

Modal Translation

The Relevance of Worlds

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For my parents, David and Mary

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Introduction

“That which does not kill us
makes us stronger”
Friedrich Nietzsche

I cannot claim that as a six-year-old, I was ever troubled by the uncertainty of Euclid’s fifth axiom. My introduction to philosophy was somewhat less cerebral. In 1981, I first encountered the partial aphorism taken from Nietzsche’s *GotzenDammerung*. It was part of the opening sequences of the film *Conan the Barbarian*, and it hit me like a thunderbolt. In the following years, I sought out literature on and by Nietzsche. I was often puzzled, however, by the contrast between the conventional wisdom surrounding his work and the work itself. For example, the accusation that he was a proto-Nazis set against his clear admiration for the Jewish community. In a similar vein, many philosophers have been left incredulous by David Lewis’ genuine modal realism (**GMR**). In particular, with respect to Lewis’ claim that there is more than one world or universe. John Mackie, for instance, designates **GMR** a form of “Ptolemaic astronomy” (Bennett 2003, p. 167) in a remark intended “derisively” (ibid., p. 167) but which Lewis was happy to accept as an accurate description of his position. “Lewis neatly expounded this matter through a ‘Ptolemaic astronomy’ – an explanatory model that portrays a system of nested ‘spheres’ with α , the actual world, at the centre:” (ibid., p. 167; Lewis 1973, pp. 14 ff.).¹ In this regard, the choice is between two incompatible theses: either a single ‘world’ or universe or a plurality of ‘worlds’ or universes.

Lewis’ counterpart theory translates one language, quantified modal logic (**QML**), into another, first-order predicate logic (**PL**) supplemented by counterpart-theoretic predicates. The standard translation of *de dicto* modal sentences is usually secured by quantification over possible worlds. Counterpart theory extends this practice to include *de re* modal sentences. The standard practice of quantification over possible worlds is expanded by counterpart theory to

¹ Saul Kripke is not persuaded by Lewis’ spatiotemporal interpretation of a ‘possible world’. He does make use of the notion, however. Kripke illustrates his model theoretic interpretation of the phrase by way of an “analogy”: suppose we roll a pair of ordinary dice that results in two numbers displayed face upwards. Although there are thirty-six possible combinations only one is realised in respect of which numbers are face-up. The thirty-six possibilities each represent a mini ‘possible world’ whilst the two numbers that land face-up represent the ‘actual world’ (Kripke 1980, p. 16).

include de-re-representation. Counterpart theory is composed of four conceptual primitives, eight postulates, and a set of translation principles (Lewis 1968 [1983], pp. 27-31). The exceptional practice of translating ordinary modal discourse into **QML** is abandoned in favour of standard translation into predicate logic with identity, supplemented by counterpart theory. In addition to quantification over possible worlds, counterpart theory quantifies over an ‘unrestricted domain’ of *possibilia* or worlds and non-worldly individuals. When we discuss what could, might, or ought to happen, we talk about a possible world in which what could, might, or ought to happen, did happen. Counterpart theoretic translation exploits an equivalence between the modal operators of box ‘ \square ’ and diamond ‘ \diamond ’ – respectively, necessity and possibility – and the universal and existential quantifiers. It is motivated by well-rehearsed problems associated with intensional languages, e.g., **QML**. Lewis’ solution to these problems is located in the systematic translation of **QML** into the extensional language of **PL** (§ 2.2) (ibid., p. 29). The *general* scheme takes the form of a direct definition or biconditional whose *analysandum* [left side] is a sentence ϕ of **QML** and whose *analysans* [right side] is a sentence ϕ^β of **PL**. The counterpart theoretic translation of modal discourse can be illustrated by the translation of two de re modal sentences (ibid., p. 31):

- A. Jeremy Corbyn could have been Prime Minister (**ordinary language**)
- B. $\exists x \diamond ((Fx \ \& \ \forall y (Fy \rightarrow y=x)) \ \& \ Gx)$ (**QML**)
- C. $\exists x \neg (Fx \ \& \ Gx) \ \& \ \exists y \exists z (Wy \ \& \ Izy \ \& \ Cz x \ \& \ Fz)$ (**counterpart theoretic**)
– it is not the case that the leader of the Labour Party in 2019 or G is the Prime Minister or F, but some counterpart z of x, at a world y, is F.
- D. Boris Johnson is essentially a human being (**ordinary language**)
- E. $\exists x \square (Fx \ \& \ Hx)$ (**QML**)
- F. $\exists x ((Fx \ \& \ Hx) \ \& \ (\forall y \forall z ((Wy \ \& \ Izy \ \& \ Cz x) \rightarrow Hz))$ (**counterpart theoretic**) – x is F and H, and every counterpart z of x, in any world y, is H.

As a “descriptivist” (Lewis 1983e [1999], p. 60), Lewis substitutes a proper name for a definite description before incorporating that description into the apparatus of counterpart theory. In the case of A-C, the proper name “Jeremy Corbyn” at A is analysed in descriptivist fashion as, say, “the leader of the Labour Party in 2019”. Interpreted in terms of **QML**, B states – in context – that it is possible that the (unique) Prime Minister or F might have been the leader of the Labour Party in 2019 or G. The **QML** translation of A at B has a clear affinity with Bertrand Russell’s seminal analysis of so-called ‘denoting phrases’. The counterpart theoretic translation of B at C states that the leader of the

Labour Party in 2019 or G is not the Prime Minister or F, although some counterpart of G, in some non-actual world, is F. In statements D-F, the use of the proper name “Boris Johnson” in D is substituted in descriptivist fashion as, say, “the Prime Minister”. Interpreted in terms of **QML**, E states – in context – that necessarily the Prime Minister, or F, is a human being, H. The counterpart theoretic translation of E states that the Prime Minister, or F, is a human being or H, and every counterpart of F in every world is a human being.

In order to provide a successful analysis of modality (Lewis 1973, p. 88: 1986a, pp. 3-4), Lewis advocates two distinct theses. The first is a counterpart theoretic interpretation of modal discourse (Lewis 1968 [1983]: 1971 [1983]). The second is **GMR**, a metaphysical thesis relating to the nature of possible worlds and other *possibilia*. Although Lewis advocates for both, care must be taken to distinguish the two. One may be persuaded by the counterpart theoretic interpretation of modal discourse, for example, without thereby incurring a commitment to **GMR**.

Proponents of counterpart theoretic translation claim it as an analytic truth. The claim is justified on the basis of several alleged theoretical benefits secured by counterpart theory (Divers 1997, p. 142: cf. Divers & Melia 2002). These benefits are directly associated with the translation of modal sentences by way of the quantifier-predicate model of **PL**. Theoretical *desiderata* include the simplification and clarity of the logical, semantic, and expressive resources enjoyed by the scheme (§ 1.1). It is a central presumption of my argument that Lewis’ modal translation scheme *is* an analytic truth (chapter five). However, I argue that this claim is justified on the grounds that differ from the aforementioned proponents of modal translation. I argue that the counterpart theoretic translation of modal sentences is analytic – in part – on the grounds that the concept *ways things could have been* ‘contains’ the concept *possible world*. I restrict the scope of my examination of analyticity, therefore, to the notion or concept of a ‘possible world’; one of the primitive predicates of modal translation. As such, my account is only a partial defence of the analyticity of the overall translation scheme.

Analyticity aside, the main problem I address is one of the expressive adequacy of counterpart theoretic translation. How does Lewis’ modal translation scheme translate extraordinary or advanced modal sentences? Advanced or extraordinary modal sentences represent a challenge to the expressive adequacy of counterpart theoretic translation. Specifically, modal sentences that ought to be true – by **GMR** lights – are translated as false by the scheme. For example, take the modal sentence ‘necessarily, there is a plurality of worlds’, which is true – by **GMR** lights – but is translated as false by the scheme. It is false because the counterpart theoretic interpretation of modal sentences does not sanction worlds that overlap (Lewis 1986a, p. 2); the analyses of this modal sentence

state that at every world, there is a plurality of worlds, i.e., that every world has worlds as parts. The problem of advanced modality is generated by the interpretation of terms as world-restricted (chapter seven). The associated spectre of expressive *inadequacy* looms over the counterpart theoretic interpretation of advanced modal sentences in several domains of discourse, e.g., sentences about set theory, natural properties, and propositions. Absent the preservation of their ‘intuitive’ truth-value, these sentences confound the logical, semantic, and expressive advantages of standard modal translation. Hence, the theoretical benefits secured by the quantification-predicate model are vulnerable to refutation by way of advanced modal claims. Therefore, genuine realism must preserve the ‘intuitive’ truth-value of advanced modal sentences, preferably by way of the conceptual tools already available to **GMR**. The primary aim of this dissertation is to preserve the ‘intuitive’ truth-values of advanced modal sentences using the conceptual resources of **GMR**. In particular, I intend to preserve in translation the use of the primitive predicate ‘ Ixy ’ or ‘ x is in a possible world, y ’ (Lewis 1968 [1983], p. 27). My solution makes explicit the continued use of the predicate ‘at a world, w ’. Hence, the postulation of a plurality of worlds continues to be pivotal in solving the problem of advanced modal claims. I distinguish my thesis from John Divers’ redundancy theory, recommended by him as the solution most conducive to the prior commitments of genuine realism.

Lewis notes that he drew inspiration for counterpart theory after reading a short story by L. Sprague de Camp (ibid., p. 28 fn. 3). Coincidentally, L. Sprague de Camp was the ‘technical advisor’ on the film *Conan the Barbarian*. This monograph is based on a Ph.D. thesis at the University of Nottingham.

Chapter One: An ontological commitment to a type of entity K , i.e., possible world, is central to Lewis’ modal translation scheme. The scheme adopts and expands on our normal practice of translation into **PL** supplemented by a counterpart theoretic interpretation of de re modal sentences. In addition to the standard quantifiers of **PL**, four new primitive predicates are introduced to the translation scheme, e.g., ‘ x is in possible world, y ’. I argue that the primitive predicate ‘ x is in possible world, y ’ is an essential component of the genuine realist interpretation of modal sentences. To this end, a solution to the problem of advanced modal sentences is provided by admitting sets as an ontological commitment of ‘total theory’. In this chapter, I identify the quantifier criterion of ontological commitment endorsed by Lewis. Possible worlds and sets are amongst the types of entities to which genuine realism is ontologically committed. However, the quantifier criterion is usually understood to be reserved for the *explicit* ontological commitments of a theory. Although a conceptual primitive of **GMR**, sets are not a component of the original translation scheme (1968). Hence, I raise the possibility of *implicit* ontological commitments of a theory

to a type of entity *K*. Surprisingly, I find that Quine endorses the notion of a theory's implicit ontological commitments. However, even if an implicit commitment to a type of entity is endorsed, Lewis' main concern in regard to sets remains unresolved. Lewis' concern about sets – as a distinct type of entity – is captured by the 'singularist dogma' (Lewis 1991). Does a collection of four apples imply the existence of a distinct type of entity, the *set* of four apples? I conclude the chapter with a somewhat cursory examination of the problem of plural predication as it applies to my proposed set theoretic solution to the problem of advanced modality.

Chapter Two: Quine aims to regiment the idioms of ordinary language into canonical notation, preferably **PL**. His preference is based on a desire for referential transparency. Unlike Quine, Lewis argues that ordinary language can reveal the *serious* ontological commitments of a theory: given the proper context, the quantifier and predicate expressions of ordinary language can be put to serious ontic use. I identify the criteria whereby the paraphrase of ordinary language may reveal the serious ontological commitments of a theory (Lewis & Lewis 1970 [1983]). I test the supposition that the serious ontological commitments of a theory may be expressed in ordinary language. The phrase of ordinary language I use to test this supposition is the 'ways things could have been' [but are not]. I conclude that the use of this ordinary language phrase may entail a serious ontological commitment to a distinct type of entity, possible world(s).

Chapter Three: Lewis accepts common sense judgements both as a *desideratum* of philosophical theory and a criterion of a genuine paraphrase. For Lewis, the desideratum of a common sense judgement is at loggerheads with the oft-cited criticism of incredulity. What is the source of the incredulity oft provoked by **GMR**? I utilise the notion of a 'Moorean fact' in order to identify the source of the incredulous stare. The putative 'Moorean fact' that I utilise pertains to our original dilemma – posed above – that there is only one world or universe. The incredulity provoked by the denial of this 'fact' has been used to justify the dismissal of **GMR** as a plausible philosophical theory. Plausibility, however, can take several forms. If incredulity is to be a decisive objection to a philosophical theory, then a 'strong' form of theoretical conservatism must be in play. Strong conservatism states that no philosophical theory could dislodge the certainty of a Moorean fact. On the other hand, if incredulity is understood as a defeasible objection, then a 'weak' form of theoretical conservatism is in play. Weak conservatism states that there may be a reason to reject the certainty of a Moorean 'fact'. They may include a preponderance of theoretical benefits other than an accord with common sense judgement. I conclude that Lewis advocates a weak theoretical conservatism that grants the incredulous stare a defeasible role in theory choice. The price attached to weak conservatism is a

failure to satisfy the third criterion of a genuine paraphrase. Namely, the paraphrase of 'ways things could have been' by 'possible world' would *not* be endorsed by a community of ordinary language users.

Chapter Four: As a theoretical virtue, Lewis argues that methodological parsimony should be evaluated on the basis of the number of *different* types of entity postulated rather than the *number* of entities of each type. Hence, an ontological commitment to a single type of entity should be preferred over the postulation of multiple types of entity – the homogeneity thesis. He acknowledges the theoretical virtue of qualitative, not quantitative parsimony (Lewis 1973). I examine the allegation that Lewis' dismissal of quantitative parsimony is too quick. I contrast an ontological commitment to a single type of entity – possible worlds – with a case study from the history of science. I argue that quantitative parsimony ought to play a derivative role with respect to theory choice. In conclusion, that qualitative parsimony favours **GMR**, whilst quantitative parsimony does not count against it. I then turn to examine an antecedent question. How should the ontological commitments of rival theories be calculated? If we accept that the quantification-predicate model reflects the 'structure' of reality, it is incumbent upon us to provide a philosophical account of the notion of a property. Lewis' account of a 'natural property' fulfills this obligation by identifying the joints at which nature 'ought to be carved'.

Chapter Five: A traditional demand imposed on philosophical analysis is that of analytic truth. I defend the view that the counterpart theoretic translation scheme is an analytic truth. That is to say, a translation that is true by virtue of the meaning of its constituent terms. To this end, I distinguish the semantic and metaphysical aspects of the translation scheme, e.g., Stalnaker accepts that 'actual' is an indexical term – the semantic aspect – but rejects the plurality of concrete worlds – the metaphysical aspect (Stalnaker 1996 [2003], p. 40: 1976/1984 [2003]). This distinction leads to a defence of the 'insubstantiality thesis': that the truth of an analytic sentence *is* exclusively determined by virtue of the meaning of its terms. I restrict my defence of analyticity to just one element of the translation scheme; the predicate expression 'possible world' is a genuine paraphrase of 'ways things could have been'. One of the implications of the insubstantiality thesis is that no restrictions are imposed on the correct interpretation of the term 'possible world'. A 'possible world' could be interpreted as a discrete spatiotemporal continuity, a set of maximally consistent propositions, a collection of unactualised properties, etc. Williamson (2007) rejects the insubstantiality thesis. His critique partly rests on its perceived failure to distinguish semantic from meta-semantic facts. How does Lewis' paraphrasing by stipulation – a meta-semantic fact – establish an analytic truth – a semantic fact? I re-assert the insubstantiality thesis and attempt to rebut Williamson's objection. My rebuttal takes the form of a 'bridge' constructed to unite the

meta-semantic and semantic aspects of language. I argue that the expressions 'ways things could have been' and 'possible world' should be understood as stipulated synonyms. As components of the argument from paraphrase these expressions help secure the analyticity demanded of traditional philosophical analysis.

Chapter Six: John Divers advocates a form of anti-realism with respect to the analysis of modal sentences (Divers 2004: 2006). The type of anti-realism he endorses is that of worldly agnosticism. The worldly agnostic can accrue the theoretical benefits associated with the quantificational-predicate model *and* withhold assent to an ontological commitment to a plurality of worlds (Divers 2004, p. 683). The threat posed by worldly agnosticism to my central thesis is clear. The first step in Divers' endeavour is to demolish the realists' conception of possible worlds; conceived either as discrete, spatiotemporal entities or as abstract sets of complete and consistent propositions. He argues that the causal isolation associated with each world type entails that modal truth is beyond our epistemological and semantic grasp. Modal truth is not beyond our epistemological and semantic grasp; ergo realism must be defective. In place of modal realism, Divers argues that we should adopt a moderate agnosticism with respect to possible but non-actual worlds (*ibid.*, p. 669). However, he is willing to acknowledge a flaw in the agnostic's argument. The moderate agnostic is vulnerable to the charge of an assertibility-belief gap (*ibid.*, p. 675). That is, the modal realist can justify a belief in a *de re* possibility that the worldly agnostic cannot. Furthermore, the modal realist can assert that the relevant modal belief is both rational *and* indispensable. In reply, Divers develops three strategies designed to show that the relevant modal belief is, in fact, rationally dispensable (*ibid.*, p. 678). I argue that each strategy falls short of its intended target.

Chapter Seven: The problem of advanced modal claims is one that threatens the expressive adequacy of standard modal translation (1968). Some modal claims fail to retain their pre-theoretical truth-value post-translation. Divers' proposed solution to this problem is based on the redundancy in the translation of the predicate expression 'x is in possible world, y' and, by implication, 'y is a possible world' (Divers 1999: 2002, pp. 48-49). He argues that genuine realism ought to adopt a non-standard translation of advanced modal claims. The debate surrounding advanced modality is ongoing (see Jago 2016). Noonan, for example, challenges the coherence of the standard model based on a derivation of consequences that are unpalatable to genuine realism (Noonan 2014: cf. Divers 2014). These consequences are due to the traditional demands of genuine philosophical analysis, e.g., strict adequacy. One consequence of strict adequacy is that the standard analysis of modal sentences entails the necessary *de re* existence of, say, talking donkeys! (Noonan 2014, Section 2 p. 3) Noonan's challenge is not restricted to the

analysis of advanced modal claims. It is partly based on work in this field by Josh Parsons (Parsons 2011). Parsons argues that genuine realism is committed to a number of theses which are collectively inconsistent (Parsons 2011, p. 3). Hence, Divers' attempt to distinguish advanced modal claims as candidates for non-standard translation is misplaced (*ibid.*, p. 10). It is a distinction without a difference. To interpret *any* modal sentence – either standard or advanced – through genuine realism is in vain. In reply, I argue that the alleged inconsistency, identified by Parsons, can be resolved and that the problem posed by advanced modal claims remains genuine.

Chapter Eight: I offer a solution to the problem of advanced modal claims compatible with the primitive conceptual resources of **GMR**. I retain the predicate expressions of standard modal translation (1968), esp. 'x is in possible world, y' and 'y is a possible world'. Importantly, I retain the relevance of worlds as a component of the analysis of modal translation [right side, biconditional]. Hence, my proposed solution retains the primitive conceptual apparatus of **GMR** and should be preferred over Divers' redundancy theory. I examine a number of potential objections and replies to my solution. Does the membership relation of set theory rest on a 'magical relation' against which Lewis has elsewhere inveighed? Are sets dispensable – do they impose an unnecessary ontological commitment on a theory? Do the antinomies of set theory generate a reason to dispense with sets altogether? I conclude that although no 'knockdown argument' in favour of my proposed solution is available, it should nonetheless be preferred on the grounds of reflective equilibrium.

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