

Dionysios Anastasiou Anapolitanos, *Leibniz: Representation, Continuity, and the Spatio-Temporal*. Dordrecht: Kluwer Academic Publishers, 1999. Pp. xii + 195.

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Approaches to historical figures may be (very) roughly divided into three clumps. Internalist approaches feature close textual exegesis, analyzing, interpreting and interpolating various texts of the thinker, all in aid of careful exposition of his or her flow of thought; Don Rutherford's *Leibniz and the Rational Order of Nature* provides an exemplar here. Externalist approaches attempt to place the thinker in his or her intellectual milieu, paying careful attention to links of origin and consequence; Catherine Wilson's *Leibniz's metaphysics : a historical and comparative study* is an exemplar of this sort of work. Historicist approaches attempt to find contemporary relevance for aspects of the thinker's work, oftentimes extending and extrapolating elements of the original texts in consistent and coherent ways; Dionysios Anastasiou Anapolitanos's *Leibniz: Representation, Continuity, and the Spatio-Temporal* is an exemplar of this approach. Anapolitanos investigates Leibniz's writings on the continuum in an attempt not only to discover the nature of Leibniz's view of the issues, but also to assess his successes and failures in dealing with this difficult topic's inherent problems. Anapolitanos's conclusion is quite straightforward: Leibniz's own solution to the *labyrinthus continui* fails, but "without substantial modifications, his metaphysics could have allowed him to adopt a solution much closer to our modern conception of the problem." (p. xi) This is a bold claim, clearly revisionary, clearly historicist, perhaps anachronistic, but, if Anapolitanos can successfully make his argument, it is a useful and interesting point to add to contemporary Leibniz scholarship. In my view, the argument succeeds.

Anapolitanos brings several new aspects to his analysis of this old Leibnizian problem. First, he is well versed in modern mathematical and logical techniques. Although one typically runs the danger of anachronism when new techniques are brought to bear upon long-dead thinkers, such danger is *prima facie* mitigated when the techniques in question are those of mathematics and logic, and the thinker is Leibniz: This particular long-dead thinker still lives on in modern mathematics! Thus, when Anapolitanos's interpretation of Leibniz's writings on continuity finds therein evidential traces of modern notions such as "not only density, but also what we would today call sequential or Cauchy completeness" (p. 69), no surprise is

called for.

Secondly, Anapolitanos's long and careful development of an interpretation of Leibniz on *representation* is strongly informed by Wilfrid Sellars' work on 'indirect representation.' According to Anapolitanos, "this important subspecies" of representation "has been largely ignored", even though it "is crucial for the understanding of Leibniz's metaphysics of the continuous and the spatio-temporal" (p. ix). Sellars' work figures significantly in another area of the book: "I adopt, discuss, and expand the Sellarsian interpretation of Leibniz's reduction of phenomenal relations to representational facts of the world of monads as they represent one another." (p. ix) In addition to these two specific aspects, the work has a general Sellarsian flavor about it; I suspect that it started life as a dissertation for Sellars, from thence evolving into its present form.

Thirdly, Anapolitanos adopts as central a view he believes to be "accepted by quite a few Leibniz scholars" [Earman, Gale, Hartz and Cover, McGuire, and Winterbourne are cited], namely "that one can distinguish three levels in Leibniz's metaphysics":

They are the levels of the real, the phenomenal, and of the ideal. These three levels and their interplay constitute the backbone of the system. The tantalizing problem of the composition of the continuum contributed to the formation of such a tripartite system and gave it its special flavor. (p. 94)

It seems to me exactly right that, as Anapolitanos here states, the three levels and their interplay constitute the backbone of Leibniz's system. Whether the genesis of the tri-level system lies in the problem of the composition of the continuum, it is up to our author to demonstrate, as he himself duly notes in a number of places.

Several other general points about the work should be noted. First, Anapolitanos concentrates upon the "later" or "mature" Leibniz. Although he gives no specific date or year for when Leibniz's later, mature period might have begun, it is fairly clear that Anapolitanos thinks that it began roughly around the turn of the century 1700, which seems fair enough. Thus, we find copious reference to correspondence with de Volder and des Bosses, letters to Remond and Varignon, the *New Essays* and *Monadology*, and, what is crucial to his argument, the exchange with Clarke. Underlying his focus upon the later writings is Anapolitanos's central claim that Leibniz's views on the continuum changed over the years. Accordingly, after placing the principle of continuity's introduction in 1687, in the "Lettre of M.L....replique à la response du R.P.D. Malebranche" published in *Nouvelles de la république des lettres*, and providing suitable comment, Anapolitanos then focuses in turn upon the various changes in presentation of that principle over the ensuing thirty years.

The changes, as he demonstrates, are sometimes subtle, but always important.

Another general aspect of the book is Anapolitanos' use of Russell as a foil, both generally and specifically. For example, although he specifically refuses "to take sides in the continuing controversy concerning the priority of the logical over the metaphysical foundations of the Leibnizian system", it is clear that Anapolitanos rejects the Russellian view which favors priority for the logical. (p. 79) This rejection flavors the whole work. In other places, Russell is taken to task for specific views; at one juncture, for example, Anapolitanos rejects much of modern Leibnizian scholarship on continuity because of its Russellian taint:

Leibniz scholars in general, under Russell's influence, seem to be confused about continuity as extended to the level of the real. The ultimate reality, after all, is that of a *discrete* multitude of monads which are not spatially situated. Thus they recognize continuity of space and, of course, continuity of the spatially extended as definite Leibnizian doctrines, without paying much attention to whether or not the monadic reality is continuous in an analogous way. (p. 115, emphasis in original)

Much of Anapolitanos's work in Chapter III is aimed at explicating the way in which monadic reality, via representation, may be considered to involve an analogue of the ideal continuity of space.

Anapolitanos's corrective to Russell is to insist throughout his analysis upon the interplay among Leibniz' mathematical, philosophical and scientific thoughts and purposes. Russell, as is now agreed, insisted much too much upon the strictly logical genesis of Leibniz' system. Anapolitanos's perspective provides a full-spectrum, balanced view of Leibniz' system, a view denied to Russell by his logical blinkers.

The leitmotiv of Anapolitanos's analysis is found on pp. 78-93. There the overriding problem begins with a question posed by Russell: "How can that which is continuous consist of indivisible elements?" (p. 78) Anapolitanos puts the issue in his own terms: "We can see Leibniz's philosophical development as the struggle to combine both his pluralist and foundationalist tendencies into one metaphysics, which would accommodate at the same time the idea of the infinite divisibility of what is or appears to be extended." That is, Leibniz' philosophical development, in Anapolitanos's view, involved more than just Russell's plumped-for logic: "Leibniz's mature system was the result of a piecemeal process, involving *both* logical and metaphysical considerations in its formulation. We see the struggle between the pluralist and foundationalist tendencies as a particularly important part of that process." (p. 79-80, emphasis added)

On two other scores, one excusing, one not, Russell would seem to escape Anapolitanos's examination: first, that Russell had only a limited amount of the Leibnizian corpus to hand; secondly, that Russell apparently had no worked-out notion of any *developmental process* in Leibniz's thought. Surely this latter point could have provided a useful foil for Anapolitanos.

Of course, given the debt we all owe to Russell for bringing Leibniz back from the Land of the Living Dead, much may be forgiven!

The overall structure of the book is simplicity exemplified. Three longish chapters constitute the major bulk of its 195 pages, with a short preface, a respectably thorough bibliography of 155 items, and a quite useful index making up the rest. Each chapter is devoted to a single topic from among the book title's three: Chapter I provides 49 pages on representationalism, Ch. II, 44 pages on continuity; and finally, Ch. III, 80 pages on space, time, the spatio-temporal, and monadic reality. Let us take a brief look at each chapter in turn.

Anapolitanos begins his first chapter in a direct and straightforward way:

It is more or less generally accepted that one of the basic themes of the philosophy of the 17th century was *representationalism*, that is, that our epistemological participation in the world is by way of our *representing* it. (p. 1, emphases in original)

From this beginning, Anapolitanos moves into a discussion of representables, Cartesian representationalism, the Cartesian contrast between objective and formal reality (whose existence and relevance in Leibniz' thought he later persuasively argues), representations and relations (during which a Sellarsian account of the nature of relations is carefully developed) and, finally, indirect representations. This last discussion bears remarking.

For Leibniz, the 'real' consists solely of monads, "substantial undivided units in their different [representational] states" and "what each monad represents is all other monads as they represent"; "this situation forces us to admit that indirect representation is a dominant feature of the Leibnizian representational metaphysics." (pp. 20-1) Indirect representation is defined in the following way:

We say that a monad *A* *indirectly represents* a monad *B* or, more generally, an unspecified something *X*, if the representation of *B* or *X* in *A* is via a representation in *A* of a monad or assemblage of monads *C* as representing *B* or *X*. (p. 21)

Speaking crudely, Smith (let us say) indirectly represents Jones if Smith's Jones-representation is gotten from Doe's representing Jones. A *direct representing* would have Smith's Jones-representation as *not* coming via any third representation. This

mechanism allows the cashing in of phenomenal statements such as “b is linearly nearer to a than c is” for monadic representational facts such as “A represents B as representing C” and “C represents B as representing A” and “B does not represent A as directly representing C” and so on.

Leibniz’ mirror metaphor—“each monad is a living mirror of the universe according to its point of view” (G III 636)—is the well-known model for the representational mechanism. That the representational mechanism generates an infinite regress is exquisitely evident when the mirror model is taken seriously: the universe consists entirely of mirrors mirroring mirrors mirroring mirrors mirroring mirrors mirroring mirrors....ad infinitum. Moreover, the same infinite regress must needs arise in the case of self-representation, that is, when a monad reflects upon itself. Anapolitanos recognizes the seriousness of the difficulty, and spends some time teasing out how Leibniz most likely solved the problem. His proposed solution lies in the fact that, as Leibniz says, “we do think of many things all at once, but pay heed only to the thoughts that stand out most distinctly” since “if we were to take note of everything, we should have to direct our attention on an infinity of things at the same time” (NE 113; G, V, 103; Anapolitanos p. 23-4). The regress does not happen in fact because, first, attention is limited, and, secondly, after several ‘mirror reflections’ the representations become indistinct and confused.

At this point, Anapolitanos’s discussion quite naturally turns to perception, apperception, and distinct, confused, petite, and unconscious perceptions. The chapter ends with Anapolitanos highlighting the fact that much of his analysis reveals a “continuity of the gradation of perceptions or representations according to their distinctness or confusedness” (p.48)—which, appropriately enough, leads inevitably into the second chapter’s focus upon continuity itself.

The principle of continuity, according to Anapolitanos, is a consequence of the principle of the best. As Anapolitanos reconstructs it (p. 55), Leibniz’s argument runs like this:

1. God willed, with reason (= namely, that it *is* the best), to create the best of all possible worlds.
2. The best of all possible worlds is a world ordered in the best possible way.
3. A possible infinite world which is ordered in the best possible way has to be governed by the principle of continuity.
4. This world is infinite.
5. Therefore, this world has to be governed by the principle of continuity.

There are some obvious weaknesses to this argument, as Anapolitanos notes.

Thus, although Leibniz wishes continuity to follow from the best, and it does, he also wishes continuity to be metaphysically necessary, just as is the best. But

as we saw, [continuity's] derivation from the principle of the best involves a premise, premise 3, which is not metaphysically necessary, in the sense that discontinuities could be characteristics of the best possible way of ordering an infinitude of things. Premise 3, in other words, is of an architectonic nature and it is a postulate of an aesthetic rather than of a metaphysical origin, in that it pleases the metaphysician. (p. 56)

Although Anapolitanos's efforts to rescue Leibniz here are heroic—he even calls in Russell to back up the notion of “pleasing the metaphysician”—in the end his heroism fails, and Leibniz remains unrescued. Perhaps this is the reason that Leibniz made other efforts to ground the principle of continuity; Anapolitanos's discussion of one such attempt, the effort to find firm foundation in the principle of sufficient reason, would evidence just such a suggestion.

This chapter's heart is its nine-page discussion of density and sequential or Cauchy completeness. Anapolitanos begins by discussing “what the basic characteristics of continuity are, from a modern point of view” and proceeds from there to see “whether we can find traces of them in Leibniz's philosophical writings.” Indeed, such traces are found: “it will be argued that not only density, but also what we would today call sequential or Cauchy completeness, is in one sense present in Leibniz's treatment of the continuous.” (p. 69) Density seems obvious. All “Leibnizian continua which belong to the realm of well-founded phenomena” are dense. For example, consider the so-called continuum of beings:

According to Leibniz, beings form a continuum which is *actually* dense, because in between any two different elements of this continuum there exists a third, which is less perfect than the first one and more perfect than the second. Beings, as represented, form a continuous spectrum of organic wholes (plants, animals, etc.) following the continuous spectrum of the gradation of their dominant monads. (p. 73)

Cauchy completeness is a tougher sell. According to this notion, roughly, every convergent sequence has a unique limit of convergence. Density is not a consequence of Cauchy completeness; Cauchy completeness “is a property of continuity, describable by a universal second-order sentence, according to which every Cauchy sequence is convergent.” Unfortunately, “such a second-order sentence is not to be found anywhere in the Leibnizian writings”; obviously, “if it were, he would have used it.” (p. 74)

But what *is* there, is a series of cases in which Leibniz evidently uses what he

himself (mistakenly) takes for a second sort of ‘density’, one which, operationally, suggests strongly that he was, at least implicitly, well on his way to an early version of Cauchy completeness. Anapolitanos’s analysis focuses upon the details of the 1702 letter to Varignon and the 1715 letter to Bourguet, and, in the end, shows that Leibniz’s claims (in the letter to Varignon) about what happens to continuity near regions of “inflection or singularity”—namely that “species which border or dwell” in these regions are “bound to be ambiguous and endowed with characters related equally well to neighboring species”—cannot follow from density, but only from continuity in the form of Cauchy completeness. Similarly, Leibniz’s claim (in the letter to Bourguet) that “perhaps there are other beings between these two” does not follow from density, even though Leibniz thinks otherwise.

Although Anapolitanos’s argument is not completely compelling, it is interesting, highly suggestive, and makes a very good start toward being convincing.

Chapter III provides the payoff for all Anapolitanos’s hard work: showing how Leibniz’s metaphysics contained the elements of a better solution to the problem of the continuum than his own “impressive, but in a sense half-baked” proposal (p. 168). The central question is How is a continuum to be composed from unextended, “ultimate indivisible elements”? (p. 159) According to Anapolitanos, Leibniz’s solution intrinsically involved the three levels of his metaphysics, ideal, phenomenal, and real. First, continua are ideal, and “are not composed of constituent parts or constituent ultimate units” (p. 168). Secondly, “at the levels of the real or the phenomenal the ultimate substantial units or their representations cannot and do not compose genuine continua.” (p. 168) As Anapolitanos justly notes, this Leibnizian solution works: it satisfies the two major demands:

- (a) how we can build up a substantial, unitary, continuous whole out of indivisible, unextended, ultimate substantial units, and (b) how we can make sense of an ontology of basic unextended entities as giving rise to extended continuous aggregates. (p. 168)

Yet this solution is somehow disappointing; it is, as Anapolitanos remarks, “half-baked.” Nicely enough, though, Leibniz’s metaphysics is powerful enough, and has “enough room”, to provide a “finer solution, one with remarkable conceptual proximity to sophisticated modern ideas about the composition of the continuum.” And, most importantly, this is not an “anachronistic contention” (p. 168).

Anapolitanos’s intervention is subtle, but straightforward: he correctly notes that Leibniz chose as his overriding sign of continuity a property which is sufficient, but not necessary, namely, uninterruptedness. From this Leibniz made two inferences, the first valid, the second not. First, the requisite *ideal* unitary wholes

are everywhere uninterrupted, hence they are continua. Secondly, inferred Leibniz, since both well-founded *phenomenal* entities and *monadic* aggregates are not uninterrupted, they are not continua. This latter argument, however, does not go through: since uninterruptedness is only sufficient for continuity, but not necessary, its lack does not imply non-continuity. With this analysis in hand, Anapolitanos now makes his intervention.

Although he himself did not see it, Anapolitanos claims, Leibniz's metaphysics was fully equipped to provide a fuller, more satisfactory solution. In the first place, as the argument of Chapter II demonstrates conclusively, Leibnizian entities at all three levels provide structures that are *everywhere dense*. And density is a necessary, but not sufficient condition, of an entity's being continuous. Secondly, just insofar as the argument of Chapter II.C (examined above) goes through, these structures have (at least implicitly) sequential or Cauchy completeness, which is also a necessary condition of continuity. Taken together, density and Cauchy completeness are sufficient. Hence, Anapolitanos concludes, there are structures at each and every level of Leibniz's metaphysics which qualify as continua.

This is a very, very neat (not to mention, congenial) argument. It typifies the whole of Anapolitanos's book. Anapolitanos reads Leibniz intelligently, sympathetically, and with an eye toward eliciting the best contained therein, at the same time providing us with an account of a Leibniz still alive, still relevant to our contemporary world. For these reasons, Anapolitanos's book belongs in the library of every serious Leibniz scholar.

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Notes

¹The book appears in Kluwer's *Science and Philosophy* series, whose role is to provide "a forum for contemporary analysis of philosophical problems which arise in connection with the construction of theories in the physical and the biological sciences." Moreover, these volumes "will include or depend significantly upon an analysis of the history of science, recent or past."

²One thinks immediately in this instance of Michael Friedman's trenchant analysis of the relation between logic and geometry in Kant's Aesthetic, *Kant and the Exact Sciences*, (Cambridge, Mass. : Harvard University Press, 1992).

³Imagine yourself standing with a mirror behind you, and another mirror in your hand. Look into the mirror behind you, via the mirror you're holding: the stack of mirrors containing your image—as well as their own!—fades away into infinity. What this might mean in theoretical physics is discussed in Gale, "Leibniz, Chew, and Wheeler on the Identity of Physical and Philosophical Inquiry", *Review of Metaphysics* 29: 322-333 (1975).

⁴Russell, B. *A Critical Exposition of the Philosophy of Leibniz*, Eighth impression, (London: G. Allen and Unwin Ltd., 1975), p. 64.

⁵They are thereby only *potentially* infinite, since they may be decomposed into as many parts as one might think—but this decomposition (or cutting) takes place only posterior to their existence.

⁶Uninterruptedness is an Aristotelian notion. Anapolitanos hypothesizes that Leibniz was blinded by it, due to the long "centuries of antagonism" between monistic and pluralistic theories. (p. 170)

⁷At the level of the real, monads are carriers of representational structures which form "real aggregates which are everywhere dense." (p. 170) At the level of well-founded phenomena exist representational structures isomorphic to those at the real. (p. 170)