# ZUR DISKUSSION

## Infinite Analysis, Lucky Proof, and Guaranteed Proof in Leibniz

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*Abstract*: According to one of Leibniz's theories of contingency a proposition is contingent if and only if it cannot be proved in a finite number of steps. It has been argued that this faces the *Problem of Lucky Proof*, namely that we could begin by analysing the concept 'Peter' by saying that 'Peter is a denier of Christ and …', thereby having proved the proposition 'Peter denies Christ' in a finite number of steps. It also faces a more general but related problem that we dub the *Problem of Guaranteed Proof*. We argue that Leibniz has an answer to these problems since for him one has not proved that 'Peter denies Christ' unless one has also proved that 'Peter' is a consistent concept, an impossible task since it requires the full decomposition of the infinite concept 'Peter'. We defend this view from objections found in the literature and maintain that for Leibniz all truths about created individual beings are contingent.

### *I*

According to one of Leibniz's theories of contingency a proposition is contingent if and only if it cannot be analysed into an identity, i.e., a proposition of the form 'A is A' or 'AB is A', in a finite number of steps.[1] The process of analysis in question is conducted by substituting definitions for the *analysanda*, thereby uncovering the concepts into which the terms of the proposition decompose until one reaches a fully analysed proposition that contains only unanalysable concepts. If one of the concepts to be analysed is infinitely complex, then there is no end to the process of analysis – or, in other words, the process of analysis in question is infinite. Not only does Leibniz claim that this is what makes a true proposition contingent – he also claims that there are such true contingent propositions. 'Peter denies Christ' is one of them.

[1] See, for example, *On Freedom and Necessity* (A VI, 4, 1444–1449/AG 19–23). GI, section 61 (A VI iv, 164–166/P 61–62), and *On Contingency* (A VI, 4, 1649–1652/AG 28–30).

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Robert Adams has pointed out a problem with this account – the so-called problem of the *Lucky Proof*. This is how Adams presents the problem:

> Even if infinitely many properties and events are contained in the complete concept of Peter, at least one of them will be proved in the first step of any analysis. Why couldn't it be Peter's denial? Why couldn't we begin to analyze Peter's concept by saying, 'Peter is a denier of Christ and …'? Presumably such a Lucky Proof must be ruled out by some sort of restriction on what counts as a step in an analysis of an individual concept, but so far as I know, Leibniz does not explain how this is to be done.[2]

The difficulty is that even if the concept 'Peter' is infinitely complex, we might be lucky and discover that it contains the concept 'denier of Christ' at the beginning of our analysis or shortly after having begun it. Thus, Leibniz owes an explanation as to why this would not count, in direct opposition to his theory, as a finite proof of the contingent proposition 'Peter denies Christ'.

It is important to note that if the problem of the Lucky Proof is a genuine problem, then there is a deeper and more substantive problem about Leibniz's infinite analysis conception of contingency. For even if we are unlucky and it takes a long time to uncover a particular predicate in the definition of the subject, it will always be uncovered in some finite number of steps. The point can be seen more clearly if we associate each one of the infinitely many concepts constituting Peter's concept with a natural number and we imagine that our analysis uncovers those constituent concepts according to the order of natural numbers. Then no matter what number the concept 'denier of Christ' is associated with, it will take only a finite – but probably very large – number of steps to reach this concept from the beginning of our analysis. In this case, although the full decomposition of the infinitely complex concept 'Peter' will not be completable in a finite number of steps, every concept composing 'Peter' can be found in 'Peter' after a finite number of steps. Thus, there will be a proof of every proposition of the form 'Peter is F'. Let us call this more general problem the problem of the *Guaranteed Proof*. This problem has nothing to do with luck: whether or not we are lucky we are guaranteed to find any constituent concept in the one we are trying to analyse after a finite number of steps.[3]

Leibniz himself seems never to have considered the problems that we have mentioned. A charitable reading of this suggests that an adequate response to the problem ought to be found readily in Leibniz's writings. In this article we shall argue that a proper understanding of Leibniz's views on infinite analysis does indeed provide a solution to the problems of the Lucky Proof and the Guaranteed Proof. We shall claim that for Leibniz one has not proved that 'Peter denies Christ' unless one has also proved that 'Peter' is a consistent concept, a task which requires the full decomposition of the concept 'Peter'. So even if the concept 'denier of Christ' is found in 'Peter' at the early or not so early stages of one's analysis, there is never a point at which one has completed the proof of 'Peter denies Christ'.

The problem of the Lucky Proof has received some attention in the literature already and our discussion will focus, in part, on its treatment by John Hawthorne and Jan Cover

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2 Adams 1994, 34.

3 After thinking about the problem of the Guaranteed Proof we discovered that it had first been raised by Patrick Maher (1980, 239), although he did not give any name to the problem.

(2000).[4] Hawthorne and Cover offer a different response to ours on Leibniz's behalf and in section II we shall argue against this alternative. Somewhat surprisingly, in their article they consider and reject the solution that we favour. Thus, section III will be devoted both to an elaboration of our positive case and to an account of why we think that their criticisms of it, made before them by Maher, are ineffective.[5]

## *II*

Hawthorne and Cover's suggested response to the problem of the Lucky Proof is inspired by their observation that Leibniz's paper *On Freedom*, in which the issue of contingency and infinite analysis is at the forefront, "aims to secure contingency above all in order to rescue creaturely freedom and moral responsibility".[6] From here, they invite us to consider a metaphor which we find in a number of Leibniz's writings that are concerned with human freedom, including the correspondence with Samuel Clarke and the *Monadology*. The basic idea is that the movement of the human soul that gives rise to action should be regarded as determined by the combined action of an infinite number of inclinations, much as the combined action of weights on either side of a balance determines the resting place of the arm. With this in mind, Hawthorne and Cover suggest that "we think of the complete concept of an individual as containing directly a specification of the monad's initial state – that state consisting of the set of minute basic inclinations enjoyed by the substance in its initial state – together with its law of development" and provide an account of the proof of contingent propositions based on this that is immune to the problem of the Lucky Proof.[7] Taking the example 'Adam succumbed to temptation', they suggest that to prove the proposition one should either "begin from the basic concept […] and work forward to reveal the full contingent details of Adam's career, or else begin with some later temporary state and work back to the basic concept".[8] The solution of the Lucky Proof problem is then offered through the provision of an explanation of why each of these procedures would "require infinitely many steps".[9] To show that infinite steps are required, Hawthorne and Cover observe the following: to prove a proposition ascribing a predicate 'F' to an individual subject 's', one would need to be able to deduce an overall tendency in favor of 'F'. But this could not be deduced from any finite subset of the infinite microinclinations that, together with its development law, comprise the initial state of the subject. Only once all the inclinations have been weighed in the balance, would it be possible to determine whether 's is F' obtains.

The reason that this obviates the worry about lucky proofs is a little murkier. Turning to the proposition 'Caesar crossed the Rubicon', we are told:

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4 Hawthorne and Cover do not recognize the problem of the Guaranteed Proof. However, we take it that they would regard their response to the problem of the Lucky Proof as equally applicable to it.

5 See Maher 1980.

6 Hawthorne and Cover 2000, 156.

7 Hawthorne and Cover 2000, 157.

8 Hawthorne and Cover 2000, 157. As they observe (Hawthorne and Cover 2000, 157, n. 19), the story needs to be a bit more complicated than this if we are to accommodate relational truths that involve terms that refer to contingently existing individuals.

9 Hawthorne and Cover 2000, 157.

> The derived macro-predicate 'crossed the Rubicon' is not itself among the infinitely many minute inclination-predicates in Caesar's complete concept. Thus if the basic micro-predicates were to be extracted (so to speak) one by one from Caesar's concept, there is no chance of coming upon 'crossed the Rubicon' early on in this procedure. Moreover, no subset of the infinitely many basic predicates is such that their appearance alone (in our finite analysis so far) is a sufficient condition for 'crossed the Rubicon' being truly predicable of Caesar. This is because no finite set of inclinations tending toward crossing the Rubicon guarantees that there will be no outweighing set of con-inclinations.[10]

Once we have identified the complete concept of an individual with its micro-inclinations none of the 'macro-predicates' that Leibniz typically uses in his explanations of infinite analysis are ones which could be reached by simple decomposition. Thus, there is no danger that we might hit upon one of these as we analyse an individual concept like 'Caesar'. Moreover, each of the constituents of the complete concept will express nothing more than a microinclination, and, since no conjunction of these will determine on its own the existence of any state of the substance that might be captured by such a macro-predicate, no matter how many constituent concepts we excavated, we would never have the grounds for inferring that the macro-predicate was applicable.

Whilst we think this solution is ingenious in some respects, it also strikes us as flawed for a number of reasons. The main problem is the most obvious one. Hawthorne and Cover do not present any direct textual evidence for the claim that the concepts comprising the complete concept of an individual substance are concepts of its microinclinations and the developmental law. As far as we can see, the only motivation for this claim is the correct observation that, in section 36 of the *Monadology,* Leibniz explains that there is "unlimited detail" to be found when trying to provide a sufficient reason for a contingent truth, in part because "there is an infinity of small inclinations and dispositions of my soul, present and past, that enter into its final cause".[11] Whilst there may be important lessons to be learned about Leibniz's conception of infinite analysis if we attend to passages such as this, it does not substantiate the claim that the concepts of such inclinations are the ones that comprise the complete concept of an individual. And, of course, there is no mention at all of a developmental law.

Turning to the texts that do speak about the issues at hand, things appear only to get worse. Hawthorne and Cover, following Leibniz, construe the grounds they are offering for the conceptual containment of the predicate in the subject as "all the basic predicates".[12] Whilst Leibniz does not say this explicitly to Arnauld, it seems natural to equate the basic predicates with "the primitive notions" that figure in definitions that are "perfect or essential".[13] If so, then there are positive grounds for rejecting Hawthorne and Cover's proposal. For, although Leibniz rarely says anything about the nature of these primitive concepts, where he does we learn an important thing. In *Meditations on Knowledge, Truth, and Ideas,* Leibniz tells us that primitive concepts are "irresolvable notions".[14]

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[10] Hawthorne and Cover 2000, 159.
[11] GP VI, 616/AG 217.
[12] Hawthorne and Cover 2000, 157, quoting from the Leibniz-Arnauld Correspondence (GP II, 44/LA 48).
[13] See *Discourse on Metaphysics* § 24, A VI, 4, 1569/AG 57. Also see *Meditations on Knowledge, Truth, and Ideas* (A VI, 4, 590/AG 26).
[14] A VI, 4, 590/AG 26.

But the micro-inclinations that Hawthorne and Cover mention do not seem to be beings that could be conceptualised without essential reference to the states of affairs to which they incline. And, if this is the case, surely they will have notions that are complex and resolvable.

But a further, and more serious, problem arises for Hawthorne and Cover's proposal. For, even if it were accepted that their proposal obviates the worry about lucky proofs and guaranteed proofs of propositions of the form 's is F' where 'F' is a macro-level predicate, it seems that the problems of the Lucky and Guaranteed Proofs would simply re-emerge at the micro-level. Let us suppose that one of the infinite basic predicates that compose the complete concept of Caesar is the concept of microinclination i. The proposition 'Caesar is i' will be reached in some finite number of steps if the concept of Caesar is analysed through substitution of definitions. And, of course, the same would occur whatever the basic concepts were that entered into Caesar's complete concept.

A natural response to this worry might be to question an important hidden assumption, namely the claim that the proposition expressing the connection between a complete individual concept and one of its constituents is contingent. Perhaps in anticipation of this final objection, Hawthorne and Cover explicitly mention the fact that on their picture "the initial set of basic microtendencies turns out to be necessary".[15] However, they seem unconcerned by this. The reason derives again from their belief that "the ultimate point of the account [*sc.* the infinite analysis doctrine; G.R.-P./P.L.] is to save certain claims relating to creaturely freedom and moral accountability".[16] And with the contingency of macro-level predicates, in particular those concerning actions, secured, they believe that "the thesis that the micro-states that we are born with are necessary to us hardly undercuts any of those claims".[17] That said, they are sufficiently troubled by this consequence that they include a footnote in which they suggest that Leibniz has other resources to "make sense of the claim that Adam could have been born differently", pointing to places in the Arnauld correspondence in which Leibniz alludes to "a precursor of counterpart theory".[18]

Let us set aside the fact that there are good reasons for thinking that Leibniz did not have a precursor of counterpart theory in mind at any point.[19] What Hawthorne and Cover admit here is that it would be good if Leibniz had a way out of the conclusion that it was necessary that Adam came into existence with the constitution that he in fact had. Even if Leibniz did have another account of the modal status of counterfactual propositions to offer, it would still turn out on the infinite analysis account that any proposition expressing the fact that Caesar has one or more of the features expressed by his basic predicates has both a lucky and guaranteed finite proof, and hence is necessary.

## *III*

As noted above, Hawthorne and Cover discuss the idea that Leibniz could have responded to the problem of the Lucky Proof by claiming that there is no proof of a proposition 'A is F' unless 'A' can be shown, by full decomposition, to be a consistent concept. They acknowl-

[15] Hawthorne and Cover 2000, 160.
[16] Hawthorne and Cover 2000, 160.
[17] Hawthorne and Cover 2000, 160.
[18] Hawthorne and Cover 2000, 160, n. 27.
[19] See Wilson 1979.

edge that this proposal is readily reconstructed from Leibnizian resources and they think the following passage, from section 64 of the *General Inquiries about the Analysis of Concepts and of Truths*, indicates that this may have been a solution Leibniz glimpsed himself:

> 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, or only one (e.g. the concept of entity), 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 in experience […].[20]

In this passage Leibniz says that if there are no concepts that are conceived through themselves, and therefore no possible concepts, then no proposition can be proved by reason, even if some propositions can be proved "perfectly" from the definitions assumed to express possible concepts.

But the *General Inquiries* has passages even more suggestive of the thesis that to prove that 'A is F' one needs to prove the consistency of 'A':

> For example, 'Alexander the Great' and 'the king of Macedonia who conquered Darius', and again 'triangle' and 'trilateral', can be substituted for each other. That these coincide can always be shown by an analysis: namely, if they are analysed until it appears a priori that they are possible, and if the same terms appear formally, then different terms are the same.[21]

This text strongly suggests that the analysis has not ended until it has been shown that the *analysanda* are consistent ("possible"), and therefore it suggests that Leibniz's answer to the problems of the Lucky Proof and Guaranteed Proof would have been that there cannot be such things since, no matter at what point in the analysis the concept in question shows up, the consistency of the *analysandum* will not have yet been established.

One might think that we should not put too much weight on these passages. For the *General Inquiries* suggests a different picture about the proof of contingent propositions. Indeed, in this essay Leibniz asserts that *every* true proposition can be proved, and he claims that contingent propositions are "proved by showing that if the analysis is continued further and further, it constantly approaches identical propositions, but never reaches them".[22] Thus one might think that there are two versions of the infinite analysis conception of contingency. According to what Leibniz says in the *General Inquiries* contingent propositions can be proved, and the proof consists in showing that their analysis continually approaches an identity. According to the version of *On Contingency* and *The Source of Contingent Truths* contingent propositions cannot be demonstrated.[23]

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20 A VI, 4, 760/P 63.

21 A VI, 4, 746/P 52f.

22 GI, sections 132 and 134 (A VI, 4, 776/P 77).

23 See A VI, 4, 1650/AG 28 and A VI, 4, 1663/AG 100 respectively. In some passages of the *General Inquiries* Leibniz also claims that the analysis can be reduced to some rule (sect. 65, A VI, 4, 760/P 63) and that a contingent proposition is proved true if, in analysing it, "it appears from the rule of progression that the reduction has reached a

Within the context of the *General Inquiries* version of the infinite analysis conception of contingent truths the answer to the problems of Lucky and Guaranteed Proof would appear to be clear: finding the relevant concept before the end of analysis does not amount to proof because finding the concept at any point in the analysis is not showing that the analysis 'constantly approaches identical propositions, but never reaches them'. This would be a solution to the problems of Lucky and Guaranteed Proof even if it does not constitute a restriction on what counts as a step in an analysis of an individual concept.

But in section 134 of the *General Inquiries* Leibniz asserts that "it is God alone, who grasps the entire infinite in his mind, who knows contingent truths with certainty".[24] Thus, only God can know for certain that if the analysis continues further and further, it constantly approaches identical propositions without reaching them. How does God know that if the analysis of 'Peter denies Christ' continues further and further, it constantly approaches identical propositions, without ever reaching them? Presumably this is because, since God grasps the infinite, he can see the full decomposition of the concept 'Peter' and see (a) that it is infinitely complex, (b) that it includes the concept 'denier of Christ', and (c) that it involves no contradiction. Then he is in a position to know that if the analysis of 'Peter denies Christ' continues further and further, it constantly approaches identical propositions (since 'Peter' includes 'denier of Christ' and contains no contradiction) without ever reaching them (since 'Peter' is infinitely complex). The following passage, from *On Freedom*, argues that even in the case of infinitely complex concepts God can see what they contain, and therefore it suggests that God can see that such concepts are infinitely complex and that they contain no contradiction:

> 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 resolution, of course, which does not exist, but the connection of terms or the containment of the predicate in the subject, since he sees whatever is in the series.[25]

In any case, the idea that in order to prove 'A is F' one needs to establish that the relevant concepts are consistent finds textual support outside the *General Inquiries.* For instance, in his *Critical Thoughts on the General Part of the Principles of Descartes*, while discussing Descartes' ontological argument, Leibniz says:

> In general, we must recognize, as I have long since pointed out, that nothing can be safely inferred about a definite thing out of any given definition, as long as the definition is not known to express something possible. For if it should happen to imply some hidden contradiction, it would be possible for something absurd to be deduced from it.[26]

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point at which the difference between what should coincide is less than any given difference" (sect. 66, A VI, 4, 760–761/P 63). But he does not seem to have been completely convinced of this idea at the time, for this is an idea that is absent from other texts, and is explicitly denied in a roughly contemporary text. Thus, in *Necessary and Contingent Truths*, Leibniz says: "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 truth not even this is conceded to a created mind"(A VI, 4, 1516/PW 97)

[24] A VI, 4, 776/P 77. Also see GI section 131 (A VI, 4, 776/P 77).

[25] F de C 182/AG 96.

[26] GP II, 359/L 386.

And in the *Meditations on Knowledge, Truth, and Ideas*, Leibniz says:

> For we cannot safely use definitions for drawing conclusions unless we know first that they are real definitions, that is, that they include no contradictions, because we can draw contradictory conclusions from notions that include contradictions, which is absurd.[27]

Leibniz is not speaking directly about analysis in this passage. But, as Leibniz says in the *General Inquiries*, the process of analysis consists in substituting definitions for what is defined,[28] and according to this text one cannot safely use definitions for drawing conclusions unless one knows such definitions are free from contradiction. Furthermore, using definitions in a process of analysis to prove a proposition is to use definitions to draw a conclusion as to whether it is true. So this passage implies that one should not draw such conclusions unless one has previously established the consistency of the definitions in question. But when the analysis is infinite, one is never in a position to establish such a thing, and therefore one has never proved the proposition.

Unlike the view defended by Hawthorne and Cover, the view defended here has direct textual support. Moreover, it is naturally suggested by some additional things Leibniz says in the *General Inquiries*. For Leibniz thinks that if a term is not possible then neither truth nor falsity apply to the propositions in which the term appears.[29] He also thinks that the possible is that which is free from contradiction.[30] And he thinks that 'L' and 'L is true' are coincident propositions,[31] i.e., that they can be substituted for one another without loss of truth.[32] So to prove 'A is F' is presumably to prove 'A is F is true'. But then one cannot prove 'A is F' unless 'A' and 'F' are free from contradiction, and it is quite natural to think that proving 'A is F' requires establishing, by a full decomposition of the concepts, that 'A' and 'F' are consistent, that is, free from contradiction.

As we noted in section I, the view that we have just advanced on Leibniz's behalf is considered and rejected by Hawthorne and Cover. Needless to say, we have responses to the considerations that lead them to this. In fact there is only one worry, namely that such a position renders too much contingent. Indeed, they claim, even propositions like 'Caesar is a rational animal' and 'Caesar is Caesar' turn out to be no less contingent than 'Caesar crossed the Rubicon'.[33] This objection is not new: it had been raised by Patrick Maher, who argued that a view like the one we are defending here makes all the properties of a created substance contingent, "since a determination of the possibility of the subject is necessary whatever the predicate may be".[34]

But did Leibniz really commit himself to the necessity of propositions like 'Caesar is a rational animal' and 'Caesar is Caesar'? Hawthorne and Cover cite no evidence to the effect. Maher does: he refers to a passage where Leibniz says that he believes that "there is something essential to individuals"[35] and another passage where Leibniz says that 'man' is

27 A VI, 4, 588/AG 25.
28 See A VI, 4, 741/P 48.
29 GI, note to section 3 (A VI, 4, 749/P 54).
30 GI, section. 2 (A VI, 4, 749/P 54).
31 GI, section 1 (A VI, 4, 748/P 54).
32 A VI, 4, 746/P 53.
33 Hawthorne and Cover 2000, 156.
34 Maher 1980, 239.
35 NE 305.

an entity in itself, but 'learned man' or 'king' are accidental entities. For, Leibniz says in the *General Inquiries*, "that thing which is called 'a man' cannot cease to be a man except by annihilation; but someone can begin or cease to be a king, or learned, though he himself remains the same".[36]

Neither text unambiguously supports the necessity of any properties. The text from the *General Inquiries* supports the idea that properties like 'being a man' are permanent rather than essential. Indeed the sentence right before the text quoted is: "An entity is either in itself or accidental; or, a term is either necessary or mutable." As the following sentence confirms, the intended contrast is between permanent and temporary properties. Furthermore, the idea that a man can cease to be a man only by annihilation is not something that seems to have been rooted very firmly in Leibniz's mind at the time. For, in 1687 for example, he wrote to Arnauld that death is transformation.[37] Thus a man can cease to be a man other than by annihilation.

The text from the *New Essays* is a curious one. Here is the context of the line cited by Maher:

> I believe that there is something essential to individuals, and more than there is thought to be. It is essential to substances to act, to created substances to be acted upon, to minds to think, to bodies to have extension and motion. That is, there are sorts or species such that if an individual has ever been of such a sort or species it cannot (naturally, at least) stop being of it, no matter what great events may occur in the natural realm.[38]

Leibniz does claim that there are essential properties but he offers a gloss that shows that what he means is that there are properties that are permanent in the sense that if something has them at a certain time then it cannot lose them naturally. So this text does not seem to support the claim made by Maher.

Nevertheless, isn't it true that according to Leibniz it is in the nature of substances to act, and in the nature of minds to think?[39] Yes, but this means that it is necessary that if something is a substance, it acts, and that it is necessary that if something is a mind, it thinks. These are *de dicto* modal claims and therefore do not support Maher's claim.

David Blumenfeld cites other evidence that according to Leibniz individual things have necessary properties. He says that for Leibniz the complete concept of an individual contains the individual's defining characteristics and so each simple property that belongs to that concept is a necessary or essential attribute of the individual in question.[40] Blumenfeld's evidence for this is that in § 8 of the *Discourse on Metaphysics* Leibniz identifies the concept of an individual with its *haecceity*. But Blumenfeld's text belongs to a work, the *Discourse on Metaphysics*, from which the infinite analysis conception of contingency is absent. This also applies to Maher's text from the *New Essays*. What would be relevant to our solution to the Lucky and Guaranteed Proof problems would be to find an assertion that implies that some propositions of the form 'Caesar is F' are necessary in the context of the infinite analysis conception of contingency. But the main point to note here is that assertions to the effect that individuals have essential properties (whether some or all of

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36 A VI, 4, 740/P 47.
37 See GP II, 99/LA 100. See also GP IV, 480f./AG 141 and GP VII, 330/S 66.
38 NE, 305.
39 See NE 112 and 118f. and GP II, 169.
40 Blumenfeld 1985, 502.

their properties) need not mean that Leibniz thought that propositions about individuals are necessary. Indeed part of the point of the infinite analysis of contingency is to account for the contingency of propositions about individuals even if every predicate true of an individual is included in its concept and therefore even if every property of an individual is essential to it. To refute the contention that Leibniz thought that even propositions like 'Caesar is a rational animal' and 'Caesar is Caesar' are contingent one needs more than merely to point out that Leibniz believed that individuals have essential properties.

On the other hand, there is some textual evidence that shows Leibniz committing himself to the idea that all propositions about created individuals are contingent. The following passage, from *On Freedom*, strongly suggests that Leibniz is committed to all truths about created individuals being contingent:

> And there is no truth of fact or of individual things which does not depend upon an infinite series of reasons, though God alone can see everything that is in this series. This is the cause, too, why only God knows the contingent truths a priori and sees their infallibility otherwise than by experience.[41]

Here Leibniz says that all truths about created individual things depend on an infinite series of reasons, a series the totality of which can only be seen by God, which is what makes God unique in knowing *a priori* the contingent truths. The conclusion that all truths about created individuals are contingent is almost explicit in this passage. According to this passage, therefore, propositions like 'Caesar is Caesar' and 'Caesar is a rational animal' are contingently true. Indeed this should also be the case with a proposition like 'Caesar the man is a rational animal'.

But isn't 'Caesar is Caesar' an identity and therefore a necessary proposition?[42] But being an identity is not simply a matter of form. We submit that the terms of the identity must display explicitly their components – that is, in Leibnizian terminology, the terms of an identity must be primitive terms, whether simple or composite.[43] There is some textual evidence for this. For instance in *A Specimen of Discoveries about Marvellous Secrets of Nature in General* Leibniz says that identical truths are the only ones that are known *per se*.[44] But truths whose terms are derivative as opposed to primitive will not be known *per se*, since they will be understood through the propositions containing the primitive terms that are equivalent or coincident with their derivative terms. And in the *New Essays* Leibniz says that primary truths are known by intuition.[45] For Leibniz we have intuitive knowledge when we understand all the ingredients of a notion at once and distinctly.[46]

[41] F de C, 180f./L 264. The context of this passage makes it clear that Leibniz intends his remarks in this passage to apply only to created individuals. Leibniz believed that some truths about God are necessary, e.g., that he exists. This is not a problem for our interpretation, since Leibniz believed he could prove *a priori* these propositions about God – for instance the ontological argument, thought of as incorporating a demonstration that the concept of God is consistent, proves *a priori* that God exists. We are grateful to Greg Brown for having pressed us on this point.

[42] It is natural to think of identities as necessary. Leibniz explicitly asserts that they are in *On Freedom* (F de C 181/AG 96), and in a letter to Hermann Conring of 19th March 1678 (A II, 1, 602).

[43] A VI, 4, 286/P 36f.

[44] A VI, 4, 1616/PW 75.

[45] NE 362.

[46] See *Discourse on Metaphysics* § 24 (A VI, 4, 1568/AG 56).

Furthermore, he claims that when a notion is very complex we cannot consider all of its component notions at the same time. Thus, since the concept 'Caesar' is infinitely complex, it appears that we cannot have intuitive knowledge of it. But if we cannot have intuitive knowledge of 'Caesar', how can we have intuitive knowledge of 'Caesar is Caesar'?

Of course, what exists is possible and so one can have knowledge of the possibility of a thing through experience. This is what Leibniz calls *a posteriori* knowledge of the possibility of a thing. And so some of us might be in a position to know that the concept 'Caesar' is possible and thereby be in a position to know that 'Caesar' is a consistent concept. However, it doesn't follow from this that 'Caesar is Caesar' is a primary or identical truth, for as we have just said an identical truth is known by intuition. This seems to require that one have intuitive knowledge of 'Caesar', which, in turn, requires that one have adequate knowledge of Caesar, the kind of knowledge one has when everything that enters into a distinct notion is distinctly known. But, as Leibniz says, this requires that the analysis of the notion in question be carried to completion,[47] and this is what we cannot do with 'Caesar'. So 'Caesar is Caesar' is not an identical truth, even if we know that it is true and that Caesar is a possible thing. For we only know that through experience, but knowledge of identities requires *a priori* knowledge of possibility, which is the knowledge we have when we have carried analysis to completion and seen that no contradiction appears.[48]

So there are reasons to think that Leibniz did not take propositions like 'Caesar is Caesar' and 'Caesar is a rational animal' (or even 'Caesar the man is a rational animal') to be necessary. This is confirmed by the fact that he typically does not mention any propositions about individual things (other than God) as being necessary. For instance in *De Libertate et Necessitate* he says that metaphysical or absolutely necessary truths are those of Logic, Mathematics, Geometry and similar ones.[49] In other texts where the infinite analysis conception of contingency is put forward examples of necessary truths are propositions like 'Every duodenary number is senary'[50], and 'A duodenary number is quaternary'.[51] Indeed, even in texts where the infinite analysis conception of contingency is not put forward, like in § 13 of the *Discourse on Metaphysics*, his examples of necessary truths concern geometrical figures rather than individual things.

Another consequence of the view we are defending is that one has no *a priori* reason to assert that Caesar is Caesar. This might seem absurd or, at least, wrong. For, it might be

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47 See A VI, 4, 588/AG 25.

48 See A VI, 4, 589f./AG 26. Admittedly Leibniz's position with respect to whether humans can have *a priori* knowledge of possibility is unstable. G. H. R. Parkinson believes that in the *General Inquiries* Leibniz maintains that the only way of proving possibility is by experience (P xxxv f.). Indeed Leibniz claims this in section 61 of the *General Inquiries*. In *Of an Organum or Ars Magna of Thinking* Leibniz observes that "it is not in our power to demonstrate the possibility of things in a perfectly *a priori* way, that is, to analyse them into God and nothing" (A VI, 4, 159/PW 3). But in several writings, including the *General Inquiries*, one finds claims that suggest that *a priori* proof of possibility is possible, e.g., the passage quoted above from pages 52f. of Parkinson's edition. There is also the letter to Bourguet of 1715 where Leibniz says that "the concept of numbers is finally resolvable into the concept of unity" (GP II, 582/ L 664).

49 A VI, 4, 1445.

50 F de C, 181f./AG 96.

51 A VI, 4, 1514f./PW 96.

thought, even if 'Caesar is Caesar' is not a necessary proposition, it is an evident truth that we can come to know without appeal to experience.

But there is evidence that Leibniz thought that we have no *a priori* reason to assert that Caesar is Caesar. For instance in the passage from the *Critical Thoughts on the Principles of Descartes* quoted above he says that nothing can be safely inferred about a definite thing out of any given definition, as long as the definition is not known to express something possible. So until we have established the consistency of the concept 'Caesar' we should not even infer, and therefore we should not even assert, that Caesar is Caesar. Of course we might know through experience that the concept of Caesar expresses a possible thing.[52] But since, given the infinite complexity of 'Caesar', we cannot know *a priori* that such a concept expresses a possible thing, we cannot know *a priori* that Caesar is Caesar.[53]

Furthermore, given certain Leibnizian assumptions, the view that until we have established the consistency of the concept 'Caesar' we are not in a position to safely infer or assert anything about Caesar is not unreasonable, for these assumptions mean that incoherent concepts cannot figure in true propositions, whatever their logical form. For Leibniz all propositions are either essential or existential.[54] True essential propositions assert the possibility of a certain subject. But a subject whose concept is contradictory is not possible.[55] So there are no true essential propositions composed of incoherent concepts.[56] True existential propositions assert the existence of a subject. But a subject whose concept is contradictory does not exist since, otherwise, a subject whose concept is contradictory would be possible (since what exists is possible).[57] So there are no true existential propositions composed of incoherent concepts. Thus incoherent concepts do not figure in either of the two classes of true propositions that Leibniz admits and 'Caesar is Caesar' is not a true proposition unless 'Caesar' is a consistent concept. So it is not unreasonable to demand that one knows that 'Caesar' is a consistent concept before one can safely infer or assert that Caesar is Caesar.

Although there are both textual and philosophical reasons to think that Leibniz did not take propositions like 'Caesar is Caesar' and 'Caesar is a rational animal' to be necessary, it must be acknowledged that Leibniz says things that seem to commit him to the claim that 'Caesar is Caesar' is a necessary truth. After all, he says things that commit him to that proposition being an identity and, therefore, to its being a necessary truth. For in-

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52 See *Discourse on Metaphysics* §24 (A VI, 4, 1569/AG 57) and *Meditations on Knowledge, Truth, and Ideas* (A VI, 4, 589/AG 26).

53 Of course we can assert *a priori* the proposition 'If Caesar is possible then Caesar is Caesar'. Failure to distinguish this proposition from 'Caesar is Caesar' might explain why the denial of the *apriority* of the latter is felt as so odd. We are indebted to Ezequiel Zerbudis for this point.

54 GI, section 144 (A VI, 4, 779/P 80).

55 GI, section 2 (A VI, 4, 749/P 54).

56 That essential propositions assert the possibility of a certain subject is more clearly seen in the case of essential propositions 'secundi adjecti' ('AB est'). But these are equivalent to essential propositions 'tertii adjecti' ('A est B') and 'primi adjecti' ('A esse B, est'). So if there are no true essential propositions 'secundi adjecti' composed of incoherent concepts, then there are no true essential propositions composed of incoherent concepts. These distinctions between kinds of propositions apply also to existential propositions. For these distinctions see GI, sections 144f. (A VI, 4, 779f./P 80f.) and Mates 1986, 54.

57 *Meditations on Knowledge, Truth, and Ideas* (A VI, 4, 589/AG 26).

stance there is a passage where Leibniz says that the proposition ‘An animal is an animal’ is true in itself.[58] This is a problem for the ideas we have been defending because ‘animal’ is not a fully decomposed term – in Leibnizian terminology, it is a simple derivative term as opposed to a simple primitive term.[59] There is also the following passage: “However, identical propositions are necessary without any understanding or resolution of the terms, for I know that A is A regardless of what is understood by A.”[60]

One could try explaining these texts away, but even if this is possible, that might seem not to be the end of the story. For there is evidence that Leibniz had *reasons* to accept propositions with simple derivative terms, like ‘Caesar is Caesar’, as identities. For a simple derivative term is equivalent, i.e., coincident, to a composite term. Suppose that the simple derivative term ‘Caesar’ is coincident with the composite primitive term ‘ABC…’. Then ‘ABC… is ABC…’ is an identity. Therefore ‘ABC… is ABC… is an identity’ is true. Therefore, since ‘Caesar’ is coincident with ‘ABC…’, ‘Caesar is Caesar is an identity’ is true. Therefore ‘Caesar is Caesar’ is an identity.

Nevertheless this presupposes that the context ‘ … is an identity’ allows for substitution of coincidents. In Leibniz’s terminology, this presupposes that ‘ABC… is ABC… is an identity’ is not a ‘reduplicative’ proposition, that is, that it is not a proposition in which “we speak so strictly about some term that we do not want another to be substituted in its place”.[61] But although we know of no text where Leibniz says that such propositions are reduplicative propositions, what we have argued above about identities having to be composed of primitive terms suggests that propositions of the form ‘ … is an identity’ are reduplicative – or at least that they are partially reduplicative, in the sense that there are at least some coincident terms whose substitution they do not allow.

Even so, there are the texts from the *Addenda to the Specimen of the Universal Calculus* and the letter to Conring cited above. As we said, one might try to explain them away; but we do not know how. However, we submit, this is not sufficient to refute our interpretation of what would be Leibniz’s response to the problems of the Lucky Proof and Guaranteed Proof. All it means is that Leibniz’s views on what counts as an identity were not totally fixed, as so many of his other ideas were not totally fixed. But there are philosophical reasons that suggest that he should have adopted the view that to prove that ‘A is F’ one needs to prove the consistency of the concept ‘A’ and the textual evidence suggests that he indeed adopted it.

Let us now consider two other objections to our view. Patrick Maher has argued that on the view we are defending all falsehoods imply a contradiction, since analysis of ‘Caesar’ will eventually reach the ‘Rubicon-crosser’ predicate and so the false proposition ‘Caesar did not cross the Rubicon’ will entail a contradiction. But then since ‘Caesar did not cross the Rubicon’ has been proved false, ‘Caesar crossed the Rubicon’ can thereby be proved to be true.[62] The objection is, thus, that on the view that to prove ‘Caesar crossed the Rubicon’ one needs to check the consistency of ‘Caesar’, there is in fact no need to do so. The second worry is that from the fact that all falsehoods imply a contradiction, one could derive the objection that all truths, including ‘Caesar crossed the Rubicon’, turn out to be necessary, since those propositions whose opposites imply a contradiction are necessary.

[58] *Addenda to the Specimen of the Universal Calculus* (A VI, 4, 292/P 42).
[59] *A Specimen of the Universal Characteristic* (A VI, 4, 286/P 36f.).
[60] Letter to Hermann Conring, 19th March 1678 (A II, 1, 602).
[61] *The Principle of Human Knowledge* (A VI, 4, 672/S 42).
[62] Maher 1980, 239.

If so, either Leibniz was seriously wrong about the character of his own philosophy, or the interpretation that entails this is seriously wrong.

But, in fact, the two objections highlight the plausibility of the requirement that to prove a proposition one needs to establish the consistency of the concepts involved. For if a concept is inconsistent then, as we argued above, no proposition of which it is its subject is true. So the fact that the proposition 'Caesar did not cross the Rubicon' entails a contradiction does not mean that 'Caesar crossed the Rubicon' is true, unless 'Caesar' is a consistent concept. Similarly, necessary propositions are those propositions *involving consistent concepts* whose opposites entail a contradiction. So the fact that a certain proposition entails a contradiction should not be taken to indicate that its opposite is necessary, unless one knows that the concepts involved in the proposition are consistent.

## *IV*

We have presented the problems of the Lucky Proof and Guaranteed Proof and have argued that Leibniz's solution to them was to stipulate that to prove that 'A is F' one needs to prove the consistency of the concepts involved in the proposition. Since concepts of individuals like Caesar are infinitely complex, there is no finite proof of their consistency. There is textual evidence that Leibniz would have adopted such a solution. This solution to the problem entails that all truths about individuals with infinitely complex concepts are contingent, but there is textual evidence and there are philosophical reasons that suggest that Leibniz would have agreed that all such truths, including the likes of 'Caesar is Caesar', are contingent. There is some textual evidence to the contrary but, we think, what it suggests is that some of Leibniz's ideas about what are identical truths were not totally fixed.[63]

Works by Leibniz

A *Sämtliche Schriften und Briefe.* Berlin 1923ff.

AG *Philosophical Essays.* Eds., trans. R. Ariew/D. Garber. Indianapolis/Cambridge 1989.

F de C *Nouvelles lettres et opuscules inédits de Leibniz*. Ed. A. Foucher de Careil. Paris 1857.

GI *General Inquiries about the Analysis of Concepts and Truths.* [Printed as A VI, 4, N.165.]

GP *Die philosophischen Schriften von Gottfried Wilhelm Leibniz*. 6 vols. Ed. C. I. Gerhardt. Berlin 1875–1890.

L *Philosophical Papers and Letters.* Second edition. Ed., trans. L. Loemker. Dordrecht/Boston/London 1969.

LA *The Leibniz-Arnauld Correspondence.* Ed., trans. H. T. Mason. Manchester 1967.

NE *New Essays on Human Understanding.* Eds., trans. P. Remnant/J. Bennett. Cambridge 1996. [Printed as A VI, 6, N.2 with identical pagination.]

P *Logical Papers.* Ed., trans. G. H. R. Parkinson. Oxford 1966.

PW *Philosophical Writings.* Ed. G. H. R. Parkinson, trans. M. Morris/G. H. R. Parkinson. London 1973.

S *The Shorter Leibniz Texts.* Ed., trans. L. Strickland. London 2006.

[63] We are grateful to Greg Brown, Ezequiel Zerbudis, and an anonymous reviewer for this journal for their comments on a previous version of this paper.

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