Newton's Empiricism in Cartesian Context: Revisiting the Argument for Space in De Gravitatione

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Reconciling Newton's empirical method of natural philosophy with his proposal of absolute space has been no easy task for historians and philosophers of science. A cursory glance at some remarks from the *Principia* makes the tension clear. In the General Scholium, which was added to the second 1713 edition, Newton explicitly claims that his 'experimental philosophy' is premised on the rejection of 'hypotheses' that are not grounded on sensory evidence (cf. Newton 1999, 943) and, in the Scholium to the Definitions, he makes equally clear that his system of mechanics – a system that purports to offer the true system of the world – requires appeal to 'absolutes', such as absolute space and time, that are not accessible to the senses (cf. ibid, 410-4).

Recently, commentators have turned to Newton's short tract *De Gravitatione* for clues as to how this tension might be resolved. For instance, in his 'Newtonian Space-Time' (1967), Howard Stein draws our attention to Newton's *De Gravitatione* argument against Cartesian relative motion as an avenue for understanding the role of space in Newton's mechanics. According to Stein's account, what *De Gravitatione* reveals is that Newton proposed the notion of space that he did precisely because he was trying to improve upon the failings of Cartesian mechanics and offer a notion of space that would allow us to make sense of the natural motions that are confirmed by empirical evidence. Stein brings this account to bear on the absolute space of the Principia and urges us to treat absolute space as an entity 'deduced from the phenomena' in the same sophisticated manner that Newton 'deduces' universal gravitation. As a result, we gain from Stein a portrait of absolute space according to which it is demanded by the evidence and thus, according to which this non-sensible space stands as a legitimately empirical component of Newton's experimental philosophy.

Andrew Janiak (2008) has recently offered a worthy challenge to Stein's account. While he doesn't discount the importance of attending to the anti-Cartesian stance Newton adopts in De Gravitatione, Janiak lays greater emphasis on the differences between the unpublished tract and what we find in the Principia. He claims in particular that, while the project of the Principia is to clarify the relationship between absolute and relative spaces and offer a definition of space that provides a way of clearly defining absolute motion, the project of De Gravitatione is one of ontology. By attending to this difference, and specifically, to Newton's claim in De Gravitatione that space is 'not absolute in itself' but is rather an 'emanative effect of God', Janiak contends that what the short unpublished work reveals is that Newton's empiricism is grounded upon and shaped by his commitment to a 'divine metaphysics', i.e., 'a fundamental conception of God's nature and relation to the natural world that is not subject to revision' (cf. Janiak 2008, 44-5).

My goal in this paper is to try to reconcile the different approaches that Stein and Janiak take to *De Gravitatione* precisely by attending to a feature of the text that they do not consider: the strategy Newton employs to establish the fundamental features of space, including its status as an 'emanative effect of God' (Newton 2004, 21). What I emphasize is that, according to Newton, it is a demand of our thinking that space exists and exists as an emanative effect of God (i.e., of an eternal and immutable being) insofar as these features of space are revealed by 'the exceptionally clear idea we all have of space' (ibid, 22). As I also claim, this apparently Cartesian (or 'rationalist') strategy does not discount a thoroughly empiricist reading of Newton's view of space (as offered by Stein), for as also revealed in De

Gravitatione, the very idea of space from which its necessary features flow is an idea gained 'by abstracting the dispositions and properties of a body' (ibid, 22). As such, what emerges as foundational for Newton is not a peculiar conception of God's relationship to space, but rather, a commitment to the neatness of fit between the information we gain from our senses and the actual, natural state of affairs. If Janiak is thus right to say that there is an unrevisable 'divine metaphysics' that shapes Newton's investigation into nature, the argument for space in De Gravitatione reveals that what is most fundamental is Newton's commitment to a view of God's creation that preserves the epistemically privileged place that humans have in nature – a commitment that brings Newton closer to Descartes than the text might first suggest.

References:

Janiak, Andrew. Newton as Philosopher. Cambridge: Cambridge University Press, 2008.
Newton, Isaac. Mathematical Principles of Natural Philosophy (Third Edition). Translated by I. B. Cohen and A. Whitman. Berkeley: University of California Press, 1999.
--- Newton: Philosophical Writings. Ed. Andrew Janiak. Cambridge: Cambridge University Press, 2004. (The translation of De Gravitatione by Christian Johnson, with the assistance of Andrew Janiak, is included on pp. 12-39 of this volume.)
Stein, Howard. 'Newtonian Space-Time.' Texas Quarterly 10 (1967): 174-200.