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ABSTRACTS OF THE PAPERS

A CLASSICIST'S NOTE ON TWO-, THREE-, AND FOUR-VALUED LOGIC

Joseph S. Fulda

The classical logician's principal dictum, «A proposition is either true or false, not neither, and not both,» still leaves considerable room for multi-valued logic.

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ONE FOR LEIBNIZ

Vernon Pratt

For Leibniz, it was a requirement upon the 'fundamentally real' to have a 'principle of unity'. What does this mean?

One general point is that Substance cannot be understood as pure extension. But there is a particular point about cohesion: a real thing had to have some means by which its parts were stuck together. But Leibniz' insistence on 'unity' is also an insistence on indivisibility. Under this head there is first the point that there appears to be a contradiction between extension and being incapable of being cut in two. Second, Leibniz uses the notion of 'indivisibility' to mark the following distinction among things made up of parts: (a) those which cannot be split without being destroyed; and (b) the rest (which are mere 'aggregates'). To be 'indivisible' is to be of the first type. Leibniz' insistence that the truly real must be 'indivisible' is then his insistence that the truly real, if it is made up of parts, must be a thing with 'integrity', i.e. not an aggregate.

What does Leibniz think of as the connection between what is truly real and the possession of 'integrity'? He took from Scholasticism the doctrine that action is necessarily attributed to a substance having 'integrity', contructing what was in effect a theory of action with two parts: (a) only self-subsistent substances can act; and (b) an action is an origination of change. Leibniz thus insists that self-subsistent substances must be indivisible, in the sense that they cannot be mere aggregates. Aggregates cannot act, and self-subsistence in effect is the capacity for action. This is the most fundamental reason Leibniz had for insisting that the truly real must have a 'principle of unity'.

It is misleading to speak of Leibniz reintroducing the Scholastic form-and-matter conception of substance for the following reasons:

(a) the Scholastic ‘form’ precisely lacked a ‘principle of action’; and

(b) during the period when it is suggested that Leibniz’ conception was essentially Scholastic he was defending the view that what his ‘form’ informed was not matter at all but what he called a ‘metaphysical point’.

LOGIC AND NECESSARY BEING

Matthew McKeon

Yuval Steinitz has argued that, since it is logically possible that there are logically necessary beings, it follows that there is at least one logically necessary being. Steinitz switches the Leibnitzean ontological argument’s concern from perfect beings to logically necessary beings. My paper has two primary aims. First, I argue that Steinitz’s quick treatment is insufficient to establish the validity of his argument. Secondly, I argue that the correct approach to logical necessity must account for those possible situations in which the meanings of some of the terms in our language might have been different; on such an approach, the premise of Steinitz’s argument is false. My remarks here are intended to add to the prima facie plausibility of Hume’s claim that logic has no existential implications.

ARISTOTELIAN AND MODERN LOGIC

Katalin Havas

Is modern logic an improvement on Aristotelian logic or is there some other relationship between the two? In which sense is modern logic more advanced than Aristotelian logic? Is logic a cummulative developing discipline or is the progress in the course of the history of logic somehow different from the cumulatively developing processes? Are these logics based on different — mutually untranslatable — paradigms? The paper analyzes these questions in connection with some more general problems of the philosophy of science.

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ON BEHALF OF THE FOOL: MOORE AND OUR KNOWLEDGE OF THE EXISTENCE OF MATERIAL OBJECTS

Edward N. Martin

In this paper I argue that G.E. Moore's naturalism (combined with his sense-data theory) falls prey to the charge, leveled recently by Plantinga, that Moore doesn't know whether his belief-forming mechanisms are functioning properly when he says he knows a pencil (or his hand) exists. Help from Alston may be sought in response to criticisms, but these are not sufficient to vindicate Moore's form of naturalism.

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«A Classicist's Note on Two-, Three-, and Four-Valued Logic»

A CLASSICIST'S NOTE ON TWO-, THREE-, AND FOUR-VALUED LOGIC

Joseph S. Fulda

The classicist's principal dictum, «A proposition is either true or false, not neither, and not both,» still leaves considerable room for multi-valued logic. To the classicist, two-valued logic is the logic of reality, three-valued logic is the logic of knowledge about reality, and four-valued logic is the logic of beliefs about reality.

The three values are **known to be true**, **known to be false**, and **unknown**; the four values are **believed to be true**, **believed to be false**, **not believed to be either true or false** (note that this is *not* «believed not to be either true or false» which is a belief within the domain of philosophy of logic and, more generally, a meta-belief which some, the classicist would say, believe to be true, some — including the classicist — believe to be false, etc.), **both believed to be true and false** (note that this is *not* «believed to be both true and false» — with the same comment as made above).

The philosophical distance between knowledge and reality is a huge matter treated in countless philosophical papers and treatises, but which we shall not even touch on here. The philosophical distance between belief and knowledge, on the other hand, is smaller: An excellent summary of current thinking on the matter can be found in Sturgeon (1993).

The logical distance between four-valued logic and three-valued logic is bridged by De Morgan's Law: $T\&F \leftrightarrow \neg(T \vee F)$. The logical distance between three-valued logic and two-valued logic is bridged by (a) the «closed world assumption» which renders the value «unknown» as F, and (b) the definition of conjunction, which renders the gap value, $\neg(T \vee F)$, i.e. T&F, as F.

We now consider some potential challenges to this account. Goldstein (1992) has convincingly argued that the Liar has neither truth value, and has proposed an elegant solution to the paradox that also does not fall afoul of the Strengthened Liar. But his truth value gap does not pose a challenge to the classical account given here, for his solution distinguishes between use and mention and on his account it can easily be argued — indeed, it is hard to argue otherwise — that it is not the case that the Liar is a proposition with a third truth value (neither T nor F), but simply that the Liar, like so many other sentences, is just not a proposition at all.

Gödel's incompleteness theorem and, more generally, unsolvability, unprovability, and incompleteness results also pose no problem for our account,

since each such result is within a system — or all systems considered individually — and therefore it is the logic of knowledge — three-valued logic — that is appropriate.

Heisenberg's uncertainty principle and, more generally, much of modern quantum physics pose no problem for our account, for it is not so much that certain statements lack a truth value as that either (a) their truth values cannot be known, or, and this is different from the case above, (b) that such statements are either vague (more often) or ambiguous (less often). In the latter case, the sentences are propositional functions and not propositions and, indeed, propositional functions bear no truth value.

What will be seen as troubling to many is the fourth truth value in the logic of beliefs. Certainly it troubled Moore. But the consensus solution to the paradox of the preface holds that the author rationally believes each of the statements in his book to be true, for he has researched them. He also rationally believes that at least one of them is false, knowing his own fallibility. Yet the two beliefs are contradictory. For those not accepting this consensus solution there is also Crimmins' (1992) elegant example. Some, like Goldstein (1993), reject that, too. We may respond that we are speaking about systems of beliefs — perhaps those implicit in a knowledge base formed by entries from different agents, perhaps those of a philosophical system elaborated on by more than one thinker. We can even say that the fourth value does not ever represent a rational belief choice, but it is still a belief choice that the empirical evidence shows is made with great frequency.

There is a place for multi-valued logic even for adherents of «the three laws of thought.»

DEDICATION

This note is dedicated with much appreciation to my most inspiring college teacher, Professor Michael Anshel.

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«One for Leibniz»

ONE FOR LEIBNIZ

Vernon Pratt

By the end of the 17th Century it was very generally agreed that the universe was entirely made up of small solid corpuscles which moved and changed direction as they bumped and were bumped. There was, in other words, a consensus in favour atomism, as a version of the mechanical philosophy,[1] with material atoms thought of as «extended, continuous, homogeneous little lumps, which are *intrinsically* indivisible».[2] This consensus however was not quite unanimity. Leibniz' voice in particular was a counterpoint to the consensual plainsong. He rejected the billiard-ball as an appropriate model for what there basically was, and he turned to *animals* for a better understanding of the basic structure of the universe.

What I want to do is to attempt a unified account[3] of the requirement he put upon what it was to be *fundamentally real.* This will lead me to challenge the influential thesis that Leibniz is to be understood as attempting to reassert the basic conceptions of Scholasticism — right up until the point of his final idealistic thoughts, coming upon him with the turn of the century and issuing in The Monadology.

The sense of 'fundamentally real' should become (somewhat) clarified in the discussion, but I should say at this stage that I mean it to have the sense in

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[1] The atomist variation of Cartesianism was introduced by Gerauld de Cordemoi (sometimes Cordemoy). See Leibniz, «A New System of the Nature and the Communication of substances, as well as the Union between the Soul and the Body», 1695 in *Philosophical Papers and Letters,* Edited and translated by Leroy E. Loemker, 2nd edition, 1969, Dordrecht, Reidel, p.456. (This collection and edition hereafter referred to as **Loemk**.)

[2] C.D. Broad, *Leibniz* (Cambridge 1975), p. 73.

[3] Brown for example accuses Leibniz of fusing two questions, (1) explaining 'the nature of organic unities' and (2) explaining how true beings must be both indestructible and indivisible. Brown acknowledges that 'Leibniz took the unusual course of attempting to unite in the same theory of substance, change, activity, and final causes' and himself attempts a unified view, but he offers no explanation of why only a self-subsistent substance can act. In fact he does not distinguish between substances which are self-subsistent and those that are not. A house is a substance but not capable of action, and thus not a self-subsistent substance in Leibniz' conception. Stuart Brown, *Leibniz* (Brighton, 1984) p.138.

which Leibniz came to deny that atoms were 'fundamentally real', the sense in which he denied that atoms could be *self-subsistent substances*. It was the task of *physics* he thought, to articulate the laws governing the movements of its self-subsistent substances, its *fundamenta*, and these laws were thought of by Leibniz as providing the basis for explaining all phenomena. But what features was physics to assume in its *fundamenta*? It was the task of *metaphysics* to supply this answer, to characterise correctly the *fundamenta* which a correct physics should have as its subject matter. Physics, he explains, concerns itself, with «the laws of nature which we learn from experience»; metaphysics is «to account for» those laws.[4]

Leibniz' difficulty with the billiard-ball atom, when advanced as the fundamental building block of the universe, and thus as a self-subsistent substance, can be put by saying that it lacked a 'principle of unity'. In a way he could be said to have adhered to this view from the moment it led him to reject the mechanical philosophy in that form to the late statement of his metaphysics in *The Monadology*. The problem in understanding Leibniz completely is largely that this summary formulation is by no means unambiguous. It can be taken to express a number of different possible points, and they do not all strike Leibniz as central at all stages of his philosophical development.

MECHANICAL COHESION

Leibniz came to be dissatisfied with the material atom only after a thorough induction into the mechanical philosophy.[5] Before his change of view, in his work towards the projected *Demonstrationes Catholicae* in 1669, he was already identifying a weakness of atomism which could be construed as a problem of 'unification'. His thesis here is that 'body is not self-sufficient and cannot subsist without an incorporeal principle', and he attempts to prove it in part by arguing that if they did not, there could be no complete explanation of why a body had the shape and magnitude it does.[6]

This is one expression of Leibniz' well-known dissatisfaction with the

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[4] Leibniz, Correspondence with Arnauld 1686-87, in Loemker, p. 454. Also: «…After trying to explore the principles of mechanics itself in order to account for the laws of nature which we learn from experience, I perceived that the sole consideration of *extended mass* was not enough but that it was necessary, in addition, to use the concept of *force*, which is fully intelligible, although it falls within the sphere of metaphysics.» (Leibniz, «A New System of the Nature and the Communication of substances, as well as the Union between the Soul and the Body», 1695, in Loemker, p.454.)

[5] — to which he subscribed in the years before his trip to Paris in 1672. See Daniel Garber, 'Motion and metaphysics in the young Leibniz' in *Leibniz: Critical and Interpretive Essays*, ed. M. Hooker (Manchester, 1982) pp. 160-184.

[6] Leibniz, «The Confession of Nature against Atheists» 1669, in Loemker, p. 111.

Cartesian thesis that what is fundamentally real as far as the physical universe is concerned — the stuff out of which everything in the universe (with the exception of minds) is made — can be identified with *extension*. Leibniz is arguing that it cannot be so identified: there has to be more to what is fundamentally real than that. As he puts it later:

> If a body is a substance [i.e. in this context something existing in its own right] it cannot consist in being extended ….[7]

This is the overall thrust of Leibniz' argument of 1669, and has often been explored. But, from the point of view of arriving at an understanding of 'unity', there is detail in this particular argument that still requires clarification, in particular the reference to *cohesion.* Leibniz asks how the *cohesion* of bodies is to be explained — the fact that 'bodies or their parts cohere with each other'? Corpuscularians, he says, have maintained that the cause of such cohesion is that the parts of bodies physically interlock with each other — 'through the interweaving of certain shapes such as hooks, crooks, rings, projections'. But, he argues, there is obviously a regress here: for if the cohesion of bodies is to be explained in terms of their parts hooking into each other, what is to explain the cohesion of the hooks that this explanation of cohesion invokes? 'Must we assume hooks on hooks to infinity?'[8]

In 1669, Leibniz does not see this as a *reductio ad absurdum*. His conclusion is rather that the regress must be halted somehow, and that in order to do so there must be posited, as the ultimate building block of bodies, a something that is *indivisible.* These indivisible somethings are, he says, the atoms of the Corpuscularians, 'which, by their varied shapes, variously combined, bring about the various qualities of sensible bodies.' Because they are 'indivisible', the cohesion of the atom itself is not to be accounted for in terms of corporeal parts: it can only be done by invoking something that is *not* corporeal: which is what he set out to prove. (In fact he thinks of this as a new proof of God.)[9]

One thought therefore is that the problem of unity is one that appeared from the perspective of corpuscularianism. If it is correct to explain the cohesion of bodies made up of particles in terms of the shape and size of those particles, as Leibniz the corpuscularian believed, then a particle cannot itself be only a body: or else there would be an infinite regress. The problem of unity construed in this way is the problem of explaining how the coherence of a body can be achieved non-corporeally.[10]

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[7] Leibniz, Correspondence with Arnauld 1686-87, in Loemker, p.338.

[8] Leibniz, «Theological Writings related to the Catholic Demonstrations», 1668-70, in Loemker, p.112.

[9] Leibniz, «Theological Writings related to the Catholic Demonstrations», 1668-70, in Loemker, p.112.

[10] Cf the *incorporeal glue* of which Garber speaks: Daniel Garber, «Leibniz and the Foundations of Physics: the Middle Years» in *The Natural Philosophy of Leibniz,* ed. K. Okruhlik & J.R. Brown (eds) (Dordrecht, 1986) p.35.

Leibniz in 1669 offers little in the way of a solution, except to say that 'in explaining the atoms, we may therefore rightly resort to God, who endows with firmness these ultimate elements of things.'[11]

Even if this is indeed a correct identification of *one* thought that Leibniz means to convey by insisting on the requirement of 'unity' in anything that is to be accounted fundamentally real, there are certainly two others, others which become articulated as Leibniz makes the transition from the mechanical philosophy first to the 'philosophy of the metaphysical point'[12] of his middle period to the idealist metaphysics he espoused in the Monadology.

Indivisibility is one of these. In speaking of the unity requirement in what is fundamentally real, Leibniz is in places at any rate meaning to insist that what is fundamentally real cannot be, in a sense that needs clarification, 'divisible'.

INDIVISIBILITY

Leibniz' thesis here could be interpreted along either of two lines. A first thought might be that what Leibniz is attempting to bring out in this way is the contradiction there appears to be between extension on the one hand and indivisibility on the other. Nothing can be both extended and indivisible.

In his early thought of course — as a subscriber to the mechanical philosophy — Leibniz attached no validity to this objection to atomism. As is clear from the passage already cited, he accepted the possibility of a materially extended but indivisible thing, objecting, as I have explained, only that the *cohesion* of the materially extended atom presented a problem. In this sense, to be divisible is to be such as might be, in principle, cut into two bits.

Later, it may be that Leibniz came to see the absence of 'divisibility' in this sense as a requirement of any *fundamentum* — which is to say that maybe he came to think of it as an objection to a materially extended fundamentum that no materially extended thing could in principle resist dissection.

INTEGRITY

But a second line of thought — presented under the same 'indivisibility' banner — certainly becomes (in Leibniz' developing thought) much more significant. There is a distinction, according to this second argument, between on the one hand things which can be divided while remaining things of the same sort, and on the other things which suffer division only at the expense of annihilation. Two

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[11] Leibniz, «Theological Writings related to the Catholic Demonstrations», 1668-70, in Loemker, p.112.

[12] Garber speaks of it as the philosophy of corporeal substance, but this is as contentious a way of characterising Leibniz' thrust during this middle period as what I suggest here … Daniel Garber, «Leibniz and the Foundations of Physics: the Middle Years» in *The Natural Philosophy of Leibniz,* ed. K. Okruhlik & J.R. Brown (eds) (Dordrecht, 1986), pp.27-130.

halves of a horse are not horses, but two pools can easily be made by dividing a single pool. If the term *substance* is invoked to cover things of the *first* kind, this is the point, fundamental for Leibniz, that there is a distinction between *substances* and *aggregates.* A substance, he says, 'cannot be divided in two, or one substance made out of two.'[13]

Aggregates are 'substantial entities put together by nature or human artifice'. They are to be contrasted with things possessing 'true unity'. 'Perfect unity should be reserved for animate bodies, or bodies endowed with primary entelechies; for such entelechies … are … indivisible and imperishable as souls are.'[14]

Leibniz maintains, from his middle period on at any rate, that what is fundamentally real has to be indivisible in the sense in play here. This is a sense of 'indivisible' which is quite the reverse of being resistant to the knife. Dissection destroys what is fundamentally real. The fundamentally real is for *that* reason 'indivisible'.

What is unsatisfactory about the material atom, interpreting Leibniz in that way, is that there are no conceptual resources in its definition to allow us to think of it as a thing in its own right as opposed to a simple collection or shred. He would then be arguing that the material atom has to be conceived of as possessing some feature in addition to those hitherto acknowledged by the mechanical philosophy, a feature that makes the difference between collection or shred and the «truly single being» which the *fundamentum* must in Leibniz' view be.

Leibniz' insistence on a substance having a 'principle of unity' then certainly refers to the requirement that to be a thing existing in its own right a thing must be 'indivisible', most significantly in the sense that it must be a thing which is not an aggregate: even if it is made of parts, those parts must posses collectively an 'integrity' which makes them more than an aggregate. Horses are like this, but piles of stone are not. Human beings are, but human arms are not.

So we reach the position that for Leibniz self-subsistent things must have integrity, be 'indivisible' in that sense, and the question arising out of that: Why should Leibniz maintain that? What is the connection between being a self-subsistent thing and being in this sense 'indivisible'?

For a proper answer we must now attempt to do some justice to a sustained theme we encounter in his arguments about what is real: the importance for what is real of having a 'principle of activity'.

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[13] Leibniz, «Discourse on Metaphysics», 1686, in Loemker, p.308. Also: 'A substance cannot come into being except by creation, or perish except by annihilation', Leibniz, «Discourse on Metaphysics», 1686, in Loemker, p.308.

[14] Leibniz, *New Essays on Human Understanding* (1st published 1765), this edition translated and edited by P. Remnant and J. Bennett (Cambridge, 1981) p.328/9. (*Hereafter this work and edition is referred to as 'New Essays …'*)

A PRINCIPLE OF ACTIVITY

The great source of Leibniz' pre-occupation with *action* in the context of his thinking about substance was Scholastic. There, in the writings of one its most sophisticated representatives, and one Leibniz clearly respected, was to be found the doctrine of the *suppositum,* with its thesis that *actiones sunt suppositorum* — an action is necessarily attributed to a *suppositum,* understood as an self-subsistent substance.[15] That is to say, in the case of an action there must be some answer to the question Who or what did it? and the Who or What must be a self-subsistent substance. It is the doctrine that only self-subsistent substances can have actions ascribed to them.

Leibniz reveals his reliance on this doctrine in a paper of 1668, which discusses transubstantiation.

The defence he gives of this doctrine is brief:

> Taken as an individual being which subsists in itself, or substance (either one), is a *suppositum.* In fact, the Scholastics customarily define a *suppositum* as a substantial individual. Now actions pertain to *supposita.* Thus a *suppositum* has within itself a principle of action, or it acts. Therefore a being which subsists in itself has a principle of action, or it acts. Therefore a being which subsists in itself has a principle of action within it. Q.E.D.[16]

He starts here by pointing out that what the Scholastics[17] meant by *suppositum* was a self-subsistent substance (i.e., a real thing existing in its own right); and then reminds us of their thesis — which he appears to have simply adopted — that 'actions pertain to *supposita*'. This entails, he says, that a *suppositum* must have within it a principle of action: which is to say, since a self-subsistent substance is what a *suppositum* is, that a self-subsistent substance has within it a principle of action. So a summary would be:

1. to be a self-subsistent substance a thing must be a *suppositum*

2. to be a *suppositum* a thing must be capable of action

Therefore

3. to be a self-subsistent substance a thing must be capable of action.

And since

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[15] There is a glancing comment in J.E. McGuire, «Labyrinthus Continui», in *Motion and Time Space and Matter,* ed. by P.K. Machamer & R.G. Turnbull (Ohio, 1976), p.295, footnote 22. Note though that according to McGuire Leibniz identified substantial form with *suppositum.* In fact the identification in the paper cited is between *self-subsistent* substance and *suppositum.*

[16] Leibniz, «On Transubstantiation», 1668(?), in Loemker, p. 115.

[17] For an authoritative modern account see Kneale, W. & Kneale, M., *The Development of Knowledge* (Oxford, 1962) pp.246-274.
Loemker (p. 119 footnote 11) refers to E.A. Moody, *Truth and Consequence in Medieval Logic,* Amsterdam, 1953, North-Holland.

4. to be capable of action is to possess a principle of action

we can conclude:

5. to be a self-subsistent substance a thing must possess a principle of action.

The interesting feature of this argument is proposition (4): the movement that appears to take place between a point in logic and a point about the capacity to generate spontaneous change. The Scholastic doctrine that an action is to be ascribed to a *suppositum* is most easily construed as a doctrine about logical categories. On this basis, it is taken to say that the category of action is such that it only makes sense to speak of an action having been performed if there is an answer to the question What self-subsistent substance (possibly Who) performed it? If there is an event which for some reason we cannot ascribe to a self-subsistent substantial Who or What, we cannot speak of it as an action.

It might be said in the philosophical context of today that if this is the doctrine of *suppositum* it says nothing about how the change that we are describing as an action was produced. Yet for *Leibniz,* it is a statement about *the origin of change.* He presents it as the key premise in authorising the conclusion that a self-subsistent substance must have within it a principle of change, and he apparently means by this that a s substance must be capable of initiating change (generating change on its own). This is why he looks to animals for his account of what a substance is: for the characteristic of animals is that they are capable of spontaneity, of initiating action. [18]

In making use of the medieval doctrine of *suppositum* Leibniz is in effect articulating a theory of action. The first part of this theory — the *suppositum* part — is that only self-subsistent substances can act. It rules out ascribing actions to parts of substances such as an arm of a human being or a sail of a windmill, and it rules out too the possibility of aggregates performing acts. It rules out my arm knocking a vase off a shelf, and it rules out a pile of stones killing someone. It insists that only self-subsistent substances can be the authors of actions.

The second part insists that an action is an *origination* of change.[19] If a happening is at the head of a causal chain that runs back to the Creation it cannot be the action of any substance but the Creator. An action *starts* a causal chain. In a truly mechanical universe there would be no actions, save the Creator's.[20]

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[18] Thus Leibniz' idea that the truly fundamental must partake of the nature of an animal — ie share with an animal the capacity for originating action — is at the heart of his philosophy. Catherine Wilson's suggestion that he was forced into such a thesis in manoevering with Arnauld would on this account be mistaken. See Catherine Wilson *Leibniz's Metaphysics,* (Manchester 1989), p.103-4.

[19] McGuire explains the dissatisfaction Leibniz felt with both Cartesians and Newtonians in the matter of their explication of the origin of change. J.E. McGuire, «Labyrinthus Continui», in *Motion and Time Space and Matter* ed. P.K. Machamer & R.G. Turnbull (Ohio, 1976) p.290-1.

[20] 'The Mechanical Philosophers, of course, had denied that activity could in any sense truly exist in nature. In their explanatory program final causes were

Before bringing in his view of activity and its importance, I said that Leibniz maintained that to be fundamentally real a thing must be 'indivisible' in the sense of not being an aggregate, of being instead an entity possessed of 'integrity'. I said that his view of action would throw light on why he needed to maintain this. The link between what is fundamentally real and 'integrity' is now clear: he thought that only integrated entities could be agents or actors. Only non-aggregates, in his terminology, could have actions attributed to them. So a necessary condition of being fundamentally real was to be a 'unified' entity, an entity having integration.

Some more flesh is put upon these bones when we consider the way in which Leibniz proposed to take account of these points. If the atom lacked the required 'integration' (it was just a bit of stuff) what did Leibniz suggest we put in its place?

What he represented himself as doing was turning back to the Scholastics. We needed something to bring integration to bits of matter, and for him at any rate, with his Scholastic university education, the Scholastic form was at hand. Here is his own account of his intellectual journey:

> At first, after freeing myself from bondage to Aristotle, I accepted the void and the atoms, for it is these that best satisfy the imagination. But in turning back to them after much thought, I perceived that it is impossible to find *the principles of a true unity* in matter alone … therefore I was forced to have recourse to a formal atom, since a material being cannot be at the same time material and perfectly indivisible, or endowed with true unity. It was thus necessary to restore and as it were, to rehabilitate the *substantial forms* which are in such disrepute today ….[21]

The Scholastic apparatus was that there was *stuff* and there were *forms*. Substances, «single beings», occurred when a parcel of stuff was associated with a *form*. The *form* made a parcel of stuff into a thing (and one of a particular kind). So much of course was the Aristotelian legacy, and it certainly allows a sense in which the Scholastics could be said to have thought that their *form* conferred «unity».

During one period of his thought therefore, Leibniz represented himself as maintaining that a fundamentally real thing was a parcel of matter made into a unified thing in virtue of its possessing a form.

This sounds thoroughly Aristotelian, thoroughly Scholastic, and it has lead to the view that during this period, dubbed by Garber Leibniz' Middle Period, the essence of Leibniz' position was Scholastic, and that his contribution to the debate about what was truly real was to reassert Scholasticism.[22]

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restricted to volitional acts.' McGuire, *Ibid*, p.299.

[21] Leibniz, in Loemker, «A New System of the Nature and the Communication of substances, as well as the Union between the Soul and the Body», 1695, in Loemker, p.454.

[22] Daniel Garber, «Leibniz and the Foundations of Physics: the Middle Years» in *The Natural Philosophy of Leibniz*, ed. K. Okruhlik & J.R. Brown (eds) (Dordrecht, 1986) pp. 38ff.

A proper understanding of Leibniz' concern with unity, I want now to suggest, prompts us to enter a caveat, I think quite a large caveat, to this thesis. My point is that some of his representations to the contrary, the 'form' that Leibniz puts to work in his Middle Period metaphysics is really importantly different from the form of the Scholastics.

THE LEIBNIZIAN 'FORM'

First, the observation already made, that Leibniz' concept of what is truly real is not the same as the Scholastic concept of substance. The Scholastic category of substance includes houses and clocks. These things are made the sort of thing that they are in virtue of their possessing the relevant form. But houses and clocks are for Leibniz mere aggregates. They are not fundamentally real (though made of things that are, of course). Leibniz' *fundamenta* are a subset of Scholastic substances, just the ones that are 'animated'.[23]

This is one difference.

A second is this. What drives Leibniz to reject the atom is that it lacks a principle of action. But as a matter of fact, as Leibniz fully realised, the Scholastic form was deficient in precisely this crucial way. The Scholastic form too lacked a principle of action.

«Active force», Leibniz says, «differs from the mere power familiar in the Schools, for the active power or faculty of the Scholastics is nothing but a close possibility of acting, which needs an external excitation or a stimulus, as it were, to be transferred into action. Active force, in contrast, contains a certain act or entelechy and is thus midway between the faculty of acting and the act itself….»[24]

What the Scholastic form lacks, Leibniz is recognising, is its own capacity to *initiate*. But it is precisely this capacity which he is insisting a truly fundamental thing must possess.

So that is the second divergence. When he invokes the notion of form, not only is it a form that animates some things and not others, but it has a principle of action lacking in its Scholastic forerunner.

There is a third point. Though I have said that Leibniz in his Middle Period represents himself as positing, as the fundamental building block, a scrap of matter 'unified' by a form — a Leibnizian form, as I would insist — he is also defending in that same Middle Period the thesis that matter cannot be 'unified' at all. That is to say, he reached the view that nothing you can do to matter will make it into a thing capable of initiating action.

Previously, as I have explained, in his mechanical phase, he tried the view that adding a soul to the matter of the Cordemoy atom would solve the problem

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[23] 'Perfect unity should be reserved for animate bodies, or bodies endowed with primary entelechies …' Leibniz, *New Essays* …, p.328/9.

[24] Leibniz, «On the Correction of Metaphysics and the Conception of Substance», 1694, in Loemker, p. 433.

of cohesion. So at *that* stage it might be argued that Leibniz was essentially persisting with Scholastic ideas. But a subsequent step, a step that takes place within the 'middle period', is to reject the idea of matter altogether.

What Leibniz posits instead of the 'unification' of matter by form is that the basis for a self-subsistent substance must be, not something extended, but a *point,* something he refers to also as an *atom of substance:*

> … *material atoms* are contrary to reason. It is only atoms of *substance,* that is to say, real unities that are absolutely destitute of parts, which are … the absolute first principles out of which things are compounded…[25]

Though these *atoms of substance* are spoken of by Leibniz as 'points', he makes it clear that they are not *mathematical* points (that on its own would eliminate matter more directly than Leibniz in his Middle Period would wish). Nor, emphatically, are they very small but materially extended corpuscles — for that would be leave them as *material* and the problem of 'unification' unsolved. They are, Leibniz says, *metaphysical* points.

> It is only *metaphysical* points, or points of substance, which are exact and real, and without them there would be nothing real….[26]

It is perfectly true that Leibniz retains in this context of the end of the material a role for what he is still prepared to call a 'form': a self-subsistent substance is, he explains, one of these metaphysical points animated by a 'form'. My point is that with Leibniz's substitution for matter of the metaphysical point he has left the Scholastic conception of substances consisting of matter animated by form *decisively* behind.

In fact what Leibniz attempted to retrieve from the Scholastics was not their forms but their doctrine that *actiones sunt suppositorum.* Once this principle were granted, you had to supplement the conception the mechanical philosophy had of the atom. And for this purpose Leibniz had to propose not the reintroduction of the Scholastic form, but the introduction of a new device which simply drew inspiration from the latter. (It drew equal inspiration of course from the mechanical philosophy itself. For we have to ask: Why did the lack of a principle of activity, in the sense identified by Leibniz as essential to an self-subsistent substance, not concern the Scholastics?)

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If that is what his idea of a substance has become, immediately it confronts a major difficulty: How could Leibniz conceive of a *point,* something in principle lacking in extension, as a building block for the whole universe, as the *fundamentum* by reference to which the laws of physics could explain all? How

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[25] Leibniz, «A New System of the Nature and the Communication of substances, as well as the Union between the Soul and the Body», 1695, in Loemker, p. 456.

[26] Leibniz, *Ibid,* p. 456-7.

can something lacking extension be the building block for a spatial universe? For his solution Leibniz turned not to the Scholastic inheritance, which (admittedly) he rather passes himself off as doing, but, again, to a conception which was radically new. The Leibnizian substance as it takes final definition is a metaphysical point serving as the *locus* for a Cartesian mind.

But that begins something else, Leibniz' final phase, the first years of the new century, of which *The Monadology* was the fruit.

SUMMARY

What I have tried to do here is to explain how Leibniz' variously expressed difficulties with what could be truly real fall into place once his concern with the origination of change is seen as fundamental. The truly real cannot be an aggregate because an aggregate cannot originate change. That is the sense in which the truly real must be 'unified' or 'indivisible'. But if this is so, there is something importantly missing from an account of Leibniz thought in the 'middle period' (when he was thinking through the notion of the fundamentally real with Arnauld) which speaks of him as championing the Scholastic conception of substance as matter with form. The Scholastic form precisely lacked the 'principle of activity' which for Leibniz was the crux of the substance question. And moreover, though he still talks of the key significance of the 'form', the conception of self-subsistent substance he actually articulates during this period substitutes for Scholastic matter the metaphysical point, so that the break with Scholasticism, letter and spirit, is surely hard to deny.

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«Logic and Necessary Being»

LOGIC AND NECESSARY BEING[1]

Matthew McKeon

§1. Introduction

In a recent publication,[2] Yuval Steinitz argues that since (1) it is logically possible that there are logically necessary beings, it follows that (2) there is at least one logically necessary being. Steinitz switches the Leibnitzean ontological argument's concern from perfect beings to logically necessary beings because he thinks that it is easier to establish the logical possibility of a logically necessary being than the logical possibility of a perfect being (at least as traditionally understood as omnipotent, omniscient, perfectly good, etc…), and, therefore, easier to establish the soundness of his argument than the soundness of a Leibnitzean ontological argument. Steinitz's justification of the soundness of his argument (A) is based on Richard Swinburne's account of logical necessity presented in, *The Coherence of Theism*.[3]

This paper has two primary aims. First, I seek to highlight what I view as the nature of the justification for thinking that (A) is valid. I do not offer a complete treatment of the logic of logical necessity and possibility in first-order logic, but I hope to show that Steinitz's quick treatment is insufficient to establish that (A) is valid. In particular, it is not clear that Swinburne's account of logical necessity grounds the validity of (A). Secondly, I attempt to show that the correct account of logical possibility makes (A)'s premise false. In pursuing both aims, I expose the inadequacies of Swinburne's account of the nature of logical necessity.

§2. The Validity of Steinitz's Argument

In order to assess the validity of (A), it is standard to identify its logical form by translating (1) and (2) into sentences of a well-defined formal language. Since these sentences contain modal terms, we appeal to a first-order modal language which is a standard first-order language supplemented with the operators 'M' and 'L' for 'possibly' and 'necessarily' respectively. Consider the following plausible

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[1] This paper benefited from the comments of Scott Lehmann and John Troyer.

[2] Yuval Steinitz, «Necessary Beings», *American Philosophical Quarterly* vol. 31 (1994): 177-181.

[3] Richard Swinburne, The Coherence of Theism (Oxford: Clarendon Press, 1977).

construal of the logical structure of (A), (A'): (1') M(∃x)L(∃y)(x=y)/∴(2') (∃x)L(∃y)(x=y).

It is standard to interpret necessary truth as truth at all possible worlds, and possible truth as truth at some possible world. In this way, the modal operators are understood as quantifiers over possible worlds. The truth or falsity of a modal claim on some interpretation of it is understood as its truth or falsity at some possible world. Furthermore, 'necessarily' and 'possibly' are defined in terms of the relative possibility (or accessibility) relation as follows: 'Mp' is true at some world if and only if (iff) there exists at least one world w' such that w' is possible relative to w and 'p' is true at w'; and 'Lp' is true at w iff for every world w', if w' is possible relative to w, then 'p' is true at w'.[4]

Different senses of necessity warrant different restrictions on the relative possibility relation, because the possible worlds relevant to assessing the truth value of 'Lp' and 'Mp' will vary on different senses of 'L' and 'M'. For example, a historian of religion claims, «Biologically speaking, Mary can't be a mother while a virgin at the same time.»[5] Presumably, she means that Mary can't be a mother while a virgin, given the laws of biology. Parsing this in a modal language we get: '~(Mary is a mother and a virgin)' is true at all worlds at which the laws of biology hold. Worlds at which these laws fail are irrelevant to assessing the truth value of the claim that Mary can't be a mother while a virgin. So the relative possibility relation serves to restrict the range of 'L' in 'L~(Mary is a mother and a virgin)' to those worlds at which the laws of biology hold. It is this subset of the totality of possible worlds that is relevant to assessing the truth value of the historian's claim (i.e., her claim is false if it is true that Mary is a mother while a virgin at one of these worlds). In general, the relative possibility relation serves to restrict the domain of the modal operators to those worlds relevant to assessing the truth value of the sentences within their scope.

If the relative possibility relation has a certain structure, then it can happen that an object necessarily exists from the point of view of one world, but not from others. In order for, say, 'It is possible that Al Gore not exist' to be true, there must exist a world w possible relative to this one at which 'Al Gore exists' is false. 'It is necessary that Al Gore exists' is true iff 'Al Gore exists' is true at all worlds possible relative to the real world. Obviously, it can't be true at a world that Gore exists contingently (i.e., it is not necessary that Gore exists) and that it is necessary (in the same sense) that he exist. However, this doesn't imply that 'Al Gore exists contingently' and 'Al Gore necessarily exists' can't each be true at distinct worlds that are not possible relative to one another.

For example, suppose that the species of possibility at work in the above sentences is metaphysical possibility. So, in evaluating the truth of sentences at a world w, we consider only those worlds that are metaphysically possible from the

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[4] I adopt the convention of creating a name for an expression by placing that expression within single quotes, but do so only when the lack of single quotes might result in confusion.

[5] A remark made by Dr. Uta Ranke-Heinemann in a PBS special on the 1992 Global Forum of Women, «Not a Bedroom War» (Dec. 1994).

point of view of w. Consider a Leibnitzean view of metaphysical possibility. That is, suppose a strong form of metaphysical determinism is true, so that for any constellation of objects and initial conditions there is just one way things can go. Still, different choices of objects and conditions are, we imagine, possible for God. The universe of metaphysically possible worlds is, then, a set of worlds partitioned into equivalence classes — each class is made up of a single world, and from the point of view of any one world w, the only world metaphysically possible relative to w, is w itself. Al Gore necessarily exists from the point of view of our world w, but there is another world — impossible (in a metaphysical sense) from the point of view of w — in which Al Gore's non-existence is metaphysically necessary, because Gore doesn't exist there (God could have not created Gore). On this view, the fact that an object necessarily exists from the point of view of one world, does not entail that it exists at each world.

Since the modal operators in (A') are understood to be operators for logical possibility and logical necessity, the validity of (A') turns on the nature of these modal notions. Steinitz's argues that (A) is valid because if we, «… assume that these necessary beings might not exist, that is, that their absence is only contingent, … then it logically follows that they could also, in principle, contingently exist.»[6] But it isn't clear that this does follow, because the content of the assumption «these necessary beings might not exist» is unclear. If we assume that an individual β doesn't exist at our world w, and necessarily exists at a world w', then this makes β's existence at w' contingent only if w is possible relative to w'. But perhaps our world is impossible from the point of view of a world at which there exists a necessary being.

In fact, the validity of (A') turns on the rationale for thinking that the structure of the relative possibility relation on the totality of logically possible worlds is both symmetric and transitive. For if '$M(\exists x)L(\exists y)(x=y)$' is true at a world w, then '$(\exists x)L(\exists y)(x=y)$' is true at some w' possible relative to w, and so '$L(\exists y)(\beta=y)$' is true at w' for some β in w'. Then, given that the relative possibility relation is symmetric, '$(\exists y)(\beta=y)$' is true at w, so β exists in w. If '$(\exists x)L(\exists y)(x=y)$' were false at w, '$(\forall x)M\sim(\exists y)(x=y)$' would be true at w, and so '$M \sim(\exists y)(\beta=y)$' would be true at w, so '$\sim(\exists y)(\beta=y)$' would be true at some w'' possible relative to from w. Given that the relative possibility relation is transitive, '$(\exists y)(\beta=y)$' would be true at w'', which is ridiculous.

This semantic proof establishes that it is logically impossible for (A')'s premise to be true while its conclusion is false on a conditional basis: if the structure of the relative possibility relation on the collection of logically possible worlds is both transitive and symmetric, then it is logically impossible for (A')'s premise to be true while its conclusion is false. Hence, this proof needs to be underwritten by some account of the collection of logically possible worlds in order to establish the validity of (A').[7]

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[6] Steinitz 177.

[7] (A') is valid in an S_5 modal semantics. But this suffices to establish the validity of the argument only if S_5 semantics is the correct formal account of the logic of logical necessity and possibility in first-order logic. In order to assess the latter, a background theory on the nature of logical necessity and possibility is

Intuitively, logical truth is a species of necessary truth, i.e., if a sentence p is logically true, then it is *impossible* for p to be false. Two traditional ways of unpacking the modal notion are: (i) if a sentence p is logically true, then p remains true (at the real world) on all possible meaning assignments to the non-logical terms occurring in p; and (ii) if a sentence p is logically true, then there is no *way the world could be* which would make p false. In what follows, I first show that (A') is invalid in the totality of worlds generated by (i), and secondly, I show why it is unclear that the totality of possible worlds generated by (ii) makes (A') valid.

(i) is derived from an approach which defines logical truth in first-order logic as follows: a sentence p is logically true iff it remains true on all meaning assignments to the non-logical terms occurring in it. This approach understands a logically possible situation (or a logically possible world) as a meaning assignment in the (real) world.[8] Meaning assignments to predicate letters, variables, and constants correlate sentences to subsets of the totality of individuals in the world in such a way as to make sentences true or false. We can establish that, say, 'Bill and Hillary are married' is not logically true by imagining that 'Bill' and 'Hillary' refer to 2, and 'married' to the *less than* relation. Following Lehmann, I will call it the possible meaning (PM) approach.[9] Given that the domain of the world is denumerably infinite, this approach secures all of standard first-order logic.[10] However, it has been pointed out that one consequence of the PM-treatment of logical truth is that if the world were finite, then more sentences

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required. This is the concern of what immediately follows.

[8] This view is held by, among others, Alfred Tarski, «On the Concept of Logical Consequence,» *Logic, Semantics, and Metamathematics* trans. J.H. Woodger (Oxford: Clarendon Press, 1956) 416-420; W.V. Quine, *Philosophy of Logic* 2nd ed. (Cambridge, Mass: Harvard UP, 1986) 47-56; Richard Jeffrey, *Formal Logic: Its Scope and Limits* 3rd ed. (New York: McGraw-Hill, 1991) 17-18; and Hartry Field, *Realism, Mathematics, and Modality* (Oxford: Basil Blackwell, 1989) 82-88.

[9] Scott Lehmann, «Slightly Non-standard Logic», *Logique Et Analyse* 92 (1980): 379-392.

[10] The Löwenheim-Skolem theorem tells us that if there exists a meaning assignment which makes a sentence p true at a possible world with a domain of n individuals (for some natural number n), then there exists a meaning assignment which makes p true in a world with no more than a denumerably infinite number of individuals. Accordingly, if there doesn't exist a meaning assignment which makes a sentence p false at a world with a denumerably infinite domain, then p is a logical truth. So, the supposition that the cardinality of the world's contents is denumerably infinite allows us to appeal solely to individuals of this world in representing logically possible situations (i.e., the domains of logically possible worlds will be subsets of the domain of the real world).

would be logically true.[11]

For example, if Parmenides were correct and the world w contained exactly one thing, then (∃x)(∀y)(x=y) would be logically true, since there would be no meaning assignment which falsifies this sentence at w (such a meaning assignment requires a domain greater than one, and in the Parmenidean world there is only «The One»). On the PM approach , a logical truth at a world w is a sentence p for which there is no meaning assignment which falsifies it at w. So, what is logically true at a possible world w, turns on the cardinality of w's domain. Judgments about what is logically true are a posteriori (in sofar as the determination of the cardinality of the world's contents is a posteriori), as well as revisable (in sofar as this determination is revisable).

The PM approach generates the following totality of logically possible worlds.[12] Let's suppose that the totality of individuals in the real world is denumerably (countably) infinite. (1) A logically possible world is any sub-collection of individuals, properties and relations from the real world. (2) A logical law at a world is a first-order logical truth at that world; a sentence p is a logical truth at a world w iff p is true under all meaning assignments at w. A meaning assignment to p at a world w is a function that assigns to each individual constant and variable occurring in p an element of the domain of w; to each n-place predicate letter a set of n-tuples from that domain. The truth rules for the logical constants determine the truth values of logically compound sentences at a world w given the truth values of their atomic parts at w. (3) The relative possibility relation is defined in terms of (1) and (2): w' is possible relative to w iff each logical law at w is a logical law at w'. Then (4) the relative possibility relation is non-symmetric. For any two worlds w, w', if the domain of w is larger than the domain of w', there will be a sentence p which is a logical law at w' but not at w, and so w will not be possible relative to w'. But since all the laws of w are laws of w', w' will be possible relative to w. (5) The truth or falsity of modal claims at worlds is unpacked by (1) and (4) (e.g., 'Mp' is true at w iff 'p' is true at a world (given by (1)) which is possible relative to w (given by (4)). For example, 'M~(∃x)(∃y)~(x=y)' is true at our world (reading 'M' as 'it is logically possible that'), because '~(∃x)(∃y)~(x=y)' is true at the parmenidean world w which contains just one thing; w is possible relative to our world because all logical laws at our world are logical laws at w. But since ~(∃x)(∃y)~(x=y) is a logical law at w and not at our world, the latter is not possible relative to the former.

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[11] See John Etchemendy, *The Concept of Logical Consequence* (Cambridge: Harvard U.P., 1990) Chapters 6 and 7; and John Etchemendy, «Models, Semantics, and Logical Truth» *Linguistics and Philosophy* 11 (1988): 91-106.

[12] My presentation of this totality is motivated by the combinatorialesque approach to possible worlds suggested by, among others, W.V. Quine, «Propositional Objects», *Ontological Relativity and Other Essays* (New York: Columbia University Press, 1968). For a detailed exposition of the idea of taking possible worlds to be set-theoretic combinatorial rearrangements of the basic atoms of which our world is composed see, M.J. Cresswell, «The World is Everything That is the Case» *Australasian Journal of Philosophy* 50 (1972): 1-13.

(A') doesn't turn out to be valid on this view of logical truth, because the relative possibility relation is non-symmetric. Here is a countermodel for the argument. Suppose that a world w contains exactly one object α, and another world w' contains exactly two objects, each distinct from α. Then w is possible relative to w', but the only world possible relative to w is w itself. Then (1') is true at w' because '(∃x)L(∃y)(x=y)' is true at w. But (2') is false at w' since no member of its domain exists at w.

On the PM approach, sentences whose denials can only be true in infinite domains (e.g., ((∀x)~Txx&(∀x)(∀y)(∀z)((Txy&Tyz)→Txz))→(∃x)~(∃y)Txy) turn out to be logically true at all finite worlds. Nevertheless, those sentences logically true at our world are necessary in a very strong sense: they are true at each world, since all worlds are possible relative to ours (assuming that there does exist a denumerably infinite totality). But for each world w_i containing less than the real world, there will be sentences logically true at w_i which are not logically true at each world.[13]

The main criticism of the PM approach to logical truth is that it generates a notion of logical necessity that is too weak.[14] What is logically necessary should be true regardless of the empirical makeup of the world, and so what is logically true at a world w should not turn on what exists at w. An adequate account of logical necessity must reflect that (ii) if a sentence is logically true, then there is no *way the world could be* which would make p false. But the significance of this criticism rests on a clarification of the modal notion in (ii). How are we to understand the appeal to *ways the world could be* in a way that grounds the validity of (A')?

In his paper, Steinitz relies on Swinburne's account of logical truth.[15] According to Swinburne, (iii) a statement p is logically true iff ~p is incoherent,

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[13] Compare this view of logical truth with a structuralist view of mathematical truth: mathematics is about the actual structures of possible worlds. '9>7' may not be true at all possible worlds, because its truth is relative to a conception of the natural numbers. If there are things in this world with the structure of the natural number sequence, then '9>7' is true of this world. In the latter case '9' and '7' would refer to some individuals and '>' to some relation between individuals. But, it may be false that 9 is necessarily greater than 7. Consider the parmenidean world w: '9>7' is false at w, since the natural number sequence is not realized in w (because the successor of a number must be different from it, and here there is nothing but «The One»). So, even though the Peano Axioms (on the standard interpretation) are mathematically necessary in the sense that they are true in all worlds which exemplify the structure of the natural numbers, they are not true at each possible world.

[14] See, Etchemendy.

[15] Steinitz, note 1 181.

where the meaning of the words occurring in p is fixed.[16] On his view, to say that p is logically possible means that p is coherent.[17] The notion of coherence is unpacked as follows. (iv) «A coherent statement is, I suggest, one for which it makes sense to suppose is true; one such that we can conceive of or suppose it and any other statement entailed by it being true; one such that we can understand what it would be like for it and any statement entailed by it to be true.»[18] Swinburne offers 'All bachelors are unmarried' and '1≠3' as examples of logical truths.

The validity of (A') requires that we understand logical truth in such a way so that p is a logical truth at each possible world if it is one at any one world. By (iii), this amounts to appealing to a sense of *coherence* which makes the coherence or incoherence of a sentence invariant from one world to another.[19] However, Swinburne's conflation of logical possibility with coherence results in psychologizing logic by making the logical necessity of a sentence p consist of the fact that p must be thought of as true. Critics of the psychologistic interpretation of logical necessity will argue that this misrepresents the modal notion in (ii). The fact that, say, human x is boy and at the same time not a boy, must be false is not due to the fact that the human mind is so made that it cannot understand the conditions required for the truth of this claim, but rather is due to mind independent facts about the world.

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[16] So in determining whether or not 1=3 is coherent '1', '3', and '=' must have their ordinary meanings.

[17] Swinburne 14.

[18] Swinburne 12 and 14.

[19] However, there are other senses of *coherence* which do not make what is coherent invariant from one world to another. For example, what is coherent depends on an ability to conceive which is determined, in great part, by the constitution of the human mind and body, the language of the conceiver, and other facts. Perhaps then in order to ascertain what is coherent in a possible world, we must imagine the powers of conceiving which would exist in that world. It may be that these powers of conceiving will vary from one world to another. For example, I can conceive of a world w in which stellar evolution is different and there are no black holes. But if there had been no black holes, it might have been the case that the inhabitants of such w would not know what is a black hole, and so no one could conceive of one. Defining logical truth in terms of this sense of coherence results in making a world possible relative to another iff the former is conceivable to someone in the latter. Then w would be possible relative to our world but not vice versa. So the validity of (A') requires a stronger sense of *coherence*: to say that a statement is coherent is to say something about it without reference to the ability of conceiving which may or may not exist in other states of affairs. See G.E. Hughes and M.J. Cresswell, *An Introduction to Modal Logic* (London: Metheun, 1968) 77-80, where Hughes and Cresswell motivate the assignment of different properties to the relative possibility relation on the basis of different senses of *conceivable.*

At any rate, the arguments in the literature levied against the reliability of conceivability — on any of its senses — as a guide to possibility, make dubious the identification of *a way the world could be* with a coherent (in Swinburne's sense) state of affairs.[20] For example, as Tidman points out, what is conceivable (in Swinburne's sense) seems to depend on what is possible. «Whether we can really conceive of, say, having a headache without being in a particular brain state, depends upon what is possible, in particular, on whether these are two essential aspects of one thing, a question that cannot be resolved by what we can conceive of.»[21]

Whether a seeming conceivability is truly conceivable depends on what is possible. We don't want to say that it was conceivable to ancient astronomers that (a) the morning star exist without the evening star existing. Rather (a) only seemed conceivable to them, for their understanding of the truth conditions of (a) was based on an ignorance of the fact that the existence of the one entails the existence of the other. Knowing that it is conceivable that p, requires a knowledge of what is possible in order to know what is entailed by p. Tidman concludes that, this «…removes from our grasp any direct ability to make judgments about possibility based on conceivability.»[22] More relevant to the concern here is the fact that the invariance of what is coherent from world to world obtains only if what is possible is invariant from world to world. So, we return to the original problem of unpacking the nature of the modal notion at work in (ii) in order to ground the latter.

One suggestion is that this modal notion is metaphysical[23]: if a sentence p is a logical truth, then there is no way the world could metaphysically be which would make p false. This motivates the following definition of logical truth: p is logically true iff it is not metaphysically possible for p to be true on any meaning assignment to the non-logical terms occurring in p. On this approach, a logically possible situation is a meaning assignment in a metaphysically possible world. $((\forall x)\sim Txx\&(\forall x)(\forall y)(\forall z)((Txy\&Tyz)\rightarrow Txz))\rightarrow(\exists x)\sim(\exists y)Txy$ is a logical truth on this approach only if it is metaphysically impossible for there to be a denumerable infinite totality of things. One might object that even if the existence of such a totality is metaphysically impossible it may nevertheless be logically possible. However, this approach is here being pursued precisely to get at the latter notion, and it is not clear what objection there can be if it turns out that such a totality exists in no metaphysically possible world.

The appeal to meaning assignments makes logical possibility weaker than

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[20] See, Paul Tidman, «Conceivability as a Test For Possibility», *The American Philosophical Quarterly* vol. 31 (1994): 297-309, and Stephen Yablo, «Is Conceivability a Guide to Possibility?», *Philosophy and Phenomenological Research* vol.53, 1993: 1-42.

[21] Tidman 305.

[22] Tidman 305.

[23] Etchemendy *Models, Semantics, and Logical Truth*, 95 and 102.

metaphysical possibility. For example, a Kripkean can hold that 'Saddam Hussein is a dog' could logically be true on the basis that, say, 'is a dog' could have meant, *is an Iraqi*. The validity of (A') then would turn on the structure of the relative possibility relation on the totality of metaphysically possible worlds. It must be at least both symmetric and transitive. While there are many who believe that what is metaphysically necessary does not vary from one possible world to another (and subscribe to an S_5 modal semantics as the correct semantic representation of the logic of metaphysical possibility), this view is not universally held. I subscribe to the modal situationalism[24] illustrated by the above Leibnitzean view of metaphysical possibility. That is, on my view the laws of modal metaphysics may vary from world to world. In particular, I believe that it is metaphysically possible that metaphysical determinism be true of worlds whose domains are finite. In such worlds, it is not metaphysically possible that there be more individuals. However, the actual world is not, on my view, deterministic. The deterministic worlds are (metaphysically) possible relative to the actual world, but not vice versa. This view will not support the validity of (A'). So, on this understanding of the modal notion in (ii), a defense of the validity of (A') must consist of, in part, an argument against modal situationalism.

There are other ways of understanding the modal notion in (ii).[25] I do not claim to have taken the matter far here. I merely wish to point out that the challenge for the proponent of the validity of (A) is to unpack the modal notion in the ordinary concept of logical truth in a way which will ground the invariance

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[24] The term is Loux's. See Michael Loux, «Modality and Metaphysics» in *The Possible and the Actual* ed. Loux (Ithaca: Cornell UP, 1979) 15-64, 28.

[25] For example, Etchemendy suggests that the modal notion in (ii) may be epistemological (*On the Concept of Logical Consequence* 88-89): if p is logically true, then there is no way the world might, for all I know, be, which would make p false. In order to secure the invariance of logical necessity and possibility from world to world on this approach, we need to argue that from the point of view of each world, all worlds are (epistemically) possible. The challenge is to spell out the relevant sense of epistemic possibility which secures this invariance. One way is derived from the fact that we do not want logic limited by a possibly radical misconception of the world. Perhaps what is logically true, should remain true on all views about the nature of the world. Very quickly, a possible world represents a view about the facts (both modal and non-modal), and from the perspective of each view, other views are doxastic alternatives. So in ascertaining what is logically possible, we must take into account the epistemological fact that any one theory about the nature of reality could be wrong. For example, Swinburne believes that (a) positrons are electrons travelling backwards in time is logically impossible because (a) is incoherent (41). But it is possible that Swinburne is wrong, and the proponents of the truth of (a) are correct (Swinburne cites the physicist Richard Feynman as one such proponent). So, on this approach to the modal notion in (ii), it is logically possible that (a) be true. The world at which (a) is true represents the case in which Swinburne is wrong. But if the fact that I might be wrong about what I claim to know is relevant to establishing the possible falsehood of a given sentence p, then it seems that very little, if anything, turns out to be logically true.

of logical truth from world to world. People like Quine believe that the notion *ways the world could be* is deeply mysterious, and opt for weaker notions of logical necessity (e.g., the one embodied in the PM notion of logical truth). I don't believe that the invariance of logical truth from world to world is self-evident or obvious, and therefore it seems to me that it needs to be defended by argument. Steinitz does not provide one. What justifies his confidence that (A) is valid?

§3. **Is it logically possible that a logically necessary being exist?**

Although Steinitz claims that there can be no conclusive demonstration for the coherence of any concept,[26] he thinks that there is reasonable justification for the coherence of the existence of a logically necessary being.

> Quine emphasizes that every self-contradictory concept forms a necessary non-being, i.e., in no possible world does there exist a barber who shaves all and only all those who don't shave themselves. *Necessary non-being* forms a coherent concept, why shouldn't *necessary being* as well? For if the combination of logical/analytical necessity with negative existential propositions can be coherent, it means that there is no essential opposition between modality and ontology. This seems to remove the only difficulty … from which the internal inconsistency of necessary beings was alleged to emerge.[27]

I am not sure what Steinitz has in mind by *internal inconsistency*. Perhaps a concept is internally inconsistent if it pictures that something is both the case and not the case. But Swinburne claims that a sentence is also incoherent if it conflicts with another coherent sentence. Hume, of course, believed that for each object, it is conceivable that it not exist, and so would argue that a necessary existent is incoherent. I don't see why the coherence of a thing whose non-existence is necessary is a reason for maintaining the coherence of an object whose existence is necessary. The condition required to establish the necessary non-existence of, say, a barber who shaves all and only all those who do not shave themselves is clear in sofar as it is clear that this claim is internally inconsistent. But Steinitz must show that not only is the concept of necessary existence internally consistent, but also that it does not conflict with other coherent claims.

At any rate, it seems to me that this is besides the point because Swinburne's approach to logical possibility is unmotivated, and so it is unclear that the sentences it makes logically impossible are really logically impossible.

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[26] Steinitz 180. If correct, this would be unfortunate given the role that the perception of coherence plays in the determination of logical truth (on Swinburne's account). Steinitz cites Swinburne (Swinburne 39-41) as the source for his belief that there is no conclusive demonstration for the coherence of any concept. But this implausibly strong claim is not held by Swinburne. For example, Swinburne takes the coherence of 'John has red hair' as self-evident, as well as the entailment of 'Someone has red hair'. Since entailment preserves coherence, this is conclusive proof that the latter is coherent according to Swinburne. The difficulty in proving coherence applies to those concepts whose coherence is dubious and which are not obviously derivable from concepts that are coherent.

[27] Steinitz 180.

Logical possibility is a logical property and all logical properties are, on my view, properties of sentences. So, the concept of the existence of a logically necessary being is internally consistent only if the claim that it exists is logically possible. Recall that on the Swinburne's approach, p is logically possible iff p is coherent, i.e., the conditions required for the truth of p are understandable, where the meaning of the words occurring in p are fixed. In what follows, I question the motivation for the latter constraint

On the standard approach to logical possibility in first-order logic, a sentence p could logically be true iff there exists an interpretation which makes p true. An interpretation of a first-order sentence p consists of two components: a domain and a meaning assignment, which (as indicated above) is a function that assigns to each individual constant and variable an element of the domain; to each n-place predicate letter a set of n-tuples from the domain. A sentence is a logical truth iff there is no interpretation which makes it false. On this approach, in order to ascertain whether or not the concept of the existence of a necessary being is consistent, we need to identify the logical structure of the claim that an individual necessarily exists. I have construed it as (2')$(\exists x)L(\exists y)(x=y)$. So, the logical possibility of (2') boils down to whether or not there exists a meaning assignment to (2') which makes it true in some domain (i.e., at some possible world).

The appeal to meaning assignments in the standard approach to logical possibility in first-order logic reflects the fact that possible uses for variables, individual constants, and predicates are elements of possible situations to be countenanced in fixing the extension of logical possibility. In fact, this approach constrains the possible uses or meanings of variables, names, predicates, and primitive sentences only by the type of expressions they are (e.g., properties to predicates, first-order particulars to names, etc…). To elaborate, consider the treatment of the existential quantifier in classical semantics. There the quantifier is attached to a variable which may be used to range over various collections of individuals. The actual use of variables is given by the kind terms in the quantifiers.

For example, the logical structure of 'There exists at least two natural numbers' can be represented as, '$(\exists x)(\exists y)\sim(x=y)$', where 'x' and 'y' range over the collection of natural numbers. In actual use, these quantifiers might point to all sorts of different collections of objects. This suggests that a possible use of variables, and therewith the quantifiers, is given by specifying some collection over which they could be used to range. By moving to a possible use of variables, we can make existential quantifications false. For example, we can make the above existential quantification false by using 'x' and 'y' to range over the offspring of Bill and Hillary Clinton.

So, if a first-order sentence p is true on a possible use of the non-logical terms occurring in it, then this establishes that it is logically possible for p to be true. In other words: a sentence is logically necessary at a world w only if it remains true at w on all possible uses to its non-logical terms (whether this is both necessary and sufficient for logical truth at a world, as is maintained by the PM approach, is a point of contention). To establish that 'Bill Clinton is a Democrat' could logically be false at the real world w, we need not consider a world in which Clinton has a different party affiliation, but simply consider a re-interpretation of the atomic sentence so that it says something false about w,

perhaps that Bill Clinton is a female.

I believe that the classical requirement that the ranges of variables be non-empty is unmotivated. It represents a qualification of the idea that the possible meaning of variables are to range as widely as possible. Since failure of reference is a possible use for a term,[28] the empty world represents the use of terms in which they fail to refer (e.g., one possible use of a variable is to range over the empty set). Since all existential quantifications are false at the empty world, none are logically necessary. The objections that allowing failure of reference generates a semantics that misses some logical truths, e.g., (∃x)(x=x), is circular. The judgment that this sentence is a logical truth presupposes some theory in which names must have referents, domains must be non-empty, etc…, but the latter is what is at issue.

Note that to imagine that, say, '~(∃x)(x=x)' is true is to imagine that 'x' could be used so that it fails to refer. It is not required that we imagine an alternative course of evolution such that the individuals of the world fail to exist. Clearly, the possibility of such a use for 'x' is independent of considerations about whether the universe could have evolved so that nothing exists. Hence, even if there exists an individual whose existence is, say, metaphysically or mathematically necessary, this is no reason to think that failure of reference is not a possible use for a term. To say that it is logically possible that there be nothing is misleading because, on my view, the appeal to the empty world in determining what is logically possible is grounded on the notion that failure of reference is a possible use for terms, and is not grounded on some claim that the universe could have been empty.

By keeping the meaning of all terms occurring in a sentence p fixed in determining whether p could logically be true, Swinburne's approach makes the evaluation of the logical possibility of a sentence p consist of inspecting different possible (conceivable) worlds in which the extensions of the terms occurring in p are changed. This makes the logical possibility of a quantification p turns on the actual use of the quantifiers occurring in p, which results in fixing the domain of quantifiers in terms of their actual use, and not subject to change from one interpretation to the next. For example, suppose a platonist, who believes that each possible world contains all the arithmetical entities, uses '(∃x)(∃y)~(x=y)', to assert that there exists at least two natural numbers. On this use, the variables range over the collection of natural numbers. On Swinburne's approach, to consider whether this sentence could logically be false is to consider whether it is coherent to suppose that the cardinality of the set of natural numbers be less than two. Since the platonist finds the latter incoherent, she is committed to the logical truth of her assertion.

However, by relativizing logical truth to the actual use of the variables, different views about the nature of mathematical objects can give us different

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[28] For example, suppose I believe that nobody loves Jane, and in order to convey my certainty of this I say: «If somebody loves Jane , then I am a monkey's uncle». Aren't I using the quantifier to range over the empty set?

answers to questions about what is logically true.[29] Moreover, on this account, logical form is not decisive to what turns out as logically true for logical truth will vary on distinct uses for terms. For example, the Platonist could use the above formal sentence to assert that Shannon has two marbles in her pocket (on such a use, 'x' and 'y' range over the marbles in Shannon's pocket). Surely the platonist is not committed to the incoherence of the denial of this assertion.

On the standard approach to logical possibility, we can establish that the above sentence could logically be false by appealing to the fact that the variables could be used to range over, say, the set of even natural numbers that are prime. By appealing to possible uses/meanings we make what is logically true a matter of form and thereby reduce the need to do metaphysics in order to do logic. On Swinburne's approach in considering whether or not the theist's assertion, 'there exists a necessary being' — $(\exists x)L(\exists y)(x=y)$ — is logically true the range of 'x' and 'y' is fixed in terms of one object β, and not subject to change from one interpretation to the next. But then the issue of whether this sentence is logically possible turns on whether there *could conceivably* exist such an object. But why make logic hostage to the resolution of issues in modal metaphysics? By restricting the possible uses of variables we make logical truth turn on things other than logical form, and this results in decreasing the epistemic transparency of judgments about what is logically true. Since we have more to say about what meanings are possible than about ways the world could conceivably be, it is better to base our assessments of logical possibility on the former in order to secure the strongest possible epistemological foundations for our logical judgments.

Since the theist believes that God is metaphysically necessary, the theist is committed to believing that the above sentence is true (reading 'L' as the metaphysical necessity operator). Reading 'L' as the logical necessity operator, is the theist committed to regarding the sentence as true? Not on the standard approach. For, if this is true, then there exists an object β such that '$(\exists y)(\beta=y)$' is true on all possible uses for the variable 'y'. But there is no such object; we can use 'y' to range over an object α such that $(\alpha\neq\beta)$ (assuming that there exists at least one object distinct from God to call on as the value of 'y'). On such a use, '$(\exists y)(\beta=y)$' is false.

So, if (1') '$M(\exists x)L(\exists y)(x=y)$' is true (reading 'M' and 'L' as the logical possibility and logical necessity operators), then there exists a referent β for 'x' such that '$(\exists y)(\beta=y)$' is true on all possible uses for 'y'. But there is no such β for there as many uses for 'y' which will falsify '$(\exists y)(\beta=y)$' as there are collections of objects which exclude β. For example, if 'y' is used to either range over the empty set or the set consisting of just one object α $(\alpha\neq\beta)$, then '$(\exists y)(\beta=y)$' is false. Hence, (1') is not true.

In sum, the difference highlighted here between Swinburne's approach to logical possibility and what I have been calling the standard approach is that on the former one determines whether it is logically possible that a given sentence p is true by looking to other possible (i.e., coherent — in Swinburne's sense) extensions of the terms occurring in p, while on the latter one can look to the actual world with its actual extensions in substituting new terms for the non-

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[29] On the view sketched in note 7, this sentence is not necessarily true.

logical terms occurring in p. I don't see the motivation for adopting an account of logical possibility which diminishes the capacity of logic as a tool for figuring out what is true by decreasing the reliability of the perception of what is logically possible in some cases, and in other cases leaving it an open question whether a sentence is logically possible or not.[30] Placing logic on a more solid epistemological footing by not grounding intuitions about what is logically possible on any one view of metaphysical or mathematical reality underwrites the uses of logic. By using the resources of logic, we can determine the truth values of a number of sentences without having to investigate that part of the world they are about. If we base the determination of logical truth on strong claims in modal metaphysics, then we obviously minimize the value of logic in helping to figure out what is true. Moreover, we use logic to clarify and frame issues in metaphysics. It is not going to have this use if it embodies one point of view. This motivates allowing the range of the possible uses of variables to be as wide as possible to insure that logic is not encumbered with issues in metaphysics. So, if it is logical possibility and necessity at work in (1'), then (1') is false because possible uses of variables should count as elements of possible situations to be countenanced in fixing the extension of logical necessity and possibility. Of course, (1') may be true on a different reading of the modal operators.

§4. **Conclusion**

Steinitz's argument for the validity of (A) is a reductio from the assumption that the argument is invalid.[31] If (i) it is logically possible for a logically necessary being to be merely logically possible and not actually exist, then (ii) it is logically possible that such a being exist contingently. But (ii) is impossible because a being that exists contingently is not necessary. But (ii) follows from (i) only if what is logically necessary is invariant from possible world to possible world. So there is no reason to take Steinitz's reduction from the assumption that (A) is invalid seriously unless there is reason to think that what is logically necessary does not vary from world to world. I have tried to make explicit the challenge of clarifying the notion of logical necessity in a way which grounds the validity of (A). The fact that this challenge is substantial motivates interest in weaker notions of logical necessity like the one captured by the PM approach. This approach does not make (A) valid.

Furthermore, the correct approach to logical necessity must account for those possible situations in which the meanings of some of the terms in our language might have been different. On such an approach, the premise of Steinitz's argument is false. This suggests that arguments for the possibility of a

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[30] For example, Mates tells us that «Nobody has yet been able to make the discovery needed for deciding whether the one premised argument — The number of stars is even and greater than four; therefore, the number of stars is the sum of two primes — is valid. Benson Mates, *Elementary Logic* 2nd. ed. (New York: Oxford: UP, 1972) 4. As Mates admits, the validity of this argument is an open question not because its logical structure is unknown, but rather because the truth of Goldbach's Conjecture has not been established. But why construe logical possibility so that logic becomes a hostage to the resolution of this conjecture?

[31] See Steinitz 177.

necessary existent which do not make logical possibility the operative modal notion are more promising than those that do.[32]

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[32] For example, Plantinga's argument appeals to what he calls broadly logical possibility which is more restrictive than logical possibility. According to him, it is logically possible, but not broadly logically possible that 'Red is a color' and 'No numbers are human beings' be false. The standard approach to logical possibility sketched in section 3 also makes it the case that these sentences could logically be false.

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«Aristotelian and Modern Logic»

ARISTOTELIAN AND MODERN LOGIC

Katalin Havas

In this paper I am not trying to give a definite answer to the question wether modern logic is the perfection of the Aristotelian logic or there is some other relationship between the two. I only wish to pose some questions related to this problem which are connected with the more general problem of the philosophy of science. Namely, is logic a cumulatively developing discipline or are the paradigms changing and consequently are the systems based on different paradigms mutually untranslatable or is there a progress in the course of the history of logic, but this progress is somehow different from the cumulatively developing processes?

A few years ago I visited the theater in Epidaurus, built in the fourth century B. C. Of course, like other tourists, I tried out the acoustics of the theater, and confirmed that a whisper, or the sound made by the lighting of a match on the central stage could be heard on each of the 55 rows of seats of the auditorium accommodating an audience of 14 thousand people. All this had been achieved without the use of complex electronic equipment. Can we then state — I was asking myself — that the sound systems employed in our contemporary theaters would be more advanced using them in the theater in Epidaurus? More advanced because for the same purpose we employ more complex means? Or is such new technology more advanced not in order to achieve the same purpose in the Epidaurus theater, but rather to achieve other results? (E.g. in sending sound over longer distances.)

A similar question can be raised in connection with logical theories. In which sense is modern logic more advanced than Aristotelian logic? In the first period of the modern logic the representatives of the cumulative theory — which was the ruling theory in that time — considered the history of logic a succession that was started by Aristotle, supplemented by the results of some mediaeval logicians, and given its full-blown form by the birth of the Frege-Russell type mathematical-logical calculi. To illustrate how the relationship between Aristotelian and modern logic was described — according to this view — let me quote A. N. Whitehead. In his Foreword to Quine's early work «A System of Logistics» (1934) Whitehead wrote: «In the modern development of Logic, the traditional Aristotelian Logic takes its place as a simplification of the problem presented by the subject. In this there is an analogy to arithmetic of primitive tribes compared to modern mathematics.»

To give another example, I would like to mention how Tarski evaluated

the whole of traditional logic, including Aristotelian logic: «The new logic surpasses the old in many respects, — not only because of the solidity of its foundations and the perfection of the methods employed in its development, but mainly on account of the wealth of concepts and theorems that have been established. Fundamentally, the old traditional logic forms only a fragment of the new, a fragment moreover which, from the point of view of the requirements of other sciences, and of mathematics in particular, is entirely insignificant.»[1]

On another page of the same book Tarski wrote: «The whole of the old traditional logic can almost entirely be reduced to the theory of the fundamental relations among classes, that is, to a small fragment of the entire theory of classes.»[2]

Can the «perfection of the methods» be used as one of the arguments to prove that the new logic surpasses the old logic? Do a theory surpass another if the results are the same and only the methods are different (let me add: more complicated)? Of course the «perfection of the methods» was not the only argument that Tarski used. He mentioned the wealth of concepts and theorems in the new logic. Because of this he thought that the old logic was only a fragment of the new. But, are really the results of Aristotelian syllogistic a fragment of the logic of classes? It is true that in the logic of classes the validity of some deductions are provable which one cannot prove within the framework of Aristotelian syllogistic. But is the Aristotelian theory of syllogism really a fragment of the modern logic of classes? Does this interpretation not alter the Aristotelian theory at least as much as even the best microphone will alter the characteristic of sound traveling in open air? A vast literature is devoted to the subject of the possible interpretations of the Aristotelian theory of syllogism. For example, M. and W. Kneale specify seven possible types of interpretation and prove that none of them fulfills all the conditions given by Aristotle.[3]

I will mention here only two of them because they suffice to show why Aristotelian syllogistic cannot be fully interpreted in the logic of classes.

1. The first requirement — mentioned by the Kneales — is that it must be natural within the Aristotelian theory to regard singular and general statements as co-ordinate species of a genus. The copula and the predicate should have the same function in both cases and the kinds differ only in the nature of the subject-term.

If however, in the formula Every A is B «A» and «B» are taken as names of classes and the copula is meant to express the relation «is included in» then «A» cannot be replaced by a singular term. If A is replaced by a singular term the relation «is included in» has to be changed to the relation «is an element of». So, in this case the above mentioned requirement is not fulfilled. The copula is not

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[1] Tarski, A. *Introduction to Logic and the Methodology of Deductive Sciences.* Oxford. University Press, Inc. Revised ed., 1946. p. 19.

[2] bid, p. 76.

[3] See Kneale, W. and M., *The Development of Logic*. Oxford University Press, 1962.

the same and that is why the singular and the general statements are not co-ordinate species of a genus.

2. Another requirement is that every general term must be capable of occurring either as subject or as predicate without change of meaning.

However, if for example — corresponding to Tarski's interpretation —, the formula Every A is B is interpreted as a form where A refers to certain individuals that are separated from other individuals by properties which they have in common and, furthermore, if the copula is the sign of predication and B expresses a property ascribed to individuals A, then it is impossible to interchange subject and predicate without change of meaning of A and of B.

Are these not sufficient argument to support the assumption that the objects of Aristotelian syllogistic and the logic of classes are different? Hence, these two theories do not speak of the same objects and consequently, both Aristotelian syllogistic and the logic of classes are fragments of the whole of logic in the sense that they are different parts of it.

The objects of the Aristotelian theory of syllogism are the general terms of the natural languages of everyday conversation and science. Aristotle was aware of the dual logical function in which the general term is used in natural languages. That is to say, in the role of logical subject its function is to denominate an individual or to refer to an individual and as logical predicate its function is to indicate what belongs or does not belong to an individual. Peter Geach mentioned in his book *Logic Matters* that in modern logic «we do not have such a formal theory that recognizes the name-status of general terms without eclipsing the difference between name and predicate.»[4] The objects of the logic of classes as well as of the predicate logic were constructed by taking out only one function — and abstracted from the other functions — of general terms. That is why the doubly-functioning general terms of natural languages are only indirect objects of these modern logics. Can we evaluate the theories created by the segregation of functions, as unquestionable progress in the development of theories? Or does this question contain its answer — like in the case of the theater at Epidaurus — depending on the universe of discourse? Are we looking at it from the viewpoint of the area of objects within the Aristotelian theory, or from some other area? Do we wish to speak of the logical relationship expressed in natural language, do we wish to explore the rules of argumentation? Or do we think that the logical relationships expressed in natural language — which was a subject matter of the Aristotle's investigations — are entirely insignificant «from the point of view of the requirements of sciences, and of mathematics in particular»?

The answers to those questions are closely linked with our way of defining the task of logic.

It is well known that Aristotle did not use the word «logic» for his works which later in the first century B. C. was collected under the name «Organon». The topics such as Aristotle discussed in the works contained in the Organon

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[4] Geach, P. T., *Logic Matters*, Univ. of California Press, Berkeley-Los Angeles 1972. p. 61.

were what in later centuries most people have called logic. However, within the Organon, Aristotle is not content with merely providing the axiomatic theory of syllogism. The range of means offered by Aristotle for the victorious conduct of arguments in discussions is much broader than that. Thus it is evident, that in subsequent centuries, based on the Organon, logic contains much more than the theory of formal analysis of deduction or the theory of some abstract objects. On the basis of the Organon, such «aids of thinking» were born — under the collective name of logical theory — as discuss the role played in cognition by various kinds of concepts, and by various kinds of statements, as well as numerous problems in methodology. With the emergence of modern logic, that is with the appearance of the Frege-Russell type of so-called classical symbolic logic a great advance undoubtedly was made in the logic whose objects are special kinds of abstract objects. At the same time the philosophical spirit of logic was almost entirely lost. It become removed from what Aristotelian, Stoic and Scholastic logic had set for itself as an important task: to explore the features of argumentation in ordinary language and to establish the rules of correct inference in order to improve the methods of cognition.

But today, when we speak of contemporary logic, we cannot mean exclusively that part of modern logic which is called classical symbolic logic. Contemporary logic contains the non-classical logics as well (intuitionist, relevant, paraconsistent logics, etc.). Contemporary logic provides more than formal study of deducibility. Making use of the results of formal studies and not divorced from them, it examines problems with philosophical content, some of them already occurring in Aristotle's work and only later removed from logic by the members of the early neopositivistic movement during the initial stage of modern logic.

To resort again to an analogy, let me mention the fact that most of the ancient Greek statues were originally colored. In the course of centuries they become soiled. When they were found and people tried to clean them, they lost their coloring. That was one of the reasons why uncolored sculpture became fashionable. Aristotelian logic also lost its colors through the centuries. But the time of rediscovering the beauty of its colors has returned. It is the right time to return to Aristotle's idea according to which logic has a double aim: it is concerned with apodeixis, and at the same time it is an episteme. To realize this idea of course is not possible in one logic, which would be «the true logic» and which would outdo Aristotelian logic in every respect. Hopefully, though, with different logical theories — built up with different aims and with different methods — logic as a whole, while retaining the Aristotelian ideas, will at the same time surpass them.

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«On Behalf of the Fool: Moore and Our Knowledge of the Existence of Material Objects»

ON BEHALF OF THE FOOL: MOORE AND OUR KNOWLEDGE OF THE EXISTENCE OF MATERIAL OBJECTS

Edward N. Martin

«Am I crazy, or are there now only two beds in this room?»

Constable to Otis Driftwood

(*A Night At the Opera*, 1936)

Each of us makes assertions, frequently and without hesitation, which amount to truth-claims or knowledge-claims about our world. I am prepared to assert that I know, for example, that Bach is my favorite composer, that the mailman has delivered mail today, and that bulls have horns. As well as these, there exist a myriad of other propositions about which I am in a good position to say I *know* are true.

Sometimes my assertions claim that a certain state of affairs obtains or has obtained (for example, that Bach is someone's favorite composer). However, sometimes my assertions concern the *contents* of particular states of affairs (for example, that I received a long-awaited book in the mail today), and at other times the contents of general states of affairs (that some animals have horns). Perhaps we could distinguish these two types of states of affairs by defining them in the following way. Say that a particular state of affairs is one which may be described by a proposition which designates rigidly an event or happening contained in that state of affairs. A general state of affairs is one which cannot be rigidly designated in the way a particular state of affairs can.[1]

Now it is certainly the case that we sometimes err in what we say about the contents of particular states of affairs. But it is a much more tenable claim, it seems, that there must exist at least some things which form the substance, the very stuff of, general states of affairs. So it seems we are all in a good position to assert that

(1) Material objects exist.

G. E. Moore, in his book *Some Main Problems of Philosophy*, has recommended a version of anti-skepticism which attempts to show that we are in our so-called

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[1] My use of 'rigid designation', etc., is intended to be in keeping with Saul Kripke's use. See his *Naming and Necessity* (Cambridge: Harvard University Press, 1980), p. 48.

epistemic rights to say, with conviction and certainty, that we *know* that (1) is the case. In this paper I shall do two things. First, I shall examine Moore's main argument in favor of anti-skepticism. Second, I shall argue that there is an epistemic defeater which Moore's system is not equipped to defeat, and which either calls for Moore to relinquish the certainty of his knowledge of objects, to probabilify his knowledge, or to bolster his system so as to defeat the proposed epistemic defeater.

§1. Moore the Anti-Skeptic

In his arguments against skepticism, Moore employs the following logical truth. Any two opposing arguments patterned after these forms are logically equivalent:

1) p

2) q

Therefore,

3) r;

and,

~3) ~r

2) q

Therefore,

~1) ~p.

His employment of this logical principle can be seen in the following passage:

> *My* argument is this: I do know that this pencil exists; therefore Hume's principles are false. My opponent's argument on the contrary is: Hume's principles are true; therefore you do not know that this pencil exists. And obviously in respect of the certainty with which the conclusion follows from the premiss, these two arguments are equally good.[2]

The missing premiss of these two enthymemes is: «If Hume's principles are true then I do not know that this pencil exists» [q]. Moore's claim is that he knows the pencil exists; the skeptic's claim goes the other way, as it were. He claims to know that Hume's principles are true and thus that whatever follows from such principles are true. This leads the skeptic to deny that Moore's pencil is known by anyone truly to exist. Moore, that is, has not met the grounds for knowledge

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[2] G. E. Moore, «Hume's Theory Examined», in *Some Main Problems of Philosophy* (New York: Collier, 1962), p. 137. Moore enumerates «Hume's Principles» as «(1) That in order absolutely to know that B *must* have been preceded by A, I must have observed in the past that things like B were *constantly* preceded by things like A; and (2) That in order to know that *B* was *probably* preceded by A, I must have observed in the past that things like B were *generally* preceded by things like A.» In «Hume's Theory», *ibid*., p. 114. (*Some Main Problems* now abbreviated 'SMPP')

which Hume's principles lay down. Clearly, both the Humean skeptic and Moore are using a valid argument form. Moore opts for the following form:

p. I do know that this pencil exists.

q. If Hume's principles are true, then I cannot know that this pencil exists.

Therefore,

r. It is not the case that Hume's principles are true.

The skeptic's argument takes the form: ~r; q; therefore, ~p, concluding that Moore cannot not know that this pencil exists. Deciding which argument is the best will come down to deciding which person has better evidence, grounds, or justification for his assertion of the first premise of his argument. A bit more on this point might be gained by making the following observations.

It is true that if Moore knows p, then Moore has grounds for his assertion that he knows that p. On the other hand, it seems reasonable to say that the skeptic knows that he has principles which, if not measured up to by any of Moore's knowledge-claims, entail that Moore does not really know what he asserts. So, the skeptic seems to be able to know something; Moore's skeptic is not a complete skeptic. He is merely one who is willing to doubt that Moore can know that some singled-out object really exists. We might say that the skeptic must accept this principle:

[AIK] (Assertion Implies Knowledge): If an individual A makes a propositional assertion p, then A claims to know that p.

If AIK is accepted, as it seems it should be, the skeptic also is making a knowledge-claim when he asserts that there is no pencil to which Moore points. Apparently, then, both Moore and the skeptic must have sufficient grounds for making their claims. It is at this point that Moore sees his way out. If the argument forms pitted one against the other are equally logically valid, then we must ask which one of (p) and (~r) is more probably true.

Which of (p) and (~r) look more likely to be the case? In behalf of Moore, (p) seems to have a bigger draw on its side. Two initial reasons could be adduced for (p)'s doxastically superior position. First, it seems self-evidently or nearly self-evidently true that a *particular* statement is epistemically easier to form, maintain, revise, and support with sufficient grounds than a general statement. Moore readily concurs on this point.

> In fact any general principle to the effect that we can never know a particular kind of proposition, except under certain conditions, is and must be based upon an empirical induction …. it follows that no such general principle can have greater certainty than the particular instances upon the observation of which it is based.[3]

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[3] In «Material Things», SMPP, p. 160.

It's much easier to believe or find more probable that a particular pit bull, Bowser, is tenacious, than that *all* pit bulls are tenacious. (Though even here there may be fairly common exceptions. It's not necessarily the case when looking out over Wrigley Field in the top of the second inning that «the man on the mound exists» is more probably true than that «all the players on the field exist» or even «every one presently in my field of vision exists» are true. But I take it that these points subvert neither Moore's point nor the doxastically superior position of (p) over (~r).) Second, there is the indirect point that even the skeptic must not be committed to an all-out abandonment of knowledge. For he relies with certainty on his knowledge that his principles are what they are, and that they can properly be applied this way and that.

Now, there is one obvious rejoinder that the skeptic might make against our assertion that (p) is a more credible assertion than (~r). Namely, he could point out that when one compares *what is said* in (p) and (~r), one finds that different *sorts* of objects are referred to, and different claims *about* those objects are being made — claims which are conceptually more complex in Moore's premiss (p) than in the skeptic's premiss (~r). And perhaps it is the complexity of (p) which ultimately makes the skeptic's claim that (~r) more tenable. For, in (p), the claim is made (by Moore) that

(p) I know that this pencil exists.

A pencil is an extended object, taking up space, whose existence entails that there exists external objects. To speak conclusively on the doxastic hopefulness of (p), one thus needs to have some account of the terms «exist» and «external world». What about (~r)? It claims that

(~r) Hume's principles are true.

(~r)'s commitments to the existence of objects is *prima facie* slimmer. This statement presupposes there being the (coherent) *concepts* of «principles» and «true». Perhaps Moore, then, has a more difficult position, thus making (p) less doxastically attractive? Of course, the point here is that it *may be* that Moore's having to explain the concepts he makes use of — «exist» and «external world" — will land him in more difficulty than the skeptic's having to explain the concepts of a principle and of the property of being «true» which some principles enjoy. But I would submit two considerations which pull back the doxastic edge to Moore's side. First, it seems to me that speaking of «exist» and «external world» are not at all any more conceptually problematic than is speaking of «true» (as the skeptic does). For, *many* propositions which, when thought of together lead one to form principles, are *made true by* the external world (or what we take to be an external world of which we are a part). Again, secondly, Hume's «principles» spoken of by the skeptic are forged in the same furnace. For principles, at least the Humean ones under consideration, are most definitely intended to say something *true* of the external world, *viz*. that no one is in his proper rights to claim knowledge about the world or any of its particulars outside himself.

Another important argument against skepticism of some merit is the argument from prior probability. Laurence BonJour among others has given an

argument of this kind.[4] Suppose we have two hypotheses which explain Moore's being appeared to in the pencil-like way: (1) Moore does see a pencil in front of him ('S'); (2) There is a malevolent demon named Rene who is massively deceiving Moore so that he seems to see a pencil in front of him ('D'). Since both hypotheses entail the seeing of the pencil ('P'), Bayesian analysis tells us that we are left to consider which is greater, the prior probability of S or the prior probability of D. The higher prior probability in this instance clearly falls, one might argue, on the side of S. Thus, Moore can overcome the skeptic's argument in this way.[5]

The few items I have considered tend to confirm Moore's assertion (p) over against the skeptic's assertion (~r). Up to this point we have undertaken to judge the merits of Moore's claim to knowledge when compared to the merits of the claims of the Humean skeptic. We have only examined Moore and knowledge largely derived from empirical observation. Of course, I think it's clear enough (from his *Principia Ethica*) that Moore holds that we also have a (largely) non-empirical type of knowledge, moral knowledge, to which we have access through our moral intuitions. An empirical state of affairs (say, Bowser's having bitten the mailman) may be the *ground* for making the judgment that being in pain on this occasion is intrinsically evil; but arguably the intuition itself which allows such a judgment or knowledge-claim to be formed and entertained is itself *non-empirical*. What I propose in the next section is primarily designed to disrupt Moore's theory of our knowledge of the external world. But it shouldn't be thought that my argument against Moore cannot also be applied to his claim that we can have *moral* knowledge as well. If my claim is right, in saying that there may be a defeater to Moore's certainty, which is rooted somewhat like a virus in one's belief-forming mechanisms, it will most definitely follow that *all* types of knowledge will be infected (for all knowledge has belief as a necessary requirement). But, it is good to remember that my main intent is to cast doubt upon Moore and his knowledge of the external world. That primarily, then, concerns empirical knowledge.

§2. Sense-Data Data

There are a number of philosophical commitments to which Moore seems fondly attached but which weaken, so I shall argue, his anti-skepticism. The two most relevant of these are Moore's naturalism, and, his sense-data theory. I wish to show that it is the former which weakens Moore's anti-skeptical argument. However, we should dwell on his sense-data theory here to prepare for the last

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[4] See BonJour's *The Structure of Empirical Knowledge* (Cambridge: Harvard University Press, 1985).

[5] Bayesian analysis gives us the following. Pr (D/P) = [Pr (P/D) X Pr (D)] / Pr(P); also, Pr (S/P) = [Pr (P/S) X Pr (S)] / Pr (P). Since denumerators are equivalent, we cancel them out. Next note that since both D and S entail P (seeing the pencil), then both Pr (P/D) and Pr (P/S) are equivalent and thus drop out also. That leaves us with the prior probabilities of D and S. The weight of intuition falls on the side of S's superiority over D's here.

section. By so dwelling I want to make it clear that the epistemic defeater of Moore's system which I shall propose later in this section is even tougher to overcome by Moore given his committment to a sense-data theory. For a number of the knowledge claims, and the *content* of those claims, that Moore thinks he is entitled to make go far beyond (by way of content) what any «directly apprehended» sense-datum might tell a person.[6]

When a human agent is in the right circumstances, Moore holds that that person will come to certain truths about her world by inferring truths from her sense-data. In his essay «Material Things» Moore presents this theory about inferring certain truths from sense-data.[7] We might call this theory the *causal implication thesis*. To illustrate the thesis, Moore employs an example of a group of people riding a train. The people in the train know that they are moving along the ground at a certain speed, that they are shaking back and forth during the ride, that the train is extended in space because it is a material object, and so forth. But they also know certain things because of the *causal* activity of the train. We infer certain things about the world from our sense-data. Moore says that it is reasonable to claim that we know that there is something, in the world, which causes our sense-data to be what they are. In his 1910 paper «Hume's Philosophy», Moore was not yet convinced that Hume's principles were very telling in regard to the limits of human knowledge. So Moore:

> We may quite well *know* many things which do not logically follow from anything else which we know. And so … we may *know* that two things are causally connected, although this does not logically follow from our past experience, nor yet from anything else that we know …. And as for Hume's argument to prove that we can never know any *external* object to be causally connected with anything which we actually observe, it is, I think, obviously fallacious.[8] [his emphasis]

Moore's attitude toward Hume's argument changed during that year, for in his lectures (Winter 1910-1911) which make up SMPP, Moore says that Hume's argument is valid. We saw this in section one of this paper. What I add here, then, is the caveat that Moore only recently had adopted a new respect for Hume's argument. But, also, Moore for the first time in his Morley College lectures speaks of sense-data. This is where I think the causal implication thesis plays a significant role in Moore's new ideas of this time. For even if we grant that there is a material object which is not a mind and is extended in space and is not a sense-datum or a collection of sense-data, there remains the ultimate question: how do you *know*, Moore, that the thing causing your sense-datum is correctly (re)presented *by* the sense-datum? Moore writes:

> I, for instance, claim to *know* that there does exist now, or did a moment ago, not only these sense-data which I am directly apprehending — seeing or feeling — but *also* something else which I am not directly apprehending. And I claim to know not merely that this something else is the *cause* of the sense-data which I am seeing or

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[6] For Moore on «direct apprehension» see Moore, «Sense Data», in SMPP, pp. 61-66.

[7] In SMPP, pp. 143-161.

[8] «Hume's Philosophy», originally in *The New Quarterly*, 1909; reprinted in *Philosophical Studies* (New York: Harcourt, Brace & Company, 1922), p. 161.

> feeling: I claim to know that this cause is situated *here*; and though by *here* I do not necessarily mean *in* the space which I directly apprehend, yet I do mean *in space* — somewhere in *some* space. And moreover I claim to know, not merely that the cause of my sensations is situated here in space, and has therefore some shape, but also roughly *what* its shape is…. It is, I think, plainly things like these that we all of us believe, when we believe in the existence of material objects.[9] [his emphasis]

In all of these knowledge-claims, of course, there is really no doubt (in Moore's mind) that there is something in space which causes Moore to have the sense-data that he does. Going back to an earlier distinction I made between general and particular states of affairs, we need to grant to Moore that there must exist something in order for us to think that there are states of affairs which obtain and which contain the objects (or at least some of the objects) which we claim to know that they do. But this in effect turns the table on Moore.

We have seen that Moore favors moving from particular sense-data (cylindrical, yellow, solid, hard, etc.) to the existence of objects. But it seems much more probably true that

(1) Material objects exist

than that

(2) This particular object exists.

Certainly the probability of the truth of a disjunctive set of knowledge-claims is much more probable than the truth of any particular knowledge-claim. It's much more probable, for example, that our school team win one of their games during the season than that they win any one particular game. And so also with our knowledge of material objects: we seem to have knowledge that they exist, but it's much less probable (*pace* Moore) that any particular one exists than that in general at least some material objects exist. This point is of no special consequence unless we judge that the probability of the particular claim that Moore makes (say, that the pencil exists) is far from being near 1 (where «1» means certainty). In other words, Moore could grant that it's more probably true that there exist many material things than that one particular ostensively referenced thing exists. But why think that *that* putatively referred to thing is *not known* to exist? The best way to show that Moore is not entitled to say that he *knows* that, say, his pencil exists is to show that a human belief-producing mechanism is not *itself* known to be reliable.[10] Perhaps we can find a defeater to

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[9] In «Hume's Theory Examined», SMPP, p. 132.

[10] The word «reliable» here poses a problem, for I examine the reliability of our belief-producing mechanisms and how that reliability is related to knowledge of the objects of perception. If I define «reliable» simple as «producing true beliefs *most* of the time», then by definition, even if Moore did have reliable belief-producing mechanisms he might still not know that the objects he perceived really do exist. So, by *reliable* I mean «producing true beliefs about the existence of the objects of perception, when those objects are both (a) readily macroscopic, and (b) well-textured substances with visible properties, plus a lot more». I would say that clouds, fog, mist, 3-D holographic images, and mirages are *not* well-textured substances, whereas tables, chairs, and pencils are. The «plus a lot more»

Moore's claim that he knows that the pencil exists by looking in this direction.

§3. An Epistemic Defeater?

There *is* a certain defeater to Moore's claims to knowledge which his system is not able to defeat. Moore was himself a naturalist.[11] This implies that humankind, according to the best going naturalistic theories of Moore's day and ours, arrived on the scene after a period of millions of years of evolutionary development. Humans, as we know, have belief-forming mechanisms which have as one purpose or function that of producing mostly true beliefs. But what of these mechanisms? How reliable can we take them to be if they have been produced over a long period of time by blind forces of chance, time, and natural selection? Darwin himself expressed doubt at this point.

> With me the horrid doubt always arises whether the convictions of man's mind, which have been developed from the mind of the lower animals, are of any value or at all trustworthy. Would any one trust in the convictions of a monkey's mind, if there are any convictions in such a mind?[12]

Patricia Churchland and Alvin Plantinga have recently expressed similar doubts.[13] Quine demurs from these doubts. He writes:

> There is some encouragement in Darwin. If people's innate spacing of qualities is a gene-linked trait, then the spacing that has made for the most successful inductions will have tended to predominate through natural selection. Creatures inveterately wrong in their inductions have a pathetic but praiseworthy tendency to die before reproducing their kind.[14]

These quotations seem to pose two questions. First, which one of these sentiments is more nearly correct? And second, what value is this discussion for Moore's

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clause covers the function of belief-forming mechanisms to form non-existential questions. I think these notes are sufficient to show that Moore is in no position to verify whether he has reliable (as defined) belief-producing mechanisms.

[11] See Moore's famous paper, «The Defense of Common Sense», reprinted in his *Philosophical Papers* (London: Allen & Unwin, 1959).

[12] Charles Darwin, letter to William Graham Down, July 3, 1881, in Francis Darwin, ed., *The Life of Charles Darwin Including an Autobiographical Chapter* (London: John Murray, 1887), Vol. 1, pp. 315-16. Quoted in Alvin Plantinga, «Is Naturalism Irrational?», in *Warrant and Proper Function* (Oxford, 1993), p. 219. See also Darwin's discussion of pleiotropy in *On the Origin of Species* (Cambridge, MA and London: Harvard University Press, 1964), p. 143.

[13] Patricia Churchland, «Epistemology in the Age of Neuroscience», *Journal of Philosophy* 84 (1987), 544-553. Alvin Plantinga, «Is Naturalism Irrational?», *ibid*., pp. 216-237. For some of the ideas in this section, I am indebted to Alvin Plantinga and his critique of naturalism in *Warrant and Proper Function.*

[14] W. V. O. Quine, «Natural Kinds», in *Ontological Relativity and Other Essays* (New York: Columbia University, 1969), p. 126.

project? Let me address each of these in turn.

First, Quine's sentiment does not sit well with all of modern evolutionary theory. A bad trait (say, inferior hearing) may not be eliminated and may be indefinitely perpetuated by its being linked with a good trait (say, overall sense of balance). A gene can carry the code of more than one trait by pleiotropy, «where one gene codes for more than one trait or system».[15] This means that the organism may never achieve optimal genetic coding, and this may or may not be telling for the reliability of the organism's belief-producing mechanisms.

Our belief-producing mechanisms are very complicated configurations many aspects of which do weigh considerably on the issue of human knowledge. Not only perception and the propositional content which comes from perception, but also memory and reason and its contents, play important roles in perceptual knowledge. But why think that the naturalistic hypothesis is ill-equipped to produce reliable belief mechanisms in humans?

It's certainly the case that an animal species's *survival* is the first concern of natural selection; thus, whether an animal's capability to picturing the world aright is reliable is not completely at center stage here. If it were reasonable to suppose that an organism best equipped for survival would be very much like an organism equipped with mechanisms which produced true beliefs about the world in which it lived, then Moore would be vindicated from the charge that I've leveled against him. But I don't see that an organism set on survival must necessarily have, as a sort of concomitant property, a reliable belief-forming mechanism (one which was able to reliably determine which things existed and which ones did not in one's perceptual field). For example, an animal's belief-producing mechanisms may quite often alert it to «dangers» which are not really dangers of any kind. Many times for us a «sensed» danger amounts to an imagined presence or an «I thought I saw something». As the Proverb says, «the wicked man flees though no one pursues».[16] Or, if an animal is to survive, it must display some sort of danger-avoidance behavior. Why think that the animal's beliefs about the most appropriate danger-avoidance behavior in some circumstance are *true* beliefs about the world? If bad cognitively-related traits are passed on by pleiotropy, our belief-producing mechanisms, if belief is causally related to our behavior, would be maladaptive and would tend to work unreliably in some set of circumstances. Unfortunately, this means that we would not know which beliefs we entertained were in fact false beliefs. In favor of avoiding tooth and fang, man's cognitive abilities would be no guarantee for anything but survival. And survival is different from truth. We may trade on Thrasymachus's view of justice in this context: might may make right, but why truth and proper belief?

This, then, is where Moore's project is pertinent. We can construct an argument which is similar in logical form to the Humean skeptic's argument we

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[15] Alvin Plantinga, «An Evolutionary Argument against Naturalism», *Logos* 12 (1991), 27-47; p. 32. This article is very similar to the chapter in *Warrant and Proper Function* referred to above.

[16] *Proverbs* 28:1.

examined in section I. It can be cast in this way: (a) Naturalism & Evolution are not sufficient to establish or guarantee that our belief-producing mechanisms are reliable. (b) Therefore, we don't know that the pencil which seems to be before us really exists. And, since A's believing that p is necessary for A's knowing that p, A would not know that p if A arrived on the scene by merely naturalistic means. There would be a defeater, D, which could not itself be defeated by Moore's ostensive demonstration or appeal to his senses.

> [**D**] Moore cannot be certain that his belief-forming mechanisms are currently producing true beliefs.

So, Moore cannot say of any particular object that he knows that it exists. Of course, this is using «know» in a certain strict way, which I cannot develop here, but which I submit meets Moore's criteria for perceptual knowledge of the type with which he is concerned. (See Appendix)

Moore might make the following initial response. If his system had an undefeated defeater, then the defeater D *itself* will have arrived on the scene through the same process as the other beliefs that Moore entertains; perhaps it itself, then, is unsubstantiated. But that doubt, which defeats the defeater, is itself defeated, on account of premise (a), that our beliefs are unreliable because of our evolutionary ascent. Moore seems plagued by the difficulty of having a defeater which, though challenged, is never undercut and thus never quelled in his system.

Perhaps a better response open to Moore is the following. William Alston has in a series of important papers made use of the concept of *level confusions*.[17] One would be committing a «level confusion» if he thought that *being justified* in accepting some claim C amounted to the same thing as *showing that one was justified* in accepting C. Cannot Moore just rest content that he *is justified* in his assertion that the pencil before him exists, without worrying over whether he can *show* that he is in fact justified (or that he knows)? I don't think so. What I am questioning is not simply whether Moore is justified in his assertion. I think that he is justified. I am rather questioning his theory's explanation of the source or origin of his (our) epistemic equipment, and asking whether the mode of construction of that equipment is sufficient for epistemic and doxastic success. In one sense we *are* asking Moore to *show* us something. But that which we want to be shown or addressed is not whether he is justified in his claim *per se*, but whether he *qua* naturalist is justified in his claim. For it follows that if he were justified in making his claim, but was not justified *qua* naturalist, then his theory would be incomplete or lacking something given its commitment to naturalism as an explanation of the origin and source of our doxastic mechanisms.

It is difficult to see what Moore would say at this juncture. What my argument points out, I think, is that there is a way to turn Moore's project on its head. He has claimed that the probability of the existence of a particular object (a pencil) is higher than any generalization from particular observations (Hume's principles). It appears that the naturalistic hypothesis supports the idea that we can

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[17] See William Alston, «Level Confusions in Epistemology», and «Epistemic Circularity», in *Epistemic Justification: Essays in the Theory of Knowledge* (Ithaca, NY: Cornell University Press, 1989).

know that material objects do exist, but that any particular knowledge-claim is subject to doubt because of its being produced by a perhaps unreliable belief-producing mechanism. That *we* doubt is enough to establish that *we* exist; however, the exact status and real existence of objects of perception can only be probabilistically known. No certainty concerning the existence of material objects besides a subjective kind is produced by immediate perception of the objects. Moore, I claim, is reduced to probable knowledge or to a call to bolster his system. If he were to claim that his belief-producing mechanism *is* reliable (and it probably is), then we either have to say that the naturalistic hypothesis *is* sufficient to guarantee that humans have reliable epistemic systems, or, that there are some other grounds for why our epistemic systems *are* reliable. I believe Moore must take the second option, if he is to get out of the undefeated-defeater circle. Moore must call upon some other grounds to fortify his claims to knowledge. I leave it to the reader to investigate what these grounds might consist of. Like Gaunilo of old, who agreed with Anselm's belief but rejected his proof, I accept Moore's conclusion: he does *know*, when he waves, that his hand exists. But I've argued that if survival is the only force that drives the ascent of the human organism, the reliability of the human belief mechanisms is not at all probable to be present. But if we find that they are reliable, something must account for that reliability. I conclude that Moore's system is inadequate and in need of repair or additional explanatory elements.

APPENDIX: MOORE AND KNOWLEDGE

SMPP contains a paper entitled «Ways of Knowing» in which he explores four different types of knowledge. One type of knowledge which Moore calls «knowledge proper» sounds very much like our concept of knowledge *after* Gettier and his suspicion's about knowledge as 'justified true belief'. Moore's treatment of knowledge proper is more or less captured in the following definition of knowledge which I want to adopt for my purposes in section II:

[K] A human person knows p iff:

(i) A believes p;

(ii) A has grounds sufficient to justify his claim to know p;

(iii) No defeater d consistent with A's other beliefs defeats his grounds for p;

(iv) p is true.

In «Ways of Knowing», Moore says that in regard to material objects, we cannot say that we can know them with knowledge proper. But the reason for this is slim: he says that «knowledge proper is a relation which you can only have to a proposition; and a material object is certainly not a proposition».[18] What is the relationship between a material object of which some human agent is conscious and a proposition? Can we not see a connection between a perceived object and a proposition in this way: the proposition only goes to linguistically depict what is true of the vision or the «seeing» of the object? If Moore wants an ostensive

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[18] SMPP, p. 99.

reference to a pencil to count as proof of the real and true existence of material objects outside of a perceiving subject, then it seems reasonable to adopt his criteria for knowledge proper in relation to some subject S's knowing the existence of an object O. All that is needed is for S to have some belief mechanism M such that M instills in S the belief that some proposition is true, namely, that O, where O is the propositional counterpart to a state of affairs which is present to S and in which S perceives that there exists a material object. I see no reason not to adopt this type of Moorean knowledge with regard to material objects, since perceptions of material objects are subject to direct translation (by M, say) into S's propositional beliefs.

Key here, of course, is that a subject S has or has had a conscious awareness of an object O, and that at that time M must have a propositional attitude in order to say that he knows that O exists, whether he says it to himself or to another. So, for my adoption of Moore's 'knowledge proper' to fail, one of two things must fail: (1) in S's inner dialogue, M forms the proposition that S knows p iff the contents of p seem to S to be part of his perceptual field; and (2) M produces a propositional attitude in S simultaneous to S's knowing that p. It appears to me that both (1) and (2) are true. [K], my tentative definition of knowledge, is amenable to Moore's use of «know» in his statement «I know that this pencil exists» in the ways that I have shown. I adopt, then, [K] in the last section of the paper.

ACKNOWLEDGEMENT

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Corrigendum

to

«The 'Right' Approach»

by Ronald A. Cordero

[***SORITES***, Issue #01, April 1995, pp. 46-50]

Owing to some unexplained mishap or «electronic glitch» we have been unable to trace to its causes, some 800 words had been left out from the paper «The Right Approach» by Ronald A. Cordero, as published in issue # 01 of ***SORITES*** (April 1994). They were replaced with the nonsensical letters «jjjq3j3».

The file was of course changed and duly corrected as soon as the error was discovered. Thus, some readers may prefer to download the amended version. SORITES would appreciate that as many users or mirror sites as possible replace the partly corrupted file with the new authorized version thereof. What follows is the accurately restored passage (not only the missing lines, but also the immediate context). We sincerely apologize to our readers and especially to our contributor, Professor Ronald Cordero.

All that I *do* wish to deny here is the likelihood of any rights theory being agreed upon by social philosophers at any time in the near future. Accordingly, I shall not argue here for what I take to be the correct theory of rights.[4] To do so would only be to add to the theoretical disagreement, and I can see no present practical value in doing that. Perhaps I am being overly pessimistic, but the history of theoretical disagreements in rights theory does not inspire much optimism.

The nature of the trouble I see with basing advocacy of social change on a reference to rights should now be clear. When differences arise over the existence and importance of rights, there simply is no means at our disposal of resolving them in a rational manner. And inasmuch as the need for social change in many areas is absolutely imperative, I submit that we would be well-advised to find a basis for advocacy that is more readily amenable to rational agreement. It *may* not be a case of Rome burning while the theorists theorize — and then again, it may be even *worse* than that.

The next question then is whether it is possible to discuss the improvement

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[4] I do think that there is a correct theory, and I discuss it in my own courses. I just do not feel that arguing for it is the best way to promote the solution of important social problems.

of society in a vocabulary that does not include rights. Can we deliberate about changes in the social order without referring to rights as the bases for the changes advocated? I submit that we can — and that this should involve no great difficulty, since it has been done before.

The classical Greek philosophers, if you will remember, were not given to framing their theories of the ideal polis in terms of rights. It is not, of course, that they could not speak in those terms. Plato, for example, certainly seems to be using the concept of rights when he describes, at *Republic* 549, the kind of father likely to produce a timocratic son…

> a brave father, who dwells in an ill-governed city, of which he declines the honors and offices, and will not go to law, or exert himself in any way, but is ready to waive his rights in order that he may escape trouble.[5]

The point, though, is that the classical Greek social theorists did *not* tend to phrase their own political ideas in terms of rights. And in fact we today have little difficulty in explaining their theories on the improvement of society without invoking that concept. They tended rather to think about political matters in terms of an end in view. Aristotle thinks of the polis as having the particular purpose of enabling people to achieve eudaemonia — and proceeds to reason out how things ought to be ordered with that end in mind. And Plato identifies «our aim in founding the State» as «not the disproportionate happiness of any one class, but the greatest happiness of the whole….»[6]

Perhaps it would not be wise to dwell on the Greeks, for many of us today might want to reject certain of their specific suggestions about the arrangement of society.[7] There is, however, no need to suppose that their method of approaching the problem leads inexorably to their particular conclusions. We might even be able to argue against certain of their proposals on the grounds that these can now be seen *not* to be conducive at all to the end in question. But be that as it may, the possibility clearly exists that we can conduct our own discussions about improving society as they did — with reference to some end in view that is not specified with reference to rights.

If we could agree upon such an end, then we would be able to reason empirically about how to obtain it. The question of whether or not a particular change in the arrangement of things in society would be conducive to that end would be a factual question of the sort we know how to handle. With a certain amount of determination and a lot of trial and error, we could find out whether a suggested change would be an improvement or not.

The major problem here, of course, lies with the specification of the end. Is it possible — if we cannot agree on basic human rights — that we *can* find some description of society which we can all accept as what we would like to

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5 Trans. B. Jowett, *The Dialogues of Plato*, vol. 1 (New York: Random House, 1920), 807.

6 *Republic* 420. Op. cit. 683.

7 A classic example is Karl Popper. V. his *The Open Society and Its Enemies*, vol. 1, *The Spell of Plato* (London: George Routledge & Sons, 1945).

see? If there are many different lists and rankings of human rights, are there not likely to be just as many different conceptions of the kind of society toward which we are working? I believe that, in fact, most of us do already share such a conception of the end in view. We may have widely divergent notions about the specific steps essential to reach it, but I think we agree — at a sufficiently high level of abstraction — on what we are trying to attain.

Suppose, for example, that we learn in some way of the existence of a small planet inhabited by intelligent beings somewhere in the far reaches of the galaxy. Suppose we learn further that the inhabitants of Planet X have arranged things in their society in such a way that they are able to lead extremely satisfying lives. The present generation there rates their society as a smashing success, and there is every reason to believe that succeeding generations will be equally satisfied. Suppose now that we know nothing else about this society — nothing whatsoever about the particular nature of their social arrangements — their customs, laws, and regulations. All we know is that because of whatever arrangements they have, they are heartily satisfied with their existence.

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(1) We will be thankful to all contributors who submit their papers in the form of [I.B.M.-PC] WordPerfect 5.1 files. There are several convertors which can be used to turn docs from other word processor formats into WP5.1 format. (Notice that with WP5.1 you can write not only almost all diacritically marked characters of any language which uses the Latin script, but moreover all of Greek and virtually all symbols of mathematical logic and set theory.)

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[1] Unfortunately we cannot yet handle TeX or LaTeX files. The convertors we've tried have proved useless.

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(6) Whenever a paper is submitted, its author must send us a covering letter as an e_mail message addressed to one of our editorial inboxes.

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(7.2) In other cases, an 8-to-7 bits converter has to be used, upon which the result can also be included into an e_mail message. 8-to-7 bits convertors «translate» any file (even a binary file) into a text file with short lines which can be e-mailed. There are several useful 8-to-7 convertors, the most popular one being UUenCODE, which is a public domain software available for many different operative systems (Unix, OS/2, DOS etc). Another extremely good such convertor, very easy to use, is Mike Albert's ASCIIZE.[3] We can also decode back into their binary original formats files encoded into an e-mailable ASCII format by other 8-to-7 bits convertors, such as: Mime, TxtBin, PopMail, NuPop, or University of Minnesota's BINHEX, which is available both for PC and for Macintosh computers. Whatever the 8-to-7 bits encoder used, large files had better be previously archived with Arj, Diet or any other compressor, the thus obtained archive becoming

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[2] At our home site, **ftp.csic.es**, there is — hanging from our main directory **/pub/sorites** — a subdirectory, **WWW**, which, among other files, contains one called 'HTML.howto', wherein the interested reader can find some useful information on HTML editors and convertors.

[3] Mike Albert's address is P. O. Box 535, Bedford, MA 01730, USA.

the input for an 8-to-7 bits convertor.[4]

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(9.1) Ours is not a logic journal, but of course one of the glories of analytical philosophy is its rigour, which it partly owes to auxiliary use of symbolic notation in order to avoid ambiguities, make matters of scope clear or render arguments perspicuous. ASCII translations of symbolic notation are problematic, especially in cases of nonclassical logics, which may use sundry negations, disjunctions, conjunctions, conditionals, implications and also different universal and particular quantifiers (e.g. existentially and nonexistentially committed quantifiers, a familiar dichotomy in Meinongian circles). While using WordPerfect 5.1 you can represent a huge variety of such nuances, it is impossible to express them within the narrow framework of text or even ASCII files (i.e. even when the 224 printable [extended] ASCII characters can be used). Still, for some limited purposes, a translation of sorts can be attempted. You are free to choose your representation, but the following translation is — for the time being — a reasonable one: '(x)' for universal quantifier, '(Ex)' for existential quantifier; '&' for conjunction; 'V' for disjunction; '->' for implication (if needed — something stronger than the mere 'if … then'); 'C' for conditional; '=>' for an alternative (still stronger?) implication; '_pos_' for a possibility operator; '_nec_' for a necessity operator.

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With WordPerfect 6 the conversion to kermit format is simple and straightforward: you only have to save your paper as a 'kermit (7 bits transfer)' file.

of a blanc space, two hyphens, and another blanc space.[6]

[6] Those devices are temporary only. Later on we'll strongly advise and encourage those of our contributors who can use neither WordPerfect format nor one of the other word-processor formats our convertors can handle automatically to resort to HTML, with certain conventions in order to represent Greek characters as well as logical and set-theoretic symbols.

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