The Philosophical Quarterly
The Scots Philosophical Association and the University of St Andrews

Matter Matters: Metaphysics and Methodology in the Early Modern Period. By Kurt Smith. (Oxford UP, 2010. Pp. X + 299. Price £45.00 h/b, £22.50 p/b).

Why did matter matter for Descartes and Leibniz? The answer, Kurt Smith argues in this thought-provoking book, is that without it mathematics would be unintelligible. A world without matter is insufficient for mathematics because the immaterial cannot be divided into discrete quantities. Without a divisible material structure, the determinate unities necessary for the additive quantities in turn necessary for mathematics are unactualisable. God needs matter to institute mathematics. However, with the creation of matter, mathematical intelligibility necessarily follows. Smith's main aim, therefore, is to show that Descartes and Leibniz believed the biconditional: 'Mathematics is intelligible if, and only if, matter exists' (p. 3).

The bulk of the book is dedicated to 'analysis' and 'synthesis'. For Smith, analysis is a kind of transcendental process by which one discovers the basic conceptual categories necessary for the possibility of any object under investigation. A triangle's analysis would show that its 'epistemologically prior' necessary conditions include 'the angle, the line, the number three, and extension' (p. 89). One of the merits of Smith's discussion of analysis is his reading of *enumerating*. He claims that this concept has a technical sense in Descartes's lexis that is not captured by its traditional reading as mere *list making*. To *enumerate* is to *analyse* insofar as it is to discover the structurally interrelated necessary elements of a system. The ideal result would be the discovery of a hierarchical 'categorizational scheme … that explicitly shows how the various classes of simple natures are related to one another' (p. 96). Insofar as enumeration shows that 'angle, line, the number three, and extension' are epistemologically prior to the triangle, it not only 'divides up' the triangle into more basic parts, but also reveals the hierarchical systematic relations between it and its more basic elements. Importantly, enumeration reveals both the classes of atomic elements and their combinatorial rules. Smith argues that understood as such, Descartes's 'analysis *qua* enumeration' considerably foreshadows Leibniz's combinatorics. Insofar as *synthesis* is underwritten by combinatorics, *analysis* points towards the very same mathematical structure: analysis and synthesis, therefore, 'are shown to be flipsides of the same coin' (p. 200). Furthermore, analysis and synthesis reveal extension as a regionally divisible nature that is combinable and arrangeable. This provides the conditions for a genuine mathematical system and the intelligibility of mathematics; consequently, *if matter exists, mathematics is intelligible*.

Unsurprisingly, there is a fair bit of mathematics in this book. Most will be easy enough for readers with school mathematics and introductory logic. The pay off is a greater understanding of both the role that 'combinatorics' and 'synthesis' played in the mathematisation of physics, and the importance of the hard work of the early modern philosophers for the philosophy of mathematics developed in the nineteenth and twentieth centuries. Smith's decision to use mathematics as his primary interpretative tool for Descartes's and Leibniz's metaphysics casts new light on their legacy and shows that in some cases their mathematical discoveries were even more sophisticated than they are still given credit for.

Of the two parts of Smith's biconditional 'mathematics is intelligible IFF matter exists', 'if matter exists, then mathematics is intelligible' receives the most convincing defence. Nevertheless, Smith has interesting arguments to suggest Descartes believed that 'if mathematics is intelligible, then matter exists'. He argues that (1) there is textual evidence to show that Descartes thought certain truths, such as 'the whole is greater than the part', depend on extension; (2) God's conception and creation are co-extensive, so it would be impossible for God to conceive extension *without* creating it; and, (3) Descartes considered number and extension as only *conceptually* distinct, so God cannot *really* conceive number without extension and vice versa. From 2 and 3 it follows that if God conceives number, he conceives extension, and if he conceives extension, he creates it. Given that God cannot conceive mathematics without creating it, *if mathematics is intelligible, it exists*. However, there are problems for Smith's argument. Descartes certainly suggests the possibility of mathematics without matter in the first *Meditation*. To this Smith responds that the suggestion's shelf life is no longer than the evil demon's and, therefore, should not be taken seriously. He lets himself off the hook too easily here. In the sixth *Meditation* Descartes makes a distinction between 'intellect' and 'imagination'. There is a difference between *understanding* a triangle and pictorially representing it in the imagination; the latter requires connection to the body, the former does not. The distinction is exemplified in the case of a chiliagon. I can *understand* a chiliagon, but I cannot *imagine* it in the distinct way I can a triangle because my representation of it would not differ from that of a myriagon. Importantly, the body is necessary for our pictorial representations of our geometrical thinking, but the intellect's geometrical thinking is possible *without* connection to the body (or matter in general). Such thought is one of the intellect's *essential* abilities. It is hard to see how this activity could be both essential to the intellect alone *and* depend on matter. Even though most of Smith's discussion is based on the *Rules*, rather than the *Meditations*, he argues for continuity. Nevertheless, it is difficult to see how this crucial distinction from the *Meditations* could remain in place and his thesis be true.

Smith's argument for this conditional is more persuasive in Descartes's case than Leibniz's. Firstly, because the book is *primarily* about Descartes, so his work receives greater attention. Secondly, because some of the basic interpretative choices with regard to Leibniz's metaphysics are questionable and introduced without sufficient textual backing. Accordingly, what Smith says about Leibniz is more speculative. Although, there is a great deal of worthwhile material on Leibniz's combinatorics in this book, the connections Smith makes between Leibniz's mathematics and metaphysics are not always convincing. For Smith's Leibniz, God could not calculate without matter. It would seem to follow that mathematics is only possible in the actual world, for it alone is conjoined with *matter*. In all merely possible worlds, mathematics is inconceivable. Also, for Smith's Leibniz matter (extension) is a relational nexus that is the immediate result of the creation of the world of monads. It is prior to, and necessary for, individual *bodies*. Not only are there texts problematic for this reading, but it also implies that one monad could not be created in isolation because one monad is not enough for a material world (even to be conceived). However, contrary to Smith's claims there are famous passages in Leibniz's work where he asserts that it is *logically* possible to create one monad alone, even if it would not agree with God's goodness. However, Smith rules out even this logical possibility.

Matter Matters is a controversial, original, varied, and ambitious book. Regardless of whether the reader is convinced by the main argument, it makes significant contributions to the history of the philosophy of science and mathematics, as well as to the history of early modern metaphysics and epistemology. There is much to be learned from his excellent discussions of (1) analysis, synthesis, and the relation between mathematics, physics, and metaphysics; (2) the grounding of combinatorics in ancient and medieval philosophy; and (3) the importance of early modern methodology for developments in nineteenth-century philosophy.

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Shaping the Normative Landscape. BY DAVID OWENS. (Oxford UP, 2012. Pp. viii + 260. Price £30.00.)

David Owens argues that we have interests in purely normative phenomena—in particular, in being obligated. That is, obligation is valuable not merely because our more obvious and non-normative interests are served via being obligated and doing what we are obligated to do, but because the various ways in which we obligate ourselves to others, and they to us, are valuable in and of themselves. This is our 'normative landscape', and we shape that landscape through our various normative undertakings, such as making promises, consenting, forgiving, and the like. This way of thinking about obligation is highly inviting, and Owens' careful exploration of both the landscape and the tools we deploy to shape it mark a significant advance in our understanding of ourselves as creatures susceptible to norms and normativity.

Owens' study consists in three parts. The Introduction and part I (chs 1–4) offer a careful study of the conceptual tools Owens deploys through his more dialectical argument in later chapters. Here Owens defends distinctive conceptions of 'practical intelligibility' (the ways what we do, including our habits and practices, are made sense of), blame and guilt, wrongs and wronging, obligations and sanctions, and of the relation between obligation, intention, and deliberation.

In part II (chs 5–7) Owens explores our normative powers, beginning with Hume's puzzle as to how exercises of normative power (such as promising) could possibly be reason-giving independently of their import for our (or somebody's) welfare. Owens makes a case for his own version of a 'practice theory' of how this is possible, arguing for the seminal idea that we have interests in having that normative power, again independently of our welfare and other non-normative interests. '[H]uman beings have an interest in the possession of authority for its