

Sunday, June 27 AM 9:00-12:00, Room 141

Session 1 (room 141): **Leibniz**

Andreas Blank, "Leibniz and the Transformation Theory of Animal Generation in Early Modern Aristotelianism"

Edward Slowik, "The (Meta)Physics of Leibnizian Space, Relational Motion, and Force"

Jeffrey K. McDonough, "Leibniz on 'Internal' Teleology and the Laws of Optics"

Michael Futch, "Leibniz on the Possibility of an Infinite Past"

"Leibniz and the Transformation Theory of Animal Generation in Early Modern Aristotelianism"

Andreas Blank

As Leibniz has pointed out, the work of the Italian philosopher and humanist Julius Caesar Scaliger can be seen as the first substantial attempt at reconciling elements from Aristotelian philosophy of nature with early modern mechanism. The first purpose of the present paper is a clarification of central themes of Scaliger's work, such as the nature of the ether, its relation to vital heat, and the role of organic forms in the generation of animals. Scaliger tries to develop an account of the nature of ether and vital heat without recurring to the idea of an immediate divine or celestial causation. Moreover, Scaliger attempts to develop an alternative to the scholastic theory of the "education" of form from "predisposed" matter by replacing the scholastic theory of form as a pure potentiality of matter through a notion of form as an actual principle of action, which functions as the principle of transformation of a portion of organic matter. The second purpose of the paper is to outline some of the influences of Scaliger's work on subsequent discussion about ether, vital heat, and animal generation. As can be plausibly argued, Kenelm Digby defends a theory of animal generation that comes very close to Scaliger's. By contrast, Daniel Sennert tries to modify Scaliger's theory by introducing a theory of substantial forms as simple substances. Finally, in the period of the *Hypothesis Physica Nova* the early Leibniz takes up Scaliger's and Digby's views of the ether and its role in organic pre-formation. It is only in writing from his Paris years that Leibniz tries to combine the transformation theory of animal generation with a theory of preformation in simple substances that dominate a living being.

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"The (Meta)Physics of Leibnizian Space, Relational Motion, and Force"

Edward Slowik

In the contemporary spacetime debates centered on the age-old "absolute versus relational" question, there is little room for doubt as to where to "place" Leibniz' natural

philosophy. His assault on the concept of an independently existing space, as developed most elaborately in the Leibniz-Clarke correspondence, unquestionably favors the relationist cause. In presenting his anti-absolutist case, not only did Leibniz challenge the Newtonians with a host of metaphysical problems that would set the spacetime agenda for several centuries, but the tenor of Leibniz' discussion would suggest to many later commentators the alleged characteristics or structures implicit in Leibniz' preferred, if not consistently avowed, vision of space and time: these include, most importantly, the restriction of the invariants of the spacetime to the relative distances, velocities, and accelerations manifest among its material occupants (see, Earman 1989, pp. 30-31). Often labeled "Leibnizian" spacetime, there are compelling reasons for investigating the chances of successfully implementing a theory of physics limited to the relative motions of this spacetime backdrop—yet, despite the importance of these concerns, it will be the task of the present essay to challenge the accuracy and suitability of a Leibnizian spacetime designation for Leibniz' own brand of natural philosophy. On the contrary, it will be demonstrated that a close examination of the many intriguing (and frequently overlooked) metaphysical and physical hypotheses that comprise Leibniz' complex view of space, motion, and matter often disclose structures and properties that more accurately fit a Newtonian conception of spacetime.

Admittedly, the non-relational (and non-Leibnizian spacetime) character of Leibniz' world system has been the subject of several recent investigations (such as Earman's important book, and the recent work of John Roberts). While these important works have considerably improved our understanding of Leibniz' natural philosophy, it will be argued that the unique, and somewhat peculiar, nature of Leibniz' physics has nonetheless eluded previous commentators. In particular, there are several features of Leibniz' overall system that have not been adequately taken into account when examining the spacetime structures of Leibnizian physics: the *local versus the global* properties of the spacetime, the foundational role of force (*vis viva*) in explicating all bodily motions, and the *plenum-continuum setting* within which Leibnizian dynamics is formulated. Underlying all of these issues is Leibniz' penchant for blurring the kinematic and dynamic components of his physics, a problematic facet of his approach which will be seen to engulf nearly all of his (quite numerous) physical hypotheses. Throughout our analysis, the closely analogous problems that beset Descartes' physics will be frequently pointed out as well. Not only will the comparison with Descartes prove informative in evaluating the content of Leibniz' hypotheses, but the obvious similarities between their respective programs will likewise betray the allegedly anti-Cartesian intent of Leibniz' physics.

“Leibniz on ‘Internal’ Teleology and the Laws of Optics” **Jeffrey K. McDonough**

As part of his relentless attempt to reconcile mechanism, the views of his predecessors, and Christian theology, Leibniz repeatedly claims that the world is governed not only by efficient mechanical causes but also by teleological final causes indicative of a wise creator. In this essay, I look at one aspect of this larger project,

namely, Leibniz's attempt to show that discoveries in the domain of optics vindicate the use of final causes serving as explanans of optical phenomena. The essay itself falls into three sections. The first section sketches the historical developments in optics that led Leibniz to first formulate his "Most Determined Path Principle" (MDPP). The second section brings out some of the features of the MDPP that Leibniz thinks renders it immune to the most common objections to teleological explanations of his day. Finally, the third section defends Leibniz's characterization of the MDPP as teleological from three contemporary objections.

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"Leibniz on the Possibility of an Infinite Past"

Michael Futch

Few topics in the philosophy of science have vexed philosophers more than the topology of time. In particular, philosophers of science have been and remain sharply divided over whether it is conceptually or metaphysically possible for time to be unbounded. G. J. Whitrow, for instance, argues that the total number of past events must be finite, and that the world therefore must have a first instant. Against this, Karl Popper and others dismiss as ineffective attempts to demonstrate the necessity of a bounded past.

Contemporary debates on this topic are only the most recent manifestation of a well-worn dispute in the history of the philosophy of science. In this paper I explore Leibniz's views on the possibility and actuality of an infinite temporal regress, both situating them against the historical backdrop from which they arise, and giving due consideration to their continuing philosophical interest. In order to motivate why Leibniz allows for a beginningless world, I begin by framing his views in the wider historical context of medieval and seventeenth-century natural philosophy. With this done, I show that Leibniz's philosophy of mathematics, and particularly his views on infinity, provide him with firm grounds for asserting, against many of his predecessors and contemporaries, the possibility of an endless temporal regress; for Leibniz, the world's eternity is not a metaphysical impossibility. Having shown that Leibniz allows for the possibility of infinite temporal regresses, I try to ascertain to what extent he is willing to say that the world's history is in fact characterized by such a regress. As we will see, some texts point to a world with no beginning. Nonetheless, I argue that in his most deliberate and thoughtful writings, Leibniz contends that the beginninglessness of the world cannot be a priori established on philosophical grounds. More rigorously, Leibniz disavows a priori, purely rational attempts to show what the world's history *must* be like, opting only to enumerate possible temporal structures that *can*, as a contingent matter of fact, be instantiated in a world. In refraining from asserting the necessity or impossibility of the world's beginninglessness, Leibniz implicitly adopts an important approach to the topology of time: the extent of the world's history is not something to be decided on philosophical grounds alone.

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