



Modal paradox II: essence and coherence

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Abstract Paradoxes of nested modality, like Chisholm’s paradox, rely on *S4* or something stronger as the propositional logic of metaphysical modality. Sarah-Jane Leslie’s objection to the resolution of Chisholm’s paradox by means of rejection of *S4* modal logic is investigated. A modal notion of essence congenial to Leslie’s objection is clarified. An argument is presented in support of Leslie’s crucial but unsupported assertion that, on pain of inconsistency, an object’s essence is the same in every possible world (in which that object exists). A fallacy in the argument is exposed. Alternative interpretations of Leslie’s objection are provided and are found to involve equivocation between different notions of “essence.” A material artifact’s modal essence, as distinct from its quiddity essence, could have been different than it is.

Keywords Accessibility model · Essence · Essential property · Quiddity · Sarah-Jane Leslie · Modal logic · Modal paradox

1 A modal paradox

I shall say that an object x has a property P *modally essentially* (and that P is a *modally essential property of x* , and is *modally essential to x*) iff it is metaphysically necessary that x has P . An object x is said to have a property P *modally accidentally* (and P is said to be a *modally accidental property of x* , and *modally accidental to x*)

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iff both x has P and x does not have P modally essentially (i.e., x has P and it is metaphysically possible that x lacks P).¹

There is a class of paradoxes (antinomies) that invoke nested metaphysical modality and are modal variations on the ship of Theseus.² An oversimplified version of one such paradox, often called ‘Chisholm’s paradox’, may be set out as follows. We consider a tripod, which we name ‘Troy’, and which is the only tripod originally made in the actual world w_1 of three intrinsically purely qualitatively identical interlocking legs L_1 , L_2 , and L_3 . Let L_4 and L_5 be intrinsically similar legs that are distinct from each other and from each of L_1 , L_2 , and L_3 .³ We assume a principle of origin-tolerance or flexibility, *Tol*, that any tripod with Troy’s plan could have been the only tripod made originally from two of the same original legs with a different qualitatively similar third leg. Let ‘ h ’ and ‘ h' ’ be variables that range over kits consisting of three legs intrinsically similar to L_1 ; let ‘ M ’ be a dyadic predicate for the relation of x being the tripod made originally from a tripod kit h ; and let ‘ O ’ be a dyadic predicate for tripod kits that have at least two legs in common. We assume also that the relationship of overlap between tripod kits is modally essential to those kits. Then we have:

$$Tol : \quad \forall x \forall h \forall h' [M(x, h) \& O(h, h') \rightarrow \Diamond M(x, h')].$$

Tol is not the sort of principle that can be true only contingently. If true, it is necessary, necessarily necessary, and so on. Indeed, according to the conventionally

¹ This terminology differs from that of Leslie (2011). Leslie writes: “An object’s essential properties are conditions on what it is to be that object, and this set of conditions fixes just which possibilities or possible worlds the object exists in, namely just those in which it satisfies those conditions. ... An object’s accidental properties are those of its properties that it can be found without at some times or at some worlds” (p. 277). Leslie’s notions appear to be at least partly modal. See note 11.

It is more common to define a modally essential property of x to be a property such that it is metaphysically necessary that x has it if x exists. I believe this to be an error, likely due at least to some extent to the widely held myth that a thing must exist to have properties. The more common definition has two peculiar consequences. First, by this definition a property P can be a “modally essential” property of x , and x can have P “modally essentially,” even if x lacks P . For example, had the Eiffel Tower not been erected, it would not have the property of being a tower, though by this definition it would nevertheless have the property “modally essentially.” Second, on the more common definition, existence is a “modally essential” property of every possible thing, whereas existence is in fact a modally essential property of some things, e.g., the number two, but not of others, e.g., the Eiffel Tower. (It should be noted that while being a man if existent may be a modally essential property of Socrates, being a man *simpliciter* is not, since Socrates is not a man and does not even exist any longer.)

Fine (1995) says that a property P of an object x is *essential to x* if x must have P to be what x is (p. 53). This definition conflicts with Fine’s effort to make ‘essence’ a term for quiddity essence, and is in fact better suited to the modal notion.

² For an overview of the nested-modality paradoxes see (chronologically listed) Chisholm (1967), Kripke (1972), at pp. 50–51; Chandler (1976), Chisholm (1976), at pp. 89–104, Quine (1976), Salmón (1981b), at pp. 229–252, Forbes (1984), Salmón (1986a), Lewis (1986), at pp. 243–248, Kripke (1987), Salmón (1989), Williamson (1990, pp. 126–143), Salmón (1993), Mackie (2006, pp. 59–69) and Robertson Ishii (2013).

³ According to contemporary philosophical usage, a *world* is a total way for things (the universe) to be. Some philosophers use the phrase ‘possible world’ incorrectly for a world (in the present sense). A *possible world* is rather a total way things might have been, in the operative sense of ‘might have’. Accordingly, an *impossible world* is a total way things could not have been. The *actual world* is the total way things actually are, and is thereby a uniquely distinguished possible world.

accepted system *S5* of propositional logic of metaphysical modality (and according also to the weaker *S4*), any proposition that is necessary is necessarily necessary—hence necessarily necessarily ... necessarily necessary, for every number of iterations.

We also assume a principle of modal essentialism, *Ess*, that no tripod of Troy’s plan could have been the tripod originally made from only one of the original legs and with two different legs in place of both of the other original legs, let alone from three different legs entirely. Any such tripod in another possible world is not Troy:

$$Ess : \quad \forall x \forall h \forall h' [M(x, h) \& \sim O(h, h') \rightarrow \Box \sim M(x, h')].$$

Let ‘*t*’ be an individual constant for Troy. Let ‘*h*₁’ be an individual constant for the tripod kit consisting of *L*₁, *L*₂, and *L*₃; let ‘*h*₂’ be an individual constant for the tripod kit consisting of *L*₂, *L*₃, and *L*₄; let ‘*h*₃’ be an individual constant for the tripod kit consisting of *L*₃, *L*₄, and *L*₅. The simplified version of Chisholm’s paradox is the following derivation:⁴

| | | |
|----|--|---|
| 1. | $M(t, h_1)$ | Initial condition |
| 2. | $O(h_1, h_2)$ | Initial condition |
| 3. | $\Box[h_2 \text{ exists} \& h_3 \text{ exists} \rightarrow O(h_2, h_3)]$ | Initial condition |
| 4. | $\sim O(h_1, h_3)$ | Initial condition |
| 5. | $\Diamond M(t, h_2)$ | 1, 2, <i>Tol</i> , logic |
| 6. | $\Diamond \Diamond M(t, h_3)$ | 3, 5, $\Box Tol$, <i>T</i> modal logic |
| 7. | $\sim \Diamond M(t, h_3)$ | 1, 4, <i>Ess</i> , <i>T</i> modal logic |
| 8. | $\Diamond M(t, h_3)$ | 6, <i>S4</i> modal logic |

2 Resolution

Chisholm’s paradox is straightforwardly resolved, following Chandler 1976, by rejecting *S4* as the logic of metaphysical modality. Although the prospect of Troy being made originally from *h*₃ is metaphysically impossible, had Troy been made originally from *h*₂ instead of *h*₁, as it might have been, it would have been possible for Troy to have been made originally instead from *h*₃. Some impossible prospects are such that they might have been possible. The paradox may be seen as a proof that the logic of metaphysical modality is not *S4*, which declares lines 6 and 7 inconsistent. This verdict of inconsistency is intuitively incorrect.

Given *Ess* and $\Box Tol$, Troy’s modally essential properties are not preserved between possible worlds. In (i.e., according to) the actual world *w*₁, Troy’s property of not being made originally from *h*₃ is modally essential to it. There is a possible world *w*₂ (a world accessible to, i.e., possible according to, the actual world *w*₁) in

⁴ The formulation ignores largely irrelevant complications arising from the additional premises that $\forall x \forall h \Box [M(x, h) \rightarrow x \text{ exists} \& h \text{ exists}]$ and $\forall h \forall h' \Box [O(h, h') \rightarrow h \text{ exists} \& h' \text{ exists}]$.

which Troy is originally made from h_2 . In w_2 , the property of not being made originally from h_3 is merely modally accidental to Troy. There is a third world, w_3 , which is accessible to w_2 and in which Troy is the tripod originally made from h_3 . But in the actual world w_1 , w_3 is an impossible world.

I shall call this response to Chisholm's paradox 'AR', an abbreviation for 'the accessibility resolution'. AR accepts *Tol*, $\lceil Tol \rightarrow \Box Tol \rceil$, *Ess*, and lines 1–7 of the paradoxical derivation, while rejecting the *S4* inference at line 8 as an instance of *the modal fallacy of possibility deletion*.

3 Leslie's objection to the foregoing resolution

Sarah-Jane Leslie (2011) objects that AR itself is inconsistent, and that the paradoxes of nested modality are not genuine and therefore not to be taken seriously. Leslie's remarks are quoted here at length with alterations to adapt the remarks to the present example:

I do not think that it is ultimately satisfactory, for a reason that has not been noted. Salmon's treatment of the paradox faces a destructive dilemma: either the 'paradoxical' argument stops at the second world, in which case there is no paradox to be explained away by Salmon's appeal to the 'deletion fallacy' or he is committed to the view that an item's essence could have been different than it is, even if we restrict our interpretation of the relevant 'could' to the accessible worlds — i.e. the worlds that are possible simpliciter. The world w_2 is accessible from w_1 and vice versa; each represents straightforward possibilities for the items that exist in the other. But on Salmon's description of the case Troy in w_1 has a different essence from Troy in w_2

What is not possible — not possible simpliciter, since it conflicts with the very notion of essence — is an object having ... an essence that varies from possible world to possible world An object's essence is its essence in every possible world; any item with a different essence simply cannot be identical to the original object. ...

... Salmon's treatment of the paradoxes implies that *Troy's essence could have been different than it is*. We in w_1 build Troy with L_1 , L_2 , and L_3 , and agree that Troy's essence is tolerant in that it could have been made with one part different. What this means [*sic*] is that Troy could [only] have been made with two out of those three parts, plus a new [*sic*] part of the relevant sort as needed If we accept Salmon's description of the case, then at w_2 — where Troy is made from L_2 , L_3 , and L_4 — Troy's essence is there such that it could [only] have been made from two out of *those* three parts (plus a new [*sic*] part of the relevant sort as needed). But then Troy has an essence at w_2 which is *different* from its essence at w_1 . Since w_2 is accessible from w_1 , we have it that Troy's essence could have been different than it is.

This is just not consistent with the notion of essence. A thing's essence could not have been different than it is. (pp. 284–285)⁵

The word 'essence' is susceptible to a multitude of interpretations in the current philosophical literature. Leslie uses the word for a "combination of essential properties," adding "for the essentialist, an item's essence determines its conditions for existence" (pp. 279–280; see note 1 above). For present purposes, we adopt the following definitions congenial to Leslie's remarks. Where K is any class of properties, we shall say that an object x has K iff x has every element of K . We say that x has K *modally essentially* iff x has every element of K modally essentially, and that x has K *modally accidentally* iff x has K but not modally essentially (x has at least one element of K only modally accidentally). We call the class of x 's modally essential properties *the modal essence of x* . Finally, we say that K is a *modal essence* iff K is the modal essence of something or other. On this usage, every object x has exactly one modal essence, and x has its modal essence modally essentially.

One reason for adopting this nomenclature is that it accords with Leslie's claim that in accepting w_3 as a world accessible to w_2 but inaccessible to w_1 , AR logically entails that Troy's "essence" varies between w_1 and w_2 . The nomenclature is strictly a matter of terminology, not of substance. The present terminology, which appears to coincide nearly enough with Leslie's, facilitates the presentation below, but nothing in the analysis depends crucially on the terminology itself. Indeed, each definiendum may be replaced everywhere it occurs by its definiens with no effect on the content of the analysis.

Leslie makes, or appears to make, a couple of puzzling claims. One is that AR 's entailing that Troy has varying essences among possible worlds (i.e., among worlds accessible to w_1) had escaped the notice of previous philosophers (*op. cit.*, p. 284). She also claims that previous philosophers—including Hugh Chandler, Roderick Chisholm, Graeme Forbes, Saul Kripke, David Lewis, Penelope Mackie, and yours truly—have uncritically accepted a purportedly inconsistent hypothesis, *to wit*, that Tol is true with respect to both w_1 and w_2 (pp. 286–287). To understand why she makes these claims, one must look more closely at Leslie's conclusions. In the quoted passage she states a disjunctive conclusion (misabeled 'a destructive dilemma'): Either (1) Tol is not true with respect to the possible world w_2 , so that there is no paradox for AR to resolve; or else (2) in advocating AR , I am committed to Troy having differing essences among possible worlds. This misstates Leslie's actual conclusion, which is significantly stronger. She in fact argues for the conjunction: (1); furthermore (2).

⁵ Here and elsewhere, Leslie does not adequately distinguish Tol and Ess . She says 'what this means' where she evidently intends 'this entails'. The imagined entailment does not in fact exist, however, as Tol does not entail Ess . The bracketed insertions of the word 'only' yield Leslie's intended instance of Ess in lieu of the corresponding cited instance of Tol . Leslie says 'a new part' where she should use 'a third part'. (That third part could be the remaining original part, hence not new.) Other interpretations do not yield a viable argument.

Leslie bases her alternative resolution of Chisholm's paradox on a contentious postulation of a plenitude of objects made from exactly the same matter as Troy.⁶ Leslie's preferred account has it that in any possible world in which Troy is originally made from h_2 instead of h_1 , there is a physical replica of Troy also made from h_2 , hence exactly coincident with Troy, such that the replica, but not Troy itself, could have been originally made from h_3 . It was stipulated, however, that in w_2 , (whatever else there might be) Troy is the only tripod originally made from h_2 . Any replicas in w_2 made from the same matter as Troy are not tripods, and hence all but completely irrelevant to the paradox. An inconsistent set of premises cannot be rendered consistent by supplementing the premises with additional theory. A full resolution ultimately must jettison one (or more) of *Ess*, *Tol*, $\lceil Tol \rightarrow \Box Tol \rceil$, and the *S4* principle that whatever is (metaphysically) necessary is necessarily so. Preferably a plausible explanation for the rejected principle's appeal should also be provided. Importantly, it is not sufficient merely to reject *Ess*, for example, or *Tol*, and to provide a weakened substitute. In contrast to the *S4* principle, each of *Ess*, *Tol*, and $\lceil Tol \rightarrow \Box Tol \rceil$ enjoys *prima facie*, pre-theoretic appeal. Those theses, and their consequences, command default assent in the absence of countervailing considerations. A plausible rationale would need to be provided for rejection of any one of them.

Leslie rejects $\Box Tol$. (It is unclear whether she also rejects *Tol* itself.) Her rationale is a bold charge: $\Box Tol$ by itself is inconsistent. (See note 5.) Leslie calls the property of having varying essences among possible worlds 'a variable essence'.⁷ She writes:

Clearly *Tol* cannot be necessary and true, for consider a pair of mutually accessible worlds in each of which x exists, but which are such that the difference between x 's constitution in the two worlds approaches but does not quite meet the allowable limits [*sic*—Leslie means 'does not exceed the allowable limit'] imposed by the requirement of "sufficient substantial overlap". If *Tol* is necessary it follows that x 's essential origins are tolerant in the second world in a way that they are not in the first world. That is, it follows that there are possibilities of variable realization of x 's essence in the second world that are not found in the first world. This is just what cannot happen, for this implies that x has a variable essence — an essence that changes from world to world — not just a variably realizable essence. (p. 286)

⁶ Several others have also urged plenitude-centered resolutions. See for example Kment (2014, pp. 194–197). See Robertson Ishii (2013) and Salmón (2018), at *n*15 for responses to Leslie's plenitude.

⁷ More precisely, this is the property expressed by ' $\lambda x[\sim \exists K\Box(x \text{ exists} \rightarrow x\text{'s modal essence} = K)]$ ', or more perspicuously by ' $\lambda x[\exists w\exists w'(w \text{ is accessible to } w' \ \& \ x\text{'s modal essence in } w \neq x\text{'s modal essence in } w')]$ '. Leslie contrasts the property of "a variable essence," which she deems oxymoronic, with a "variably realizable essence," which she defines as an "essence whose fixed fulfillment conditions can admit of varied realization from world to world" (p. 285). She says "none of these paradoxes arise if we distinguish variably realizable 'intolerant' essences and variable essences" (p. 286). The terminology of 'variably realizable essence' and 'a variable essence' encourages the confusion in question. To my knowledge none of the philosophers Leslie criticizes for "sliding from" the former to the latter uses Leslie's terminology or confuses these properties.

Accordingly, Leslie criticizes previous philosophers' uncritical acceptance that if *Tol* is true with respect to w_1 then it is equally true with respect to w_2 : "True, once we indulge in this kind of thinking the familiar paradoxes get underway. But the thinking is itself already paradoxical, indeed it is genuinely inconsistent, for it entails that *Troy has a different variably realizable essence depending on whether we start with w_1 or w_2* . This, once again, is the incoherent idea of a variable essence" (pp. 286–287). What Leslie thinks her predecessors failed to recognize is not merely that *AR* countenances variable essences, but that $\Box Tol$ alone already attributes variable essences, and that therefore $\Box Tol$ itself is inconsistent (or inconsistent with *Ess*—see again note 5) and the alleged paradoxes of nested modality are not genuine.

Leslie's objection to *AR* can be encapsulated by the following valid argument:

P1: According to *AR*, Troy has a variable essence.

P2: The prospect of an object having a variable essence is inconsistent with the very notion of essence.

Therefore, *AR* is inconsistent.

4 The crux of Leslie's objection

Leslie supports her premise *P1* by observing that according to *AR*, Troy's essence in w_1 includes not being made originally from h_3 whereas Troy's essence in w_2 excludes this same property. The prospect of a variable modal essence is indeed integral to *AR*. No less crucial to Leslie's objection is her premise *P2*. Yet she provides no rationale for *P2*, and it is far from obvious why she believes it.

It is trivial that *AR* depicts Troy as having a variable modal essence; that is indeed the very point of *AR*. It is also trivial that *AR* is consistent. The combination of *Ess*, $\Box Tol$, and lines 1–4 of the paradoxical derivation, together with their consequence that Troy has a variable modal essence, has a Kripke *B* model—a reflexive, symmetric, non-transitive accessibility model—that interprets all the non-logical constants as intended ('M', 'O', 't', etc.). The metaphysical picture painted by this combination of propositions is not merely coherent. It represents a very plausible theory, which many endorse, of the metaphysical facts about material artifacts. Metaphysical necessity is a special way of being true. The characteristic *T* axiom ' $\Box p \rightarrow p$ ' is straightforwardly analytic if ' \Box ' means metaphysical necessity. The characteristic *S4* axiom ' $\Box p \rightarrow \Box \Box p$ ' does not enjoy this same status. The mere coherence of *AR* places the burden of proof squarely on supporters of *S4* (or something stronger) as the logic of metaphysical modality. Unreserved assertion of *P2* is no substitute for an argument.⁸

⁸ Leslie (2011) does not acknowledge that there are non-transitive-accessibility models of "variable" modal essences. Perhaps she tacitly assumes that such models violate the logic of metaphysical modality. Admittedly, there are also non-reflexive-accessibility models, and these are inadmissible in the logic of any alethic modality, since they clash with the analyticity of ' $\Box p \rightarrow p$ '. Likewise, there are inadmissible

I submit that Leslie's tacit rationale for $P2$ commits the informal fallacy of equivocation, perhaps several times over. If her phrase 'a variable essence' is used in a sense on which $P1$ is true, $P1$ is then quite obvious; and on that sense $P2$ is straightforwardly false, as Kripke B and T models attest. Contrariwise, if the phrase 'a variable essence' is used in a sense on which $P2$ is true, on that sense $P1$ is simply false and altogether lacking in intuitive support.

A compelling interpretation of Leslie on $P2$ arises out of an observation of Teresa Robertson Ishii's: that Leslie appears to slide between the nested modal notion of x modally accidentally modally essentially having a property P and the incoherent notion of x having P both modally accidentally and modally essentially. More generally, Leslie appears to slide between a proposition p being contingently necessary and p being both contingent and necessary. One argument in support of $P2$ that is strongly suggested by the passage quoted above is the following purportedly logical deduction:

By the definition of 'modal essence' (by "the very notion of essence"):

- (1) For every object x , x 's modal essence is such that x has it in every possible world (in which x exists—see footnote 1).

Therefore,

- (2) For every object x , x has the same modal essence in every possible world (in which x exists).

Therefore,

- (3) For every object x , x 's modal essence is the same in every possible world (in which x exists).

The initial observation (1) is correct. However, there is equivocation at (2), which is both ambiguous and slippery. The two relevant readings are given by the following:

- (2') For every object x , there is a modal essence E such that x has E in every possible world (in which x exists).
- (2'') For every object x , there is a modal essence E such that E is x 's modal essence in every possible world (in which x exists).

Unlike (2'), (2'') entails that for every pair of possible worlds w and w' (in which x exists), x 's modal essence in w is the same as x 's modal essence in w' . Whereas (2') is a consequence of (1), it does not yield (3). Alternatively, (2'') delivers (3), but

Footnote 8 continued

classical models of 'Jones is married and Jones is a bachelor'. There is a crucial difference between the two modal cases. As regards metaphysical modality, the axioms of T are not only analytic but intuitively so. The notion of a false necessary truth is oxymoronic in the same way as the notion of a married bachelor. By contrast, the characteristic axiom of $S4$, ' $\Box p \rightarrow \Box \Box p$ ', is not intuitively analytic; indeed, Leslie is engaged in an on-going controversy concerning its truth. Furthermore, AR is clearly coherent, and it poses a forceful case that the characteristic $S4$ axiom is even falsified by actual specific instances. The thesis that all instances of that axiom for metaphysical necessity are analytic, so that non-transitive accessibility models are inadmissible, carries the burden of proof and cannot be legitimately assumed, let alone assumed tacitly. Cf. Salmón (1989), pp. 28–31.

it is not a consequence of (1). To interpret (2) as (2'') is in effect to treat the phrase 'x's modal essence' in (1) without justification as a rigid designator. It is analytic that every object has its modal essence modally essentially, but there is no inconsistency in the idea that an object might have had what is actually its modal essence without that being its modal essence. Thus (2'') is no mere analytic consequence of (2')—unless *S4* (or something stronger) is illicitly assumed as the background modal logic.

The ambiguity of (2) is one of scope, not lexical. There is an alternative potential basis for Leslie's premise *P2*. On the most straightforward interpretation, Leslie does not use 'essence' univocally to mean *modal essence*. (See note 1.) Let us say that *x* has a property *P* *logically essentially* iff *x* has *P* in every logically possible (i.e., in every consistent) world, whether metaphysically possible or metaphysically impossible; and let *the logical essence of x* be the class of properties that *x* has logically essentially. (See Salmón 1989.) The hypothesis that by 'essence' Leslie means *logical essence* rather than *modal essence* would explain her repeated assertion without support, as if none is needed, that the prospect of an object having "a variable essence" is incoherent and "conflicts with the very notion of essence." The idea that an object's logical essence somehow varies among possible worlds is indeed extremely dubious.

If one uses the word 'essence' to mean *logical essence*, then it may be correct to say that the notion of "a variable essence" is inconsistent, meaning thereby that the notion of a variable *logical essence* is inconsistent. But it is then incorrect to say that *AR* has the consequence that an artifact has "a variable essence." An object's logical essence is an extremely meager lot compared to the object's modal essence. Troy's logical essence, which includes properties like being either round or not, also includes Troy's haecceity—its thisness, the property of being Troy—and any properties logically entailed by it (e.g., the property shared by Troy and Woody Allen of being either Troy or Woody Allen, and even the property of being either Troy or made originally from *h*₃). It does not include Troy's more lionized modally essential properties. According to *AR*, Troy has the property of not being made originally from *h*₃ in every world that is accessible to *w*₁. *AR* does not cast this property as one that Troy has in every logically possible world. On the contrary, *AR* explicitly depicts Troy as lacking this property in *w*₃. Leslie sees *AR* as depicting Troy as having "a variable essence," merely on the ground that it denies that the properties that Troy has in every (Troy-inclusive) world accessible to *w*₁ are the same as those that Troy has in every (Troy-inclusive) world accessible to *w*₂. It does not follow from this depiction of Troy that the issue of which properties it has in every (Troy-inclusive) logically possible world is somehow relative to *w*₁ or *w*₂. The properties that Troy has in every (Troy-inclusive) logically possible world are the very same according to *w*₁, *w*₂, and *w*₃.

Leslie appears to confuse *modal essence* with *logical essence*, with resulting equivocation in her use of the word 'essence'. She argues for her premise *P1* by observing that according to *AR*, not being made originally from *h*₃ is modally essential to Troy in *w*₁ but is modally accidental to Troy in *w*₂. If by 'essence' she means *modal essence*, then her argument for *P1* is correct but her assertion of *P2* is incorrect. If instead by 'essence' she means *logical essence*, then *P2* is justified but

her argument for *PI* is then fallacious. *AR* does not have the consequence, which is of dubious coherence, that Troy has a variable logical essence. If by ‘*x*’s essence’ Leslie means *that which is both *x*’s modal essence and *x*’s logical essence*, then there is a more radical failure. *AR* entails that Troy does not have a modal-cum-logical essence.

The very same issues arise in connection with an alternative interpretation of the word ‘essence’. As Teresa Robertson Ishii (2013) points out, although Leslie is objecting to *AR*, which employs the notion of an object *x*’s modally essential properties, she sometimes appears to employ instead, or in addition, an Aristotelian notion of “essence” urged by Joseph Almog, Kit Fine, and Stephen Yablo: *what *x* is*, or what it is to be *x* (pretending these are the same thing). An object’s *quiddity essence*—its whatness—is supposed to be a very select, privileged segment of the object’s modally essential properties (but presumably not merely the object’s haecceity).⁹ If there is such a thing as Troy’s quiddity essence—if Troy has a whatness (and only one)—it is a severely restricted subclass of Troy’s modal essence. As Robertson Ishii notes, Leslie’s terminology blurs together modal essence and quiddity essence. Contrary to some grandiose claims the alternative uses of ‘essence’ are not competing, but they are different. The modal concept is clear; the quiddity notion is unclear. But it is clear that what has just been said concerning an object’s logical essence is equally true of its alleged quiddity essence. The idea that Troy’s quiddity essence varies among metaphysically possible worlds is indeed of dubious coherence. Fine (2005), pp. 348–349 writes that

the identity of an object is independent of how things turn out, ... not just in the relatively trivial sense that the identity of an object is something that will hold of necessity. Rather it is the core essential features of the object that will be independent of how things turn out and they will be independent in the sense of holding *regardless* of the circumstances, not *whatever* the circumstances. The objects enter the world with their identity predetermined, as it were; and there is nothing in how things are that can have any bearing on what they are.

I take it that Fine means to say this: The quiddity essence of a possible object is independent of the circumstances of a world, not only in the trivial sense of ‘holds in every possible world whatever its circumstances’, but furthermore in the stronger sense of ‘holds in a possible world quite independently of its circumstances’. A possible object supposedly has its quiddity essence in every possible world precisely *because* quiddity essence is world-independent. The world-invariance is a consequence of the world-independence.¹⁰

If by ‘essence’ Leslie means *quiddity essence*, then again, even if *P2* is justifiable her argument for *PI* is fallacious. Kripke models demonstrate that varying modal essences are consistent with fixed quiddity essences. It is perfectly compatible with

⁹ Yablo (1987), Almog (1991) and Fine (1994, 1995). Fine also refers to the quiddity essence of an object *x* as *x*’s “identity” (a term better suited to *x*’s haecceity) and *x*’s “definition”.

¹⁰ It will not do for Fine’s purposes to allow that a property that is part of an object’s quiddity essence can be a metaphysically contingent property of the object.

AR that although Troy's modal essence varies among w_1 , w_2 , and w_3 , Troy's quiddity essence—what it is to be Troy—supposing Troy has such a thing, is the very same in all three worlds.¹¹

In fact, it would seem that Troy's quiddity essence (assuming it has one) must be the same in all transitively metaphysically possible worlds (where a transitively metaphysically possible world is one that is metaphysically possible, metaphysically possibly metaphysically possible, or so on). For if Troy's quiddity—if what it is to be Troy—were different in any pair of worlds w and w' , Troy would not be in w' exactly what it is in w , *to wit*, that very *tripod*. In both worlds, Troy has the property of being a tripod, for example, and in both worlds Troy has the very same haecceity, the property of being *this very* thing.

It should be noted that contrary to Fine, objects can nevertheless lose even their quiddity essences in some far away worlds. In a logically possible world in which Troy is a credit-card account or a poem instead of a tripod—a metaphysically impossible way for things to be that is not even transitively possible—Troy presumably lacks the quiddity essence that it has (assuming it has one) in w_1 , w_2 , and w_3 . (Troy retains its haecceity even in such far away worlds.)

5 A final interpretation

It is possible that Leslie uses the phrase 'a variable essence' altogether differently. In an alternative nomenclature one might define '*the essence of* an object x in a world w to be the class of properties that x *actually* has modally essentially, i.e., the class of properties P such that x has P in every world w' that is accessible to the actual world w_1 (rather than to w). In the terminology of the present essay this is x 's *actual modal essence*, i.e., the modal essence of x in *the specific world* w_1 . Of course, the actual modal essence of an object x is just x 's modal essence, nothing more and nothing less. For this reason, it is easy to confuse the notion of an object's modal essence with that of an object's actual modal essence. There is a very important difference between the two notions. The difference shows itself in non-actual worlds, e.g., in merely possible worlds like w_2 . It is an element of Troy's actual modal essence that Troy not be made originally from h_3 . This same property—not being made originally from h_3 —is not an element of Troy's modal essence in w_2 , but it remains an element of Troy's actual modal essence in every world, including w_2 .

¹¹ One candidate for Troy's quiddity essence is the property of being both Troy and a tripod, or the pair set consisting of the property of being a tripod together with Troy's haecceity (being Troy).

Leslie might endorse the highly dubious thesis that an object's quiddity essence determines the object's full modal essence, and it is possible that this thesis is part of Leslie's rationale for P2. Numerous philosophers are committed to a weaker thesis: that the collective quiddity essence of (the plurality of) all objects determines the modal essence of each object. As Robertson Ishii observes, AR poses a very formidable challenge even to this weaker thesis. If Leslie endorses either thesis, she is not entitled simply to assume it, especially not as a tacit premise. Both the weaker thesis and the stronger thesis bear the burden of proof. AR disputes both theses, and more importantly, it presents a very forceful case against even the weaker thesis. (See note 8.)

What is actual (in the indexical sense) is actual in every world; the idea that an object's actual modal essence varies among different worlds is incoherent. That Troy's actual modal essence is invariant among (Troy-inclusive) possible worlds is a potential basis for Leslie's assertion of *P2*. The prospect of an object having a variable actual modal essence is indeed inconsistent with the very notion of an actual modal essence.

This is not to say that Leslie and I mean different things by 'essence' so that the differences between us are merely verbal. Leslie and I sharply disagree on matters of both metaphysical and modal-logical substance. All parties should agree that Troy's entire actual modal essence is the same in w_2 as it is in w_1 . In particular, the property of not being made originally from h_3 is as much an element of Troy's actual modal essence in w_2 as in w_1 . *AR* also has it that in w_2 , Troy could have been made originally from h_3 , i.e., if w_2 had been realized—as it might have been—then it would have been possible for Troy to have been made originally from h_3 . That Troy's actual modal essence precludes the prospect that Troy is made originally from h_3 merely confirms that Troy's modal essence in w_2 is different from Troy's actual modal essence (i.e., from Troy's modal essence in w_1). By contrast, Leslie contends that insofar as Troy could not have been made originally from h_3 , even if Troy had been made originally from h_2 , it would still have been metaphysically impossible (by the very notion of "essence") for Troy to be made originally from h_3 .

It is a consequence of Leslie's view of the matter that given *Ess*, the putatively metaphysically impossible world w_3 —which she stipulated to be a world (assuming there is one) in which Troy is made originally from h_3 (p. 283)—is impossible even according to w_2 . Yet Leslie asserts that Troy does not exist in w_3 (pp. 288–289), directly contrary to her stipulation. This provides indirect evidence that by 'essence' she means *actual modal essence*. Leslie mistakes the stipulated impossible world w_3 , which includes Troy, for a possible world w_1' in which Troy is absent and a different tripod, Trevor, is made from h_3 . In effect, Leslie misidentifies w_3 with its metaphysically possible twin. (On Leslie's view, w_1' is also possible according to w_2 . On my view, it is not.) The likely explanation for her confusion of w_3 with w_1' is that Leslie does not recognize actually impossible worlds and sees only actually possible worlds.¹² Whereas w_3 is not among the possible worlds, w_1' is. When her attention is directed toward the impossible world w_3 , Leslie attends instead to its possible counterpart.

In (1989) I referred to the general confusion of the notion of necessity with that of actual necessity, as 'the ostrich approach to metaphysical modality', because it fails to acknowledge worlds like w_3 that are possibly possible but not possible *simpliciter*. The ostrich approach maintains the discredited *S5* as its modal propositional logic by ignoring worlds inaccessible to the actual world. The "logical

¹² The four-world paradox compares w_2 , which includes Troy, with a world w_2' that is possible according to w_1' and in which Trevor instead of Troy is made from h_2 . David Lewis (1986, p. 245n) in effect also misidentifies w_3 with w_1' , for the same reason as Leslie but supported also by his highly idiosyncratic understanding of metaphysical modality (which I deem a colossal misunderstanding).

space” of the ostrich approach is metaphysically impoverished. It is missing a plenitude of impossible worlds.

If by ‘essence’ Leslie means *actual modal essence* (or *modal-essence-cum-actual-modal-essence*), then her assertion of *P2* is justified but her argument for *P1* is fallacious. *AR* does not have the incoherent consequence that Troy has a variable actual modal essence.

It is possible that Leslie does not equivocate with (2) (or anything similar) in support of her crucial premise *P2*. It is possible that she does not confuse *modal essence* with *logical essence* or with *quiddity essence* or with *actual modal essence*. It is equally possible that she equivocates in all these ways. If her tacit rationale for *P2* is not mistaken in any of these ways (nor in the way criticized in note 8), then I am unable to guess what that rationale is.

It is inconceivable that Kripke, Lewis, and others who have addressed *AR* were all unaware that it has the consequence that an artifact might have had some of its actually modally essential properties merely modally accidentally. The reason they had not noticed that *AR* is inconsistent is that it is consistent. The intended Kripke model establishes consistency. (See notes 7 and 8.) Leslie’s rationale for rejecting $\Box Tol$ thus collapses. *AR* is not merely consistent in *T* and *B* modal logics. Its core theses—*Tol*, $\lceil Tol \rightarrow \Box Tol \rceil$, and *Ess*—reflect metaphysical common sense. Artifacts, and presumably also material objects of some natural kinds, genuinely have different properties modally essentially in different possible worlds. The modal essence of any material artifact genuinely could have been different than it is.

Leslie says that *AR* runs a gamut, being at once ingenious, influential, based on confusion, incoherent, and inconsistent (pp. 283–287). As far as I am able to determine, *AR* is in fact none of the above. Numerous philosophers who reason with modality persist in embracing *S5* as the presumed propositional logic of metaphysical modality. Allegiance to *S5* modal logic notwithstanding, the axioms and rules of *S5* were not handed down unto us engraved on sacred tablets. That it is at least logically possible that some *de re* metaphysical necessities are only contingently necessary—so that the logic of what might have been is not even as strong as *S4*—is little more, but nothing less, than good philosophical sense.

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