation and philosophical evaluation of Galileo’s legacy, life and work.

Open Access This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

Reference

Finocchiaro, M.A. 2010. *Defending Copernicus and Galileo: Critical reasoning in the two affairs*. Dordrecht: Springer.