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Eric Schliesser. *Newton's Metaphysics*. OUP, 2021.

Newton owes his high regard to the quantitative science he left us, but his overall picture of the world had some robustly metaphysical threads weaved in as well. Posthumous judgment about the value of these threads has varied wildly. Christian Wolff thought him a metaphysical rustic, and so did Reichenbach some two centuries later ("Die Bewegungslehre bei Newton, Leibniz und Huygens," *Kant-Studien*, 29: 416–38). In the 1960s, the tide would turn, as Howard Stein and J.E. McGuire separately began to show that Newton's metaphysics was not just sophisticated, but often more compelling than its early modern alternatives (cf. respectively "Newtonian spacetime," *Texas Quarterly* 10 (1967):174–200; and *Tradition and Innovation*. Kluwer, 1995). Eric Schliesser's book unfolds in that same register of appreciative, high scholarship; and it attests to the enduring attraction of its subject.

The book grew out of previous, discrete papers, to which he added a few more for this occasion. Accordingly, it does not come with a master argument. Rather, it is an in-depth exploration of some key metaphysical themes in Newton. As such, it befits its subject figure, who reflected on themes and concepts but stopped short of working out systems.

The first major theme is Newton and Spinozism. The latter does not denote Spinoza's metaphysics. In fact, Schliesser explains, Newton shared with Spinoza some weighty commitments, e.g. to space being actually infinite, and to substance monism: "for Newton, there is strictly speaking only one genuine substance," viz. God (33). Rather, 'Spinozism' is an interpreter's category for a bundle of three theses: identifying God and nature; denying final causation in the physical world; and the assumption of "blind" metaphysical necessity. Some counted Hobbes and John Toland as Spinozist in this sense; and even Epicurus, *avant la lettre*. Newton and his followers argued vehemently against this package, as Schliesser shows in chs. 4, 5 and 8. Their chief complain was that 'Spinozism' is unable to account for the "origin of motion," for a certain type of

order, and for the stability of cosmological structure—and to do so in a way that "meets the standards of Newtonian mechanics" (122). This interpretive lens allows Schliesser to draw Kant in, by reading his youthful *Theory of Heaven* as a possible 'Spinozist' reply to their objections (ch. 3).

A second theme is the metaphysics of mechanics, where Schliesser weaves together several strands. One is the ontology of gravity, for which he offers a novel construal: for Newton, gravity counts as real, but in a qualified sense. Namely, it is not essential and not intrinsic: "even after creation, a lonely partless particle of matter in the universe would not be said to gravitate" (19). And, gravity is relational: a "shared quality" of two or more bits of matter, which obtains in virtue of their sharing a nature. Another strand is Newton's ontology of time—really, a subtle, difficult topic long neglected. Famously, Newton in *Principia* defends "absolute, true, and mathematical time." The question is what these three qualifiers denote, and whether Newton thought they were synonymous. Schliesser in ch. 7 argues for the provocative view that "absolute-" and "true" time are not identical concepts, and they pick out different entities (179). These entities share a common structure, viz. metric and topological. That makes them species of "mathematical" time. But, Schliesser contends, Newton has unequal warrant for his two concepts of time.

Yet another theme is formal causation. It comes to the fore in ch. 5, which grapples with Newton's opaque idea that space is an "emanative effect." Schliesser explains: here, "emanation picks out a species of formal causation" (147), but in a novel, early modern sense that comes from Bacon, not Aristotle. If space has a formal cause then so has its twin brother, time, the topic of ch. 7. God is their common formal cause. Then in ch. 6 (coauthored with Zvi Biener) he adds that, for Newton, laws too count as formal causes—of bodies and forces (171).

A recurring refrain in this book is divine teleology. It takes center stage in the final chapter, on an argument that Schliesser calls 'Posidonian.' It comes from Cicero, and is a species of *Gottesbeweis* from design. Specifically, it relies on a premise that, at cosmological scales, the universe is structurally isomorphic to an armillary sphere, or spherical astrolabe, which is a man-made "product of rational design" (227). Schliesser produces and dissects a wealth of evidence for the Posidonian argument's robust presence in early modern natural philosophy. Still, what has this got to do with Newton? Quite a bit, Schliesser argues. Newton took his

gravitation theory to be evidence for nature having the right order, viz. isomorphic as above; he thought that order can only be the result of final causes; and that the continued success of science—the one that lived up to his exacting standards, anyway—gives us knowledge of that divine order (252). Samuel Clarke and Voltaire agreed with him.

These themes are novel and forward-looking; they lend themselves to further reflection, so they are fruitful. Which is just as well, because Schliesser values that in an interpretation. He thinks (and I agree) that sometimes fruitfulness trumps direct textual support. In a move I found refreshing, he directs this thought polemically at the more sclerotic forms of contextualism.

Newton's stance vis-à-vis Spinozan determinism has a diachronic dimension. As Schliesser shows in ch. 3, Newton ca. 1687 held views closer to the 'Spinozism' he would denounce as he got older. On a broader note, Schliesser plausibly argues we must take seriously the diachronic aspects of Newton metaphysics. In this regard, his point is consonant with the more subtle strands in scholarship, notably by Zvi Biener. From this diachronic vantage point, Newton is baffling. Over time, he learned to turn some metaphysical problems—about matter, space, and force—into *empirical* ones: he found unprecedented ways to "put the question to nature," as Schliesser's former teacher, George E. Smith, puts it. And yet, an upshot of this book is that, in philosophical theology, he seems to have traveled in the other direction: increasingly vocal about divine designs, but hardly interested in strong empirical support for those views. To modern eyes, this looks like a deep tension. Schliesser might suggest it is an illusion of hindsight—back then, Newton's empirical success was comfort and reassurance to theologians of his ilk, not a source of concern.

The book stands out on another count that matters. A magnanimous spirit pervades it—of intellectual generosity toward his peers, especially the young ones, whose voices sometimes go unheard—coupled with a good deal of humility. In that respect, Schliesser teaches a lesson we all stand to learn. Regrettably, however, the publisher did nothing to help the reader. The book is set too loose, the text unevenly spaced, and the margins too narrow, which works against immersive reading. Oxford must do better.

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