Leibniz on Contingency and Infinite Analysis*

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One of the most widely discussed issues in the philosophy of Leibniz is his attempt to escape the charge of necessitarianism. Critics from Arnauld to the present have questioned whether his most basic doctrines (such as the Predicate-in-Notion Principle and the Principle of Perfection) leave room for any significant sense of freedom and contingency. Although Leibniz gave a number of different answers to this problem, the one that domi-

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In the footnotes, wherever possible, I have cited first a translation and then a reference to a standard edition of the original text. The abbreviations I use are: C = *Opuscules et fragments inédits de Leibniz*, ed. by Louis Couturat (Paris, 1903). CA = *The Leibniz-Arnauld Correspondence*, ed. and trans. by H. T. Mason (Manchester, 1967). FC = *Nouvelles lettres et opuscules inédits de Leibniz*, ed. by Foucher de Careil (Paris, 1857). G = *Die philosophischen Schriften von Gottfried Wilhelm Leibniz*, ed. by C. I. Gerhardt, 7 vols. (Berlin, 1875-90), cited by volume and page. Gr = *Leibniz: Textes inédits*, ed. Gaston Grua, 2 vols. (Paris, 1948). L = *Leibniz: Philosophical Papers and Letters*, ed. by L. E. Loemker, second edition (Dordrecht, 1969). LC = *The Leibniz-Clarke Correspondence*, ed. by H. G. Alexander (Manchester, 1956). LP = *Leibniz: Logical Papers*, ed. and trans. by G. H. R. Parkinson (Oxford, 1966). NE = *New Essays Concerning Human Understanding*, by G. W. Leibniz, trans. by A. G. Langley (New York, 1896). S&G = *From Descartes to Locke*, ed. by T. V. Smith and M. Grene (Chicago, 1957). Sch = *Leibniz: Monadology and Other Philosophical Essays*, trans. by Paul Schrecker and Anne Martin Schrecker (New York, 1965). T = *G. W. Leibniz: Theodicy*, trans. by E. M. Huggard (London, 1952).

nates much of his later writing involves the notion of an infinite analysis.[1] The idea that there are true propositions in which the connection between the subject and predicate concepts cannot be elicited in a finite number of steps struck him as an insight which provided a definitive solution to the problem of contingency.

Many readers, of course, have thought that Leibniz's confidence was ill-founded, and some have even regarded his 'solution' as irrelevant to the issue of contingency.[2] But of late a tendency has developed to treat the notion of infinite analysis with greater respect. Nicholas Rescher, for example, thinks that it resolves the problem and he refers to the idea of infinite analysis as the "inner sanctum" of Leibniz's system.[3] More recently, in an important article, Robert Adams has given an account of the theory of infinite analysis that is also very sympathetic.[4] Referring to the fact that Leibniz thinks of everything in the world as determined ultimately by the relations of concepts in God's intellect, Adams says,

> From this point of view the problem of contingency is to find a difference between *ways* in which facts are determined by relations of concepts—a difference that is both important and plausibly related to the preanalytic notions of logical necessity and contingency. The difference between truths that are and that are not demonstrable in a finite number of steps fills this role admirably.[5]

In view of this growing confidence, it is appropriate to reexamine the idea of infinite analysis and see whether it really can bear the weight which Leibniz placed on it. I believe that it cannot.

This essay is divided into three sections. In the first I state several important Leibnizian problems about contingency and explain why the notion of an infinite analysis might be thought to provide a powerful solution to each of them. In the remaining sections I give reasons for supposing that the solution is inadequate. In part II, I explore some of the

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[1] For an analysis and critique of another Leibnizian approach to the problem of contingency see my "Superessentialism, Counterparts, and Freedom" in *Leibniz: Critical and Interpretive Essays*, ed. by Michael Hooker (University of Minnesota Press, 1982.)

[2] Bertrand Russell, "Recent Work on the Philosophy of Leibniz," *Mind* 12 (1903), reprinted in *Leibniz: A Collection of Critical Essays*, ed. by Harry G. Frankfurt (New York, 1972), p. 378, footnote 8. A. O. Lovejoy, *The Great Chain of Being* (Cambridge, Massachusetts: 1936), pp. 174-75. More recently see, Hide Ishiguro, *Leibniz's Philosophy of Logic and Language* (London, 1972), pp. 138f., and E. M. Curley, "The Root of Contingency" in Frankfurt, op. cit., pp. 67-97. Curley finds that only one of the ways in which Leibniz invokes infinite processes has any bearing on the problem of contingency.

[3] Nicholas Rescher, *The Philosophy of Leibniz* (Englewood Cliffs, 1967), p. 46.

[4] Robert M. Adams, "Leibniz's Theories of Contingency," Rice University Studies, *Essays on the Philosophy of Leibniz*, ed. by Mark Kulstad (Houston, 1977), pp. 1-41.

[5] Ibid., p. 18.

counterintuitive aspects of the theory, maintaining that it is not a plausible way of explicating our preanalytic notions of necessity and contingency. In part III, I argue that the doctrine has consequences that are in conflict with some of the most central features of Leibniz's system, such as the doctrine of world-bound individuals, the theory of creation, and the Principle of Sufficient Reason. Consequently, even if the theory of infinite analysis were intuitively appealing it still would not provide a solution to the problems of freedom and contingency which is consistent with Leibniz's other major metaphysical doctrines. I close with an hypothesis about the development of Leibniz's thought which explains how the conflicts and inconsistencies which are discussed in section II may have come about.

I

Before assessing Leibniz's doctrine we must first get some insight into why he took the idea of infinite analysis to be such a breakthrough in his philosophy. Even if he is mistaken in the significance which he attributed to this idea, it would be unsatisfactory if our reconstruction of his thought did not provide an account of why he found the idea compelling. Let us begin by formulating several arguments against freedom and contingency based on Leibnizian assumptions, and see how the concept of infinite analysis might be used to deal with them.

Perhaps the most obvious question about contingency has to do with the Predicate-in-Notion Principle. We know that Leibniz held that in every true proposition the concept of the predicate is in some way contained in that of the subject or, in other words, that all true propositions are analytic.[6] But it seems that analyticity implies necessity and this yields the result that all true propositions are necessary. Thus we have the following simple argument.

Argument A

(1) If a proposition is true, then it is analytic.

(2) If a proposition is analytic, then it is necessary.

(3) Therefore, if a proposition is true, it is necessary.

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[6] Leibniz identifies truth with analyticity at many places, for example, L, pp. 267-68; C, pp. 518-19; CA, p. 63; G II, p. 56; CA, p. 50; G II, p. 46; S&G, p. 306; C, p. 16. This doctrine applies in the first instance to affirmative propositions that are universal or singular. For some qualifications about propositions that are particular see LP, pp. 18-19; C, pp. 51-52.

It is to be noted that Leibniz made contingency one of the conditions of freedom and so if Argument A is sound, he is also forced to the conclusion that no one every acts freely.[7]

Another argument against freedom and contingency depends on theological considerations. Leibniz holds that God is a perfectly good being who, in consequence of his goodness, wills whatever is best — namely, the actualization of the best possible world. (Hereafter "the best possible world" = "BPW".) Furthermore, this goodness — this choice of the best — is a necessary part of God's nature, for it follows from his concept and is part of his very definition.[8] But God's existence itself is necessary, and this, together with what has preceded, implies that BPW exists necessarily. If a certain possible world (BPW) exists necessarily, however, then all actual events are necessary, since everything that occurs is contained in the concept of the world to which it belongs. This reasoning is captured in Argument N.

Argument N

(1) N (God exists).

(2) N (If God exists, God wills what is best).

(3) N (If God wills what is best, God actualizes BPW).

(4) N (If God actualizes BPW, BPW actually exists).

(5) Hence, N (BPW actually exists). [From (1) - (4)].

(6) If (5) is true, then everything that occurs, occurs necessarily.

(7) Thus, everything that occurs, occurs necessarily. [From (5) and (6)].

For reasons already indicated, Argument N, like Argument A, has the further undesired consequence of ruling out human freedom.

A final argument shows that even if God could have actualized a different world, it is still the case that human beings do not act freely. Leibniz takes the Predicate-in-Notion Principle to imply that every possible individual has a concept so complete that it expresses everything that would be true of that individual, if he were brought into existence by God.[9] Consequently, there is nothing that any actual individual does (nor anything that befalls him) that is not contained in his complete concept. Adam's

[7] T, section 288, p. 303; G VI, p. 288; Sch, p. 117; G VI, p. 441.

[8] For example, L, p. 303-4; G IV, p. 427.

[9] CA, p. 47; G II, p. 43; CA, pp. 60-64; G II, pp. 54-57; L, pp. 267-68; C, pp. 518-20; L, pp. 307-8; G IV, pp. 432-34.

concept, for example, contains the property of *eating the apple offered by Eve* and it follows from this that Adam eats the apple if he exists at all. That is, it is hypothetically necessary that Adam accepts the apple: (N) (If Adam exists, Adam accepts). Of course, this, by itself, does not make the proposition "Adam accepts the apple" a necessary truth. For, on the assumption that God could have actualized a different world, it was open to God not to have created Adam. And clearly if Adam did not exist, it would not be the case that he accepts the apple. But, allowing this, there is still a serious difficulty. The real worry is: if it is hypothetically necessary that Adam accepts (if his actualization entails his acceptance), how is it open to him to *refuse* the apple? This is a question on which his possible nonexistence has no bearing. The problem, which can easily be generalized to cover every act of every human being, is expressed in Argument E.

Argument E

(1) Adam acted freely in accepting the apple only if Adam could have refrained from accepting.

(2) But, it is hypothetically necessary that Adam accept the apple. (Adam's concept contains the concept of *apple-acceptance* and so it is necessary that Adam accept if he exists at all, i.e., it is not possible that Adam exist and refrain from accepting.)

(3) Therefore, it is not the case that Adam could have refrained from accepting the apple. [From (2)].

(4) Hence, it is not the case that Adam acted freely in accepting the apple. [From (1) and (3)].

The idea of an infinite analysis, and its relation to these problems, is best introduced by looking first at Leibniz's response to Argument A. In a rare piece of intellectual autobiography he chronicles his struggle with this problem, and his eventual discovery of the appropriate strategy for dealing with it. According to his own account, he became convinced of the absurdity of necessitarianism by reflecting on the obvious fact that there are some genuine possibilities that will never be realized. Only later did he see the apparent conflict of this belief with his analytic theory of truth.

When I considered that nothing occurs by chance . . . I found myself very close to the opinions of those who hold everything to be absolutely necessary . . . But I was pulled back from this precipice by considering those possible things which neither are nor will be nor have been. For if certain possible things never exist, existing things cannot always be necessary; otherwise it would be impossible for other things to exist in their place, and whatever never exists would therefore be impossible. For it cannot be denied that many stories, especially those we call novels, may be regarded as possible, even if they do not actually take place in this particular sequence of the universe which God has chosen — unless someone imagines that there are certain poetic regions in the infinite extent of space and time where we might see wandering over the earth King Arthur of Great Britain, Amadis of Gaul, and the fabulous Dietrich von Bern invented by the Germans.[10]

Having recognized the contingency of things, Leibniz turned to the theory of truth — and the problem struck him.

For I saw that in every true affirmative proposition whether universal or singular, necessary or contingent, the predicate inheres in the subject, or that the concept of the predicate is in some way involved in the concept of the subject. I saw too that this is the principle of infallibility for him who knows everything a priori. But this very fact seemed to increase the difficulty, for, if at any particular time the concept of the predicate inheres in the concept of the subject, how can the predicate ever be denied of the subject without contradiction and impossibility, or without destroying the subject concept?[11]

Leibniz now had all the elements of Argument A clearly before him and it is easy to see why it worried him. A1 was backed by his firmest intuitions — and so was the denial of A3. He concluded that A2 *must* be the culprit, even though we know that for some time he could see no reasonable way of denying it either. For he tells us elsewhere that he was "long perplexed" by the question "how the predicate could be in the subject, and yet the proposition not be necessary."[12]

The answer which he finally hit upon requires showing that a certain principle on which A2 rests is false. The structure of the answer is as follows. A necessary truth is defined as one whose contrary implies a contradiction. It is one which can be reduced to an identity or for which a demonstration can be given.[13] A consequence of this definition is that a contingent truth is one that cannot be reduced to an identity and whose denial therefore involves no contradiction. The connection between analyticity and necessity which is asserted in A2 presupposes the truth of a

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[10] L, p. 263; FC, pp. 178-79.

[11] L, pp. 263-64; FC, p. 179.

[12] S&G, p. 308; C, p. 18.

[13] LP, p. 64; C, p. 374; S&G, p. 308; C, p. 18; LP, p. 77; C, p. 388; LP, p. 61; C, p. 371; L, pp. 264-65; FC, p. 181; L, p. 646; G VI, p. 612. To avoid confusion, two points need to be made about demonstrability. First, as I use the term "demonstrable" here, both explicit identities (i.e., propositions of the form "A is A") and propositions reducible to identities are demonstrable. I do this for convenience. Leibniz himself usually uses the term "demonstrable" to refer only to propositions that are not explicit identities. But at some points he also says that all necessary truths are demonstrable, clearly suggesting that "A is A" is demonstrable. I believe that he does this for simplicity in contexts in which the necessity of explicit identities is not at issue. I do likewise. (See, for example, S&G, pp. 306-7; C, p. 17; Cf. also Monadology sections 33 and 35, L, p. 646; G VI, p. 612.) Secondly, I restrict the use of the term "demonstrable" to propositions that can be proven *a priori*, as opposed to merely *a posteriori*.

thesis which can be called the Principle of Analytic Demonstrability.

Principle of Analytic Demonstrability:

If a proposition is analytic, then it is demonstrable.

Given the definitions of necessity and contingency, premise A2 will be correct if and only if this principle is true. For only then will one be able to give the supporting argument on which A2 implicitly depends.

Argument A2

(1) A proposition is necessary if and only if it is demonstrable.

(2) If a proposition is analytic, then it is demonstrable.

(3) Therefore, if a proposition is analytic, then it is necessary. [(A2)].

Leibniz eventually came to see that the Principle of Analytic Demonstrability could be denied.

In contingent truths . . . though the predicate inheres in the subject, we can never demonstrate this, nor can the proposition be reduced to an equation or an identity. . . . [14]

This idea was suggested to Leibniz by mathematical considerations concerning the infinite. The latter, he says, cast "a new and unexpected light" by bringing to mind "an analogy . . . between truths and proportions which seems admirably to clarify the whole matter of contingency."[15]

Just as the smaller number is contained in the larger in every proportion . . . so in every truth the predicate is contained in the subject . . . But in proportions the analysis may sometimes be completed, so that we arrive at a common measure which is contained in both terms of the proportion an integral number of times, while sometimes the analysis can be continued to infinity, as when comparing a square with the diagonal. Just so, truths are sometimes demonstrable or necessary, and sometimes free and contingent, so that they cannot be reduced to identities as if to a common measure by analysis. This is the essential distinction between truths as well as proportions.[16]

Since there can be incommensurable proportions, surd roots, asymptotes, and the like in mathematics, Leibniz concluded that there can be something similar in the analysis of individual concepts. Contingent truths are those in which the containment of the predicate concept in that of the subject would require an infinite analysis to reveal. In virtue of the fact that its analysis is infinite, however, the proposition cannot be reduced to an identity or demonstrated. Argument A2 fails because the principle that all

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[14] L, p. 265; FC, p. 182.

[15] L, pp. 264-65; FC, pp. 179-80 and p. 183.

[16] L, pp. 265-66; FC, pp. 183-84.

analytic truths are demonstrable is false. Once this is seen, Argument A also collapses, for the connection between analyticity and necessity has been broken.

It is to be observed that although Leibniz laid great store by the analogy with mathematics, he was very careful to point out that in one respect the comparison is not exact. "The science of geometry," he says, "has mastered incommensurable proportions, and we have demonstrations even about infinite series."[17] No such demonstrations can be found for contingent truths, however. Otherwise, as he puts it elsewhere, "it would be as easy to be prophet as to be a geometer."[18] In surd roots, for example, we can,

> carry out demonstrations, by showing that the error is less than any assignable number, but in contingent truths not even this is conceded to a created mind.[19]

In the mathematical case we can prove that an infinite series converges on a certain specifiable limit. But though there is a similar convergent series involved in the analysis of a contingent truth, the limit cannot be demonstrated. As Leibniz says,

> . . . if the analysis is continued further and further, it constantly approaches identical propositions, but never reaches them. Therefore, it is God alone, who grasps the entire infinite in his mind, who knows all contingent truths with certainty.[20]

Only God can know contingent truths *a priori* and he arrives at this knowledge "not by demonstration — for this would involve contradiction — but by an infallible vision."[21] God sees, "not the end of the analysis indeed since there is no end, but the nexus of terms or the inclusion of the predicate in the subject."[22] This knowledge is possible for God because, unlike us, he sees everything which is in the series and is capable of taking the infinite in a single stroke of thought.[23] Notwithstanding this difference, however, Leibniz feels that the mathematical analogy supplies the required critique of Argument A, by providing a plausible model for denying the Principle of Analytic Demonstrability.

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[17] L, p. 266; FC, p. 184.
[18] CA, p. 59; G II, p. 53.
[19] S&G, pp. 307-8.
[20] LP, p. 77; C, p. 388.
[21] L, p. 266; FC, p. 184.
[22] L, p. 265; FC, p. 182.
[23] Gr, p. 303. Also S&G, p. 307; C, p. 317.

The denial of this principle does not merely undercut a troublesome argument to prove the necessity of things. It actually supplies the materials for the following Leibnizian demonstration that there are contingent truths.

Argument CT

(1) A proposition is necessary if and only if it is demonstrable.

(2) It is not the case that all true propositions are demonstrable.

(3) Therefore, it is not the case that all true propositions are necessary.[24]

It is also plausible to suggest that the idea of infinite analysis helps with a closely related issue in Leibniz's philosophy. A notorious problem for commentators has been to straighten out various things Leibniz had to say about whether existence is contained in the concepts of those finite individuals who actually exist. For example, he tells us both that existence is a predicate and that in every true proposition the concept of the predicate is contained in that of the subject.[25] So we should expect him to hold that existence follows from the concept of every actually existing individual. Yet in fact he insists that existence cannot be deduced from the concept of any individual other than God.[26] Commentators have frequently tried to harmonize these claims by supposing that Leibniz really meant to qualify the Predicate-in-Notion Principle and to make an exception for existence.[27] But it has also been noted that this suggestion raises serious questions of its own. If Leibniz meant to qualify the Predicate-in-Notion Principle, then why did he repeatedly state it in an unqualified form? What justifies making an exception for existence? And, if existence is an exception to the Predicate-in-Notion Principle, what becomes of the ontological argument? According to Leibniz the concept of God *does* contain the concept of existence. A virtue of the theory of infinite analysis, it might be said, is that it enables us to achieve a more satisfactory account of these matters. We begin by drawing a distinction between those predicate concepts which can be elicited from their subject concepts in a finite number of steps and those which cannot. In so doing we differentiate two modes of inclusion, the demonstrable and the indemonstrable. On this interpre-

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[24] This seems to be pretty much the way Leibniz reasons at L, p. 266; FC, pp. 184-85.

[25] Leibniz says that existence is a predicate at NE, p. 401; G V, p. 339.

[26] L, p. 647; G VI, p. 614.

[27] Bertrand Russell, *A Critical Exposition of the Philosophy of Leibniz*, second edition (London, 1937), p. 27. Russell took this view in the first edition, but retracted it in the preface to the second, after the appearance of Couturat's work. See also Curley, op. cit.

tation existence *is* included in the concept of any individual who actually exists — just as the Predicate-in-Notion Principle implies. But this does not entail that the inclusion can always be demonstrated. In the case of God, the inclusion of existence can be demonstrated. His existence is thus necessary. In the case of other individuals, however, the inclusion cannot be demonstrated and so their existence is contingent.

Leibniz believed that the theory of infinite analysis also provides the answer to Argument N. There are in fact two distinct strategies which he employs to show this. The first strategy is to deny premise N2, which says that it is a necessary truth that if God exists, he wills what is best. Leibniz frequently contradicts this, claiming that the proposition "God wills what is best" is only contingent. Perhaps the most well-known passage in which he takes this stand is the *Discourse on Metaphysics*, section 13, where he refers to "the first free decree of God, which leads him always to do what is most perfect."[28] Since God's decree is free, and freedom implies contingency, it follows that "God does what is most perfect" is a contingent truth. At another place Leibniz contrasts the propositions "God loves himself" and "God does what is most perfect." The former, he says, is necessary since it is demonstrable from the definition of God, but the latter "cannot be demonstrated, for the contrary does not imply a contradiction."[29] Finally, in the *Theodicy* he remarks that although "in a certain sense . . . it is necessary that . . . God himself should choose the best [nevertheless] . . . this necessity is not of the kind called logical, geometrical, or metaphysical, whose opposite implies contradiction."[30] In these passages Leibniz's position is that "God wills what is best" is *not* a necessary truth. While the concept of God includes the concept of willing whatever is best, the inclusion cannot be demonstrated. This makes the proposition contingent and defeats Argument N.

Leibniz's second strategy is to argue that it is a contingent matter which possible world is the best. Although this world (the actual world) in fact contains the most perfection, it is not a necessary truth that it does, because the proposition that it contains the most perfection is not demonstrable *a priori*. In view of this, even if "God wills what is best" were necessary, it would not follow that this world exists necessarily. Since this world might not have been the best, it might not have been actualized. And so things could have been otherwise after all.[31]

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28 L, p. 311; G IV, p. 430.

29 Gr, p. 288. Also T, section 233, p. 175; G VI, p. 256.

30 T, section 282, p. 299; G VI, p. 284. See also Gr, p. 301 and T, section 234, p. 271-72; G VI, pp. 256-57.

31 Although Leibniz invokes the first strategy at the places mentioned above, I should point out that he is not always of one mind about the matter. Thus at Gr, 336 he opts for the

Approaching the matter slightly more rigorously, we should first note that the expression "BPW" can be taken in either of two senses throughout Argument N. It can be read (1) as a rigid designator for *this* world (which is in fact the best) or (2) it can be taken as a descriptive phrase whose referent may vary. With this in mind consider premise N3: N (If God wills what is best, God actualizes BPW). On its first reading N3 has the following sense: N (If God wills what is best, God actualizes *this* world). The necessity of God's actualizing the best, in other words, is asserted of BPW *de re*. On its second reading, the force of N3 is: N (If God wills what is best, God actualizes whatever world happens to be best). In this case the necessity is asserted only *de dicto*. Applying his second strategy, Leibniz would deny N3 when taken in its first sense. All he would agree to is that God actualizes whatever world happens to be best. But this blocks the necessitarian implications of Argument N. For it means that N5 (that is, N [BPW actually exists]) only follows from the previous premises if it is taken in the second of its two senses: N (Whatever world happens to be best actually exists). Since the world which happens to be best is only contingently best, N5 does not entail that everything occurs necessarily.

Now many commentators have supposed that Leibniz would not have been inclined to adopt this sort of strategy. His view, they have thought, is that all truths about possible worlds, considered purely as possible, are necessary.[32] If so, the question, "Which possible world is best?" has a necessary truth as its answer. Nevertheless at numerous places Leibniz does argue as I have described. At one point he says that even if it were conceded that it is necessary that God chooses the best, it still would not follow that what is chosen is necessary, "since no demonstration is given that it is the best."[33] At a different place he says that "this work [i.e., possible world] is most worthy" is an indemonstrable, contingent, truth of fact.[34] And still elsewhere he asserts that the proposition "A is the best

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second strategy over the first and at Gr, pp. 493-94, he claims that the proposition that God wills the work that is most worthy of him is *necessary*. (It is noteworthy, however, that in the latter passage he *also* says that he does not know whether God's not chosing the best implies a contradiction.) For further references see "Leibniz's Theories of Contingency." Adams has argued (a) that Leibniz preferred the second strategy and (b) that ultimately the first strategy should not be regarded as being a thesis of Leibniz's philosophy or a basis of one of his principal solutions to the problem of contingency (p. 30). Point (a) may be right, but I think (b) is too strong.

32 For example, C. D. Broad, *Leibniz: An Introduction*, ed. C. Lewy (London, 1975), p. 36 and Curley, op. cit., p. 92f. For more on this topic, however, see section III of my paper.

33 Gr, p. 305-6.

34 Ibid., p. 493.

[world]" is certain but not necessary, since it cannot be demonstrated.[35] Furthermore, in taking the position that it is not a necessary truth that this world is best, Leibniz is merely asserting something that follows quite naturally from his ideas about infinite analysis. The actual world is infinitely complex and so no finite analysis of its contents can reveal its degree of perfection. Over and above this, the *a priori* proof that a given world is best requires a comparison of its quality with the quality of infinitely many other (infinitely complex) possible worlds.[36] Since this process involves a veritable infinity of infinite analyses, it can be at most a contingent truth that this world is best.

The theory of infinite analysis also seems to provide a convenient way around Argument E. This time the critical premise is E2:

> It is hypothetically necessary that Adam accept the apple. (Adam's concept contains the concept of *apple-acceptance* and so it is necessary that Adam accept if he exists at all, i.e., it is not possible that Adam exist and refrain from accepting.)

E2 involves an interpretation of hypothetical necessity according to which there is a contradiction in the supposition that Adam refrains from accepting the apple. The basis for this interpretation is the idea, first, that Adam's concept contains the concept of *apple-acceptance* and, second, that conceptual containment is a necessary relation. But the doctrine of infinite analysis actually implies that the second of these claims is false: a predicate concept can be contained in that of a subject without the containment being necessary. The doctrine implies, in other words, that there can be contingent connections between possibles, *qua* possible. To see this consider Leibniz's explanation of the contingency of "Adam accepts the apple." On the present account, this proposition is contingent because an infinite analysis would be required to exhibit the connection between *Adam* and *apple-acceptance*. It is in virtue of this infinite analysis that "Adam accepts the apple" cannot be reduced to an identity and is thus not necessary. The very same reasoning, however, applies to the proposition, "The concept of *Adam* contains the concept of *accepting the apple*." Since an infinite analysis is required to exhibit the connection between *Adam* and *apple-acceptance*, the latter proposition cannot be reduced to an identity either. This commits Leibniz to saying that, considered purely as possible, the connection between Adam and his sin is contingent. It also puts him in a position to deny E2: the fact that the notion of Adam's sin is

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[35] Ibid., p. 336.

[36] S&G, pp. 308-9; C, pp. 18-19; T, section 225, pp. 267-68; G VI, p. 252.

contingently contained in his concept does not entail that it is impossible for Adam to refuse the apple.

In this spirit Leibniz says specifically that there are indemonstrable truths about contingent things "regarded as possible."[37] Similarly, in the *General Inquiries* he explains the contingency of "Peter denies Christ" along the lines I have described above.[38] He asserts that the concept, *Peter*, is infinitely complex and that no finite analysis will suffice to elicit the concept, *denial*, from it. Consequently, there can never be a perfect proof of the idea that Peter denies, although the analysis "always approaches it more and more."[39]

According to the present interpretation, then, Leibniz would argue that E2 is based on a misunderstanding of hypothetical necessity. All he would be prepared to admit is:

> It is hypothetically necessary that Adam accept the apple. (That is, Adam's concept contains the concept of *apple-acceptance* and so it is certain — but not absolutely necessary — that Adam accept if he exists.)

Clearly, this premise is inadequate for the purposes of Argument E.

Now if this is Leibniz's position, it needs to be said that his choice of the term "hypothetical necessity" was not entirely felicitous. A proposition is necessary only if its denial is contradictory. Thus the assertion that it is hypothetically necessary that Adam accept the apple strongly suggests that it is contradictory to deny "If Adam exists, Adam accepts." If Leibniz wanted to say that there is no contradiction in the denial of this proposition, he probably should not have used the term "necessary" at all. Still, it might be replied that he went out of his way to distinguish what is certain from what is (absolutely) necessary. So, while his choice of terms may have been misleading, this by itself is not a conclusive objection to the proposed resolution of Argument E.

In light of these considerations I think we can understand why Leibniz was so enthusiastic about his doctrine of infinite analysis: if the theory is viable it provides him with just the kind of answer to Arguments A, N, and E that he needs. It should be noted, however, that there are a number of gaps in his account which he apparently never filled in. He gives an extensive and tolerably clear treatment of the notion of a demonstration, and he also gives examples which show what such an analysis involves. (The general idea is familiar and fairly straightforward: in analyzing a necessary

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[37] Gr, p. 353.

[38] C, pp. 376-77; LP, p. 66.

[39] Ibid.

truth one begins with a proposition and makes substitutions on the basis of definitions of terms until one arrives at an identical proposition (e.g., one of the form "A is A," "AB is B," etc.).[40] But in the case of an infinite analysis he relies heavily on mathematical analogies, which he expressly says are inexact, and which, as far as I know, he never develops in much detail. Leibniz tells us that the analysis of a contingent truth "constantly approaches" (or converges upon) an identity but never reaches one.[41] It is not obvious, however, how the notion of convergence is to be carried over from the mathematical case to that of the analysis of a complete individual concept. We understand what it means for a series of numbers to approach a limit because this idea has been given a precise sense. But how are we to apply the idea to the analysis of a proposition such as "Adam accepts the apple offered by Eve"? What, in fact, does it mean for the steps in the analysis of the concept of *Adam* to "approach" the concept of *apple-acceptance*? The idea of convergence on a limit involves (among other things) the notion of a well-behaved or rule-governed series of terms. As far as I have been able to discover, however, Leibniz does not explain how a rule-governed series of steps would arise in the analysis of a contingent truth.[42]

Further questions of this sort can be raised, but I shall not develop them here. In what follows I shall simply assume that answers to problems about the exact model of an infinite analysis can be given. The kinds of issues I wish to stress are ones which would be difficulties for Leibniz even if an exact model were available.

II

An important question to ask is whether Leibniz's doctrine of infinite analysis is adequately related to our pre-analytic notions of necessity and contingency. To decide this we will eventually have to examine his argument for contingency more closely. Before doing that, however, I want to consider a once very popular criticism of Leibniz which I believe misunderstands his position. The objection I have in mind is that in connecting contingency with infinite analysis Leibniz confused an epistemic with a metaphysical notion. As a result, it has been said, his own definitions

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[40] For example, L, pp. 264-65; FC, p. 181; L, p. 646; G IV, p. 612; LP, p. 60; C, p. 371; LP, p. 64; C, p. 374; LP, p. 77; C, p. 387. But see footnote 13.

[41] LP, p. 134; C, p. 388.

[42] For an extremely important attempt to construct answers to some of these questions see Robert Sleigh's paper, "Truth and the Principle of Sufficient Reason in the Philosophy of Leibniz" in *Leibniz: Critical and Interpretive Essays*, ed. by Michael Hooker (University of Minnesota Press, 1982).

imply that there is no real contingency in nature, but only the appearance of it to a limited intellect. The support for this objection runs as follows. The contingency of a proposition is a matter of whether its negation can be shown to involve a contradiction. But in the case of a proposition which requires an infinite analysis, the question whether a contradiction can be revealed depends on who is attempting the demonstration and, in particular, on the degree of that person's intellectual capacities. We humans can never exhibit the contradiction (or identity) in a proposition whose resolution involves an infinite number of steps. The proposition will therefore be contingent "for us." That is, it will be contingent as far as we can tell or relative to our epistemic powers. God, on the other hand, *can* see the contradiction and so the proposition will be necessary "for him" or relative to his powers. But surely the way God sees things is the way they really are. Consequently, judged in its own terms, Leibniz's doctrine has room at most for the *appearance* of contingency. It was in this spirit that Russell criticized Leibniz, saying:

> where an infinite analysis, which only God can perform, is required to exhibit the contradiction, the opposite will *seem* to be non-contradictory.[43]

Or, as Lovejoy put it,

> the distinction between the necessary and the contingent expresses a . . . difference between the ways in which certain specific truths present themselves to our minds. A judgment which appears to us as contingent could by itself be shown to be necessary . . . only through an analysis of those notions which would proceed *in infinitum* and is therefore impossible to a finite mind. But though we are unable to attain an intuitive apprehension of the necessity . . . we can nevertheless be sure that the necessity is there and is recognized by the mind of God. [Because of the Predicate-in-Notion Principle] no judgment is true unless its opposite is—to a sufficiently analytic and sufficiently comprehensive intelligence—a self contradiction.[44]

This objection assumes that Leibniz's view is that every true proposition is such that, in one way or another, its opposite implies a contradiction. According to Russell and Lovejoy, Leibniz holds that in some cases the contradiction can be elicited in a finite number of steps, whereas in others the contradiction arises only after an infinite number of steps. But the point of the theory of infinite analysis is to maintain that there are analytic truths whose negations simply are not contradictory. It is exactly in this way that Leibniz hopes to avoid the charge that his contingent propositions are *really* necessary. For he recognizes, I think, that if a proposition implies a contradiction at all (even if only *via* an infinite analysis) then, by his definition, it is not contingent. Thus, he tells us in no

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[43] *Leibniz*, ed. by Frankfurt, p. 378, footnote 8.

[44] Lovejoy, op. cit., pp. 174-75.

uncertain terms that there are propositions "which cannot be reduced *by any analysis* to identities or to the principle of contradiction."[45] He believes, in other words, that a truth which cannot be proven by a finite analysis, cannot be resolved into an identity by any other analysis either. Demonstration, on Leibniz's view, is always finite.[46] Thus, even God cannot reduce a true contingent proposition to an identity nor see a contradiction in the negation of such a statement. According to the theory, there is none to see. What God sees is the "connection" (i.e., the inclusion or noninclusion) that holds between the predicate and the subject concepts. Furthermore, his knowledge of the connection is arrived at "by an infallible vision" ("*infallibili visione*"), not by a demonstration.[47] It is therefore not true that Leibniz's doctrine implies that propositions that are contingent "for us" are necessary "for God."

Leibniz defined contingency in terms of whether a proposition is in principle demonstrable. This is not an epistemic property. It is a logical notion which depends on the nature of the concepts themselves and is not relative to the capacities of any given intellect. Robert Adams has provided an example that is helpful in bringing out this point and in illustrating Leibniz's view generally. It is an example to which I shall return later for somewhat different purposes.

> It may be that there is a property, ϕ, such that for every natural number n, it can be proved that n has ϕ, but the universal generalization that every natural number has ϕ cannot be proved except by proving first that 7 has ϕ, then that 4 has ϕ, and so on until every natural number has been accounted for—a task that can never be completed. In this case it is a purely mathematical truth that every natural number has ϕ, but it cannot be demonstrated. And it is a purely mathematical falsehood that some natural number lacks ϕ, but no contradiction can be derived from it in a finite number of steps. In such a case Tarski decided to say that "Some natural number lacks ϕ" is *consistent, but not ω-consistent.* He thus reserved the use of "consistent" and "inconsistent," without qualification, to express proof-theoretical notions rather than the notions of mathematical truth and mathematical falsity. Similarly Leibniz reserves "implies a contradiction" to express a proof-theoretical notion rather than the notion of conceptual falsity or being false by virtue of the relations of concepts. He thinks, of course, that the latter notion is expressed simply by "false."[48]

Now to be sure Leibniz believes that certain epistemic results follow from his definition of contingency. It follows that only an infinite intellect can have an *a priori* grasp of contingent propositions and that we humans are precluded from knowing such truths except by experience. But these epis-

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[45] L, p. 266; FC, pp. 184-85. Italics have been added.

[46] This, at any rate, is the view that Leibniz almost always takes in his infinite analysis papers. It may be that he slips at LP, p. 66; C. p. 377.

[47] L, p. 266; FC, p. 184. See also S&G, p. 306; C, p. 17.

[48] Adams, op. cit., pp. 15-16.

temic aspects of Leibniz's doctrine are merely consequences of his definition; they are not its essence.

In framing his account of contingency, then, Leibniz chose a logical or metaphysical notion. But did he choose a logical notion that reflects our preanalytic intuitions about necessity and contingency? I believe that Leibniz was convinced that he did. For he stresses that in giving his solution he merely employs the traditional definition of necessity. This definition, he says, is one that everyone accepts and finds intuitively attractive. But, he notes, once the distinction between finitely and infinitely analytic propositions is drawn, it is evident that it *follows* from this definition that there are contingent analytic truths. Thus, anyone who accepts the definition of necessity ought to find the Leibnizian solution to the problem of contingency compelling.

> If we admit this general concept of necessity—and everyone does admit it—namely, that all propositions are necessary whose contraries imply a contradiction, it is easily seen from a consideration of the nature of demonstration and analysis that there can and must be truths which cannot be reduced by any analysis to identities or to the principle of contradiction but which involve an infinite series of reasons which only God can see through.[49]

This account of the matter does not seem to me entirely satisfactory, however. The problem Leibniz faced was this. The notions of necessity, demonstrability, and analyticity were generally thought of as equivalent. That is, it seemed evident that a proposition is necessary if and only if it is demonstrable; it is demonstrable if and only if it is analytic; and it is analytic if and only if it is necessary. Since Leibniz believed that all truths are analytic but that some are not necessary, he needed to provide a reason for separating analyticity and necessity, and for showing that, contrary to common opinion, they are not equivalent. His solution was to argue that demonstrability and analyticity are separable, on the grounds that some analytic truths are infinitely analyzable and thus indemonstrable. He then concluded that since everyone agrees that necessity and demonstrability are equivalent, necessity must be separable from analyticity. But this conclusion is hasty. It relies heavily on the fact that there was a prior consensus that necessity and demonstrability are equivalent and that no one would have regarded them as separable. But there was also a prior consensus that necessity and analyticity go together; no one would have regarded these ideas as separable either. What Leibniz's argument for a cleavage between demonstrability and analyticity actually implies is that either necessity and analyticity are separable or necessity and demonstrability are. In other words, the denial that every analytic truth is demonstrable forces one to admit either that there are contingent analytic truths

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[49] L, p. 266; FC, pp. 184-85.

or that there are indemonstrable necessities.

The question I want to raise is which of these alternatives is the more intuitive or which accords best with our preanalytic grasp of the concepts of necessity and contingency. As far as I can see, there is a considerably stronger case for rejecting the Leibnizian definition of necessity than there is for rejecting the idea that all analytic truths are necessary. The root idea of necessity is that of something which could not have been otherwise. Accordingly the root idea of contingency is that of something which might have been different. Now putting aside the Leibnizian definition of necessity for the moment, and judging the matter strictly intuitively, it is very hard to get a grip on the idea that analytic truths (conceived as eternal ideas) could have been otherwise. Leibniz admits that there is the strong appearance of a paradox here, but he thinks it will be dispelled if one reflects on his discovery that not every analytic truth is demonstrable. Yet this revelation does not seem to me to affect the conviction that analytic truths are necessary. Confronted with the fact that there are indemonstrable analytic propositions, one's natural response, I think, is simply to suppose that there are indemonstrable necessities. Analyticity seems to involve necessity quite apart from any assumptions about demonstrability, but necessity does not obviously entail demonstrabilty. (On the contrary, we shall soon consider powerful reasons for rejecting this connection.) Therefore, when Leibniz infers that there are contingent analytic truths from the fact that not all analytic propositions are demonstrable — rather than giving up his definition of necessity — he makes an implausible move in order to be able to find room for contingency in his system. But there is no real victory here. The sense of contingency which is brought into his scheme is a counterintuitive one which has a very tenuous connection with our preanalytic grasp of that concept.

This line of thought can be reinforced by returning to the mathematical analogies which Leibniz used as the basis for his doctrine of infinite analysis. The purpose of these examples was not to show the contingency of mathematical propositions. Leibniz regarded mathematics as necessary.[50] The point was to give us a clear model of a nonterminating but convergent sequence so that it would seem plausible that there could be a similar regress in the analysis of individual concepts. The most important difference was supposed to be that demonstrations of mathematical truths are always possible (The Principle of Mathematical Demonstrability), whereas this is not always the case in the analysis of individual concepts. But in fact we now know that not every mathematical truth is demonstrable or provable in a finite number of steps: the denial of a

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[50] L, p. 311; G IV, p. 430; LC, p. 15; G VII, p. 355.

proposition which is ω-inconsistent is a case in point. So, although Leibniz could not have been expected to realize this, it follows from his account that there are contingent mathematical truths. This, I take it, is an embarrassing result. It is embarrassing not merely because Leibniz actually held that mathematics is necessary, but because the intuitive conclusion for a Leibnizian to draw from the discovery that there are indemonstrable mathematical truths is that there is something wrong with identifying necessity with demonstrability. If one's view is that mathematical propositions are eternal relations of concepts, it would be very odd to infer that there are contingent mathematical truths. But in all crucial respects the cases of mathematics and analyticity are on a par: it is no *more* plausible to infer that there are contingent analytic truths from the denial of the Principle of Analytic Demonstrability than it is to conclude that there are contingent mathematical truths from the refutation of the Principle of Mathematical Demonstrability.

There is a further difficulty which will require a certain amount of background to explain. It concerns the notion of a complete individual concept. Leibniz says that we can never arrive at a demonstration of a proposition such as "Peter denies" (i.e., "Peter is a denier of Christ") and he bases this claim on the idea that the concept of *Peter* is complete and therefore infinitely complex.

> [T]he concept of Peter is complete, and so involves infinite things; so one can never arrive at a perfect proof [of "Peter denies"], but one always approaches it more and more, so that the difference is less than any given difference.[51]

When Leibniz speaks of a complete individual concept he has in mind a set of simple attributes jointly satisfiable by exactly one individual. This set is complete in the sense that it contains every simple attribute the corresponding individual would have if he were actualized by God, and also in the sense that absolutely every attribute, complex as well as simple, follows from the concept of the individual in question.[52] Furthermore, a complete individual concept consists of an infinite number of attributes, which is why a perfect grasp of it can be possessed by God alone.[53] Now it is important to observe that Leibniz identifies the complete concept of an individual with an infinite subset of the total set of attributes which the individual would have if he existed. This infinite subset is such that the total set of the individual's attributes follows from it. Thus, in some remarks on a letter from Arnauld, Leibniz says,

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[51] LP, p. 66; C, p. 377.

[52] For the development of the ideas expressed in the last two sentences see Mates's important paper, "Leibniz on Possible Worlds" in *Leibniz*, ed. by Frankfurt, p. 339.

[53] NE, p. 309; G V, p. 268; L, pp. 307-8; G IV, pp. 432-34.

> . . . one can always prove that there must exist a complete concept of . . . Adam . . . For all the predicates of Adam depend or do not depend upon other predicates of the same Adam. Setting aside, therefore, those which do depend on others, one has only to consider together all the basic predicates in order to form the complete concept of Adam adequate to deduce from it everything that is ever to happen to him, as much as is necessary to be able to account for it.[54]

If we refer to this set of basic properties as the "core set," the general picture we obtain is this.[55] To every individual, whether actual or merely possible, there corresponds a complete concept or core set of simple properties which is infinitely rich and which entails the individual's total set of attributes. The core set contains the individual's defining characteristics (or *haecceity*) and each simple property that belongs to the set is a necessary or essential attribute of the individual.[56] On Leibniz's view, however, some of the properties of the total set are only contingently connected to those of the core set. The deduction of a property like Peter's *denial of Christ*, for example, involves an infinite analysis of the complete concept of *Peter*, thus rendering its containment in the concept merely contingent. On this view necessary truths about an individual are ones which follow from properties in the core set in a finite number of steps, while contingent truths are ones which require an infinite analysis to reveal.

Now for the difficulty. Each simple constituent of the complete concept of *Peter* is essential (or necessarily connected) to that concept, for every such property is part of the very definition of *Peter*. The core set of Peter's concept, however, is also supposed to be infinitely complex or to consist of an infinite conjunction of such properties. Taken together these assumptions lead to a surprising result: every proposition which asserts that one of these elements is contained in the concept of *Peter* is necessarily true, but the proposition that expresses the *entire* definition (or the complete concept) is contingent. Suppose, for example, that the set of attributes comprising the complete concept of *Peter* has among its members the simple properties p, q, and r. In that case the proposition that the concept of *Peter* contains the concept of p is a necessary truth. Its denial can be reduced to a contradiction in a finite number of steps. Likewise for the proposition that the concept of *Peter* contains the concept of q, and so on.[57] For each of the members of the core set, the assertion that

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[54] CA, pp. 47-48; G II, p. 44.

[55] The label "core set" is due, I believe, to Margaret Wilson.

[56] Leibniz identified the concept of an individual with its *haecceity* at L, p. 308; G IV, p. 433.

[57] Since human beings do not have an *a priori* grasp of a concept like *Peter*, I am not suggesting that we are in a position to give these proofs. God is in a position to do so, however.

the concept of *Peter* contains *that* property is necessarily true. But what about the proposition that the concept of *Peter* contains the conjunction of *all* the properties in the core set (the proposition, that is, that the concept of *Peter* contains *p*, and *q* and *r et cetera ad infinitum*)? This proposition is an infinite conjunction and its denial cannot be shown to involve a contradiction in a finite number of steps. It is therefore contingent. (Note that what the denial of this proposition asserts is that there is at least one member of a certain, infinitely large, set of properties which the complete concept of *Peter* fails to contain. Proving that this is contradictory would require showing that each and every one of the properties in the set *is* contained in the concept of *Peter* — a task that could never be completed).

I do not know whether Leibniz ever recognized that his views had the surprising consequence which I have just described, or whether he would have been prepared to embrace it. But it does seem to me to *be* a consequence of his doctrines and, in fact, one which runs contrary to a rather deeply entrenched preanalytic intuition we have about logical necessity and contingency. It is very counterintuitive to suppose that the complete concept of *Peter* contains each and every one of a set of properties necessarily, but that it does not contain the conjunction of these properties necessarily. A proposition formed by conjoining only necessary truths must itself be necessary. And this would seem to be true regardless of the *number* of conjuncts in the proposition. But while this is our strong intuition about necessity, it is not our intuition about demonstrability. For clearly it does not follow from the fact that each conjunct of a proposition, taken separately, can be proven in a finite number of steps that the proposition as a whole can be. On the contrary, if it has an infinite number of conjuncts, the proposition may be indemonstrable. What this suggests, again, is that our intuitions about necessity and contingency are not captured very well by the distinction between finitely and infinitely analyzable propositions.

III

More important than the issue of intuitive appeal, however, is the fact that Leibniz's solution to the problem of contingency is in flagrant conflict with some of his most central ideas. To see this we shall have to take a closer look at the strategies which have been suggested for dealing with Arguments E and N. (It will not be necessary, I think, to look specifically at Argument A.)

Let us begin with E. Leibniz answers this argument by denying its second premise. That is, he rejects the following claim:

(E2) It is hypothetically necessary that Adam accept the apple. (Adam's concept contains the concept of *apple-acceptance* and so it is necessary that Adam accept if he exists at all, i.e., it is not possible that Adam exist and refrain from accepting.)

Leibniz takes exception to this claim because of the way it is construed in the parenthetical material. His view is that although Adam's concept does contain *apple-acceptance* it would take an infinite analysis to elicit this containment and it is therefore possible that Adam should refrain from accepting. A serious problem with this, however, is that if there is only a contingent connection between *Adam* and *apple-acceptance*, then it follows that the concept of *Adam* belongs to more than one possible world. This is because Leibniz is committed to holding that whatever is possible is true at some possible world. To be sure he does not *define* "possible" in this way. His definition is rather "that which does not imply a contradiction."[58] However, if the term "possible" is taken univocally then it is a *consequence* of a proposition's being noncontradictory that it is true at a possible world. At several places Leibniz clearly acknowledges that this *is* a consequence of his views. For he says that there are as many possible worlds as there are series of things that can be conceived without contradiction.[59] At the end of the *Theodicy* he tells us that the worlds which God surveys at creation are "representations of all that which is possible."[60] But if every noncontradictory proposition is "represented" in some possible world, then every possible, or coherent, proposition is true at some world. In that case, if it is possible that Adam refrain from accepting the apple, there is a possible world at which he does refrain. Similarly, if there is no contradiction in the idea of Adam's rejecting the apple, then there is a possible world at which this very individual does reject the apple. Thus there are possible worlds at which Adam refrains and possible worlds at which the same Adam accepts. But Leibniz emphatically denies that the concept of any finite individual belongs to more than one possible world, and he repeatedly asserts that any supposed difference in the properties possessed by any individual would yield the concept of a different individual.[61] Furthermore, Leibniz purports to deduce these conse-

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58 LP, p. 54; C, p. 364; LP, p. 76; C, p. 387.

59 Gr, p. 390.

60 T, section 414, p. 370; G VI, p. 362.

61 The ideas expressed in the remainder of this paragraph can be found at various places in Leibniz. For example, CA, pp. 15-16, 43-47, 59-60; G II, p. 20, 40-43, 53; L, pp. 321-22; G IV, pp. 454-56; L, pp. 267-69; C, pp. 518-21; T, sections 414-16, pp. 370-73; G VI, pp. 362-64; L, pp. 307-8; G IV, pp. 432-34; T, section 9, p. 128; G VI, p. 107; L, pp. 661-62; G III, p. 573.

quences from the Predicate-in-Notion Principle. He reasons that if the Predicate-in-Notion Principle is true, then there exists in God's mind a complete concept of every possible individual. This concept contains the idea of absolutely everything that would be true of the individual if he were actualized by God. As such a complete individual concept expresses or "mirrors" the entire universe to which it belongs. An imagined change in even one of the properties of any of these individuals ultimately would entail the idea of a different person and a different possible world. Because each possible individual mirrors his entire universe, it is Leibniz's view that no possible person is compossible with individuals from more than one world. Individuals, to borrow an expression from Plantinga, are "world-bound." But, as we have already seen, the strategy Leibniz employs against Argument E implies that individuals are *not* world-bound. (It should perhaps be mentioned that this problem — as well as many of the others that follow — will arise not only for the infinite analysis theory of contingency, but for *any* view which implies that there is a contingent connection between concepts considered as possible. In that sense the critique is generalizable to any 'solution' that has this consequence.)

The belief in world-bound individuals plays a crucial role in Leibniz's doctrine of creation, and so the latter is also in conflict with the theory of infinite analysis. We are told specifically that when God was deciding whether to actualize Judas Iscariot, it was not open to him to decide whether Judas would betray Jesus or remain loyal. The reason Leibniz gives for this is that the concept of *Judas* contains the idea of *betraying Christ*. Anyone who did not perform this act of betrayal would not have been Judas Iscariot, but some other individual. If we ask why a particular man commits a particular sin, Leibniz answers, "The reply is easy: it is that otherwise he would not be this man."[62] God's choice was thus between actualizing Judas (together with his betrayal) or not actualizing that individual at all. God could have refused to create Judas and he would have done so had it been for the best. But he could not have created this very person and also arranged things so that he refused the thirty pieces of silver. Consequently, Leibniz points out, neither Judas nor any of the rest of us sinners can complain of the fact that God did not create us better than we are. Since our concepts contain the idea of our sins, that is not possible.

It *is* possible according to the theory of infinite analysis, however. For reasons which have already been stated this theory implies that there are possible worlds at which Adam refuses the apple and ones at which Judas

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[62] L, p. 322; G IV, p. 455.

is loyal to Christ. Now God has the power to actualize any possible world he pleases. It is therefore a consequence of the doctrine of infinite analysis that God could have arranged things so that Adam refused the apple and Judas remained loyal to Jesus.

There are still further theological problems. Leibniz holds that the relations between concepts, considered as possible, are outside the control of God. Whether Adam's concept contains the idea of *apple-acceptance* rather than *apple-refusal* is not a matter that is within the scope of the divine will. God *sees* the containment, but he is not responsible for having *produced* it. The domain of possibles is an inviolable sphere and God can neither fix nor alter the eternal relations which the pure possible have to one another. He can determine which, if any, set of possibles is actualized. But this is all he can do.[63]

In contrast to this, the idea of infinite analysis implies that God does have the power to fix the order of certain of the possibles. More specifically it implies that he can determine whether or not the concept of *Adam* contains the concept of *accepting the apple*. The argument for this conclusion is simple. Since Adam's concept contains *apple-acceptance* contingently, it is possible that it should not have contained it. Its noncontainment, in other words, involves no contradiction. But God is omnipotent; he can do whatever is possible and bring about any state of affairs that is noncontradictory.[64] It follows, therefore, that he could have arranged for Adam's concept to include the idea of *rejecting the apple*.

This consequence of the theory of infinite analysis is extremely damaging to Leibniz's theodicy. In order to support his solution to the problem of evil, it is very important to be able to maintain — as he almost always does — that God *cannot* affect the possibles. As everyone knows, Leibniz's vindication of evil is that God chose the best combination of possibles. Thus, although God allowed evil to exist, it was not within his power to do better. But if God could have made other things possible, then the fact that he chose the best of what is (in fact, or contingently) possible does not show that he could not have done better. If he had the power to reorder the possibles, what proof is there that he might not have come up with a world that was even better than ours? The idea, on the other hand, that relations among pure possibles are necessary blocks this objection, for even God cannot change necessary truths. It is perhaps for this reason that in the *Theodicy* (a work from which the theory of infinite analysis is conspicuously absent) Leibniz denies that God can affect the possibles and asserts flatly that truths about pure possibles are all necessary.

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[63] T, section 335, pp. 326-27; G VI, pp. 313-14.

[64] Gr, p. 307. Also LC, pp. 80-81; G VII, pp. 408-9.

Evil springs from the *Forms* [or possibles] themselves in their detached state, that is, from the ideas that God has not produced by an act of will, any more than he thus produced numbers and figures, and all possible essences, which one must regard as eternal and necessary; for they are in the ideal region of the possibles, that is, in the divine understanding. God is therefore not the author of essences in so far as they are only possibilities. But there is nothing actual to which he has not decreed and given existence; and he has permitted evil because it is involved in the best plan existing in the region of possibles, a plan which supreme wisdom could not fail to choose. This notion satisfies at once the wisdom, the power and the goodness of God, and yet leaves a way open for the entrance of evil. God gives perfection to creatures in so far as it is possible in the universe.[65]

In general the things Leibniz says about the structure of possible worlds and about the compossibility of one substance with another do not fit well with his infinite analysis theory of contingency. He characterizes a possible world as a "collection of compossibles" or set of complete concepts which are capable of joint actualization.[66] Each such set is 'maximal' in the sense that it contains *all* the complete concepts that are compossible with the ones it does contain. "Our" world is the very richest of these sets. Because each set is maximal (or closed with respect to the notion of compossibility), not even one more complete individual concept can be added to it.[67] Consequently, the addition of any further *species* to a possible world is also ruled out by its incompossibility with the members of that world. *Apropos* of this Leibniz claims that although the actual world does not contain all possible species, it does contain the richest and most harmonious combination of species which are compatible with one another.

I have reason to believe that all possible species are not compossible in the universe, great as it is, and that too, not only in relation to things which exist contemporaneously, but also in relation to the whole series of things. That is to say, I believe that there are of necessity species which have never existed and never will exist, not being compatible with this series of creatures which God has chosen. But I believe that all things, which the perfect harmony of the universe can receive, exist therein.[68]

The modalities that Leibniz employs here indicate that he thinks the collection of creatures which exist in "our" world *cannot* coexist with any additional species. The reason God did not put more species into this world is that the addition of further species is impossible.

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65 T, section 335, pp. 326-27; G VI, pp. 313-14.

66 L, p. 662; G III, p. 573.

67 For the development of the idea of a possible world as a maximal set of mutually compossible complete individual concepts see Mates (op. cit., especially p. 340f.) to whom I am indebted here.

68 NE, p. 334; G V, p. 286.

It is very unlikely, however, that a finite proof can be given that a contradiction arises from the supposition of additional species existing in the universe. One would need to catalogue the infinity of species contained in this world, analyze their concepts, compare them to the (presumably infinite) other possible species which are not contained in this world, etc. But if there is no contradiction in there being additional species, then further species *are* compossible with the creatures that actually exist. In that case "our" world is not a maximal set of concepts, for it could contain more than it does. Even more disturbing perhaps, there is an unactualized possible world containing all the substances of this world *plus others*. As we have just noted, no one can demonstrate that a contradiction is involved in the idea of such a world. *A fortiori* a world of this type is possible. For somewhat similar reasons there is an unactualized possible world that is as good as the actual world in other respects but which lacks one particular substance — Adolph Hitler. Given the other things Leibniz says about infinite analysis, we cannot suppose that it is demonstrable that the existence of Hitler is required for the overall good of the universe.[69]

It appears, then, that the entire theory of world-bound individuals and those aspects of the doctrine of creation which are tied to it, would have to be surrendered if the theory of infinite analysis were pursued consistently. The conception of hypothetical necessity which is required by the theory of world-bound individuals is, in fact, the one embodied in Argument E: (E2) N (If Adam exists, Adam accepts the apple.). We have seen what results from the denial of E2. The assumption that E2 is true, on the other hand, restores the fundamental elements of the doctrine of creation. If there is a contradiction in Adam's concept lacking the property of *apple-acceptance*, then there is no possible world wherein Adam is an apple-refuser — in which case God *cannot* arrange for Adam to refuse. Likewise, if this conception of hypothetical necessity is extended to all of Adam's properties, then many other parts of the standard picture of possible worlds will fall into place. For example, Adam will belong only to one possible world; it will not be possible for any additional substances (or any fewer) to belong to Adam's universe; and it will not be open to God to tamper with the contents of any complete individual concept. But if we follow this line of thought to its logical conclusion, the result is that *all* truths about possibles, *qua* possible, are necessary since the connections among pure possibles are in principle demonstrable. It seems to me, then, that commentators who have attributed to Leibniz the view that claims about possibles, *qua* possible, are necessary have a considerable ~~about~~ amount of

[69] Cf., Adams, op. cit., p. 34. A difference between our views is to be observed here.

logical (and textual) justification. Although Leibniz frequently denies this thesis when developing this theory of infinite analysis, it is nevertheless required by the other views which I have been discussing.

I believe that this also provides a partial vindication of those who attribute to Leibniz a merely epistemic account of the distinction between necessity and contingency. It is wrong to claim that the theory of infinite analysis is itself an epistemic idea. But the principle that all analytic truths are demonstrable is presupposed by the theory of world-bound individuals and it is hard to see how the latter can accommodate anything more than an epistemic distinction. If there *is* a contradiction in denying, for example, that the concept of *Judas* contains the concept of *betraying Jesus*, then the most that can be said is that *we* cannot elicit the contradiction, though God can. In that case, "Judas remains loyal to Christ" is only epistemically possible. Thus, if one focusses on the theories of creation and world-bound individuals, and assumes that the theory of infinite analysis is consistent with these doctrines, one would naturally reach the Russell/Lovejoy result.

Paradoxes and inconsistencies also arise from Leibniz's two attempts to cope with Argument N. His second strategy, it will be recalled, was to claim that "This world is best" is contingent. But if it is just a contingent fact that this world is best, then the matter of whether or not it is best is something that is within God's control. For God has control over all contingent facts. Presumably, then, he could have seen to it that this world was not the best. This, however, conflicts with some of the theses about creation that Leibniz was most concerned to uphold. On his official view, which he never renounced, God actualizes "our" world because he sees that it is objectively best. He does not (and cannot) *make* any possible world the best by his will. The reason is that if God controlled which possible world is best, the fact that a certain world is best could not supply the sufficient reason for his actualizing it. As Leibniz put it at one place, "every act of willing supposes some reason for the willing and this reason, of course, must precede the act."[70] So, if the bestness of this world is to be the ultimate explanation for God's choosing it, then the proposition that it is best cannot be a merely contingent truth.

Here is another problem. According to Leibniz's second strategy *being BPW* is a property the actual world possesses contingently. This entails that it is a property which is "world-relative" or one which is possessed at certain worlds but not at others. The reason is that if anything has a property contingently then it is possible that it should not have that property — and, accordingly, there are worlds at which it does not have that property.

[70] L, p. 304; G IV, pp. 427-28.

So if "our" world possesses the property *being BPW* contingently, then there are worlds at which "our" world is not the best. Another way of seeing this is to consider the claim that it is a mistake for the proponent of Argument N to treat "BPW" as a rigid designator, since the referent of "BPW" may vary. If the referent of "BPW" varies, however, then there are worlds at which this world (i.e., "our" world) is not the best. The doctrine of infinite analysis thus implies that the question whether a certain world is best is one whose answer differs from world to world. But while the doctrine has this implication, it is doubtful whether Leibniz ever recognized that it did. His theory of creation implies that the question which world is best has a single answer which does not differ from world to world. According to Leibniz, when God considers which world to create he ascertains which world is best — *simpliciter*. There is no indication that there are worlds at which this world is not the best or that the property of *being BPW* is world-relative.[71]

Leibniz's other main tactic against Argument N is to claim that it is only contingent that God wills whatever is best. Since God freely subscribes to the Principle of Perfection it would have been possible for him to actualize a world even though that world was *not* the best. This, in effect, is to grasp the second horn of a famous dilemma which Russell propounded many years later. Either God's goodness (i.e., his tendency to choose what is best) is necessary or it is contingent. If we suppose that it is necessary, Russell argued, then everything that follows from it is necessary. But if we suppose that it is only contingent,

> we should merely remove the difficulty one stage further, since we should then require a sufficient reason for God's goodness. If this reason were necessary, God's goodness would also be necessary; if contingent, it would itself require a sufficient reason, concerning which the same difficulty would recur.[72]

Russell thought the second horn of the dilemma obviously involved a vicious regress. Considering Leibniz's version of the cosmological argument, this claim is plausible. Leibniz says that no ultimate reason can be found for an infinite series of contingent events each one of which provides a reason for some other one in the chain. The series as a whole requires a reason outside of itself and this can be found only in something that is metaphysically necessary, to wit, the divine nature.

Now I have not been able to find any text in which Leibniz deals satisfactorily with this difficulty. Rescher, however, has made an ingenious suggestion as to how Leibniz could get out of the problem. God is both

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[71] Although I have stated the point in my own way, I have benefited here from Adams. Cf. Adams, op, cit., p. 34.

[72] Russell, op. cit., p. 39, footnote 1.

morally and metaphysically perfect, but only the latter is true by definition; God is morally perfect by free choice. Since this choice requires a reason, Russell was correct in thinking that an infinite regress results. He was wrong, however, in supposing that the regress is vicious, because a sufficient reason for the entire series can be found in the divine nature.

> God's moral perfection follows from His metaphysical perfection but the deduction would require an infinity of steps. God's moral perfection has a sufficient reason, and this in turn a sufficient reason, and so on *ad infinitum*—an infinite regress which converges on God's metaphysical perfection.[73]

This seems to solve the problem. The regress of reasons involved in God's free choice is reconciled with the Principle of Sufficient Reason by arguing that the regress converges on something absolutely necessary, namely, God's metaphysical or ontological perfection.

Although this strategy avoids Russell's problem, there is another one which I believe is inescapable. If "God wills what is best" really is contingent, it follows that it is strictly impossible for us to show that this proposition is true. This can be seen by constructing a new dilemma. There are only two ways a proposition can be proven for Leibniz — *a priori* or *a posteriori*. But neither of these ways is open to us to show that God is perfectly good. If "God wills what is best" is contingent, then by hypothesis it cannot be proven *a priori* in a finite number of steps. On the other hand, the proposition cannot be established *a posteriori* either, as I shall now try to show.

The only way of proving *a posteriori* that God wills the best is to establish that the actual world is the best of all possible worlds. For only if the best actually exists can it be shown *a posteriori* that God wills what is best. It is important to see, however, that one natural way of establishing "BPW actually exists" is ruled out from the start. We could easily prove this proposition if we knew that God wills the best. For then we could simply infer that the actual world is best from the fact that it was chosen by God. But in the present context this would be patently circular. Our ultimate objective is to *prove* that God wills the best and so we cannot use it as a premise in the argument.

A different sort of *a posteriori* proof could be given if Leibniz were in a position to show that it is a necessary truth that this world (which I will refer to as "W_1") is BPW. If it were a necessary truth, "W_1 is BPW" could be demonstrated or proven *a priori* in a finite number of steps. (Remember: it is a matter of definition that every necessary truth can be demonstrated *a priori*.) Once having proven that W_1 is BPW we could establish

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[73] Rescher, op, cit., p. 45. At first sight, Gr 301f. looks rather like a place at which Leibniz is taking this line. But see Adams' perceptive comments on this. Adams, op. cit., pp. 28-29.

that BPW actually exists by showing *a posteriori* that W_1 actually exists. And from this we could infer that God wills the best.

The argument has two serious flaws, however. The first, and most fundamental, is this. Given what Leibniz tells us about possible worlds, there is simply no way for him to demonstrate *a priori* that W_1 is BPW. As he points out, there is an infinite number of possible worlds and the *a priori* determination which of these worlds is best involves a comparison that is beyond the grasp of any finite mind. In view of this Leibniz cannot prove the proposition "W_1 is BPW" *a priori* and thus cannot use it to establish that God wills the best. This difficulty arises, I think, whether or not he adheres to his infinite analysis test for contingency. For whatever criterion of contingency is employed, if there is an infinite number of possible worlds, there will be no way that any human being can prove *a priori* which particular one is best.

The second problem is that if Leibniz does adhere to his doctrine of infinite analysis, he is committed to holding that "W_1 is BPW" is *contingent*. If an infinite comparison of possible worlds is required to show *a priori* that W_1 is best, then it is theoretically impossible for anyone (even God) to demonstrate this proposition. This entails that it is contingent. So on his infinite analysis theory, Leibniz must actually *reject* the claim that "W_1 is BPW" is necessary.

Finally, it will not do to try to infer *a posteriori* that BPW actually exists from any observations about the special features of this world, such as the fact that it contains many wonderful and varied things. However fabulous the things we discover in this world, no such observation would entail that a better universe is impossible.

Since I can see no other way of showing *a posteriori* that God wills what is best, I conclude that if this proposition is a contingent truth it is also one which we have no way of proving. Either "God wills what is best" is necessary or it is a mere article of faith.

These consequences of the thesis that God is only contingently good are at odds with many of Leibniz's official views. For example, he flatly denies that God's goodness is known only by faith.

> Now we have no need of revealed faith to know that there is . . . a sole Principle of all things, entirely good and wise. Reason teaches us this by infallible proofs . . .[74]

What is more, in the first paragraph of the *Discourse on Metaphysics* Leibniz gives an *a priori* demonstration that God is completely good. Starting with the definition of God as the absolutely perfect being, he first proves that infinite knowledge and power are perfections and then

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[74] T, Preliminary Dissertation, section 44, p. 98; G VI, p. 75.

deduces, in one step, that God "acts in the most perfect way and does this not only in a metaphysical but also in a moral sense."[75] But if God's goodness were contingent, no such demonstration would be possible.

The solution to the problem of evil also presupposes that God's perfect goodness is necessary. Leibniz proves that this is BPW (and hence that all the evils "had to be permitted") by arguing *a posteriori* from the fact that this world is actual. We know that this world is the best, he says, because we know that God chose it.[76] But a proof of this kind will go through on Leibnizian assumptions only if it is a necessary truth that God chooses what is best. For only then can we *show* that God chooses what is best and hence be in a position to infer that this world is best from the fact that it is actual.

The results of sections II and III of this paper lead me to the conclusion that the theory of infinite analysis is a very unsatisfactory way of trying to solve the Leibnizian problems about freedom and contingency. Not only is it counterintuitive, but it is inconsistent with other critical parts of his philosophy. We have seen that the various ways in which he uses the doctrine against Arguments E and N undercut some of the most important ideas in his system. Taken together the strategies based on infinite analysis conflict with the theory of world-bound individuals, the doctrine of creation, the solution to the problem of evil, and ultimately with the Principle of Sufficient Reason itself.

In closing, I would like to offer an hypothesis about the probable development of Leibniz's thought, based on the conflicts and tensions in his system which have been uncovered here.[77] Many of the antinomies I have discussed have a common root: Leibniz's official account of creation (including the theory of world-bound individuals) implies that all truths about possibles, *qua* possible, are necessary, while his infinite analysis solution to the problem of contingency implies exactly the opposite. His doctrine of creation presupposes that all analytic truths are demonstrable, whereas the infinite analysis theory involves the denial of that thesis. What this suggests, I think, is that when Leibniz first worked out his doctrine of creation he must have been supposing that the Principle of Analytic Demonstrability is true. In other words, he must have been taking it for granted that there is a contradiction in denying that Adam's concept contains the idea of *apple-acceptance*, or in asserting that "our" world

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[75] L, p. 303; G IV, p. 427.

[76] For example, T, sections 10 and 226, p. 129 and 268; G VI, p. 108 and 252-53.

[77] This hypothesis was originally based (principally) on the irresolvable conflicts that plague Leibniz's system. I believe, however, that Sleigh's illuminating study of Leibniz's theory of truth provides a great deal of additional confirmation for it. For reference see footnote 42.

could contain more types of things than it does, and so on. Leibniz as much as tells us that he had once tacitly assumed that all analytic truths are demonstrable. For, as I noted earlier, he remarks that he was long perplexed by the question how the predicate could be in the subject and the proposition not be necessary. He indicates that it took him a considerable amount of time before he realized how to solve the problem through the theory of infinite analysis. So I suspect that something roughly like the following transpired in the evolution of Leibniz's views. He first developed his doctrine of creation and theory of world-bound individuals while assuming the Principle of Analytic Demonstrability. Later, when he realized that grave problems about freedom arise from his system, he tried a number of different solutions and eventually decided that the theory of infinite analysis was the most fundamental and the best. Leibniz experimented with this idea, sometimes pushing it one way (arguing, for example, that God's goodness is contingent) and sometimes pushing it another way (claiming that it is contingent that this world is best). He recognized some of the important consequences of his conception of infinite analysis, but he certainly did not recognize all of them. He was satisfied with his doctrine primarily because it gave him a formal way of showing how the predicate can be in the subject without the proposition being necessary. That, he thought, was its real triumph. But he never realized how counterintuitive his theory is or — more significantly — to what extent it conflicts with his other views. And that, I think, is the real failure of his idea.