Justin Haruyama

Bryan Smith

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<center>Spinoza and the Axiomatic Method</center>

Ever since Euclid first laid out his geometry in the *Elements*, his axiomatic approach to geometry has been widely praised and admired. For centuries geometry was considered the only sure and certain "science," for precisely the reason that the axiomatic method used to prove its propositions seemed so irrefutable in its logic. However, geometry is not the only area in which the axiomatic method first developed by Euclid has been put to use. One of the most noteworthy examples of an employment of the axiomatic method far outside the reaches of pure geometry comes in Baruch Spinoza's famous work: the *Ethics*. While much of the *Ethics* is concerned with, as the title might suggest, normative claims about the proper form of human behavior, Part One "On God," especially, purports to prove a number of very interesting assertions. Spinoza begins this section with a set of eight definitions and seven axioms (he leaves none of his terms undefined).

While perhaps somewhat obscure to a modern reader, none of these definitions or axioms seem from the outset to be anything but quite innocuous. Once Spinoza sets in earnest to proving his 36 propositions and assorted corollaries, however, it rapidly becomes clear that these definitions and axioms are going to lead to some quite astonishing conclusions. By Proposition 15, for example, Spinoza appears already to have proved the incredible claim that "whatever is, is in God, and nothing can be or be conceived without God."[1]

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[1]   1. Baruch Spinoza, *Ethics*, trans. Edwin M. Curley (Princeton: Princeton University Press, 1985), 420.

While the immanence of God has long played an important role in Western theology, and while Spinoza is certainly not the only pantheist in history, his essential argument that pantheism is the obvious and logically inevitable conclusion of certain more or less self-evident axioms and uncontroversial definitions is bold to the point of audacity, perhaps even more so to a modern audience than to one of his contemporaries. Unlike his contemporaries, for instance, many modern readers might strongly resist even his earlier proposition (Proposition 11) that "God… necessarily exists"![2] Several options present themselves, then, to any modern reader of Spinoza. The first is to bite the bullet and accept the logical force of his arguments, with all the surprising conclusions that follow. The second is to reject the validity of the axiomatic method—as a system of argumentation—itself. If we choose to doubt the genuine validity of the axiomatic method in the realm of philosophy, however, this will cast severe doubt as well on all other areas in which it has been employed, most notably geometry. This is obviously a quite forbidding approach. The only other recourse that is available, however, is to find some flaw in his use of the axiomatic method, a flaw that might lie with any one of his definitions, axioms, or demonstrations (read: "proofs"). It is with this latter approach that this paper will be primarily concerned.

Before moving too quickly on to a discussion of the relative validity of Spinoza's arguments, however, a moment should be taken to provide some philosophical background on what, precisely, it is that Spinoza is proving in the first section of the *Ethics* (and that is supposed to be so objectionable to the modern reader). What Proposition 15 makes clear is that what Spinoza is advocating is a kind of radical monist pantheism. What are monism and pantheism? Monism is the view that the universe (i.e. everything that exists) is composed of only one thing

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2   2. Ibid., 417.

(or type of thing). Moreover, Spinoza seems to be pushing for the stronger version of this thesis, whereby there is not only simply one *type* of thing in the universe (such as physical, mental, or spiritual types, say), but rather that there is ultimately only one thing in the universe, period. Pantheism is the view that "God is everything and everything is God … the world is either identical with God or in some way a self-expression of his nature."[3] Thus, the combination of these views represents a radical vision both of ontological reality (what there really is) and of theology (what is the nature of God). Of course, not all readers might find these claims quite so objectionable. There are, for example, a number of literary and other artistic figures whose views might be considered sympathetic to pantheism (for instance Emerson, Walt Whitman, D.H. Lawrence, Robinson Jeffers, Beethoven, and Martha Graham). Nevertheless, Spinoza's views represent a radical departure from mainstream thinking in philosophy, any of the sciences, and even theology, and so any reader who is disposed to accept the basic tenets of any of these fields is likely to find Spinoza's views to be implausible.

One immediate feature of Spinoza's method of argument is that he employs the axiomatic method almost entirely as it was used by Euclid himself. Yet there are many aspects of Euclid's method that modern mathematicians and geometers now reject. Two of these discrepancies between Euclid's conception of the axiomatic method and the manner in which it is employed by mathematicians today seem particularly relevant here. The first is the attempt on Euclid's part to define all of his terms, contrary to the modern view that in an *axiomatic system* (as opposed to a *model* of that system), certain primitive terms should be left undefined. The difficulty of defining all the terms in an axiomatic system is immediately clear given how obscure Euclid's definitions of terms such as, for example, "point," "line," "straight line," "surface," and "plane surface."

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3   3. H. P. Owen, *Conceptions of Deity* (London: Macmillan, 1971), 74.

What exactly does it mean, for example (in the case of Euclid's straight line) for something to be a "line which lies evenly with the points on itself"?[4] It seems as if this "definition" is only at all comprehensible if one already has a clear mental image of what a "straight line" is supposed to be. Thus the impetus in modern geometry, and modern mathematics more generally, is to leave primitive terms undefined, at least in terms of an axiomatic system itself (though not of course within models of that system).

The second discrepancy between Euclid's approach to axiomatization and the modern approach that is instructive with regards to Spinoza is the attitude towards axioms as *self-evident* truths, i.e. propositions that may be taken to be true without any need for a proof whatsoever. Of course, any axiomatic system in which anything is proved except for pure tautologies will have to have certain axioms which are simply assumed and are not provided with any proof. So far, the modern mathematician would agree with Euclid (and Spinoza). Where a modern mathematician would almost certainly disagree with Euclid, however, is the question of the *truth-status* of the axioms in question. While Euclid, Spinoza, and almost every other commentator before the 19th century saw these axioms as more or less self-evident, a modern mathematician would be more likely to see them as *merely hypothetical* statements, "assumed for the sake of argument," so to speak, but not necessarily true in any other context outside of the axiomatic system itself. It is these two discrepancies between the use of axiomatic systems as used by the likes of Euclid and Spinoza and the axiomatic systems in use by mathematicians today that this paper will especially focus on.

What has gone wrong, then, that Spinoza has been able to derive such seemingly implausible conclusions? I mentioned previously that the impetus to define all terms may prove

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4   4. Euclid, *Elements*, trans. Thomas L. Heath (New York: Dover Publications, 1956), 153.

problematic for Spinoza, just as it did for Euclid. Indeed, to a modern reader the very meaning of many of the definitions (especially the definitions of substance, attribute, and mode) may be quite obscure (e.g. "by mode I understand the affections of a substance, *or* that which is in another through which it is also conceived"[5]). However, the problem runs deeper than this. As Edwin M. Curley notes, some of the terms which are central to Spinoza's philosophy are not merely out of fashion in twentieth-century philosophy, but would be rejected by many philosophers of our times as meaningless. The term "substance" serves as a good example. Without delving too much into the philosophic specifics, it can safely be said that many contemporary philosophers would argue that the empiricist critique has more or less demonstrated the bankruptcy of the notion of an unknowable subject of predicates, which is arguably the way in which Spinoza uses the term "substance" in his work.[6] And though Spinoza's definitions of terms like "substance," "attribute," and "mode" closely resemble notions that were common currency among philosophers of his time, these superficial resemblances belie some very important distinctions.[7] The obvious solution might be to count Spinoza's original exposition as a single model of a more general axiomatic system in which primitive terms such as "substance," "attribute," and "mode" are simply left undefined. This solution would mirror the way in which Euclid's original exposition in the *Elements* has been updated in contemporary Euclidean geometry. However, there is at least one very important difference between Spinoza and Euclid that may not make this such a viable solution for the former. Unlike Euclid, who

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5   5. Spinoza, *Ethics*, 409.

6   6. Edwin M. Curley, *The Collected Works of Spinoza* (Princeton: Princeton University Press, 1985), 403-404.

7   7. Edwin M. Curley, *Spinoza's Metaphysics: An Essay in Interpretation* (Cambridge: Harvard University Press, 1969), 4-28.

never uses the definitions of any of his primitive terms in any of his proofs, Spinoza begins using the definitions of some of the most controversial of his primitive terms, such as Definition 3 ("substance") and Definition 5 ("mode"), right from the starting gate. Indeed, his first two propositions are proved *using nothing but these two definitions alone*. And these same definitions will play a crucial role in the demonstrations of all his propositions leading up to Proposition 15. This presents a very different case from Euclid, where no demonstration relies on definitions of terms alone and no definition of a primitive term ever appears in a demonstration at all. Thus, it seems as if an attempt to strip Spinoza's problematic terms of their definitions and recast them as undefined terms would demolish almost his entire line of argumentation in Section One of the *Ethics*. If one is disposed to doubt the soundness of Spinoza's arguments, then the fact that those arguments rest so crucially on such problematic definitions suggests at least one reason that they might have gone awry.

The other possible problem in Spinoza's use of the axiomatic method, from a modern eye, is the attitude he held regarding the relative truth-status of his axioms. Euclid and most of his commentators took the truth of the axioms (postulates) of Euclidean geometry to be self-evident (with the possible exception of Postulate 5). Spinoza's attitude towards his own axioms is somewhat less clear. On the one hand, he certainly believed that the *Ethics* demonstrated conclusively the truth of his propositions, rather than just the fact that they followed logically from a set of axioms. This would imply, given the truth-preserving nature of the axiomatic system, that he took the axioms to be clearly true, as well. However, as both Thomas Carson Mark and Edwin Curley note, it is a mistake to think that, when Spinoza designates something as an axiom, he really thinks that no one could question it and is not willing to listen to arguments about it. Indeed, the history of Spinoza's experiments with axiomatic exposition shows clearly

enough that he was prepared to be flexible, and that what at one stage was treated as an axiom, might at a later stage be treated as a proposition, if experience showed that his readers might resist the assumption. This consideration has led Jonathan Bennett to recommend viewing the *Ethics* as a "hypothetico-deductive" system, in which Spinoza "starts with general hypotheses, deduces consequences from them, and checks those against the data."[8] Bennett concedes, however, that Spinoza did not regard his axioms and definitions as *mere* hypotheses. He states that "Spinoza could—and I think would—say that although his system must work on untutored minds in a hypothetico-deductive manner, when the tutoring is completed the reader will see the starting point to be certain."[9] This again leaves Spinoza in an uncertain position with regards to how his arguments should be taken. It is not clear that, as Bennett asserts, even after we become "tutored" the axioms of Part One of the *Ethics* will become "self-evident" in any strict sense. Reasonable, perhaps, but probably not self-evident.

If, instead, we are to take the *Ethics* as a "hypothetico-deductive" system, then Spinoza's work becomes a fascinating toy system, but it is uncertain what relation this would have to the real world. In particular, under these circumstances readers would have absolutely no reason to accept either Spinoza's monism or his pantheism, unless by contingent chance they happen to accept all of his axioms (and of course also view his definitions as unproblematic). Given the dated conceptual framework that grounds Spinoza's arguments, it is not clear that many modern readers would do so.

Spinoza is probably unique among philosophers in his attempt to reduce his arguments to a purely axiomatic form. Despite his attempts to present the argument in a manner so as to avoid

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8   8. Jonathan Bennett, *A Study of Spinoza's "Ethics"* (Indianapolis: Hackett, 1984), 20.

9   9. Ibid, 21.

all error, however, it seems as if something has gone wrong with his arguments. Of course, not everyone might choose to think so. As mentioned at the beginning of the paper, some readers might choose to simply bite the bullet and accept Spinoza's rather surprising conclusions as true. As I have hinted in this paper, however, this is not the only possible response to Spinoza's arguments in Part One of the *Ethics*. Instead, Spinoza seems to have made some very definite missteps, both with regards to the definitions of his terms and his attitude towards the truth-status of his axioms, and these missteps might provide an opening with which to criticize Spinoza's conclusions without necessarily doubting the validity of the axiomatic system as a whole.