The Leibniz-De Volder Correspondence, with Selections from the Correspondence Between Leibniz and Johann Bernoulli. Translated, edited, and with an Introduction by Paul Lodge. New Haven and London: Yale University Press (= The Yale Leibniz Series), 2013. Ci + 415pp.

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In 1698 a young Johann Bernoulli, then professor of mathematics at the University of Groningen, paid a visit to the city of Leiden, whereupon he had the good fortune to meet the prominent natural philosopher Burcher De Volder. Among the topics they discussed during their frequent meetings over lunch and at the homes of other professors from the local university was a controversy that had been brewing by then for several years. The dispute, now known as the *vis viva* controversy, began with the appearance of Leibniz's "Brevis Demonstratio Erroris memorabilis Cartesii" in the March 1686 issue of *Acta Eruditorum* (GM VI, 117-19/L 296-98). In this brief essay, Leibniz challenged the view of Descartes and his followers that a body's "motive force" (*vis motrix*), that is, the force which moves it, equals its "quantity of motion" and thus varies as the product of the body's size or bulk and its speed (roughly, *mv*). By way of a clever counterexample, Leibniz purported to show that a body's motive force does not always track its quantity of motion but instead tracks the quantity of the *effect* its force is capable of producing, a quantity which was known to vary as the product of the body's bulk and the *square* of its speed (roughly, mv^2). He thereby sparked a lively series of exchanges between himself and the Cartesians Abbé Catelan and Denis Papin, who stood fast in defending the received view.[1]

De Volder, it turned out, harbored some sympathy for the Cartesian view, as indeed Bernoulli himself once had. But Bernoulli had since been convinced by his friend Leibniz to switch sides. Accordingly, when he learned of De Volder's Cartesian sympathies during his visit to Leiden, Bernoulli offered to share with him the relevant excerpts of his correspondence with Leibniz in the hopes that the arguments which won him over to Leibniz's point of view might also persuade De Volder. Unfortunately for Bernoulli, the task of persuading De Volder proved more difficult than perhaps he had initially hoped, and by the end of that year he decided it might be best to put De Volder directly in touch with the great philosopher. In turn, he enticed Leibniz to participate with the suggestion that such a correspondence might bear great fruit:

> Since he [i.e., De Volder] has admitted to me that he has long since abandoned the principles of Cartesianism as inadequate and mostly false, there is no doubt that once he properly understood your philosophy and imbibed it, he would propagate it diligently and impress it upon his students (of which he always has an extraordinary number) in such a way that perhaps it might soon have dominion over the Cartesian and Aristotelian philosophies, as if reconciling the ancients and the moderns. I ask you again and again whether you are willing to consider the world of philosophy worthy of this. I beg you to consider us and posterity, and erect a memorial to your name. After all, do you think you are inferior to Descartes? (25-27)

Shortly thereafter, in December of 1698, Leibniz addressed himself directly to De Volder and the two began a wide-ranging correspondence, mediated throughout by Bernoulli, that would last some seven years and become one of our richest sources of insight into Leibniz's mature philosophy.

Paul Lodge's excellent new contribution to the Yale Leibniz series collects together the entirety of the Leibniz-De Volder correspondence, totaling some thirty-three letters, together with a generous selection of relevant excerpts from Leibniz's concurrent correspondence with

Bernoulli, which Lodge has helpfully interspersed throughout. As with previous volumes in the series, the texts appear in the original language, in this case Latin, together with an English translation on opposing pages. Lodge's transcriptions reflect his careful study of all the available manuscripts and represent a significant improvement over the existing versions in GP II (Leibniz-De Volder) and GM III (Leibniz-Bernoulli). Rounding out the volume are a long introduction (79 pp.), itself a valuable contribution to Leibniz scholarship, together with extensive notes on the texts, a bibliography, and indexes for names and subjects.

Lodge plausibly suggests that these intertwining correspondences may be divided into five phases. The first (Letters 1-7) comprises a series of letters exchanged between Leibniz and Bernoulli in the months leading up to the beginning of the correspondence with De Volder. In these letters Bernoulli relates De Volder's concerns about Leibniz's view and Leibniz offers some initial reactions. The second phase (Letters 8-34) then sees De Volder enter the fray as he debates the proper measure of motive force with both Leibniz and Bernoulli. This phase, the longest of the five, draws to a close shortly after De Volder appears to concede in Letter 33 (5 April 1700) that Leibniz's measure is indeed the correct one, though ironically De Volder relates that it was an argument of Bernoulli's rather than one of Leibniz's that finally convinced him.

In March of 1694, Leibniz had published another brief essay in *Acta Eruditorum*, "De primae philosophiae Emendatione, et de Notione Substantiae" (GP IV, 468-70/L 432-33). De Volder had read this essay and was particularly intrigued by Leibniz's contention that substances are essentially active. If it were possible to produce an *a priori* proof of this thesis, De Volder thought, this would be a remarkable result; for as he related to Bernoulli, such a proof would be in his eyes a "most fruitful source of truth" and a key to resolving not only his worries but also "those difficulties that have burdened every natural philosopher up until now" (21). In many of his letters to Leibniz, therefore, De Volder pressed the philosopher for such a proof, though to little avail. At one point Leibniz did offer what he described as a "first attempt at a proof" (161), which he sent more than anything as a gesture intended to show De Volder that his requests were not being ignored. In essence, the proof was this: The changes a substance undergoes must be caused; but they cannot be caused by other substances, since such an influence is inexplicable; nor can they be caused by God, since that would be an unreasonable hypothesis; hence, each substance must be intrinsically active. Judging from his response, De Volder was not impressed. From his perspective, Leibniz's entirely reasonable dismissal of occasionalism rested on *a posteriori* considerations, whereas he was seeking an *a priori* demonstration of the intrinsic activity of substance "from the notion of substance itself" (169). In his next letter, De Volder continued to press Leibniz for the *a priori* demonstration. Meanwhile, Leibniz was well aware that he was not in possession of any such demonstration, and indeed he confided as much to Bernoulli (161). But for whatever reason, he hesitated to admit this to De Volder, and so the dance continued.

In his reply to the request for a demonstration from the notion of substance itself, Leibniz observed that "we must first establish a notion of substance and agree upon it" (181). Instead of using this as an opportunity to advance and defend his own definition of substance, however, Leibniz decided to turn the tables on De Volder and ask for his definition instead. In his next letter, De Volder was happy to oblige. In keeping with a familiar tradition, he maintained that substance is that which can be conceived separately, or equivalently, that which exists through itself, i.e., independently of all other created things (187-89); and in good Cartesian fashion, he suggested extension as an example of something which satisfied this definition. This raised Leibniz's hackles and set the agenda for the third phase of the correspondence (Letters 35-47), as

he pressed several lines of criticism in an unsuccessful bid to liberate De Volder from these opinions.

In the fourth phase of the correspondence (Letters 48-58), De Volder managed to turn the tables back on Leibniz. To this point Leibniz had largely avoided discussion of his own metaphysical system, perhaps for fear that it would be judged too radical. But this would change in the fall of 1702, when De Volder received from Leibniz a copy of his "Réponse aux réflexions contenues dans la seconde edition du Dictionnaire critique de M. Bayle" (GP IV, 554-71/L 574-85). De Volder took this opportunity to shift the focus of discussion to Leibniz's views on substance, force, body, and other allied topics. Over the remainder of the fourth phase, De Volder continued to press Leibniz for clarifications of his view, and Leibniz did his best to explain and defend his views. In this, however, he met with limited success, and eventually the philosopher's patience began to wear thin. Though his tone had been consistently polite up to this point, it took a turn for the worse in his letter to De Volder of 21 January 1704 (Letter 55), as we can see from this excerpt:

> You speak as if you do not understand what I mean when I say that derivative forces are mere modifications, and that the active cannot be a modification of the passive. So do you not understand what modification means, or active, or passive? In the meantime, finding I know not what obscurity in my argument, you have touched on what I said so cursorily that you even attribute to me things that I did not say or, rather, the opposite of what is said. You maintain that I deny that derivative forces are active …. But in fact, I am so far from denying that they are active that from the fact that they are active and, nonetheless, modifications, I conclude that there is some primitive active thing of which they are modifications. (287)

After not hearing from De Volder for several months, Leibniz wrote to Bernoulli in May of 1704 (Letter 57): "Perhaps Mr. De Volder has taken some offense at some of the things I may have said too freely because he seems to have been writing without paying enough attention and to have shown himself to be insufficiently teachable. This has made me fear that we may be debating in vain" (293-95). After some prompting from Bernoulli, De Volder did eventually reply to Leibniz. But Leibniz was right to suspect that De Volder had taken offense; for De Volder replied thus to Bernoulli: "You ask why I have been silent so long. It is because I was unsure whether I should reply to the illustrious Leibniz at all. For his last letter contains some things that convince me that he does not like to be contradicted, as is the way with great men. I would not want to do anything that might displease him, especially since I do not expect very great fruit from this debate of ours" (299). With renewed politeness, Leibniz and De Volder continued to correspond for another twenty months, this being the fifth and final phase of the correspondence (Letters 59-67). But the discussion progressed little and De Volder eventually lost the will to continue.

Lodge's edition of this correspondence will no doubt prove immensely valuable to Leibniz scholars and indeed anyone with an interest in this episode in the histories of philosophy and science. Among its many merits, I would like to call special attention to three. First, though in this respect it will one day be superseded by future volumes in the Akademie series, it is now the most accurate available edition of the Leibniz-De Volder correspondence and the directly relevant portions of the Leibniz-Bernoulli correspondence. Second, this volume goes a long way toward making these valuable correspondences more accessible. Up till now, only a selection of Leibniz's letters to De Volder and one of his letters to Bernoulli, and indeed none of De Volder's or Bernoulli's replies to Leibniz, had appeared in English. Thanks to Lodge's skill and hard

work, Anglophones who are not expert Latinists will now have access to the full range of this material. Finally, the excerpts from the Leibniz-Bernoulli correspondence included in this volume are tremendously helpful for following and understanding the main debate. The decision to include them was a wise one. For all these reasons and more, Lodge should be applauded for producing this superb resource.[2]

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[1] For a helpful account of these exchanges, see Carolyn Iltis, "Leibniz and the *Vis Viva* Controversy," *Isis* 62:1 (Spring 1971): 21-35.

[2] I thank Paul Lodge for helpful comments on a prior draft of this review.