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Iterated Modalities, Meaning and A Priori Knowledge

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I

Here are some well-known principles featuring iterated modalities:[1]

(B) If Φ, then necessarily possibly Φ.

(4) If necessarily Φ, then necessarily necessarily Φ.

(5) If possibly Φ, then necessarily possibly Φ.

The Kneales report that C.I. Lewis, the founder of modern modal logic, was inclined to deny that each instance of the above principles holds,[2] while Bennett remarks that their universal generalisations "have an unusually irritating quality, in that there appear to be at first sight powerful reasons for rejecting [them], and at the same time equally powerful ones for rejecting their contradictories".[3] Prior notes that "many people would find [the view that (5) always obtains] very dubious", although he is tempted to accept the universal forms of (B), (4), and (5), because modal logics without formal analogues of those principles are "clumsy".[4]

More recently, Armstrong once denied that (B) and (5) always hold,[5] while we will see below that Chandler and Salmon have force-

1. All talk of "necessity" in what follows should be read as involving the strongest variety of alethic necessity; "possibility" should correspondingly be identified with the weakest type of alethic possibility. Throughout what follows, the "instances" of the various "principles" produced in the text are meant to be all and only those propositions of a suitable sort; so, for example, the propositions that [if necessarily 0=1, then necessarily necessarily 0=1], that [if necessarily 1=2, then necessarily necessarily 1=2], … are among the instances of (4) below.
2. Kneale and Kneale (1962), pp. 551–2.
3. Bennett (1955), p. 46 — Bennett eventually concludes that each instance of (5) holds.
4. See Prior (1962), p. 198, for the first quotation and p. 205 for the second.
5. Armstrong (1989), pp. 62–3. Armstrong later concluded (Armstrong (1997), p. 170) that if he were to alter his position appropriately he might not have

fully argued that some a posteriori necessities generate false instances of (4) and (5).[6] Salmon reports that Kripke is "nearly convinced" by his arguments[7], and Peacocke also tentatively supports them.[8] Finally, David Lewis denies that the contents expressed by open sentences of quantified modal languages always generate true instances of (B), (4), and (5), because he denies that the relation of counterparthood has suitable structural features.[9]

All that name-dropping surely illustrates that it is not obvious that (B), (4), and (5) always hold. But it is hard to accept that there are *no* nontrivially correct instances of those principles; that is, no choices of Φ which make true both the antecedent and consequent of one of (B), (4), and (5). Consider, for instance, the truth that 2+2=4. It could have been impossible that 2+2=4 only if it could have been necessary that 2+2≠4. And it could have been nonnecessary that 2+2=4 only if it could have been possible that 2+2≠4. But it is tempting to suppose that it could have been neither necessary nor possible that 2+2≠4. Hence it is pretty natural to think that it is necessarily possible and necessarily necessary that 2 + 2 = 4. So (B), (4), and (5) seem to be nontrivially instanced by the necessary and possible truth that 2 + 2 = 4.[10]

It is also worth noting that (B), (4), and (5) are standardly assumed to apply within certain domains. When philosophers put modal logic to work in their examinations or presentations of modal reasoning, they invariably employ logics that extend the propositional modal logic T. Philosophers presumably would not concentrate upon those modal logics unless they thought that the theorems of T can at least sometimes be interpreted as expressing truths. But where ϕ is a theorem of T, so too are $\Box\phi$ and $\Diamond\phi$ (and hence $\Box\Box\phi$ and $\Box\Diamond\phi$ are also theorems of T). The customary focus upon modal logics which extend T thus reflects the assumption that there are at least sometimes nontrivially correct instances of (B), (4), and (5).

On the one hand, then, it is unclear that (B), (4), and (5) always hold. But, on the other, it is bizarre to think that there are no choices of Φ which yield nontrivially true instances of (B), (4), and (5). Perhaps because it is far from obvious when (B), (4), and (5) apply, work on iterated modalities has tended to suffer from heavy theoretical burdens — lacking intuitive starting points, philosophers have often merely tracked the consequences of their favoured theories of modality for principles featuring iterated modalities.[11]

That situation is unsatisfying. It would be better to have arguments for principles concerning iterated modalities that were relatively independent of particular theories of necessity and possibility. While plenty of philosophers have, of late, constructed jaw-droppingly ambitious theories of modality, seeking for instance to reduce the modal to the nonmodal and to uncover the grounds of modal truths, the elementary question precisely when it is acceptable repeatedly to apply modal operators has been sidelined. Yet until we know the answer to that basic question, or until we feel certain that its answer is so inaccessible that the question can fairly be ignored, we cannot be confident that we are doing enough to ensure that our theories of modality are headed in even roughly the right direction.[12]

This paper examines various theses which might be hoped to establish that modal operators can be iterated under certain conditions,

to reject (B) and (5) after all, regarding this for some unstated reason as "a distinct advantage" of the proposed alterations.

6. See, for instance, Chandler (1976) and Salmon (1989).

7. See footnote 12 of Salmon (1989).

8. See Peacocke (1999), pp. 195–7.

9. Lewis (1968), p. 36.

10. Peacocke writes, similarly, that "[i]n special cases, such as those in which we are considering only a restricted vocabulary, like that of arithmetic, it is relatively uncontroversial that we have arbitrary necessitations" (Peacocke (1999), p. 196). See also Salmon (1986), p. 109 (quoted at the start of the following section).

11. Chandler's and Salmon's arguments against the view that every instance of (4) and (5) holds are important exceptions, however; see the next section for an example of the sorts of cases which they take to cast doubt upon those principles.

12. I am assuming in what follows that there is a fact of the matter about whether, for example, (4) always holds. For a view which allows one to deny that assumption, see Gregory (2006).

where the relevant theses are designed to respond to a particular range of putative counterexamples to the claim that all of the instances of (4) and (5) are true.[13] To some extent, the paper ends as it has begun, with a range of hunches about iterated modalities but no watertight arguments with which those intuitions can be backed up. But the intervening discussion will at least have articulated one very promising way of supporting a host of uses of (B), (4), and (5), using principles that do not specifically concern iterated modalities. And it will have established some notable connections between the described strategy and some significant general questions about the relationships between modality, meaning and the a priori.

II

Salmon writes, in relation to (4) above:

> [T]here may be special cases of necessity iteration [inferences of the form 'necessarily, Φ; so necessarily necessarily Φ'] that are logically valid. For example, it may be that [as an argument of Forbes's suggests] necessity iteration is legitimate whenever the proposition in question is necessary by virtue of being *a priori*. Certainly, necessity iteration is legitimate with respect to purely mathematical propositions and (classical) logical truths.[14]

Perhaps, then, each instance of the following holds:

13. It is worth noting that the following discussion therefore effectively ignores some others sorts of concerns which philosophers of certain stripes may have with regard to principles featuring iterated modalities. So, conventionalist accounts of modality lead fairly naturally to denials that each instance of (B), (4), and (5) holds (see, for example, Bennett's discussion of Carnap's views on iterated modalities, on pp. 46–8 of Bennett (1955)), but I will not attempt to address those worries in this paper. (Many thanks to an anonymous referee for this journal for emphasising this point.)

14. Salmon (1986), p. 109. Salmon's remarks may contain an implicit restriction to certain kinds of propositions, however, because he earlier mentions certain "somewhat rare and, for present purposes irrelevant, exceptions" to Forbes's view that "conceptual *a priority* entails metaphysical necessity" (p. 108).

(a) If we can know a priori that Φ — if *it is a priori that* Φ, for short — and if necessarily Φ, then necessarily necessarily Φ.

As we will now see, (a) is at least untroubled by what I take to be the only apparent counterexamples to (4), various a posteriori necessities considered by Salmon himself.

So, for example, many people would accept, in the light of Kripke's discussions of origin, that "a particular material artifact — say a particular wooden table which we may call 'Woody' — could have originated from matter slightly different from its actual original matter *m** … but not from entirely different matter". But "it would seem that … we may select some … matter *m* such that, although Woody could not have originated from *m*, *m* is close enough to being a possibility for Woody that if Woody *had* originated from certain matter *m′* that *is in fact* possible for Woody — matter differing in as many molecules from the actual original matter *m** as possible, and sharing as many molecules with *m* as possible, while remaining a possibility for Woody — then it *would have been* possible for Woody to have originated from *m*, even though it is not *actually* possible".[15]

If the previous example holds water, though, it follows that the necessary truth that Woody is not made from *m* is not necessarily necessary, which clashes with the view that each instance of (4) holds. (It also clashes with the claim that each instance of (5) holds: as illustrated by the relationships between the modal logics S4 and S5, the truth of each instance of (5), combined with the fact that necessity implies truth, requires the truth of each instance of (4).) But the case clearly does not present any problems for the restricted version of (4) flowing from (a) above. For (a)'s always obtaining merely requires that those necessities which are knowable a priori are necessarily necessary; and the truth that Woody is made from *m** is something that can only be known a posteriori.

As a more restrictive alternative to (a), however, one might suspect that those truths *whose necessity is knowable a priori* are subject to (4).

15. Both quotations from Salmon (1989), p. 5.

One might conjecture, that is, that each instance of the following is correct:

(b) If it is a priori that necessarily Φ, then necessarily necessarily Φ.

If either (a) or (b) always hold — and (a)'s always obtaining is sufficient for (b)'s holding universally, because knowledge is factive and we know a priori that what is necessary is true — we can safely assume (4) within certain restricted contexts. We know a priori that 2+2=4 and that necessarily 2+2=4, for instance, so both (a) and (b) give us that it is necessarily necessary that 2+2=4.

Now, it is worth noting that standard examples of contingent a priori truths, like the claim that grass is actually green just in case grass is green, do not create any problems for (a) and (b). For (a) only applies necessity iteration to a priori necessities, while (b) only applies it to those truths whose necessity is knowable a priori. And contingent a priori truths certainly fall into neither of those categories. But contingent a priori truths undermine the general view that what is a priori is also necessary, and an awareness of that fact might make one wary of endorsing each instance of (a) and (b). For it is hard to see why the class of contingent a priori truths should not include some ascriptions of necessity. Yet if some truth of the form 'necessarily, Φ' is both contingent and a priori, some instances of (a) and (b) are false.

The preceding worry is merely programmatic, but it can be made more substantial. Consider the following:

(α) If actually necessarily Φ, then Φ.

We know a priori that, if actually necessarily Φ, then necessarily Φ. But we also know a priori that [actually Φ just in case possibly actually Φ].[16] Putting those things together provides us with an a priori demonstration that necessarily [if actually necessarily Φ, then Φ] — with an a priori demonstration that each instance of (a) is a necessary truth. (To see this, just suppose that possibly (actually necessarily Φ and not-Φ) and derive a contradiction.)

Note next, and in the light of the previous point, that (a) and (b) both imply that each instance of (α) is a necessarily necessary truth. For, as just noted, it is a priori — and therefore true — that any instance of (α) holds necessarily, and hence also a priori that each instance of (α) is simply true. But we can therefore plug any instance of (α) into one of (a) or (b) to get that the relevant instance of (α) is necessarily necessary.

Now suppose that P generates a false instance of (4); suppose, that is, that it is necessary that P although it is not necessarily necessary that P. If necessarily P, then actually necessarily P; so actually necessarily P. But if actually Φ, then it is necessarily necessary that actually Φ. (For if Φ holds at world w then, for any world y, it is true at y than Φ holds at w; and [it is actually the case that Φ] just in case Φ holds at the actual world.) Hence, in particular, it is necessarily necessary that it is actually necessary that P.

Now, it is necessarily necessary that it is actually necessary that P; but it is not necessarily necessary that P. Hence there is a possibly possible world w at which P is false yet at which the claim that it is actually necessary that P holds. But, at w, the conditional claim that (if actually necessarily P, then P) will be false. So it is not necessarily necessary that (if it is actually necessary that P then P); that is, we have a claim of form (α) which is not necessarily necessary.

Given our choice of P, then, we have an instance of (α) which is not necessarily necessary; and that contradicts the claim that one of (a) and (b) always holds. More generally, we have just seen that, granted some standard assumptions, some instances of (a) and (b) are false if some proposition is necessary but not necessarily necessary. So neither (a) nor (b) can help us in our search for a restricted domain of propositions within which we can safely rely upon (4) above.[17] Similar

16. I am here reading 'actually' as a *rigidifier*; for more on the rigidifying function of 'actually' and related issues, plus further references, see Gregory (2001).

17. The instance of (α) envisaged in the text creates difficulties for a range of further restrictions of (4) that might be proposed. For example, someone might suggest that any necessary statement which can be deduced using

points apply to the following, which one might hope to use in identifying restricted regions within which (B) and (5) may be applied:

(c) If it is a priori that Φ, then necessarily possibly Φ.

(d) If it is a priori that possibly Φ, then necessarily possibly Φ.

For an instance of (c) is false if some *P* is true but not necessarily possible (to see this, consider 'if *P* is actually true then *P*'), while an instance of (d) is false if some *P* is possible but not necessarily possible (to see this, consider 'if *P* is actually possible then *P*').

III

Students of the paraphernalia surrounding contingent a priori truths may not have been startled by the points made in the previous section: claims expressed using 'actually' operators and related semantic devices tend to create problems for simple attempts to connect epistemic features to modal ones. Maybe, therefore, we will be able to identify unproblematic restrictions of (B), (4), and (5) by paying closer attention to the workings of those sorts of semantic devices.[18]

conceptually underwritten inferences from some conceptual truths is necessarily necessary, or that any statement whose necessity can be deduced using conceptually underwritten inferences from some conceptual truths is necessarily necessary. Although those proposals cannot be fully assessed without some fuller account of their central notions, there are reasons for doubting that they will win through. For the necessitation of (α) can be demonstrated using entirely elementary resources, ones that seem to be natural candidates for analyticity.

18. Why not sidestep the problems which (α) made for (a) and (b) by simply restricting the admissible instance of the latter to ones featuring statements whose expression doesn't require the use of 'actually'? It is fairly straightforward to produce (α)-like cases which do not feature 'actually' operators, by setting up appropriate reference-fixing stipulations for rigid designators in the manner of Tharp (1989). For instance, suppose that *P* is necessary but not necessarily necessary. Now fix the reference of the rigid designator 'Atled' as follows: 'Atled' refers to 0 in any situation if *P* is actually necessary, and to 1 otherwise. Then, just as we can demonstrate the necessity of each instance of (α) a priori, so we can provide an a priori demonstration of the necessity of (β) 'Atled = 0 only if *P*'. Yet (β) is not necessarily necessary, because *P* is not necessarily necessary. Similar points apply to the examples mentioned at the close of the previous section, which can be used to create problems for (c) and (d).

Let's say that a context is being taken as the *context of* a certain (disambiguated and declarative) sentence's *occurrence* if it is the context which is being used to fix the semantic values of the sentence's context-dependent elements and whose containing world is being taken as actual; sentences express propositions relative to contexts of occurrence.[19] Contexts of occurrence contrast with contexts of evaluation: where proposition *P* is expressed by a given sentence relative to a given context of occurrence, the *context of evaluation* is the context relative to which the truth of *P* is being evaluated. So, for instance, the proposition that the sentence 'You are there now' expresses relative to a suitable context of occurrence *c* holds at context of evaluation *d* just in case, at *d*, the referent supplied by *c* for 'You' occupies the place supplied as the referent for 'there' by *c* at the time supplied as the referent for 'now' by *c*.

Suppose that we are given a sentence containing 'actually'. On account of its containing 'actually', the sentence will express different propositions relative to any two contexts of occurrence which are located in distinct worlds. Can we improve upon (a) and (b) by somehow restricting our attention to the propositions which are expressed by sentences which lack that kind of contextual variability?

A sentence *S* is *constant* just in case there is some proposition *P* which is such that, for any possible context *c* taken as the context of occurrence, *S* expresses *P* relative to *c*. And sentence *S* is a priori just in case a suitable process of reasoning might lead someone to accept *S* and thereby to a priori knowledge of what *S* expresses, where the person's context is being taken as the context of occurrence. Then here is an attempt in the direction described at the end of the last paragraph:

19. What follows is a bit rough; I am basically assuming that the reader is familiar with and not entirely unsympathetic to the "two dimensional" distinction that I am about to introduce. For a much fuller treatment of lots of relevant material, plus further references, see Chalmers (2006); Kaplan (1989), pp. 493–5 and section VI; plus Jackson (1998), pp. 46–62.

(e) Where constant and a priori sentence S states that Φ relative to each possible context of occurrence, necessarily Φ.

So, take the sentence '2 + 2 = 4'. That sentence is constant and a priori. The proposition which it expresses is also necessary. By way of contrast, consider 'necessarily, if it is actually necessary that 2 + 2 = 4, then 2 + 2 = 4'. That sentence is a priori but it is not constant, because of the occurrence of 'actually' within the sentence. Principle (e) therefore does not imply the necessity of the proposition expressed by the previous sentence, relative to our context as the context of occurrence. More generally, the previous section's arguments relating to (a) and (b) — which focused upon the propositions expressed by sentences containing 'actually' — do not affect principle (e).

Principle (e) looks set to justify very many applications of (B), (4), and (5). For instance, 'it is necessary that there are infinitely many primes' and 'it is possible that there are infinitely many primes' are constant sentences; and they look to be a priori. So (e) licenses the conclusion that it is necessarily necessary and necessarily possible that there are infinitely many primes. One can also use (e) in arguing that the theorems of the propositional modal logic T always express truths, so long as any atomic sentences occurring within those theorems are interpreted using constant sentences; so (e) implies that very many uses of modal logics which include T are fair enough.[20]

Principle (e) thus looks like a nice starting-point for attempts to reckon the extent of the realms within which (B), (4), and (5) hold sway. But why would anyone accept it?

IV

Here is a quick argument for (e). Suppose that sentence S is a priori. As S is a priori, S expresses a truth relative to each possible context of occurrence. But assume that S is constant, stating that P relative to each possible context when that context is taken as the context of occurrence. Then P must be necessary, being true relative to any possible context of occurrence. I will not attempt to settle here the question whether that argument is sound; I will merely limit myself to identifying the hard issues that must be addressed if that question is to be answered.

A crucial move in the above argument clearly occurs when it employs the following general thesis about the a priori:

(f) Each a priori sentence S expresses a truth relative to each possible context, when that context is taken as the context of occurrence.

Principle (f) was once supported by Stalnaker,[21] and it has recently been endorsed by Chalmers, who states that "[i]t is clear that when S is a priori, it will have a necessary primary intension".[22]

A quick survey of examples speaks in (f)'s favour. Thus consider

20. Assume, first, that our knowledge of whether sentences are a priori and constant is itself a priori. Suppose, second, that the various instances of (e) above which result from plugging in constant sentences for 'S' are themselves constant and a priori (their being a priori would be assured by the soundness of the argument for (e) given in the next section). Third, note that, where S is constant, so too is 'necessarily S'. Finally, note that each instance of an axiom of T which results from interpreting each of the atomic sentences which it contains using a constant sentence — each *constant* instance of T's axioms — is constant and a priori. It then follows that what is stated by any constant instance of T's theorems is necessary and necessarily necessary and … The preceding reasoning cannot simply be run on nonconstant instances of T's theorems, however. One might try to work around this issue by revising the preceding argument so that it concentrates upon universally quantified versions of T's axioms (so one would note that, for example, the sentence 'each necessary truth is true' is a priori and constant and so expresses something that is necessary, necessarily necessary …), deriving the conclusion that what is expressed by each of those universally quantified claims is necessary and necessarily necessary … But this will only allow one to derive the necessity and necessary necessity … of what is stated by the nonconstant instances of T's axioms if one assumes that the domain of actual propositions is a subset of each possible, possibly possible … domain of propositions. Perhaps this can be shown, but I do not know how to show it.

21. See Stalnaker's comments on the "square dagger" operator on p. 83 of Stalnaker (1978). I am not sure what Stalnaker's attitude towards (f) would now be, however; see Stalnaker (2001). Davies and Humberstone also seem to find (f) fairly plausible (Davies and Humberstone (1980), p. 10).

22. Chalmers (2002), p. 164.

the following a priori sentences: '2 + 2 = 4', 'everything is self-identical', and (more controversially) 'if there is a unique inventor of the zip then Julius is the inventor of the zip'.[23] For my own part, I am strongly inclined to hold that each of those sentences expresses a truth relative to any possible context of occurrence. It is worth remarking, though, that each of the examples drawn upon in the preceding straw-poll was nonmodal. And this suggests a retort that one might make to (f): one might argue that, while a restricted version of (f) does apply to *nonmodal* sentences, (f) fails just because it covers *modal* sentences as well.

Unadorned as it is, that objection is weak. Principle (f) is appealing because it harmonises with an intuitive picture of how a priori knowers relate to their environments: they are, for epistemologically relevant purposes, disconnected from their surroundings, and hence their internal enunciations of items of a priori knowledge must express truths in all possible contexts of occurrence if they express truths in any. But that picture does not distinguish between different categories of a priori knowledge. So why should a sentence's status as modal have any more bearing on whether it is subject to (f) than, say, its status as disjunctive?

Those who doubt (f) would do better to question its application even to nonmodal sentences. And there is more obscurity surrounding these matters than may immediately be apparent.

For instance, suppose that somebody forms beliefs in accordance with the following, seemingly a priori, method: one should believe those propositions *P* that one can validly deduce a priori from the assumption that somebody believes *P*. Then, as Williamson (the method's originator) points out,[24] the previous method is very reliable: each belief that the person forms using the method is guaranteed to be correct; and so, one might think, those beliefs count as known. But some of the sentences that our individual would use to formulate her conclusions express false propositions relative to some contexts of occurrence. For example, she may use Williamson's method to form the belief that there is a believer.[25]

The previous putative counterexample to (f) may be challenged, of course. One might reasonably question the reliabilist inclinations which most naturally underwrite the idea that Williamson's method produces knowledge, for instance. But it is nonetheless clear that (f) is far from trivial, however plausible it may seem to be at first glance.

V

Before concluding, I wish briefly to examine an elegant argument, owed to Ross Cameron, that bears upon various aspects of the previous discussion.[26]

It is widely thought that our knowledge of a posteriori necessities is always backed up by corresponding a priori conditionals. Kripke writes, for example, that "if *P* is the [supposedly necessary a posteriori] statement that the lectern is not made of ice, one knows by a priori philosophical analysis, what is expressed by some conditional of the form 'if *P*, then necessarily *P*'".[27] Or, to take another example, we know a priori that if Hesperus is Phosphorus then it is necessary that Hesperus is Phosphorus, although we cannot know a priori that Hesperus is Phosphorus. Assume that the necessary a posteriori is indeed like that — or, as I'll put it, assume that the necessity of necessary a posteriori truths always has a priori *support*.

Suppose that we are given some sentence *S* expressing the necessary a posteriori truth *P*, where the necessity of *P* receives a priori support from the conditional 'if *S*, then necessarily *S*'. And suppose that the previous conditional is not merely a priori but is constant and

23. Where, following Evans (1982), p. 31, 'Julius' is a name whose reference is fixed using the description 'the inventor of the zip'.

24. Williamson (1986), p. 114.

25. See Hawthorne (2002) for a fairly recent discussion of Williamson's example and a range of other nonmodal cases that sit uneasily with (f).

26. Cameron presented the ensuing argument in the questions following a talk which I gave based around an earlier version of the current paper. More generally, I am particularly indebted in this section both to Cameron, who has provided me with very helpful comments on it subsequent to the talk just mentioned, and to one of the anonymous referees for this journal.

27. Kripke (1971), p. 153.

hence, by (e) above, expresses a necessary truth.[28] The necessity of the claim that [if *P*, then necessarily *P*] implies the truth of the claim that [if necessarily *P*, then necessarily necessarily *P*]. But, by assumption, it is necessary that *P*. Hence necessarily necessarily *P*. And so — despite Salmon's claims to the contrary and despite this paper's earlier tendency to give a hearing to his arguments — necessary a posteriori truths are in fact necessarily necessary.

How to respond? One relevant initial point is that some at least of Chandler's and Salmon's putative counterexamples to the claim that necessities are always necessarily necessary will also provide, to those who find them at all convincing, apparent counterexamples to the idea that a posteriori necessities always have a priori support in the sense just explained. So, to return to the example rehearsed in section II, above, reconsider the necessary a posteriori truth that Woody did not originate from the matter *m*. Do we know a priori that if Woody did not originate from *m* then it is *necessary* that Woody did not originate from *m*?

If one accepts one of the starting points of Salmon's example — that Woody did not originate from the intermediate matter *m′*, yet Woody might have originated from *m′* — one should surely return a negative answer to that question. For one should then accept that it is false, and hence not knowable a priori, that if Woody did not originate from *m′* then it is necessary that Woody did not originate from *m′*. But, given that the previous conditional is false, it could hardly be knowable a priori that if Woody did not originate from *m* then it is necessary that Woody did not originate from *m*, even though that last conditional is true; we cannot know a priori that Woody's relationship to *m′* is substantially different from its relationship to *m′*.[29]

While those points are fine as far as they go, they do not go far enough. For, while the necessity of 'Woody did not originate from *m* may not receive a priori support from a suitable conditional which has that very statement as its antecedent, it surely does receive a priori support from *another* conditional whose antecedent is not knowable a priori.

So, for example, it seems that we do know a priori that [if *m** is largely distinct from *m* and Woody originated from *m**, then it is necessary that Woody did not originate from *m*]. Yet if the a priori conditional just stated is slotted into a slightly revised version of Cameron's argument — one which works with a priori conditionals whose antecedents are perhaps distinct from the necessitated claims contained in their consequents — the soundness of the resulting argument would again give the necessary necessity of the claim that Woody did not originate from *m*.

Now, the arguments most obviously resulting from the preceding manouevre are unproblematic. For example, and in the very case just sketched, the envisaged argument would need to proceed from the supposed necessity of [if *m** is largely distinct from *m* and Woody originated from *m**, then it is necessary that Woody did not originate from *m*] and the necessity of [*m** is largely distinct from *m* and Woody originated from *m**] to the conclusion that [it is necessary that necessarily, Woody did not originate from *m*]. Yet anyone who finds Salmon's

28. One way of blocking this inference to necessity would be to appeal to the idea that the conditional just cited is not constant, on the grounds that its constituent *S* is not constant. The nonconstancy of *S* —given that *S* in fact expresses a necessary truth and is not a priori— would follow from the truth of the following principle: (g) any sentence which expresses a truth relative to any possible context, when that context is taken as the context of occurrence, is a priori. But is (g) true? Although, to echo Davies and Humberstone, (g) isn't obviously correct, Stalnaker seems once to have thought that (g) holds, while Chalmers argues for the principle. (See, for example, Chalmers (2002), pp. 189 – 94. Davies and Humberstone say on p. 10 of their (1980) that "it is not obviously correct to say that all deeply necessary truths are knowable a priori". Stalnaker says on p. 83 of his (1978) that "[a]n a priori truth is a statement that … expresses a truth in every context".) I must confess that I do not know of any decisive arguments for or against (g); the question whether (g) holds is an important question concerning the relationships between the a priori and the modal. Again, though, it is a question that does not have anything specifically to do with iterated modalities.

29. Here I am indebted to an anonymous referee for this journal, for voicing the suspicion that cases like Woody might in fact be taken to provide apparent counterexamples to the idea that the necessity of necessary a posteriori truths always has a priori support in the sense suggested by Kripke.

example appealing will deny that it is necessary that [m^* is largely distinct from m and Woody originated from m^*], because that person will think that Woody did not have to originate from m^*; Woody might also have originated from m'.[30]

At this point, though, one might move to a more refined range of arguments, by invoking 'actually' operators. So,

[if m^* is largely distinct from m and Woody actually originated from m^*, then it is necessary that Woody did not originate from m]. But Woody actually originated from m^*, so it is necessary that Woody actually originated from m^*; and it is necessary that the hunks of matter m and m^* are largely distinct. The necessity of [if m^* is largely distinct from m and Woody actually originated from m^*, then it is necessary that Woody did not originate from m] would then mean that it is necessary that necessarily, Woody did not originate from m.

But why think, in this case, that the a priori status of our conditional — 'if m^* is largely distinct from m and Woody actually originated from m^*, then it is necessary that Woody did not originate from m' — translates into the necessity of the proposition that it expresses? Principle (e) above certainly does not license that conclusion; the conditional just cited is not constant, on account of the inclusion of 'actually' in its antecedent. And, in fact, Salmon's example suggests that we merely have here an interesting example of the contingent a priori. For if it is possibly possible for Woody to originate from m, then it is possible for the previous conditional to be false, as its antecedent is then necessary although its consequent is possibly false.[31]

30. More generally, the sorts of examples owed to Chandler and Salmon exploit a supposed dependency of certain necessities upon contingent features of actuality. So while those dependencies may be knowable a priori, and may even hold necessarily, the contingency of the conditions resulting in the relevant necessities would stop suitable versions of Cameron's argument from getting off the ground.

31. Following on from the previous footnote, then, one cannot create problems for the cases owed to Chandler and Salmon by using rigidifiers to sidestep the contingency of the actual features upon which the necessity of their supposedly possibly nonnecessary propositions is based. For if Chandler and Salmon are correct about the cases which they consider, the resulting a priori conditionals merely express contingent truths.

VI

Principles featuring iterated modalities are notoriously baffling. It is very hard to make progress on the question whether possibilities are necessarily possible, for example, by mentally gazing at possible truths and asking whether they are necessary. As we saw earlier, one common way of responding to this quandary is to construct a philosophical theory of modality and to let the iterated modalities take care of themselves.

The overarching aim of this paper has been to illustrate another, less despairing way of approaching the problems which iterated modalities present. Although the previous discussion manifestly has not established whether (B), (4), and (5) can ever safely be used, it has shown how to derive a positive answer to that question from an affirmative answer to other — admittedly hard — questions in which iterated modalities play no special role. The resulting perspective perhaps makes iterated modalities seem less interesting than they appear when they are left in splendid isolation, but it also makes them look more tractable, which can only be a good thing.

Someone might complain, I suppose, that the previous discussion does not provide the materials for providing a deep explanation of *why* (4), say, should be applicable to certain types of propositions. The more common strategy of constructing a theory of modality and checking its consequences for iterated modalities may, by contrast, hold out the promise of explaining why modal operators can or cannot be iterated in certain contexts. But we need to do things in the right order — before we construct putative explanations of facts about iterated modalities we should do our best to ascertain the facts that need explaining. This paper was merely intended to contribute to the latter task.[32]

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