GRAEME FORBES

MELIA ON MODALISM

(Received 13 February, 1992)

Modalism is the view that the fundamental modal idioms are the operators 'possibly' ('$\Diamond$') 'necessarily' ('$\Box$') and 'actually' ('A') and that other means of expressing modal notions are ultimately to be explained in terms of these three; in particular, quantificational locutions such as 'some possibility' and 'every possible world' are to be explained by operators and not vice-versa.

However, a modal language with just these three operators is limited as to expressive power, and in *Languages of Possibility* (hereafter *LP*) [4], I used Christopher Peacocke's device [12] of indexing the three operators with numeral subscripts, to overcome such limitations.[1] The effect of this, as we will see below, is to allow a '$\Box$' or a '$\Diamond$' to bind occurrences of 'A' that are not immediately within its scope. But according to Joseph Melia, such a device is simply a disguised way of introducing quantification over possible worlds, so that someone who uses it is disqualified from being a modalist. This is the objection (to modalism) *from expressive power*: any purported operator language which allows us to say enough of what we want to say is surreptitiously quantificational. Melia gives his point some force by setting up a quantificational language L^{EX} whose sentences bear a striking structural similarity to those of the modal languages with indices. For instance, and simplifying a little, the possible-worlds proposition 'there are two worlds with mutually disjoint domains', or for short, 'two mutually disjoint worlds', could be expressed with indexed operators as

(1) $\Diamond_1\Diamond_2\Box(\forall x)\,[A_1Ex \leftrightarrow\ \sim A_2Ex]$

whose semantic counterpart in Melia's L^{EX} (simplified) is

(2) $(\exists w_1)\,(\exists w_2)\,(\forall w)\,(\forall x)\,[w_1Ex \leftrightarrow\ \sim w_2Ex]$

and it is not hard to understand how someone familiar with quantifier

Philosophical Studies **68**: 57—63, 1992.

formalisms and new to indexed operators might suspect that (1) is simply a rather idiosyncratic way of writing (2).[2]

However, a certain amount of gerrymandering has gone into the formulation of L^{EX}. First, L^{EX} is two-sorted, but two-sortedness is simply a device of convenience that allows us to write shorter formulae in place of longer ones with relativized quantifiers. Thus underlying (2) there is a formula which looks less like (1) in virtue of containing the predicate 'W' for 'is a world' and 'I', or perhaps '$\sim$W', for 'is an individual', plus assorted conditional and conjunction symbols. Secondly, the symbol '$\exists$' is treated non-univocally in L^{EX}, carrying a possibilist sense when coupled with a world variable and an alleged actualist sense when coupled with an individual variable. Essentially, the semantics has been written to allow the simple '$\forall x$' in (2) to express what is really meant, '$\forall x \in d(w)$', the presence of which would further lessen the formal likeness between (1) and its quantificational counterpart. Particularly in view of the modalist actualist reductions of extensional languages,[3] then, the direction of explanation remains an open question.

In what follows, I will argue against the objection from expressive power. If my arguments are successful, their upshot is that any reason to think the indexed '$\Box$' and '$\Diamond$' are understood as quantifiers and the indexed 'A' as a variable must primarily be a reason to think that the unindexed operators are understood as quantifiers and the unindexed 'A' as a name. Since there is no appearance of any quantification over worlds in very simple modal judgements, this places a burden on the anti-modalist. I will end by arguing that Melia's defense is too weak to bear it.

As Melia recognizes, it is important to my use of the language of (1) in defense of modalism that there be propositions of ordinary language which are naturally understood in a way which does not seem to involve quantification and which lend themselves to representation by the indexed operators. In *LP* I gave

(3) It could have been that there could have been something which does not actually exist

as a purported example, with the symbolization

(4) $\Diamond_1\Diamond(\exists x) \sim A_1Ex.$

In possible worlds terms the idea is that (3) might be held by someone who thinks that the actual world is a plenum (all possible objects actually exist) but that this is contingent: things could have been such as not to constitute a plenum. Melia considers a regimentation of (3) without the subscripts, '$\Diamond\Diamond(\exists x) \sim AEx$', and posits a non-transitive accessibility relation so that this formula can be true while '$\Diamond(\exists x) \sim AEx$' is false. But this is a red herring, since it is not the reading I intend; the point is not that, at the first level of inaccessibility, we find things which do not exist in *this* world, but rather that there is a way things could have gone such that some of the things of some world, say, this one, do not exist in *it*, so *that* way for things to go is, *ipso facto*, not a plenum.

Melia seems to doubt that ordinary English can express this idea, since he writes that (3) "does not capture the thought that 'there could have been something which did not actually exist' is contingent". Here I can only report the judgement of my own linguistic introspection, corrupted as it is by much theory. In (3), I can hear the initial 'it could have been' as *capturing* the subsequent 'actually', and the numerals in (4) simply make the binding relationship explicit. Of course, the standard case of binding is when a noun phrase binds a pronoun within its scope, requiring that the pronoun be assigned the same reference that is assigned to the noun phrase. But it hardly follows that every binding relationship must consist in a governing phrase supplying a semantic value, conceived of as a reference, to the bound phrase. In formal languages, binding is a syntactic notion. In natural language, binding may be fundamentally semantic, but whether it is constitutive of the binding in (3) or merely a consequence of it, we can explain the relationship between 'it could have been' and 'actually' in the following way: for (3) to be true, its being possible that there exists a certain object must be true compossibly with that object's non-existence. There is no talk of reference to possible worlds in this, though of course someone might insist that "true compossibly with" just means "true at the same world as". But such ideological refusal to take operator discourse at face value seems unmotivated. I submit that anyone who can understand "there could have been things which do not actually exist" without construing "there could have been" as an existential quantifier and "actually" as a name can similarly understand (3) as I intend it.

Indeed, to make an *ad hominem* point, apparently Melia himself can do the trick. In criticizing my account of possible worlds semantics, in which the crucial quantificational locutions are explained by means of operators rather than the other way round, Melia says that if this were right for logics of 'actually', these logics would not generate simple, unintuitive validities, and then he gives the unintuitive but valid '$AP \rightarrow \Box AP$' as a counterexample. However, anyone who thinks this is an unintuitive validity does so because he or she hears the 'A' as bound by the '$\Box$'; such a person would say that it can be contingent, rather than necessary, that something is actually the case, or that something which is actually the case might not have been actually the case. This is to hear the second 'actually' as bound by the modal operator. In other words, '$AP \rightarrow \Box AP$' is being heard as '$AP \rightarrow \Box_1 A_1 P$'. Of course, one can get the same effect by interpreting the operator as a quantifier and the 'actually' as a non-rigid definite description 'the actual world', but no argument has been given that this *must* be how the formula is processed, and it does not *appear* that such an interpretation is being employed by someone, Melia included, who just finds the validity of '$AP \rightarrow \Box AP$' intuitively strange.[4] So the objection from expressive power lacks force, unless the capacity of 'possibly' and 'necessarily' to bind 'actually' is regarded as unintelligible if not assimilated to quantifier/pronoun binding. At any rate, I find it perfectly intelligible without such an assimilation. And if a homophonic semantics for a language is demanded before its constructions are conceded to be intelligible *sui generis*, one is indicated in [12] (see especially note 17).

There is also another difficulty for the objection from expressive power, involving a means of expression which, despite its centrality in *LP*, goes curiously undiscussed by Media. I pointed out there (pp. 93–102) that such statements as (1) and (3) can be expressed by a language whose only modal operators are '$\Box$' and '$\Diamond$' but which, in addition to the usual objectual quantifiers, also contains *plural* quantifiers. I suggested in *LP* that understanding of this apparatus underlies grasp of the indexed versions of '$\Box$' and '$\Diamond$', which I now think is wrong — we simply have another, independently intelligible, way of expressing the mutually disjoint worlds and the contingency of the plenum theses. For the first of these, in place of (1) we can say

(5) ◇(things are such that ◇(nothing is one of them))

and in place of (3) we can say

(6) ◇(things are such that ◇(something is not one of them)).

(5) and (6) do not even give the appearance of quantifying over worlds, which undermines the idea that there may be something intrinsic to the content of (1) and (3) which requires the apparatus of L^{EX} to represent its semantics accurately.

So it seems that if the anti-modalist is to make a case, he must do it for the standard operators '□' and '◇'. But as I argued in *LP*, the idea that the modal operators are at the most basic level to be construed as quantifiers is very hard to swallow. First, it is implausible that '□' and '◇' are quantifiers over possibilities (partial worlds), on account of the intuitionist-style complications in construing negation which partiality brings with it.[5] So if '□' and '◇' are quantifiers, they range over worlds, *complete* ways things could have been. Thus "it could have rained today" cannot be understood by someone who lacks the conception of a total way things could have been. Melia agrees with me that for any actualist, this conception is itself ineliminably modal (*LP* pp. 79—83). However, I was wrong in *LP* to claim that this shows that the construal of modal operators as quantifiers is circular; it means only that grasp of '□' and '◇' comes as a complex package involving quantification and the idea of a total way things could have been. Following Salmon,[6] we might take the latter idea itself to factor into two components, the idea of a way for things to be, and the drawing of a dividing line among such things, partitioning them into the possible and the impossible. But whatever the details, the anti-modalist has to say that the basic, most fundamental application of the notion of possibility is in connection with such totalities. Once we have mastered that, we can then progress to more advanced cases, such as "it could have rained today". Surely this view has little to recommend it.

To make it more palatable, Melia praises possible worlds semantics for its role in 'explaining' the counterfactual conditional and in clarifying the validity of arguments involving iterated modalities. But these benefits appear to me to be spurious. The first case shows nothing about the relative primacy of operators and quantifiers, since it may be (though I doubt it) that we first grasp the modal operators and the idea of a state of affairs, define possible worlds with these resources, then introduce a similarity relation (almost certainly itself intrinsically modal) and finally define the counterfactual in its terms. As for iterated modalities, these seem no more obscure than iterated quantifiers – most people find $\exists\forall\exists$ prefixes very hard to understand. And we can sensibly discuss whether, say, ‘it is possible that P’ follows from ‘it could have been possible that P’ just using operator discourse. Quantifiers are understood and discussed in their own terms. In philosophy, if not mathematics, modal operators deserve the same treatment.

NOTES

[1] Where possible, references are to Melia’s Bibliography, p. 56 of this issue. I will be assuming a basic grasp of how the indexed operators work.

[2] Example (1) allows me to correct a technical error in *LP*. I conjectured (p. 89) that a language in which only the numeral ‘1’ may occur as a subscript on modal operators is strictly less expressive than a language in which both ‘1’ and ‘2’ may occur as subscripts, and more generally, that as the number of possible subscripts increases, so does the expressive power of the language. Kit Fine, Harold Hodes and Rohit Parikh all agree that this conjecture is true (personal communications). However, Parikh has shown me that the example I used as an alleged illustration of the increase is incorrect. I suggested (*loc. cit.*) that expressing “there are $w_1 \ldots w_n$ such that the domain of w_i is included in the domain of w_{i+1}, $1 \leqslant i < n$”, $n \geqslant 3$, requires at least n different subscripts. For the case of $n = 3$, Parikh gives the counterexample ‘$\Diamond_1\Diamond_2[\Box(\forall x)\ (A_1Ex \rightarrow A_2Ex)\ \&\ \Diamond_1\Box(\forall x)\ (A_2Ex \rightarrow A_1Ex)]$’, which exploits the transitivity of containment and generalizes to all greater n. However, it seems that the conjecture can be illustrated using instead the sentences “there are n mutually disjoint worlds”, $n \geqslant 2$, each of which requires at least $n - 1$ distinct subscripts.

[3] See, for example, Kit Fine’s “Plantinga on the Reduction of Possibilist Discourse” in *Alvin Plantinga*, edited by James Tomberlin and Peter Van Inwagen, Reidel 1985, 145–86.

[4] One could also get the same effect by reading the ‘necessarily’ as the operator ‘fixedly’ (or, with some redundancy, ‘fixedly actually’) of “Two Notions of Necessity” by Martin Davies and Lloyd Humberstone, *Philosophical Studies* 38 (1980) 1–30. But it seems to me implausible that there is an operator ‘fixedly’ expressed by some standard modal phrase of English, certainly not ‘necesarily’: if P is an ‘A’-free contingent truth, ‘necessarily P’ is false but ‘fixedly P’ is true. Perhaps this just means that for some mysterious reason, ‘fixedly’ never occurs except coupled with ‘actually’. However, ‘fixedly’ also has the drawback that it binds every occurrence of ‘actually’ over which it has primary scope, whereas one wants to allow that some occurrences should be free. Analogously, someone can say “Jill was the hero; she got the applause, she got the money and she got the man” in which the first and third “she”s are anaphoric and the second demonstrative.

[5] '$\Diamond \sim$P' means 'there is a partial world none of whose extensions are possibilities that P'. For details, see [5].
[6] See his "The Logic of What Might Have Been", *The Philosophical Review* 98 (1989) 3—34.

Department of Philosophy
Tulane University
New Orleans, LA 70118-5698
USA