telescopes which, unfortunately, he had already given the Grand Duke of Tuscany in whose honour he had named Jupiter's satellites 'Medicean stars'.

Biagioli spends considerable time on the acrimonious debate over who discovered sunspots. Galileo and the Jesuit Christoph Scheiner observed them at roughly the same time but both claimed priority, although Thomas Harriot was probably the first to view them in December 1610. Galileo made better observations than Scheiner (with a projection apparatus developed by his pupil Benedetto Castelli), and he offered a better explanation of their nature, but his belligerent stance lost him the backing of the Society of Jesus from which he had until then received recognition and support.

It is against this psychological and sociological background that Biagioli re-examines Galileo's problems with the Church. He shows that Galileo was undoubtedly right in his distinction between the role of Scripture as 'teaching how to go to heaven' and the role of science as 'teaching how the heavens go', but that he made the fatal mistake of thinking that having moved to the courtly top of prestige he could impose his views on the ecclesiastical Establishment. His work was censured and he was placed under house arrest, but his condemnation ended up canonizing him as a hero of science and turning his punishment into posthumous credit.

What a guy! But can this be all? Of course not! If Galileo was proud of his image it was as a scientist and not merely as a courtier. He had not only discovered a new world in the sky with his telescope, he had also discovered, with the even more powerful instrument of his mind, the two laws of physics that Newton was to hail as the gateway to modern science: the law of freely falling bodies and the parabolic path of projectiles.

Not an easy man, Galileo, but a genius none the less.

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Matthew L. Jones, **The Good Life in the Scientific Revolution: Descartes, Pascal, Leibniz, and the Cultivation of Virtue.** Chicago and London: University of Chicago Press, 2006. Pp. xvii + 384. ISBN 0-226-40954-6. $65.00, £46.00 (hardback). ISBN 0-226-40955-4. $27.50, £17.50 (paperback).

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Certain disciplines have been viewed as good repositories of knowledge which you might put to use; others are said to be good *for you*. In the early modern period, mathematics and philosophy were commonly said to be both useful *and* good for you. (These days, few academic disciplines have the nerve to claim that they are good for you, though maths and philosophy are still amongst the most likely to do so.) Matthew Jones's aim is to retrieve the senses in which early modern mathematics and natural philosophy were supposed to be good for you, and, in doing so, he has made a consequential contribution to seventeenth-century intellectual history.

Jones starts his exercise at an advanced level, so he does not devote much attention to some quite general aspects of 'good-for-you' arguments. Mathematics – in all forms, but especially the 'pure' version – was widely said to be good for you because it disciplined the mind, keeping cognitive trains on the rails. It showed what genuine certainty was, and, therefore, what qualities of assurance in other disciplines fell short of that certainty. Natural philosophy was often said to be good for you because it was the effort to read the causal structure of God's Book of Nature, and that might mean it was as good for you, and as morally uplifting, as the study of Scripture.

Jones mostly takes such sensibilities for granted, and his interest is in the detailed mechanisms in terms of which a range of seventeenth-century thinkers argued that their practices conduced to virtue and in those moral impulses which supposedly animated their mathematical or philosophical practices. First, there were discussions about what human beings were and were not

capable of knowing. It was hubris to aim for what we cannot know, and it was an insult to God to aim too low. A proper estimation of human knowledge amounted to the virtue Descartes called 'generosity'. So one pervasive aspect of the relationship between scientific knowledge and virtue consisted in debates over the Fall from Grace and its implications for the quality of knowledge which post-lapsarian human beings might attain. No early modern writer considered that we could possess God's knowledge, and so the debate was over what we might permissibly know, what intellectual aims we had to abandon and what it was divinely intended we should know. You had to get that right as the precondition of knowledge conducing to virtue.

Once a position had been taken on this matter, you had then to decide how genuine knowledge, or the methods for securing it, might rectify the mind's untutored limitations, expand its powers, enable it to discern the reality behind appearances and protect it from error. All this could come under the heading of cognitive virtue, and, if successfully executed, could fashion a new and improved sort of knowing subject – virtuous in the philosophical life. Jones selects three subjects for close examination – Descartes, Pascal and Leibniz – even though the grounds for choice are never made entirely clear and a sense of causal connection between right knowledge and virtuous action was commonly shared by contemporary philosophers. Nevertheless, the depth of detail that Jones offers about how such causal arguments worked for these three thinkers is unparalleled in recent history of ideas.

Descartes, for example, railed against the 'pedantry' which construed mathematics as good only for trade and trickery. One of the great benefits of mathematics was not merely its ability to discipline the mind but its individualism: to say that one knew something in the domain of proper mathematics was to say that one knew it oneself and not that one was unreflectively deploying standard logical routines. Pascal similarly scorned pedantry, laying far greater stress than Descartes on the capacity of properly conceived mathematics to ensure learned civility, albeit a civility that embraced rather than rejected sharp exchanges of contrary views. And, like Descartes, Pascal sought to make a distinction between mere mathematical drills and the virtues that accrued to a mind habituated to understanding. So some mathematical techniques were scorned as mechanical routines while others were celebrated as the results of reflective reasoning. For Leibniz, the capacity of mathematics and philosophy to inculcate virtue resided in modes of presentation that allowed practitioners to see complex things 'all at once' rather than sequentially or bit by bit. The recognition of universal harmony was the goal; intellectual projects that permitted people to see that harmony at a glance were the means.

Jones's preferred mode is close textual exegesis, history of ideas in the Highest Manner. His book is tightly focused on mathematical and philosophical manoeuvres and his argument is that one can properly appreciate the meaning and force of these techniques only if one recognizes that they were meant, as he writes, to 'direct one's everyday existence' (p. 25). However – and it may be only a quibble – it is the texture of these thinkers' 'everyday existence' that one hears little about. The intention to use reformed mathematics and philosophy to underpin the Good Life is superbly documented; the lives lived much less so.

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John Brooke and Ian Maclean (eds.), **Heterodoxy in Early Modern Science and Religion.** Oxford: Oxford University Press, 2005. Pp. xxi + 373. ISBN 0-19-926897-5. $120.00, £65.00 (hardback).
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The focus of this volume is on 'heterodoxy', specifically on how positions divergent from orthodox doctrine in both science and religion in the early modern period might be related. While