

# Remarks on Bolzano's Conception of Necessary Truth

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## Introduction

In §182 of the *Theory of Science*,<sup>1</sup> Bolzano defines necessity and related modal notions in terms of purely conceptual truth. Once one is familiar with Bolzano's system, these definitions are easy enough to understand, and indeed remarkable for their precision. What is more difficult to understand is why Bolzano thought them to be *acceptable* definitions, for it seems safe to say that contemporary readers will find it hard to see why, e.g., Bolzano's definition of 'necessity' should be regarded as a definition of *necessity*. The goal of this essay is to provide an interpretation that will allow us to see why Bolzano thought his definitions did indeed capture the modal notions at which he aimed. Though I shall raise some questions and possible objections along the way, it is not my intention here either to defend or systematically evaluate Bolzano's theories. Rather, I aim simply to present them as clearly and completely as possible so that others may make up their own minds about whether they contain anything of value.

The most thorough discussion to date of Bolzano's conception of necessity is to be found in Mark Textor's book *Bolzano's Propositionalism*.<sup>2</sup> Though it shall emerge in the course of this paper that I disagree with a number of Textor's conclusions, I would like to emphasize that I found in his work a great number of acute insights into Bolzano's treatment of modality. At bottom, I believe many of our differences of opinion stem from a difference of perspective. Where Textor assesses Bolzano's theories in contemporary terms, asking whether they can contribute anything to current debates, my interest is more historical. Rather than seeing in Bolzano's treatment of modality a series of unsatisfying answers to contemporary questions, I look upon it as a highly interesting attempt to deal with eighteenth-century problems.

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<sup>1</sup>Bernard Bolzano, *Wissenschaftslehre* [WL] (Sulzbach, 1837); new edition by J. Berg in the *Bernard Bolzano-Gesamtausgabe* [BBGA], Series I, Vols. 11/1-14/3 (Stuttgart-Bad Cannstatt: Frommann-Holzboog, 1985-1999). All references to this work will be by section number and, where appropriate, by volume and page number, following the pagination of the 1837 edition, e.g., WL, §24 [I.108].

<sup>2</sup>Berlin: De Gruyter, 1996, especially chapters 5 and 6. Shorter discussions may be found in E. Morscher, "'Philosophische Logik' bei Bernard Bolzano," [1974] reprinted in Edgar Morscher, *Studien zur Logik Bernard Bolzano's* (St. Augustin: Academia, 2007), pp. 169-197 and E. Casari, "Remarks on Bolzano's modalities," *Atti del Convegno Internazionale di Storia della Logica*, San Gimignano 5-8 dicembre 1987 (Bologna: CLUEB, 1989), pp. 319-322.

What Bolzano says about modality in the *Theory of Science* is at best incomplete. Some fundamental questions are not addressed at all, others at best sketchily. Moreover, the presentation is not up to the high standards Bolzano himself set and frequently met. It is thus necessary to look at his other writings in order better to understand what is said in the *Theory of Science*, principally to his *Treatise of the Science of Religion*, but also to a number of other published and unpublished writings where he discusses modality in greater depth and detail.<sup>3</sup> This being said, my focus will be on the definitions set out in the *Theory of Science*, and the other texts will be drawn upon principally to illuminate that account. I begin with a brief review of some of the basic concepts of Bolzano's logic, including his definition of necessary truth.

## Bolzano's definitions

The starting point of Bolzano's presentation of logic is the notion of a *proposition in itself*.<sup>4</sup> One of the best presentations of Bolzano's conception is due to Wolfgang Künne:

[Bolzano] takes the concept of a proposition [in itself] to resist analysis or conceptual decomposition (*Erklärung*), but there are other ways of "achieving an understanding (*Verständigung*)" of a concept. Consider a report of the following type: "Johanna said that copper conducts electricity, Jeanne said the same thing, though in different words, and Joan believes what they said." Here a that-clause is used to single out something that is (1) said by different speakers, (2) distinct from the linguistic vehicles used for saying it, and (3) believed by somebody. "Now, this is the sort of thing I mean by proposition," Bolzano would say, "propositions are sayables and thinkables, possible contents of sayings and thinkings, that can be singled out by that-clauses."<sup>5</sup>

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<sup>3</sup>Bernard Bolzano, *Lehrbuch der Religionswissenschaft* [RW], 4 Vols. (Sulzbach: Seidel, 1834); new edition by J. Louzil in the **BBGA**, Series I, Vols. 6/1-8/4 (Stuttgart-Bad Cannstatt: Frommann-Holzboog, 1994-2006). Other important sources include: *Dr. B. Bolzano und seine Gegner* (Sulzbach, 1839; new edition in **BBGA**, I.16/1); *Bolzano's Wissenschaftslehre und Religionswissenschaft in einer beurtheilender Uebersicht* (Sulzbach, 1841); *Paradoxien des Unendlichen*, ed. F. Prhonsky (Leipzig, 1851); *On the Mathematical Method and Correspondence with Exner* [MM-EX], ed. and tr. P. Rusnock and R. George (Amsterdam: Rodopi, 2004); as well as Bolzano's notebooks: *Philosophische Tagebücher*, **BBGA**, Series II B, Vols. 16-18.

<sup>4</sup>WL, §19.

<sup>5</sup>Wolfgang Künne, "Analyticity and Logical truth: from Bolzano to Quine," pp. 184-249 in M. Textor, ed., *The Austrian Contribution to Analytic Philosophy* (London: Routledge, 2006), p. 184.

As abstract objects, propositions in themselves, unlike trees and fish, do not exist. In Bolzano's preferred terminology, they lack the attribute of actuality [*Wirklichkeit*]. Nonetheless, Bolzano is committed to the existence of propositions in themselves in the mathematical sense; that is, he maintains that there are propositions, just as, e.g., there are continuous, nowhere differentiable functions. The distinctions required to make sense of these claims are set out in §§137 and 142 of the *Theory of Science*. There, Bolzano explains that when he says that there are propositions in themselves, this should be taken to mean that the idea [proposition in itself] has at least one object.<sup>6</sup> In Bolzano's preferred idiom, this would run:

The idea [proposition in itself] has objectuality.

Thus this sort of existence claim concerns ideas of objects rather than the objects themselves. By contrast, Bolzano takes a claim such as 'Propositions in themselves do not really exist', to be an assertion not about the idea [proposition in itself], but rather about propositions. It would be better expressed as follows:

Propositions in themselves have lack-of-actuality.

In addition to propositions in themselves, or *objective* propositions, Bolzano also speaks of *thought* or *subjective*, as well as *expressed* propositions. For every subjective proposition, Bolzano maintains, there is a corresponding objective proposition, which can be said to be the *matter* of the former. Similar distinctions apply to other entities studied in logic, such as concepts or arguments.

All propositions are complex, according to Bolzano, and the sub-propositional parts he calls *ideas in themselves*.<sup>7</sup> Some ideas are in their turn complex, but others, the *simple* ideas, have no parts at all.<sup>8</sup> Again, some ideas have objects (e.g., [mammal]) and, among those that do, some have only one (the so-called *singular* ideas; e.g., [even prime number]).<sup>9</sup> Bolzano thinks that there is a very special kind of idea that combines the attributes of simplicity and singularity. Appropriating Kant's term for his own purposes, he calls them *intuitions*.<sup>10</sup> Bolzano thought that

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<sup>6</sup>Here, I adopt the device, widely used in the literature on Bolzano, of employing square brackets to form designations of the ideas or propositions expressed by a given verbal expression. Single quotes are used to indicate mention of linguistic expressions. These conventions are not applied to quotations from Bolzano's writings.

<sup>7</sup>WL, §46.

<sup>8</sup>WL, §61.

<sup>9</sup>WL, §68.

<sup>10</sup>WL, §§72-77. Intuitions are also discussed at length in Bolzano's correspondence with Exner (MM-EX). See also Rolf George, "Intuitions: the theories of Kant and Bolzano," pp. 319-353 in M. Siebel and M. Textor eds., *Semantik und Ontologie* (Frankfurt/Lancaster: Ontos Verlag, 2004); Paul Rusnock and Rolf George, editors' introduction to MM-EX, especially pp. 14-20; Textor, *Bolzanos Propositionalismus*, especially part I.

his objective definition also picked out a very important natural kind of *subjective* ideas, those involved in the most basic kind of experience, that in which the mind simply registers the occurrence of some change within itself.

When, for example, I am near a rose, various changes may occur within me, changes I call seeing certain colours, smelling various odours, etc. Although these changes are often described in general terms, Bolzano argues, it is clear that they are particulars:

Someone brings a rose near us. We see—not red in general, but this red present in the rose. We smell, not odour in general, but rather only this pleasant fragrance, which just this rose has; when we are injured by one of its thorns, we feel not pain in general, but rather this determinate pain.<sup>11</sup>

Intuitions represent these particulars. They are thus not general ideas such as [red] or [pain], but rather singular. But the singular representation does not occur through complexity, Bolzano argues, as is the case, for example, with the idea [the man that corrupted Hadleyburg]. Rather, intuitions are *simple* ideas that represent particulars.<sup>12</sup> In perception, the mind is aware in the first instance not of redness or of pain, but rather merely of a *this*. Only afterwards does it make judgments about these various sensations (e.g., that one is a pain and another red, etc., or that they were both caused by one and the same physical object) and construct on this basis a set of judgments about the external world.<sup>13</sup>

An idea that is not an intuition and numbers no intuitions among its parts is called a *concept*, and a proposition containing only concepts is called *purely conceptual*. Propositions containing intuitions, by contrast, are called *intuitional*, *empirical* or *perceptual*.<sup>14</sup>

We arrive, finally, at Bolzano's definition of necessary truth. To begin with, Bolzano claims that the term 'necessary', when taken in its strict sense, always qualifies actual existence:

I think that every 'must', when it is taken in the stricter sense, is a 'must-exist', or a 'has to exist' . . .<sup>15</sup>

But the term 'necessary' is also used in an improper sense, Bolzano thinks, where it is applied to propositions.

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<sup>11</sup>From Bolzano's letter to Exner of 9 July 1833 (MM-EX, p. 96).

<sup>12</sup>In this respect, they are similar to what Russell called "logically proper names" (see, e.g., *The Philosophy of Logical Atomism* (Chicago: Open Court, 1998), p. 61 ff.), though Russell's definition is linguistic while Bolzano's is framed in terms of ideas in themselves.

<sup>13</sup>Cf. WL, §303.

<sup>14</sup>WL, §133.

<sup>15</sup>WL, §182 [II.229-230].

Whenever a proposition ‘A has b’ is a purely conceptual truth, it is customary to say that the attribute b belongs *necessarily* to object A regardless of whether or not this object, and hence that attribute, is actual. Thus we say that every equation of odd degree necessarily has a real root, although neither equations nor their roots are something that exists.<sup>16</sup>

Since Bolzano maintained that all propositions stand under the form ‘A has b’,<sup>17</sup> his remarks here are quite general in scope. It thus seems reasonable to say that for Bolzano necessary truth is simply purely conceptual truth.<sup>18</sup>

This essay deals exclusively with Bolzano’s conception of necessary truth, reserving discussion of necessary existence for another occasion.

## The ground of necessity

Bolzano, as we have seen, defines necessity in terms of purely conceptual truth. This raises the question of what purely conceptual truth has to do with necessity. Unfortunately, in the *Theory of Science* at least, Bolzano does a miserable job of explaining what he takes the connection to be, apparently assuming it would be obvious to his readers. For his twentieth- and twenty-first-century readers, it seems safe to say that he was profoundly mistaken in this expectation. This section will attempt to fill in what Bolzano left out there by drawing on his other writings.

In the note to §182 of the *Theory of Science*, Bolzano writes:

The reader will gather for himself why I spoke only of purely conceptual truths, and not truths in general, in the attempted definitions of the concepts of necessity, possibility, and contingency. . . . Only an existence which follows from purely conceptual truths (or the assertion of which is a purely conceptual truth) can be called necessary existence, and only the attributes which belong to an object on account of certain purely conceptual truths can be called necessary attributes. Indeed, it is only for this reason that one calls these truths necessary. Had I said that everything which follows from some truth (even if it is

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<sup>16</sup>WL, §182.4 [II.231-232].

<sup>17</sup>WL, §127; the defense of this thesis requires some rather ingenious paraphrases.

<sup>18</sup>Cf. WL, §182.6. Elsewhere, Bolzano gives a different definition, according to which both purely conceptual truths and the propositions that are deducible from them count as necessary. See, e.g., *Uebersicht*, p. 52; WL, §119 [I.563]. Mark Siebel (“Variation, derivability, and necessity,” *Grazer philosophische Studien* 53 (1997) 117-137) has pointed out a variety of problems with this wider definition. I shall here examine only the definition given in §182, which does not involve deducibility.

not a purely conceptual truth) was necessary, then everything which is would have to be called necessary.<sup>19</sup>

As Edgar Morscher pointed out in an essay of 1974, the reader does *not* gather for himself why the purely conceptual truths are singled out here.<sup>20</sup> We can certainly agree with Bolzano that something less than the collection of all truths is required if there is not to be a collapse of modalities, but why it should be precisely the purely conceptual truths receives no explanation whatsoever here.

Some twenty years later, Mark Textor arrived at a similar conclusion:

Bolzano is right to claim that the concept of truth as such does not suffice to draw the intended [modal] distinctions. But why does Bolzano fall back precisely on the concept of conceptual truth for this purpose? We find no answer from Bolzano to this question.<sup>21</sup>

Thinking that Bolzano had no position of his own, Textor offered the following conjecture:

The truth of a purely conceptual truth depends ultimately on conceptual basic truths, and the truth of the latter can only depend upon the concepts of which they consist. But if the truth of a proposition ultimately depends only on its components, then it is unthinkable that it is contingently true.<sup>22</sup>

Earlier, he had set out this position in somewhat greater detail:

According to my interpretation, Bolzano's theory of necessary truth is based upon parts of his theory of the objective grounds of truths.

[...]

For Bolzano, the objective ground of a conceptual truth can only lie in other conceptual truths. The ultimate objective grounds of a conceptual truth are conceptual basic truths, and the truth of the conceptual basic truths can only be grounded in the properties of the concepts of which they are composed. If the truth of a proposition ultimately depends only upon the attributes of its components, then it is inconceivable that it is contingently true. If a truth *x* is a conceptual truth, then it is inconceivable that things stand otherwise than *x* states.<sup>23</sup>

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<sup>19</sup>WL, §182, note [II.234]; cf. *Paradoxien des Unendlichen*, §14.3; *Uebersicht*, p. 62.

<sup>20</sup>“Philosophische Logik’ bei Bernard Bolzano,” p. 182, note 50.

<sup>21</sup>Textor, *Bolzano's Propositionalism*, p. 285.

<sup>22</sup>Textor, *Bolzano's Propositionalism*, p. 285.

<sup>23</sup>Textor, *Bolzano's Propositionalism*, p. 236-237.

Textor's interpretation is, as I am sure he would be the first to admit, speculative, and receives little if any support from Bolzano's texts.<sup>24</sup> For Bolzano never appeals to the relation of ground-consequence when setting out his account of necessity in §182 of the *Theory of Science*,<sup>25</sup> and never once speaks of necessity in his lengthy discussion of the ground-consequence relation.<sup>26</sup>

The main piece of textual evidence Textor cites comes from §42 of the *Theory of Science*, where Bolzano writes:

If [a] proposition [...] consists merely of concepts, as for example the proposition that virtue deserves respect, or that the sum of any two sides of a triangle is longer than the third, etc., then its truth and falsity will merely depend upon the constitution [*Beschaffenheit*] of these concepts; . . . It is different with judgments that contain intuitions of objects existing outside of your representation. These may be of one of the two following kinds: *this* (what I see here now) *is red*, where the subject idea of the proposition is a simple intuition (this) and the predicate idea a concept (red); or propositions of the following kind: "the same object which produces within me the intuition A is also the cause of the intuition B which I have." The following judgment is of the latter kind: "the pleasant fragrance which I experience just now is caused by the red object which I see before me (i.e., by the rose)." Judgments of the first kind cannot possibly be in error. . . . However the truth of judgments of the second kind. . . does not merely depend upon your ideas. . . , but also upon the constitution of the external objects which are represented by them.<sup>27</sup>

Textor appears to cash out Bolzano's talk of dependence here in terms of the relation of ground to consequence [*Abfolge*], which holds between true *propositions*. This seems fully justified to me, especially in view of what Bolzano says elsewhere. In an early essay, for example, he writes:

That a certain predicate belongs to a certain subject depends as much on the subject as on the predicate and its properties. Now if the latter is a composite concept, then its properties depend on those individual

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<sup>24</sup>This much seems clear from what Textor himself writes on p. 285 (emphasis added): "Even though Bolzano gives no informative answer to our question, he might have given the following one."

<sup>25</sup>The ground-consequence relation is mentioned in passing in the note to **WL**, §182 [II.237], but this is clearly an aside.

<sup>26</sup>**WL**, §§162, 198-221.

<sup>27</sup>**WL**, §42 [I.180-181].

concepts of which it is composed and on their properties, i.e., on those judgements which can be formed about those concepts. Therefore the truth of a judgment whose predicate is a composite concept depends on several other judgements and so... it is clear that it cannot be an axiom [*Grundsatz*].<sup>28</sup>

We observe here that talk of the dependence of the truth of a judgment (its predicate belonging to its subject) on the properties of its constituents is replaced by talk of relations of dependence between *judgments*.<sup>29</sup>

Similarly, in §203 of the *Theory of Science*, we read:

[W]hen we say that the ground of why certain ideas can be combined to form a true or a false proposition lies in the nature of these ideas themselves, we mean only that the ground of the truth that this proposition is true or false lies in the various truths concerning the nature of the ideas of which it is composed. Thus here too the name of ground is applied only to truths.<sup>30</sup>

But if this is so, Textor's proposal cannot be extended to cover *all* purely conceptual truths and, in particular, cannot be applied to purely conceptual *basic* truths.<sup>31</sup> To see why this is so, let us begin by noting that if we wanted to say that the ground of a supposed basic truth lay in the *properties* of the concepts of which it is composed, this could only be allowed as an improper manner of speaking. For the terms of the ground-consequence relation are always *truths*.<sup>32</sup> Strictly speaking, then, as Bolzano himself points out, we would have to say that the ground lies in *truths* stating that the components of an alleged basic truth have certain properties:

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<sup>28</sup>*Beyträge zu einer begründeteren Darstellung der Mathematik* (Prague, 1810), I, §20. Eng. tr. by S. B. Russ in *The Mathematical Works of Bernard Bolzano* (Oxford University Press, 2004), p. 117. Cf. **WL**, §350 [III.401-402].

<sup>29</sup>In 1810, Bolzano had not yet hit upon the concept of a proposition in itself, and still spoke of judgments.

<sup>30</sup>**WL**, §203 [II.355].

<sup>31</sup>*Grundwahrheiten*; in the *Beyträge*, axioms [*Grundsätze*] are also expressly excluded. In the second, unpublished installment of the *Beyträge* ("Allgemeine Mathesis," I, §13 [**BBGA** II.A.5, p. 25]), Bolzano is even more explicit on this point: "With genuine axioms [*Grundsätze*], no ground is thought why the predicate belongs to the subject. For this ground would have to be *another* judgment. Now one might well counter that the ground of why the predicate belongs to the subject may lie in the subject and predicate themselves. But with a little reflection one will easily recognise that if this ground does not lie in one or several new judgments, the expression 'the ground lies in the subject or the predicate' just says: it's that way because that's the way it is, or the ground why this predicate belongs to this subject lies in the fact that this predicate belongs to this subject, i.e., it is grounded in itself, i.e., in other words, it has no ground."

<sup>32</sup>**WL**, §203.

Some might well expect us to interpret the expression that a proposition contains its ground within itself to mean that the ground of this proposition lies in the attributes of the *concepts* of which it is composed. This might well be correct, provided that we think of these attributes as being expressed by means of *truths*. But in that case, the ground of the truth of the proposition would lie in these truths rather than in the concepts.<sup>33</sup>

But now our putative basic truth *would* have a ground in other truths, and thus not be basic after all.<sup>34</sup> In general, it seems clear that an attempted explanation along the suggested lines will inevitably lead to an infinite regress—for the truths stating the attributes of the concepts contained in a given truth would themselves have to be purely conceptual truths (since Bolzano maintains that the grounds of purely conceptual truths are themselves purely conceptual), and we would then have to inquire into *their* ground, and so on.

Nor do I think it would be of any help to appeal to some other notion of dependence, since it seems to me that, speaking more loosely, one could say on Bolzano's principles that the truth of *all* propositions (intuitional as well as conceptual) depends only upon the attributes of their constituents. For Bolzano says that a proposition [A has b] is true if every object standing under the idea [A] has an attribute standing under the idea [b].<sup>35</sup> But he also claims that the extension of an idea is one of its attributes, and an *inner*, or non-relational, attribute at that.<sup>36</sup> Thus he will not permit us to say that an empirical proposition like [Some Greeks are philosophers], though true, *could have* been false because, say, the idea [Greek] might have had a different extension than it does. For in that case, we would have not the same idea with a different extension, but rather a different idea. But if the extensions of ideas are counted among their attributes, and the truth of any proposition depends only upon the extensions of its subject- and predicate-ideas, why should we not say that the truth of an intuitional proposition also depends only on the attributes of its constituent ideas?

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<sup>33</sup>WL, §204, note. Cf. WL, §45 [I.208-209], where Bolzano considers Krug's claim that everything has a ground. He remarks: "...the demand that we posit nothing without a ground is too general. For we cannot always adduce a ground; indeed in some cases there is no ground. Krug himself admits (*Log.*, §20, note 4) that we may be immediately aware of the agreement of certain of our concepts, and thus require no other ground for their combination. Indeed, he goes so far as to say that the ground lies in the combined concepts themselves. But is it not an improper way of speaking when one says that something is its own ground? Rather than saying that the ground of a truth lies in itself, should we not say that it has no ground, and is a basic truth?"

<sup>34</sup>Bolzano's stated position is that basic truths *have no ground*. See, e.g., WL, §214.

<sup>35</sup>WL, §§28 [I.124], 131 [II.26-27]; MM-EX, p. 167.

<sup>36</sup>WL, §66.4.

Thus I cannot agree with Textor's proposed explanation of the ground of necessary truth. Nor do I think speculation is warranted on this matter. For even though Bolzano's presentation in the *Theory of Science* provides us with no information on this subject, there are sufficient indications elsewhere of what he took the connection between purely conceptual truth and necessity to be.

Perhaps the clearest expression of Bolzano's views on this question occurs in a manuscript entitled "Differences between Leibniz's views and my own."<sup>37</sup> Leibniz, we recall, had claimed that there is a fundamental division between truths of reason and truths of fact, or between the eternal verities and the rest.<sup>38</sup> The former are necessary, true in all possible worlds, while the latter are contingent, true in some worlds (including this one) but not in all. The necessity of the eternal verities is explained by their not being determined by God's arbitrary choice:

[T]he eternal truths exist [*subsistent*] by their nature, and not by an arbitrary choice of God.<sup>39</sup>

To deny this, as Leibniz argues at some length, is to land oneself in all sorts of theological absurdities. Things would be good only because God arbitrarily decided so. He could, for instance, have made murder good had it so pleased him. This, Leibniz notes, would remove all reason to praise God:

[W]hen we say that things are not good by any rule of excellence but solely by the will of God, we unknowingly destroy, I think, all the love of God and all his glory. For why praise him for what he has done if he would be equally praiseworthy in doing exactly the opposite? [...] This is why I find entirely strange, also, the expression of certain other philosophers who say that the eternal truths of metaphysics and geometry, and consequently also the rules of goodness, justice, and perfection, are merely the effects of the will of God; while it seems to me that they are rather the consequences of his understanding, which certainly does not depend upon his will any more than does his essence.<sup>40</sup>

From his essay, we gather that Bolzano is in broad agreement with Leibniz's explanation of the necessity of the eternal verities, but he makes two significant

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<sup>37</sup>"Verschiedenheiten zwischen Leibnitzens und meinen Ansichten," *Philosophische Tagebücher* 1827-1844, **BBGA**, IIB.18/2, p. 37-47.

<sup>38</sup>See, e.g., *Monadology*, no. 33.

<sup>39</sup>*Theodicy*, tr. E. M. Huggard (La Salle, IL: Open Court, 1993), §184 (p. 244).

<sup>40</sup>"Discourse on Metaphysics," §2; quoted after G. W. Leibniz, *Philosophical Papers and Letters*, ed. and tr. L. Loemker, 2nd ed. (Dordrecht: Reidel, 1970), p. 304.

revisions. First, he speaks not of eternal verities but rather of purely conceptual truths.<sup>41</sup> Second, he claims these truths to be independent not only of God's will but also of His understanding:

I agree completely with Leibniz when he claims that the truth of laws and Ideas does not depend on God's will. . . ; but when he adds that the necessary truths depend only on God's understanding, I contest this as well, and indeed affirm the exact opposite. It is not the case that  $2 \times 2 = 4$  because God thinks so; rather, because  $2 \times 2 = 4$ , God thinks so.<sup>42</sup>

Leibniz had used the distinction between what depends upon God's will and what depends upon His understanding to rebut Bayle's objection that God, if bound by the eternal truths, was subject to a kind of fate:

This so-called *fatum*, which binds even the Divinity, is nothing but God's own nature, his own understanding, which furnishes the rules for his wisdom and his goodness; it is a happy necessity, without which he would be neither good nor wise. Is it to be desired that God should not be bound to be perfect and happy? Is our condition, which renders us liable to fail, worth envying? And should we not be well pleased to exchange it for sinlessness, if that depended upon us? One must be indeed weary of life to desire the freedom to destroy oneself and to pity the Divinity for not having that freedom.<sup>43</sup>

Thus, even though God is constrained by the eternal truths, the constraint comes from within, and this is perfectly compatible with the highest kind of freedom.<sup>44</sup>

Bolzano offers a similar, but subtly different, defense:

When Leibniz says that the so-called fate, which binds even the divinity, is nothing other than God's own *nature*, His own *understanding*, I say, on the contrary, that the purely conceptual truths are this fate, insofar as they express not God's holiness, but other things.<sup>45</sup>

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<sup>41</sup>"Verschiedenheiten," **BBGA** IIB.18/2, p. 46 (quoted below, p. 1). Cf. **RW**, I, §90.11 (**BBGA**, I.6/2, p. 29; Eng. tr. in *Selected Writings on Ethics and Politics* [**EP**], ed. and tr. P. Rusnock and R. George (Amsterdam: Rodopi, 2007) p. 213-214).

<sup>42</sup>"Verschiedenheiten," **BBGA** IIB.18/2, p. 44. Cf. p. 45: "I must disagree with Leibniz [*Theodicy*, §§184, 189.] when he will not concede to the Scotists that certain eternal truths would still subsist even if there were no understanding and no God." See also **WL**, §25 [I.115].

<sup>43</sup>*Theodicy*, §191 (p. 246-247). Cf. §228.

<sup>44</sup>Cf. *Theodicy*, response to objection VIII (p. 386).

<sup>45</sup>"Verschiedenheiten," **BBGA**, IIB.18/2, p. 46. For recent criticism of Bolzano's views, reminis-

On Bolzano's account, the purely conceptual truths (with the important exception of those expressing God's holiness) indeed constrain God, and are not determined by God's arbitrary choice.<sup>46</sup> But even though the purely conceptual truths which express God's holiness do not *constrain* God in the same way (are not his *fate*), they are equally necessary in Bolzano's eyes, since God can no more arbitrarily decide whether to be holy or unholy than he can choose to make an equilateral right-angled triangle.<sup>47</sup>

Contingency, for Bolzano, seems always to be the result of free, or indeterminate, choice.<sup>48</sup> Necessity, correlatively, is rooted in independence of the free choice of any being, including God.<sup>49</sup> Clearly, Bolzano thinks that the truth or falsity of a proposition does not depend upon the arbitrary choice of any being if and only if it is purely conceptual. His modern readers may well be dissatisfied with this bare claim. They might ask, in particular, why it is precisely the purely conceptual propositions whose truth or falsity is not conditioned by the free choice of any being.<sup>50</sup> As far as I can tell, Bolzano simply takes this as fundamental, something which neither requires nor admits of further explanation. In the conclusion, I shall sketch an argument of my own in support of the claim that only purely conceptual truths are necessary.<sup>51</sup> I am aware of no compelling argument for the converse, however. In saying this, I remind my readers that my aim in this paper is to present Bolzano's views, not to defend them.

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cent of Bayle's objection to Leibniz, see Dariusz Lukasiewicz, "Logical and metaphysical assumptions of Bernard Bolzano's Theodicy," *Forum Philosophicum* 12 (2007) 33-56, esp. p. 51 and p. 54.

<sup>46</sup>Lukasiewicz ("Logical and metaphysical assumptions of Bernard Bolzano's Theodicy," p. 51) comes to a similar conclusion, but he does not distinguish between necessary and contingent truths in Bolzano's sense. On his interpretation, God is equally constrained by all truths, regardless of whether they are purely conceptual or not. Based on the texts I have cited, I do not think this interpretation is correct. Indeed, what Bolzano says about conceptual truths expressing God's holiness seems to me to indicate that not even all purely conceptual truths can be said to contribute to the "program" God is supposed to be obliged to follow in the way Lukasiewicz seems to suppose.

<sup>47</sup>Recall that Leibniz, too, held that God's essence did not depend upon his will ("Discourse on Metaphysics," §2; quoted above, p. 1).

<sup>48</sup>*RW*, I, §76, note 2; cf. *Beiträge*, I, §13.

<sup>49</sup>If Bolzano only speaks of God and not of other beings in the above citations, I believe this is because, like Leibniz, he is contemplating God's situation prior to the creation.

<sup>50</sup>This objection was raised by an anonymous reviewer for this journal.

<sup>51</sup>Below, p. 1.

## What kind of necessity?

Mark Textor, who evaluated Bolzano's theory as an account of *metaphysical* necessity and related notions, deemed it to be a failure.<sup>52</sup> Mark Siebel, who weighed Bolzano's theory as an account of *logical* necessity, also found it wanting.<sup>53</sup> If one accepts the premise of either of these assessments, it is difficult to disagree. For if it was intended to capture the notion of metaphysical or logical necessity, Bolzano's definition is not only flawed but flawed in ways that should have been obvious to Bolzano himself. To take but one example, Bolzano claims that any actual object that can be uniquely represented by a pure concept exists necessarily.<sup>54</sup> At the same time, he claimed that the (actual) universe is such an object.<sup>55</sup> It follows immediately that the actual universe exists necessarily—not a promising start for a theory of metaphysical or logical necessity. Moreover, it is not at all clear why, if we are speaking of metaphysical or logical necessity, an actual object that is uniquely represented by some pure concept should exist necessarily. Even supposing that in the entire history of the universe there happened to be only one A (where [A] is some pure concept, say, [red triangle with sides in the ratio 3:4:5]), it is surely conceivable in many cases that there *might have been* two or more. Why should Bolzano think that (metaphysical or logical) necessity is in play here? Given their premises, then, I agree entirely with the judgments of Textor and Siebel: if Bolzano's definition was intended to capture metaphysical or logical necessity, it fails miserably.

The obviousness of this failure, however, suggests that Bolzano may not have been aiming at metaphysical or logical necessity at all, and a variety of his remarks add weight to this conjecture. Already in §182 of the *Theory of Science*, where Bolzano sets out his definitions, he distinguishes metaphysical necessity (along with physical, psychological, etc., necessity) as a species of necessity in general.<sup>56</sup> Also, in a manuscript entitled “Improvements and additions to the Logic [i.e., the *Theory of Science*],” Bolzano considered narrowing his concept of necessity, writing:

*Possibility, necessity, etc.* Perhaps it would not be inappropriate to define the concept of the necessary as an actuality whose non-existence contradicts some purely *theoretical* conceptual truth or other.<sup>57</sup>

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<sup>52</sup>*Bolzano's Propositionalism*, p. 232, p. 359-360.

<sup>53</sup>“Variation, derivability, and necessity.”

<sup>54</sup>**WL**, §182.2.

<sup>55</sup>**WL**, §74 [I.333].

<sup>56</sup>**WL**, §182, note [II.236].

<sup>57</sup>“Verbesserungen und Zusätze zur Logik,” **BBGA** IIA.12/2, p. 123. Cf. **BBGA** IIB.18/2, p. 23, quoted below, p. 1, note 82, where Bolzano makes similar remarks about his concept of possibility.

From this passage, it is clear that Bolzano thought that there were also necessities (in the general sense of **WL**, §182) grounded in *practical* purely conceptual truths, something that is surely at odds with logical or metaphysical necessity as usually understood. The highest moral law (“Among all possible actions, always choose the one that, all things considered, most promotes the well-being of the whole, no matter in which of its parts.”), as we read in the *Treatise of the Science of Religion*, is chief among these practical truths.<sup>58</sup> Its relevance to necessity, we are told there, is that this law binds not only creatures, but also the Creator:

[T]he highest moral law, [...] is not conditioned by God's will, but rather, like all purely *conceptual truths*, holds completely independently of this will.<sup>59</sup>

As we have seen, the last part of this remark reflects Bolzano's view that the collection of purely conceptual truths constrains God's creation of the universe, similarly to the way that the eternal truths constrain the creation according to Leibniz; for if the purely conceptual truths hold independently of the will of God or any other being, then it might seem that they will be true regardless of what God creates.<sup>60</sup>

There is an important difference between Leibniz and Bolzano, however. Leibniz rigorously observes a distinction between what he calls *metaphysical* and *moral* necessity when speaking of God and the creation, generally reserving the term 'necessary' for the former.<sup>61</sup> In his view, the difference between the two kinds of necessity can be captured formally, in that the opposite of a metaphysically necessary truth is (or implies) a contradiction, while the opposite of morally necessary truths does not.<sup>62</sup> Metaphysically speaking, there are according to Leibniz many possible worlds. Among them, however, one is uniquely determined as the best. Although it is not metaphysically necessary that God confer actuality on that one, it is *morally* necessary, in view of His perfect goodness, that He do so. Thus, if we are speaking of *moral* modalities, there is only one possible world, the actual one, and it exists necessarily.

Moreover, it seems clear that Leibniz held that every last detail of the actual universe is determined by God's choice, and is thus morally necessary. Take the fact that Spinoza died at The Hague, for instance:

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<sup>58</sup>**RW**, I, §88.4 (**BBGA**, I.6/2, p. 18; **EP**, p. 204).

<sup>59</sup>**RW**, I, §90.11 (**BBGA** I.6/1, p. 29; **EP**, p. 213-214).

<sup>60</sup>There is obviously a sticky point concerning purely conceptual truths *about* God's will and what results from it. Bolzano was aware of this, as his more careful later formulation shows. See “Verschiedenheiten,” **BBGA**, IIB.18/2, p. 45; quoted above, p. 1.

<sup>61</sup>See, e.g., Leibniz's fifth letter to Clarke, no. 9 (Loemker, p. 697); *Theodicy*, §§174, 281, 367.

<sup>62</sup>See, e.g., the *Monadology*, no. 33 (Loemker, p. 646); *Theodicy*, §174.

It is true that there would have been no contradiction in the supposition that Spinoza died in Leyden and not at The Hague; there would have been nothing so possible: the matter was therefore indifferent in respect to the power of God. But one must not suppose that any event, however small it be, can be regarded as indifferent in respect of his wisdom and goodness. Jesus Christ has said divinely well that everything is numbered, even to the hairs of our head. Thus the wisdom of God did not permit that this event whereof M. Bayle speaks should happen otherwise than it happened, not as if by itself it would have been more deserving of choice, but on account of its connexion with that entire sequence of the universe which deserved to be given preference. To say that what has already happened was of no interest to the wisdom of God, and thence to infer that it is therefore not necessary, is to make a false assumption and argue incorrectly to a true conclusion. It is confusing what is necessary by a moral necessity, that is, according to the principle of Wisdom and Goodness, with what is so by metaphysical and brute necessity, which occurs when the contrary implies contradiction.<sup>63</sup>

It thus seems to be a Leibnizian thesis that all metaphysically contingent truths are *morally* necessary:

God chose between different courses all possible: thus, metaphysically speaking, he could have chosen or done what was not the best; but he could not morally speaking have done so.<sup>64</sup>

Hence, from Leibniz's point of view, if the notion of necessity were to cover moral as well as metaphysical necessities, the notion of necessary truth would become coextensive with that of ordinary truth. This is why, when he speaks of possibility and necessity, he generally means the metaphysical notions. For otherwise, given his assumptions, the possible, the actual and the necessary would coincide, and the terms would become perfectly useless:

In a word, when one speaks of the *possibility* of a thing it is not a question of the causes that can bring about or prevent its actual existence: otherwise one would change the nature of the terms, and render useless the distinction between the actual and the possible. This Abélard did, and Wyclif appears to have done after him, in consequence of which they fell needlessly into unsuitable and disagreeable expressions. That

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<sup>63</sup>*Theodicy*, §174.

<sup>64</sup>*Theodicy*, §234.

is why, when one asks if a thing is possible or necessary, and brings in the consideration of what God wills or chooses, one alters the issue. For God chooses among the possibles, and for that reason he chooses freely, and is not compelled; there would be neither freedom nor choice if there were but one course possible.<sup>65</sup>

In the manuscript on his differences of opinion with Leibniz, Bolzano tells us that he embraces Leibniz's distinction between the two kinds of necessity, but disagrees with Leibniz's proposed explanation of it:

I accept Leibniz's distinction between moral and metaphysical necessity in the same sense. That which exists through the perfection of the divine will has a merely moral necessity. But the distinction between moral and metaphysical necessity does not lie in the circumstance that the opposite of the latter is contradictory, for that holds also for the former, as it contradicts a truth of reason to say that God does not do the best. Rather, the difference lies in the kind of truths of reason that the proposition contradicts.<sup>66</sup>

From the theological point of view, there are obviously many nice distinctions to be drawn within the realm of necessity. From the point of view of Bolzano's logic, however, what Leibniz calls moral and metaphysical necessities appear to be on the same plane.<sup>67</sup> That is, Bolzano frames his general definition of necessity in such a way that it covers both metaphysical and moral necessities, evidently thinking that (as the names suggest) these are, in fact, two species of *necessity*.

We find confirmation of this interpretation at many places in the *Treatise of Religious Science*. For example, Bolzano expressly contradicts Leibniz's thesis that God acts freely in creating the universe, writing:

A *freedom* in the sense which human beings have in my view, namely, a possibility to resolve in the same circumstances on the opposite of what one really resolves, cannot be found in God.<sup>68</sup>

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<sup>65</sup>*Theodicy*, §235.

<sup>66</sup>“Verschiedenheiten,” *BBGA*, IIB.18/2, p. 45. Bolzano's difference of opinion with Leibniz reflects his different, and arguably more sophisticated, understanding of contradiction. Cf. his comments on so-called “formal truth” in *WL*, §29, part 4b [I.338 ff]; also *WL*, §§154, 159.

<sup>67</sup>Here, as above, we are speaking of moral necessity as applied by Leibniz to God. Later in *WL*, §182 [II.237], Bolzano discusses the more common sense of ‘moral necessity’, which is equivalent to obligatoriness. He regards this as a “faulty concept”, since things which are morally necessary in this sense often do not happen, violating the axiom that whatever is necessary is actual.

<sup>68</sup>*RW*, I, §78 (*BBGA*, I.6/1, p. 223). Leibniz briefly considers, then rejects, a similar position (which he ascribes to Abélard) in §171 of the *Theodicy*.

A manuscript containing Bolzano's course notes elaborates on this point:

God's will is free, though not in the sense of the word in which the human will is free, as if God could *choose* between good and evil; rather, it is free in the sense that His resolutions are *completely independent* of every other being.<sup>69</sup>

In contrast to the actions of God, however, those of his creatures *are* sometimes free and hence contingent (as are the results of these actions).<sup>70</sup> Free actions, he explains elsewhere, *have no ground*,<sup>71</sup> not even in God's choice (thus the principle of sufficient reason is not universally true according to Bolzano,<sup>72</sup> another key disagreement with Leibniz). The existence of creatures capable of acting freely certainly depends upon God's creation of the best among the metaphysically possible worlds (and is thus morally, though not metaphysically, necessary), but the particular way they exercise their freedom does not. To speak in an anthropomorphic manner, the universe is not finished when it leaves God's hands: many of the details are left up to his freely-acting creatures, and nothing determines their choices when they act freely. Thus there is genuine contingency, moral as well as metaphysical, in the universe as Bolzano sees it.

Not surprisingly given his assumptions, Bolzano speaks of necessity in describing the creation and its infinite variety: "God *had to* [*mußte*] create beings that are capable of being happy. . . and indeed infinitely many of them. [. . .] There *must* have been living creatures at all times in the past, and there will *have to be* such creatures in the future as well."<sup>73</sup> "[I]n my opinion, there is no other law of God's

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<sup>69</sup>Quoted after *Lehrbuch der Religionswissenschaft*, ed. Louzil, **BBGA**, I.6/1, p. 223, note r. Cf. *Athanasia*, 2nd ed. (Sulzbach, 1838), p. 183. *Bolzano und seine Gegner*, p. 28 (**BBGA**, I.16/1, p. 35).

<sup>70</sup>See, e.g., **RW**, I, §76, Note 2 (**BBGA**, I.6/1, p. 221). In the **RW**, Bolzano presents this position as his own. In *Athanasia* (2nd. ed., p. 176 ff), by contrast, he remains neutral between this position (which he calls indeterminism) and determinism. Remarks in a couple of letters suggest that, despite the neutrality expressed in the *Athanasia*, Bolzano inclined more and more towards determinism. See his letter to F. Prihonsky of 30 August 1825 (**BBGA**, III.3/1, p. 64) and the letter to M. J. Fesl of 20 April, 1835 (E. Winter. ed., *Wissenschaft und Religion im Vormärz: Die Briefwechsel Bernard Bolzanos mit Michael Josef Fesl* [Berlin: Akademie-Verlag, 1965], p. 107). The acceptance of determinism would seem, at least *prima facie*, to bring Bolzano into full agreement with Leibniz, with a resultant collapse of (moral) modalities. This may be one reason he considered changing his definition of necessity to attempt to capture something like Leibniz's notion of metaphysical necessity; see "Verbesserungen und Zusätze zur Logik," **BBGA** IIA.12/2, p. 123, quoted above (p. 1) and note 82, below. In this paper, I investigate only the indeterminist view.

<sup>71</sup>**RW**, I, §15.13 (**BBGA**, I.6/1, p. 83-84; **EP**, p. 181-182); "Allgemeine Mathesis," I, §12 (**BBGA** II.A.5, p. 24).

<sup>72</sup>*Ibid.*

<sup>73</sup>**RW**, I, §81 (**BBGA**, I.6/1, p. 230-231). Emphasis added.

rule than that of bringing about the greatest possible happiness in created beings. From this law, it is easy to understand why there *must* be innumerable *differences* among creatures. . . .<sup>74</sup> “[W]ith respect to God we may know from concepts alone that He *must* have the intention of producing the greatest possible sum of happiness, and also that as a means to this end He *must* have created an infinite number of sensate beings, that he *must* reward goodness and punish evil, and allow us to persist after death, etc.”<sup>75</sup> I do not think there is even the slightest negligence in Bolzano’s use of modal expressions here.<sup>76</sup> For him, truths stating the actual existence and omniscience, omnipotence, holiness, etc., of God, as well as the highest moral law, have the same modal status: they are all purely conceptual, and thus necessary in his broad sense, as is the proposition that follows from them to the effect that God creates the best among the metaphysically possible worlds, one that is infinite both in extent and variety.

In sum, it seems clear that Bolzano aimed at this broad sense of necessity (covering both metaphysical and moral necessities) when framing his definitions. This is not to say that one cannot distinguish special kinds of necessity within the general conception, and indeed Bolzano himself does so. These special kinds will be distinguished not formally (as Leibniz had claimed in the case of metaphysical or brute necessity) but rather in terms of content, more specifically in terms of the kinds of concepts contained in the propositions concerned.<sup>77</sup>

Modern critics of Bolzano have generally objected that his concept of necessity is too *broad*. From the foregoing, one may gather that Bolzano would have been most surprised by the direction of this criticism. For since his concept of necessity embraces both metaphysical and moral necessities in Leibniz’s sense, the truly surprising thing is that on his view there are truths, and indeed quite a few of them, which are contingent in his narrow sense (i.e., neither metaphysically nor morally necessary).

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<sup>74</sup>WL, I, §574 [IV.378]. Emphasis added.

<sup>75</sup>WL, §383 [III.526]. Emphasis added.

<sup>76</sup>See also the examples he cites in a letter to Exner of 23 August, 1833 (MM-EX, p. 111-112): “The proposition: ‘it is *impossible* for the virtuous to be eternally unhappy’ has only the meaning: the proposition that the virtuous remain eternally unhappy contradicts a purely conceptual truth. The proposition: ‘it is *possible* for a virtuous person to be unhappy for some length of time,’ says only: the assumption that. . . etc. contradicts no purely conceptual truth.”

<sup>77</sup>In WL, §182, Bolzano merely gestures towards definitions of special kinds of necessity, claiming such distinctions to be “of no particular importance” (WL, §182, note [I.236-237]). I return to this point in the conclusion.

## Conclusion

Bolzano has been called the Bohemian Leibniz, and the name seems doubly appropriate in light of his treatment of necessity. Not only are his theories recognizably Leibnizian in some of their key features, they also have that rare ability to surprise, also notable in Leibniz's writings, rooted in logical sophistication and true independence of thought. Before Leibniz, no one, I think it fair to say, had looked at the questions of necessity and contingency in the way he did; and the same can be said for Bolzano, who built upon the work of his great predecessor here just as he did in mathematics.

Bolzano's theories, as we have seen, are not mere elaborations of Leibniz's, but differ from them on two crucial points. First of all, Bolzano rejects Leibniz's proposed formal demarcation of the class of eternal truths (or "brute" necessities), claiming instead that this distinction can only be drawn on the basis of the content of propositions (namely, of those propositions to which the negation of a given one is compared, in order to determine whether there is any contradiction). Second, Bolzano's conception leaves genuine room for contingency in the universe, moral as well as metaphysical. The actions and attributes of individual substances are in many cases contingent, not even morally necessary through God's choice. Instead, it seems, they are constrained in many instances only in the sense that certain contingent choices have necessary consequences, like the hangover following a binge one didn't have to go on. God's plan, on this conception, is less like a classical score than a jazz chart: a variety of general features are fixed, but considerable room is left for improvisation.

The room for contingency that Bolzano clearly assumes may also help to make his claim that only purely conceptual truths are necessary seem somewhat more plausible. Where Leibniz had assumed that God determined every last detail of the universe, Bolzano clearly thought that God left a fair number of the details up to His creatures.<sup>78</sup> It would seem to follow from this that God cannot know prior to the creation exactly what real objects there will be, since, given the causal connections between all real things,<sup>79</sup> this depends in part on the free actions of his creatures. This holds in particular for the real things which are the *objects* of intuitions. That is, the object of an intuition would not be exactly what it is had the universe been different in any respect. But intuitions, like all simple ideas, are individuated solely by their extensions.<sup>80</sup> Thus it seems that God cannot know prior to the creation which intuitions there will be. But if intuitions are in this sense posterior to the creation, it seems reasonable to suppose that they cannot be used in

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<sup>78</sup>Cf. above, p. ??.

<sup>79</sup>See, e.g., *Paradoxien des Unendlichen*, §60.

<sup>80</sup>WL, §96.

drawing up the plan of the universe. By contrast, one might attempt to defend the view that pure concepts could be thus used, since they might be held to fix features of the universe only in a top-down fashion, without determining all the attributes of any of the real objects in their extensions.

Bolzano's theories as they stand are at best incomplete. For instance, distinctions between various kinds of modalities are important not just for theology, but also for ethics, since the notion of possibility appealed to in the highest moral law ("Among all *possible* actions, always choose the one that, all things considered, most promotes the well-being of the whole, no matter in which of its parts.") is clearly not possibility in the narrow sense (i.e., moral possibility), but some wider notion.<sup>81</sup> Yet Bolzano does not give a satisfactory definition of this wider kind of possibility. Moreover, it seems that in some cases the free and hence contingent actions of creatures are the truth-makers for purely conceptual propositions, e.g., [Someone sins]. Bolzano would accordingly seem to be committed to the view that while [A sins] is contingent whenever the idea [A] represents a freely-acting being, the proposition [Someone sins] would be necessary. While I see no inconsistency in these claims, there is no doubt that they require further explanation.

I have no wish to minimize these and other difficulties with Bolzano's account. Nor do I intend to suggest that he had explored this notion with the intensity he devoted to, e.g., real function theory. No doubt had he taken the time to investigate these questions more carefully, significant revisions to his theories would have been forthcoming.<sup>82</sup> All this being said, however, I do think Bolzano's conception, incomplete as it is, is quite an interesting contribution, and worthy of further investigation.

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<sup>81</sup>Otherwise, since the highest moral law is itself a purely conceptual truth, we would have a vicious circle. Bolzano also seems to rely on a wider notion of possibility in the following, decidedly Leibnizian passage (**WL**, §272 [III.11]): "In my view, the world owes its existence not to God's power of representation, but rather to his power of creation. His powers of representation encompass far more than the things which are actual, including the merely possible things whose elevation to existence would be contrary to his purposes. . . ."

<sup>82</sup>A remark in one of his notebooks indicates that he considered a return to Leibniz's position (**BBGA IIB.18/2**, p. 23): "It seems to me that one must define the concept of possibility more narrowly [presumably, he means more broadly], and say that one only intends to call that possible which does not contradict any purely conceptual truths, with the exception of those that depend upon the wisdom of God (i.e., that stand under the proposition: God must will and bring about that which most assures the well-being of His creatures). For if we do not make this limitation, we could not say of any arrangement that is not found in nature that it is possible." This is the most promising attempt, by the way, that I have found in Bolzano's writings to define metaphysical possibility (and thence metaphysical necessity).

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