

Was Leibniz Entitled to Possible Worlds?

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Leibniz has enjoyed a prominent place in the history of thought about possible worlds.¹ I shall argue that on the leading interpretation of Leibniz's account of contingency — an ingenious interpretation with ample textual support — possible worlds may be invoked by Leibniz only on pain of inconsistency. Leibnizian contingency, as reconstructed in detail by Robert C. Sleight, Jr.,² will be shown to preclude propositions with different truth-values in different possible worlds.

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- 1 See, for example, Robert Merrihew Adams, 'Theories of Actuality,' *Noûs*, 8 (1974) 211-31, and Benson Mates, 'Leibniz on Possible Worlds,' in Harry Frankfurt, ed., *Leibniz: A Collection of Critical Essays*, (New York: Doubleday 1972) 335-64.
 - 2 Robert C. Sleight, Jr., 'Truth and Sufficient Reason in the Philosophy of Leibniz,' in Michael Hooker, ed., *Leibniz: Critical and Interpretive Essays* (Minneapolis: University of Minnesota Press 1982) 209-42.

If there is a plurality of possible worlds, of course, there must be differences among the worlds that distinguish one from another. And if there are such differences, then certain propositions – contingent propositions – have different truth-values in different possible worlds.³ A necessary condition for world w_n to be distinct from world w_m is that there be a proposition P such that

(C) Proposition P is true in w_n and false in w_m .

Call propositions satisfying (C) 'contingent propositions.' It will emerge that, given Sleight's reconstruction of Leibniz's views on propositions and truth, there are no such contingent propositions. And if there are no propositions with different truth-values in different possible worlds, then there are no possible worlds distinct from the actual world.

Leibniz held that propositions like

(1) Adam is the first human

are true or false, depending on which world is actual.⁴ Thus, (1) would be taken by Leibniz to satisfy (C) and hence to be contingent.⁵ The naive

3 Leibniz himself clearly espoused the view that there are an infinity of nonactual worlds, any one of which God, without contradiction, could have decreed to become actual. As Leibniz wrote to Arnauld,

I think there were an infinity of possible ways of creating the world according to the different plans which God might have formed and that each possible world depends upon certain principal plans or designs of God that are his own; that is to say, upon certain primary free decrees conceived *sub ratione possibilitatis*, or upon certain laws of the general order of this possible universe, with which they agree and whose concept they determine.

Discourse on Metaphysics, Correspondence with Arnauld, Monadology, trans. George R. Montgomery (La Salle, Ill: Open Court 1980) 124.

4 See, for example, Arnauld: 'God was free to create or not create Adam,' Montgomery, trans., 73. Cf. Mates, 'Leibniz on Possible Worlds,' 344.

5 The concerns here by-pass the controversy over whether Leibniz legitimately could hold that Adam, say, had some of his properties contingently. For even if Leibniz's critics carry the day on that point, Leibniz could still maintain that there are propositions satisfying (C). For recent discussions with numerous references, see E.M. Curley, 'The Root of Contingency,' in Frankfurt, ed., 69-98, and Robert Merrihew Adams, 'Leibniz's Theories of Contingency,' *Rice University Studies*, 63 (1977) 1-42.

view, held by Leibniz and many of his critics alike, is that if (1) is true in the actual world, then there are other possible worlds (indeed, for Leibniz, all other possible worlds) in which (1) is false, by virtue of the fact that Adam fails to exist in them. On Sleigh's interpretation of Leibnizian contingency, the naive view, as I hope to show, will turn out to be radically incoherent. For, on that interpretation, even (1), a contingent proposition if any is, fails to satisfy (C).

In I, I discuss Leibniz's account of contingent propositions in terms of infinite analysis, and in II and III show that that account leads to contradiction. In IV, I modify infinite analysis by a kind of counterpart theory, which modification again leads to contradiction. Then, dropping Leibniz's notion of infinite analysis altogether, I outline a counterpart theory of contingent propositions and suggest that, whether true to Leibniz's views on contingency or not, it too is beset with insurmountable difficulties. Finally in V, I briefly point out the implications of the argument for Leibniz's account of nonsingular propositions.

I. Infinite Analysis

Leibniz embraced a combination of doctrines that at first glance seems to preclude any significant distinction between necessary and contingent propositions. He held, first, that associated with each individual is a concept so complete that all of the individual's properties may be deduced from it; second, that the individual's concept represents the individual in any singular proposition concerning him or her; and, third, that a proposition is true if and only if the concept of the predicate is 'contained' in the concept of the subject.⁶ Nevertheless, without giving up any of these doctrines, Leibniz ingeniously found a place for a distinction between contingent and necessary propositions. The solution was based on the notion of the infinite analysis of contingent propositions. Sleigh has argued that Leibniz came to this solution before 1690, and that he never abandoned it.⁷

6 *Discourse on Metaphysics* VIII and XIII, Peter Lucas and Leslie Grint, trans., (Manchester, 1953), 13; 18-22. *Leibniz: Philosophical Writings*, Mary Morris and G.H.R. Parkinson, trans., (London: J.M. Dent 1973) 93-4; 96. *Correspondence with Arnauld*, Montgomery, trans. 110ff; 132

7 The following is a sketch of the interpretation offered by Sleigh in *Truth and Sufficient Reason in the Philosophy of Leibniz*.

A proposition may be thought of as the ordered pair of the concepts of the subject and of the predicate. Let C be Adam's individual concept, a maximal, consistent set of properties. It is C , Adam's complete individual concept, that represents Adam in singular propositions about him.

(1) Adam is the first human

is represented by

(2) $\langle C, F \rangle$

where F is the property *being the first human*. Concepts here may be regarded as sets of properties. Properties such as *being the first human* are obviously complex, but so, according to Leibniz, are properties such as *being human* (or perhaps even *being red*). These properties are themselves composed of sets of less complex properties, each set of which is a 'decomposition' of the original concept. Associated with a complex concept is a series of decomposition sets, each obtained in principle by substituting definitions for terms, until finally the decomposition set contains only primitive properties for which there are no further decompositions. The latter set is the ultimate decomposition set of the original concept.⁸ To take a trivial example, {being rational, being animal} may be a decomposition set of {being human}, but not an ultimate decomposition set. Most likely, ordinary properties like *being human* are infinitely complex, in which case finite minds can never hope to specify their ultimate decomposition sets.

An analysis of a proposition is a sequence of decompositions of the subject- and predicate-concepts. If, in a finite number of steps, a decomposition set of the predicate is exhibited as a subset of a decomposition set of the subject, the sequence terminates. E.g., if the original proposition is that all isosceles triangles have two equal angles, the analysis terminates when some decomposition of *having two equal angles* is exhibited as a subset of some decomposition of *being an isosceles triangle*. If the sequence so terminates, the analysis is finite, and according to Leibniz, the proposition is necessarily true. If a contradiction is implied in a finite number of steps, the proposition is necessarily false. E.g., the proposition that all isosceles right triangles have three equal angles will have

8. Leibniz on the Simplicity of Substance,' Robert C. Sleigh, Jr., *Rice University Studies*, 63 (1977) 117. Also, Mates, 'Leibniz on Possible Worlds,' 339.

a decomposition of the subject-concept containing *having two equal angles* and a decomposition of the predicate-concept containing *having three equal angles*. If the sequence never terminates, the analysis is infinite, and according to Leibniz, the proposition is contingent. To sum up:

- (A1) An analysis of a proposition $\langle \alpha, \beta \rangle$ is finite iff there is an i such that $\langle \alpha_i, \beta_i \rangle$ is a term in the analysis and either $\beta_i \subseteq \alpha_i$ or the conjunction of α_i and β_i implies a contradiction. Otherwise, it is infinite.

Since an analysis is a sequence of decompositions, and not a human activity, the distinction between necessary and contingent propositions, based on infinite analysis, is not merely epistemic but is suitably metaphysical.⁹

Leibniz, on Sleight's reading, wanted to understand contingent truth in terms of 'convergence' of an infinite analysis on decompositions such that the decomposition of the predicate-concept is a subset of the decomposition of the subject-concept. On this interpretation, convergence of an infinite analysis is necessary and sufficient for contingent truth. Let me quote just one passage from Leibniz that lends plausibility to such an interpretation:

Every true proposition can be proved... . A true contingent proposition can not be reduced to identical propositions, but is proved by showing that if the analysis is continued further and further, it constantly approaches identical propositions, but never reaches them.¹⁰

Leibniz's account of contingency, on Sleight's interpretation, may be illustrated as follows:

- (I1) (1) is contingent iff $\langle C, F \rangle$ has an infinite analysis.

9 A number of writers have made similar points. E.g., see 'Leibniz's Concepts and Their Coincidence *Salva Veritate*,' Hector-Neri Castañeda, *Noûs*, 8 (1974) 393.

10 'General Inquiries About the Analysis of Concepts and of Truths,' *Logical Papers*, G.H.R. Parkinson, trans. (Oxford: Clarendon Press 1966), 77. Leibniz counts propositions of the form 'AB is A,' as well as of the form 'A is A,' as identical propositions. (See Parkinson's introduction, xxxiv.) Also, see Morris and Parkinson, trans., 109.

- (I2) An infinite analysis of $\langle C, F \rangle$ converges iff there are decompositions, DC and DF, of C and F, respectively, such that $DF \subseteq DC$. Otherwise, the analysis diverges.

Since the analysis of (1) is infinite, the decompositions DC and DF, such that $DF \subseteq DC$, never appear as a term in a converging analysis. Indeed, the requisite decompositions are the ultimate decompositions of C and F, the infinite sets of simple attributes which have no further decompositions.¹¹ Although the ultimate decompositions to which an analysis 'asymptotically' converges are unknowable to finite minds, we are assured of their existence by the postulate that all properties result from the conjunction of absolutely simple properties.

Whether infinite analysis yields a sufficiently robust notion of contingency is not the concern here; the deeper, overlooked question is whether infinite analysis is compatible with the claim that there are propositions having different truth-values in different possible worlds — i.e., whether Leibnizian 'contingency' in terms of infinite analysis is compatible with (C). The strategy will be to formulate Leibnizian truth-conditions for (1), and then to show that the assumption that (1) satisfies (C) leads to contradiction.

II. Analysis as Independent of World

It is immediately apparent that the notion of convergent infinite analysis can not suffice to account for contingent truth. If it could, then the truth-condition for (1) would be given by

- (T1) For any world, w_i , (1) is true in w_i iff the analysis of $\langle C, F \rangle$ converges.

But (T1), together with the assumption that (1) satisfies (C), leads straight to contradiction: Suppose that (1) is true in w_1 and false in w_2 . Since (1) is true in w_1 , its analysis converges, by (T1); since (1) is false in w_2 , its analysis diverges, by (T1). Thus, if we assume that a contingent

11 The limiting proposition is known to God a priori: '... it is God alone, who grasps the entire infinite in his mind, who knows all contingent truths with certainty.' (See preceding note.)

proposition has a single infinite analysis without regard to world, we place a contradictory demand on the analysis: in order to accommodate contingency, the analysis must both converge and diverge.

The difficulty with this world-independent construal, for which there is no solution, is this: (T1) does not allow the truth-value of a proposition to vary according to which world it is being evaluated in. Yet a contingent proposition has different truth-values in different possible worlds. If true propositions have converging analyses and false propositions have diverging analyses, then there is no conceivable way to allow truth-value to vary from world to world without also allowing the analysis itself to vary from world to world.

Before proceeding to a world-relative account of infinite analysis, however, let us consider a different interpretation of Leibniz, one at odds with Sleight's. Mates, for example, formulates Leibnizian truth-conditions for singular propositions as follows: "A is B" is true of a possible world W just in case the concept expressed by B is contained in the concept expressed by A and the latter concept belongs to W .¹² This suggests that the truth-condition for (1) has two parts:

- (T2) For any world, w_i , (1) is true in w_i iff (i) C is exemplified in w_i , and (ii) the analysis of $\langle C, F \rangle$ converges.

Although (T2) avoids the contradiction that undercut (T1), it has a number of difficulties.

First, unlike Sleight's interpretation, the interpretation that gives rise to (T2) must systematically overlook much of the text of Leibniz. More particularly, it would wreak havoc with one of Leibniz's central ideas, viz., that a proposition is true just in case its predicate-concept is 'contained' in its subject-concept; for on truth-conditions like (T2), the condition that the predicate-concept be contained in the subject-concept would be satisfied by numerous *false* propositions.

Second, (T2) does not yield the right results; indeed, it runs into a contradiction of its own. For example, suppose that Adam exists in w_1 , but that he is not the first human in w_1 (that honor having gone to Eve). Assume as a *reductio* premise that (1) satisfies (C) and hence is contingent. Then, since (1) is false in w_1 and the first clause of (T2) is

12 'Individuals and Modality in the Philosophy of Leibniz,' Benson Mates, *Studia Leibnitiana* IV/II (1972) 94

satisfied, the second clause must fail to be satisfied: the analysis of $\langle C, F \rangle$ diverges. On this world-independent construal of infinite analysis, however, if the analysis of $\langle C, F \rangle$ diverges at all, it diverges regardless of which world (1) is being evaluated in. Then clause (ii) of (T2) must remain unsatisfied regardless of which world (1) is evaluated in. In this case, there is no possible world in which (1) is true, and hence (1) fails to satisfy (C), and hence turns out on (T2) not to be contingent. Surely, the status of (1) as contingent should not depend on whether or not Adam was in fact the first human in the actual world.

Third, (T2) violates a deep intuition about contingency. In the case just described, in which Adam exists in w_1 but is not the first human, (1) turns out to be *necessarily* false on (T2), but the negation of (1) turns out to be *contingently* true on (T2). It would seem to be a constraint on an account of contingency that the negation of a contingent (necessary) proposition is contingent (necessary).¹³

Thus, neither world-independent construal, expressed by (T1) or by (T2), is remotely adequate as an account of contingent truth. It appears, therefore, that if there is any way to reconcile infinite analysis and (C), analyses themselves will have to be world-relative. For the world-relative account, I shall revert to Sleight's interpretation, according to which Leibniz understood contingent truth in terms of converging infinite analyses.

III. Analysis as Relative to World

Analyses will be world-relative if convergence and divergence are taken to be world-relative. This fact suggests that (I2) should be revised to

- (I2') For any world, w_i , an infinite analysis of $\langle C, F \rangle$ converges in w_i iff there are decompositions in w_i such that $DF \subseteq DC$.

Then the truth-condition for (1) will be

- (T3) For any world w_i , (1) is true in w_i iff the analysis of $\langle C, F \rangle$ converges in w_i .

13 Leibniz would agree: 'Now nothing is necessary of which the opposite is possible.' (See note 17.)

To see that the world-relative account of infinite analysis, represented by (T3), leads to a contradiction, we need several eminently plausible principles. The first is perfectly general. Let us say that one set of properties entails (\Rightarrow) another if, necessarily, anything that has all the members of the first has all the members of the second. Then

- (P1) For any two sets of properties, S and S' , if $S' \subseteq S$, then $S \Rightarrow S'$.

Next we need a principle concerning infinite analyses. Roughly, an infinite analysis converges if, after some point, progressively more subsets of decompositions of the predicate-concept are exhibited as decompositions of the subject-concept. Consider a subset S of a decomposition of the predicate-concept of a true contingent proposition; since the analysis of such a proposition is infinite and converging, sooner or later there will be some decomposition of the subject-concept that has a subset logically equivalent to S . On the other hand, in a diverging infinite analysis, there are subsets of decompositions of the predicate-concept that are not subsets of *any* decomposition of the subject-concept, no matter how far the analysis is extended. By this informal reasoning, which seems to capture the intuitive basis of convergence, we have

- (P2) The nonterminating sequence $\langle \alpha_1, \beta_1, \rangle, \langle \alpha_2, \beta_2 \rangle \dots$ is a converging infinite analysis iff for any set S such that $S \subseteq \beta_j$, there are an α_k ($k \geq j$) and an S' , such that $S' \Leftrightarrow S$ and $S' \subseteq \alpha_k$.

Finally, we need two principles concerning decompositions. Let us exploit a (rather weak) feature of analysis: If X is a definition of Y , and X' is a definition of Y' , and X is not logically equivalent to X' , then $Y \neq Y'$. A decomposition of a concept is a definition of it. So any decomposition of a set of properties in one possible world is logically equivalent to any decomposition of it in any other possible world. More generally,

- (P3) If DF and $D'F$ are both decompositions of a concept F , then DF and $D'F$ and F are all logically equivalent.

The other principle concerning decompositions is suggested by deep Leibnizian theses — viz., the concept-containment account of truth and the notion of the analysis of concepts. If the singleton set of one concept entails that of another, then, necessarily, anything having the first property has the second property. Then, in Leibniz's view, the second is 'included' in the first, where one set is included in another if some decom-

position of the second is a subset of some decomposition of the first. Thus we have

- (P4) If $A \Rightarrow B$, then there are decompositions of A and B such that $DB \subseteq DA$.

For the reductio, suppose that (1) is true in w_1 and false in w_2 . Since (1) is true in w_1 , we are assured by (T3) that C and F have decompositions in w_1 such that $DF \subseteq DC$. Since (1) is false in w_2 , we are assured by (T3) that C and F have *no* decompositions in w_2 such that $DF \subseteq DC$. But by (P3) all decompositions of a given concept are logically equivalent. So the assumption that (1) satisfies (C) again leads to contradiction.

In more detail: Suppose that (1) is true in w_1 and false in w_2 . then by (P2) and the assumption that (1) is true in w_2 . Then by (P2) and the assumption that (1) is false in w_2 , there is a subset of some decomposition in w_2 of F which is logically equivalent to *no* subset of any decomposition in w_2 of C. Let A be that subset. So where DF_i and DC_i are variables over decompositions in w_2 of F and C respectively, and S is a variable over sets,

There is DF_i such that

- a. $A \subseteq DF_i$

and

- b. There are no S and DC_i such that $S \subseteq DC_i$ and $S \Leftrightarrow A$.

Since by (P3) all decompositions of A are logically equivalent, there is no decomposition of A that is a subset of any decomposition of C. So, where DA_i is a variable over decompositions in w_2 of A,

- c. For all DA_i and DC_i , $DA_i \not\subseteq DC_i$.

But by (P4), then by (P3),

- d. For all DC_i and DA_i , $DC_i \not\Rightarrow DA_i$.
- e. $C \not\Rightarrow A$.

Ex hypothesi, (1) is true in w_1 . Let DF_k and DC_k range over decompositions in w_1 of F and C, respectively. By (P2), together with the assump-

tion that (1) is true in w_1 , for any subset of any DF_k in w_1 , there is a subset of a DC_k in w_1 to which it is logically equivalent. That is,

- f. For any S' and DF_k such that $S' \subseteq DF_k$, there are S'' and DC_k such that $S'' \subseteq DC_k$ and $S' \Leftrightarrow S''$.

By line a., A is a subset of a DF_i in w_2 . And by (P3) all decompositions of F are logically equivalent. Thus, A is logically equivalent to a subset of DF_k in w_1 . So

- g. There is some S' such that $S' \subseteq DF_k$ and $A \Leftrightarrow S'$.

From lines f. and g., with an application of (P1),

- h. There are S'' and DC_k such that $S'' \subseteq DC_k$ and $A \Leftrightarrow S''$.

- i. There are S'' and DC_k such that $DC_k \Rightarrow S''$ and $A \Leftrightarrow S''$.

By (P3), any DC_k is logically equivalent to C . Thus, from line i.,

- j. $C \Rightarrow A$.

Lines e. and j. are directly contradictory, and (1) again fails to satisfy (C). So the world-relative account fares no better than the world-independent interpretation of infinite analysis.

My diagnosis is this: Leibniz's notion that a proposition is true just in case the predicate-concept is 'contained' in the subject-concept irresistibly invites treatment of the relation between subject- and predicate-concepts of a true proposition as a relation between sets. But relations between sets hold in all possible worlds, whereas contingency requires that the relation between subject-concept and predicate-concept by virtue of which contingent propositions are true does *not* hold in all possible worlds. There is no getting around the fundamental incongruity between mathematical relations, which are independent of world, and those matters of existence and fact that are relative to world. Contingency as infinite analysis was a stunning attempt to harmonize incompatible views on truth and contingency. Neither infinite analysis nor anything else, I fear, can reconcile those views.

IV. Counterpart theory

We know, from consideration of the world-independent account in II, that contingency as infinite analysis requires some kind of relativity to worlds, but the obvious way of achieving world-relativity led to contradiction in III. There may be another way to achieve needed relativity, however. Instead of taking the infinite analyses to be relative to worlds, let us take the complete individual concepts to be relative to worlds. So instead of speaking of Adam's concept *simpliciter*, we may speak of the concept-in-a-world of Adam-in-a-world. And instead of having decompositions of C, we have decompositions of C-in- w_i , where C-in- w_i is the complete individual concept of the individual that would be the counterpart -in- w_i -of-Adam-in-our-world if w_i were actual.¹⁴ If Adam-in-our-world has no counterpart in w_i , then there is no C-in- w_i . This move avoids the contradiction of the world-relative account in III: that there are decompositions such that $DF \subseteq DC\text{-in-}w_1$ is consistent with there being no decompositions such that $DF \subseteq DC\text{-in-}w_2$; all that follows is that C-in- w_1 is not equivalent to C-in- w_2 . And this result is right in line with Leibniz's view that a complete concept is exemplified in no more than one world.

On the present proposal, the principles of contingency must be amended:

- (I1') (1) is contingent iff for any world, w_i , such that there is a C-in- w_i , $\langle C\text{-in-}w_i, F \rangle$ has an infinite analysis.
- (I2'') For any world, w_i , such that there is a C-in- w_i , an infinite analysis of $\langle C\text{-in-}w_i, F \rangle$ converges iff there are decompositions such that $DF \subseteq DC\text{-in-}w_i$.
- (T4) For any world, w_i , such that there is a C-in- w_i , (1) is true in w_i iff the analysis of $\langle C\text{-in-}w_i, F \rangle$ converges.

What is a proposition, on this view? With world-relative individual concepts, (1) can no longer be represented by $\langle C, F \rangle$. Nor can $\langle C\text{-in-}w_i, F \rangle$ represent a proposition, or else propositions themselves would be

14 David Lewis is the originator of counterpart theory. See 'Counterpart Theory and Quantified Modal Logic,' *Journal of Philosophy* (1968) 113-26

relative to worlds; in that case, there would be no comparison of truth-values of a proposition from world to world, and hence no contingency (nor, for that matter, necessity). It looks as if (1) will have to become $\{ \langle C\text{-in-}w_1, F \rangle, \langle C\text{-in-}w_2, F \rangle, \dots \}$, where the relation among the $C\text{-in-}w_i$'s is a counterpart relation.

This revision puts enormous pressure on the counterpart relation, which is notoriously obscure. The very proposition expressed by 'Adam is the first human' now depends upon which worlds contain counterparts of Adam-in-our-world. (This account nudges one toward an indexical view of the actual, as Adam himself seems to dissolve into a set of counterparts, to one counterpart of which we stand in a special relation.) Commentators have argued for and against reconstructing Leibniz in terms of counterpart theory;¹⁵ rather than rehearsing their arguments here, let me suggest why I think that, whether Leibniz would have found it congenial or not, counterpart theory fails to bolster the defense of infinite analysis.

To see how infinite analysis, when combined with relativized individual concepts, again leads to incoherence, consider the following contingent proposition:

- (3) Jane is a sister.

Suppose that Jane in w_1 is female. Consider a possible world, w_2 , populated entirely by males. Let S be *being a sister*, and let $J\text{-in-}w_i$ be Jane's concept $\text{-in-}w_i$. Suppose that Jane has a counterpart in w_2 , i.e., suppose that there is a $J\text{-in-}w_2$, who is male, say, George, whose concept is $G\text{-in-}w_2$. Then $J\text{-in-}w_2 = G\text{-in-}w_2$. In w_1 , where Jane is female, $\langle J\text{-in-}w_1, S \rangle$ has an infinite analysis, but in w_2 , where Jane's counterpart is George, $\langle G\text{-in-}w_2, S \rangle$ has a finite analysis: in the latter case, a contradiction would be implied in a finite number of steps when a decomposition of $G\text{-in-}w_2$ contains, say, *being nonfemale* and a decomposition of *being a sister* contains *being female*. So again we have a con-

15 Benson Mates argues against applying counterpart theory to Leibniz; see his 'Individuals and Modality in the Philosophy of Leibniz,' esp. 110-13. Fabrizio Mondadori and Gregory Fitch argue for applying counterpart theory to Leibniz; see Mondadori's 'Reference, Essentialism, and Modality in Leibniz's Metaphysics,' *Studia Leibnitiana* (1973) 74-101, as well as his 'Leibniz and the Doctrine of Inter-world Identity,' and see Fitch's 'Analyticity and Necessity in Leibniz,' *Journal of the History of Philosophy*, 17 (1979) 29-42.

tradiction. Since (3) has different truth-values in different worlds, it is contingent; but since the analysis of $\langle J\text{-in-}w_2, S \rangle$ is finite, (3) is not contingent (by the obvious analogue of (I1')). But (3) can not be both contingent and not contingent.

At this point, the only move left to the defender of infinite analysis seems to me to reduce the idea of contingency to the absurdity of taking contingency itself to be relative to worlds, replacing 'contingent' by 'contingent-in- w_i '. But since contingency has as its root idea a comparison of truth-values between worlds, such an intra-world account violates (C) and hence is not an account of contingency. So it seems that infinite analysis, even when coupled with counterpart-concepts fails to yield an account of contingency.

In light of the untenability of the combination of infinite analysis and counterpart theory, it seems that counterpart theory, if it makes any contribution to a Leibnizian account of contingency, obviates the need for infinite analysis. Next I shall sketch a counterpart theory of contingency that is at least in the spirit of Leibniz; then I'll conclude this section by raising doubts about it.

Leibniz held that, although there is no contradiction in supposing that the actual world is less than the best, God has chosen to create the best possible world. Following Sleigh, then, let us assume that a world is actual just in case there is no other possible world with higher value. Let w_b be the world with the highest value; let $C\text{-in-}w_b$ be the counterpart in w_b of $C\text{-in-}w_i$, if there is one. A counterpart theory of contingency is embodied in the following:

- (I) (1) is contingent iff it is contingently true or contingently false.
- (II) (1) is contingently true iff there are $C\text{-in-}w_b$ and $C\text{-in-}w_i$, and there are decompositions such that $DF \subseteq DC\text{-in-}w_b$ and $DF \not\subseteq DC\text{-in-}w_i$.
- (III) (1) is contingently false iff either (i) there is no $C\text{-in-}w_b$ and there are $C\text{-in-}w_i$ and $C\text{-in-}w_j$ such that there are decompositions such that $DF \subseteq DC\text{-in-}w_i$ and $DF \not\subseteq DC\text{-in-}w_j$, or (ii) there are $C\text{-in-}w_b$ and $C\text{-in-}w_i$ such that there are decompositions such that $DF \not\subseteq DC\text{-in-}w_b$ and $DF \subseteq DC\text{-in-}w_i$.
- (IV) (1) is necessarily true iff for all $C\text{-in-}w_i$, there are decompositions such that $DF \subseteq DC\text{-in-}w_i$.

- (V) (1) is necessarily false iff for all C -in- w_i , there are no decompositions such that $DF \subseteq DC$ -in- w_i .

There are at least two major, perhaps insurmountable, obstacles facing such a counterpart theory. The first concerns the counterpart relation; the second concerns the status of the actual world.

First is the problem of what makes one set of properties a counterpart of a distinct set of properties. If the proposition is to be understood as an infinite set of ordered pairs of counterpart-concepts and the predicate concept, then some sets of properties that Adam does *not* have are constituents of propositions about Adam. The proponent of counterpart-concepts must try to relieve his position of its apparent arbitrariness by showing both (i) that it is plausible to take *any* sets of properties that Adam does not have to be constituents of every proposition concerning Adam, and (ii) that there is some satisfactory way to determine which of the sets of properties that Adam does not have are constituents of propositions about him, and which are not. (The latter raises the threat of circularity. E.g., Gregory Fitch takes essential properties to determine which sets are counterparts of a given set of properties.¹⁶ But such an approach presupposes a distinction between necessity and contingency and hence can not account for it.)

Second, there is the problem of the status of the actual world on the proposed counterpart theory. Leibniz held that it is noncontradictory, although false, to suppose that the actual world is not the best of all possible worlds.¹⁷ It is logically possible, then, that Adam is the first human in w_b , but that the actual world is w_2 , in which Eve is the first human. Then, given (II) and (III), a defender of counterpart theory would be forced to hold the following to be noncontradictory: 'It is con-

16 Gregory Fitch, 'Analyticity and Necessity in Leibniz,' 41-2

17 For example, Leibniz wrote in *Discourse on Metaphysics* XIII:

although God always chooses the best assuredly, that does not prevent that which is less perfect from being and remaining possible in itself, even though it will not happen, for it is not its impossibility but its imperfection which makes God reject it. Now nothing is necessary of which the opposite is possible.

Peter Lucas and Leslie Grint, trans., 21-2. For a full discussion of complexities in this neighborhood, see Adams, 'Leibniz's Theories of Contingency,' 12ff, and 23ff.

tingently true that Adam is the first human, and it is contingently false that Eve is the first human, and Eve, not Adam, is actually the first human.' If not out-and-out contradictory, this result at least makes contingency incoherent. Thus, it seems doubtful that counterpart theory can rescue for Leibniz any account of contingency.

V. Nonsingular Propositions

The significance of the issues raised here extends far beyond singular propositions. The same difficulties arise for general propositions for Leibniz. What leads to contradiction is the assumption that a proposition (of any sort) has a single subject-concept that figures in the evaluation of the proposition in different worlds.

The generality of the difficulties may be illustrated by consideration of two ostensibly nonsingular propositions. First,

- (4) All gold is malleable,

is, according to Leibniz, susceptible of an existential reading.¹⁸ In that case, (4) is an abbreviation of a conjunction of singular propositions concerning pieces of gold, and the truth-condition for (4) may be given by

- (T5) For any world, w_i , (4) is true in w_i iff
 $\{X|G \subseteq X\} = \{X|G \subseteq X \wedge M \subseteq X\}$,

where G is *being gold*, M is *being malleable* and X ranges over the complete individual concepts in w_i . On an existential interpretation, then, general propositions are beset by any problems that singular propositions have.

Second, consider

- (5) The first human was blond.

Leibniz would have to allow a nonsingular reading of (5), because he

¹⁸ *Logical Papers*, Parkinson, trans., 80. R.C. Sleigh, Jr. brought this example to my attention.

held that God was free to create someone other than Adam as the first human. On a nonsingular reading, according to which *the first human* is instantiated by different (perhaps noncounterpart) individuals in different worlds, then the truth-conditions of (5) may be given by

- (T6) For any world, w_i , (5) is true in w_i iff there are decompositions in w_i such that $DB \subseteq DF$.

where B is *being blond* and F is *being the first human*. A contradiction can be derived from (T6), together with the assumption that (5) is contingent, by an argument similar to the one in III. Just as the contradiction in III forced replacement of "C" by "C-in- w_i ", so the contradiction derived from (T6) forces replacement of "F" by "F-in- w_i ".

If the earlier arguments concerning singular propositions lead a Leibnizian to accept counterpart-concepts, it seems that a Leibnizian will also have to accept counterpart-properties generally. For the upshot of consideration of (T6) is that *being the first human* is not the same property from world to world. The intelligibility of having ordinary properties vary from world to world seems at least questionable. But unless some account of counterparts, for both complete individual concepts and ordinary properties, can be worked out, the notion of a proposition that is true in some worlds and false in others is totally incoherent within a Leibnizian framework.

VI. Conclusion

Critics of Leibniz, beginning with Arnauld in the 17th century, have conceded to Leibniz the minimal kind of contingency that has been challenged here.¹⁹ The familiar criticisms of Leibniz's views on contingency focus on his claims that humans have freedom of the will and that they have some of their properties necessarily and other properties only contingently. Arguments for and against these claims about freedom and necessity occur in a context that takes for granted the much leaner notion of contingency embodied in (C).

19 See the Leibniz/Arnauld correspondence, Montgomery, trans., 73; cf. 108, 124. Also, *Monadology*, paragraph 53, Montgomery, trans., 262. Also, see Fabrizio Mondadori, 'Leibniz and the Doctrine of Inter-World Identity,' *Studia Leibniana* VII (1975) 21-57.

What we have seen is that, on the most detailed reconstruction of Leibniz's account of contingent truth (Robert C. Sleigh's), even the minimal contingency of (C) seems unavailable to Leibniz. But unless Leibniz has an account of contingency on which some propositions satisfy (C), then he is not entitled to invoke possible worlds at all. The only hope of rescue that I can foresee is that there will emerge some version of counterpart theory which can accommodate the non-identity both of individual concepts across possible worlds and of ordinary properties across possible worlds; and that hope, I have suggested, is unlikely to be fulfilled.²⁰

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