

RICE UNIVERSITY

**Leibniz on Modality**

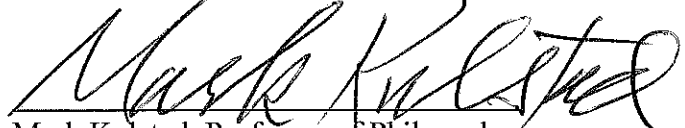
by

**Jacob Shaw Mills**

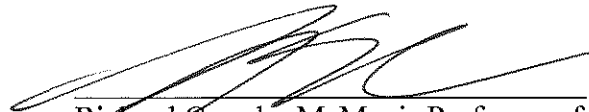
A THESIS SUBMITTED  
IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE

**Doctor of Philosophy**

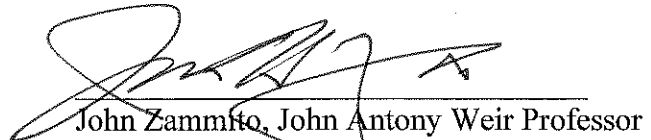
APPROVED, THESIS COMMITTEE:




Mark Kulstad, Professor of Philosophy



Richard Grandy, McManis Professor of  
Philosophy, Chair



John Zammuto, John Antony Weir Professor  
of History



Gregory Brown, Professor of Philosophy,  
University of Houston

HOUSTON, TEXAS

MAY 2014

# ABSTRACT

## Leibniz on Modality

by

Jacob Shaw Mills

This dissertation is a systematic account of the concept of modality in Leibniz's thought. In chapter 1 I will give a detailed account of the metaphysics of Leibnizian possible worlds and show how to link them up with the notion of a possible world as it functions in contemporary possible worlds semantics. I then conclude with some observations on what it means to have a possible worlds semantics and give my solution to a standard problem with Leibniz's infinite analysis approach to modality. In chapter 2 I show the development of and eventual deep connection in Leibniz thought between the infinite analysis and possible worlds accounts. Possible worlds supply the reason for the infinity of the analysis involved in contingent predicates. Chapter 3 begins with a summary of attempts in the literature to avoid the scope of Leibniz's essentialism. I then argue that Leibniz employed an intensional theory of reference and provide a model for it. I conclude with an account of Leibniz's treatment of counterfactuals. Lastly, in chapter 4 I give a treatment of Leibniz's *per se* and moral modality. I conclude by showing in what sense Leibniz thought all of an individual's properties are intrinsic and in what sense he didn't think all of an individual's properties were essential.

## Acknowledgements

The people and institutions that I owe thanks to are too numerous to list here. In particular I would like to thank Mark Kulstad for being the best advisor *ever*, Greg Brown for getting me started down this rabbit hole, Richard Grandy for helping me to taste the Forms, the Rice University and UH Philosophy Departments, Robert Sleigh, Sam Newlands, and Sean Greenberg for their support and getting me to think about evil, Minranda Robinson-Davis for keeping me in check, Carl Feierabend for teaching me how to *do* philosophy, Dustin Atlas, Peter Zuk, and many others for doing philosophy with me, my mom, dad, Fernando Orona, Nathaniel Orona, Anthony Messina, and Sara Montgomery for always being there for me.

## Table of Contents

Chapter 1	1
1.1 A Brief Taxonomy of Possible Possible Worlds	1
1.2 Leibnizian Possible Worlds	3
2.1 World Boundedness and World Apart	5
2.2 Compossibility and Connection	14
3.1 Things and Concepts: Properties and Predicates	21
3.2 Alethic Reduction	23
3.3 Relational Truths and Cambridge Changes	26
3.4 Compossibility Revisited: The Law of the General Order and Force	29
3.5 Abstracta and Eternal Truths	37
3.6 World Books and Concept Packing	40
4 Evidence of Quantification	42
5.1 The Infinite Analysis	47
5.2 Some Proof Problems	49
5.3 Non-Containment Containment Theories	50
5.4 Infinite Complexity of CIC	55
5.5 Non-Standard Arithmetic	60
Chapter 2	64
1 Contemporary Possible Worlds Semantics and Leibnizian Modality: Methodological Warnings and Results	65
2.1 Leibniz's Truth Motif: Variations on a Theme	75
2.2 Early Texts	78

2.3 Middle Texts	85
2.4 Late Texts	96
3 The Infinite Ground of Analysis: Possible Worlds	98
Chapter 3	103
1.1 Some Essentialisms	103
1.2 Superessentialism and Superintrinsicness: Arnauldian and Leibnizian Intuitions	104
1.3 Harmonious Worlds, Counterfactual Non-Identity, and Transworld Identity	107
1.4 Adams's Wonky Worlds and Superessentialism	111
1.5 Strong Essentialism	114
1.6 Cambridge Changes	117
2.1 Intensional Theories of Reference	121
2.2 Leibniz and Locke on Real Essences and Monsters	125
2.3 Incomplete Individual Concepts and the Intensional Interpretation of the Quantifier	131
3.1 Loose Ends: Contingencies, Mondadori, and Indexicals	137
3.2 Counterfactuals and the Hierarchy of Worlds	143
3.3 Jesuits and Dominicans on Future Free Actions and Counterfactuals of Freedom	149
Chapter 4	155
1 Wilson's Multiple Gods	155
2.1 The Theological Threat to Contingency and the Per Se Account	161
2.2 Adams's First Main Solution	164

2.3 Hypothetical Necessity: Necessity of the Consequence vs. Necessity of the Consequent	166
2.4 The <i>Real</i> Reality of (Divine) Choice	181
2.5 Moral Necessity and Per Se Possible	187
3.1 Modal Logic with Incomplete and Complete Individual Concepts: A Rejection of Superessentialism and a Vindication of A Priori Reasons	188
3.2 Leibniz's Modal Philosophy: A Non-Necessitarian Error Theory	191
Abbreviations and Works Cited	198

## Leibniz on Modality

### Chapter 1

#### 1.1 A Brief Taxonomy of Possible Worlds

There are many different positions on the ontological status of possible worlds. I want to locate Leibniz in a taxonomy of such positions. Roughly speaking, one can either be a realist or an anti-realist about possible worlds. Realism divides into possibilism and actualism (Loux 2006, 173). The possibilist admits possibilia into his ontology at face value—there exist non-existent possibles. The actualist admits them into his ontology with the proviso that they be reduced to or constructed from less suspect types of things in ontological good standing. Perhaps the only full-blooded examples of possibilism are David Lewis and Alexius Meinong. According to Lewis, possible worlds are worlds just like ours, other universes spatio-temporally isolated from each other (182-84). Thus for Lewis, worlds are concrete particulars. For Meinong, on the other hand, “things” embrace anything that can be the object of a thought—including impossibilia (Marek). Both would parse the seemingly paradoxical claim that there exist non-existent things by making a distinction between the quantifiers involved (Loux 1979, 45-7 and Lycan 283-84). Lewis would claim that there exist non-actual things, meaning that there exist things that are not parts of *this* universe. Meinong would make a distinction between “so being,” an object having a property or fitting a description, from being, and

say that there are things with so being, they are so-and-so or fit such-and-such a description, that nonetheless are non-beings (Marek).

Some actualists try to make do with actually existing *abstract* objects. Thus for Plantinga a possible world is a maximal or complete state of affairs only one of which obtains (44, 48-9).<sup>1</sup> According to Adams, the actual world corresponds to a maximally consistent set of true propositions, while possible worlds are logical constructions based on this set and involve no ontological commitment to possibilia (1979, 202-4). For Stalnaker, the “way things are” is an instantiated property of the world, while “ways things might have been” are uninstantiated, but existent, properties (228-29). Other actualists, combinatorialists, try to make do with actually existing *concrete* objects, constructing possible worlds as alternative configurations of atoms or distributions of energy among space-time points (Lycan 304-5).

Among the anti-realists there are conceptualists and nihilists. For Rescher, possible worlds or ways things might be are dependent upon the conceptual activities (those possible and actual) of minds (167-69). Also included among anti-realist are nihilist positions such as fictionalism and Quinianism. Fictionalist approaches to modality would claim that most of our modal discourse is literally-speaking false because there are no possible worlds and modal discourse is committed to the existence of some such entities. They claim that one can continue talking in the normal way and yet not be committed to possible worlds by interpreting modal talk as shorthand for sentences with a fictional prefix, such as “In the modal fiction  $\phi$ ” (see Rosen). Then of course there is the Quinian approach. Quine sees modal notions as playing no role in the regimented end-

---

<sup>1</sup> Plantinga builds consistency into his definition of completeness.



of-the-day theories that are to be our best guide to reality. At most, necessity can be identified with the analytic truths of a theory, and is thus more dependent on linguistic and conceptual idiosyncrasies than any concrete facts (Hylton 353-54).

Kripke's position is harder to track. At times he talks as if he would rather replace possible world talk with counterfactual situations talk (15). This would appear to put him in league with something close to Rescher's position—what is fundamental is a counterfactual discourse about situations, discourse that is informed and guided by our best theories of the world. However, he also seems to think of them as abstract states of the world or concrete parts of the world (17-19). This appears to put him closer to some of the possible worlds actualists such as Stalnaker, to whom he explicitly invites comparison in a footnote (20).

Leibniz does not fit neatly within any of these camps. For Leibniz, possible worlds are collections of complete individual concepts within the mind of God. This fits nicely with Rescher's conceptualism, with the proviso that the conceptual activities involved are those of God. However, Leibniz includes substances and their modifications at the ontological ground floor, and thus he doesn't nicely fit into the anti-realist camp. Since the collections of concepts within God's mind are in ontological good standing, it would be better to characterize Leibniz's as a realist position. Because of these factors, I conclude that Leibniz is best characterized as a divine conceptual realist about possible worlds. Possible worlds are real because they are the content of a real modification of a really existing divine substance.

## 1.2 Leibnizian Possible Worlds

Leibnizian possible worlds are collections of complete individual concepts. Complete individual concepts (CIC) are the touchstone and real definition of thinghood.<sup>2</sup> As Leibniz claims in the DM, a substance is usually defined as whatever entity is referred to by an ultimate subject of predication—a term of which things are predicated, but cannot itself be predicated of any other term (AG 41). Leibniz goes on to claim that this definition is merely a nominal one, as opposed to a real definition. In *Meditations on Knowledge, Truth, and Ideas*, Leibniz draws the distinction between “*nominal definitions*, which contain only marks of a thing to be distinguished from other things, and *real definitions*, from which one establishes that a thing is possible” (AG 26). The definition of a substance as the ultimate subject of predication is nominal presumably because what counts as an ultimate subject of predication depends on idiosyncratic elements of our language or even of language in general. Perhaps there are Spinozistic languages in which the only ultimate subject of predication is the world itself. Leibniz goes on to give the real definition of an entity or substance as whatever has a CIC associated with it. A CIC is a concept of a thing that is so complete that it contains, in a sense to be further specified, every predicate concept that will ever be true of the thing, and is itself contained in no greater, more inclusive, concept. In the DM, Leibniz goes on to claim that this definition of substance is real because it makes sense of how we could ever truly predicate—it reveals the possibility of true predication. If in every true statement the predicate is contained in the subject, and if the “marks” we use to distinguish substances include being the referents of ultimate subjects, then the existence

---

<sup>2</sup> I use CIC as an acronym for both the singular and plural.

of CIC's would indeed make it intelligible how it is possible to make true claims about things. CIC's would be required as the conceptual analogs of these ultimate subjects and would be needed to ground the truth of any statements involving them.

## 2.1 World Boundedness and World Apart

It is important to note some features of these collections of CIC that constitute Leibnizian possible worlds. I follow Mates and assume that Leibnizian possible worlds are both maximal and consistent, that is, they consist of maximal collections of compossible complete individual concepts, and that no CIC appears in more than one collection—that is, possible substances are world bound (Mates 75-78). Summarizing this position, Mates says,

...the possible worlds are just the equivalence classes of complete individual concepts with respect to the relation of compossibility [compossibility forms a relation that is reflexive, symmetric, and transitive]. There are infinitely many such worlds, we are told, and each world contains infinitely many concepts; every individual concept belongs to exactly one world. (Mates 78)

I endorse everything here except the thesis that each world contains infinitely many members. This is certainly true of the actual world, but it is not at all clear that it holds of every possible world. What's more, maximality doesn't require it. Two concepts are compossible, of course, if together they don't imply a contradiction. The point to note here is that the maximality constraint is consistent with saying that in constructing possible worlds, one collects together *as many* compossible CIC *as one can*. It says

nothing about their being infinite in number. Of course infinitely many worlds will contain an infinite number of CIC, but this doesn't mean there can't be an infinite number of worlds with a finite number of CIC constituting them (see Sleight 1990, 180).

In fact, Leibniz needs solipsistic or singleton worlds, worlds consisting of a single substance, to support things he says regarding his world-apart doctrine (see DM sec. 14, AG 47; *New System of Nature*, AG 144; letter XIV to Des Bosses, L 610-11). Most famously, the world-apart doctrine is that,

...each substance is like a world apart, independent of all other things, except for God; thus all our phenomena, that is, all the things that can ever happen to us, are only consequences of our being... This [my perception of phenomena] would never fail, and it [my perceptions] would happen to me regardless, even if everything outside of me were destroyed. (AG 47)

As stated by De Bosses, it is that "...the monads of the universe get their perceptions out of their own store, so to speak, and without any physical influence of one upon the other" (L 610). According to the world-apart doctrine then, substances in their production of modifications are causally insulated from one another.

On the face of it, the world-apart doctrine *appears* to require solipsistic worlds and be a violation of world boundedness—the thesis that each CIC belongs to only one world. Cover and Hawthorne argue along just these lines (97-103). If my perceptions are causally independent of any other substance beside myself and God, then it appears *possible* that, despite appearances to the contrary, I inhabit a solipsistic world. The phenomenal world I inhabit would go on exactly the same as it does now, even if there were no other finite substances. So Leibniz appears to commit himself in the world apart-doctrine to the notion that there are other possible worlds consisting solely of a CIC

numerically identical with the one that corresponds to my substance in the actual world.

However I think it is a mistake to think these worlds are counterexamples to world boundedness. Part of why I think this is a mistake is that I take world boundedness as something that Leibniz was deeply committed to. In the Arnauld correspondence (letter IX), in the context of a discussion of the nature of complete individual concepts, Leibniz famously argues:

It, therefore, also follows that he would not have been our Adam, but another Adam, had other events happened to him, for nothing prevents us from saying that he would be another. Therefore, he is another. (AG 73)

It has been claimed that his reasoning here is less than impeccable (Adams 57, Wilson 729). In order to mitigate this negative assessment of the passage, I want to bring it into context by citing the previous Arnauld letter to which Leibniz is responding here. In letter VI of the correspondence, Arnauld argues:

Besides, Sir, I do not know how by taking Adam as the example of a singular nature one can conceive of many possible Adams. It is as though I were to conceive of many possible varieties of myself, which is certainly inconceivable. For I cannot think of myself without considering myself as a singular nature, so distinct from any other existing or possible that I can as little conceive of different varieties of myself as of a circle whose diameters are not all of equal length. The reason is that these different varieties of myself would all be distinct one from another, otherwise there would not be many of them. Thus one of these varieties of myself would necessarily not be me: which is manifestly a contradiction. (LA 29)

Arnauld is arguing, utilizing the indiscernibility of identicals, for the incoherence of transworld individuals. He states that it is inconceivable that there be different possible individuals, individuals with different properties, that are nonetheless the same

individual. In his own words, “It is as though I were to conceive of many possible varieties of myself, which is certainly inconceivable.” It is not conceivable that the individuals are both qualitatively distinct and yet numerically identical, that is, if the individuals are qualitatively distinct, then they are numerically distinct as well—the contraposition of the indiscernibility of identicals.

We are now in a better position to understand Leibniz’s talk in letter IX. Leibniz argues that there is no reason for not thinking of the individuals in other worlds as numerically distinct, therefore they are. It has been objected that there is equally no reason for not thinking that they are numerically identical (Adams 57, Wilson 729). However, given the fairly uncontroversial principle of the indiscernibility of identicals, there is a reason for saying that they are not numerically identical, namely, that they have different properties (see Mates). In addition, given the context, Arnauld had just stated this very principle. Given the background of Arnauld’s argument, I think it best to read Leibniz here as accepting his argument as a friendly terminological amendment regarding talk of possible Adams, and going on to present his own argument, based on the PSR, for thinking that the individuals are, in fact, numerically distinct.

Let us return to the subject of solipsistic worlds and the world-apart doctrine. Given my acceptance of world boundedness as a Leibnizian doctrine, it is incumbent to give some reason for thinking that solipsistic worlds are not a violation of world boundedness. It must be kept clearly in mind that the world-apart doctrine is primarily a thesis about the causal isolation of monads, not about their ontological or conceptual independence. In the context of DM 14, Leibniz is clear that what is at issue is the ability

to make true judgments about phenomena given the causal isolation of monads, and not their ontological separability. Here is the DM:

And since these phenomena maintain a certain order in conformity with our nature...an order which enables us to make useful observations to regulate our conduct, observations justified by the success of future phenomena, an order which thus allows us often to judge the future from the past without error, this would be sufficient to enable us to say that these phenomena are true without bothering with whether they are outside us and whether others also perceive them. Nevertheless, it is very true that the perceptions or expressions of all substances mutually correspond... And God alone...is the cause of this correspondence of their phenomena... (AG 47)

Leibniz is arguing that we could make true claims about the phenomenal world, even if it were to lack a substantial backing, because the notion of justification involved in claims about the phenomenal world is a coherentist one. It is because our actual phenomenal world is ordered and regulated to the degree that it is, that we are justified in making certain claims and inferences about it, and in acting on those claims and inferences for all practical purposes. Furthermore, it is our knowledge of God's perfections, specifically his moral perfections, that allows us to know that the actual world is the best of all possible, and that consequently the phenomenal world is not a skeptical deception, but on the contrary, has a true substantial foundation.

In the context of the Des Bosses correspondence, the world-apart doctrine comes in the form of a dilemma Des Bosses proposes *vis a vis* Leibniz's notion of pre-established harmony. In his words:

I add another objection about the pre-established harmony. If the monads of the universe get their perceptions out of their own store, so to speak,

and without any physical influence of one upon the other; if, furthermore, the perceptions of each monad correspond exactly to the rest of the monads which God has already created, and to the perceptions of these monads, and are harmonized so as to represent them; it follows that God could not create any one of these monads which thus exist without constructing all the others which equally exist now, for God can by no means bring it about that the natural perception and representation of the monads should be in error...But if it is true that God could not do this, I do not see why we should so greatly praise the divine wisdom in the selection and organization of things with each other. (L 610)

The first horn of Des Bosses's dilemma is that the world-apart doctrine is true, monads are causally independent and God could have created a phenomenal world with no substantial basis, in which case it is possible that God is a deceiver and lacks power.<sup>3</sup>

The second horn is that God could not have done this, but must create all the monads of a world as a piece, in which case the pre-established harmony of their perceptual activity is not as great a proof of God's existence and glory as Leibniz had wanted to claim (see *New System of Nature*, AG 145).

Leibniz's reply is as follows:

He can do it absolutely; he cannot do it hypothetically, because he has decreed that all things should function most wisely and harmoniously. There would be no deception of rational creatures, however, even if everything outside of them did not correspond exactly to their experiences, or indeed if nothing did, just as if there were only one mind; because everything would happen just as if all other things existed, and this mind, acting with reason, would not charge itself with any fault. For this is not to err. That the probable judgment which this mind formed of the existence of other creatures should be true, however, would no more be necessary than it was necessary that the earth should stand still because, with few exceptions, the whole human race once held this to be right. Not

---

<sup>3</sup> Descartes had argued that God is not a deceiver because to deceive implies a lack of power and God is perfectly powerful (35). The reason that the first horn has bite in this context is that external world skepticism is in violation of "certain propositions prohibited in our [Jesuit] schools" as Des Bosses makes clear in his next letter (L 612).



from necessity, therefore, but by the wisdom of God does it happen that judgments formed upon the best appearances, and after full discussion, are true... (L 611)

Here Leibniz seems to be responding slightly differently than in the DM. He seems to say that solipsistic worlds are possible, but that they are hypothetically or morally impossible—given God’s goodness, he will not create them. He goes on to say that even if the phenomenal world had no substantial basis, our judgments about it should not count as errors and we would not be deceived. However, the probable judgments of the *existence* of substances outside of us on the basis of phenomena would still be false. It’s hard to know exactly what Leibniz had in mind here. I think the best way to read this is in line with the previous DM passage. We are not deceived because our judgments concerning the phenomenal world are justified due to the coherence of phenomena. So far, the passages seem to be making the same point. However, the Des Bosses letter diverges from the DM passage by saying that even though our judgments about phenomena would be justified, insofar as they have existential import, they wouldn’t be true. In the DM Leibniz had claimed that order and regularity were “sufficient to enable us to say that these phenomena are true without bothering with whether they are outside us and whether others also perceive them.” Perhaps Leibniz had in mind some kind of notion of “true enough” for all practical purposes in the DM, whereas in the Des Bosses letter he is speaking in stricter terms.

The upshot is that in both contexts Leibniz’s point is that given complete causal isolation, we can still make claims about the phenomenal world that are true enough for all practical purposes due to the order and regularity of phenomena. In both contexts he goes on to say that we can be assured that there are other monads with phenomena that

correspond to ours in the appropriate way due to our knowledge of God's supremely perfect will and consequent choice of the best, most harmonious world. It is not at all clear that either passage is concerned with the ontological separability of monads in a world, that is, with whether God could instantiate just one CIC of a given world, say the actual one. Their focus is instead epistemic problems concerning true judgments and the existence of other monads given the causal isolation of the world-apart doctrine. Leibniz's answer in both is the same—even if one were in a skeptical scenario, which one is not, the practical consequences would be nil.

There are other things that Leibniz says that should convince us that solipsistic worlds are not violations of world boundedness. In letter IX of the Arnauld correspondence, Leibniz is clear that when God decides to create the Adam of the actual world all other entities and events are determined: "*that all human events occur necessitate ex hypothesi, given the single assumption that God wanted to create Adam*" (AG 69). Complete individual concepts are locked-in to worlds, so to speak, such that God cannot create one of them without creating all the others linked to it by their common world. Given that God wanted to create the Adam of the actual world, every other substance and event was locked into place, necessarily. In addition, Leibniz explicitly says in *On Contingency* that, "There are, in fact, an infinite number of series of possible things. Moreover, one series certainly cannot be contained within another, since each and every one of them is complete" (AG 29). Here Leibniz is absolutely clear about the issue. No possible world is contained within another, that is, none is a proper subset of any other, because each world is complete, i.e., maximal. If there is a solipsistic world containing a CIC numerically identical to one in the actual world, then this solipsistic

world is a proper subset of the actual world. It is therefore incomplete or non-maximal. This scenario is something the passage from *On Contingency* clearly states is not possible due to the maximality constraint on worlds.

Given this evidence we are forced to come up with another interpretation of solipsistic worlds, one that does not involve their consisting of a CIC numerically identical to one in any other world. The individual substance that populates a solipsistic world cannot be strictly speaking *me*. It is at most a substance that is consciously equivalent to me, a substance with all the same conscious perceptions, but differing in unconscious perceptions in countless ways. We should remember that for Leibniz, monads are only causally, not ontologically, insulated from each other because CIC's are not conceptually isolated from each other. As Leibniz says,

...my assumption is not merely that God wanted to create an Adam whose notion was vague and incomplete, but that God wanted to create a particular Adam, sufficiently determined as an individual. And according to me, this complete individual notion involves relations to the whole series of things. (AG 69)

The concept of the Adam of the actual world involves the concept of Eve and you and me, so the existence of the Adam of the actual world entails the existence of Eve and you and me.

But then what are we to make of the Des Bosses passage where Leibniz explicitly says that God “can do it [create a solipsistic world] absolutely; he cannot do it hypothetically?” Given the evidence above, that Leibniz is firmly committed to the doctrine of world boundedness, I suggest that we read this passage as saying that God can create solipsistic worlds, but that these worlds should not be thought of as containing any

CIC numerically identical to a CIC in any other world. At most these CIC would agree in all of their conscious perceptions. Furthermore, we can be assured that our world is not a solipsistic one given our knowledge of God's moral and aesthetic perfection—it is absolutely possible, but not hypothetically (given God's moral-aesthetic perfection) or morally so (what is obligatory for a perfect moral agent).

## 2.2 Compossibility and Connection

The issue of what exactly it means for two CIC to be compossible or impossible, though seemingly simple, is a debated topic. If the only predicates contained in a CIC are monadic ones and one interprets this as meaning that they have the form  $Fx$ , then it becomes totally unclear how any two CIC could ever be inconsistent or impossible.<sup>4</sup> As Cover and Hawthorne summarize the problem:

After all, if the law-of-the-series, considered in itself, fixes only an intrinsic monadic sequence and thus does not, considered in itself, determine any relational facts, how is it to exclude another given law-of-the-series from existing? We have arrived at the view that all possible substances are, considered in themselves, compossible with each other: all possible substances are *per se* compossible. (137)

---

<sup>4</sup> Formally speaking it becomes impossible to generate a contradiction between two different atomic propositions of the form  $Fx$  and  $\neg Fy$  for two different  $x$  and  $y$ . The general point is that we appear to need relations in order to get impossibility results. Thus if  $Rxy$  is contained in  $x$  and  $\neg Rxy$  is contained in  $y$  for some  $x$  and  $y$ , then  $x$  and  $y$  are impossible. It should be noted that Ishiguro holds that CIC contain predicates of the form  $Rxa$ . She considers these to be monadic predicates that ascribe relational properties to their corresponding subjects (99-100).

Mates seems to think that the solution to the compossibility problem is somehow connected with the doctrine of universal expression, what he calls the mirroring principle.

He says,

...the “mirroring” principle clearly implies that concepts belonging to different possible worlds must be impossible. It may be illustrated with Adam and Eve. Adam would not have been the same person if he had not been the husband of Eve, nor would Eve have been the same person if she had not been the wife of Adam; thus neither Adam nor Eve could have existed without the other. (76-7)

I agree with Mates that CIC are not conceptually distinct and thus that substances are not ontologically distinct either—Adam would not have been our Adam without Eve. The problem is that Mates does not make clear exactly how CIC are impossible. We know that concepts belonging to different worlds are impossible. What we want to know is how we know whether or not they are impossible without appeal to their being in different possible worlds!

Rutherford appears to have advanced some way with regard to this problem. He seems to take the world-apart doctrine as implying transworld individuals, and is thus hesitant about the tight conceptual connection between CIC that I endorse. He claims that, *pace* Mates, all that follows from universal expression is that,

Adam expresses himself as the father of someone with all the properties of Cain; Cain expresses himself as the son of someone with all the properties of Adam; and *for that reason* we are entitled to assert that Adam is the father of Cain and Cain the son of Adam. (186-87)

Rutherford seems to think that Adam expressing himself as the father of a Cain-like phenomena is enough to avoid what he sees as a violation of the world-apart doctrine (187 ft. 18). Adam expressing himself as the father of a Cain-like phenomena does not entail the existence of a corresponding Cain substance. I have already indicated above how I think the world apart doctrine can best be understood—not as implying conceptual independence of CIC or ontological independence of substances, but merely their causal independence. Rutherford thinks that although there would be no logical contradiction between two substances with incoherent phenomena existing, there would be difficulties in thinking of them as in a *unified* world, in thinking of them as in the same *possible world* (187). He thus goes on to strengthen the compossibility relation by requiring that the phenomena of monads in a single world form a unified spatio-temporal and quasi-causal framework (STQC framework):<sup>5</sup>

...we may take it as given that a plurality of monads is compossible, or jointly realizable in a world, if and only if they are suitably connected...such a connection exists just in case these monads can be conceived as related within a common spatiotemporal and causal framework... (188)

There are several points to bring out here. I agree that Leibniz thinks that each of his possible worlds is unified in a common STQC framework. There are texts cited by Rutherford that seem to say as much.

I call 'World' the whole succession and the whole agglomeration of all existent things, lest it be said that several worlds could have existed in different times and different places. For they must needs be reckoned all

---

<sup>5</sup> For the notion of quasi-causation see Sleight (1990, 161-70) and DM sec. 15 (AG 48).

together as one world or, if you will, as one Universe...For it must be known that all things are connected in each one of the possible worlds: the universe, whatever it may be, is all of a piece, like an ocean... (T 128)

However, I think there is a deeper reason for compossibility at work here. Rutherford appears to want to disqualify solipsistic scenarios as worlds. He says that:

There is thus no contradiction in supposing the existence of Adam without the existence of Cain. What Leibniz does appear to claim, however, is that a group of substances could not be conceived (and would not be conceived by God) as existing together in a world unless there were the appropriate sort of agreement among their expressions of the universe as a whole. (187)

Solipsistic worlds seem to be worlds that are unified phenomenally by a STQC framework in whatever sense the actual world is. Yet Rutherford seems to want to reject these scenarios as worlds. It is unfortunately just not clear why the lack of other substances at a solipsistic world is enough to fracture its STQC framework and disqualify it as a world. STQC frameworks concern a substance's phenomena, not the existence of other substances. The very point of solipsistic worlds is that you can't tell the difference between them and the actual because of the very fact that all the conscious perceptions are the same, and thus would appear to be STQC framework equivalent. Thus on Rutherford's own criteria for world-hood, solipsistic scenarios ought to be included as full-blown worlds.<sup>6</sup>

---

<sup>6</sup> Perhaps what Rutherford has in mind is completely mashed-up, wonky worlds, with each substance marching to its own tune. In this case, he might admit solipsistic worlds as full-blown worlds and relegate wonky worlds to mere creation scenarios. In this case he appears to have captured a necessary condition for compossibility.

Furthermore, it is not at all clear that STQC frameworks can do the job of providing a sufficient condition for compossibility. On the one hand, if we mean by an STQC framework something determinate like, the STQC framework of this world, then STQC frameworks are not a sufficient condition for compossibility. As we saw above with solipsistic worlds, two monads can have precisely the same STQC framework and belong to radically different worlds. On the other hand, if we mean something less definite, like a STQC framework that has a certain mathematical structure (R3 Euclidean space, linear time, local causal forces etc.) then it is still not sufficient for compossibility. There can be many worlds whose STQC frameworks share the same mathematical structure, and thus many monads that qualify as being in that STQC framework yet without belonging to the same world, because there are multiple ways of filling out that STQC framework.

I think the deeper issue involved here is the notion of metaphysical connection, or the doctrine of universal expression.<sup>7</sup> So while I agree with Rutherford that STQC frameworks are required for worlds, yet I think most of the compossibility work is done through the notion of universal expression or the metaphysical connection of things. Here is a passage from the Theodicy that mentions connection without mentioning a STQC framework:

---

<sup>7</sup> I distinguish metaphysical connection, the doctrine of universal expression, that the content of every perception of a substance contains information about the content of every other perception of every other substance in its world, from physical connection, the doctrine that the phenomenal world forms a plenum. Furthermore, although distinct, I think there is reason to believe that metaphysical and physical connection are intimately related, so that if it turns out that metaphysical connection is necessary and sufficient for compossibility, then it will turn out that the plenum will be a necessary phenomenal feature of worlds (Thanks to Gregory Brown for helping me make this connection).



They say that God could have given to souls what thoughts he would, without making them depend on any relation to the body...now it is sufficient to bear in mind that God cannot establish a system ill-connected and full of dissonances. (T 202)

Notice that in this and the previous *Theodicy* passage (T 128), it is not only the case that the actual world is connected, but that all possible worlds are connected, that it is metaphysically impossible to have a world that is not connected. It is also metaphysically impossible to have a world poorly connected. Just where the line is to be drawn between a well connected and poorly connected world is hopelessly unclear. Yet clearly connection is a necessary condition on compossibility. As Leibniz says in his *Clarification of the Difficulties which Mr. Bayle has found in the New System of the Union of Soul and Body*,

God could give to each substance its own phenomena independent of those of the others, but in this way he would have made as many worlds without connection, so to speak, as there are substances... (L 493)

So without connection, possible substances do not form worlds. In addition to this, there are things Leibniz says that indicate that connection is sufficient for compossibility as well. In the *Metaphysical Foundations of Mathematics*, after defining simultaneity of perceptual states and constructing an intra-monadic temporal ordering via the notion of one state being the reason for another, Leibniz proceeds to construct an inter-monadic temporal ordering that essentially relies on connectedness.

My earlier state involves a reason for the existence of my later state. And since my prior state, *by reason of the connection between all things*, involves the prior state of other things as well, it also involves a reason for

the later state of these other things and is thus prior to them. (L 666; my emphasis)

Leibniz says that because my previous state contains information about one of your states via the metaphysical connection of things, my earlier state can be said to be simultaneous to that state and thus prior to any state you have that is posterior to that state, given your own temporal ordering. He then goes on to construct space in terms of minimal paths or transforms between simultaneous states of substances. The notion here is admittedly vague, but the idea is that metric relations between the perceptual content of substances are determined by the minimal paths that would transform the content of the one into the other. Thus if it takes less to transform the content that is my perception of my coffee mug to the content that is my perception of my computer than it does to transform it into the content that is the perception of my friend Carl, then the phenomena that is my computer is “closer” in space to me than is the phenomena that is my friend Carl. Notice first that connection here cannot be connection *via* a STQC framework, as that framework is in the process of being constructed on the basis of metaphysical connection. Notice second that it appears that any system of monads that is connected will be susceptible to some kind of STQC framework *via* the construction given above.

So it appears that metaphysical connection is both necessary and sufficient for compossibility. If substances aren't connected (or poorly connected), they cannot form a world, and if they are connected, a STQC framework is constructible. But we still haven't discovered what it is in the concepts that make them compossible and impossible. That is, we have figured out that substances must be connected to form

worlds, but how do we determine, given information about the content of two random CIC whether or not they belong to the same world? It is to this problem that I now turn.

### 3.1 Things and Concepts: Properties and Predicates

To get a better grasp on the terrain here, we need to understand just which predicates are contained in a CIC. In order to do this it will be helpful to remind ourselves of the kind of properties that are had by Leibnizian substances. The only true things that exist, the only true substances which correspond to CIC, for Leibniz are monads—mind-like entities that we conceive of on the basis of our own mental experience.<sup>8</sup> The only other kinds of thing that exist are modifications or properties of substances, what Leibniz calls perceptions, and appetites or acts of willing. In a famous letter to de Volder, Leibniz asserts, “there is nothing in things but simple substances, and in them, perception and appetite” (AG 181). Perceptions here are not to be identified as mere sensations, but are to be understood broadly as any type of mental state, ranging from the cognitive to the sensory and affective.<sup>9</sup> Appetitions are tendencies or strivings of a substance that move mental life along from one perceptual state to another. The way appetites move from perception to perception is a manifestation of, and governed by, what Leibniz calls the individual law of the series. This individual law of the series

---

<sup>8</sup> I bracket concerns here about the status of corporeal substances in Leibniz and the rich debate it has produced. In the following I assume a monadological picture where monads express themselves in phenomena as corporeal substances.

<sup>9</sup> It is not clear how the concept of a mental state, much less a perception, is applicable to the modifications of what Leibniz calls, bare monads. However, even these bare monads will be embodied, and the resulting “protozoa” will be involved in a phenomenal world which they will need to minimally represent in some way in order to interact with. This falls directly out of Leibniz’s pan-organicism—that there are animals “all the way down.”

constitutes the substancehood of a monad, and is sometimes referred to as the substantial form or the substance's primitive force (Adams 1994, 77-81).

Having established the basic structure of Leibnizian substances, we are now in a better position to understand what the monadic predicates are that populate the content of CIC. Speaking in terms of intrinsic denominations rather than monadic predicates or properties, Rutherford claims that, "These intrinsic denominations designate perceptual states of the monad that express its relatedness vis-à-vis the rest of the universe" (194). I endorse this position wholeheartedly and believe that neglecting its ramifications has led to confusion about the nature of monadic properties. The properties of substances are not items like "being red" or "being six feet tall," but things like "perceiving that there is an apple on the table" or "thinking about birds." In general, we may schematize the form of monadic properties as follows:

Substance  $s$  perceives  $p$ -wise that  $\phi$ .

Perceiving  $p$ -wise that  $\phi$  is the general form of a property of Leibnizian substances.

Examples might include: substance  $s$  perceives sensation-wise that there is an apple on the table, or substance  $s$  perceives cognitive-wise that  $1+1=2$ . I take this point about the nature of monadic properties to put serious constraints on any account of the basic content of CIC. There is an isomorphism between expressions of properties and predicates, by which one can easily be translated into the other *via* locutions such as " $\phi$ -ness," "being  $\phi$ ," and "is  $\phi$ ." Thus at a minimum we should respect this isomorphism and include within the CIC of a substance predicates that reflect the perceptual modifications

of that substance.<sup>10</sup> The monadic predicates that populate Leibniz's CIC should take the form of "is perceiving p-wise that  $\phi$ ," what I will refer to as monadic perceptual predicates to avoid confusion with one-place predicates in general. In addition, it should be noted that I take this to be a minimal theory in the sense of a maximally safe theory. It is a theory about what we are fairly confident should be included within a CIC. Thus I take it that any divergence from this practice, involving the inclusion of predicates of some other form within the CIC, should be well motivated and based on an inability to ground those predicates in monadic perceptual predicates.

### 3.2 Alethic Reduction

If the only monadic predicates that CIC contain are of the form "is perceiving p-wise that  $\phi$ " then how are we to understand Leibniz's oft repeated concept containment theory of truth? Leibniz believes that in any true subject-predicate proposition, the concept of the predicate is contained in the concept of the subject. So if Carl is a substance and Carl was born in 1972 and has brown hair, then the concepts of the predicates "is born in 1972" and "has brown hair" should be contained in the CIC of Carl. Yet I argued above that strictly speaking, all of the predicates contained in CIC are of the form "is perceiving p-wise that  $\phi$ ."<sup>11</sup>

Here I think it is important to distinguish phenomenal truths, truths about the world or the appearances, from substance-level truths, truths about the subjective

---

<sup>10</sup> Or the perceptual modifications that a CIC's corresponding substance would have, were it to exist.

<sup>11</sup> In the following I will alternate freely between talk of concepts of predicates and predicates.

perceptual states of monads. The former are based on the latter, in the sense that they are included in a kind of deductive closure of the monadic perceptual predicates of a CIC. It is in this sense, that in every true subject-predicate proposition, the concept of the predicate is contained in the concept of the subject. Let's look at the examples of phenomenal truths given above: Carl is born in 1972 and Carl has brown hair. If it is true that Carl is born in 1972, then being born on a certain date in that year can be "derived" from the concept of the monadic perceptual predicates contained in the CIC associated with Carl. Of course, the substance that is Carl has existed since the beginning of the world, according to Leibniz, so the monadic perceptual predicates in question are something like "is perceiving unconsciously a hospital room, being held, entering upon the human stage, etc." In the case of Carl having a certain color hair, the relevant predicates are something like, "is perceiving visually that his hair is brown."

The situation gets more complicated when we consider propositions whose subject term does not refer to an organism. For Leibniz, anything inorganic is not a true substance, and so any subject term that refers to something inorganic is not a true subject term. Inorganic things for Leibniz are aggregates of organisms. So the truth of a proposition like, "This coffee mug is yellow" is actually shorthand for something more complicated like "Coffee mug animal 1 is yellow and coffee mug animal 2 is yellow and etc...." Here, once we have reached the organisms that make up the aggregate, we tell a similar story to that told above. The monadic perceptual predicates in question that characterize the bare-monads making up the coffee mug are something like "is perceiving itself unconsciously as yellow."

Before moving on, I want to clear up one possible confusion about the way truths are grounded in monadic perceptual predicates. One might object that it simply does not follow from the fact that substance *s* perceives visually that the ball is green, that the ball is green. The substance's visual perception might be confused for any number of reasons. Say the ball is not really green, but instead blue. The truth of the ball is blue is not based merely on the fact that substance *s* visually perceives that the ball is green, but, once again thanks to the doctrine of universal expression, on the basis of countless other perceptions, mostly unconscious, that substance *s* has. Included among these is the fact that substance *s* perceives unconsciously the true state of affairs, that the ball is blue, and that substance *s* perceives unconsciously that ball animals 1-n perceive themselves to be blue. Every substance perceives every event in the universe, these events ultimately being reducible to the perceptual states of substances. Therefore, the conscious illusory perceptual state of one substance is made up for by its unconscious veridical perception of the facts and of its unconscious veridical perception of the conscious and unconscious veridical perceptions of countless other substances.

One way of putting all of this is the following. Monadic perceptual predicates that correspond to conscious perceptions are both opaque and create intensional contexts. From the fact that you consciously perceive that the ball is green it does not follow that the ball is green, and the fact that you consciously perceive the morning star does not mean that you consciously perceive Venus. However, monadic perceptual predicates that correspond to unconscious perceptions are both transparent and fully extensional. If you unconsciously perceive that the ball is green it does follow that the ball is green, and from

the fact that you unconsciously perceive the morning star it does follow that you unconsciously perceive Venus.

### 3.3 Relational Truths and Cambridge Changes

What about relational truths? In what way are these grounded in the monadic perceptual predicates of a CIC? Leibniz famously claims that there are no purely extrinsic denominations. What he means by this is not that there are no relations, or  $n$ -place predicates where  $n > 1$ , but that all relations are grounded in the properties of substances and the monadic perceptual predicates of CIC. So the truth of phenomenal relations, like Harry is married to Emily and ball 1 is 3 meters from ball 2, are grounded in the monadic perceptual predicates of Harry and Emily, on the one hand, and ball 1 and ball 2, on the other. The reason for Leibniz's rejection of purely extrinsic denominations has to do with the notion of a Cambridge change and his denial that substances enter into any kind of causal interaction.

A Cambridge change can perhaps best be explained by means of an example. Suppose Sally is taller than John. Now suppose John gets a growth-spurt, outstripping Sally in height. The relational predicate "is taller than John" that was once true of Sally is now false. A truth about Sally has changed. She has gone from being taller than John to being shorter than him, all without anything *intrinsic* to Sally changing at all. Thus it appears that John has induced a Cambridge change on Sally and has *caused* a change in what predicates are applicable to her. Leibniz famously denies that substances can causally interact, hence he rejects Cambridge changes across the board. Substances



cannot induce Cambridge changes in one another because substances cannot truly causally influence one another. This is the content of his famous denial that there are any purely extrinsic denominations.

Leibniz backs up his denial of purely extrinsic denominations with metaphysical weight through his doctrine of universal expression. The notion of expression is nicely summarized in a work from 1676:

For it is sufficient to the expression of one thing in another, when there is a certain constant law of relations, by which each thing in the one can be assigned to each answering thing in the other. (Grua 15)

More formally, according to one version of Kulstad's, the expression relation is analyzed as:

x expresses y, in virtue of sets w and z, and according to relation R if and only if w and z are sets associated with x and y respectively, and R(x) is a function mapping w into z. (75)

Adopting Kulstad's formalism, the doctrine of universal expression is that every perceptual state of a substance expresses every other perceptual state of every other substance, in virtue of sets that consist of the perceptual contents of those respective states and according to a certain mapping described by the law of the general order  $\gamma$ .

Universal expression is the metaphysical doctrine that backs up Leibniz's denial of purely extrinsic denominations. Any change in one substance that would induce a Cambridge change on another is blocked by a corresponding spontaneous intrinsic change in the perceptual content of the other substance, vouchsafed by the metaphysical connection of

things according to the law of the general order. For example, suppose Sally and John live miles away from each other, when John gets his growth-spurt and appears to induce a Cambridge change on Sally, instead the law of the general order maps from the content of John's perception that he is a certain height to Sally's unconscious perception that she is now shorter than John. Indeed, Leibniz declares in *Primary Truths* that,

Every individual substance contains in its perfect notion the entire universe and everything that exists in it, past, present, and future. For there is no thing on which one cannot impose some true denomination from another thing, at the very least a denomination of comparison and relation. (AG 32)

Every substance perceives in some way every event that is happening, was happening, or will happen in the universe, because otherwise, any change in one substance would produce some kind of Cambridge change in every other. Suppose that some substance *s* has property *P*. Then every other substance *s'* will be related by some kind of relation *R'* to the fact that *s* has *P*. When *s* goes from having *P* to not having *P*, every other substance *s'* will no longer stand in relation *R'* to the fact that *s* has *P*, and thus a wave of Cambridge changes will be sent out across the universe affecting every other substance. Thus, to take a tragic example of universal expression from Leibniz, the man in the British East India Company whose wife dies in London must unconsciously perceive her death to avoid the existence of a Cambridge change. The relational predicate "Harry is married to Emily," say, is no longer true of him after his wife's untimely demise. Yet the unfortunate man in this scenario is not subject to any Cambridge change due to his perception of everything in the universe because of the doctrine of universal expression. The shift from being married to unmarried is grounded in the fact that the monadic

perceptual predicate “perceiving unconsciously that Emily is dead” is contained in his CIC.

Thus the connection between phenomenal relations and the set of monadic perceptual predicates of a collection of CIC composing a possible world is stronger than mere supervenience. There is an isomorphism between phenomenal relations and subsets of the set of monadic perceptual predicates of a collection of CIC. Specifically, any phenomenal relation  $R$  will correspond to a subset  $\Pi$  of the total monadic perceptual predicates  $\Delta$  of all CIC making up a world.

### 3.4 Compossibility Revisited: The Law of the General Order and Force

Continuing the project of reducing truths at a world to truths about monadic perceptual predicates, we can ask, what about truths of the form: Substance  $s$  is the manifestation of law of the series  $\alpha$ ? Or Substance  $s$  is part of a world with law of the general order  $\gamma$ ? Arguably, these are truths about a substance and must somehow be derivable from monadic predicates.<sup>12</sup> In *On Freedom*, Leibniz flatly asserts that the complete notions of substances “contain the whole series of things in which they will be contained” (AG 97). Thus there is a kind of mutual containment between substance and world. Each CIC contains information about the law of the general order of its world, and that law of the general order contains information about each law of the individual series of each substance existing in that world. The law of the individual series expresses

---

<sup>12</sup> Much of the following comes out of numerous fruitful discussions with Gregory Brown, to whom I owe much thanks. Any missteps are my own.

information about every perceptual state that a substance can have as a function of time. The law of the general order contains, not only information about each law of the series existing at its world, but in addition, as we saw above in connection with our discussion of universal expression, the mapping relation between the contents of any two of these perceptions.

There is textual evidence that Leibniz did, in fact, believe that substances contained information about their law of the series. In response to the notion that substances are autonomous sources of their activity, Bayle had objected that upon introspection we have no idea what kinds of perceptions we will have next:

Does the internal and active power communicated to the forms of bodies know the series of actions which it must produce? By no means, for we know by experience that we are ignorant of what kinds of perceptions we shall have in an hour. (L 495)

In responding to this in his *Clarification of the Difficulties Which Mr. Bayle Has Found in the New System of the Union of Soul and Body* (1698), Leibniz says,

I reply that this power, or better, this soul or form itself, does not know them distinctly but that it does feel them confusedly. In each substance there are traces of everything which has happened to it and of everything which will happen to it. But this infinite multitude of perceptions prevents us from distinguishing them, just as I cannot distinguish one voice from another when I hear the loud confused noise of a crowd. (L 495)

Of course, if a substance knows or feels confusedly all of the perceptual states that it ever has and ever will occur in it, then there is a very real sense in which we can say that substance *s* perceives unconsciously that its law of the series is  $\alpha$ . In fact, the law of the

series as a function of a substance's perceptual states over time can be exhaustively described by a simple list of that substance's perceptual states themselves.

In what sense then, is the law of the general order derivable from monadic perceptual predicates? The story here is less straightforward than the previous one concerning the law of the series. However, the first thing to note is that Leibniz does believe that we express the law of the general order. Besides the passage quoted above from *On Freedom* about the containment of the law of the general order in CIC, there is the following from DM 16:

And to the extent that every person or substance is like a small world expressing the large world, we can say equally that the extraordinary action of God on this substance does not fail to be miraculous, despite the fact that it is included in the general order of the universe insofar as it is *expressed* by the essence of the individual notion of this substance. (AG 49, my emphasis)

Here Leibniz is saying that even miracles are included in the scope of the law of the general order and that this law is expressed by the CIC. So I take it that these passages set up the problem space nicely for us. The problem is this: In what way can we make Leibnizian sense of the expression of the law of the general order by CIC, given our previous commitments?

To begin, I must say a few things about Leibniz's physics. It is commonly held that Leibniz was a relativist about motion, that is, that he believed that motion was not an absolute quantity, but could be assigned to any body one pleased. This, however, is not quite right. What Leibniz actually held was that *if* there were no forces acting in the world, then motion would be purely relative. Since there are, in fact, forces acting in the

world, these forces determine a unique reference frame by which to assign absolute values to the motion of bodies. Another way of putting this is that Leibniz believed that a purely kinematic understanding of motion, in terms of the mere position of bodies, is relative, while a dynamic understanding of motion, in terms of forces or powers in bodies to move, is absolute. This position is stated in DM 18:

For if we consider only what motion contains precisely and formally, that is, change of place, motion is not something entirely real, and when several bodies change position among themselves, it is not possible to determine, merely from a consideration of these changes, to which body we should attribute motion or rest...

But the force or proximate cause of these changes is something more real, and there is sufficient basis to attribute it to one body more than to another. Also, it is only in this way that we can know to which body the motion belongs. (AG 51)

There is, however, a hiccup here. If motion, as measured by velocity, is relative, then surely force, as measured by  $mv^2$ , will be as well.<sup>13</sup> The questions, then, are how does force allow us to attribute absolute motion to one body rather than another, and what is the “sufficient basis” that allows us to attribute force to one body rather than another. The first question, of course, reduces to the second. The correct reference frame to use for motion is whatever reference frame accounts for the true distribution of force. So the question that remains is how we determine this latter reference frame.<sup>14</sup> Luckily, Leibniz tells us how to do just that.

---

<sup>13</sup> Roberts takes this to be a real problem and claims that force cannot be empirically determined (see 562-63, 567-68). I also note here that Leibniz’s measure of force is not our Newtonian  $F=ma$  but rather what we would call kinetic energy.

<sup>14</sup> The solution to this problem that I endorse here was first brought to my attention by Puryear. For a much better treatment of the complex terrain here, see Roberts and Puryear. For a much better defense of this solution, see Puryear.

In discussing the two rival hypotheses of planetary motion, the Copernican and the Ptolemaic, Leibniz says in *On Copernicanism and the Relativity of Motion* (1689):

But since, in explaining the theory of the planets, the Copernican hypothesis wonderfully illuminates the soul, and beautifully displays the harmony of things at the same time as it shows the wisdom of the creator, and since other hypothesis are burdened with innumerable perplexities and confuse everything in astonishing ways, we must say that, just as the Ptolemaic account is the truest one in spherical astronomy, on the other hand the Copernican account is the truest theory, that is, the most intelligible theory and the only one capable of an explanation sufficient for a person of sound reason. (AG 92)

Here Leibniz says that one should use the Ptolemaic system when attempting to calculate the positions of objects in the sky relative to our position on earth, while one should use the Copernican system when one is attempting to give an account of actual planetary motion. The reason he gives for using the Copernican rather than the Ptolemaic system is that the former is more intelligible and simpler than the latter; it is “the only one capable of an explanation sufficient for a person of sound reason.” Previously, in the same work, Leibniz had declared that, “...one should choose the more intelligible hypothesis, and that the truth of a hypothesis is nothing but its intelligibility” (AG 91).

So we have an explanation to our question above about force. Out of the competing hypotheses as to reference frames that distribute forces among bodies, and hence account for the absolute motions of those bodies, we ought to choose the simplest and most intelligible hypothesis, that is, we ought to choose the reference frame that distributes forces in the most intelligent and simple way.<sup>15</sup> However, there is one more

---

<sup>15</sup> Again, this solution was first put forward by Puryear.

important element to add to the story in order for us to understand how CIC express the law of the general order.

In DM 15, Leibniz is at pains to rescue our folk and physical-causal talk from oblivion, given the causal isolation and independence of substances; in his own words he attempts to “...reconcile the language of metaphysics with practice...” (AG 48).<sup>16</sup>

Leibniz proposes the following:

...when a change takes place by which several substances are affected (in fact every change affects them all), I believe one may say that the substance which immediately passes to a greater degree of perfection or to a more perfect expression exercises its power and acts, and the substance which passes to a lesser degree shows its weakness and is acted upon. (AG 48)

Leibniz believes that we can retain our ordinary causal talk, given that we understand that a metaphysical reduction is always possible. Thus, when we ordinarily say that one substance acts on another and is therefore the cause of an effect in that other, all that is going on metaphysically is that the substance designated commonly as the cause is passing from a less perfect to a more perfect state, while the substance in which the “effect” takes place is passing from a more perfect to a less perfect state. Perfection of state is then cashed-out in terms of how well that substance expresses the universe.<sup>17</sup>

---

<sup>16</sup> I say folk-causal talk and physical-causal talk because I want to emphasize that Leibniz’s “reconciliation” is meant to apply to ordinary causal talk as well as whatever causal relata enter into current physical theory.

<sup>17</sup> We have not discussed a metric whereby one substance can be said to express the universe better than another. One *prima facie* possibility is that one substance expresses the universe better than another insofar as more correct inferences can be made about the universe from the contents of its perceptions and the expressive mapping between the two than can be in the case of the other.



We are now in a position to knit these seemingly disparate threads together. All monads, including the most basic simple substances, or bare monads, will unconsciously perceive all the motions of the universe from a particular reference frame. This particular configuration of motions from a particular reference frame will express the true configuration of motions as determined by the real reference frame. This real reference frame will be the simplest hypothesis that accounts for the motions in the world, that is, it will be the reference frame from which those motions and the forces behind them are rendered simplest or most intelligible. This real reference frame will thus determine the correct distribution of phenomenal force, whose total quantity,  $mv^2$ , will be conserved across changes in motion. Not only will it determine the real motions of phenomenal bodies by determining the correct distribution of force, but it will also determine a correct quasi-causal framework for phenomena. For example, if from the perspective of the real reference frame, one body collides with another, changing the latter's motion in the process, then we can say that the first body is the quasi-cause and the second body's motion the quasi-effect. Of course, no two monads ever truly causally interact. Therefore, what this quasi-causal structure reveals is that the monads in the first body, as quasi-causes, are, in their changing perceptions, moving to more perfect representations of the world, while those in the second, as quasi-effects, are moving to less perfect representations. Thus given the correct quasi-causal distribution among phenomenal bodies, we can also determine the distribution of changes in the degree of perfection of monads' perceptions. It is this expression of the way in which monads are changing their perceptions, from less to more and more to less perfect ones, that allows us to say that monads express the law of the general order.

Thus we have:

- 1) Substance  $s$  perceives unconsciously the distribution of phenomenal motions  $\delta$
- 2) Distribution of phenomenal motions  $\delta$  expresses the real distribution of phenomenal forces  $\rho$  according to simplicity mapping  $\sigma$ <sup>18</sup>
- 3) Real distribution of phenomenal forces  $\rho$  expresses distribution of perfection changes in monads  $\pi$  according to quasi-causal mapping  $\chi$

so,

- 4) Substance  $s$  expresses the distribution of perfection changes in monads  $\pi$  by perceiving unconsciously the distribution of phenomenal motions  $\delta$ .<sup>19</sup>

Now, a description of these perfection changes would constitute at least one important part of the law of the general order. Recall that the law of the general order contains information about every law of the individual series that exists at its world, that is, it contains information about all of the perceptual states that a monad at its world ever has had and ever will have. In addition to this, it also contains information about the harmony of that world, that is, about what perceptions express what other perceptions. A description of the distribution of perfection changes in substances' perceptions would

---

<sup>18</sup> The formalism for the expression relation that I use here is, again, due to Kulstad.

<sup>19</sup> Of course, this argument assumes that Leibnizian expression is transitive, but given the above formalism for expression I see no reason why it is not. Thus the unconscious perception of the distribution of phenomenal motions  $\delta$  expresses the distribution of perfection changes in monads  $\pi$  according to mapping  $\chi(\sigma)$ .

contain information about those substances' perceptions themselves in much the same way that the equation for the differential of a curve contains information about the curve itself. Thus in the same way that one can recover information from the equation  $y=2x$  about the equation  $y=x^2$ , one can retrieve information about the perceptions of other monads at a world from a description of their changing degrees of perfection. In this way, we have shown how one very important part of the law of the general order is expressed in a substance's perceptions.

We are now in a position to answer the question of compossibility raised before. Two monads will be impossible iff their unconscious perception of the distribution of relative motion expresses different distributions of perfection changes in substances. In this way, truths about compossibility and impossibility will be grounded in the monadic perceptual predicates of CIC.<sup>20</sup>

### 3.5 Abstracta and Eternal Truths

Finally we must say something about necessary truths like those of mathematics. Abstract objects present a unique difficulty for the project of reducing truths at a world to monadic perceptual predicates. Take the fact that the interior angles of a triangle sum to

---

<sup>20</sup> Of course, for this solution to compossibility to be viable, I must take these results to be modally robust. That is, for it to be a general solution to the compossibility problem, it has to be the case that simplicity and intelligibility determine the correct distribution of force in *all possible* worlds. One might think this move suspect, as part of why the actual world is the best possible is that its laws are the simplest and most intelligible. However, I see no reason to think that the laws of a world are the simplest *relative to that world* and that the laws of the actual world are the simplest of the simplest (given the maximization of phenomena). According to the present account, Leibniz's optimism may know no bounds!

180 degrees (in a Euclidean space). Thus according to the concept containment account of truth, the concept of summing to 180 degrees is contained in the concept of a triangle. Yet the mathematical concept of a triangle is not a substance and is not capable of being instantiated as a substance. Worse than this, it is not even possible for a triangle to be instantiated by an aggregate of substances, as Leibniz believes that there are no precise shapes in nature due to the infinite complexity of matter.<sup>21</sup> So it may appear that necessary truths like those of mathematics do not fall neatly into the proposed reduction to monadic perceptual predicates.

Leibniz thinks that the truth-makers for eternal truths are the essences of things in God's mind, essences which are due to the nature of God's intellect itself.

...this possibility and this necessity form or compose what are called the essences or natures and the truths which are usually called eternal. And we are right in calling them this, for there is nothing so eternal as what is necessary. Thus the nature of the circle with its properties is something which exists and is eternal, that is, there is some constant cause outside of us which makes everyone who thinks carefully about a circle discover the same thing, not merely in the sense that their thoughts agree with each other, for this could be attributed solely to the nature of the human mind, but also in the sense that phenomena or experiences confirm them when some appearance of a circle strikes our senses. (L 152)

Of course, as mentioned above, phenomena never exactly confirm the eternal truths of geometry, because matter has no precise shapes. Yet phenomena will always

---

<sup>21</sup> Leibniz actually gives two different arguments for the denial of precise shapes in nature. A diachronic argument based on the idea that an objects shape is constantly changing due to constant bombardment by other particles of matter in the plenum, and a synchronic argument due to the actual infinite division of matter. For a good discussion of this issue see Adams 1994, pp. 228-232. It is a debated question whether Leibniz shows with these arguments that matter has no shape, that is, that extension is a secondary property of matter, or that matter has an infinitely complex, fractal shape (see Levey).

approximately conform to the ideal world of eternal geometrical truths—for any given error, the phenomena will conform to the ideal within this error.<sup>22</sup> It is in this sense that “phenomena or experiences confirm them [truths about abstract objects].”

In addition to existing in God’s mind and providing an ideal structure for phenomena, we have innate access to these abstract objects. As he explains in the DM and later in the NE in response to Locke’s criticism of innate ideas, they are innate in us in the sense that whether or not a given individual ever actually contemplates them, a normal representative of the human race, or any other rational creature, has the inherent capacity to think of them, if he turns his mind to it. Furthermore, as Leibniz makes clear above, this capacity is not due to the nature of the rational mind, *per se*, or any idiosyncratic elements thereof. Instead it is due to the fact that rational minds are expressions not only of the world, but of God itself.

...our soul always does have within it the disposition to represent to itself any nature or form whatever, when an occasion arises for thinking of it. I believe that this disposition of our soul, insofar as it expresses some nature, form, or essence, is properly the idea of the thing, which is in us and is always in us whether we think of it or not. For our soul expresses God and the universe, and all the essences as well as all the existences. (L 320)

As he goes on to explain in the DM, this is the true meaning of the Avicenna-Aristotelian doctrine that God is the active intellect. God is the active intellect of the rational soul, not insofar as God is the world mind, and we participate in that world mind insofar as we think necessary truths, but that our capacity to think necessary truths is due to the fact that we express the divine.

---

<sup>22</sup> That is, for any given error you propose I can find a precise shape within that error.

To return to the main theme of this section, the insight as to how the proposed reduction of eternal truths goes lies in the containment relation among concepts. Concepts can contain and be contained in other concepts. Recall that it is the mark of a CIC that it is so complete that it is not contained in any other concept. So concepts can contain other concepts from the most complex CIC all the way down to the simple elements or simple concepts of the Forms or perfections or attributes of God. The truth of the interior angles of a triangle summing to 180 degrees is grounded in the monadic perceptual predicate “perceiving clearly and distinctly cognitive-wise that a triangle’s angles sum to 180 degrees,” where the concept of summing to 180 degrees is contained in the concept of triangle, which in turn is a constitutive part of the content of some substance’s predicate concept “perceiving clearly and distinctly cognitive-wise that  $\phi$ .”

### 3.6 World Books and Concept Packing

Borrowing a notion from Plantinga, we may talk of each possible world, or maximal compossible collection of CIC, as associated with a particular world book (see 45-6). The world book for a possible world is the set of atomic propositions  $p$  such that  $p$  is entailed by the set of monadic perceptual predicates of the total CIC constituting world. Constructing world books in this way will allow us to have a clear bridge between Leibnizian possible worlds and the possible worlds employed in contemporary semantic theories. It is important to note here that for every atomic proposition  $p$ , either it or its negation will be contained in the world book for a world. Thus I take a world book to roughly correspond to what Adams calls the *complete* concept of a possible world (14).

In fact, the goal of the alethic reductions of the previous sections was to shore up this claim; it was to show in detail how truths can be grounded in monadic perceptual predicates. First we showed how truths about substances and aggregates of substances could be grounded in these monadic perceptual predicates. We accounted for illusions by noting the difference between opaque and transparent contexts created by conscious and unconscious perceptions. Next, we showed how phenomenal relations could be grounded in these predicates. We even saw how more recondite truths such as the law of the general order and abstract truths such as those of mathematics could be derived from monadic perceptual predicates. Whether any truths are left over that resist such analysis remains to be seen. However, I take myself to have provided the scaffolding on which to perform any such needed reductions in the future.

Of course, all this is related to the charge of “concept packing” against Leibniz (see Sleight 1990, 72-78).<sup>23</sup> The idea is that when Leibniz claimed that all the truths about a world could be derived from a CIC, Leibniz really meant that they could be derived from a concept that contained not only properties of that substance, but one with additional information about the laws of the world packed in. I agree with Sleight that Leibniz was not engaged in concept packing, and have tried to provide the conceptual means to justify this belief. According to the view presented here, the law of the general order is not something added, in addition to the monadic perceptual predicates, to a CIC. Quite the contrary, according to our solution to the compossibility problem, the law of the general order is derivable from those monadic perceptual predicates. In addition to this answer to concept packing, the account here provides the resources for answering

---

<sup>23</sup> The name is due to Sleight. The charge of concept packing was originally made by Loeb (284-290).

whether Leibniz held what Sleight has called the weak and strong theses of intrinsic foundations. The weak thesis of intrinsic foundations is that relational truths can only be reduced to monadic predicates of both relata. The strong thesis of intrinsic foundations is that relational truths can be reduced to monadic predicates of merely one of the relata.<sup>24</sup> It follows from the account here that not only are phenomenal relations reducible to monadic perceptual predicates of both CIC involved in the relation, they are also reducible to monadic perceptual predicates contained in each. If it is true that Harry is married to Emily, this truth is grounded, not only in countless perceptions of both Harry and Emily relevant to their union, but also in the conscious cognitive perception of each that they are married to each other.<sup>25</sup> So according to this account of the contents of CIC, the strong and the weak thesis of intrinsic foundations both turn out true.

#### 4 Evidence of Quantification

It is an uncontentious piece of Leibnizian cosmogony that God chooses the best world from an infinite number of possible worlds to create. It is also clear that possible worlds played an essential role in Leibniz's thought in avoiding necessitarianism. In addition to the oft-quoted "precipice" passage from *On Freedom*, the following is from *The Source of Contingent Truths*.

---

<sup>24</sup> The weak thesis is that  $(Fa \ \& \ Gb) \supset Rab$ , the strong thesis is that  $Fa \supset Rab$  (for a fuller account of the distinction, see Sleight 1990, 75-77).

<sup>25</sup> Again, even if Harry were hallucinating in having a conscious cognitive perception of being married to Emily, he would still unconsciously perceive the truth that he was not married to Emily.



If everything that exists were necessary, then it would follow that only things which existed at some time would be possible (as Hobbes and Spinoza hold) and that matter would receive all possible forms (as Descartes held)...And so, we should say, rather, that from an infinite number of possible series, God chose one for reasons that go beyond the comprehension of his creatures. (AG 100)

And from the *Monadology*:

Now since there is an infinity of possible universes in God's ideas, and since only one of them can exist, there must be a sufficient reason for God's choice, a reason that determines him toward one thing rather than another. (AG 220)

And from the *Theodicy*:

...there is an infinitude of possible worlds among which God must needs have chosen the best, since he does nothing without acting in accordance with supreme reason. (T 128)

Here we have a clear picture of God choosing one from among an infinity of possible worlds. Furthermore, his choice is not arbitrary but governed by reasons, even if those reasons lie beyond our intellectual grasp. Leibniz goes on to tightly link contingent truths with God's choice of which world to instantiate. Necessary truths, on the other hand, while in some sense dependent on God's intellect, are independent of his will. The following two passages are from the DM and the *Monadology*.

But they [contingent truths] do not have necessary demonstrations, since these reasons [for their truth] are based only on the principle of contingency or the principle of the existence of things, that is, based on what is or appears to be best from among several equally possible things. On the other hand, necessary truths are based on the principle of

contradiction and on the possibility or impossibility of essences themselves, without regard to the free will of God or his creatures. (AG 46)

However, we should not imagine, as some do, that since the eternal truths depend on God, they are arbitrary and depend on his will... This is true only of contingent truths, whose principle is fitness or the choice of the best. But necessary truths depend solely on his understanding, and are its internal object. (AG 218-19)

I take these passages, and more like them, as evidence that Leibniz thought of modal truths in terms of quantification over worlds. The contingent truths are ones that could have been otherwise, because they depend on God's choice of the best. If God had chosen a different world to create, at least one contingent proposition that is now true would be false. Thus that proposition is not true in all possible worlds. Necessary truths depend only on God's intellect and are independent of his will. Their independence of his will is strong evidence that Leibniz thought that they would hold no matter what decision God made in world selection. Thus necessary truths would hold no matter which world God selected. They would thus be true in all possible worlds. In fact, Leibniz implies just this in *Necessary and Contingent Truths*.

...there are some propositions which pertain to the essences, and others to the existences of things. Propositions of essence are those which can be demonstrated by the resolution of terms; these are necessary, or virtually identical, and so their opposite is impossible, or virtually contradictory. The truth of these is eternal; not only will they hold whilst the world remains, but they would have held *even if God had created the world in another way*. (P 97-98; my italics)

It is difficult to walk away from these passages and not infer that the reason necessary truths would have been true "even if God had created the world in another way" is that

they don't depend on his will or which world he creates, and that because of this they are true in all possible worlds.

In addition to the above, there is evidence that Leibniz clearly understands the interdefinability of the strong and weak alethic modal notions—the necessary and the possible. In the *Confessio philosophi* he defines the necessary as a truth whose negation is not possible and the possible as that whose negation is not necessary (RS 55). In the DM and *New Essays* he says,

For it will be found that the demonstration of this predicate of Caesar is not as absolute as those of numbers or of geometry, but that it supposes the sequence of things that God has freely chosen...But every truth based on these kinds of decrees [God's will to choose the best] is contingent, even though it is certain; for these decrees do not change the possibility of things...And nothing is necessary whose contrary is possible. (AG 46)

The real existence of beings which are not necessary is a matter of fact or of history, while the knowledge of possibilities and necessities (the *necessary* being that whose opposite is not *possible*) is what makes up the demonstrative sciences. (NE 301)

We have seen that there are strong reasons to think that necessary truths are true in all possible worlds because they are independent of God's will as to which world he decides to create. Contingent truths are dependent on his will, and hence would have been false had he chosen otherwise. Thus contingent truths are clearly not true in all possible worlds. Given the interdefinability of the strong and weak alethic modal notions, I think there is ample reason to believe that Leibniz was explicitly operating with a fully quantificational theory of modality. If the necessary is true in all possible worlds and the possible is that whose negation is not necessary, then it is clear that the possible is

that whose negation is not true in all possible worlds, i.e., the original proposition is true in some possible worlds.

I think the evidence presented is enough to believe that Leibniz is explicitly committed to quantification over worlds. However, even if another reading can be given of the relevant texts, and thus even if it is claimed that Leibniz was not explicitly committed to quantification over worlds, there is reason to believe that his modal thinking is susceptible to treatment in terms of possible worlds. I take it that it is a fairly straightforward claim that Leibniz believed that all logical truths are necessary. I also take it that he would have endorsed the following principle: that if it is necessary that if A then B, then if it is necessary that A then it is necessary that B.<sup>26</sup> For instance, if it is necessary that if God is good he creates the best of all possible worlds, then if it is necessary that God is good then it is necessary that he create the best of all possible worlds. These two principles, that all logical truths are necessary and that if it is necessary that if A then B, then if it is necessary that A then it is necessary that B, are called necessitation and distribution (Garson 30). Together they commit him to the weakest modal logic K. Any sound and complete modal logic satisfying K will be susceptible semantically to quantificational treatment. Thus, given that Leibniz would endorse the two principles above, there is every reason to think that his system is, if not

---

<sup>26</sup> There are places where Leibniz seems to deny the following piece of basic modal truth: If it is necessary that A, and it is necessary that if A then B, then it is necessary that B (RS 55). However, this is not the principle of distribution formulated above (although it does follow from the principles of necessitation and distribution). In addition, there is all the reason in the world to believe that Leibniz did not actually deny this modal truth. When Leibniz is careful, he makes a distinction between kinds of modality, and denies the following, different principle: If it is necessary per se that A, and it is necessary that if A then B, then it is per se necessary that B. I will have much more to say about this in chapter 4.

explicitly committed, at least susceptible to treatment of alethic modals in terms of quantification.

### 5.1 The Infinite Analysis

The other major branch of Leibniz's treatment of modality, more specifically of contingency—states of affairs that are actual, but whose complements are possible—is the infinite analysis account. Leibniz's rationalism leads him to hold the conceptual containment theory of truth, that is, in any true proposition, the concept of the predicate is contained in or a part of the concept of the subject. Thus all truths for Leibniz are analytic in this sense of analyticity. Leibniz says in *Primary Truths*, "...the predicate or consequent is always in the subject or antecedent, and the nature of truth in general or the connection between the terms of a statement, consists in this very thing..." (AG 31). Of course, the problem is that according to the "golden triad" analytic truths are usually associated with necessary truths, so Leibniz's conceptual containment theory of truth seems to lead to the Spinozistic conclusion that all truths are necessary truths. If the concept of the predicate is in the concept of the subject then it appears that an analysis of the subject will reveal this conceptual connection between subject and predicate concept. Leibniz's famous solution is to say that while in necessary truths the conceptual connection between subject and predicate can be revealed by a finite analysis, in contingent truths, finding the conceptual connection requires an infinite analysis, that is, an analysis that will never end. Thus in *On Freedom* from around 1698 Leibniz writes:

But in contingent truths, even though the predicate is in the subject, this can never be demonstrated, nor can a proposition ever be reduced to an equality or an identity, but the resolution proceeds to infinity, God alone seeing, not the end of the resolution, of course, which does not exist, but the connection of the terms or the containment of the predicate in the subject, since he sees whatever is in the series. (AG 96)

The kinds of analyses Leibniz has in mind are where the concept of the subject and the concept of the predicate are replaced by equivalent sets of concepts until one has reduced the true proposition in question to what Leibniz calls the form of an identity, explicitly revealing the conceptual containment in question. When one can do this in a finite number of steps Leibniz says there is a demonstration of the proposition, and in what follows I will speak of finite and infinite proofs, reserving the term “demonstration” for finite proofs. Of course given that the subject concept will be more complex than the predicate concept this form of an identity that true propositions are reduced to in a demonstration will actually be such that the decomposed predicate concept will be a proper subset of the decomposed subject concept, such as “ $S_1P_1$  is  $P_1$ ” or  $\{P_1\} \subset \{S_1, P_1\}$ . This, of course, is all fairly well-trod ground in Leibnizian metaphysics of truth.

It may be objected that the infinite analysis is an account of contingency, not possibility across the board. The idea is that the account only applies to truths that could have been otherwise, but says nothing about false possibles—propositions false of the actual world but nonetheless possible, such as, “Unicorns exist.” How can the infinite analysis handle these falsehoods, where the predicate is presumably not contained in the concept of the subject? Leibniz believes in global bivalence. If it is false that unicorns exist, then it is true that unicorns don’t exist, and this truth would require an infinite analysis to reveal the predicate concept “non-existence” in the subject concept “unicorn.”

So if it is true that unicorns don't exist and this is contingent, then it is possible that unicorns exist. In this way the infinite analysis account can be expanded to handle false possibles.

## 5.2 Some Proof Problems

One problem with all of this, originally stated by Maher (1980) and subsequently dubbed the Lucky Proof by Adams (1994), is that one wonders why, in the analysis of a contingent truth, one couldn't luckily start the analysis off in such a way that one discovered the predicate in the subject in a finite number of steps. A more damning problem, also originally stated by Maher (1980) and dubbed the Guaranteed Proof by Rodriguez-Pereyra and Lodge (223), is that if the predicate is actually in the subject, then one will be guaranteed to discover it in a finite number of steps, no matter how "far off" it is in the analysis.

To see why the Guaranteed Proof works one can as a first pass think of an analogy with the natural numbers. If one thinks of a Leibnizian analysis as the setting out of all the component concepts of a subject in a string, one after another, then, like the natural numbers, that string of concepts will be infinite. However, any given natural number in the infinitely long string will be finitely many steps away from the beginning. Similarly, any predicate in the decomposition string will be finitely many steps away from the beginning of the analysis. So, the Guaranteed Proof reasons, any given true predicate will show up after a finite number of steps in the analysis of its subject.

It will be helpful later to briefly state now the mathematical mechanism behind the Guaranteed proof. From the perspective of Graph Theory, the natural numbers in their standard ordering form what is known as a *connected graph*, with the natural numbers being the vertices of the graph and the successor relation being its edges.<sup>27</sup> To say that a graph is connected means that for any two vertices in the graph, one can “get” from one to the other following the edges in a finite series of vertex-edge combinations. This is the mechanism behind the fact that any natural number  $n$  can be reached from 1 in a finite number of steps. Being clear about this mechanism now will help in diagnosing a solution later.

The Lucky Proof and the Guaranteed Proof, what I will rename the Connectedness Problem in order to capture more accurately what that problem is, together constitute a serious tangle for Leibniz’s infinite analysis account of contingency and it would be nice if there was a way around them. Before proposing my own solution I want to look at some of the attempts that have been made at a work around.

### 5.3 Non-Containment Containment Theories

Maher works around connectedness by denying that the predicate is literally in the subject. Thus in the true contingent proposition “Caesar crossed the Rubicon” what is literally in the subject concept is not the predicate “crossed the Rubicon,” but instead the

---

<sup>27</sup> A graph is specified by a set  $G = \{V, E, f\}$  where  $V$  is a set of vertices,  $E$  is a set of edges, and  $f$  is a function that maps edges to pairs of vertices. In our example  $V$  is the set of natural numbers, and  $f$  is technically a “next to” function as it maps to unordered pairs of vertices.  $E$  has no natural translation here, so I simplify things above by calling it the successor relation.



predicate “appearing best to cross the Rubicon” (241). According to Maher, the predicate is “contained” in the subject in the sense that crossing the Rubicon can be derived from appearing best to cross the Rubicon along with the “Principle of Perfection”—that God has set things up in such a way that substances will freely choose what seems best to them (241). Infinite analysis enters the picture when we ask ourselves about the status of the Principle of Perfection. According to Maher, God chose a word that instantiated the Principle of Perfection because God chose the best possible world, but the predicate, “chooses the best” is not found within the concept of God. Instead an infinite series of predicates of the form “it seems best to God to choose the best,” and “it seems best to God that it seems best for him to choose the best,” etc... are contained in God (241).

Another solution, due this time to Cover and Hawthorne (2000), shares a feature of Maher’s solution to connectedness, namely, the denial that the predicate is literally in the subject. According to Cover and Hawthorne, macro-predicates like crossing the Rubicon are not literally in the subject. Instead what are in the subject concept are an infinite number of micro-inclinations (159). A macro-predicate is “contained” in the subject in the sense that one can deduce from all the micro-inclinations what macro-predicate is true of the subject. Infinite analysis enters the picture when one considers that in deducing a given macro-predicate one has to take account of the infinite number of micro-inclinations that tend toward and against the macro predicate in question, a task that clearly requires an infinite analysis (159).

It is not clear what kind of textual evidence there is to support such non-containment containment theories. One *prima facie* obvious candidate occurs in the correspondence with Arnauld where Leibniz says,

...all the predicates of Adam either depend on other predicates of the same Adam or they do not. Then, setting aside all of those predicates that depend upon the others, we need only gather together all the primitive predicates in order to form Adam's complete notion... (AG 74)

This looks as if Leibniz thought that not all true predicates of a subject were contained in its CIC and would constitute a violation of a strict interpretation of the conceptual containment theory of truth. However, I think when viewed in context this text does not support this conclusion. This quote occurs as part of a background debate between Leibniz and Arnauld concerning the status of the following controversial proposition: "The individual concept of each person contains once for all everything that will ever happen to him" (LA 25). Arnauld goes on to explain that one of the reasons for their initial "misunderstanding" is that Leibniz maintains that the nature and content of CIC has to be judged relative to how they exist in God's mind, whereas Arnauld thinks that they have to be judged relative to us, or as he sometimes says, as they are in themselves. He explains,

I confess in good faith that I did not understand that by the individual concept of each person...you had meant this person in so far as he exists in the divine understanding...For it seems to me that one does not customarily consider the specific concept of a sphere in relation to the way it is represented in the divine understanding, but in relation to what it is in itself: and I thought that this was the case for the individual concept of each person or of each thing. (LA27)

Arnauld goes on to give positive reasons for not proceeding as Leibniz does—that speculation into the inner workings of God is fraught with peril!

...I find it hard to believe that good philosophy consists in seeking out in the way God knows things what we are to think either of their specific or of their individual concepts. Divine understanding is the rule of the truth of things, as they are in themselves, but so long as we are in this life it does not seem to me that it can be the rule as far as we are concerned. For what do we know at present of God's knowledge? (LA 30)

Given this background, here is Leibniz's full response to Arnauld including the original quote:

For even if we did not say that God, when considering Adam whom he is resolving to create, sees in him everything that will happen to him, it suffices that one can always prove that there must be a complete notion of this Adam which contains them. For all the predicates of Adam either depend on other predicates of the same Adam or they do not. Then, setting aside all of those predicates that depend upon the others, we need only gather together all the primitive predicates in order to form Adam's complete notion, a notion sufficient for deducing everything that will ever happen to him, and this is as much as we need for us to be able to explain it. It is evident that God can construct—and even actually conceive—a notion sufficient to explain all the phenomena pertaining to Adam; but it is no less evident that this notion is possible in itself. (AG 74)

What Leibniz is doing here is saying to Arnauld that even if Arnauld is right and we must not judge CIC in relation to how they exist in God's mind, it is perfectly possible for us to construct CIC as they are "in themselves," and that when we do, we find that, still, "The individual concept of each person contains once for all everything that will ever happen to him." So it is not at all clear that this text is evidence that Leibniz thought that there are true predicates of a subject that are not contained in its CIC.

In addition to the lack of textual evidence for non-containment containment theories, if the idea behind non-containment theories is to get around connectedness then

I think there is little theoretical motivation for them.<sup>28</sup> To see why, consider some true contingent predicate P. The non-containment theorist will say that you will not find P in a finite number of steps because the true contingent predicate will show up nowhere in the analysis of the basic concept, even though the analysis will provide the resources for deducing it. The opponent of the non-containment theorist can reply that one can just take the deductive closure of the basic concept and call that the CIC in some extended sense. Each deduction will then show up as a step of the analysis of this fuller concept and we are faced with the Connectedness Problem all over again. It seems to me that the only thing for the non-containment theorist to do at this point is to deny that deductions should count as steps of an analysis, a move that strikes me as *ad hoc*.

Considerations such as these show that the real work being done to get around connectedness in non-containment theories is not done by the non-containment of the predicate in the subject, but instead by infinitistic considerations. Maher does it by employing an infinite series of reasons for reasons within God for choosing the best, while Cover and Hawthorne do it by having an infinite premise set of micro-inclinations required in order to do any deductive work. While I think that each of these accounts

---

<sup>28</sup> There is one other kind of non-containment theory lurking in logical space, what I will refer to as “limit theories.” The limit theorist maintains that true contingent predicates are not in the subject, but denies that any analysis of the basic concept will provide the resources for deducing the predicate. Instead, the limit theorist maintains that the analysis of the basic concept will infinitely approach the predicate as a limit point. What I say above does not apply to this kind of non-containment theory. “The sole difference is that in the case of surd relations we can, none the less, establish demonstrations, by showing that the error involved is less than any assignable error, but in the case of contingent truths not even this is conceded to a created mind” (P 97). I’d like to thank Mark Kulstad for pointing these out to me. However, there is also this from *Of the Art of Combination* (1666), “Since all things which exist or can be thought of are in the main composed of parts, either real or at any rate conceptual, it is necessary that those things which differ in species differ either in that they have different parts...or in that they have a different situation...” (P 3).

may work, given the lack of textual evidence and the fact that non-containment is not doing any of the real lifting here, I think there is reason to see if we can get around connectedness within the theoretical context of full-blown containment theories.

#### 5.4 Infinite Complexity of CIC

Another very interesting attempt around these difficulties, and in the context of full-blown containment, is due to Rodriguez-Pereyra and Lodge. Their basic idea is that connectedness presents no problem because even if one can deduce some true contingent proposition in a finite number of steps, one hasn't proved S is P unless one simultaneously has a proof that the subject concept S is consistent, something that would require a full decomposition of S and therefore could not be accomplished in a finite number of steps (227). This possible solution was considered by Maher originally and again by Cover and Hawthorne and rejected because, among other things, it makes all truths about substances contingent (239; 155-56). Rodriguez-Pereyra and Lodge accept this non-intuitive solution and argue that even properties like self-identity are contingent for Leibniz (229-34). They try to soften this conclusion by arguing that statements like "Caesar is Caesar" aren't really identities, noting that "...Leibniz's views on what counts as an identity were not totally fixed..." (234).

First I want to look at some of the main textual evidence for their position. They rely heavily on passages culled from the 1686 *General Inquiries about the Analysis of Concepts and of Truths*. Among such texts are the following:

The question is, therefore, whether it is possible for the analysis of incomplex terms to be sometimes capable of being continued *ad infinitum*, so that one never arrives at terms which are conceived through themselves. Certainly, if there are in us no concepts conceived through themselves which can be grasped distinctly...then it follows that no proposition can be proved perfectly by the reason. For even if it can be proved perfectly, without the data of experience, from the definitions and axioms assumed, yet the definitions presuppose the possibility of the terms, and so their analysis either into terms which are conceived through themselves, or into those discovered by experience... (P 63)

Following a suggestion by Cover and Hawthorne, Rodriguez-Pereyra and Lodge take this passage as evidence that Leibniz thought that infinitistic considerations enter proofs because one needs to prove the consistency of an infinitely complex subject concept. There are two main problems with this interpretation. One problem with citing passages from the *General Inquires* is that the text has a clear experimental nature to it. Leibniz is constantly repeating and reworking problems in it, so it is not clear how much weight should be given to any one thing Leibniz says there on its own.

Another problem is that this passage is taken out of context. The context in which it appears is one in which Leibniz is dealing with the problem of how to distinguish merely possible propositions, propositions that are false but possibly true, from true contingent ones. The section that starts off this part of the *General Inquiries* states,

Possible propositions are those of which it can be proved that a contradiction will never arise in their analysis. True contingent propositions are those which need an analysis continued to infinity. False contingent propositions are those whose falsity can be proved only by the fact that it cannot be proved that they are true. It seems doubtful whether it is sufficient to prove a truth that, on continued analysis, it should be certain that no contradiction will arise; for it will follow from this that everything possible is true. (P 61)

The problem is that in proofs of both merely possible propositions and true contingent ones, infinitistic considerations enter, so Leibniz needs a way of distinguishing these two cases. As Leibniz says at the end, if proving something contingently true just means showing that no contradiction enters the infinite proof then there is no space for the merely possible and, “it will follow from this that everything possible is true.” The passage that Rodriguez-Pereyra and Lodge cite then occurs within the context of Leibniz trying to figure out a mechanism by which proofs could be infinite.

Leibniz begins by discussing the problem of inconsistent concepts. He states:

However, if we proceed further, it is required of a definition that there should be an agreement that it is possible. That is, it is necessary that it should be proved that A is possible, or, that it should be proved that EFG does not involve a contradiction...But this can be known only by experience, if it is agreed that A exists, or has existed, and so is possible. Or at least, if it is agreed that something like A has existed. (P 62)

So it is clear that within the part of the *General Inquiries* that Rodriguez-Pereyra and Lodge cite, Leibniz already has an answer to the problem of inconsistent concepts, one which involves having a posteriori knowledge of the thing, or something relevantly like it.

Leibniz concludes this paragraph by telling us that all analyses result in 1) axioms, 2) definitions, and 3) a posteriori truths. The definitions, he goes in to claim, are themselves further resolvable into axioms and a posteriori truths. Axioms are known in themselves. A posteriori truths, Leibniz then claims, as truths, are themselves susceptible to proof. Now, what Leibniz is trying to do in the passage quoted by Rodriguez-Pereyra and Lodge is to secure the infinite analysis itself. Leibniz's point there is that even if a

posteriori truths can be perfectly reduced to axioms and definitions, these definitions themselves will require further analysis into axioms and a posteriori truths, the latter of which he has already claimed must be provable, and so the analysis will be guaranteed to go on forever. Here is the full ending of the passage quoted by Rodriguez-Pereyra and Lodge:

For even if it [a proposition] can be proved perfectly, without the data of experience, from the definitions and axioms assumed, yet the definitions presuppose the possibility of the terms, and so their analysis either into terms which are conceived through themselves, or into those discovered by experience; so we return to the data of experience, or to other propositions. (P 63)

Leibniz then concludes this extended discussion with a solution to the problem he started off by raising, namely, the difference between merely possible and contingently true propositions.

But if, when the analysis of the predicate and the subject has been continued, a coincidence can never be proved, but it does at least appear from the continued analysis (and the progression and its rule which arises from it) that a contradiction will never arise, then the proposition is possible. But if, in analyzing it, it appears from the rule of progression that the reduction has reached a point at which the difference between what should coincide is less than any given difference, then it will have been proved that the proposition is true.

So Leibniz's solution to the difference between merely possible propositions and contingently true ones on display here is that, while both involve infinite analyses, in merely possible propositions, we can tell from the analysis that no contradiction will enter at any step, while for contingent propositions we can tell from the analysis that it



will asymptotically approach an identity. In none of this do I see evidence that Leibniz thought that the infinite analysis arose from the need to fully analyze, a priori, infinitely complex complete individual concepts to guarantee their consistency.

Rodriguez-Pereyra and Lodge also cite passages from *Critical Thoughts on the General Part of the Principles of Descartes* and from *Meditations on Knowledge, Truth, and Ideas* that seem to support their view of how infinitistic considerations enter into Leibniz's containment theory of truth and avoid the Connectedness Problem. In both of these texts Leibniz argues that the standard Ontological Proof of God's existence is flawed because one has not proved the *possibility* of a perfect, necessarily existing, being. Hence one cannot safely infer the existence of such a being because the concept might be impossible by secretly containing a contradiction.

It is true that Leibniz insists on this critique of the Ontological Proof many times. Yet I don't find in it any support for Rodriguez-Pereyra and Lodge's thesis. Leibniz insists on the distinction between nominal definitions and real definitions. Nominal definitions merely enable one to distinguish one concept from another, while real definitions establish the possibility of a thing. In *Meditations on Knowledge, Truth, and Ideas*, Leibniz claims that real definitions come in two flavors, a priori and a posteriori. A real definition is had a priori when we have a causal definition of the thing, through which we give the means by which it can be produced mechanically, or we fully analyze it into the primitive attributes of God. A real definition is had a posteriori when we have experience that it exists (for all this see AG 26). The reason that Leibniz insists that we need an a priori proof that the concept of a perfect being is possible is, of course, that none of us (presumably) has an a posteriori real definition of such a being because none

of us has had an experience of the existence of such a being. This is relevantly different from the case of a created being like Caesar. The reason we don't need an a priori proof that the concept of Caesar is consistent is because we have an a posteriori real definition of Caesar, presumably based on the historical records of humans that did have an experience of the existence of such a man.

It is important to not equivocate two distinct kinds of analysis. One kind of analysis is the kind that we, finite creatures, can accomplish or might attempt and have at any one time. Another kind is the perfect analysis as it exists ideally, as it were, and in the Platonic mind of God. It is the latter, metaphysical, Platonic kind that Leibniz has in mind when he says every true proposition contains an identity or is provable, in either a finite or an infinite number of steps. The former, of course, try to approach and approximate the latter. The texts we have been citing all pertain, I maintain, to the former kind of analysis. Inconsistent concepts are a problem for *our* analyses, not the analyses as they are Platonically in the mind of God. Certainly, in God's mind, there are no inconsistent concepts, and so Rodriguez-Pereyra and Lodge's worry never gets off the ground. Perhaps it is a failure to make this distinction that cause Rodriguez-Pereyra and Lodge to transplant concerns about inconsistent concepts that apply only to the practical workings of our everyday analyses to solve the problem of connectedness as it applies to analyses as they are in the mind of God.

## 5.5 Non-Standard Arithmetic

I now want to develop a solution to the problem of connectedness within a full-blown containment context and, furthermore, avoid such non-intuitive results as making all propositions about created substances contingent. I take my inspiration from some thoughts of Adams. Adams, in trying to make sense of how a contingent predicate could be literally in a subject concept without the denial of that predicate creating a contradiction, appeals to the mathematical notion of  $\omega$ -inconsistency (1994, 26-7). A system that proves for each natural number that it has some property F, and yet also proves that there is some number such that it doesn't have F, is consistent but not  $\omega$ -consistent.<sup>29</sup> Adams explains that in the same way that a system can be consistent and yet not be  $\omega$ -consistent, we can view the claim that the denial of a contingent predicate does not generate a contradiction as the view that the denial is consistent but not  $\omega$ -consistent. He concludes that, "...Leibniz reserves 'implies a contradiction' to express a proof-theoretical notion rather than the notion of conceptual falsity..." (1994, 27). I think this line of thought deserves to be developed.

The notion of  $\omega$ -consistency is tightly connected to non-standard arithmetics.<sup>30</sup> One way of generating a non-standard model of the Peano axioms is to start adding axioms to the effect that there exists some number greater than n, starting with n=1 and working one's way up. For each n, this extended system of axioms is, of course, satisfied by the standard model of the natural numbers. This process can be infinitely extended, adding an axiom for each standard natural number. Because of compactness, which states that if every finite subset of an infinite set of sentences has a model, the entire

---

<sup>29</sup> That is, the system proves, F1, F2, F3...for each natural number n, and also proves  $\exists x \sim Fx$ .

<sup>30</sup> I am deeply indebted to Richard Grandy for what follows. Any mistakes are my own.

infinite set does, we know that there must be some model that satisfies the infinitely extended Peano axioms and that it cannot be the standard one. That is, each finitely extended Peano system has a model in the standard natural numbers, but the infinitely extended Peano system cannot have a model in the standard natural numbers because you have effectively stated that there is some number  $n$  greater than each of those standard natural numbers. The reason that you can have a distinction between consistency and  $\omega$ -consistency is that on this non-standard model, you can prove both that each standard natural number has some property  $F$  and that there exists some non-standard natural number that doesn't have  $F$ .

I believe this notion of non-standard arithmetic holds the key to solving the Connectedness problem. The first thing to notice is that the non-standard natural numbers have a non-standard ordering, that is, they are of order type other than  $\omega$ . In less technical terms they have an ordering that goes  $1, 2, 3 \dots$  and then something more.<sup>31</sup> The other thing to note is that this non-standard ordering of something other than  $\omega$  means that in terms of Graph Theory, they are not connected. Having previously seen that connectedness was the mechanism by which problems like the Guaranteed Proof and the Lucky Proof were being generated, it follows that a non-standard ordering of the predicates in a subject concept is the key to solving such difficulties within the context of a full-blown containment theory.

The question remains whether a non-standard ordering is a Leibnizian solution to the Connectedness Problem. I think there is evidence that Leibniz certainly thought that

---

<sup>31</sup> In more technical terms they have an ordering that runs  $1, 2, 3 \dots, \dots a-3, a-2, a-1, a, a+1, a+2, a+3 \dots, \dots b-3, b-2, b-1, b, b+1, b+2, b+3 \dots$ , where each of the non-standard chunks,  $x-3, x-2, x-1, x, x+1, x+2, x+3$ , are themselves densely ordered.

concepts had some kind of internal ordering or structure among their constituent concepts. The following is from the New Essays:

...someone who said *The triangle and the trilateral are not the same* would be wrong, since if we consider it carefully we find that the three sides and the three angles always go together...However, one can still say in the abstract that *triangularity is not trilaterality*, or that the formal causes of the triangle and of the trilateral are not the same, as the philosophers put it. They are different aspects of one and the same thing. (363)

Here I take it that Leibniz is saying that although the concepts of triangularity and trilaterality are extensionally equivalent and pick out all the same things, they are intensionally, viewed as concepts, distinct. Concepts can be distinct either through their constituent parts or through the structure of those constituent parts. Given that they don't differ in the objects that they pick out, I think it is fair to conclude that they don't differ in their constituent concepts. The best way for accounting for the difference between the two that I know of is to claim that there is a distinction in the internal ordering of those constituent concepts. So I take this to be textual evidence that Leibniz did believe that concepts had an internal ordering.

The next question then is whether this solution, which introduces the notion of a non-standard ordering, is an un-Leibnizian solution, and I think that it is not. Leibniz was intoxicated with the notion of infinities within infinities and this is exactly what a non-standard ordering is. In some notes on a conversation with Fardella he writes, "From an infinite number of possibilities God chose a certain universal series, composed of an infinite number of substances, each of which exhibits an infinite series of operations" (AG 102). And to Bernoulli, "...there could be, indeed, there have to be, worlds not

inferior in beauty and variety to ours in the smallest motes of dust, indeed in tiny atoms” (AG 169). Most clearly from the Fardella notes, Leibniz is imagining, if we were to order it, some kind of  $\omega^\omega$  structure, where you have an infinite list of worlds each composed of  $\aleph_0$  number of  $\omega$  structures. So I think Leibniz’s thoughts on infinity do lend themselves to treatment easily in terms of transfinite arithmetic.

More intriguing is the following passage from an early work entitled, “Infinite Numbers” where Leibniz grapples with the problems of the infinite.

Thus if you say that in an unbounded [series] there exists no last finite number that can be written in, although there can exist an infinite one: I reply, not even this can exist, if there is no last number. The only other thing I would consider replying to this reasoning is that the number of terms is not always the last number in the series. That is, it is clear that even if finite numbers are increased to infinity, they never—unless eternity is finite, i.e., never—reach infinity. This consideration is extremely subtle. (RA 101)

Subtle indeed! Here Leibniz seems to be sussing out the basic insight of transfinite numbers some 200 years before Cantor! The only other thing he would reply is that in an infinite series, as opposed to a finite one of natural numbers in their usual ordering, the cardinality of the series cannot simply be read off from its last member! Leibniz obviously did not have the technical resources available to construct non-standard arithmetics and orderings, but the notion of the transfinite is something that, I believe, is not entirely foreign to his thought.

## Chapter 2

## 1 Contemporary Possible Worlds Semantics and Leibnizian Modality: Methodological Warnings and Results

Having previously spelled out in depth Leibniz's two accounts of alethic modality, one in terms of possible worlds and the other in terms of analysis, I want to turn to the question of which contemporary system of modality best fits Leibniz's thought. The question, then, is this: *If* Leibniz had a quantificational account of modality in terms of possible worlds, which contemporary possible worlds semantics does it best correspond to?

Arguing ultimately *against* the idea that Leibniz is the originator of possible world semantics, Adams claims that S4 provides the best semantics for a conception of a possible world that is not demonstrably inconsistent, that is, from which it is not possible to derive a contradiction in a finite number of steps (1994, 47-8).<sup>32</sup> Thus Adams interprets the *possible* in *possible world* in terms of demonstration. He says, "the possible worlds semantics based on the demonstrability conception of possible worlds seems to fit the modal logic suggested by the demonstrability conception of necessity [i.e., S4]" (1994, 48).<sup>33</sup> However, he goes on to list what he takes to be some problematic, "strikingly un-Leibnizian consequences," of the demonstrability conception of possible worlds.

---

<sup>32</sup> S4 consists of the basic modal system K along with axioms (M) [sometimes referred to as T]  $\Box A \supset A$  and (4)  $\Box A \supset \Box \Box A$ .

<sup>33</sup> It's unclear exactly what Adams means by a "demonstrability conception of necessity" here, beyond his intuitions about proofs. Standard logics of proof such as GL lack such basic modal axioms as (M)  $\Box A \supset A$  (Boolos 5). Just because a system can prove something does not mean it is true, due to the possibility that the system itself may be inconsistent.

Next, Adams claims that some kind of satisfactory possible worlds semantics can be constructed for modal locutions if we understand possible worlds as *consistent* worlds and construe “it is possible that p” as shorthand for “if it were not a conceptual truth that God is perfectly good, it would not be a conceptual falsehood that p” (1994, 50). He ends up saying that although we might be able to come up with a possible worlds semantics for this conception of modality, it was not Leibniz’s considered view on the subject, and he mainly put this conception of possible worlds to use in theodician contexts. His considered view of modality, Adams claims, is the proof-theoretical view in terms of demonstrability and indemonstrability. He concludes, “Leibniz’s main conception of possible worlds [consistent worlds] does not provide a possible worlds semantics for his main conception of possibility [the proof-theoretical one]” (1994, 50).

There are several things to point out here. First, it is not clear what exactly Adams imagines is involved in a possible world that is not demonstrably inconsistent. One thing he might mean is something along the following lines. Corresponding to each world is a world book, or set of atomic propositions that are true at that world, which descriptively exhausts the state of affairs that obtain at that world.<sup>34</sup> So perhaps what it means to talk about a possible world that is not demonstrably inconsistent is that from its associated world book we cannot deduce a contradiction, even though the world book might, in fact, contain a contradiction. Supposing our premise set to consist of a finite set of propositions from the world’s world book, it’s unclear that this interpretation of Adams’s proposal is cogent. Certainly from certain sets of propositions it will be impossible to derive a contradiction because those premise sets do not contain or entail

---

<sup>34</sup> See Plantinga (44-6).



the contradiction  $A \& \sim A$ . However, certain other selections of premise sets will contain or entail the contradiction and hence the contradiction will be derivable from those. In other words, there will always be a finite set of sentences which we can select that do entail the contradiction, so it is not clear that the notion of a world that contains a contradiction, yet in such a way that it is not demonstrable, that is, a world that is not demonstrably inconsistent, makes sense.<sup>35</sup>

In addition to the technical obscurities that pop up when one begins to spell out exactly what it means to talk of a *merely* demonstrably consistent world, it is not at all clear to me that Leibniz ever thought that demonstrations were the kind of thing that apply to worlds. The primary form that a demonstration takes is the analysis of a subject and predicate in order to discover if the predicate concept is contained conceptually within the subject concept. The subject concept refers to a substance for Leibniz, and worlds are not substances.<sup>36</sup> Rather, they are aggregates of substances in the case of the actual world, and aggregates of CIC in the case of possible worlds. So it is doubtful that analysis is the kind of thing that applies to worlds.

---

<sup>35</sup> Of course, a world may be such that it is not demonstrably inconsistent simply because the world does not contain a contradiction. However, if this is all that Adams has in mind with the notion of not demonstrably inconsistent worlds, then it seems that this notion just reduces to the standard one of a world that is not inconsistent.

<sup>36</sup> Leibniz does talk at times as if subjects could be abstract concepts, for instance, in his analysis of the sentence “A pious person is happy,” it may appear that the abstract concept of piety is the subject that contains the concept of happiness (see *Samples of the Numerical Characteristic* (AG 10-18)). However, as Leibniz makes clear elsewhere, propositions can be treated as individual terms, and the above sentence is to be analyzed as, “Every pious person is happy,” which in turn is reduced to two propositions, “A person is pious,” and, “That same person is happy.” Both of these propositions are transformed into terms that refer to the abstract concepts of “piety” and “happiness,” and the latter concept is said to be contained in the former (see *General Inquiries About the Analysis of Concepts and of Truths*, (P 78ff.)). However, I don’t think this affects my claim above. I know of no place where Leibniz treats a conjunction of names of an aggregate of substances as an individual term.

Perhaps, however, one can think of the demonstrability conception of a possible world as meaning that all of the possible demonstrations performed on all of the CIC that make up the aggregate that is the world, do not produce a contradiction in a finite number of steps. The thing to notice here is that contradictions arise in analyses when predicating *false* things of a subject. That is, a proposition that attributes a contingently false predicate to a subject will contain a contradiction that will not be revealed in any finite analysis, while a predicate necessarily false of a subject will be revealed in a finite analysis. In analyzing all the CIC that make up a world, one is merely unpacking subjects and predicates, these predications being by definition true at that world. Perhaps, again, one has in mind a CIC that is internally inconsistent but such that this inconsistency cannot be revealed in a finite number of steps. This again, strikes me as wrong in this context due to its theologically suspect consequences. It involves incoherent CIC in the divine intellect. This is something that Leibniz would not have been willing to endorse; God is not confused. Finally, perhaps one has in mind some kind of contradiction arising (in an infinite number of steps) between two different CIC within a world, perhaps because they contain inconsistent relations. Again, for Leibniz possible worlds are maximally *compossible* sets of CIC. Two CIC generating any kind of contradiction aren't aggregated into a world to begin with. So it is simply not clear what sense can be made of the notion of a *merely* demonstrably consistent possible world.

Returning to the question of which possible worlds semantics best fits Leibniz's view, I want to proceed with caution. In particular, I think it is a mistake to pick an interpretation for the strong modal operator, for instance, by interpreting  $\Box A$  as meaning that "A is demonstrable," and then proceeding to probe our diverse intuitions about

individual axioms.<sup>37</sup> One reason for this caution lies in a difficulty about how to read stacked, or iterated, modalities, such as  $\Box\Diamond A$ , in a Leibnizian voice. Related to this difficulty, and in part concealing it, is a tendency to shift between Leibniz's notion of demonstration and some kind of intuitive contemporary idea we have of what constitutes a proof. I will return to some of these ideas below. For now, I will begin with what I think we can be fairly confident about.

As far as I know, Leibniz simply did not write anything about some of the more complicated modal axioms that we are familiar with from contemporary modal logic. So there is little or nothing to go on directly from the text. However, I think we can be fairly confident that Leibniz did endorse axiom (M)  $\Box A \supset A$ . This seems to be a cornerstone of modal truth for any interpretation of the strong modal operator as meaning “necessary,” and there is ample evidence that Leibniz thought that what was necessary was true in all possible worlds, including the actual one (see chapter 1). Also, if we consider the dual of (M)  $A \supset \Diamond A$ , I think we meet with a proposition Leibniz would certainly endorse. Leibniz believed that the aggregate of substances that constitutes the actual world had a conceptual analog in God's intellect consisting of the aggregate of CIC of all the actually existing substances. Thus if I am now drinking a cup of coffee, this is reflected in the realm of possibilia as a conceptual connection between the predicate “now drinking a cup of coffee” and my CIC.

With slightly less certainty, I think Leibniz would have endorsed (4)  $\Box A \supset \Box\Box A$ . To deny it would result in the Cartesian axiom  $\Box A \ \& \ \sim\Box\Box A$ . For Descartes's voluntarist God, a God whose will determines the eternal truths, it is certainly the case

---

<sup>37</sup> This is Adam's procedure on pp. 47-48.

that what is necessary is not necessarily so. Had God willed otherwise  $1+1$  might have resulted in 3. For Leibniz, however, the eternal truths exist and are in some sense coeval with the divine intellect, and independent of the divine will. Leibniz's God cannot will that  $1+1=3$ . So I think we can be fairly confident that, for Leibniz, what is necessary is necessarily so.

This certainty in (4) is increased when one considers another doctrine that Leibniz was committed to: contingent connections among possibles as such. For Leibniz, not all of the conceptual connections between a CIC and its predicates are necessary, for some predicates the connection could have been otherwise, that is, certain predicates of CIC are contingent. Adams treats in detail the concept of contingent connections among possibles as such and alternative ways Leibniz could have justified such a view (see 1994, 30-4). After attempting to explain this contingent connection in terms of the possible free decrees of God concerning the laws of a world that are contained in CIC, he seems to settle on an explanation involving the infinite analysis (1994, 32-4). What is important for my purposes regarding this doctrine is that it forces us to accept a semantic accessibility relation among worlds that corresponds to axiom (4), and thus counts as independent evidence for us accepting it in a reconstruction of Leibniz's modal thinking.

To see this consider the actual world  $w_@$  where an entity  $a$  is purely possible, that is, using the language of free logic where we have access to an existence predicate  $E$ ,  $f_{w@}(Ea)=F$ . But there must be some possible world  $w_1$  where  $a$  exists, that is,  $f_{w_1}(Ea)=T$ , and has some contingent property  $G$ , so that,  $f_{w_1}(Ga)=T$ . However, because  $G$  is merely contingently connected to the purely possible substance  $a$  considered as possible, there must be some other world  $w_2$ , related to  $w_1$ , but where  $a$  lacks  $G$ , that is,  $f_{w_2}(Ga)=F$ .

Notice that we have to stipulate another possible world  $w_2$ , different from  $w_@$ , not only because  $a$  doesn't exist at  $w_@$ , but also because assuming that  $w_@$  must be  $w_2$  assumes a symmetric accessibility relation, and the property of this accessibility relation is exactly the issue we are trying to determine. Now for this to be a contingent connection for us from our perspective at  $w_@$ , it must be the case that  $w_@$  is related to  $w_2$ , and therefore the accessibility relation among worlds has to be transitive to be able to account for the doctrine of contingent connections among possibles as such.

I now turn to a discussion of other modal axioms like (B)  $A \supset \Box \Diamond A$  and (5)  $\Diamond A \supset \Box \Diamond A$ . Here I want to repeat my earlier caution in dealing with complex axioms involving iterated modalities like these. As far as I know there is no place where Leibniz considers or discusses the issue of stacked modalities so there is no textual evidence to go on to guide us as to what he may or may not have thought about axioms like these. This is relevantly distinct from the situation we found ourselves in with (M) and (4). There we were at least able to connect those axioms in relevant ways to things Leibniz did say and to beliefs that he did hold. Here there is just nothing to grab on to.

One possible way of proceeding here is to propose an interpretation of the strong modal operator that accords with what we know Leibniz thought about necessity and then probe our intuitions about the varying cases. This is in fact how Adams proceeds, interpreting the strong modal operator as “demonstrable that” (1994, 47-8). So he interprets (5) as saying if it is not demonstrable that  $A$  then it is demonstrable that it is not demonstrable that  $A$ .<sup>38</sup> He goes on to dismiss (5) on the basis that “a proposition may be

---

<sup>38</sup> Here we are substituting a specific proposition  $\sim A$  for the variable  $A$  in the schema  $\Diamond A \supset \Box \Diamond A$ . The result is  $\sim \Box \sim \sim A \supset \Box \sim \Box \sim \sim A$ , cleaning up a bit we get  $\sim \Box A \supset$

indemonstrable without being demonstrably indemonstrable” (1994, 47). The intuition here is presumably that there might be some theorem in mathematics that is unprovable without there being some meta-proof or proof that it is unprovable. If Gödel is right then it is certainly the case that if our axiomatized system for capturing arithmetic is consistent then there will be mathematical truths that we cannot prove in that system, and there is no in general way of telling which specific mathematical truths those happen to be.

Adams agrees similarly for (4) and against (B). Regarding (4) he remarks that “what can be demonstrated can thereby be demonstrated to be demonstrable,” presumably because if you have a proof of A, then the existence of that proof itself counts as proof that A is provable (1994, 47). His argument against (B) is frustratingly vague and essentially consists of a single sentence. He asserts, “For there is, as Leibniz supposes, at least one proposition p which is possible, and actually true, but not demonstrably possible” (1994, 48). If Adams is right about this then Leibniz would not endorse (B), but that is only because this sentence is itself just the denial of (B). Unfortunately, Adams doesn’t elaborate or give any justification for it, so it is difficult to know what to say in reply. If he stuck to his interpretation of the strong and weak modal operators, he is committed to justifying the claim that Leibniz thought there was a proposition A that was such that the indemonstrability of its negation was itself indemonstrable, and he gives no reason to believe this.<sup>39</sup>

---

$\Box \sim \Box A$ : if it is not demonstrable that A then it is demonstrable that it is not demonstrable that A

<sup>39</sup> That is, he is committed to the denial of (B)  $A \supset \Box \Diamond A$ , which is  $A \ \& \ \sim \Box \Diamond A$ . Cleaning up a bit we have  $A \ \& \ \sim \Box \sim \Box \sim A$ , that is, there is a proposition A such that the indemonstrability of its negation is itself indemonstrable. Or as Adams puts it, “For there

This brings me to the danger associated with straightforwardly interpreting the strong modal operator as demonstrability, and then testing axioms against our intuitions. The first thing to note is that our intuitions in these cases tend to get confused because of noise from our contemporary notion of proof distorting Leibniz's notion of demonstration. I think you see this clearly in Adams's arguments against (5) and for (4). Take Adams's justification for (4). A demonstration is an analysis that shows the containment of a predicate in a subject in a finite number of steps. Assuming we have this for a given proposition A, in what sense do we, by this very fact, have a demonstration that A is demonstrable? It appears that Adams lets his intuitions about contemporary notions of proof interfere here, as he immediately infers from the fact that you have a demonstration of A that you have a proof of A's demonstrability because it is, in fact, demonstrated. The fact of the matter is that it is just not clear what Leibnizian sense can be made of stacked modalities, that is, of notions such as being demonstrable that A is demonstrable.

Let's look at what stacked modalities could possibly mean for Leibniz in a bit more detail. The single biggest problem with interpreting stacked modalities is that a demonstration involves a subject and a predicate and it is not clear where to locate the subject and predicate that serve as the nexus of an analysis in the sentence "It is demonstrable that A." Let A be the sentence Fa. If the predicate F is contained in the subject a in a finite number of steps then we can say that it is demonstrable and that  $\Box Fa$ . Now, what possible sense can we make of the claim that  $\Box Fa$  is demonstrable? What predicate are we finding in what subject in a finite number of steps? There is evidence

---

is, as Leibniz supposes, at least one proposition p which is possible, and actually true, but not demonstrably possible."

that Leibniz thought that any sentence could be transformed into an equivalent subject predicate form. So perhaps  $\Box Fa$  can be rewritten in terms of some complex wonky subject and predicate  $Gb$ , and if  $G$  is contained in  $b$  in a finite number of steps we are justified in concluding that  $\Box Fa$  is demonstrable, that is that  $\Box \Box Fa$ . The problem here is that it is not clear that the wonky subject  $b$  is going to correspond to a substance. In addition to this it is not clear that there is any systematic connection between the original subject  $a$  and the complex wonky subject  $b$ , so given the truth of  $\Box Fa$ , we simply have no guide as to the result of stacking modal operators. Another possible route is to claim that the subject of  $\Box Fa$  is  $a$  and that the predicate is “being  $F$ -contained-in- $a$ -in-a-finite-number-of-steps.” So in the same way that we asked the question of whether “being  $F$ ” is contained in  $a$  in a finite number of steps, we now ask the same question about “being  $F$ -contained-in- $a$ -in-a-finite-number-of-steps.” I’m highly suspicious of conceiving the modal status of a proposition as a first-order predicate. Yet even if there is no problem in doing this we are left in a similar predicament to that above. The fact that “being  $F$ ” is contained in  $a$  in a finite number of steps appears to have no systematic connection to whether or not “being  $F$ -contained-in- $a$ -in-a-finite-number-of-steps” is contained in  $a$  in a finite number of steps, and so does little to help us judge the status of stacked modal claims.

The upshot of all this is that one needs to be very careful when one is thinking about propositions involving stacked modalities within the context of Leibniz’s modal thought. If one interprets the strong modal operator in terms of demonstrability, one must not let other contemporary notions of proof influence one’s intuitions about what those propositions are saying. Even if one manages to be consistent in interpreting these



sentences, it is either unclear that they make sense, or completely unhelpful in determining the truth of those claims. I conclude that there is just no way to make sense of axioms like (B) and (5) within the context of Leibniz's modal thought. (4) presents an interesting case because there we had two independent reasons for attributing it to Leibniz, and these reasons were completely independent of any interpretation of the strong modal operator. So our argument for attributing (4) to Leibniz avoids the problems we have been canvassing. Unless some motivations independent of an interpretation of the strong modal operator as demonstrability are forthcoming, I conclude that we have reasons for attributing *at least* S4 to Leibniz, and so far no reasons for attributing anything stronger like B, and hence the resulting S5 to him.

## 2.1 Leibniz's Truth Motif: Variations on a Theme

In this section I want to turn to an examination of texts in order to highlight what I call Leibniz's "truth motif." What I mean by truth motif is a specific argumentative and rhetorical structure with minor variations on particular themes that we see Leibniz deploying across a variety of key texts. By an examination of this argumentative pattern I hope to show that Leibniz's analysis account of modality originally stems from his alethic theory, while the possible worlds account originates in his theology. However, as Leibniz develops, his analysis account becomes fused with the possible worlds, and that by the time of the mature infinite analysis, the two cannot be neatly separated without losing all motivation for the infinite analysis.

The pattern will be familiar to most readers of Leibniz once pointed out and consists of the following structure:

- 1) A Commitment to Rationalism
- 2) Two Principles Govern Necessary and Contingent Truths
  - a) Principle of Non-Contradiction
  - b) Principle X

Leibniz's Truth Motif always begins with his commitment to a thoroughgoing rationalism in the form of an affirmation of the PSR. However, Leibniz's version of the PSR is stronger than one that claims that everything has a reason; that for every true proposition  $p$  there exists another true proposition  $q$ , such that  $q$  stands in an explanatory relation to  $p$ .<sup>40</sup> Leibniz's commitment to rationalism leads him to believe that every true proposition  $p$  has another true proposition  $q$  such that  $q$  stands, directly or indirectly, in an *a priori* explanatory relation to  $p$ . That is, every truth ultimately has a *conceptual reason* or *a priori reason* why it is true, as opposed to bottoming out on some a posteriori fact or another.<sup>41</sup> In the case of contingent truths, this commitment has far reaching implications for Leibniz.

---

<sup>40</sup> This holds even for tautologies like identities, the reason being that assuming they are false leads to a contradiction.

<sup>41</sup> What I have in mind here is that every truth bottoms out in some proposition such that any sufficiently curious and rational mind ceases to feel the need to ask why questions. An example may (or may not) help. Suppose I ask why my pen drops when I let go of it and am told that it does so because objects attract each other in proportion to the product of their masses and inversely as the square of their distance. Suppose I ask why the universal law of gravitation takes this form, and am told that quantum fluctuations during the inflationary period of our universe's expansion caused the laws of physics to assume

In addition to his strong version of the PSR, Leibniz thinks rationalism entails a particular theory of truth. Leibniz believes that all truth is conceptual truth, so he is committed to the idea that in every truth there is a *conceptual connection* or *containment* between the subject and predicate concept of the proposition. There is a relation here between a priori explanation and concept containment. A proposition that has an a priori explanation will also have a conceptual connection between its subject and predicate concept. Leibniz is unclear about exactly what the connection is between conceptual explanations for propositions and conceptual connections between the subject and predicate of a proposition.<sup>42</sup> In some texts he even seems to think that they amount to the same thing. In most places where Leibniz talks about conceptual or a priori explanations what he has in mind is a causal chain that bottoms out in the existence or will of God.<sup>43</sup> On the other hand, when he talks about a conceptual connection between subject and predicate what he has in mind is the conceptual containment of the predicate in the

---

the form that they do. Suppose I go on to ask why these quantum fluctuations rather than those, and am told that our universe is actually part of a multiverse, and that every possible quantum fluctuation and its resulting universe are simultaneously realized in some universe of this multiverse. At this point it is arguable that any sufficiently curious and rational mind ceases to feel the need to ask why questions, being sufficiently intoxicated with wonder. This answer to the question “Why this rather than that?” says that the question is ill-posed, the answer is “This and that and any other possibility.” Leibniz, of course, will answer the question with “Because this is best.” Both answers to the question are, in my opinion, philosophically viable and deeply interesting.

<sup>42</sup> Here is a highly speculative attempt at an answer. Take a contingent truth  $Fa$ . In coming up with an a priori explanation for why  $Fa=T$  one will presumably invoke the quasi-causal structure of the world, involving the physical laws of phenomena and the previous state of the world. This a priori explanation will have a monadological analogue, involving psychological laws that describe how appetitions move from perceptual states to other perceptual states. These laws will describe how the content of the previous perception of  $a$  leads to its current perception with content  $F$ , and it is in this sense that the predicate  $F$  is contained in  $a$ . The idea for this explanation of the connection between a priori explanation and concept containment comes out of discussion with Gregory Brown.

<sup>43</sup> I will argue for this below.

subject. I think the way to view the connection between these two rationalist commitments is to understand that if God is the ultimate a priori ground or reason or explanation for all truths, then all truths are analytically true in the sense that they are based on ideas in the divine mind. Thus they must be conceptual truths, and so in all truths the predicate must be conceptually contained within the subject.<sup>44</sup>

Given these views about the consequences of rationalism, it is important for Leibniz to find some kind of distinction between necessary and contingent truths in order to avoid necessitarianism. Consequently, next in Leibniz's Truth Motif is an account of these two kinds of truth, necessary and contingent. In the case of necessary truths, the motif is quite stable—these are always governed by the principle of non-contradiction or what he sometimes calls the principle of identities. It is necessarily true that  $A=A$  and that it is not the case that  $A \neq A$ . In the case of contingent truths, however, the motif is less stable, and he variously assigns them to a principle X. It is to the evolution of this principle that I now turn.

## 2.2 Early Texts

---

<sup>44</sup> It is true that Leibniz has other reasons for his conceptual containment theory of truth, most of them stemming from his views on logic. Leibniz's is an intensional, rather than an extensional, model theoretic semantics, that is, if  $Fa$  is true, then that means that  $F \subseteq a$  rather than  $a \in \{F\}$ . He believes this due to problems involved with terms that don't refer, the need to maintain deductive relations among Aristotle's square of opposition, particularly the entailment from the universal affirmative to the particular, and finally, due to Aristotle's own views on truth. See P pp. 77, 115, 120 for the last two, and p. 82 for the first.

I want to begin with some early texts where we see Leibniz working to formulate his Truth Motif. The following is from an early piece entitled, *First Thoughts for an Encyclopedia or Universal Science* (winter 1678/79?)

A true proposition is that which is known per se, or can be demonstrated from what is known per se.

A proposition known per se is one in which it is expressly revealed that the predicate is contained in the subject or the consequent in the antecedent.

To demonstrate a proposition is to make manifest, by a resolution of terms into equivalents, how the predicate or consequent is contained in the antecedent or subject.

Thought is certain when it is either per se certain, or recognized that it is demonstrated from what is per se certain.

Per se certain is that to which we assent because of itself, so that it cannot be proved by another which we more readily admit the truth of. From this it is apparent that everything known per se is also certain per se; thus, in addition, certain per se are those experiences of our own thoughts or what we actually think, what we are conscious of. Therefore, per se certain propositions are of two kinds, the one, of course, is based on a reason or on revealed terms, and such per se knowledge I also call identities; the other are facts, and they become knowledge for us by indubitable experiences, and they are of such kind that they are themselves testimonies of our present consciousness. And while those facts have their reasons, and indeed, their nature can be resolved, yet they cannot be known by us a priori through their causes, except by thinking the entire series of things, which surpasses the power of human genius, and so they are discovered a posteriori by experience. (A VI.iv.135; my translation)

Leibniz begins by laying out a foundationalist picture, saying that all truths are either self evident or demonstrable from what is self evident. He goes on to define a demonstration as the resolution of subject and predicate to the point where it is evident how the latter is contained in the former. Thus we have the conceptual containment portion of his commitment to rationalism. He then says something striking. All truths, Leibniz says, are of two kinds, the one he calls “identities,” which we may assume are the necessary

ones, the other are what he calls “facts,” which we may assume are the contingent ones. Of these latter he says that even though they are known by us a posteriori, the connection between subject and predicate can be revealed and known a priori by cognizing “the entire series of things.” So here Leibniz tells us that all truths involve a conceptual connection between subject and predicate, that truths come in two flavors—identities and facts—and that all truths can be known a priori, the facts requiring an infinite amount of information about the series of things.

The next early text is from *On the Affects* (20-22 April 1679):

A true predicate on the part of a thing is always contained by the nature of the subject; as in *A is B*, it is *in A itself that B is in*. And so if A would be perfectly understood, it must be understood that B is in it, or that the concept of the existence of A itself involves this concept because that which exists, A, is B.

If from the concept of the essence of A itself or if from the sole possibility of A itself it follows: *that which is A is B*, the proposition is necessary or eternal.

If from the concept of the essence of A itself, by adding the concept of time this proposition follows: *that which is A is B*, then the proposition is contingent.

And so in things which are not eternal, nothing is necessary, for it cannot be demonstrated out of the concept itself, but by the added concept of time. And now in this way we can avoid this Scylla of expression.

But the concept of time involves the total series of things and the will of God and also other free things. (A VI.iv.1441; my translation)

Here Leibniz asserts his standard conceptual containment account of truth. He then goes on to draw the distinction between the necessary and the contingent along the following lines. The necessary is that which can be proved from the concept of the subject alone, while the contingent can only be proved from the subject when we add to it the concept of time. It's not clear exactly what Leibniz may have had in mind here. Presumably, if

things had been ordered differently, or if the temporal series were to have been other than it is, many propositions that are now true would cease to be true. And in fact, this is how we see Leibniz glossing this account of contingency in the last line. The concept of time involves the series of things and the will of God, and so, presumably, the addition of the concept of time to a contingently existing subject would involve the addition of an infinite amount of information.

Already in these two early texts from the late 70's we can see Leibniz consistently affirming several things. First, that all truths involve a conceptual connection between and containment of subject and predicate, and are in this sense a priori. Second, that the distinction between necessary and contingent truths is that in contingent ones, this conceptual containment can be revealed only with the help of information about the series of things, which is infinitely complex. Thus in these texts from the late 70's we can see the beginnings of the full infinite analysis account.

In our next text, from *On First Truths* (middle to end 1680?), Leibniz locates the principle of contingency in a slightly different place.<sup>45</sup>

Absolutely first truths are, among truths of reason, identities, and among truths of fact certainly this one, from which all experience can be demonstrated a priori: *Everything possible strives to exist*, and hence it would have existed if another had not impeded it, because even now it strives to exist, but is incompatible with what precedes it, whence it follows that what exists is always a combination of things, that which exists is maximal...And so this reveals that things exist in the most perfect way. (A VI.iv.1442-43; my translation)

---

<sup>45</sup> It is to be noted that this text is not what AG call *Primary Truths*, the latter is titled by the Akademie as *Logico-Metaphysical Principles* and is dated further back to 1689, not 1686. See A VI.iv.1643.

In *On First Truths* Leibniz says that truths are divided into those of reason and those of fact. Truths of reason are governed by the self evident principle, or as Leibniz here refers to it, the absolutely first truth, of identities. Presumably they are such that the predicate is explicitly contained in the subject upon resolution of the terms. While truths of fact are governed by the self-evident principle that possibilia strive toward existence. From this doctrine of the striving possibles, Leibniz claims that all experience can be proved a priori. On a first pass it is not clear how the doctrine of the striving possibles is able to demonstrate contingent truths a priori. Indeed, it is not even clear what it means to say that possibilia strive for existence.

Later in the same work, Leibniz says:

If Essences were not in themselves a nature that inclined toward existing, nothing would exist; for to say that some essences have this inclination, and some do not, is to say that something is without a reason, seeing that in general it appears that existence is given to all essence in the same way. (A VI.iv.1443; my translation)

The doctrine of the striving possibles appears to be Leibniz's answer to the question of why there is something rather than nothing. His argument for it here is along the following lines. Assume that the doctrine of striving possibles is false. Then nothing would exist, which we know is false a posteriori, or some possibles strive to exist while others do not, in which case Leibniz claims there is a violation of the PSR. Since it is not the case that no possibles strive to exist, nor is it the case that only some do, Leibniz concludes that they all must. This may explain Leibniz's reasoning behind the doctrine of the striving possibles, but it leaves unclear how this doctrine can explain contingent truths a priori. I think the connection lies in the last line of the first quote above, "this



reveals that things exist in the most perfect way.” Because there is competition for existence among the possibles, and some are impossible with others, what results is the best or most perfect. Existence is the most perfect because only the essences with the most amount of essence or reality survive this struggle among themselves to be instantiated. The realm of possibility, as Leibniz describes it, is like a perfect free-market economy (for existence!). So in this text, instead of locating the principle of contingent truths in the infinite series of things, he locates it in the doctrine of the striving possibles, and derivatively in the principle that what exists is best.

In *On Freedom and Necessity* (1680-84?),<sup>46</sup> we see the appearance of the first full form of the Truth Motif. Leibniz begins by asserting the conceptual connection between subject and predicate and his commitment to a priori explanation.

*...there is nothing without a reason, that is, that there is no proposition in which there is no connection between the subject and the predicate, that is, no proposition which cannot be proved a priori.* (AG 19)

He then moves on to his two principles:

There are two primary propositions: one, the principle of necessary things, *that whatever implies a contradiction is false*, and the other, the principle of contingent things, *that whatever is more perfect or has more reason is true...* All truths contingent by their nature, which are necessary only on the hypothesis of the volition of God or of some other being, rest on the latter principle. (AG 19)

---

<sup>46</sup> AG refers to this work as *On Freedom and Possibility* and assigns a shorter date range, from 1680-82. See A VI.iv.1444.

Here Leibniz identifies the principle of contingent truths as what he later in the text calls the “principle of perfection.” This principle of perfection, or reason, states that *whatever has more perfection, and thus more reason to exist, is true*. In parallel to his principle of perfection, and linking up with it, Leibniz lays out his distinction between hypothetical necessity and per se possibility. In the text above, truths governed by the principle of perfection are such that they are hypothetically necessary, specifically, they are necessary given information about the will of God. Later in the text Leibniz states the per se possible half of this coin:

...things remain possible, even if God does not choose them. Indeed, even if God does not will something to exist, it is possible for it to exist, since, by its nature, it could exist if God were to will it to exist. “But God cannot will it to exist.” I concede this, yet, such a thing remains possible in its own nature, even if it is not possible with respect to the divine will... (AG 21)

The last thing I want to point out about this version of the Truth Motif, is that Leibniz expounds on what is involved in judgments about the perfection of things.

...all truths concerning contingent things or the existence of things, rest on the principle of perfection...the reason why some particular contingent thing exists, rather than others, should not be sought in its definition alone, but in a comparison with other things. For, since there are an infinity of possible things which, nevertheless, do not exist, the reason why these exist rather than those should not be sought in their definition...but from an extrinsic source, namely, from the fact that the ones that do exist are more perfect than the others. (AG 19)

Here Leibniz says that when wondering about the reason for the existence of a contingent thing, one must go beyond its definition, and compare it to an infinity of possibilia in

order to determine its value or degree of perfection. Only then, after this infinite comparison of possibilia, can one go on to safely make a judgment about its perfection, and then invoke the principle of perfection to give the reason for its existence. I want to note one feature of this account. Leibniz has specifically told us that in every truth there is a connection between subject and predicate, and now he here asserts that in contingent truths one must go beyond a thing's definition. Presumably then, going beyond the definition does not mean going beyond the subject concept, for otherwise there would be no connection between subject and predicate here. So in this text from the first half of the 80's, we see that Leibniz must have been committed to the idea that the connection between subject and predicate concepts of contingent propositions was infinite because its a priori proof requires a judgment about the perfection of the world, and this in turn requires an infinite comparison among possibilia.

### 2.3 Middle Texts

In *On the Nature of Truth, Contingency and Indifference, and also On Freedom and Predetermination* (end 1685—middle of 1686?),<sup>47</sup> we see the first appearance of the infinite analysis account of contingent truths. First Leibniz begins with the conceptual containment aspect of his Truth Motif.

---

<sup>47</sup> This piece is entitled *Necessary and Contingent Truths* in MP, where they date it sometime around 1686. Looking only at AG, one would think that the first appearance of the infinite analysis is in *On Contingency* and hinted at in *Primary Truths*. The dating for both of these works has been revised back, from sometime in 1686 to 1689. To my knowledge this is the genuine first explicit appearance of the infinite analysis in Leibniz's corpus.

An affirmative truth is one whose predicate is in the subject; and so in every true affirmative proposition, necessary or contingent, universal or particular, the notion of the predicate is in some way contained in the notion of the subject, in such a way that if anyone were to understand perfectly each of the two notions just as God understands it, he would by that very fact perceive that the predicate is in the subject. (MP 96)

All truth is a priori from a God's eye view. He continues, giving the standard account of the principle of necessary truths.

An *absolutely necessary* proposition is one which can be resolved into identical propositions, or, whose opposite implies a contradiction. (MP 96)

Finally, he gives us the principle of contingency and the first appearance of his infinite analysis account.

In the case of a contingent truth, even though the predicate is really in the subject, yet one never arrives at a demonstration or an identity, even though the resolution of each term is continued indefinitely. In such cases it is only God, who comprehends the infinite at once, who can see how the one is in the other, and can understand a priori the perfect reason for contingency; in creatures this is supplied a posteriori, by experience. So the relation of contingent to necessary truths is somewhat like the relation of surd ratios (namely, the ratios of incommensurable numbers) to the expressible ratios of commensurable numbers. (MP 97)

In addition, Leibniz is explicit in this text about why contingent truths require an infinite analysis. Here is his answer:

And this [the full reason or explanation for contingent truths] cannot be given in full except as a result of a perfect knowledge of all the parts of the universe—a task which surpasses all created powers. (MP 98)

So contingent truths require an infinite analysis because that analysis requires in some way information about the entire series of things. But why does the analysis require information about the entire series of things? Leibniz implies, as he says in *On Freedom and Necessity*, that it is because things are governed by the principle of perfection.

Indeed, even if someone could know the whole series of the universe, even then he could not give a reason for it, unless he compared it with all other possibles. From this it is evident why no demonstration can be found, however far the resolution of notions is continued. (MP 99)

Contingent truths require an infinite analysis because their reason requires an infinite comparison of possibilia to determine that they are part of the most perfect series, which exists according to the principle of perfection.

The next example of the Truth Motif occurs in DM (1686). The connection thesis in the form of concept containment occurs early on in the summary of sec. 9.

That each singular substance expresses the whole universe in its own way, and that all its events, together with all their circumstances and the whole sequence of external things, are included in its notion. (AG 41)

He moves on in sec. 13 to assert the two principles of necessary and contingent truths.

I assert that the connection or following is of two kinds. The one whose contrary implies a contradiction is absolutely necessary; this deduction occurs in eternal truths... The other is necessary only *ex hypothesi* and, so to speak, accidentally, but it is contingent in itself, since its contrary does not imply a contradiction. And this connection is based not purely on ideas and God's simple understanding, but on his free decrees and on the sequence of the universe. (AG 45)

Here Leibniz is explicit about the principle of non-contradiction but is less clear about principle X. He does repeat that contingent things are hypothetically necessary, while being per se possible, or as Leibniz phrases it, “contingent in itself.” However, whereas the text from *On Freedom and Necessity* linked the hypothetical necessity of contingent things to information about God’s will, and information about the entire universe (in fact, all possible universes) was used to set epistemic standards for judgments of perfection, here he links contingents’ hypothetical necessity to both God’s will and the entire world. Note the similarity to *On the Affects*, where demonstrations of contingent truths required the concept of time, which in turn involved the series of things and God’s will.

Later in that same section, Leibniz returns to the distinction between hypothetical necessity and the per se possible, this time within the context of the connection between subject and predicate concept in a true proposition, specifically, within an analysis or demonstration account of that connection.

For it will be found that the demonstration of this predicate of Caesar’s is not as absolute as those of numbers or of geometry, but that it supposes the sequence of things that God has freely chosen, a sequence based on God’s first free decree always to do what is most perfect... But every truth based on these kinds of decrees is contingent...for these decrees do not change the possibility of things, and, as I have already said, even though it is certain that God always chooses the best, this does not prevent something less perfect from being and remaining possible in itself, even though it will not happen, since it is not its impossibility but its imperfection which causes it to be rejected. (AG 46)

Here Leibniz explicitly links up the principle of perfection and God’s will in his hypothetical necessity account in a way that sheds light on the previous quote. The reason that the “sequence of the universe” is included there is that one must compare

worlds to determine that this one is the most perfect. That is, the hypothesis that one must assume to make contingent things necessary is not only that God's will is perfectly good, but that this world is the most perfect. Of course, the latter bit of knowledge will require an infinite amount of information.

In the final paragraph of sec. 13, Leibniz affirms the PSR and a priori proof components of the Truth Motif, but also reaffirms the identity of the principle of contingents as the principle of perfection, although this time he calls it the principle of existence.

...all contingent propositions have reasons to be one way rather than another...they have a priori proof of their truth... But they do not have necessary demonstrations, since these reasons are based only on the principle of contingency or the principle of the existence of things, that is, based on what is or appears to be best from among several equally possible things. (AG 46)

Finally, in close connection with the Truth Motif in DM there is a passage from Letter IX of the correspondence with Arnauld (May 1686). In the context of stressing the differences between general and individual notions as grounds for treating them differently, Leibniz says,

The reason [for treating them differently] is because the notion of a species includes only eternal or necessary truths, but the notion of an individual includes considered as possible, what, in fact, is true, that is, considerations related to the existence of things and to time, and consequently it depends upon God's free decrees considered as possible; for truths of fact or existence depend upon God's decrees. (AG 70)

Here Leibniz appears to be once again bringing in God's will as an explanatory factor in contingent truths. One major difference from the DM, however, is that here God's will is not being invoked as a move in a hypothetical necessity argument. Arnauld doesn't buy the hypothetical necessity argument that Leibniz had previously deployed (see the beginning of Letter IX)! In fact, Arnauld, "still finds it strange that I [Leibniz] seem to maintain *that all human events occur necessitate ex hypothesi, given the single assumption that God wanted to create Adam*" (AG 69). So God's will is somehow tied up here with "considerations related to the existence of things and to time" in explaining contingent truths. A little further on Leibniz is a bit clearer.

That is why, in individual or practical considerations, which are concerned with singulars, in addition to the shape of the sphere, we must consider the matter of which it is made, the place, the time, and the other circumstances, considerations which, by a continual linkage, would in the end include the whole series of the universe, if everything these notions included could be pursued. (AG 70)

In explaining contingent facts, "considerations related to the existence of things and to time" involve a "continual linkage" of fact upon fact, until the "whole series of the universe" is finally included. This is highly reminiscent of the infinite considerations move Leibniz invoked in *On Freedom and Necessity* in the context of the principle of perfection. It's linking of the infinite detail of the world and God's will is like the move made in DM, but again, here the context is explicitly *not* one of hypothetical necessity.<sup>48</sup>

---

<sup>48</sup> To be clear, I don't think Leibniz gave up his hypothetical necessity argument in the letters, but rather the conversation took a different turn. Arnauld is here objecting that we ought to consider concepts of individuals as they exist in our mind, while Leibniz is trying to motivate his position that we have to consider individual concepts as they are in



The next version of the Truth Motif I want to look at is from *On Contingency* (Spring—Fall 1689?).<sup>49</sup> Here, Leibniz begins with the account of the principle of necessary truths.

Necessary truths are those that can be demonstrated through an analysis of terms... That is, necessary truths depend on the principle of contradiction.

Contingent truths cannot be reduced to the principle of contradiction; otherwise everything would be necessary... (AG 28)

He then goes on to assert the PSR component of the Truth Motif.

In my view it is common to every truth that one can always give a reason for every nonidentical proposition... (AG 28)

Next he asserts the principle of perfection, this time applying it to both necessary and contingent truths.

And it seems to be common to things that exist, both necessarily and contingently, that they have more reason for existing than others would, were they put in their place. (AG 28)

In the next paragraph he states the conceptual connection component of the Truth Motif.

---

God's mind, and from this perspective, everything that is ever true of an individual flows from its concept a priori.

<sup>49</sup> AG has the date for *On Contingency* as around 1686. The Akademie dates it later to somewhere around the Spring and Fall 1689. This is important because, as I mentioned above, looking at AG makes it seem as if the infinite analysis's first appearance is in *On Contingency*, whereas its first genuine appearance seems to be in *On the Nature of Truth, Contingency and Indifference, and also On Freedom and Predetermination* (end 1685—middle of 1686?).

Every true universal affirmative proposition, either necessary or contingent, has some connection between subject and predicate. In identities this connection is self-evident; in other propositions it must appear through the analysis of terms.

Next comes his account of the principle of contingents in terms of the infinite analysis.

And with this secret the distinction between necessary and contingent truths is revealed, something not easily understood unless one has some acquaintance with mathematics. For in necessary propositions, when the analysis is continued indefinitely, it arrives at an equation that is an identity; this is what it is to demonstrate a truth with geometrical rigor. But in contingent propositions one continues the analysis to infinity through reasons for reasons, so that one never has a complete demonstration, though there is always, underneath, a reason for the truth, but the reason is understood completely only by God, who alone traverses the infinite series in one stroke of mind. (AG 28)

We have already seen above that Leibniz asserts the principle of perfection in *On Contingency*. What remains unclear is what the relationship is between the infinite analysis and the principle of perfection in this text. The following helps some.

Since we cannot know the true formal reason for existence in any particular case because it involves a progression to infinity, it is therefore sufficient for us to know the truth of contingent things *a posteriori*, that is, through experience, and yet, at the same time, to hold, universally or in general, that principle divinely implanted in our mind, confirmed both by reason and experience itself (to the extent that we can penetrate things), that nothing happens without a reason, as well as the principle of opposites, that that which has more reason always happens...

Unless there were such a principle, there would be no principle of truth in contingent things... (AG 29)

Leibniz says here that the “formal reason” for the existence of a contingent thing is infinite. I assume this infinite formal reason is the infinite analysis. He then claims that

because of this, we come to know contingent things a posteriori, but, we are told, we can be assured that whatever we discover about the world through a posteriori means is guaranteed to be in accordance with the principle of perfection, what he calls here the principle of opposites, and he claims that this is the principle of contingent things. I can only extrapolate that if one were to be able to discover something purely through the use of the principle of perfection, this would require, at least, an infinite amount of information about this world, and that this is the explanation for why contingent truths require an infinite analysis.

The next Truth Motif appears in *On Freedom, Contingency, and the Series of Causes, and also on Providence* (Summer 1689?). After affirming the concept containment thesis and the principle of non-contradiction as the principle of necessary truths, Leibniz says,

But in contingent truths, even though the predicate is in the subject, this can never be demonstrated, nor can a proposition ever be reduced to an equality or identity, but the resolution proceeds to infinity, God alone seeing, not the end of the resolution, of course, which does not exist, but the connection of the terms or the containment of the predicate in the subject, since he sees whatever is in the series. Indeed, this very truth was derived in part from his intellect, in part from his will, and it expresses his infinite perfection and the harmony of the entire series of things in its own particular way. (AG 96)

Here Leibniz says that the analysis of contingent truths is infinite. He also says at the end that contingent truths express the perfection of God and the harmony of the series of things. So they are the result of God willing the best and this series of things being the most perfect. From these two factors results the principle of perfection—that whatever has more reason to exist exists. However, it is still unclear in this text what the

relationship is between the infinite analysis and the principle of perfection. He immediately goes on to say:

However, two ways remain for us to know contingent truths, one through experience, and the other through reason...by reason when some thing is known from the general principle that nothing is without a reason, or that there is always some reason why the predicate is in the subject. And so, we can take it for certain that God made everything in the most perfect way, and that he does nothing without a reason... (AG 96)

Here again we have a remarkably similar structure to that in *On Contingency*. The principle of perfection provides an in-principle-a-priori way of knowing contingent things. The principle of perfection guarantees that whatever has the greater reason obtains. However, we cannot normally use this principle in our investigations of the world due to the infinite considerations involved in assessing the reason for one contingent fact rather than another.

The next passage to consider is from *The Source of Contingent Truths* (Summer 1689?). After affirming that in every true proposition the predicate is in the subject and stating that necessary truths have a finite analysis while contingent ones require an infinite one, Leibniz says,

That there are contingent truths, in whose explanation the progression of reasons is infinite, can also be understood from the fact that there is an actually infinite number of creatures in any part of the universe whatsoever, and each and every individual substance contains the whole series of things in its complete notion, and harmonizes with everything else, and to that extent contains something of the infinite. (AG 100)

So the reason for the infinite analysis given here is both that matter is infinitely divided and that the concepts of individuals contain information about the entire world, and this information is infinite. Three paragraphs later, Leibniz says:

Every truth which is not an identity admits of a proof; a necessary truth is proved by showing that the contrary implies a contradiction, a contingent truth by showing that there is more reason for that which has been done than there is for its opposite. (AG 101)

Here Leibniz says that contingent truths can be proved by resorting to the principle of perfection, so the proofs he has in mind here surely must be different than proof by analysis, which can never be completed. Leibniz goes on to give as an example of this kind of reasoning that if God were to have to make a triangle out of a given circumference, we know by the principle of perfection that he would make an equilateral one.

What I think is going on in *The Source of Contingent Truths*, is that Leibniz is playing around with the idea that the principle of perfection can be used to reason a priori about the world. It remains true that for contingent truths, the principle of perfection is only an in-principle route to knowledge a priori, because to use it would require an infinite amount of information about this world to make a judgment about its perfection, and thus it provides a reason for the infinite analysis of propositions involving substances. However, Leibniz also believes that there are teleological principles operating in nature and that *given that this world is the best*, we can use the principle of perfection to effectively deduce higher order principles of nature, such as the principle of least action, from which the optical laws of reflection follow, or the notion that if a

triangle were to exist in nature and no other constraint on the problem were given, God would make an equilateral one.<sup>50</sup> The thing to notice here is that even though these proofs follow a priori given the hypothesis that the world is the best, they are not necessary, because the knowledge that this world is best would, of course, take an infinite amount of information to know.

## 2.4 Late Texts

Aspects of Leibniz's Truth Motif also show up in his later writings. In *Principles of Nature and Grace, Based on Reason* (1714), Leibniz mentions the principle of perfection as the governing principle of contingent truths.

---

<sup>50</sup> I would like to thank Carl Feierabend for helping me to realize the importance of a-priori teleological principles in Leibniz's physics. In this context I would like to quote at length from a lecture by Max Planck on the subsequent development of teleological principles in physics.

According to all that we know about the laws relating to the processes taking place in any physical structure, we can characterize in all its details the course of each process by the principle that among all the conceivable processes which can change the state of a given physical structure into another state during a certain time interval, the process which actually takes place is always one for which the integral over that time interval of a certain magnitude, the so-called Lagrange function, has the smallest value. Therefore, if we know the value of the Lagrange function, we can fully specify the course of the process actually taking place.

It is certainly no wonder that the discovery of this law—the so-called least-action principle after which the elementary quantum of action was later also named,—made its discoverer Leibniz, and soon after him also his follower Maupertuis, so boundlessly enthusiastic; for these scientists believed themselves to have found in it a tangible evidence for a ubiquitous higher reason ruling all nature. (Planck 178-79)

It follows from the supreme perfection of God that he chose the best possible plan in producing the universe... For, since all the possibles have a claim to existence in God's understanding in proportion to their perfections, the result of all these claims must be the most perfect actual world possible. And *without this, it would not be possible to give a reason for why things have turned out in this way rather than otherwise.* (AG 210; my italics)

In the *Monadology* (1714) he returns to the theme of the two great principles.

Our reasoning's are based on *two great principles, that of contradiction...*

And *that of sufficient reason*, by virtue of which we consider that we can find no true or existent fact, no true assertion, without there being a sufficient reason why it is thus and not otherwise, although most of the time these reasons cannot be known to us. (AG 217)

And he even mentions the infinite chain of reasons involved in the analysis or explanation of contingent truths.<sup>51</sup>

But there must also be a sufficient reason in contingent truths, or truths of fact, that is, in the series of things distributed throughout the universe of creatures, where the resolution into particular reasons could proceed into unlimited detail because of the immense variety of things in nature and because of the division of bodies to infinity. (AG 217)

In the same text, in the context of denying Descartes's voluntarist God, whose will determines necessary truths, Leibniz says,

---

<sup>51</sup> In this text Leibniz speaks only of a "resolution into particular reasons," so it is unclear if he is thinking here of an infinite explanation or an infinite analysis. Three sections earlier he speaks of the "analysis" of necessary truths into primitive notions, so there is some reason to think that Leibniz has an infinite explanation as grounds for the infinite analysis in mind in the text above.

This is true only of contingent truths [that they depend on God's will], whose principle is *fitness* or the choice of the *best*. But necessary truths depend solely on his understanding, and are its internal object. (AG 219)

Again, here we have the principle of perfection, or as Leibniz says, the principle of fitness, governing contingent truths.

### 3 The Infinite Ground of Analysis: Possible Worlds

I now want to try to synthesize these findings into a coherent story about the relationship between possible worlds and infinite analysis. In brief outline: Leibniz very early on saw that his commitments about the nature of truth, specifically conceptual containment, and his belief that the world is fundamentally rational, that is, that all truths are conceptual or a priori, got him into trouble with modality. Hence, from early on he drew the line between the a priori necessary and the a priori contingent with infinity. As his ideas progressed through the mid 80's, we see him tightly linking his possible worlds framework to the infinite analysis as providing the reason for the infinity of the analysis. It would take an infinite comparison of possibilities to know a priori a contingent truth by the principle of perfection. It's to the details of this story that I now turn.

As early as late 1678 or early 1679 we see Leibniz asserting several things: that all truths involve a conceptual containment, that necessary truths are governed by the principle of non-contradiction, and that a priori knowledge of contingent truths involves, in some way, an infinite amount of information. In *First Thoughts* Leibniz says this is due to the total series of things while in *On the Affects* he attributes it to the concept of time which involves the series of things. Between this period and sometime between



1680 and 1684, we see him experimenting with another principle of contingent truths—the doctrine of the striving possibles and that what exists is the most perfect. However, by the time Leibniz writes *On Freedom and Necessity* sometime between 1680 and 1684, several key features of his mature theory are locked in place. That all truths have a priori proofs, that true propositions involve a conceptual containment between subject and predicate, and that necessary truths are governed by the principle of non-contradiction. Most importantly, in this period Leibniz first begins to articulate the principle of contingent truths as the principle of perfection, and that the reason we cannot understand contingent truths a priori is due to the need for an infinite comparison of possibles to determine that the actual is the best.

Sometime between the end of 1685 and the middle of 1686, when Leibniz writes *On the Nature of Truth*, we see the first appearance of infinite analysis. In this key text Leibniz is explicit that the reason for the infinite analysis is the need to know not only an infinite amount of information about this world, but in addition, an infinite amount of information about an infinite number of other worlds in order to give a reason for this one. One can't help but see the presence of the principle of perfection at work in Leibniz's reasoning here.<sup>52</sup>

In the DM in 1686, Leibniz tries, as he had previously in *On Freedom and Necessity* (1680—84?), to combine these elements with his per se possible account of contingency. A contingent fact is per se possible and requires an infinite analysis because the hypothesis needed to make it demonstrable involves information about both God's will and the entire universe in order to know that it is perfect, a judgment that

---

<sup>52</sup> Of course, all of this is inspired by the Calculus. Leibniz first discovered it in 1674 and first published in 1684.

requires an infinite amount of information. Although the per se possible account is tangled up with the infinite analysis and principle of perfection in the DM, in the exchange with Arnauld, Leibniz affirms the relationship he established in the DM between infinite analysis on the one hand, and God's will and the infinite information required to judge of the world's perfection on the other, but this time independent of the per se possible story.

In 1689 we again see that the infinite analysis is grounded in the infinity of the world, and that contingent truths are an expression of God's perfection by being the most perfect of any possible alternative, a judgment that requires an infinite amount of information about the entire created world.

What we see occurring in these and related texts is the development of the infinite analysis emerging and ultimately uniting itself in a tight conceptual package with the principle of perfection. Leibniz already had the notion of an infinite explanation for contingent truths in the early 1680's based solely on the principle of perfection. After he hits upon the infinite analysis account of contingency, it becomes fused with the principle of perfection by 1686. The infinite considerations involved in judging that this world is perfect become the ground and justification for the fact that the analysis of contingent truths is infinite. In addition to this, we can see elements of Leibniz's Truth Motif in works as late as 1714. In the *Monadology* we see the two great principles, infinite analysis or explanation, and the principle of perfection or sufficient reason or fitness, as he variously calls it, at work, although not as neatly coordinated as in the texts from the 80's. I know of no texts where he discusses the infinite analysis and substantively differs from this basic connection between it and the principle of perfection established in mid

1680's, and so I conclude that he never changed his mind on at least the broad outlines of this account.

This connection between the infinite analysis and the principle of perfection has some interesting consequences when it comes to our thinking about the relationship between possible worlds and infinite analysis. When we consider what is involved in a judgment about the perfection of this world, we see that not only does it involve an assessment of the value of this world, an infinite task, but also an evaluation of all the other possible worlds in order to compare the results with this world in order to be sure that the value of this world is, in fact, maximized. I conclude that the ground or reason for the infinite analysis is the principle of perfection and the infinite amount of information required to make perfection judgments. What are packed into this infinite amount of information are not only facts about this world, but facts about all other possible worlds. So ultimately, possible worlds, through the principle of perfection, are the ground or reason for the infinite analysis.

Another way of stating these results is as follows. Leibniz says that contingent truths would require an infinite analysis, but why think that all the contingent predicates of a subject are neatly stored away, beyond the  $\omega$  step, in the analysis of a subject? In other words, why think the analysis must be infinite? In chapter 1 I gave an account of the internal structure of CIC that involved an order type greater than  $\omega$  in order to avoid the Guaranteed Proof problem. But I have not yet given any reason why the contingent predicates are packed neatly away beyond  $\omega$ . The principle of perfection and possible worlds provide the answer to this question. The reason that contingent predicates must require an infinite analysis is that their analysis ultimately requires an infinite amount of

information about this world and all others possible to know that they are part of the most perfect world, as is required by the principle of perfection. So I think that the infinite analysis cannot be neatly separated from possible worlds as it is the latter that provides the final justification for its existence. Without possible worlds and the role they play in backing up the principle of perfection there is simply no reason to think that all contingent predicates will require an infinite analysis.

This result is important for understanding Leibniz's modal philosophy. It has too often been said that Leibniz's infinite analysis account and his possible worlds account of modal judgments are jointly incompatible. I disagree. However, even if I am wrong about this, if I am right in my interpretation of these texts from the 80's, there is good evidence to believe that *Leibniz* didn't think his two accounts were incompatible. In fact, all the evidence points to the fact that he saw them as complementary, and that possible worlds, via the principle of perfection, provided the explanation for the infinity involved in a priori contingent truths, an account he was already and independently committed to in the context of his alethic musings of the late 70's. If Leibniz thought the two accounts were connected then I believe there is a heavy burden on interpreters to take this idea seriously and to soberly consider how the two accounts can be made to work together free of contradiction and mischaracterization. In addition, too often, commentators have explored Leibniz's infinite analysis on its own terms only to conclude that the infinity of the analysis simply sheds no light on our common sense philosophical notions of necessity and contingency (see Adams 1994, 29 for instance). I think this is because these commentators have simply failed to see the connection between the infinite analysis and possible worlds via the principle of perfection. The infinity of the analysis is a

product of the infinite amount of information required to know a priori that this is the best. It is not so much infinity that is the cause or explanation of contingency, but rather highly complex aesthetic considerations that enter into the explanation for why this rather than that.

## Chapter 3

### 1.1 Some Essentialisms

In section 2.1 of chapter 1 I argued that there was evidence in the correspondence with Arnauld that Leibniz believed in world bound individuals, that is, that he denied transworld individuality. I also argued there that the world apart doctrine and the existence of solipsistic worlds did not constitute, as is sometimes maintained, evidence to the contrary. So given that Leibniz believed in world boundedness, and given that he intended his possible worlds and infinite analysis account of modality to complement each other, as I argued for in chapters 1 and 2, a serious problem arises. According to the infinite analysis account, for some contingent property *F* that I instantiate, the revelation of the concept of *F* in my complete concept requires an infinite analysis. Given that the possible worlds and analysis account are meant to be two sides of the same modal coin, this means, according to the possible worlds account, that while I instantiate *F* in the actual world, there is some other possible world where I do not instantiate *F*. However, world boundedness means that I don't exist at any other world than the world that I do. The standard account of essentiality in terms of a semantics of possible worlds is that a

property is instantiated necessarily by an object if and only if that property is instantiated by the object in every world where the object exists.<sup>53</sup> So if I only exist in one possible world, then all of my properties are instantiated by me essentially. Since the same reasoning can be had for every other substance, it appears that world boundedness and possible worlds jointly entail what is known as superessentialism, and are in conflict with the infinite analysis account. This is a serious problem and has led some commentators to jettison the role of possible worlds in an account of Leibniz's modal philosophy, and instead account for it purely in terms of infinite analysis (see, for example, Sleight's account (1990, 51-2)).<sup>54</sup> In what follows I will look at some of the major attempts in the literature to avoid superessentialism by limiting the scope of a substance's essential properties.<sup>55</sup> I will then argue that Leibniz had an intensional theory of reference and show how this can solve the problem of how to get contingency in the midst of world boundedness. I will conclude with an account of Leibniz's treatment of counterfactuals.

## 1.2 Superessentialism and Superintrinsicness: Arnauldian and Leibnizian Intuitions

---

<sup>53</sup> When I speak about an object's or entity's properties being had necessarily, I do not mean that the object exists in all possible worlds, merely that it has the properties in all worlds where it exists.

<sup>54</sup> Sleight notes in his account that superessentialism results by the reasoning above only if one denies the possibility of relativizing individual to concept at a world. So that one individual could exist in multiple worlds and have  $CIC_1$  at  $W_1$  and  $CIC_2$  at  $W_2$  etc. I don't think Leibniz would have ever thought of things in this way, and so I pass it over in the account above.

<sup>55</sup> It is important to note that necessitarianism is not usually equated with superessentialism. Thus superessentialism may be true, I may have all the properties I do at all the worlds where I exist, and necessitarianism false, there are other worlds where I don't exist and where other stuff happens.

Sleigh's deep analysis of Leibniz's correspondence with Arnauld has yielded equally deep insight into Leibniz's thought. While Sleigh rejects the pathway into superessentialism outlined above because he rejects the idea that Leibniz had a possible world semantics, superessentialist worries creep back in by way of the notion of a CIC. According to Sleigh, Arnauld's basic argument against Leibniz's position in their correspondence looked something like this:

- 1)  $\Box$  (CIC of Adam entails eating the fruit)
- 2)  $\Box$  (CIC of Adam is Adam's CIC)
- 3)  $\Box$  (If Adam exists then he eats the fruit)
- 4)  $\Box$  (If God creates Adam, Adam eats the fruit)
- 5) Therefore, God is not free with respect to the kind of Adam he will create (1990, 58-60)

Sleigh claims that Leibniz rejected Arnauld's conclusion because he rejected premise 1). Leibniz denied, while Arnauld maintained, that all of a substance's properties being intrinsic is equivalent to them all being necessary. The idea that a substance has all its properties intrinsically is known as superintrinsicness, while the idea that a substance has all its properties necessarily is known as superessentialism.<sup>56</sup> Sleigh's position is that Leibniz accepted superintrinsicness while rejecting superessentialism (1990, 56-58).

---

<sup>56</sup> Formally, and using the resources of free logic, superessentialism is the claim that for all properties F and for any entity a (see 1990, 70):

$Fa \ \& \ \Box(Ea \supset Fa)$

Leibniz deploys several strategies within the correspondence to make good on the distinction between superintrinsicness and superessentialism by trying to come up with explanations for how there could be contingent connections among possibles as such. One such strategy Sleigh calls the *sub ratione generalitatis* strategy while the other is the possible free decree strategy. According to the first, the only necessary properties in a CIC are those that follow from the species concept under which that individual falls (1990, 64-65). Thus, if I am human and rationality follows from the concept of humanity then I am necessarily rational. According to the possible free decree strategy, included in the CIC of actual individuals are God's decrees concerning the world, and the properties whose entailment essentially relies on those free decrees are the contingent ones. What's more, all possible individuals, that is, every CIC, includes in it possible free decrees of God—decrees God would have made, if he had admitted that CIC to existence (1990, 65-67). So the non-essential properties of a CIC are those entailed only by the inclusion of God's decrees, actual and possible, in the CIC.<sup>57</sup> Sleigh concludes that Leibniz would ultimately settle on a better way of distinguishing between a CIC's intrinsically necessary and contingent properties in terms of the infinite analysis (1990, 67).<sup>58</sup>

---

while superintrinsicness is:

$Fa \ \& \ (\sim Fa \Rightarrow \sim Ea)$

I use  $\Rightarrow$  as the symbol for the counterfactual conditional.

<sup>57</sup> I run together here what Sleigh calls the possible free decree strategy and the possible free decree defense. The latter is more general, applying to pure possibilia, and is supposed to be a response that denies 1) above, while the former is supposed to apply to contingent properties of individuals, i.e., *actual* properties that could have been otherwise. The main point is that both use the free decrees of God to ground contingent properties of actual and possible individuals.

<sup>58</sup> Sleigh also recognizes the importance of the per se modalities in Leibniz mature thought, due to the work of Adams (see Sleigh 1999, 266)



A serious problem is how to make sense of Leibniz's endorsement of superintrinsicness and rejection of superessentialism. It seems intuitive that the truth of the claim that if anything were to have gone differently with you then you wouldn't exist entails that you have all the properties you do at all the worlds where you exist—namely, the one where you exist. Sleigh recognizes this difficulty and suggests the following:

One possible program is this: We might utilize contemporary treatments of modality and subjunctive conditionals in order to forge a distinction between [superessentialism] and [superintrinsicness] sufficient to sustain the claim that while [superessentialism] implies [superintrinsicness], the converse fails. The distinction forged must be sufficient to sustain the claim that superintrinsicness does not imply superessentialism. The second step in this program would involve using the distinction forged in its first part in order to motivate Leibniz's acceptance of superintrinsicness. (1990, 71)

I take much of the content of this chapter and the next as an attempt to fill in the details of such a program.

### 1.3 Harmonious Worlds, Counterfactual Non-Identity, and Transworld Identity

For Adams, the conceptual distinctions among the *per se* possible, hypothetical necessity, and absolute necessity are the “innermost and surest bastion of Leibniz's defenses against the denial of contingency” (1994, 22). According to this account, other events, histories, and worlds are possible in themselves, even if they are hypothetically necessary given information about God's goodness and choice of the best possible world. Adams also believes that Leibniz had another tool in his defense of contingency, denying not only that this world is necessary, but also that God necessarily chooses to actualize

this best of all possible worlds (1994, 23). Adams argues that for Leibniz, while it is necessary that God choose the best, he thought that which world is the best possible is not necessarily so (1994, 42, 23-26). In trying to make sense of how one might think that the bestness of the best possible world is a contingent feature of it, Adams claims that the infinite analysis played a key role in influencing Leibniz here (1994, 26). It would require an infinite analysis to show that this world is the best, so it is a contingent fact about this world that it is the best.

In arguing with Arnauld over the concept containment account of truth, Adams maintains that Leibniz denied counterfactual identity, that is, Leibniz believed that if anything had gone differently from the way it goes in the actual world, no substance that is now actual would exist (1994, 53-4). This seems to be the counterfactual constitutive of superintrinsicness. What follows is a long discussion of the issue of transworld identity that covers the next two chapters of his book. It is very important to distinguish from the beginning between *counterfactual identity* and *transworld identity*. *It is perfectly consistent to deny counterfactual identity while maintaining transworld identity*, and this is precisely what Adams and Cover and Hawthorne do, each in their respective ways. It may be true that in all the nearby world bands where things go differently, or in all the contextually relevant worlds where things go differently, no substance that is actual exists. However, this is perfectly consistent with maintaining that there exists some non-actual world where some actual substance exists.

Adams begins by separating conceptually the claims of concept containment and the denial of transworld identity, maintaining that neither implies the other. Thus, Adams points out that concept containment does not entail transworld non-identity because one

can imagine world-indexed properties. Thus one CIC would capture individuals across worlds. On the other hand, Adams believes that transworld non-identity does not entail concept containment because one can imagine a scenario where creation occurs by means of a voluntaristic God. In this scenario, there would be no information in a CIC about whether it existed or not because of God's radical freedom (1994, 71-4).

Having separated these two historically connected notions, Adams begins to think about what resources Leibniz had for denying transworld identity. He does this in terms of alternative possible continuations of an individual's history, that is, he asks about whether there could be another possible world with an individual in it whose history is qualitatively identical to the history of some actual individual up to a point, but then diverges after that (1994, 76). He goes on to argue that the primitive force that instantiates the law of the individual series guarantees that this kind of scenario is impossible in normal circumstances. However, Adams claims that it can happen miraculously, by God choosing to annihilate the substance (1994, 99-102). Thus, Adams concludes that transworld identity as an alternative continuation of some actual substance's history is not possible for Leibniz *given* God's goodness because of the causal role that the law of the individual series plays in the future states of a substance.

Next, Adams asks about a scenario in which there is a possible world in which all of an actual substance's intrinsic properties are the same, but where it differs in its relational properties, due to the existence in that world of some other substance not in the actual world (1994, 102-3). Adams outlines two possibilities. On the first,

...the whole general order of the universe, including its relational aspects, would be incorporated in the concrete substance as it is included in the

substance's complete individual concept, and not merely by virtue of God's wise choice of a most harmonious world. The relational laws of the general order would be incorporated in the substance's perceptions as the laws of intrasubstantial causation are incorporated in its primitive force. And all of the substance's states and relations would follow from the force and the perceptions it has at any given time, so that there would be no possibility of a predicate's being contained in the individual concept and not being contained in the concrete substance. (1994, 104)

I take myself to have developed a position substantially the same as the one Adams describes here in my first chapter. There, in asking questions about what makes CIC compossible, I was led to the conclusion that the perceptual states of substances express the law of the general order of the world to which they belong. Adams recognizes the important connection between this view and questions about compossibility, as he immediately adds that "this [view] has the very important advantage for Leibniz of providing a nontrivial sense in which possible individuals can fail to be '*compossible*' with each other" (1994, 104). Unfortunately, Adams drags Leibniz in the opposite direction. Influenced by world apart passages and Leibniz's use of the pre-established harmony as evidence of God's glory, Adams concludes that there can be no possible world containing a substance with all the same intrinsic properties as one in the actual world, but with different relations, only because of the pre-established harmony among substances' perceptions, and that this latter feature of worlds is only guaranteed to hold because of God's goodness (1994, 106).

Thus for Adams, it seems at this point that it is only God's goodness that stops substances from existing across worlds. In worlds that, had they been actualized, would have displayed less evidence of God's goodness or none at all, transworld individuality is possible. The question of how this is consistent with superintrinsicness, the claim that

had anything gone differently no actual substance would have existed, remains. Adams claims that “the demands of God’s wisdom and goodness are more than strong enough to ground counterfactual conditionals” (1994, 107). Thus Adams appears to be claiming that the nearby world bands that are relevant to assessing the counterfactual constitutive of superintrinsicness are all governed to some degree by God’s goodness, and yet there are far off worlds that are not so good and contain substances numerically identical to substances in the actual world.<sup>59</sup> Adams claims in a footnote that his position is similar to Sleigh’s in endorsing superintrinsicness and rejecting superessentialism (1994, 108). However, in the end Adams cannot bring himself to believe that Leibniz endorsed transworld individuality, and he goes on to speculate that perhaps these far off worlds are not harmonious enough to constitute full blown possible worlds, and that the requirement that *bona fide* possible worlds be harmonious is one more way in which Leibnizian possible worlds behave differently than contemporary possible worlds (1994, 108-9).

#### 1.4 Adams’s Wonky Worlds and Superessentialism

It is extremely difficult to understand just what Adams’s picture amounts to. He seems to endorse superintrinsicness and grounds counterfactual non-identity on the basis that all the relevant counterfactual worlds are harmonious enough that God’s goodness guarantees that no transworld individual will exist at those worlds. He then

---

<sup>59</sup> Notice that Adams is committed here to the idea that there is a sharp demarcation among worlds as to the ones that are “good enough for government work” and those that just don’t work at all. However, I think Leibniz is committed to the idea that all possible worlds, insofar as they arise from a combination of God’s perfections and limitation, display some degree of goodness.

appears to reject transworld individuality across the board by claiming that wonky worlds that God could have created that contain a transworld individual do not count as true Leibnizian possible worlds.

I suppose this position does give Adams superintrinsicness—if anything had gone differently than it does, no actual substance would exist—but that is due not to God’s goodness, but instead because Adams has disqualified, so to speak, as worlds all of the “worlds” where there are transworld individuals. In fact, it is essential to Adams’s position that he do this. Had he not, the relevant set of worlds that would be brought under consideration in the assessment of superintrinsicness would include them all. The relevant antecedent to the counterfactual is, “Were anything to go differently than it does,” and not, “Were anything to go differently than it does and the world remain harmonious,” and the former includes the entire set of possible worlds as relevant, and these will include the unharmonious worlds that contain transworld individuals. Again, Adams takes his position to be similar to Sleigh’s in affirming superintrinsicness while denying superessentialism. Speaking of the connections between the individual law of the series and other events at a world, Adams says,

But connections do not have to have absolute metaphysical necessity in order to ground counterfactual conditionals. The connection in this case may depend on the wisdom and goodness of God. (1994, 107)

So presumably Adams thinks that while his position endorses counterfactual non-identity or superintrinsicness, it does not make all of a substance’s properties necessary, and thus avoids superessentialism. It remains unclear how Adams does the latter. Remember that Adams has rejected worlds with transworld individuals in them as too wonky to be

Leibnizian possible worlds, so it seems that in all *worlds* where you exist you have the properties that you do, so it seems that you have all of your properties necessarily and thus superessentialism is true. However, given that Adams rejects the idea that Leibniz had a possible world semantic account of modality, this line of reasoning may be off the mark (see Adams 1994, 46-50). Recall that Adams maintains that the *per se* modalities lie at the inner core of Leibniz modal thinking. The key for Adams to be able to avoid superessentialism is for him to be able to find a way to say that it is *per se* possible for an actual substance to have properties other than the ones that it does. Speaking of *per se* possibility, Adams says,

The theory [the *per se* account] requires a relatively narrow understanding of the nature, essence, or concept of a thing or a world. The essence of a substance, in the narrow sense, contains information about such things as the perceptions the substance has, and perhaps the geometrical configurations and motions expressed by those perceptions, and about the substance's powers and tendencies to produce perceptions in itself—but not about other substances. (1994, 13)

Given Adams's own account of the information relevant to judgments of *per se* possibility it is apparent that he cannot avoid the slide into superessentialism.

Presumably included in information about “the substance's powers and tendencies to produce perceptions in itself” is the law of the individual series, and according to this it is unclear that my phenomenal world could have developed in any other way than the way that it does. So on Adams's own account, it is not even *per se* possible for me to have any other properties than the ones that I do, and so his account falls into superessentialism.

## 1.5 Strong Essentialism

One clear response to the threat of superessentialism is to drop world boundedness and endorse transworld individuality. Cover and Hawthorne have articulated a Leibnizian essentialism that avoids superessentialism and is compatible with limited transworld identity—strong essentialism. As they put it:

Leibnizian essentialism isn't up for grabs: Leibniz accepted it. The scope or strength of his essentialism is more difficult to discern...we have argued that Leibnizian essentialism itself is consistent with TWI, bringing with it no commitment to claiming that 'if anything at all had gone differently from the way things go in the actual world, no actual individual would have existed.' (1999, 110)

Strong essentialism is comprised by the following four theses (1999, 103-4, 115):

- 1) If an individual  $x$  has a complete concept  $C$  then it is necessary that  $x$  has  $C$
- 2) All of a substance's intrinsic monadic properties are essential to it
- 3) 1) and 2) are consistent with transworld individuality
- 4) Leibniz deployed a counterpart theory in dealing with the truth-value of modal and counterfactual statements

They contrast this with superessentialism, which they characterize as agreeing with strong essentialism in all but 2) and 3). Contrary to strong essentialism, superessentialism holds that,



2') *all* of a substance's properties are essential to it

and that, consequently,

3') individuals are world bound (1999, 92-3).

By Cover and Hawthorne's lights, strong essentialism is compatible with transworld identity because relational truths supervene, not just on the monadic properties of an individual complete concept, but on the monadic properties of the *total* set of complete concepts that make up a possible world. Following the path of strong essentialism:

One thus arrives at a picture according to which, first, (a) relational truths about the world supervene on the global monadic facts...and second...(b) relational truths about an individual substance supervene on the monadic truths about that substance alone together with the laws of expression. Items (a) and (b) are connected by this: facts of expression as between substances supervene on the distribution of monadic facts. (1999, 85)

And again,

...derived, relational truths about x at a world follow from its complete concept only in conjunction with certain generalizations true at that world—intuitively, only in conjunction with the global laws of nature describing the sequence of harmonious changes in substances at that world. (1999, 105)

Cover and Hawthorne's picture is one in which relational truths pop out of their monadic base in one of two ways. Either you have the total set of CIC making up a possible

world, or you have an individual CIC in combination with what they alternately call the laws of expression or the global laws of nature that hold at a world. Either way, an individual CIC is not a robust enough base for relational truths to supervene on.

Now we are in a position to see just how Cover and Hawthorne's strong essentialism is compatible with transworld identity. According to strong essentialism, only a substance's intrinsic monadic properties are essential to it. So as long as the CIC of that substance includes all of these properties, that CIC can be included in different possible worlds. These different possible worlds will of course consist of a different total set of CIC and will include different laws of expression, thus resulting in different supervening relational truths. Yet because the monadic properties of the CIC are unaffected, those different worlds contain the same individual CIC.

Cover and Hawthorne also articulate a position they equate with Sleight's endorsement of superintrinsicness—what they call, moderate essentialism. In attempting to parse Sleight's claim that Leibniz endorsed superintrinsicness without accepting superessentialism, Cover and Hawthorne claim that moderate essentialism is committed to the position that in all the nearby world bands where a substance lacks some property had by a substance in the actual world, that substance is not identical to the substance in the actual world, thus grounding semantically the truth of the counterfactual constitutive of superintrinsicness—if you were to lack any property you do possess, you would not exist, i.e., all of your properties are intrinsic. And yet, according to their moderate essentialism, there are other far off worlds where the substance exists and does not have the properties it has in the actual world, thus guaranteeing the falsity of the statement that the substance necessarily has the properties

it does, and thus avoiding the necessitarianism of superessentialism (see Cover and Hawthorne 1999, 128-30).<sup>60</sup>

## 1.6 Cambridge Changes

To see what is wrong with strong essentialism, consider that a standard Leibnizian refrain is that there are *no purely extrinsic denominations*. The problem with extrinsic denominations is that they allow for Cambridge changes, and Leibniz denies the reality of Cambridge changes (see Cover and Hawthorne 1999, 65, 77; Rutherford 183).

Cambridge changes are a subset of changes that satisfy a very loose criterion, according to which a change occurs when a predicate that did not previously apply to a subject

---

<sup>60</sup> Again, in discussing Adams I made the point that counterfactual non-identity does not entail the denial of transworld identity. This is related to the fact that while superessentialism entails superintrinsicness, the reverse entailment fails. Cover and Hawthorne have in fact provided a correct semantic model for this. For those souls interested in the details, I go through the proofs for both below.

$Fa \ \& \ \Box(Ea \supset Fa)$  entails  $Fa \ \& \ (\sim Fa \Rightarrow \sim Ea)$ . Suppose it doesn't. Then either  $Fa$  is false or there is some world  $w_1$  in the relevant world band where  $Fa$  is false and  $Ea$  is true. The first contradicts the fact that  $Fa$  is true. The second contradicts the fact that in all worlds if  $Ea$  is true so is  $Fa$ .

$Fa \ \& \ (\sim Fa \Rightarrow \sim Ea)$  doesn't entail  $Fa \ \& \ \Box(Ea \supset Fa)$ . Suppose that it does. Then trying to construct a model where the first is true and the second is false will lead to a contradiction. If superessentialism is false then either  $Fa$  is false or  $\Box(Ea \supset Fa)$  is false, that is,  $\Diamond(Ea \ \& \ \sim Fa)$  is true. Assuming the first leads to a contradiction. Assuming the second does not.  $\sim Fa \Rightarrow \sim Ea$  can be true in that in all the contextually relevant worlds where  $\sim Fa$  is true, so is  $\sim Ea$ . However,  $\Diamond(Ea \ \& \ \sim Fa)$  can still be true in that there can be some world  $w_2$ , not in the contextually relevant worlds used in assessing the counterfactual, where  $Ea$  and  $\sim Fa$  are both true. Therefore we can construct a model where  $Fa \ \& \ (\sim Fa \Rightarrow \sim Ea)$  is true and  $Fa \ \& \ \Box(Ea \supset Fa)$  is false. Therefore the former does not entail the latter.

becomes applicable (Mautner 63). According to this criterion, if b is taller than c, and c gets a growth spurt, c becomes taller than b, and the predicate “shorter than c” now becomes applicable to b. The problem with Cambridge changes is that it doesn’t seem like anything changed in b that would warrant the applicability of this new predicate. Arguably, b hasn’t been doing any changing at all.

The problem with purely extrinsic denominations is that their very existence opens the door to all variety of Cambridge changes. By an extrinsic denomination, Leibniz means any way of characterizing or picking out a substance that essentially relies on reference to another substance (cf. Mates 219). One can think of them as kinds of descriptions. Thus, in the example above, we characterize b indirectly through an essential reference to c via the predicate “is smaller than c.” Because it is in the nature of extrinsic denominations to involve this kind of essential reference to another substance, the substance characterized by an extrinsic denomination is at the mercy, so to speak, of the vicissitudes of another substance. Should the other substance change in the appropriate way, a Cambridge change is immediately induced on the substance denominated extrinsically.

Of course, Leibniz denies that these Cambridge changes are real, and his doctrine of universal expression, according to which an individual substance tracks the changes in every other substance in the universe, is supposed to provide the metaphysical resources for doing so. Leibniz writes:

Therefore, extrinsic denominations, which arise and disappear without any change in the subject itself but only because a change comes about in something else, appear to pertain properly to Relation; thus a father becomes a father when the child is born, even if he happens to be in India

and thus not affected...It must be admitted, however, that speaking rigorously there is no extrinsic denomination in reality, since nothing happens anywhere in the universe which does not affect every existent thing in the universe (quoted from Mates 225)

and,

...there are no extrinsic denominations, and no one becomes a widower in India by the death of his wife in Europe unless a real change occurs in him. For every predicate is in fact contained in the nature of the subject. (L 365)

Thus Leibniz's doctrine of universal expression guarantees the presence of an intrinsic change in a substance every time a Cambridge change is induced on it by its inevitable exposure to a host of extrinsic denominations. The intrinsic properties of the man in India change through the vicissitudes of his son's birth and wife's death. Leibniz's point in saying that there are no purely extrinsic denominations is the claim that the relational predicates these denominations induce are reducible to and supervene on the intrinsic monadic properties of substances (Mates 218-19; Cover and Hawthorne 1999, 70-1, 83-85).

Now we are in a better position to begin to articulate some shortcomings of Cover and Hawthorne's strong essentialist reading of Leibniz. Recall that strong essentialism was compatible with transworld identity because the same CIC could be included within different sets of CIC making up different possible worlds. The worlds consisting of the sets of CIC  $w_1 = \{A, B, C\}$  and  $w_2 = \{A, D, E\}$  would include the numerically identical individual concept A across both worlds. According to strong essentialism the relational properties of the two worlds  $w_1$  and  $w_2$  would differ because they supervene on different

sets of CIC, but the intrinsic monadic properties of A in  $w_1$  and  $w_2$  would be the same. Yet surely there are extrinsic denominations of A that induce changes in A across  $w_1$  and  $w_2$ . For instance, one can extrinsically denominate A as the CIC that is a member of the world consisting only of itself, B, and C. This predicate, though a bit wonky, is a viable way of extrinsically denominating A. So suppose that A is a transworld individual. Then one way of extrinsically denominating A is with the predicate “the CIC that is a member of the world consisting only of itself, B, and C.” When we shift consideration to  $w_2$ , we can equally extrinsically denominate A as the CIC that is a member of the world consisting only of itself, D, and E. In the process of shifting from  $w_1$  to  $w_2$  we change the extrinsic denomination of A without any apparent internal change in A because A is by hypothesis transworld identical and thus has all the same intrinsic monadic properties. We seem to be in clear violation of Leibniz’s injunction against purely extrinsic denominations and their accompanying Cambridge changes.

Perhaps some will see a disanalogy here. Perhaps some will reject talk of change to A across worlds as not sufficiently similar to the previous case, where c grew to be taller than b. I admit that I see no difference. In the previous case time was the dimension along which Cambridge change was induced. In this case possibility is the relevant dimension. Someone who believes that numerically the same individual endures through time and also believes in transworld identity has no reason to believe that Cambridge changes can be induced along the former dimension but not the latter. If my example of a Cambridge change induced along a modal dimension is apt, then on Leibnizian principles we must deny the reality of this Cambridge change and claim that something internal to A has changed. Call the substance so changed A\*. A\* must be

expressing the change in CIC across worlds  $w_1$  and  $w_2$  and must have different intrinsic monadic properties in order to balance the effect of its changing extrinsic denomination. And if the intrinsic monadic properties of  $A^*$  are different from  $A$ , then  $A$  and  $A^*$  is not numerically the same individual. Thus it appears that, whatever the other merits of strong essentialism may be, it is not consistent with transworld individuality, given the denial of Cambridge changes across worlds.

## 2.1 Intensional Theories of Reference

As I hope to have shown by now, it is difficult to understand how Leibniz could have endorsed superintrinsicness while rejecting superessentialism. It is equally difficult to understand how he could have had a substantive modal story to tell at all in terms of a possible worlds semantics, given his endorsement of worldbound individuality. In order to approach these difficulties it is important to first detour through a neglected position in the philosophy of language held by some early modern thinkers, most notably Locke and Leibniz. For both Locke and Leibniz, the immediate signification or reference of a word is an idea, not an object. It is only through our ideas correctly representing the world that we have purchase on it. Language is primarily about ideas and their communication, and only mediately about the world. I call these kinds of theories of reference intensional.

Leibniz opens book 3 of NE with the following:

‘God having designed man for a sociable creature, made him not only with an inclination, and under a necessity to have fellowship with those of his

own kind; but furnished him also with [the faculty of speaking], which was to be the great instrument, and common tie of society.’ This is the origin of words, which serve to represent [*representer*] and even to explicate ideas. (273 sec. 1)

Locke, for his part, opens chapter 2, entitled “Of the signification of words,” of book 3 of the *Essay* with this:

Thus we may conceive how Words, which were by Nature so well adapted to that purpose, come to be made use of by Men, as the Signs of their Ideas; not by any natural connexion, that there is between particular articulate Sounds and certain Ideas, for then there would be but one Language amongst all Men; but by a voluntary Imposition, whereby such a Word is made arbitrarily the Mark of such an Idea. The use then of Words, is to be sensible Marks of Ideas; and the Ideas they stand for, are their proper and immediate Signification. (405)

Here Locke is absolutely clear—words signify ideas. Leibniz, for his part, in his reply to this section in NE, spends the next eight pages in speculative etymology, taking Locke to task not for his view about what words signify, but for his claim that the connection between words and ideas is arbitrary. If Leibniz held a fundamentally different view of language and reference, now was the time to say it.<sup>61</sup>

The closest text I can find in the NE where Leibniz comes close to apparently denying an intensional theory of reference is the following:

Ideas represent [*représentés*] substances and modes equally, and in each case words indicate [*marquées*] the things as well as the ideas. So I do not

---

<sup>61</sup> For further references to the notion that words signify ideas in NE see 273 sec. 1, 275, 278 sec. 1, 286 sec. 2, 304 sec. 15, 313 sec. 22, 324 sec. 34, 329 sec. 1, 335 sec. 3, 5, and 9, 348 sec. 22, and 349 sec. 25. Although these references are put into the mouth of Philalethes, the interlocutor representing Locke, in no context does Leibniz ever have Theophilus, his own voice, asserting the opposite.



see much difference, except that ideas of substantial things and of sensible qualities are more settled. Furthermore, it sometimes happens that our ideas and thoughts are the subject-matter of our discourse and are the very things we wish to signify [*signifier*]; and reflexive notions enter more than one might think into notions of things. Sometimes words themselves are spoken of materially, and in such a context one cannot precisely replace the word by its signification, i.e., by its relation to ideas or to things. This happens not only when one speaks as a grammarian but also when one speaks as a lexicographer, giving the explanation of a name. (287 sec. 5)

However, care must be taken in interpretation. Here is the bit of Philalethes that Leibniz is responding to in the NE.

This observation of yours is very true. ‘It often happens that men...do set their thoughts more on words than things. Nay, because words are [most] of them learned, before the ideas are known for which they stand: therefore some, not only children, but men, speak [often as] parrots do.’ However, men usually think they are revealing their own thoughts, and in addition they attribute to their words a ‘secret reference’ to other people’s ideas and to things themselves. For if the sounds were attached to another idea by the person with whom we are speaking, this would be ‘to speak two languages.’ It is true that men do not pause long to examine what the ideas of others are; it is assumed that our idea is the one which the majority and ‘the understanding men of that country’ attach to the same word. This applies especially to ‘simple ideas and modes;’ but with regard to substances it is more especially believed that words ‘stand also for the reality of the thing.’ (287 sec. 4 and 5)

We will have occasion in the next section to look at what Locke actually said. For now I want to concentrate on what Leibniz has Locke saying. After claiming that people often have vague or confused ideas associated with the words they use, Philalethes says that people take their ideas to refer not only to their own ideas, but also, “secretly” as it were, to the ideas of others and to objects, or things in themselves. He then goes on to claim that we do the former more often with words for modes and the latter more often with those for substances.

Leibniz's reply is that there is no difference in the way substances and modes are represented by ideas, and that words equally indicate or mark ideas and things. It is difficult to know what he has in mind here. It is tempting to read this as a denial of an intensional theory of reference, that is, as Leibniz claiming that words refer to ideas and things equally. In a sense I think this is correct. However, Leibniz does not use the French verb *signifier* but instead *marquer*. Given the proliferation of references to words signifying ideas in the NE I think it is a significant terminological distinction. Leibniz's following examples are illuminating. He continues with the claim that we often refer to ideas and words themselves, and as an example of this speaks of reflexive ideas and the ability to make the use-mention distinction respectively. Reflexive ideas presumably point to or indicate themselves. This appears to be the exception that proves the rule. Words immediately refer to ideas and then ideas mediate reference to, or indicate, or mark things, and in the special case of reflexive ideas, they mark the ideas themselves. Thus I don't think this passage is at all a denial of an intensional theory of reference. When Leibniz says words mark things as well as ideas [...et les choses, aussi bien que les idées, dan l'un et l'autre cas sont marquées par les mots.], I take him to be saying that the case of things is the normal or focal one, and that in addition [aussi bien que] they can pick out ideas. His example of reflexive ideas appears to confirm this reading. In the normal case words refer to ideas that then pick out objects, in the case of reflexive ideas, words refer to ideas that then pick themselves out, and when speaking materially of a word, words refer to an idea that picks out the word itself.

Looking at other sections of the NE should clarify the referential relation between words and ideas and the marking relation between words and world via ideas. Here are two:

There is a failure in the third respect [language's role in knowledge acquisition] when the ideas which words signify [*signifiées par les mots*] do not agree with what is real [*ne s'accordent par avec ce qui est réel*]. (349 sec. 25)

and

The fourth [remedy] is to declare what sense [*sens*] one takes a word to have, whether one is making words anew, or is employing old ones in new senses, or has found that usage has not adequately fixed the signification [*signification*]. (352 sec. 12)

Reconstructing from these passages, the sense of a word is the content of the idea that the word signifies or refers to. This idea in turn represents the world and can agree or not agree with what is real. For the early moderns in general, and for Leibniz and Locke in particular, the mind-world relation is not primarily referential but *epistemological*, in terms of agreement and disagreement. Words refer to or signify ideas that represent the world according to their content. In short, words have referential bite on the world only insofar as the ideas they signify have representational purchase.

## 2.2 Leibniz and Locke on Real Essences and Monsters

I want to turn back to what Locke actually said in sections 4 and 5 of chapter 2 of book 3. Here is the relevant part of the “secret reference” section that Leibniz is replying to above.

But though Words, as they are used by Men, can properly and immediately signify nothing but the Ideas, that are in the Mind of the Speaker; yet they in their Thoughts give them a secret reference to two other things.

First, they suppose their Words to be Marks of the Ideas in the Minds also of other Men, with whom they communicate...

Secondly, Because Men would not be thought to talk barely of their own Imaginations, but of Things as really they are; therefore they often suppose their Words to stand also for the reality of Things. But this relating more particularly to Substances, and their Names, as perhaps the former does to simple Ideas and Modes, we shall speak of these two different ways of applying Words more at large, when we come to treat of the Names of mixed Modes, and Substances, in particular: Though give me leave here to say, that it is a perverting of the use of Words, and brings unavoidable Obscurity and Confusion into their Signification, whenever we make them stand for any thing, but those Ideas we have in our own Minds. (406-7)

Locke says that we often mistakenly take our words to “secretly” refer to things as they are in themselves, and that this occurs more often with the names of substances than those of mixed modes.<sup>62</sup> Presumably what he means is that we often take the content of the ideas our words signify to represent reality as it is in itself, and that this is a mistake. Names of substances refer to the abstract ideas by which we categorize the world into sortal kinds—what Locke calls nominal essences. This basic position is the core of his skepticism about our ability to correctly cognize the world around us.

---

<sup>62</sup> I want to deal with Locke and Leibniz here only on names of substances, and not with those of simple ideas and mixed modes. Against Locke, Leibniz believes that *Lockean* simple ideas do admit of definition and analysis (see NE 297-98), while mixed modes are non-arbitrarily derived from possibilities of thought and apply to the world (see NE 304).

Turning now to Leibniz and Locke's discussion of the secret reference to substances in chapter 6, Locke deploys a number of arguments to defend his skepticism about our ability to cut the world at its joints. The main one is that nominal essences are defined as the collection of ideas referred to by the name of a substance, while real essences are defined as the internal constitution of the substance itself that is responsible for the production of our specific collection of ideas of it (439). So by definition, according to Locke, we cannot know the real essences of things. Consequently, we cannot have any guarantee that our nominal essences cut nature at its joints. This is what I take Locke's skeptical argument to be in outline.<sup>63</sup>

How does Leibniz reply? In his chapter "On General Terms," he had already begun to push back against Locke's position. There Leibniz claims that talk of *nominal essences* is a contradiction, and he shifts this kind of talk to *nominal definitions*—definitions that suffice to identify the thing, but not to guarantee its possibility a priori, either because of the lack of a causal definition or a full analysis of the concept (NE 294). Leibniz has essentially shifted the debate on essences. Instead of nominal *essences* being

---

<sup>63</sup> Locke does talk about the possibility of knowing the real essence of a substance through the employment of "microscopical eyes." Yet he thinks that such an ability would do us no good, first, because we would then not have the nominal essences available to us in order to compare how the two essences cut the world up, and second, because we would suffer from sensory overstimulation, and would not be able to function in our world of macroscopic objects. That Locke thinks the key to his skeptical argument is a comparison of the categorization schemes of the nominal and real essences is confirmed by his subsequent discussion of angels. He speculates that their superior knowledge of the mechanism of the world is due to their being able to craft, at will, sensory organs suitable for perception of both the macroscopic and microscopic aspects of the world (301-4). For an alternative account of Locke's skepticism see Goodin (1998). Goodin argues that an a priori science of bodies is impossible for Locke because knowing the real essence requires that we know which part of the microstructure is responsible for the set of ideas we associate with the nominal essence, and this task would require solving the mind-body problem (150-154).

a hindrance to our access to real essences, nominal *definitions* act as way stations and provide provisional knowledge on our path to the discovery of the real essences of things. Here are two responses that Leibniz gives in the face of Locke's skepticism about our knowledge of real essences.

...no matter what rules men make to govern how things are to be named and what entitlements go with names, provided that the system of rules is orderly (i.e., interconnected and intelligible) it will be founded in reality, and men will be able to imagine only such species as have already been made or distinguished by nature—nature which even encompasses possibilities. (NE 309)

And he continues shortly after,

...even if we agreed that some of the apparent natures which lead us to name things had nothing in common internally; our definitions would nevertheless be grounded in real species, for phenomena themselves are realities. It can be said, then, that whatever we truthfully distinguish or compare is also distinguished or made alike by nature, although nature has distinctions and comparisons which are unknown to us and which may be better than ours. (NE 309)

These two responses are interesting. In both Leibniz is asserting that, contra Locke, we ought to have some faith in our categorization of nature. His justification for such faith in the two passages differs. In the first, Leibniz takes away with one hand what he gives with the other. He claims that *any* orderly cutting of the realm of nature according to our ideas will be found to correspond to *some* reality. By broadening the definition of nature to include pure possibilities, Leibniz claims that any categorization will apply to some possibility of nature or other. Surely this is not to the point. Although the claim that any orderly categorization scheme will correspond to some plan of nature

is interesting, Locke is interested in the way nature is *actually*. This first response has no purchase on Locke's skeptical position.

The second response is a bit more promising. Leibniz says that even if we make mistakes in our categorization schemes, they are still grounded in reality because there is something real about phenomena. Presumably what Leibniz has in mind is some kind of systematic relation, perhaps causal, between reality and appearance, such that the lines by which we naturally cut the phenomenal world are grounded in lines that exist in reality.<sup>64</sup> Of course, reality has a more fine-grained cut than that which we can make at a phenomenal level, but the lines we make are at least reflected in broad outline in the real.

Throughout the NE, Leibniz agrees with Locke on much, but whereas Locke draws the pessimistic conclusion, Leibniz is the eternal optimist. Leibniz insists on replacing nominal essences in Locke's conceptual scheme with revisable nominal definitions. Both agree that there is miscategorization between the phenomenal and real, but Leibniz insists on a strong relation between the two, such that the situation is one of fine grainedness rather than global cross-categorization. Locke himself thinks that there is a causal relation between his real essences and nominal essences, so one is left wondering just why Locke was such a pessimist about our epistemic situation after all.

Before closing this section I want to touch briefly on the issue of monsters and aliens. Locke claims that there are five desiderata that need to be satisfied by any kind of procedure for categorizing nature. The last two amount to the skeptical argument seen

---

<sup>64</sup> Leibniz is not super keen in the NE to advertise his monadological position, though hints of it show up now and again. So the "causal" relation between phenomena and reality here must be cashed out in terms of the real causal relation between an individual law of the series that generates perceptions and the pre-established harmony between all of the perceptions of each substance due to the law of the general order.

above—that one needs to know the real essence in order to confirm that one’s cutting of nature based on nominal essences corresponds with reality. Of course Leibniz denies this claim. He thinks that our nominal definitions of the phenomenal world are pretty good indicators of the essential lines of the real. The first three desiderata are as follows:

- 1) That nature is designed in such a way as to produce things according to “regulated established” essences
- 2) That nature succeeds in producing things according to these essences
- 3) That some explanation of monsters must be given

All of these desiderata reduce, in Leibniz’s mind, to 3), as it is the only objection he directly addresses, even though he lists all three in Philalethes voice. I think there is some justification for this. The existence of monsters, absent some further hypothesis, seems to be a denial of either 1) or 2). The existence of monsters means that either nature doesn’t manage to successfully pass on stable essences in its production of creatures through generation, or it doesn’t manage to carry out its own blueprints.

Here is what Leibniz has to say about monsters.

In trying to determine whether a monster belongs to a given species, one is often reduced to conjectures. And that shows that one is not then restricting oneself to outer features; since one would like to guess whether the inner nature which is common to the individuals of a given species (for example reason, in man) is also present—as suggested by the facts of birth—in individuals lacking some of the outer signs which ordinarily occur in that species. But our uncertainty does not affect the nature of things: if there is such a common inner nature, the monster either has it or lacks it, whether or not we know which. And if the monster does not have the inner nature of any species, it can be a species all its own. (NE 311)



Leibniz's response is that the outward features of monsters matter little when trying to determine if it is human or not. The essential feature is whether or not it is a rational creature, and the facts about its origin make us presume that it is, until time may prove otherwise. Leibniz goes on to point out that until we know that the monster is rational, whether it is human or not is a fact, independent of our knowledge, and further, that if it turns out to have a different essence, it is fine to say it is of a different species according to whatever essence it happens to have, or to say that it is an entirely new species should its essence turn out to be novel. So in response to Locke, Leibniz seems to think monsters entail the denial of 1). Nature doesn't always succeed in duplicating essences through generation as the existence of irrational monsters born from human parents attest to. Yet he also seems to think that 2) is false, in that monsters will develop according to whatever essence they happen to in fact possess. Several responses later, Leibniz also addresses the issue of rational aliens from the moon. These Lunarians, even if their "outer form differed slightly from ours," would be granted the status of human being, despite their non-Earth origins. Leibniz even goes on to speculate as to what might happen should they be converted to Christianity, and decides that they would be conditionally baptized on the provision that Christ's saving grace extends to them, although Leibniz refuses them entry into the priesthood on fears that any sacraments they performed would be invalid. Better safe than sorry.

### 2.3 Incomplete Individual Concepts and the Intensional Interpretation of the Quantifier

Having argued that Leibniz was operating with an intensional theory of reference, I want to turn back to one of the central questions of this chapter: How could Leibniz have deployed a possible world semantics to account for modal claims while at the same time endorsing world boundedness? I think the key to answering this question relies on combining an intensional theory of reference with the notion of an *incomplete* individual concept.

An incomplete individual concept can be thought of as a complete individual concept with some of its properties taken out or missing.<sup>65</sup> That Leibniz believed in the existence of such incomplete individual concepts and their importance to his thought can be seen from the famous “vague Adam” passage from the correspondence with Arnauld:

I have said that all human events can be deduced not simply by assuming the creation of a vague Adam, but by assuming the creation of an Adam determined with respect to all these circumstances, chosen from among an infinity of possible Adams. This has given Arnauld the occasion to object, not without reason, that it is as difficult to conceive of several Adams, taking Adam as a particular nature, as it is to conceive of several mes. I agree, but *when speaking of several Adams, I was not taking Adam as a determinate individual*. I must therefore explain myself. This is what I meant. When *one considers in Adam a part of his predicates*, for example, that he is the first man, set in a garden of pleasure, from whose side God fashioned a woman, and similar things conceived *sub ratione generalitatis*, in a general way (that is to say, without naming Eve, Paradise, and other circumstances that fix individuality), and when one calls Adam the person to whom these predicates are attributed, *all this is not sufficient to determine the individual, for there can be an infinity of Adams, that is, an infinity of possible persons, different from one another, whom this fits*. Far from disagreeing with what Arnauld says against this multiplicity of the same individual, I myself used this to make it better understood that the nature of an individual must be complete and determinate. I am even quite convinced of what St. Thomas had already taught about intelligences, which I hold to apply generally, namely, that it

---

<sup>65</sup> We will see below that the story is more complicated than this. It matters a great deal just which properties are extracted.

is not possible for there to be two individuals entirely alike, or differing only numerically. Therefore, we must not conceive of a vague Adam, that is, a person to whom certain attributes of Adam belong, when we are concerned with determining whether all human events follow from positing his existence; rather, we must attribute to him a notion so complete that everything that can be attributed to him can be deduced from it. Now, there is no room for doubting that God can form such a notion of him, or rather that he finds it already formed in the realm of possibles, that is, in his understanding. (AG 72-3; mostly my italics)

And Leibniz concludes with the argument considered in chapter 1:

It, therefore, also follows that he would not have been our Adam, but another Adam, had other events happened to him, for nothing prevents us from saying that he would be another. Therefore he is another. (AG 73)

And here is the analogous passage from the letter Arnauld actually received.

...in speaking of many Adams, I was not considering Adam as a determinate individual, but as a certain person conceived of in general terms in circumstances which seem to us to determine Adam as an individual, but which in truth do not determine him sufficiently, as when one understands by Adam the first man that God places in a garden of pleasure which he leaves because of sin, and from whose rib God draws forth a woman. But all that is not sufficiently determining, and in this way there would be many disjunctively possible Adams or many individuals whom all that would fit. That is true, whatever finite number of predicates incapable of determining all the rest one may take, but what determines a certain Adam must absolutely contain all his predicates, and it is this complete concept that determines generality in such a way that the individual is reached. (LA 60-1)

Leibniz claims here that when he speaks loosely of multiple possible individuals that God could have created, he is not taking these individuals as determinate, but as vague individuals, that is, according to the present interpretation, he has an incomplete concept in mind. Thus he says that “there can be an infinity of Adams, that is, an infinity of

possible persons, different from one another, whom this [the incomplete concept corresponding to the vague Adam] fits.” Leibniz continues, explaining that it is only in reference to *complete* individual concepts that the proposition that troubled Arnauld follows: that all events can be deduced and known a priori. It is important to appreciate that Leibniz is wanting to do two things in these passages at the same time. On the one hand he wants to justify his talk of God’s creating one among many possible versions of a person. On the other hand, he wants to distinguish this way of conceiving of an individual from the one he had in mind when talking about God’s perfect a priori knowledge of events. He makes this distinction with the use of incomplete and complete concepts.

When we combine the idea of incomplete individual concepts with an intensional theory of reference the results are striking. It is obvious that finite creatures like us do not operate with complete individual concepts on a daily basis, these being reserved for the mind of God alone. According to an intensional theory of reference, when I speak of Adam, my words refer to an incomplete individual concept of Adam in my mind, which represents reality in a certain way. Given that the contours of reality fit those of the content of my incomplete idea of Adam in a sufficient way, I manage to represent successfully, or talk about, the world. Now, when I begin to engage in modal discourse, when I ask such things as, “Is it possible that Adam did not eat the fruit of the tree of knowledge?” my incomplete concept of Adam manages to pick out several Adams in multiple possible worlds. If it is true in that world that Adam didn’t eat the fruit then it is possible that Adam didn’t eat the fruit. This is so even though the complete individual concept of Adam only picks out an individual in a single possible world. In this way

Leibniz can have his cake and eat it too! As he says to Arnauld, God chose this world and this Adam from an infinity of other possible Adams with various possible life paths and choices, the other possible Adams picked out by a vague and incomplete notion of Adam, and yet all actual events of history follow from the complete individual concept of the Adam that populates the actual world.

Let's look at how all this might work out formally.<sup>66</sup> I have argued previously that Leibniz's modal metaphysics is best represented by something at least as strong as S4. In addition, we probably want to switch to a free logic, so that we are not existentially committed to everything we have a name for. To capture the notion of incomplete individual concepts it is essential to make use of the intensional interpretation of the quantifier. On the standard, objectual interpretation of the quantifiers, what one is quantifying over are entities or objects that constitute the domain of quantification  $D$ . On the substitutional interpretation of the quantifiers, one is quantifying not over objects in the domain, but names in the language. One limitation of the substitutional interpretation is that one can only express denumerably infinite domains. On the intensional interpretation of the quantifier, one is quantifying over particular functions or concepts  $i$  constituting a set of functions  $I$ , which map from worlds to individuals in the domain of those worlds. Specifically, we want a set  $I$  of concepts  $i$  that includes incomplete individual concepts for Leibnizian individuals or substances, so that for each proper name of a substance  $a$ , our assignment function  $f$  will return an incomplete individual concept,  $f(a)=i$  for some  $i \in I$ .

---

<sup>66</sup> For the following formal treatment of modal logic and the intensional interpretation I am heavily indebted to Garson. Any mistakes are my own.

Formally then, the semantics involves a model  $\langle W, R, D, I, f \rangle$  consisting of a set of possible worlds  $W$ , an accessibility relation  $R$  that corresponds to the axioms we want for our modal logic, a set of domains at a world  $D$  consisting of all the  $D_w$  that contain the objects that exist at that world, a set of functions corresponding to incomplete individual concepts  $I$ , and an assignment function  $f$ . In addition we know that in a Leibnizian model  $R$  is at least reflexive and transitive to capture axioms M and 4, and that the set of domains  $D$  is completely disjoint, in order to capture the idea of world boundedness. That is, for any two  $w$  in  $W$ ,  $D_{w1} \cap D_{w2} = \emptyset$ . The following are definitions of truth in a model:

$Fa = T$  iff there is a function  $i \in I$  such that  $f(a) = i$  and  $i(w_{@}) \in D_{@}$  and  $f_{w@}(Fi) = T$ , that is,  
 $i(w_{@}) \in f_{w@}(F)$

$\Diamond Fa = T$  iff there is a world  $w \in W$  and  $w$  is accessible from  $w_{@}$  and there is a function  $i \in I$  such that  $f(a) = i$  and  $i(w) \in D_w$  and  $f_w(Fi) = T$ , that is,  $i(w) \in f_w(F)$

When we ask whether it is possible that Adam did not eat the apple, where  $R$  is the relation “ $x$  eats  $y$ ” and “ $a$ ” is a name for Adam and, simplifying to avoid definite descriptions, “ $f$ ” is the proper name for the apple that Adam ate, we are asking symbolically:

$\Diamond \sim Raf$

When this sentence is true, then semantically there exists some possible world  $w$  and there is a function  $i \in I$  such that  $f(a)=i$ , and  $i(w) \in D_w$  and another function  $i_2 \in I$  such that  $f(f)=i_2$ , and  $i_2(w) \in D_w$  and  $f_w(\sim Rii_2)=T$ . This captures the intuition that when I ask about what could have happened to Adam, the name “Adam” picks out an incomplete individual concept that then secures reference to distinct individuals in other possible worlds. Through the use of incomplete concepts mediating reference to individuals in other possible worlds, one is able to keep world boundedness and also hold on to modal discourse through a kind of quasi-counterpart theory.

### 3.1 Loose Ends: Contingencies, Mondadori, and Indexicals

I want to point out a philosophically unique result of Leibniz’s modal metaphysics as presented here. Given that one secures reference to other individuals in other worlds by means of the content of an incomplete concept, anything that does not match the representational content of the incomplete concept will not be picked out using the name associated with the concept. Thus if I was acquainted with Adam and my incomplete concept of him involved his having blond hair and blue eyes, any individual in another world without these features would not be Adam, and so Adam would instantiate these properties necessarily. This is, *prima facie*, a bad result for a Leibnizian modal metaphysics as it clashes too greatly with our intuitions about Adam’s hair and eye color not being essential features of him. However, it pays to go back to what Leibniz says about this vague concept of Adam. What he says is that it contains items such as “that he is the first man, set in a garden of pleasure, from whose side God fashioned a woman, and

similar things conceived *sub ratione generalitatis*, in a general way (that is to say, without naming Eve, Paradise, and other circumstances that fix individuality).” It is difficult to know exactly which are the “circumstances that fix individuality,” and thus difficult to know exactly how to construct the concept “under the rule of generality.” However, the path is not so dark here. The specific features that are included in an incomplete individual concept appear to be certain salient life achievements or happenings. For Adam, Leibniz lists origin, that he lived in a paradise, and that he had a wife genetically concocted from his rib. So Leibniz’s modal metaphysics agrees with Kripke’s in including origin as an essential feature of an individual. It is stronger than Kripke’s in that it includes some other things as well. Again, it is difficult to specify exactly what these other features are, but we can say in a rough way that they are character-shaping events in a person’s life arc. Which ones? Whichever are meaningful enough, such that without those events the person would not be who he is. I think this result is not so strange upon philosophical reflection. There is a sense in which had Barack Obama not been president it wouldn’t have been him, or had I not gone into philosophy it wouldn’t have been me.<sup>67</sup> At any rate I think this is one of the more interesting features of Leibniz’s modal metaphysics, and deserves to be noted.

I should also note some connections between the views presented here and those of Fabrizio Mondadori.<sup>68</sup> Both Mondadori and I are motivated to provide an account of de re modal claims in Leibniz in terms of possible worlds. Both of us believe that Leibniz is committed to world bound individuals and both of us cash out our accounts in

---

<sup>67</sup> Of course, this way of stating things is less than precise. A more exact description would be that any individual in another world that does not instantiate the property in question is not a suitable candidate for being identified as me.

<sup>68</sup> What follows is taken from Mondadori (1973) and to a lesser extent (1975).



terms of a counterpart or quasi-counterpart theory. Beyond this we begin to diverge. Mondadori believes that Leibniz was a superessentialist—that all of an individual's properties are had essentially.<sup>69</sup> He attempts to secure our de re modal claims in the face of superessentialism by giving a theory of reference. For Mondadori's Leibniz, we secure reference to individuals in the actual world by utilizing what he calls "variable senses" of a proper name. However, a proper name also has a constant sense, and these correspond to Leibniz's complete individual concepts. He then says that for each constant sense, that is the sense of a name of something in the actual world, there is a collection of constant senses that pick out counterparts to that thing in other worlds, and he calls these senses "counterfactual constant senses." These counterfactual constant senses are the constant senses the name "Adam" would have had had that world been actual.<sup>70</sup> When we claim that it is possible that Adam not eat the apple, what we mean is that among the collection of counterfactual constant senses associated with the constant sense of the name "Adam," there is one from which can be deduced the property of not eating.

Unfortunately it is not clear that Mondadori's account works. To see what is problematic about it we need to consider the semantics he gives for modal expressions.

---

<sup>69</sup> It is not clear in my mind that it is clear in Mondadori's mind what the connections are between superessentialism, superintrinsicness, and world boundedness. At times he talks of superessentialism as if it were superintrinsicness and that the latter is just equivalent to world boundedness (see 1973, 84-5). At other times when he talks about superessentialism he seems to mean it (see 1973, 86). In his "Understanding Superessentialism," Mondadori makes clear that he thinks that superessentialism is conceptually prior to world boundedness and that he makes no distinction between superintrinsicness and superessentialism as I have characterized them above; instead he conceives of them both as different ways of expressing superessentialism (169 ft. 14 and 164).

<sup>70</sup> Thus Mondadori seems to think that the CIC of Adam is not had by him necessarily.

When we do it becomes apparent that a consistent application of that semantics pulls his de re modal account apart from his commitment to superessentialism. At one point, Mondadori expresses the notion of superessentialism formally as, for any property  $a$  may have,  $\Box \exists x(x=a \supset Fa)$  (1973, 86). I have rendered the same claim as  $Fa \ \& \ \Box(Ea \supset Fa)$  using the resources of free logic. If we now look at his semantic account of a de re modal claim such as  $\Diamond \sim Fa$  we get the following. There exists a counterfactual constant sense in the set  $C_a$  of counterfactual constant senses associated with the constant sense of the term  $a$  such that it entails  $\sim Fa$ . Assuming the interdefinability of  $\Box$  and  $\Diamond$ , if we now consider the claim  $\Box Fa$ , we must mean that there does not exist a counterfactual constant sense in the set  $C_a$  of counterfactual constant senses associated with the constant sense of the term  $a$  such that it entails  $\sim Fa$ . When we turn back to the statement of superessentialism, we get the following semantic story. The constant sense of  $a$  entails  $Fa$ , and there does not exist a counterfactual constant sense in the set  $C_a$  of counterfactual constant senses associated with the constant sense of  $a$  such that  $Ea \ \& \ \sim Fa$ . That is, none of the counterfactual constant senses picks out a counterpart such that  $\sim Fa$ . Thus Mondadori's commitment to superessentialism gobbles up any working account of de re modal claims he may have had on hand.

Let's talk now a little about indexicals. There might be an objection to my account of Leibniz and reference along Kripkean lines. One might think that we have no need of incomplete individual concepts in order to secure reference in this world and others because we can just use indexicals, and speak of *this* man, and thereby secure reference to something in this world without the use of telescopes aimed at other worlds. Of course, for Leibniz, if this were possible all modal reference would collapse, because

*this* man has a complete individual concept that only exists in one world. Luckily, I don't think this is possible for Leibniz.<sup>71</sup>

First, indexicals essentially rely on space and time to do any referential work. When a referring subject points and says, "This man," the referent is picked out by determining the subject's position in space and time. For Leibniz the phenomenal world can be thought of as divided between real and ideal entities. Real entities are corporeal substances, organisms, which are the phenomenal manifestations of monads. Space and time are ideal entities imposed by the mind onto the phenomenal world. So it is not clear that any referential mechanism that essentially relies on space and time can get any serious referential traction.

Consider what Leibniz says in the *Confessio*. The theologian has just asked the philosopher that given that souls are perfectly similar and can differ in number alone, how can God be justified in setting up one soul in a space-time trajectory that leads to damnation and another in a space-time trajectory that leads to salvation.<sup>72</sup> Leibniz's answer is that had soul A been in soul B's space-time trajectory then it wouldn't have been A but B, because difference in space-time trajectory is difference in the perceptual content of soul. That is, there is no difference in number alone. That is, the principle of the identity of indiscernibles holds. Here is Leibniz's *reductio* argument.

---

<sup>71</sup> I mention here that much of Kripke's criticism of Frege-Russell descriptive theories of reference are more aptly aimed at early modern intensional or conceptual theories of reference than Frege. The issue of the proper senses of proper names was never fully settled in Frege's mind in my opinion.

<sup>72</sup> I'd like to thank Robert Sleigh for first bringing this very interesting passage to my exegetical attention.

Let there be two eggs so similar to each other that not even an angel (on the hypothesis of the greatest possible similarity) can observe a difference, yet who can deny that they differ? At least they differ in this: that one is this one, the other, that one, that is, they differ in *haecceity*, or because they are one thing and another thing, i.e., because they differ *numerically*. But what do we mean when we count, that is, when we say *this* (for to *count* is to repeat *this*). What is *this*? What is it to determine something? What is it except the perception of time and place... (RS 103)

Leibniz says here that they differ in haecceity because they differ in number. I take this to be just the contraposition of the identity of indiscernibles. He goes on to explore the basis of our ability to say that they are two things, that they differ numerically. He claims that we can count that they are two and not one, that we do this with the aid of indexicals, and that indexicals essentially rely on space and time. He goes on to explain what is involved in this.

For between these two eggs no difference can be assigned either by an angel or, I have the audacity to say, by God (given the hypothesis of the greatest similarity possible) other than that at the present time this one is at place A, and that one is at place B. That is why, in order of you to be able to distinguish them continuously—which is what a *designation* (i.e., a continuous determination) consists in (supposing that nothing can be written on them, no mark attached to them, no sign printed on them, by which they cease to be similar)—it is necessary either that you keep these eggs in some immobile container, where they themselves remain unchanged, or that you make their site or container, if it is mobile, unbreakable, and fix them in it, so that they retain the same relation always to certain previously determined marks imprinted on parts of the container, or, finally, if you are going to allow them total lack of restraint, you must continuously follow the motion of each, during the entire period and through every place, either with your eyes or your hands or by some kind of contact. (RS 105)

Here Leibniz says that in order to use indexicals to refer, one must be able to use space in such a way that it can “designate” them, which is nothing other than to be able to

continuously “determine” or “distinguish” them. Given the impossibility of all three ways he proposes to do this, that is, given the impossibility of an absolutely immobile or unbreakable container, and given the impossibility of any ability to continuously track them, I think the conclusion is that Leibniz simply thinks one cannot use space and time to successfully refer to things. And so much the worse for indexicals and, *a fortiori*, differences in number alone.

### 3.2 Counterfactuals and the Hierarchy of Worlds

In the last two sections I have presented and defended an account of how Leibniz could have and did make *de re* modal claims in terms of a structure of possible worlds. In doing so I have made essential use of the notion of an intensional theory of reference and incomplete individual concepts, both of which are largely unnoticed, yet key elements in Leibniz’s thought. Now I want to touch on another subclass of modal discourse known as counterfactuals, statements expressed by subjunctive conditionals of the form: If *x* had *F*’d, then *y* would have *R*’d. As it turns out, this class of modal discourse was extremely important to Leibniz, and he gives a fairly detailed account of their semantic behavior. Indeed it was incumbent upon him to do so to guarantee human freedom.<sup>73</sup>

---

<sup>73</sup> Modulo concerns about a kind of Spinozistic freedom. In Spinoza’s ethical system, humans are free when their behavior conforms to a hypothetical imperative structure that guarantees the preservation and increase of their power. This imperative structure has teeth because humans, like all things on Spinoza’s account, strive to maintain and increase their power. However, all of this takes place in the context of a necessitarian world-view, where reactive attitudes, such as praise and blame, are cognitive mistakes and all “could have done otherwise” claims are false.

The main text from which Leibniz's theory of counterfactuals can be reconstructed is the Theodicy. Building on a story found in Laurentius Valla's *Dialogue on Free Will*, Leibniz describes how the high priest, Theodorus, was visited in a dream by Athena and taken to the palace of the fates. The following long passage is Athena's revelation to him.

Here are representations not only of that which happens but also of all that which is possible. Jupiter, having surveyed them before the beginning of the existing world, classified the possibilities into worlds, and chose the best of all...I have only to speak, and we shall see a whole world that my father might have produced, wherein will be represented anything that can be asked of him; and in this way one may know also what would happen if any particular possibility should attain unto existence. And whenever the conditions are not determinate enough, there will be as many such worlds differing from one another as one shall wish, which will answer differently the same question, in as many ways as possible. You learnt geometry in your youth, like all well-instructed Greeks. You know therefore that when the conditions of a required point do not sufficiently determine it, and there is an infinite number of them, they all fall into what the geometricians call a locus, and this locus at least (which is often a line) will be determinate. Thus you can picture to yourself an ordered succession of worlds, which shall contain each and every one the case that is in question, and shall vary its circumstances and its consequences. But if you put a case that differs from the actual world only in one single definite thing and in its results, a certain one of those determinate worlds will answer you. These worlds are all here, that is, in ideas. I will show you some, wherein shall be found, not absolutely the same Sextus as you have seen (that is not possible, he carries with him always that which he shall be) but several Sextuses resembling him, possessing all that you know already of the true Sextus, but not all that is already in him imperceptibly, nor in consequence all that shall yet happen to him. You will find in one world a very happy and noble Sextus, in another a Sextus content with a mediocre state, a Sextus, indeed, of every kind and endless diversity of forms. (T sec 414)

First, it is clear that what is given above is an account of counterfactuals. Leibniz says that, "in this way one may know also what would happen if any particular possibility

should attain unto existence.” That is, it is an account of God’s knowledge of counterfactuals and derivatively of the ground of their truth. Second, from the above highly descriptive passage we can immediately start to construct the specifics of that account. The basic picture looks something like this. The antecedent of a counterfactual proposition “picks out” a possible world in the space of possible worlds. If the consequent of the counterfactual is true in that world, the counterfactual is true, and if false, then the counterfactual is false. This is a workable first pass, but not the end of the story. Leibniz talks about what happens when “the conditions are not determinate enough” and he claims, on analogy with an algebraic expression that picks out a curve in coordinate space, that a locus of possible worlds jump out to answer the counterfactual, some in one way, others in others. Thus when I ask a counterfactual whose antecedent does not suffice to uniquely determine a world, that is, whose antecedent obtains in multiple possible worlds, multiple worlds answer it, and there appears to be no unique answer to the counterfactual question. I call these “indeterminate counterfactuals.” This situation, of course, is embarrassing for someone who, like Leibniz, believes in global bivalence. So there must be more to the counterfactual account that deals with these indeterminate counterfactuals. And so there is.

Following the long passage quoted above, Leibniz continues his description of Theodorus’s vision, this time detailing the structure of the space of possible worlds.

The halls rose in a pyramid, becoming even more beautiful as one mounted towards the apex, and representing more beautiful worlds. Finally they reached the highest one which completed the pyramid, and which was the most beautiful of all: for the pyramid had a beginning, but one could not see its end; it had an apex, but no base; it went on increasing to infinity. That is (as the Goddess explained) because amongst an endless

number of possible worlds there is the best of all, else would God not have determined to create any; but there is not any one which has not also less perfect worlds below it: that is why the pyramid goes on descending to infinity. (T sec 416)

The description of the space of worlds is one hierarchically arranged by an aesthetic metric of bestness. While there is a top or best world, there is no lowest or worst. Presumably this is because each world is born out of the combinatorial possibilities of God's perfections, modulated in various degrees, and therefore every world contains some amount of perfection and hence registers to some degree on the metric. Also in this passage Leibniz claims that were there not a best world God would not have created any of them. This fact about God's choosing provides a partial solution to the problem of indeterminate counterfactuals. Given a set or locus of worlds each satisfying the antecedent of an indeterminate counterfactual, some will pronounce the counterfactual false by various scenarios while others will pronounce it true by various other scenarios confirming the consequent. Were God to choose among these, God would choose the best. Therefore the world that determines the truth-value of the counterfactual is the best world in this locus of worlds.<sup>74</sup>

This solution does not completely fix the problem of indeterminate counterfactuals. Consider any horizontal slice of the pyramid-space of possible worlds.

---

<sup>74</sup> For an in depth analysis of counterfactuals in Leibniz, see Griffin (1999). My account closely follows the one presented there in using the bestness metric to select among worlds. One point of disagreement is on the subject of indeterminate counterfactuals indeterminable on aesthetic grounds. Griffin decides to call all of these false because God wouldn't have chosen any of them (334). This solution seems to be not so much a violation of bivalence as a violation of the basic properties of negation:  $P \Rightarrow Q = F$  and  $P \Rightarrow \neg Q = F$ . For my take, see below. I should also note that this account of counterfactuals complicates our semantic picture slightly. Our models will now be  $\langle W, R, D, I, f, B \rangle$ , where  $B$  is a betterness relation on the set of worlds that is irreflexive, asymmetric, and transitive.



All the worlds in this slice will be equal according to the aesthetic metric, and therefore God's choice of the best cannot determine which world will uniquely answer the counterfactual. It is possible that no two worlds answering the antecedent of the counterfactual yet differing in the consequent will end up in the same horizontal slice of space, but nothing guarantees that they won't, so it would be good to have something to say about these cases (see Griffin 333). Here is Leibniz in a piece entitled "Extracts from Twisse."

If the rooster sings, the sea will rise, certainly if God had decreed it so; if the horns of Joshua make a sound, the walls of Jericho will fall.

For the most part, conditionals of the future are senseless conditions. Clearly when I ask what the future would have been if Peter had not denied Christ, it is asked what the future would be if Peter were not Peter, for having denied is contained in the complete notion of Peter. But it is nevertheless excusable on this occasion that by the name of Peter is understood some things involved in him, from which denying doesn't follow, and likewise there will be simultaneously subtracted from the entire universe all of those things from which it does follow, and then sometimes it can happen that the decision itself follows from the remaining posits in the universe, but sometimes it does not follow unless there occurs a new divine decree by reason of the best. If nothing follows from the natural chain or the consequences of the remaining posits, it cannot be known what the future will be, unless from the decree of God according to that which is best. Therefore, things resolve either into the series of causes or into the decree of the divine will, and they seem to gain exactly nothing by middle knowledge. (Grua 358; my translation)<sup>75</sup>

This is an interesting passage. In the first half Leibniz flatly claims that counterfactuals are senseless because of superintrinsicness. He then goes on to describe

---

<sup>75</sup> I follow Sleight here in reading the "ex quibus non sequitur" as a typo. See Sleight (1994, 564 n51).

a way in which they can make sense.<sup>76</sup> I want to try to put the account on display in this passage together with that presented in the *Theodicy*. When one asks “What if x hadn’t  $\phi$ ’ed?” according to this text, what one is doing is subtracting out of the complete concept of x everything that entails having  $\phi$ ’ed until one is left with something that doesn’t entail having  $\phi$ ’ed.<sup>77</sup> Leibniz tells us that this simultaneously involves subtracting out from the world everything that entails that x  $\phi$ ’ed. This subtracting out process tracks the selection of a world on the basis of the antecedent of a counterfactual on display in the *Theodicy*. Here Leibniz then says that sometimes having not  $\phi$ ’ed follows from the “remaining posits in the universe.” I take this to be the case described in the *Theodicy* when a single world answers the antecedent of the counterfactual. He goes on to say that at other times having not  $\phi$ ’ed only follows by a new divine decree. This tracks the case where a locus of possible worlds, no two of which occupy the same highest horizontal slice of the space of possible worlds, answers the antecedent of the counterfactual. That is, where the antecedent picks out multiple worlds where one is the best relative to the others. This case requires God’s choice of the best to select among this locus of worlds, and hence a new divine decree is required for having not  $\phi$ ’ed to follow.

This passage meshes with the picture encountered in the *Theodicy*, but it doesn’t directly address the question of indeterminable counterfactuals—counterfactuals whose antecedents pick out multiple worlds of equal value. Given the cautionary remark that

---

<sup>76</sup> This tension between superintrinsicness and a positive account of counterfactuals is not lost on Sleight. See Sleight (1994, 563). I hope to say something about this tension in the next chapter.

<sup>77</sup> Of course, neither you nor anyone else is doing anything to the complete concept because you don’t have cognitive access to it. The account that follows is a description of the metaphysical situation.

Leibniz gives at the beginning of this passage about the frequency with which counterfactuals are senseless, I think it is best to say that these indeterminable counterfactuals are just that, senseless. They do not express propositions at all, and hence are not a violation of bivalence.

### 3.3 Jesuits and Dominicans on Future Free Actions and Counterfactuals of Freedom

Much of Leibniz's discussion of counterfactuals is embedded in a scholastic theological debate about human freedom and God's foreknowledge. I want to comment briefly on this debate.<sup>78</sup> The main parties involved were the Jesuits, guided by the work of Luis de Molina, and the Dominicans, by that of Domingo Bañez. Roughly, the issue is that God's perfect knowledge, including a foreknowledge of what humans will and would choose, appears to be in conflict with the notion that those choices are made freely, and hence subject to divine praise and blame, salvation and perdition. The Dominicans held that God knows what a creature will do, and would do in counterfactual circumstances, by knowing what his particular causal contribution to the action is through divine concurrence with it.<sup>79</sup> The objection to the Dominican position is that this divine contribution seems to gobble-up human freedom. The Jesuit view is that human action is radically free, in the sense that the same conditions leading up to an action are compatible both with its occurrence and non-occurrence. They account for God's foreknowledge of

---

<sup>78</sup> The main secondary literature that I draw on here include Sleight (1994), Murray (1995), Davidson (1996), and Griffin (1999). For an excellent telling of the rich historical background see Davidson.

<sup>79</sup> I don't have room here for a full treatment of the theological concept of concurrence. Suffice it to say that concurrence is the divine contribution to creaturely actions that accounts for their ability to be causally efficacious agents.

free actions by a mechanism called middle knowledge. Middle knowledge is a *sui generis* kind of divine knowing, distinct both from God's knowledge of vision, which captures actual truths, and his knowledge of simple intelligence, which encompasses possible truths.

Leibniz criticizes both the Jesuits and Dominicans. However, his own position is harder to locate. His main criticism of the Jesuits is that middle knowledge is theoretically excessive and that their take on human freedom violates the PSR. His main criticism of the Dominicans is that they force God into being too busy and threaten the spontaneity of free human acts (see Davidson 102-7 and Griffin 341). Leibniz's solution involves his possible worlds framework. God knows the future free actions of creatures by his knowledge of the actual world, and counterfactuals by his knowledge of the space of possible worlds spread out in the divine intellect. The details of how this story gets fleshed out become quickly complicated.

Sleigh thinks, with good reason, that there is a serious tension between superintrinsicness and any counterfactual account Leibniz may have on offer. However, he also thinks that theological pressures forced Leibniz's hand. Taking the Twisse passage cited earlier as embodying his official counterfactual story, Sleigh argues that Leibniz held that God's knowledge of future free actions and counterfactuals of freedom was a kind of post-volitional knowledge, based on his knowledge of his actual and counterfactual decrees associated with each world. Sleigh then speculates that the decrees involved here are whatever laws are required to get the predicate in the consequent of a counterfactual to follow from the incomplete concept (1994, 563-5). I have argued above how this text is to be read as in line with the possible worlds

framework on display in the Theodicy. Following Griffin, I take the decrees of the Twisse text to be just the decree to create the best world out of a locus of worlds answering the counterfactual. Davidson argues that God's knowledge of future free actions and counterfactuals is had pre-volitionally, and emphasizes the role of complete individual concepts in Leibniz's solution to the Jesuit and Dominican problems. Against the Jesuits, CIC provide a way for the PSR to take root in human action, and against the Dominicans, the content of those same CIC provide an intrinsic determiner of those actions that avoids infringing upon a substance's spontaneity (102-9). Griffin concludes that because counterfactuals are sometimes determined by God's choice of the best relative to a locus of worlds, Leibniz differs from the Jesuits in making knowledge of future free acts and counterfactuals depend in some way on his will, while differing from the Dominicans in avoiding repeated individualized acts of willing in his concurrent activity (341).

Leibniz certainly thought he could get rid of middle knowledge and make his way just with knowledge of vision and simple intelligence. I think at times he thought he could just get along with knowledge of simple intelligence cashed out in terms of the space of possible worlds within the divine intellect. His knowledge of actual future free acts is based on his knowledge of which world is the best of all possible, while his knowledge of counterfactuals is based on his knowledge of which world is best among a locus of worlds. None of this, however, involves post-volitional knowledge, strictly speaking. While it is true that God's knowledge may involve knowledge of the decrees he makes at worlds, this knowledge is of those decrees considered as possible, even in the case of the actual world. Thus God is perfectly able to know what he is going to will and

what he would have willed under various circumstances independently of any specific acts of the divine will, by simply considering the possible worlds in the divine intellect.

Consider the following passage entitled “For and Against Ludovicus a Dola, ‘On the Way of the Conjunction of the Interactions of God and Creatures.’”

God was not able to keep himself merely permissive towards sin, not because he determines our will towards it, but because he is determined by our will. p. 37

My opinion: Middle knowledge is reduced to knowledge of simple intelligence, that is, to the knowledge of possibility. For instance, it is known whether the besieged-Keilites would surrender the city to Saul, and this knowledge is not of our actual Keilites, whose complete concept involved not being besieged, but of other possible Keilites, whose characters have everything like the actual ones except those things which are coherent with the hypothesis of a siege. God thinks that which might come to be by the very same knowledge by which he understands what in our world might come to be before he decrees it, as a whole, from certain posits constituting the totality, certainly known by God himself by a consideration of the reasons of that which is better. And in truth, from the knowledge of contingent conditions, through a constituting awareness of the decree of the condition to be created, there results knowledge of vision in itself, had non-discursively. Knowledge of simple intelligence is of possibility, vision is of the future, middle is of the future under a condition. (A VI.iv.1789; my translation)

In responding to the first line, Leibniz flatly asserts that middle knowledge reduces to knowledge of simple intelligence.<sup>80</sup> He then gives the example of the Keilites to illustrate an example of God knowing counterfactuals of human freedom. Leibniz says that God knows these counterfactuals in the same way he knows the actual future before he

---

<sup>80</sup> It is difficult to understand exactly what the first line of the passage is asserting. Given Leibniz’s response to it, I think it fair to say that it involves the postulation of middle knowledge. Here is a first pass at interpretation. God cannot be merely permissive of sin, because his intellect is modified through the means of middle knowledge whenever we use our radical freedom to choose sin, and not because God had a hand in constructing our will such that it has a propensity towards sinning.

decides to create the actual world. Leibniz says he does so by knowing “certain posits constituting the totality.” We may take these posits to be states of affairs or CIC, and the totality as the world that is constructed from them.<sup>81</sup> He then claims that knowledge of vision just is God’s knowledge of his decree concerning the actual world. Again, the thing to note is that knowledge of vision is not different in kind from knowledge of simple intelligence. God does not know the actual future post-volitionally, by willing and then knowing what he in fact willed. His knowledge of vision is just a case of knowing something by simple intelligence. He knows what he would have to will in choosing to create the best of all possible worlds. All work done by middle knowledge in accounting for God’s knowledge of counterfactuals is done by God’s knowledge of simple intelligence—God knows the space of possible worlds.

I now want to turn briefly to an interesting position held by Michael Murray. Murray seems to accept the general outline of the dispute between Jesuits and Dominicans canvassed above. However, he argues that Leibniz was not a standard compatibilist when it comes to free action. He claims that the category of moral necessity is a *sui generis* mental mechanism that leads from one mental state to the next. This mechanism cannot be captured by any physical law of nature, but instead is governed by the law of general order. Again, this is not a normal compatibilist position because the laws with which freedom is compatible are not physical laws of nature, but what we may call super-physical laws (93-102). Relative to physical laws we are radically free. This is an interesting position, and Murray has historical evidence to back

---

<sup>81</sup> Alternatively, these posits may be thought of as the law, or parts of the law, of the general order. However we think of these posits, they have to contain sufficient information to recover a world.

up his claim that the notion of moral necessity may have been semantically shaped by its scholastic context. However, Murray says it is neither physical necessity nor metaphysical necessity so presumably it has to be sandwiched somewhere in between the logical and metaphysical. I want to point out one tension that his position generates. According to Leibniz, the physical world is determined by physical laws that operate in accordance with mechanical mechanisms, that is, mechanisms that are essentially local—there is no action at a distance. The mental world is equally governed and determined by psychological laws that operate in accordance with final causes, that is, mechanisms that are responsive to reasons. This is Leibniz’s solution to the mind-body problem and generates Leibniz’s two worlds, functioning perfectly autonomously and perfectly harmoniously, much like Spinoza’s parallelism. Presumably, Murray would want to cash out final causes in this picture with moral necessity and parts of the law of the general order instead of acting in light of reasons, as I have. The point to notice is that according to Murray’s picture, no deterministic physical laws will be possible at all. Instead, if Murray is right, the best we can have will be stochastic physical laws, due to the complexity and transcendence of the law of the general order. Of course, Murray, inspired by the “private miracles” passage, might be fine with these kinds of free-will violations of the deterministic unfolding of physical law. If he is then a further problem arises with psychological laws. Psychological laws, for Murray, are parts or aspects of the law of the general order. If they are not violated in free acts, then the harmony and parallelism between physical laws and psychological laws is disrupted. If they are violated, then we have a part of the law of the general order being violated by miraculous free acts. Either horn involves biting a serious bullet in my opinion. So while Murray



may be right in pushing us to think harder about moral modalities, I think there are some fundamental problems that result from the way Murray has developed his account.

## Chapter 4

### 1 Wilson's Multiple Gods

In this chapter I will try to make sense of a constellation of related modal concepts in Leibniz's thought: the *per se* possible, moral necessity, and hypothetical necessity. I will conclude by showing how Leibniz endorsed superintrinsicness and rejected superessentialism. I will claim that Leibniz was a kind of error theorist about everyday modal claims about an individual. Strict claims about what *you* could have done are false if assessed relative to complete individual concepts. However, when assessed relative to incomplete individual concepts, we can make all the standard modal claims about individuals that we want. However, before I get to these details, I want to first deal with a famous objection in the literature against seeing a possible worlds semantics in Leibniz.

Margaret Wilson has been taken by some to have shown that using a possible worlds semantics to account for Leibniz's views on modality is a mistake, specifically, "it is a mistake to ascribe to Leibniz a counterpart-theoretical account of possibility and necessity *de re* in terms of alternative possible Adams" (Adams 1994, 55). Of course, this statement of the situation is far too strong; what Wilson has done depends critically upon the specifics of the counterpart account. Wilson criticizes what she calls the

Mondadori-Ishiguro account of modal discourse in Leibniz. The Mondadori-Ishiguro account of modal discourse is the one covered previously in chapter three. Roughly, all of an individual's properties are essential to it—superessentialism—yet, when I say that  $x$  could have  $F$ 'd, what I mean is that  $x$ 's complete individual concept is such that it has a counterpart complete individual concept from which  $F$  follows.

Wilson begins with the commonplace that Leibniz thought that some of God's properties are contingent—God willed this world into existence but he could have willed some other in its place. She goes on to block any account of this in terms of per se modality, noting in a footnote that:

It is, I think, fairly uncontroversial that Leibniz did hold this [that some of God's properties are contingent], and that (at least in his later writings) he did not normally think of the "contingency" of God's choices as reducing to the claim that more than one world is possible *in itself*, or self-consistent (where God's choosing the world He does might still be necessary). (723)

Given that Leibniz did invoke the per se modal account in pieces as early as 1671 in the Letter to Magnus Wedderkopf and as late as 1710 in the *Theodicy* (see particularly objection 8 in the appendix pp. 386-88), it is far from being uncontroversial that he did not invoke it to explain God's freedom and hence his contingent properties. Perhaps Wilson has in mind here something other than the per se modal account, as she goes on to say that other world-choosing's are possible in themselves, but that "God's choosing the world He does might still be necessary," something that Leibniz would have never endorsed in deploying his per se modalities.

Next Wilson argues that God has a CIC and is thus subject to superessentialism. When we apply the Mondadori-Ishiguro account to God, we get the result that when we say that God could have willed something different, we mean something like, God has a CIC that has a counterpart CIC, such that willing something different, while not following from the former CIC, does follow from the latter. She goes on to note that any God concept will be such that existence follows from it, that is, any concept whose existence does not follow from its essence is not even a contender for being a counterpart to God's CIC. She concludes that the Mondadori-Ishiguro account of modal discourse results in multiple existing Gods who each will, efficaciously, to create different worlds (724-27). Wilson concludes her argument by targeting *any* account of modal discourse in terms of possible worlds.

It might be argued that the problem we have generated exists in Leibniz's system in any case, and is not merely the product of the Mondadori-Ishiguro proposals. (Hence the problem does not constitute an objection to their proposals.) For, given that Leibniz does maintain there is no impossibility in God's having chosen some other world, how *can* we rule out the reality (in whatever sense possibles are real) of a possible God who does make this alternative choice? But then, since there's nothing to rule out this other possible God's being attributed infinite perfections, He too will necessarily exist in actuality. In other words, we get our contradictions in any case. (727)

There are a number of very subtle disambiguations that need to be made here. Any theological use of possible worlds that incorporates the objectual interpretation of the quantifier is going to have an entity, God, existing at all possible worlds, insofar as that

account takes God's existence to be necessary.<sup>82</sup> In some of those worlds God may make different decisions concerning the world. This fact does not mean that all of those possible Gods are actual and that all of those decisions and corresponding worlds are actual. God's existing in all those worlds just means that his existence in the actual world is necessary, and similarly, God's alternate decisions in those worlds just means that his decisions in the actual world are not necessary. Wilson seems to be simply misunderstanding the distinction between something occurring at a world and something being actual (note her odd way of expressing the situation at another world: "He too will necessarily exist in actuality"). So accounting for God's necessary existence in terms of his existence at all other possible worlds does not result in multiple Gods, but rather one God, who is actual and actually exists necessarily.<sup>83</sup>

An important upshot of Wilson's account is the need to think harder about the relation between modal claims about God and possible worlds. For Leibniz, God is not in any possible world in the way that CIC are "in" worlds and are, in fact, constitutive of them. For Leibniz, the world is simply the aggregate of all finite things, and a possible world is an aggregate of CIC (see Adams 1994, 15). If we resort back to the use of world books that I introduced in chapter 1, we can say that the sentence "God exists" holds at

---

<sup>82</sup> The argument I present above assumes a fairly standard metaphysics of possible worlds. There are important issues that I pass over, such as the fact that God is usually taken to be some kind of transcendent entity, so it is not clear that he should be included in the domain of quantification at a world in a straightforward way. Also, if one follows Lewis and believes that the predicate "actual" is an indexical term, then you might get the result that there are multiple actually existing possible Gods, in some sense. Of course, this is not quite the correct way of expressing the situation, given that from one's perspective at a world, there is only one *actual* world and one *actual* God, namely, the one in *this* world.

<sup>83</sup> Even if Wilson's conclusion did follow, this would not be a problem peculiar to Leibniz, but rather any merging of theology with possible worlds.

every world book, but not that God is part of any possible world. The problem now is to come up with some kind of semantic story about how this sentence shows up in every world book. Recall that every sentence in a world book has to be derivable from the set of monadic perceptual predicates of the CIC that make up that world. Given that God is not a constitutive part of any possible world, we need to apply some sort of “translation therapy” to the statement “God necessarily exists,” it can’t mean what its surface structure seems to say—that there is an entity that exists at all possible worlds. In chapter three I argued that the space of possible worlds is characterized by a semantic model  $\langle W, R, D, I, f \rangle$  where  $W$  is the set of all worlds,  $R$  is the accessibility relation among worlds,  $D$  is a disjoint set of domains at a world,  $I$  is the set of individual functions that map members of  $W$  into  $D$ , and  $f$  is the assignment function.

Let us recall briefly some semantic facts based on the model.

- 1) When we say “Peter is D” then there is a function  $i \in I$  such that  $f(p)=i$  and  $i(w_{@}) \in D_{@}$  and  $f_{w@}(Di)=T$ , that is,  $i(w_{@}) \in f_{w@}(D)$
- 2) When we say “It is possible that Peter is not D” then there is a world  $w \in W$  and  $w$  is accessible from  $w_{@}$  and there is a function  $i \in I$  such that  $f(p)=i$  and  $i(w) \in D_w$  and  $f_w(Di)=F$ , that is,  $i(w) \notin f_w(D)$
- 3) When we say “It is essential that Peter is D” what we mean is that there is a function  $i \in I$  such that  $f(p)=i$  such that for all worlds  $w \in W$  where  $w$  is accessible from  $w_{@}$  if  $i(w) \in D_w$  then  $f_w(Di)=T$ , that is,  $i(w) \in f_w(D)$

Now, when we say that “God exists” is part of every world book, and hence that “God necessarily exists,” what we mean, on the present semantic account, is that in all worlds all substances perceive, in some manner or other, that God exists. I think the following semantic formulation captures the “intuitive” notion here.

4) For all  $w \in W$  such that  $w$  is accessible from  $w_@$  and for all  $i \in I$  such that  $i(w) \in D_w$   
 $f_w(\Phi i) = T$  where  $\Phi$  is a perceptual predicate to the effect that  $i$  perceives in-some-wise that  $G$ , where  $G$  has the content “God exists”

The idea here is, again, to ground truths at a world, truths that show up in a world book, in the monadic perceptual predicates of CIC at those worlds.

Leibniz didn’t think that “God necessarily exists” means that God exists in every possible world, but he certainly did think that every substance at every world perceives, even if only unconsciously, that God exists. Worlds themselves, as resultant combinations of God’s perfections in various degrees, just are expressions of God, and Leibniz thought that every substance perceives its entire world. The above formulation is merely meant to capture this notion and to show that a possible worlds account, as I’ve formulated it, can capture the Leibnizian fact that God necessarily exists: “God exists” is true at each possible world book, even if God is not a constituent part of any possible world.

However, having shown that the account I have given in terms of possible worlds can meet Wilson’s objection and account for the truth of the claim that God exists

necessarily is not to have shown that Leibniz treated modal claims about God in this way. As I stressed above, God is not *in* the space of possible worlds, rather, the space of worlds is *in* God's intellect, and God's freedom is reflected in the space of possible worlds through his possible free decrees being included in the informational content of the various possible worlds. Leibniz usually told a different story when ascribing modal claims to God—one in terms of his per se modal account.

## 2.1 The Theological Threat to Contingency and the Per Se Account

In order to get some traction on the per se modalities, I want to set up the problem space by introducing what Sleigh has called the “theological threat to contingency” (1999 363-64). The threat is necessitarianism. The argument, with justifications, is roughly as follows.

1)  $\square$  God is an absolutely perfect being (i.e., a being whose essence entails existence and contains all perfections, that is, all attributes capable of being maximized (See DM sec 1 here, where Leibniz specifically mentions knowledge, power, and moral perfection))

This is true by the definition of God.

2)  $\square$  State of affairs *s* is part of world *w*<sub>1</sub>

The total collection of states of affairs that obtain at a world  $w$  are constitutive of  $w$ . So if  $s \in w_1$ , then assuming  $s \notin w_1$  leads to the conclusion that  $w_1 \neq w_1$ , which is absurd. So 2) is true by a logical, and hence metaphysical, necessity.

3)  $\Box$  World  $w_1$  is the best of all possible worlds

Presumably the aesthetic metric by which worlds are evaluated is an objective fact about the space of worlds and is in some sense necessary.

4)  $\Box$  God knows which world is the best, has the power to actualize it, and is a perfect moral agent

This follows from 1).

5)  $\Box$  God chooses to actualize the best world

Presumably this follows from 3) and 4).

6)  $\Box$   $w_1$  is actual

This follows from 3) and 5).

7)  $\Box$   $s$  obtains



This follows from 2) and 6).

Note that state of affairs *s* is perfectly general. The argument threatens to reintroduce necessitarianism back into Leibniz's metaphysical system, this time not through his logic of complete individual concepts and world boundedness, but through the theology. This argument has been extensively treated in the literature (see Adams 1994, 9-46 and Sleigh 1999). The consensus is that Leibniz had two ways of avoiding the conclusion. He either denied 3) or 5).<sup>84</sup> In denying 3), Leibniz says at times that it would take an infinite analysis to determine that *w*<sub>1</sub> is the best of all possible worlds, so one route to avoiding the necessitarianism of 7) is to replace 3) with:

3')  $\sim \Box$  World *w*<sub>1</sub> is the best of all possible worlds.

The other route for avoiding the necessitarian conclusion is to deny 5). In this context Leibniz usually says that it is only morally necessary that God chooses the best possible world and that other worlds remain per se possible, so that 5) is replaced by:

5')  $\Box_M$  God chooses to actualize the best world.

The result is:

---

<sup>84</sup> Adams notes that Leibniz usually denied 3) in private notes while denying 5) in his more public writings such as the *Theodicy* (1994, 37).

7')  $\sim \Box$  s obtains

because

8)  $\Diamond_p$  s doesn't obtain and  $\Diamond_p$  that some other world, w2, is actual involving some other state of affairs s'.<sup>85</sup>

I want to focus on the denial of 5) and the related notions of moral necessity and per se possibility, as I believe them to be Leibniz's main weapon against the theological threat to contingency.

## 2.2 Adams's First Main Solution

Adams takes the theological route to necessitarianism as the focal one in Leibniz's thought. Speaking of a version of the theological argument, he claims that,

...the necessity of all events is not based [here] on the conceptual containment theory of truth, but rather on the nature of God and the principle of sufficient reason. This latter, more theological argument against contingency is by far the one most often addressed by Leibniz in his writings. (1994, 12)

---

<sup>85</sup> I use  $\Box$  for metaphysical necessity,  $\Box_M$  for moral necessity, and  $\Diamond_p$  for per se possible.

Maybe, but I'm not convinced of this. I think it far more likely that Leibniz's system was equally threatened by necessitarianism on two fronts: the one logical and the other theological.

Adams goes on to characterize the per se modalities.

...the actual world, and the things that exist in it, are not necessary but contingent, because other worlds are possible in which those things would not exist. The possibility of those other worlds does not depend on the possibility of God's choosing them. It is enough, for the contingency of the actual world, if the other possible worlds are 'possible in their own nature' or 'do not imply a contradiction in themselves,' considered apart from God's choice. (1994, 12-13)

Most of what is said here I agree with. The one place I think Adams slips is the sentence: The possibility of those other worlds does not depend on the possibility of God's choosing them. As I will explain in detail when I deal with the related notion of moral necessity, it is essential to a world's being per se possible that it exist in the space of possibility in God's intellect and that it be *really* possible that God choose that world in his world selection activity.<sup>86</sup>

Adams then claims that the notion of a possible world involved in the per se possible conception of a world is a pared down notion of a possible world, what he calls

---

<sup>86</sup> I can only speculate that the view that per se possible worlds are only possible considered independently of God's will is reflected in Wilson's comments above on per se possibility. Recall that she states, "that more than one world is possible *in itself*, or self-consistent (where God's choosing the world He does might still be necessary)" (723). Again, I reject this notion of per se possibility. It is essential to Leibniz, when he employs the per se modalities, that God's choice is not necessary, simply because other worlds remain per se possible independent of his actual world choice, i.e., other worlds being per se possible just means God's choice was not necessary. To misunderstand this relationship is to run rough-shod over the per se modalities. Again, I will have more to say about this below.

the “basic concept” of a possible world. It “contain[s] information about everything that happens *in* that world, but not everything that is true about its relation to God’s will” (1994, 14). Adams wants to eliminate information about whether the world is the best or not, and hence information about God’s creative activity concerning it, such as whether or not it is actualized. I see the motivation for Adams’s picture but not the need. First the motivation: if a world contained information to the effect that God chooses not to actualize it, then there is a sense in which we might think that that world was never a serious contender for creation, and hence not really *per se* possible. However, I’m not sure we really need to have this worry. Leibnizian possible worlds exist in God’s intellect and that existence is independent of his will, or which world he decides to create. It is true that worlds contain information about God’s possible decrees, decrees he would have to make were he to instantiate a particular world. But those decrees concern things like the law of the general order of a world, physical and psychological laws, and not the creation-granting *fiat*. The upshot is that Leibnizian possible worlds just are what Adams calls basic concepts of possible worlds, and from a Leibnizian point of view, one never needs to worry about Adams’s complete concepts of possible worlds. The basic concept of a possible world is not a pared down concept, it is *the* concept, while Adams’s complete concept of a possible world appears to be an unnecessary beefing-up.

### 2.3 Hypothetical Necessity: Necessity of the Consequence vs. Necessity of the Consequent

Next Adams takes on a notion close at hand to the per se modalities—hypothetical necessity. At many points where Leibniz is discussing the per se modalities, he says that while a given state of affairs P is hypothetically necessary, it remains contingent because other states of affairs remain per se possible (see DM 13, the first part of the Letters to Arnauld, T 386, for instance). Adams claims that for Leibniz, hypothetical necessity is often equated with necessity of the *consequence* ( $\Box(H \supset P)$ ) rather than necessity of the *consequent* ( $H \supset \Box P$ ), where P is the proposition that is claimed to be hypothetically necessary and H the hypothesis. Adams goes on to note that to claim that some state of affairs is hypothetically necessary relative to God's choice of the best does no work to avoid necessitarianism, given that God's choice of the best is necessary (16). In other words, from:

1)  $\Box(\text{God chooses the best} \supset P)$  i.e., that it is hypothetically necessary that P

and

2)  $\Box \text{God chooses the best}$

It follows that:

3)  $\Box P$

While Adams is surely right about this inference, we need to move a bit more cautiously when translating into a logic the claims Leibniz makes about necessity of the consequence and necessity of the consequent. Let us look at some of the things Leibniz says about these notions.

This first passage is from a work entitled, “On Freedom and Grace” (Summer 1680-84).

Necessity of the consequence is what is founded on the principle of contradiction, that is, on a hypothesis, which already involves that very thing being asked about. Hence it follows with regard to matters of fact that there cannot be a necessity of the consequent, or to already involve necessity without any hypothesis, for necessity cannot be demonstrated except by the principle of contradiction, and it is because of this that something is presupposed. But in propositions of eternal truth things are different, because they are not affected by existence, not to mention by mere hypothetical propositions. (AVI.iv 1457; my translation)

Here Leibniz seems to say that a necessity of the consequence is something that is demonstrable because of a hypothesis that conceptually involves the thing in question. However, Leibniz says that a contingent fact will not “involve necessity without any hypothesis, for necessity cannot be demonstrated except by the principle of contradiction,” and the hypothesis that involves the contingent fact supplies the basis for the contradiction when the contingent fact is denied. This suggests that at least in this text Leibniz thought that contingent facts could be demonstrated given hypotheses because they were constituent parts of those hypotheses—to assume that the contingent fact is not the case will lead to a contradiction, given the hypothesis of which it is a part. However, the contingent fact that forms a constituent part of the hypothesis cannot, by itself, be demonstrated—it is not a necessity of the consequent. We can rightly ask why

he thought that if a contingent fact can be demonstrated from a hypothesis, of which it forms a constituent part, and that the hypothesis itself can be demonstrated, the contingent fact cannot thereby be understood to have been demonstrated. That is, if some contingent fact P carries with it a necessity of the consequence, and the hypothesis relative to which it does carry such a necessity is the fact that God chooses the best, and this latter state of affairs is necessary, it seems that this necessity would transfer to P. In other words, it seems that if a state of affairs is necessary then its constituent parts are as well. Unfortunately, this text is not forthcoming with an answer to this problem.<sup>87</sup>

The next bit of text is from, “For and Against Bellarmine, On the Controversies of Thomas” (1680-84).

(+NB. Necessity of the consequence is when something follows from something else by a necessary consequence, absolute necessity is when the contrary of the thing implies a contradiction. From the essence of God, or from the highest perfection, it certainly follows by a necessary consequence, if this way of speaking pleases, that God chooses the best, nevertheless he freely chooses the best, because in itself the best is in no way absolutely necessary, otherwise the contrary of it would imply a contradiction, and only the best would have been possible, the rest truly would have been impossibilities, contrary to the hypothesis. And so (we may suppose that) between a circle and triangle mutually concurring he freely chooses the circle given that he chooses on account of the greater reason of beauty, but on the other hand, between a circle of uniform and deformed circumference he doesn’t choose, but given that a circle will be created, he will necessarily create a uniform one, and it can absolutely be said that a deformed circle cannot be chosen by God, because its nature is impossible, and so it is absolutely necessary for it to be rejected.+)

(+The root of freedom in God is the possibility of things, that is, their being contingent, whereby he makes innumerable things to be discovered

---

<sup>87</sup> Of course, Leibniz’s move here is just to say that the constitutive part of the state of affairs is not necessary when considered independently of its whole. The problem is that it’s just not clear that the modal status of a state of affairs is relative to contexts of consideration. I suppose that the whole state of affairs might be necessary *de dicto*, leaving the identity of its constituent parts in limbo, so to speak. More on this below.

that neither are necessary nor impossible, from which God chooses those things which bring about the greatest testimony to his glory. The root of freedom in man is the divine image, insofar as God certainly wills to create him free and makes him in such a way as to not be moved except by some kind of consideration of his own good, just as God in choosing doesn't have a reason except his glory, there is only this difference, that man can always be mistaken because of the original defect of a creature, God cannot.+) (AVI.iv 2577; my translation)

Here, unlike the previous text, Leibniz begins by distinguishing necessity of the consequence from absolute necessity. He says that necessity of the consequence is when something follows from something else necessarily, while absolute necessity is when something is governed by the principle of contradiction and is thus demonstrable. Leibniz then claims that "God chooses the best" carries with it a necessity of the consequence, because it follows necessarily from his essence, and from this it follows that the best obtains. Nevertheless, God chooses the best freely, and, presumably, it is not absolutely necessary because that the best obtains is not absolutely necessary, and its opposite remains per se possible. Again, it is hard to understand what Leibniz is up to here. If something follows necessarily from something else that is necessary, as presumably the best obtaining follows from God choosing the best, which in turn follows from his essence, it is hard to see how the former is not necessary as well. I think that in this text, and to some extent in the former, Leibniz is struggling to find a way to harmonize several key intuitions. That other states of affairs remain per se possible because there is no contradiction in the assumption that they do obtain, that God freely chooses the best and hence deserves to be praised, and that God is necessarily morally good, that is, that there is some kind of contradiction lurking in the assumption that God might not choose the best.



We might gain some insight on the problematic inference by looking at the famous alterations Leibniz made to his earlier “Confessio philosophi” (1672-73?)<sup>88</sup>, where he changed:

...it is false that whatever follows from something necessary is itself necessary. (RS 55)

to:

...it is false that whatever follows from something necessary <per se> is itself necessary <per se>. (RS 55)

Here Leibniz has identified the very problem we have been dealing with, the transmission of the necessity of the antecedent to the consequent. The context is his response to the following argument:

the existence of God is necessary; the sins included in the series of things follows from this; whatever follows from something necessary is itself necessary. Therefore sins are necessary. (RS 55)

And Leibniz’s explanation of his revised response is as follows:

Now I have defined *the necessary* as something whose contrary cannot be conceived; therefore, the necessity and impossibility of things are to be sought in the ideas of those very things themselves, not outside those things. It is to be sought by examining whether they can be conceived or whether instead they imply a contradiction. <For in this place we call *necessary* only what is necessary *per se*, namely, that which has the reason for its existence and truth in itself. The truths of geometry are of this sort.

---

<sup>88</sup> See RS xxiv-xxvii for much more about this alteration.

But among existing things, only God is of this sort; all the rest, which follow from the series of things presupposed—i.e., from the harmony of things or the existence of God—are *contingent per se* and only hypothetically necessary, even if nothing is fortuitous, since everything proceeds by destiny, i.e., from some established reason of providence.> Therefore if the essence of a thing can be conceived, provided that it is conceived clearly and distinctly (e.g., *a species of animal with an uneven number of feet, also a species of immortal beast*), then it must already be held to be possible, and its contrary will not be necessary, even if its existence may be contrary to the harmony of things and the existence of God, and consequently it never will actually exist, but it will remain *per accidens* impossible. Hence all those who call impossible <(absolutely, i.e., per se)> whatever neither was nor is nor will be are mistaken. (RS 57)

Here we see Leibniz invoking the per se and per accidens modal distinctions. He claims that what we commonly mean when speaking of necessity is the per se variety—that whose opposite involves a conceptual contradiction. All contingent things, “which follow from the series of things presupposed—i.e., from the harmony of things or the existence of God—are *contingent per se* and only hypothetically necessary,” and their opposites are merely “*per accidens* impossible.” I think that it is clear that this modal distinction is enough to avoid Adams’s argument against Leibniz. If some contingent fact P follows logically from the fact that God chooses the best, and it is per se necessary that God chooses the best, then the space is open for Leibniz to claim that it does not follow that P is per se necessary, that it remains per se contingent and merely hypothetically necessary or necessary per accidens. Semantically, even if there is a contradiction involved in the concept of God not choosing the best, that is, that God chooses the best is per se necessary, and P follows from the fact that God chooses the

best, the concept of the opposite of P does not involve a contradiction in itself and is thus per se possible.<sup>89</sup>

I want to now turn to some considerations of the Medieval logical background that Leibniz inherited in order to get some traction on his use of the per se/per accidens modal distinction and through that on the necessity of the consequence and necessity of the consequent one. The background is Aristotelian logic and a set of modal inferences, one involving the “conversion” of modal statements and the other involving modal syllogisms. By “conversion” of a modal statement was understood the corresponding modal statement with antecedent and consequent switched, and the quantifier flipped to its corresponding dual, for example, “Necessarily all A are B” becomes “Necessarily some B are A.” The problem was that there appear to be obvious counterexamples to some of the inferences Aristotle endorsed. Much of Medieval modal logic was spent attempting to articulate conditions under which such inferences are valid and invalid, including the per se modal move and the distinction between necessity de re and de dicto. Consider the following account by Simo Knuuttila:

In his treatise *On Hypothetical Syllogisms* Boethius speaks about two kinds of conditionals which express a necessary consequence between the antecedent and the consequent. The consequence is accidentally necessary when the antecedent and consequent are immutably true but

---

<sup>89</sup> Of course, it is essential here that the “follows from” or “consequence” relation here is not itself per se necessary. Given that Leibniz defines per se necessary here in terms of conceivability, and given the Medieval logical background I discuss below, and given Leibniz’s own tendency to see hypothetical propositions in terms of concept containment, it is arguable, and I will argue, that Leibniz held the consequence relation to involve some kind of relevance condition. If this is the case then it is not per se necessary that if God chooses the best then P, because there is no conceptual impossibility in the notion that God chooses the best and not P, i.e., P’s concept does not wear its bestness on its sleeve.

have no internal link between them, for example, 'If fire is hot, the heavens are spherical'. In a non-accidental consequence, which Boethius calls natural, there is a conceptual connection between the parts; for example, 'If something is human, it is an animal'. Abelard also teaches that a genuine conditional expresses a necessary consequence in which the antecedent of itself requires the consequent. These were taken to express immutable laws of nature derivable from the nature of things. A related distinction between *per se* and *per accidens* necessary propositions was employed in mid-thirteenth century discussions of modal conversion and modal syllogistic. Robert Kilwardby states that some necessary connections between terms are merely accidentally necessary in the sense that the things signified are inseparable. These necessities are not dealt with in modal syllogistic the necessity propositions of which express *per se* necessities explained in *Posterior Analytics* I.4. The first type is said to occur when the definition of the subject includes the predicate and the second type when the definition of the predicate includes the subject. Typical *per se* necessary propositions were those expressing the properties determined by the substantial form of a subject or, as in the second class, other features based on the genus-species structure....

Necessary propositions which were not *per se* necessary were often exemplified by propositions about inseparable accidents. In the *Isagoge*, Porphyry defines the inseparable accident as something which cannot actually be removed from its subject though the subject can be conceived of without it. (Knuuttila 529)

Speaking of the 13<sup>th</sup> century logician and Archbishop Robert Kilwardby's approach to the recalcitrant modal inferences, Knuuttila says that:

Robert Kilwardby...moves to a 'more probable' interpretation which is based on the view that convertible necessity premises in modal syllogistic are necessity propositions *per se* and not *per accidens*... In affirmative necessity propositions *per se*, the subject is *per se* connected to the predicate. In negative necessity propositions *per se*, the subject is apparently *per se* incompatible with the predicate. In accidental necessity propositions, the connection is not based on a *per se* inherence or repugnance. (539)

And the 12<sup>th</sup> century Averroes before him employed a similar strategy.

While Averroes's commentary on the Prior Analytics follows the main lines of Aristotle's text, his separate treatise on modality involves new systematic ideas, mainly the theory of accidental and per se necessary essential terms. According to Averroes, necessary syllogistic premises are per se necessary propositions with per se necessary essential terms. Since modal premises are of the divided type, assertoric premises in Aristotelian mixed necessary-assertoric-syllogisms must have a predicate term which in fact is necessary. (544-45)

Without getting too bogged down in the intricacies of these different Medieval approaches to Aristotle's modal inferences, it should be clear that most of the authors employed some kind of distinction between per se and per accidens necessary propositions and connections between propositions. Furthermore, that distinction is usually spelled out along conceptual lines, as the conceptual inherence of the predicate in the subject or the conceptual connection between consequent and antecedent. Knuuttila summarizes the different attempts at rescuing Aristotle's modal logic as going beyond logic to make metaphysical distinctions between kinds of modality:

Averroes, Robert Kilwardby, Albert the Great, and their followers regarded Aristotle's modal syllogistics as a correct theory of modalities, the explication of which often demanded metaphysical considerations. Restricting the modal conversion of necessity propositions to those involving essential terms is an example of this attempt to discern the unity and coherence of Aristotle's theory. (540)

Speaking of Buridan and other 14<sup>th</sup> century logicians' work, the "metaphysical considerations" about the notion of necessity is cashed out in terms of the de re de dicto distinction:

...it was considered imperative to distinguish between modal premises in the compound (de dicto) and divided (de re) senses and to divide the de re

modals into two groups depending on whether the subject terms refer to actual things or possible things. Aristotle's modal syllogistics was regarded as a fragmentary theory in which the distinctions between different types of fine structure were not explicated. (553)

Catarina Dutilh Novaes, speaking of the standard behavior of the consequence relation, has this to say about the Medieval logical background:

These rules [*ex impossibili* and *ad necessarium* (a contradiction entails anything and anything entails a logical truth)] follow naturally from the modal definition of consequence [that it is not possible for the antecedent to be true and the conclusion false] (if it is seen as a sufficient condition), such that those who accept this definition as a sufficient condition for a consequence must admit the validity of these two principles....

But in several periods of the history of logic, some have seen these two principles as highly counterintuitive given that, according to them, propositions that are otherwise not related by meaning or logic in any way whatsoever are in a relation of consequence with one another....

Prior to the 14<sup>th</sup> century, illustrious logicians such as Abelard and Kilwardby had already restricted their notion of consequence, not accepting the modal definition as a sufficient condition. Abelard, for example, required that the consequent be contained in the antecedent for a consequence to hold... With this move, *ex impossibili* and *ad necessarium* no longer hold. (482-83)

Thus for many Medieval logicians the consequence relation was closer to contemporary relevance logics—there had to be a conceptual connection between antecedent and consequent. We see a similar move here to the previous one of restricting modal inference in terms of *per se* versus accidental necessity.

The similarity between Leibniz's attempts to explain necessity of the consequent and consequence to these Medieval predecessors are striking. In "On Freedom and Grace" Leibniz had said that, "it follows with regard to matters of fact that there cannot be a necessity of the consequent, or to already involve necessity without any hypothesis."

Here Leibniz seems to be invoking the idea that a contingent fact cannot be given a necessity of the consequent because to see it as necessary one must already include the hypothesis of which it is a constituent part, and that this kind of necessity is merely a necessity of the consequence. Here there is a conceptual connection between antecedent hypothesis and contingent consequent in the consequence relation. However, for reasons mentioned above, I think this text does little to block the necessitarian inference. If the hypothesis is necessary then its constituent parts will be as well. In “For and Against Bellarmine” Leibniz says that, “From the essence of God, or from the highest perfection, it certainly follows by a necessary consequence, if this way of speaking pleases, that God chooses the best, nevertheless he freely chooses the best, because in itself the best is in no way absolutely necessary.” This bears striking resemblance to the idea that per se necessary connections must involve a conceptual connection between the antecedent and the consequent. The connection between God’s essence and his choosing the best bears out this connection. However, the connection between God choosing the best and some contingent fact P that is part of the best, does not according to Leibniz. Therefore, although there may be a causal connection between God choosing the best and P, there is no logical one, and the problematic inference cannot be made.

The next text where Leibniz mentions the distinction between what is a necessity of the consequence and of the consequent that evidences Leibniz’s connection to, and engagement with, the Medieval logical tradition is from “On Contingency” (1689):

So, although one can concede that it is necessary for God to choose the best, or that the best is necessary, it does not follow that what is chosen is necessary, since there is no demonstration that it is the best. And here the distinction between necessity of the consequence and necessity of the

consequent is in some way relevant; in the end, the proposition in question is a necessity of the consequence, not of the consequent, because it is necessary once we grant the hypothesis that we take it to be the best, assuming that the best is necessarily chosen. (AG 30)

Here Leibniz seems to have evolved the argument. He claims that even if one admits that God choosing the best is necessary, something he was willing to admit in “For and Against Bellarmine,” (even though he chooses freely because the best is not absolutely necessary), it doesn’t follow that what obtains is necessary. He says that P, where P is some contingent fact that obtains, is a necessity of the consequence, because it is hypothetically necessary, given that P is the best and that God necessarily chooses the best. The question Leibniz had been asking is this:

Assuming that the proposition “the proposition that has the greater reason for existing [i.e., being true] exists [i.e., is true]” is necessary, we must see whether it then follows that the proposition that has the greater reason for existing [i.e., being true] is necessary. But it is justifiable to deny the consequence. (AG 30)

Leibniz appears to be evoking the de re/de dicto distinction in this text, one we already have seen was relevant to Medieval logical discussions of modal inferences. It is necessary de dicto that God choose the best, whatever that happens to be. However, it is not necessary de re that P obtains because there is no demonstration that it is the best. Said in another way, there is simply no conceptual connection between God choosing the best and P.

This is what I think is going on. Around the time of the *Confessio*, during the 1672-73 period, Leibniz saw and recognized the problem that is embodied in Adams’s argument, that what necessarily follows from something necessary is itself necessary. At



that time Leibniz, influenced by Medieval logical accounts, began to evoke the distinction between what is per se necessary and what is merely accidentally necessary. I think something very close to this original approach is what Leibniz ends up adopting as late as the Theodicy. Around the period of 1680-84, we see Leibniz employing, in various ways and to various degrees of success, a distinction between necessity of the consequence and consequent, one not very well worked out or distinct in his own head. We see this in the various different accounts in “On Freedom and Grace” and “For and Against Bellarmine” of that period. Finally, by the time of writing “On Contingency” in 1689, Leibniz has all but given up the verbiage of necessity of the consequent and consequence, as evidence by his statement that, “here the distinction between necessity of the consequence and necessity of the consequent *is in some way relevant*.” What that relevant way is Leibniz had been working on in the intervening years to determine. At any rate the strategy is to block the inference by invoking different kinds of necessity. What I believe is going on in “For and Against Bellarmine” and “On Contingency” is that Leibniz is invoking a relevance condition on the consequence relation in order to transfer per se necessity from the antecedent to the consequent. So that while admitting that from:

$$1) \Box(H \supset P)$$

$$2) \Box H$$

It follows that:

3)  $\Box P$

Leibniz would deny that:

1')  $\Box(H \supset_R P)^{90}$

So that while it is per se necessary that H, or alternatively, necessary de dicto that H:

2')  $\Box_P H$

or

2'')  $\Box_{\text{DE DICTO}} H$

It remains accidentally necessary or hypothetically necessary or not necessary de re that P, that is, not-P is per se possible, because the per se necessity of H cannot transfer to P because of the lack of a relevant consequence relation. So Leibniz will only admit that:

3')  $\Box_H P \ \& \ \Diamond_P \sim P$

And thus Leibniz blocks the pernicious necessitarian inference to 3).

---

<sup>90</sup> Where  $\supset_R$  represents the relevance condition on the consequence relation.

To summarize, Leibniz would admit that it is *per se* necessary that God choose the best but deny that it is *per se* necessary that *P*, where *P* is some contingent fact that is part of the best, because there is no conceptual connection between God choosing the best and *P*, and a conceptual connection is what is required to transfer the *per se* necessity of the antecedent to the consequent. That is, it is only necessary *de dicto* that God choose the best, whatever that happens to be, but not necessary *de re* that God choose *P*, which is the best. *P* remains only necessary accidentally or hypothetically necessary or necessary by a necessity of the consequence, where some other incompatible contingent fact *P'* remains *per se* possible.

The upshot of all this is that commentators have been too quick to read Leibniz's necessity of the consequence and necessity of the consequent in terms of the classical modal logic expressions  $\Box(A \supset P)$  and  $A \supset \Box P$ , respectively. They have failed to see that Leibniz is working with his own notion of derivability, a Medieval modal logic inheritance, and multiple notions of necessity. The failure to see this has led many to see problems where Leibniz, read on his own terms, had none, or at least had a different set of ones.

## 2.4 The *Real* Reality of (Divine) Choice

As an example of such misunderstanding, consider the following possible objection that Adams makes.

For what is contingent in this Leibnizian sense may still be necessary by necessity of the consequent—that is, absolutely necessary—in the

traditional (and twentieth-century) sense. And the choice of this world to actualize may be necessitated by God's nature as perfectly good, even if other worlds remain possible in themselves. If this is all that Leibniz has to offer in defense of contingency, his system may be thought as necessitarian as Spinoza's. (1994, 20)

Adams's objector takes up the argument that Leibniz's distinction between necessity of the consequence and necessity of the consequent slips into necessitarianism. Adams's reply is as follows:

Most of what is said in this objection is right, in a way, but it overlooks the nature of Leibniz's interest in free will and contingency, along with his stated view of the difference between his determinism and Spinoza's. His interest in contingency is rooted in his interest in divine and human free will—with respect to which he is, after all, a compatibilist. We must let him define for himself what kind of compatibilist he is....his principle reason for insisting on some sort of contingency in connection with free action seems to have been to ensure the reality of choice—to ensure that what happens is really influenced by final causes and judgments of value. (1994, 20)

I cannot understand Adams's stated answer to his own objection. Adams claims that the objection "overlooks the nature of Leibniz's...stated view of the difference between his determinism and Spinoza's." There is no difference between the determinism of Leibniz and Spinoza. They are both determinists in the relevant sense.<sup>91</sup> He then goes on to claim that, "We must let him define for himself what kind of compatibilist he is." There is no compatibility between freedom and necessity, between contingency and necessity, only between freedom and determinism. Adams, uncharacteristically, seems to be

---

<sup>91</sup> The relevant sense being that from the relevant laws and initial conditions, any future state of the system is rendered unique. There is a one-to-one mapping between laws, conditions, and elapsed time to states of affairs.

mixing the notions of necessitarianism, determinism, and compatibilism into an incoherent brew.

I take his point to be something along the following lines. An objector says that the notions of per se possibility and hypothetical necessity do nothing to rescue Leibniz from necessitarianism. Adams's reply is that Leibniz isn't a necessitarian like Spinoza because, for Leibniz, there are real final causes operating in the world as a result of real agents responding to real value. If something like this is his point, then I begin to have philosophical difficulties with Adams's position here. What philosophical good sense can be made of a picture that involves necessitarianism, but in the same breath one is told that there is real contingency and free choice due to the operation of final causes in the world? I'm not sure I can make any sense of this, and it seems to me to be little more than bald assertion. Necessitarianism surely means that things *could not have gone otherwise*, and while there may be some conceptual wiggle room to save could-have-gone-otherwise intuitions and definitions of determinism, there is none between those intuitions and necessitarianism. That Adams himself could have ever thought otherwise is surely related to his mixing of the concepts mentioned above. Inserting final causes into a necessitarian world does little to stem the tide of a blind necessity.

Of course, Adams is correct in emphasizing that for Leibniz, as opposed to Spinoza, God is an agent that makes choices in accordance with the good. The problem is you can't get this in a metaphysical system where all events are necessary. Adams apparently tries to make good on this picture by inserting a section on the notion of moral necessity. Adams says that, "the morally necessary is what one morally ought to do" (1994, 22). This is certainly correct, but uninformative. Later he says that

Accordingly, when Leibniz says that God's choice of the best is morally necessary, we must take him to mean that it is necessary that if God did not choose the best, God would not be perfectly good. (1994, 22)

On this picture, Adams would parse:

$\Box_M$  God choose the best

as:

$\Box(\text{God did not choose the best} \supset \text{God is not perfectly good})$

This, by contraposition leads to:

$\Box(\text{God is perfectly good} \supset \text{God chose the best})$

but:

$\Box$  God is perfectly good

and so it follows that:

□ God chose the best

And it appears that the morally necessary as defined by Adams winds us right back into necessitarianism, and by the very same route that Adams worried about in the context of exploring necessity of the consequence and consequent. Something must have gone wrong, as Leibniz is adamant that moral necessity is not metaphysical necessity.

However, Leibniz is of little help. Most of what he says directly about moral necessity is along the following lines:

...and obligation is a moral necessity, which is certainly imposed on a good man, if he would want to protect his name. (A VI.iv 2857, see also 2850 and 2855; my translation)

As I mentioned above, a consideration of God's omnibenevolence seems to lead back into necessitarianism. It may be true that God chooses what is best by a moral necessity, but it seems that God's omnibenevolence entails that God is metaphysically necessarily good and so it seems to follow that the moral necessity of God's choice is swallowed up by the metaphysical necessity of his goodness.

A consideration of Deontic logics may help to clear some conceptual space here. Deontic logics reject axiom (M)  $\Box P \supset P$  and instead adopt the weaker axiom (D)  $\Box P \supset \Diamond P$  (Garson 45-50). Just because something is obligatory does not mean that it is the case, from the obligatory one can only infer the permitted. Note that this is independent of explanations as to why this is the case, i.e., nothing in the logic entails that it is due to akrasia or a lack of power, although of course those considerations may have been important in the opposite direction in the motivation for the rejection of M. By rejecting

$\Box P \supset P$ , Deontic logics plausibly reject the principle that if some state of affairs  $P$  is obligatory, then  $P$  obtains. So some state of affairs  $P$  may be morally necessary  $\Box_M P$  and it may be that God is perfectly good by a metaphysical necessity,  $\Box(\text{God is good})$ , but it does not follow by any inference that  $P$  is metaphysically necessary. I suppose one could argue that it is metaphysically necessary that if God is perfectly good then God does what is morally necessary, God is necessarily perfectly good and  $P$  is morally necessary, therefore God necessarily does  $P$ . But for this argument to work it would have to be shown that the fact that  $P$  is morally necessary is itself metaphysically necessary. I think Leibniz's metaphysics would reject this latter claim, because in order to show that  $P$  was morally necessary would involve showing that  $P$  was the best or part of the best, and this latter claim would involve an infinite analysis.

So what it means to say that God is omnibenevolent is that he is perfectly good and that God necessarily does what is best, but the necessity here is a moral necessity. That God is necessarily good is a metaphysical necessity. God necessarily does what is best but he does it freely. Could he have done otherwise? Yes. Does this mean that there is some possible world or possible God where he does do otherwise? No, the semantics for counterfactuals involving God run differently than those for creatures. It means that there is a space of possibilities that exist in God's intellect and are world expressions of his divine nature and remain in existence independent of his will. Recall what Leibniz says in "For and Against Bellarmine," that, "The root of freedom in God is the possibility of things." One may still ask: What sense can be made of an agent that possesses a moral character with metaphysical necessity but whose actions, which flow from this character as a causal source, are merely morally necessary and freely done?



Leibniz's answer is that the choice is done within a space of possibles. Hence my account of moral necessity has ended up reemphasizing the importance of Leibniz's per se possible account!

## 2.5 Moral Necessity and Per Se Possible

I have shown that the divine freedom compatible with a morally necessary action simply is the existence of worlds that are per se possible. I now want to turn to Leibniz's mature per se solution to the theological threat to contingency. In one of the appendices to the *Theodicy* entitled "Summary of the Controversy Reduced to Formal Arguments," the last objection runs:

Whoever cannot fail to choose the best is not free.  
 God cannot fail to choose the best.  
 Therefore God is not free. (T 386)

Leibniz's response to the challenge is the following:

I deny the major of this argument [premise 1)]. Rather is it true freedom, and the most perfect, to be able to make the best use of one's free will, and always to exercise this power, without being turned aside either by outward force or by inward passions, whereof the one enslaves our bodies and the other our souls. (T 386)

He continues:

Nevertheless, although his will is always indefectible and always tends toward the best, the evil or the lesser good which he rejects will still be

possible in itself. Otherwise the necessity of good would be geometrical (so to speak) or metaphysical, and altogether absolute; the contingency of things would be destroyed, and there would be no choice. But necessity of this kind, which does not destroy the possibility of the contrary, has the name by analogy only: it becomes effective not through the mere essence of things, but through that which is outside them and above them, that is, through the will of God. This necessity is called moral, because for the wise what is necessary and what is owing are equivalent things; and when it is always followed by its effect, as it indeed is in the perfectly wise, that is, in God, one can say that it is a happy necessity. (T 387)

Here again we see Leibniz's integrated use of the per se modalities and moral necessity to combat the theological threat to contingency. The sense in which God could not fail to choose the best, or that he necessarily chooses the best is a moral necessity. God is free because other alternative choices remain per se possible. Again, "The root of freedom in God is the possibility of things," and not the other way around. The root or ground or explanation of God's freedom are the per se possibility of other worlds in his intellect, and the explanation of their possibility does not lie in an account of the specifics of God's free choice. To mistake this is to reverse explanans and explanandum.

### 3.1 Modal Logic with Incomplete and Complete Individual Concepts: A Rejection of Superessentialism and a Vindication of A Priori Reasons

I want to now put together in one place a formal treatment in terms of a possible worlds semantics. I have shown so far that Leibniz most likely endorsed some kind of relevance logic with the addition of a free logic interpretation of existence. Our fully specified model looks like this:

$\langle W, R, D, I, B, f_i, f_c \rangle$

Where  $W$  is the set of worlds,  $R$  the accessibility relation among those worlds,  $D$  the disjoint set of domains at a world no two of which share a member,  $I$  the set of intensional functions that map worlds into members of the domain at that world,  $B$  is an aesthetic measure that relates worlds in terms of a better than relation,  $f_i$  the assignment function for incomplete individual concepts, and  $f_c$  the assignment function for complete individual concepts. For any name, say  $p$  for Peter,  $f_i(p)$  will pick out multiple individuals across worlds because of the incomplete nature of the concept used to refer to Peter. Of course, only one of those individuals is our actual Peter, and so  $f_c(p)$  will pick out only the individual Peter of the actual world. The truth conditions are as follows using  $D$  for denies and  $p$  for Peter:

Peter denies= $T$  iff there is a function  $i \in I$  such that  $f(p)=i$  and  $i(w_{@}) \in D_{@}$  and  $f_{w_{@}}(Di)=T$ , that is,  $i(w_{@}) \in f_{w_{@}}(D)$

It is necessary that Peter denies= $T$  iff there is a function  $i \in I$  such that  $f(p)=i$  such that for all worlds  $w \in W$  where  $w$  is accessible from  $w_{@}$ ,  $f_w(Di)=T$ , that is,  $i(w) \in f_w(D)$

It is essential that Peter denies= $T$  iff there is a function  $i \in I$  such that  $f(p)=i$  such that for all worlds  $w \in W$  where  $w$  is accessible from  $w_{@}$  if  $i(w) \in D_w$  then  $f_w(Di)=T$ , that is,  $i(w) \in f_w(D)$

The counterfactual  $A \Rightarrow C = T$  iff for all  $w$  such that  $f_w(A) = T$  there exists some  $w^*$  such that  $Bw^*w$  for all relevant  $w$  and  $f_{w^*}(C) = T$

The difference between a property being necessary and essential comes down to relativizing quantification over worlds where the individual exists. An essential property is one that an individual has in all worlds where he exists, or is necessary relative to worlds where he exists. Notice that in giving the truth conditions I have neglected the distinction between the functions  $f_i$  and  $f_c$ , that is, between incomplete and complete individual concepts. The kinds of modality involved will differ with each of these functions. Using  $f_c$  all of an individual's properties will turn out to be necessary relative to worlds where he exists, while using  $f_i$  will result in an individual having a normally robust modal profile. What is this distinction? Restricting our consideration to worlds where  $p$  exists, how can both  $\Box Dp$  be true relative to  $f_c$  while false relative to  $f_i$ ? The answer is that the name  $p$  is picking out different things when assessed with the different functions. This is intended to capture in the logic relevant differences in the  $\Box$ . The relevant  $\Box$  involved in using  $f_c$  can be thought of as an a priori necessity, or what Leibniz calls certainty or infallibility, while the  $\Box$  associated with  $f_i$  can be thought of as metaphysical necessity.

...all contingent propositions have reasons to be one way rather than another or else (what comes to the same thing) that they have a priori proofs of their truth which render them certain and which show that the connection between subject and predicate of these propositions has its basis in the natures of both. (AG 46)

Above we need to revise our truth conditions for relative necessity or essentiality to the following:

It is essential that Peter denies= $T$  iff there is a function  $i \in I$  such that  $f_i(p)=i$  such that for all worlds  $w \in W$  where  $w$  is accessible from  $w_@$  if  $i(w) \in D_w$  then  $f_{iw}(Di)=T$ , that is,

$$i(w) \in f_{iw}(D)$$

And the truth conditions for a priori necessity or certainty become:

It is certain that Peter denies= $T$  iff there is a function  $i \in I$  such that  $f_c(p)=i$  such that for all worlds  $w \in W$  where  $w$  is accessible from  $w_@$  if  $i(w) \in D_w$  then  $f_{cw}(Di)=T$ , that is,

$$i(w) \in f_{cw}(D)$$

Given this, it is plausible that not all of Peter's properties will be essential to him. There will be other possible Peters in other worlds that don't deny. However, given the behavior of  $f_c$ , we know that all of Peter's properties will turn out to be certainly true of him because the function involved picks out his CIC and this exists in only one world.

### 3.2 Leibniz's Modal Philosophy: A Non-Necessitarian Error Theory

The question now is how to make sense of the diverse modal strands of Leibniz's thought. In particular, how do we make sense of Sleigh's observation that Leibniz endorsed superintrinsicness and rejected superessentialism? In addition, how do we

avoid necessitarianism given world boundedness? The answer to the latter is that Leibniz avoided necessitarianism by his *per se* possible account. Things are not necessary because God could have chosen another world to create and his choosing remains free and only morally necessary. This is the basic account in terms of possible worlds. State of affairs *s* is not necessary because *s* doesn't obtain in all worlds. Of course, this is because *s* in all its infinite detail obtains in only one world. This is little comfort for individuals because had God chosen differently *everything* would have been different, and no individual that actually exists now would then exist. This is the thesis of *superintrinsicness*: had anything been different you would not exist.

As we have seen, Leibniz puts *superintrinsicness* to theodician work, justifying God's providential dispensation of grace in light of the fact that some of us didn't get enough to be saved.

...I parried the arguments of those who were indignant that God did not eliminate Adam and Eve from the world at once when they first sinned (so that their stain would not be propagated to their posterity) and that God did not substitute others better than they were. For I have drawn attention to the fact that if God had done that, sin having been taken away, an entirely different series of things, entirely different combinations of circumstances, persons, and marriages, and entirely different persons would have been produced and, consequently, sin having been taken away or extinguished, they themselves would not have existed. They therefore have no reason to be indignant that Adam and Eve sinned and, much less, that God permitted sin to occur, since they must rather credit their own existence to God's tolerance of those very sins. (RS 107)

Of course, I'm not sure how satisfying Leibniz's move is. To be told that even though one is damned, it is better to exist and be damned than never to have existed at all, is very little recompense to my ear, but it is Leibniz's solution. Leibniz does offer some hope in

the *Confessio*. Damnation is, for Leibniz, simply hating the harmony of things and therefore hating God.

Therefore in the world no indignation is ever just, and no emotion of the soul, other than tranquility, is free from fault. Even to desire in such a way that makes you suffer, if it is not satisfied, is a sin and a kind of concealed anger against God and against the present state of things and against the series and universal harmony on which the present state of things depends. (RS 89)

Leibniz offers hope for the damned in their continual cycle of anger.

The damned are never damned absolutely; they are always worthy of damnation. They are damned by such a pertinacity, such a perversion of appetite, such an aversion to God that they enjoy nothing more than having something through which they suffer, and they seek nothing more than to discover a reason to be angry. This is the highest degree of the madness of reason... (RS 93)

So what about our modal profile that we normally think of as fairly robust? What of all the counterfactual claims that we think of as true and make up the content of our hopes and fears? Leibniz's considered position is that strictly speaking these are all incoherent and involve a presupposition failure on the part of the holder of these propositions. The presupposition that fails is the fact of one's existence at other worlds. Leibniz is an error theorist when it comes to counterfactual and modal claims about an individual's modal profile. Those claims are all incoherent strictly speaking, but insofar as one can possibly mean anything coherent by them, one must be speaking in terms of incomplete or vague concepts. Recall in this light what Leibniz says to Arnauld.

I have said that all human events can be deduced not simply by assuming the creation of a vague Adam, but by assuming the creation of an Adam determined with respect to all these circumstances, chosen from among an infinity of possible Adams. This has given Arnauld the occasion to object, not without reason, that it is as difficult to conceive of several Adams, taking Adam as a particular nature, as it is to conceive of several mes. I agree, but when speaking of several Adams, I was not taking Adam as a determinate individual. I must therefore explain myself. This is what I meant. When one considers in Adam a part of his predicates...and when one calls Adam the person to whom these predicates are attributed, all this is not sufficient to determine the individual, for there can be an infinity of Adams, that is, an infinity of possible persons, different from one another, whom this fits. (AG 72)

Here Leibniz says to Arnauld that it is incoherent to talk of other possible individuals when one takes the notion of an individual substance strictly, as one that possesses a complete individual concept. Insofar as it does make sense to talk of multiple possible individuals, one must be using an incomplete concept, one that contains only “a part of his predicates.” Recall as well what Leibniz says directly about counterfactuals.

For the most part, conditionals of the future are *senseless conditions*. Clearly when I ask what the future would have been if Peter had not denied Christ, it is asked what the future would be if Peter were not Peter, for having denied is contained in the complete notion of Peter. But it is nevertheless excusable on this occasion that by the name of Peter is understood some things involved in him, from which denying doesn't follow. (Grua 358; my translation and emphasis)

And this from a letter to Arnauld:

It seems obvious to us that this block of marble brought from Genoa would have been altogether the same if it had been left there, because our senses allow us to judge only superficially. But at bottom, because of the interconnection of things, the whole universe with all its parts would be quite different and would have been different from the beginning, if the least thing in it had happened differently than it did. It does not follow



from this that events are necessary, but rather that they are certain, given God's choice of this possible universe, whose notion contains this series of things. (AG 73)

Leibniz says in these passages that counterfactual intuitions about Peter or the Genoan marble are either senseless or wrong. In the former he goes on to give an account of how these claims might make sense, one that involves incomplete or vague concepts. Leibniz says that it is "excusable on this occasion that by the name of Peter is understood some things involved in him."

The following passages to Arnauld make clear the kind of balance Leibniz wants to strike:

...I agree that in order to determine the notion of an individual substance it is good to consult the one I have of myself, just as one must consult the specific notion of the sphere in order to determine its properties. Yet there is a considerable difference, for my notion and the notion of every other individual substance is infinitely broader and more difficult to understand than a specific notion, like that of the sphere, which is only incomplete. It is not enough that I sense myself to be a substance that thinks; I must distinctly conceive what distinguishes me from all other minds, and I have only a confused experience of this. The result is that, though it is easy to determine that the number of feet in the diameter is not included in the notion of sphere in general, it is not so easy to judge whether the trip I intend to make is included in my notion; otherwise, it would be as easy for us to be prophets as to be geometers. I am uncertain whether I will make the trip, but I am not uncertain that, whether I go or not, I will always be me. (AG 75)

and:

For I suspect that Arnauld did not want to grant me this proposition only because he took the connection I am maintaining to be both intrinsic and necessary, whereas I hold it to be intrinsic, but in no way necessary; for now, I have sufficiently explained that it is founded on free decrees and

acts. I do not intend any connection between the subject and the predicate other than that which holds in the most contingent of truths, that is, that we can always conceive something in the subject which serves to provide a reason why this predicate or event belongs to it, or why this happened rather than not. But these reasons for contingent truths incline, rather than necessitate. Therefore, it is true that I could fail to go on this trip, but it is certain that I shall go. This predicate or event is not connected with certainty to my other predicates, conceived incompletely or *sub ratione generalitatis*; but it is connected with certainty to my complete individual notion, since I suppose that this notion was constructed explicitly so that everything that happens to me can be deduced from it. (AG 76)

Leibniz says that, “whether I go or not, I will always be me” and “it is true that I could fail to go on this trip, but it is certain that I shall go.” In what sense could he, Leibniz, have failed to make the trip? There is certainly a sense in which he could have failed to make the trip because he never existed. However, in these texts Leibniz is keen on cashing out his error theory, and he does it in terms of incomplete concepts. In the latter text Leibniz makes clear that the connection between predicate and subject is intrinsic and not necessary or essential. But this intrinsic connection that is the basis for the apriority of the associated truth is only had in a CIC and not in an incomplete one, whose very incompleteness leaves open a space for possibility. Leibniz says that, “This predicate or event is not connected with certainty to my other predicates, conceived incompletely or *sub ratione generalitatis*; but it is connected with certainty to my complete individual notion.”

To summarize: Superintrinsicness is strictly speaking true. If anything had been different you would not have existed. Leibniz avoids necessitarianism because God could have freely chosen another possible world. All counterfactuals and claims about your modal profile are strictly speaking incoherent because of superintrinsicness. Leibniz avoids superessentialism by making sense of counterfactuals and claims about

modal profiles in terms of an error theory. These claims can only be made sense of by resorting to incomplete or vague concepts and it is relative to these that one must make judgments about essentiality. The possible people in other worlds referred to by incomplete concepts form the basis for an account of the modal status of individuals in terms of possible worlds. Properties that an individual has in the actual world but where a possible version or counterpart of him lacks are the very same ones that take an infinite analysis to arrive at on the basis of determining that the actual world is best.

Counterfactuals are determined by the relative bestness of the group of worlds that the antecedent picks out. Finally, contingent connections among possibles as such are accounted for by the infinity of the analysis involved. This is due to the fact that it would take an infinite analysis to reveal that that world is better than some other in which the contingent predicate of the purely possible substance fails to obtain.

## Abbreviations

- A        *Sämtliche Schriften und Briefe*. Berlin: Akademie, 1999.
- AG        *Philosophical Essays*. Trans. and ed. by Roger Ariew and Daniel Garber. Indianapolis: Hackett, 1989.
- Grua      *Textes Inédits*. Ed. by Gaston Grua. Paris: Presses Universitaires de France, 1948.
- L        *Philosophical Papers and Letters*. Trans. and ed. by Leroy Loemker. Boston: Kluwer, 1989.
- LA        *The Leibniz-Arnould Correspondence*. Trans. and ed. by H. T. Mason. NY: Manchester UP, 1967.
- MP        *Leibniz: Philosophical Writings*. Trans. by Marry Morris and G. H. R. Parkinson. Ed. by G. H. R. Parkinson. London: J. M. Dent and Sons Ltd., 1973.
- P        *Leibniz: Logical Papers*. Trans. and ed. by G. H. R. Parkinson. NY: Clarendon Press, 1966.
- NE        *New Essays on Human Understanding*. Trans. and ed. by Peter Remnant and Jonathan Bennett. NY: Cambridge UP, 1996.
- RA        *The Labyrinth of the Continuum: Writings on the Continuum Problem, 1672-1686*. Trans. and ed. by Richard Arthur. New Haven: Yale UP, 2001.
- RS        *Confessio philosophi: Papers Concerning the Problem of Evil, 1671-1678*. Trans. and ed. by Robert C. Sleigh, Jr. New Haven: Yale UP, 2005.
- T        *Theodicy*. Trans. by E. M. Huggard. Chicago: Open Court, 1990.

## Works Cited

- Adams, Robert Merrihew. 1979. *Theories of Actuality*. In *The Possible and the Actual: Readings in the Metaphysics of Modality*, ed. Michael Loux. Ithaca: Cornell UP.
- \_\_\_\_\_. 1994. *Leibniz: Determinist, Theist, Idealist*. NY: Oxford UP.
- Boolos, George. 1993. *The Logic of Provability*. NY: Cambridge UP.
- Brown, Gregory. "Leibniz on the Possibility of a Spatial Vacuum." Unpublished Manuscript.
- Cover, J. A. and John O'Leary-Hawthorne. 1999. *Substance and Individuation in Leibniz*. NY: Cambridge UP.
- \_\_\_\_\_. 2000. "Infinite Analysis and the Problem of the Lucky Proof." *Studia Leibnitiana* 32(2): 151-165.
- Davidson, Jack. 1996. "Untying the Knot: Leibniz on God's Knowledge of Future Free Contingents." *History of Philosophy Quarterly* 13(1): 89-116.
- Garson, James. 2006. *Modal Logic for Philosophers*. NY: Cambridge UP.
- Goodin, Susanna. 1998. "Why Knowledge of the Internal Constitution is Not the Same as Knowledge of the Real Essence and Why This Matters." *Southwest Philosophy Review* 14(1): 149-155.
- Griffin, Michael. 1999. "Leibniz on God's Knowledge of Counterfactuals." *The Philosophical Review* 108(3): 317-343.
- Hylton, Peter. 2007. *Quine*. NY: Routledge.
- Ishiguro, Hidé. 1972. *Leibniz's Philosophy of Logic and Language*. Ithaca, NY: Cornell UP.

Knuuttila, Simo. 2008. "Medieval Modal Theories and Modal Logic." In *Handbook of the History of Logic, Vol 2: Mediaeval and Renaissance Logic*. Ed. by Dov Gabbay and John Woods. NY: Elsevier.

Kripke, Saul. 1972. *Naming and Necessity*. Cambridge, MA: Harvard UP.

Kulstad, Mark. 1977. "Leibniz's Conception of Expression." *Studia Leibnitiana* 9(1): 55-76.

Levey, Samuel. 2005. *Leibniz on Precise Shapes and the Corporeal World*. In *Leibniz: Nature and Freedom*, ed. Donald Rutherford and J. A. Cover. NY: Oxford UP.

Lewis, David. 1979. *Possible Worlds*. In *The Possible and the Actual: Readings in the Metaphysics of Modality*, ed. Michael Loux. Ithaca: Cornell UP.

Locke, John. 1975. *An Essay Concerning Human Understanding*. Edited by Peter H. Nidditch. NY: Oxford UP.

Loeb, Louis. 1981. *From Descartes to Hume*. Ithaca: Cornell UP.

Loux, Michael. 1979. *Introduction: Modality and Metaphysics*. In *The Possible and the Actual: Readings in the Metaphysics of Modality*, ed. Michael Loux. Ithaca: Cornell UP.

\_\_\_\_\_. 2006. *Metaphysics: A Contemporary Introduction*. NY: Routledge.

Lycan, William. 1979. *The Trouble with Possible Worlds*. In *The Possible and the Actual: Readings in the Metaphysics of Modality*, ed. Michael Loux. Ithaca: Cornell UP.

Maher, Patrick. 1980. "Leibniz and Contingency." *Studia Leibnitiana* 12(2): 236-242.

- Marek, Johann, "Alexius Meinong", *The Stanford Encyclopedia of Philosophy* (Summer 2012 Edition), Edward N. Zalta (ed.), URL = [<http://plato.stanford.edu/archives/sum2012/entries/meinong/>](http://plato.stanford.edu/archives/sum2012/entries/meinong/).
- Mates, Benson. 1986. *The Philosophy of Leibniz: Metaphysics and Language*. NY: Oxford UP.
- Mautner, Thomas, ed. 1996. *A Dictionary of Philosophy*. Cambridge, MA: Blackwell.
- Mondadori, Fabrizio. 1973. "Reference, Essentialism, and Modality in Leibniz's Metaphysics." *Studia Leibnitiana* 5(1): 74-101.
- . 1975. "Leibniz and the Doctrine of Inter-World Identity." *Studia Leibnitiana* 7(1): 21-57.
- Murray, Michael. 1995. "Leibniz on Divine Foreknowledge of Future Contingents and Human Freedom." *Philosophy and Phenomenological Research* 55(1): 75-108.
- Novaes, Catarina Dutilh. 2008. "Logic in the 14<sup>th</sup> Century After Ockham." In *Handbook of the History of Logic, Vol 2: Mediaeval and Renaissance Logic*. Ed. by Dov Gabbay and John Woods. NY: Elsevier
- Planck, Max. 1949. *Religion and Natural Science*. In *Scientific Autobiography and Other Papers*. NY: Philosophical Library.
- Plantinga, Alvin. 1974. *The Nature of Necessity*. NY: Oxford UP.
- Puryear, Stephen. "Force, Absolute Motion, and the Threat of Circularity in Leibniz." Unpublished Manuscript.
- Rescher, Nicholas. 1979. The Ontology of the Possible. In *The Possible and the Actual: Readings in the Metaphysics of Modality*, ed. Michael Loux. Ithaca: Cornell UP.
- Roberts, John. 2003. "Leibniz on Force and Absolute Motion." *Philosophy of Science* 70(3): 553-573.

- Rodriguez-Pereyra, Gonzalo and Paul Lodge. 2011. "Infinite Analysis, Lucky Proof, and Guaranteed Proof in Leibniz." *Archiv für Geschichte der Philosophie* 93(2): 222-236.
- Rosen, Gideon. 1990. "Modal Fictionalism." *Mind* 99(395): 327-354.
- Rutherford, Donald. 1995. *Leibniz and the Rational Order of Nature*. NY: Cambridge UP.
- Sleigh, R. C. 1990. *Leibniz and Arnauld: A Commentary of Their Correspondence*. New Haven: Yale UP.
- \_\_\_\_\_. 1994. "Leibniz on Divine Foreknowledge." *Faith and Philosophy*. 11(4): 547-571.
- \_\_\_\_\_. 1999. "Leibniz on Freedom and Necessity: Critical Notice of Robert Adams, Leibniz: Determinist, Theist, and Idealist." *The Philosophical Review* 108 (April): 245-277.
- Stalnaker, Robert. 1979. *Possible Worlds*. In *The Possible and the Actual: Readings in the Metaphysics of Modality*, ed. Michael Loux. Ithaca: Cornell UP.
- Wilson, Margaret. 1979. "Possible Gods." *The Review of Metaphysics* 32(4): 717-733.