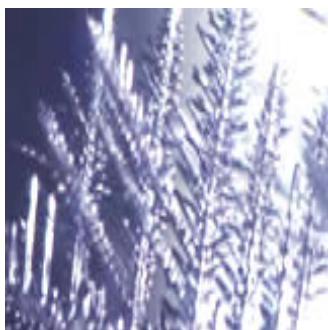


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home

- ::: [about](#)
- ::: [news](#)
- ::: [links](#)
- ::: [giving](#)
- ::: [contact](#)

events

- ::: [calendar](#)
- ::: [lunchtime](#)
- ::: [annual lecture series](#)
- ::: [conferences](#)

people

- ::: [visiting fellows](#)
- ::: [resident fellows](#)
- ::: [associates](#)

joining

- ::: [visiting fellowships](#)
- ::: [resident fellowships](#)
- ::: [associateships](#)

being here

- ::: [visiting](#)
- ::: [the last donut](#)
- ::: [photo album](#)

[::: center home >> events >> conferences >> other >> 2007-08>> &HPS](#)

The God of Geometry, The God of Matter: The Connection between Descartes's Math and Metaphysics

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There is no question that René Descartes's has earned an important place in both the history of mathematics and the history of philosophy. In the domain of mathematics, he proposed a novel analytic approach to geometrical curves that enabled him to secure a connection between geometry and algebra. In the domain of philosophy, he promoted a 'rationalist' program of metaphysics and epistemology that shed new light on problems surrounding the existence of God and the human soul. Though the importance of these innovations is uncontroversial, there remains a question of how Descartes's contributions to the progress of mathematics and of philosophy are connected.

In recent scholarship, attempts to pinpoint the connection between Descartes's mathematics and his general philosophical program have primarily assumed one of two strategies. On the one hand, some scholars focus on the method that Descartes embraces in both domains and try to illuminate the extent to which Descartes applies the method of mathematics to the philosophical problems presented in his mature metaphysical works, namely, the *Meditations* (1641) and the *Principles of Philosophy* (1644). The force of such accounts rests on Descartes's explicit admiration for mathematical reasoning in his unpublished *Rules for the Direction of the Mind* (ca. 1628) as well as in his anonymously published *Discourse on Method* (1637). The *Discourse* is especially important, because in this work, Descartes presents mathematics as offering the very standard for certainty which we ought to embrace when investigating what can be known in the domain of metaphysics (CSM I 119-120). It seems natural then to connect the method of mathematics to the method employed in the metaphysical works, because it's an approach to his work that Descartes himself sanctions.

On the other hand, some scholars have tried to connect Descartes's mathematics with his metaphysics by directing our attention to the mathematical character of the Cartesian matter, and in turn, the mathematical character of Cartesian physics. Crucial to this approach is Descartes's identity of matter with spatial extension, an identity from which it follows that material bodies are nothing other than geometrical figures to which sensible attributes and properties are attached. Metaphysics and mathematics, therefore, find common ground on the plane of Cartesian physics. Support for this approach is presented in *Meditation Six*, where Descartes establishes that the corporeal things in nature "possess all the properties which I clearly and distinctly understand, that is, all those which, viewed in general terms, are comprised within the general subject matter of pure mathematics" (CSM II 55).

Though the above reading rightly emphasizes the general importance of the mathematical character of both Cartesian matter and Cartesian physics, it leads us to an account of the connection between Descartes's metaphysics and mathematics that discounts other central features of Descartes's metaphysical program, most notably the proposal of a supremely perfect God who is creator of all that exists. As Daniel Garber (1992a, 1992b) has emphasized, any historical account that claims to do justice to Descartes's physics must pay heed to the role assigned to God's concurrence in the natural world. Only by so doing can we, for instance, understand and appreciate the metaphysical grounding of Descartes's laws of motion. Garber thus offers the following assessment of approaches that emphasize the mathematics of Cartesian physics: Because [the objects of Cartesian physics] are created and sustained by God, and, perhaps, subject to his continual push, they satisfy laws of motion that are entirely foreign to the objects of pure mathematics. In trying to link Descartes' physics closely to mathematics, one forgets the crucial connection between Descartes' physics and his

metaphysics...(1992a, 292-293).

I agree with the general sentiment of Garber's remarks: we do an injustice to Descartes's physics if we ignore the connections he forges between God and the regular motions of natural bodies. I disagree, however, with the suggestion that we forget the crucial connection between Descartes's physics and his metaphysics if we link his physics to his mathematics. For I think it is only by linking Descartes's mathematics with his metaphysics that we gain a portrait of his physics that is faithful to the general spirit of the Cartesian program.

Rather than adopt one of the two methods described above, I want to offer an account that takes as its starting-point the fable presented in Chapter 6 of the unpublished *Le Monde* (ca. 1633). According to the creation story presented therein, God creates the world by choosing an area of empty space, creating a chaos of uniform matter in that space, and then separating matter into individual bodies by imposing laws of motion onto the chaos. The laws of motion we witness, however, do not merely depend on God's initial act of creation; they depend on "God's conserving everything by a continuous action" at an instant" (pp. 29-30). What follows, then, is that God conserves the regular motion of bodies by means of straight line motions, for these are the only motions which are "entirely simple and [have] a nature which may be grasped wholly in an instant" (p. 30). And here we have a natural bridge from Cartesian metaphysics to Cartesian geometry, for the very same simple straight line motions of *Le Monde* play a central role in the *Geometrie* (1637), where Descartes claims that properly geometrical curves must be constructible by simple lines and simple motions. On his account, they must be constructible in this manner, for this is the only way to guarantee the intelligibility of geometrical curves.

I hope to show that by focusing on Descartes's notion of intelligibility, which is intertwined with simple motions and simple lines both in his metaphysics and his mathematics, we are granted a fruitful way of understanding the connection between the different domains of the general Cartesian program. For the motions of the divine, the geometer, and the bodies of nature all rest upon the same plane of simplicity and intelligibility that are a hallmark of Descartes's 'rationalism'.