

Against Metaphysical Necessity

Manuel Bremer

Abstract. The paper argues against a commitment to metaphysical necessity, semantic modalities are enough. The best approaches to elucidate the semantic modalities are (still) versions of linguistic *ersatzism* and fictionalism, even if only developed in parts. Within these necessary properties and the difference between natural and semantic laws can be accounted for. Another target besides metaphysical necessity are substantial forms of iterated modalities, as used, for instance, in the philosophy of religion.

§1 *A Reductive Analysis of Modality?*

Many accounts of the alethic modalities¹ like ‘possibility’ and ‘necessity’ try to be reductive. Modalities are supposedly explained by providing truth conditions for modal statements in a semantics that does not contain modalities itself, but refers to some *sui generis* entities like ‘propositions’ or ‘possible worlds’. One may ask whether there could or should be any reductive account of the modalities at all. Modality may be an irreducible semantic concept, and all we can do is to elucidate it by some model (e.g. some type of ‘possible worlds’ talk). Modality of some type may point to a fundamental feature of reality.

The reason for this scepticism concerning reduction rests in the hidden modal assumptions made with respect to the entities that are employed to explain modality. The very term “possible world” points to such presuppositions. These presuppositions may hide in some construction principle (like ‘independence’ of the building blocks of a combinatorial account of modality) or be given with assumptions of consistency. For example, ‘consistency’ explained as the non-

¹ In the following ‘modalities’ for short.

derivability of a contradiction rests on ‘derivability’. ‘derivable’ is a (hidden) modal notion (as witnessed by the “-able” in the English term). One is not saying that the contradiction has been derived, but – sic! – that it could be derived, i.e. that it is *possible* to derive it.

There may be reductions of modality, however – *inter alia* versions of consistency accounts. Nonetheless even a non-reductive elucidation (e.g. in terms of consistency) may be illuminating. It may (i) establish meaningful modal talk; modal talk could be meta-semantic talk (with respect to consequence) being *mirrored in the object-language* (like in Provability Logics). It may (ii) be part of a full-blown metaphysical picture (like Modal Realism) – of course rejected by Logical Empiricists.

§2 *Linguistic Fictionalism (I): Consistency and Possibility*

Linguistic ‘ersatzism’ as an account of the modalities provides a version of a *fictionalist account of possibilities*: the possibilities do not exist (neither in the space-time universe nor anywhere else in reality), there are no possible existants, there are only *stories*. Or stories about them *might be written*. If the stories just ‘might’ be written the account cannot be reductive. It can be *reflective*, however: ersatzism *is* a story about possibilities itself. It tells how and why such stories might be written.

Carnap in *Meaning and Necessity* aims at an explication of modal terms in terms of his semantic construction of state *descriptions* and Meaning Postulates.² He does not supply a formal system of modal logic, although his suggestions point to something close to **S5**. Modality is modelled by means of a theory of formal languages. The main idea is that all complete re-combinations of basic terms (singular terms and general terms) which *do not* contradict the Meaning Postulates (including logical axioms) constitute a state description, the logical closures of which are the possible worlds.

This means that

$$\alpha \text{ is possible iff there is a possible world } w, w \models \alpha$$

because this means it is not L-false, i.e.

² Remember [from §4]: Meaning Postulates are just axioms including non-logical concepts without any presumption of providing complete conceptual analysis. They need not be biconditionals. Explicit nominal definitions can also be set up as axioms where on the left side of a biconditional the *definiendum* occurs.

$$\not\models \neg\alpha \text{ iff } \models \Diamond\alpha.$$

This is not **S5** inasmuch as **S5** is deductively complete with respect to some (standard) possible worlds semantics for it, and for this $\Diamond\alpha$ should be *derivable* if valid (i.e. true with respect to all possible worlds, which can access all other possible worlds). But to know in the conception here whether $\Diamond\alpha$ is valid, one has to know $\not\models \neg\alpha$, i.e. a *negative* fact about derivability. This not just makes it dependent on a (hidden) modal concept like derivability, but is a fact which in the interesting cases (say, of quantified logics with non-finite domains) is *not decidable* in general. It will be decidable in principle given *finitistic* restrictions on the number of basic singular terms (individuals) and general terms (properties).

Even if this conception was not deductively complete, however, would not make it useless. Statements of the type $\Diamond\alpha$ are epistemically difficult to assess, but such epistemological difficulties do mean neither that we do not understand what the statement says nor that we do not know how to argue for such a statement's truth or falsity. Modal statements need not be epistemically simple. They are not on any of the main accounts of modal semantics.

$\not\models \alpha$ is if true *not* itself a derivable truth in a sufficiently expressive First Order System, as for the property of being provable ("B")

$$(*) \quad \not\models \alpha \Rightarrow \vdash \neg B\alpha$$

is *not* valid in the logic of provability (by *Gödel's Incompleteness Theorems*). So, although $\not\models \neg\alpha / \not\models \neg\alpha$ is a semantic/logical property of the system, $\neg B\neg\alpha$ cannot be a *derivable* truth in *such systems* in all cases of α . So, strictly speaking, Carnap's supposed system is *not* deductively incomplete, as $\Diamond\alpha$ is not a *consequence* that can be *expressed* in general as a logical truth *in* the system (by first deriving $\neg B\neg\alpha$). $\Diamond\alpha$ is true by the logical/semantic rules of the system, thus a logical/semantic truth, but a truth *about* the system, not a logical/semantic truth *in* the system.

$\Diamond\alpha$ could be *derivable* in a paraconsistent system in which Gödel sentences are (just) further antinomies – in a system in which the meta-reasoning about derivability is done in the system itself.³ Thus – given semantic closure combined with an application of the *Church Turing*

³ Cf. Bremer, *An Introduction to Paraconsistent Logics*.

Thesis of capturing our (meta-)reasoning within a sufficiently extended (paraconsistent) formal system – one may argue:

- i. Suppose: $\not\models \neg\alpha$ is true given a system of inference.
- ii. Then: $\models \neg B\neg\alpha$ as the argument for (i) is existing *within* the system of inference, reflecting in paraconsistent semantic closure on itself.
- iii. Thus: $\models B\neg B\neg\alpha$ again as the argument for (ii) is existing *within* the system
- iv. Thus, by definition: $\models B\Diamond\alpha$
- v. Thus: $\models \Diamond\alpha$ by the plain correctness of “B” [$\models (B\alpha \supset \alpha)$], as *Löb’s Theorem* [i.e. $\models (B(B\alpha \supset \alpha) \supset B\alpha)$] does not apply in a paraconsistent context.

Semantic closure and self-reflection allow to capture a truth about the (semantic) framework in a modal statement within the framework. Without reference to a paraconsistent derivation of the kind (i) – (v) non-constructive truth conditions for the modal operators can achieve the same (i.e. $\models \Diamond\alpha$ iff $\exists w w\models\alpha$) [cf. §8].

§3 *Modality as Meta-Semantic*

Alternatively to such an approach one could proceed in a fashion of elucidating modality *without* logical/semantic closure by starting from the observations just made:

- i. there being a (often hidden) dependency on derivability
- ii. possibility being the *meta*-property of ‘possibly true’ with respect to sentences of a formal system.

and see them as a way to *forsake* a philosophically loaded primitive notion of possibility altogether. One could claim that $\Diamond\alpha$ is just an object-language rendering of a meta-language statement, namely one of *satisfiability*:

$$\models \Diamond\alpha \text{ iff } M\models\alpha \text{ for some model } M \text{ (i.e. } \alpha \text{ being satisfiable)}$$

And the claims about satisfiability and the existence of models can – given the presumption of at least correctness if not completeness as well – be further traced back to statements about a story’s *consistency*:

$\models \diamond \alpha$ iff $(\exists s)(\alpha \in s)$ and $s \not\vdash \perp$

i.e. α is part of a (complete) consistent story (a negation-complete consistent set of sentences).
A consistent story s has a model, thus:

$\alpha \in s, s \not\vdash \perp \Rightarrow \exists M(\forall \gamma \in s) \models_M \gamma$, i.e. $\exists M \models_M \alpha$, i.e. $\models \diamond \alpha$.

§4 *Linguistic Fictionalism (II): Existing Derivations*

Possibility is thus reduced to consistency, where consistency has a modal element in talking about the *derivability* of sentences.

A realist with respect to abstract entities who considers a formal system as an abstract object, which exists even without our successive epistemic access to it, can *eliminate* the *residual* model element in ‘derivable’ and simply state $\not\vdash \perp$ as a *fact* given the system as it is.

This (“ \vdash ” meaning “there *exists* a derivation”) would be a complete reduction of modality.

Thus, on the one hand “possible” as a term can be reduced ultimately to a syntactic concept, which thus elucidates it in a regimented form. An ‘explication’ in Carnap’s sense is achieved. On the other hand, we see that the basic syntactic notions contain an aspect of modality *if* we restrict ourselves to talk in terms of our limited (epistemic and deductive) abilities.

§5 *Metaphysical Modalities*

An account of this sort would, it seems, take all modalities to be *de dicto*; there are no modal properties ascribed to entities independently of linguistically established modalities. The fact that a formal system might be able to express *de re* modalities is in itself no reason to consider the respective sentences (possibly) true. One might give their truth conditions in a way that leads back to *de dicto* modalities, e.g. $\exists x \diamond F(x)$ may be seen as making a *de dicto* claim for all assignments to the variable (i.e. some sentence being true of that object).

But *de re* claims seem to make sense. *In* the object-language $\diamond \alpha$ says not of a sentence but of a state of affairs that it is possible. Modal talk in the object-language applies to the world. We say what is possible or not *in* the world. Derivatively we ascribe modal properties to entities in the world. They have them themselves (in that sense *de re*) [cf. §14].

These *de re* modalities, nevertheless, go back to the ways we in our theories and in the Meaning Postulates of our language describe or conceive of the world. We have chosen these ways of talking and formulated our theories, on the other hand, *because* we want our language and theories *to fit to* reality. By our *de dicto* modalities we try to trace any inevitable (i.e. exception forbidding) objective connection in reality. The strength we attach to some connection determines whether we see it as semantic or just empirical.

Considering just semantic axioms we can talk of a broader class of possibilities than if we are taking the *empirical* assumptions of our best theories into account as well. We see links (between properties) of different strength and we want to capture the differences in strength. Consistency with respect to some empirical theory elucidates empirical possibility (i.e. compatibility with the laws of nature [cf. §15]). Consistency with respect to semantic axioms elucidates logical/semantic possibility.

The contrast between metaphysical and linguistic possibility should not be understood in a way that any linguistically *based* elucidation of modality rejects the distinction between the strength of some connections between properties. Our best theories and corresponding Meaning Postulates try to trace the structure of reality. If they are true, these connections are *there*. ‘Metaphysical Necessity’ understood as the obtaining of strict dependencies between properties in reality is then *not* to be contrasted to ‘Semantic Necessity’: in our best theories they should coincide. *There is no further ‘metaphysical necessity’ beyond or besides semantic necessity*, especially not one necessity stronger than semantic necessity.

§6 *Necessary Existents*

If modalities are elucidated by Meaning Postulates and the semantic and syntactic properties of a formal system, there are no exclusions with respect to sentence types that are considered possibly or necessarily true. So, existential claims can be possibly true (if the concept of the entity involved contains no contradiction) – or even be necessarily true. If there are Meaning Postulates/Axioms making *existence claims* these existence claims are – *prima facie* in the *shallow* or *broad* sense of a Carnapian explication of ‘analytic’ (as ‘following from the Postulates’) – derivable as theorems, thus being necessarily true. In the narrow or traditional sense they are synthetic (as they do not decompose by the form of an implication the meaning of a term, as most Meaning Postulates). So, in that sense postulating them renders them *synthetic a priori*.

These necessary existence claims – prototypically in mathematics – may be part of our best theories, thus we understand that necessary existants are part of reality. Controversial posits are entities like the ‘perfect being’, necessarily existent.

Our linguistic frameworks are not directly proven themselves (as they set out what counts as a proof). In that sense synthetic *a priori* sentences in them cannot provide a – non-shallow (i.e. not just axiom repeating) – *proof* of a necessary existant as postulated. They can be used in proving other necessary existants conditional on the ones postulated. Our frameworks are viable in the holistic pragmatic fashion that ultimately serves as our best available justification of proceeding with these frameworks and believing their theorems and assumptions.

§7 *Linguistic Fictionalism (III): Constructing Possible Worlds*

A linguistic ersatzism avoids the postulation of (new) kinds of *sui generis* entities: necessarily existing abstract propositions which do not contain their subject matter as constituents (which these do not to avoid possible existants and overlap between such propositions which take on the role of possible worlds, as abstract stories).⁴ If one has other reasons besides an account of modality for this type of entity, they come in handy: As they need not be constructed (like real sentences) a reduction of modality seems possible. The possible is the realm of these complete, conjunctive propositions (standing in for possible worlds). Supposedly inconsistent propositions just do not exist. In contrast linguistic ersatzism has to explain why supposedly inconsistent sets of sentences are not constructed (or are not constructible). The postulation of abstract propositions – as an ontological investment – solves a problem of analysis by fecund ontological postulation. *Nonetheless* we see a postulation here which inherits all the epistemological and metaphysical problems of postulating abstract entities. Linguistic ersatzism avoids such metaphysics. Once one has a linguistic theory of semantic content and an ontology of sentences one may use talk of ‘propositions’ as mere convenience in non-foundational analyses related to semantics, just as one could do with ‘possible world’ [cf. §13].

A linguistic ersatzism also has advantages over a non-linguistic account in the tradition of Ludwig Wittgenstein’s *Tractatus logico-philosophicus*, which deals in a combinatorial account of the modalities using a non-abstract ontology, the major ingredient of which are states of

⁴ An example is Alvin Plantinga’s *The Nature of Necessity*.

affairs.⁵ The problem such an account faces is to talk about possibilities ('possible states of affairs') without either taking them as sentences or as abstract entities (like propositions). There seems to be no place left to place such entities. A 'possible states of affairs' cannot *be* a recombination of the constituents of actual states of affairs (i) because these are parts of the actual states of affairs *already* (and at least the individuals cannot be replicated), (ii) because *if* they were combined thus, they *are* combined, i.e. one would have actual states of affairs.⁶ So where are the combinations? One seems to land on a general principle:

(*) $\Diamond\alpha$ iff the constituents of α could be combined in that fashion.

This is, of course, no longer a reductive explanation of modality, but just a substitution of *possible combination* for *possible truth*. A reductive account might proceed on the general principle

(**) All combinations of atomic individuals and atomic properties are possible.

This shows the alignment of such a theory to Logical Atomism. This explanation now rests on the assumption of independently existing atomic constituents. This might be an option, but it certainly faces the epistemological challenges (i) to identify such atomic constituents, and (ii) to analyse all complex individuals and properties in their terms. No one has delivered on these desiderata – presumably relegated to a completed science! The problem was – at least – involved in the downfall of Logical Atomism.

Linguistic ersatzism, therefore, remains the best option. So long as it relies on the idea of sets of sentences being 'constructible' and (semantic) consistent in adhering to previously given axioms or Meaning Postulates it cannot provide a reductive explanation of the modalities. It can, however, provide an elucidation of our modal talk and the role of modal talk in our linguistic frameworks. At the same time, it avoids more controversial ontological posits.

To make it explicit: The *story* of linguistic ersatzism goes something like this: 'possible worlds' can be stepwise constructed (i) and (ii) evaluating a modal claim will typically involve construction only up to a point dependent on the logical structure and the constituent terms of the claim under consideration.

⁵ An example is D.M. Armstrong's *A Combinatorial Theory of Possibility*. The ontology of non-transcendent universals and states of affairs Armstrong sets out in *A World of States of Affairs*.

⁶ The problem resembles Bertrand Russell's problem in his attempt of a *Theory of Knowledge* with having individual negative states of affairs which make negated sentences true.

The whole construction concerns a specific language L and a corresponding consequence relation (logic). In the simplest case possible worlds are negation-complete, consistent and deductively closed. In all interesting cases L contains a negation symbol and (at least) one detachable conditional. As possible worlds are interesting only in modal semantics L should have modal operators, in the simplest case with universal accessibility between the possible worlds.

One can model this construction in terms of Turing Machines (TMs). What TMs compute is computed constructively and finitely (apart from the assumption of indefinite storage capacities).

The possible worlds are constructed by a complex TM TM_{pw} , which consists of several sub-machines. The complex TM_{pw} executes alternately chunks (or single steps) of the constituent machines. (Because of the alternating execution some copying, adding and replacing steps have to be repeated.)

The input of TM_{pw} consists of:

1. A list of general terms of the language
2. A list of singular terms of the language
3. A list of the axioms (including nominal definitions and meaning postulates) of the language

The output of TM_{pw} consists of:

1. An indexed list of state descriptions
2. An indexed list of possible worlds

In the second list a supposed possible world that within the construction process below turns out to be inconsistent (and so no possible world after all) is marked closed.

The sub-machines are the following TMs:

1. A TM_{sd} that sets up the state descriptions:
 - a. MT_{sd} looks for a general term and a singular term not dealt with and applies the general term to the singular term (giving an atomic sentence); these terms are searched for starting from the list of terms: a general term and a singular term are new if in the list of state descriptions no corresponding atomic fact can be found.

- b. if the list of state descriptions is empty, two entries are created: one with the atomic fact, one without it; otherwise: the list of state descriptions is extended by a self-copy where the first half of the state descriptions are extended by the atomic fact;
 - c. MT_{sd} proceeds to either another general term or another singular term (alternately) and goes back to step (a), it stops when all terms have been dealt with (i.e. the search for new terms terminates with failure).
2. A TM_t which enumerates the theorems of the language and adds them to all possible worlds. For all theorems α TM_t adds $\Box\alpha$ to all possible worlds.⁷
3. A TM_c which copies from state descriptions to possible worlds:
- a. TM_c goes to the first not treated index of a state description;
 - b. If there no possible world with that index a copy of the state description is added with that index to the list of possible worlds;
 - c. If there is a possible world with that index and is marked closed TM_c moves to the next index; otherwise: TM_c copies sentences in the state description not present in the possible world to the possible world. [This can be required because of the mutual stepwise construction of state descriptions and possible worlds.]
 - d. TM_c goes to the next not treated index or stops otherwise.
4. A TM_{cl} which computes the deductive closure of possible worlds:
- a. TM_{cl} goes to the first not treated index of a possible world;
 - b. If the world at that index is marked closed TM_{cl} goes to the next index.
 - c. If the world contains sentences with a general term δ and sentences with a singular term γ but not the atomic sentence $\delta(\gamma)$ TM_{cl} adds $\neg\delta(\gamma)$ to that world;
 - d. If the world contains conditionals, then for each of them: If the world contains the antecedent of the conditional and the negation of the consequent, then TM_{cl} marks the world as closed, otherwise TM_{cl} adds the consequent to the world.

⁷ TM_t exits by well-known computability theory theorems.

[Introduction of conjunctions and disjunctions happen then by closure with respect to corresponding conditionals derived as theorems.]

- e. For each sentence α in the possible world: if $\diamond\alpha$ is not contained in the world, $\diamond\alpha$ is added to the world and to all possible worlds which do not contain $\diamond\alpha$;
- f. For each sentence α in the possible world TM_{cl} checks whether the sentence is contained in all other possible worlds; if so, $\Box\alpha$ is added to the world, otherwise $\neg\Box\alpha$ is added to the world;
- g. For each sentence of the form $\Box\alpha$ in the world TM_{cl} checks whether α is contained in all other worlds; if not so, $\Box\alpha$ is replaced by $\neg\Box\alpha$. [By the stepwise construction of possible worlds non necessary sentences can transiently seem being necessary.]
- h. TM_{cl} goes to the next not treated index or stops otherwise.

If one assumes that all objects are named by singular terms TM_{cl} also has to add $\forall x \delta(x)$ into a possible world if for a general term δ all instances with respect to the singular terms are in the possible world.

If one was to develop the machine tables of the TMs involved in detail one would need to program immense amounts of copying and shifting of contents, because of the extension of state descriptions and possible worlds. The running time in steps of computation for any mildly complex language L will be astronomical.

The point of the outline of an algorithm of possible world construction is not, however, to proceed to program it in detail and use the output in an philosophical inquiry. The description of TM_{pw} is *a proof in principle* that such a construction is available.

§8 *Modal Instrumentalism*

A fictionalist account involves many intricacies and might be cumbersome to handle at least in its semantics expressed with *stories* (about entities) for modal talk and existing *entities* of various types for non-modal talk. Quantifying-in and counterfactual reasoning about existing objects raise then technical intricacies in formalising them within one (object) language. Higher order quantification aggravates the complexities.

The point of setting out the conception of fictionalism, however, is not to propose working with a formal system that mirrors fictionalism and its claims properly. The point is to have a theory

that shows how modal analysis *could* be done without extravagant ontological commitments. This resembles a nominalist or fictionalist account of numbers – one sets out the account and then goes on to use the standard formal systems in the knowledge that their efficiency and seeming simplicity of expression is valuable, i.e. taking an *instrumentalist* stance on their ontology, especially set theory and model theory. The same can be done in modal logic: One may use higher order intensional/modal logic with a model theoretic framework (in the broad sense of including inaccessible cardinals or classes ...) including an ontology containing possible worlds and possible entities (of whatever type). The fictionalist just does not believe in these scaffolding structures (i.e. the ontological talk taken literally).

Given the ersatzist theory this is not instrumentalism in the vein of early Logical Empiricism. There *is* a preferred ontologically less committal account, which one endorses. For mere convenience of daily non-foundational science, a scheme is employed which one does not endorse. The background or foundational scheme are not on a par with this.

An argument for scientific structural realists to be modal instrumentalist may stress the difference between a commitment to unobservables of some kind and a commitment to non-existing entities (whatever ‘non-existing entity’ means).

§9 *Necessary Properties*

Suppose a species term “F” is *defined* by characteristics F_1, F_2, F_3 . An object a of the type F , insofar as it is F , necessarily has the feature F_1 . That is, *relative* to being F , being F_1 is semantically necessary, *de dicto*. a is not *absolutely* necessarily F_1 unless a necessarily exists. *De dicto* necessities are *conditional* with respect to a definition of a species concept. Objects cannot lose their species concept without ceasing to be that object, even if – for example in the case of physical objects – the physical components continue to exist. An object a , which necessarily exists *in its type* F , necessarily has the properties F_1, F_2, F_3 . If an *object* exists necessarily, then it – as an object – necessarily exists in its kind. A necessarily existing object therefore has necessary properties because these are relatively necessary to the kind and the kind property itself belongs to the object. These properties belong to the constitution of the object, they are *de re* (in the object as it exists).

First Question:

- (1) Can one say of an object that *its* nature could be different?

Answer: No. Because then it wouldn't be *this* object.

Insofar as an object necessarily exists, its kind properties are necessarily *de re*. So necessarily existing objects have their species-relative properties *absolutely* necessarily, it seems.

Second Question:

- (2) Can one deny that the characteristics F_1, F_2, F_3 that define a species F are necessary for that species?

If one defines “ F ”, the characteristics of F -objects are fixed (i.e. the characteristics that they have if they are correctly described as “ F ”). Appropriate definitions capture the characteristic properties of a species. *Appropriate* definitions thus capture the properties that necessarily belong to objects of a species – as objects of that species.

Third Question:

- (3) How do we know that a particular definition is appropriate?

Only within the framework of our overall theory of reality do we assume that certain definitions (parts of our theories and language) are appropriate. There are no isolated arguments for the adequacy of a linguistic framework. However, *if* a linguistic framework is adequate, then the objects of type F necessarily have the features F_1, F_2, F_3 *de dicto* according to the species definition. This (with the adequacy of the *linguistic framework*) does not yet justify the existence of objects of type F . If it is part of our best theory that there are objects of kind F , then it is part of our best theory that there are objects that necessarily (*de dicto*) have the properties F_1, F_2, F_3 . If our best theory is true, these objects have the properties F_1, F_2, F_3 *de re*. If it is part of our best theory that some objects of the kind F necessarily exist, then it is part of our best theory that these objects necessarily have the properties F_1, F_2, F_3 *de re*. If this best theory is true, these objects necessarily have *the properties* F_1, F_2, F_3 .

Fourth Question:

- (4) Can the constitution of a species be further questioned? Can one ask: “Why F_1, F_2, F_3 for the species F ?”

The identity of the language frame (i.e., semantic necessity) could point to the language-*constitutive* character of *definitions*. The necessity explained above relates to these definitions. The definitions are adequate if reality is in a certain way (namely that of the definitions). Then

reality will be such that objects of the kind *F* are necessarily F_1, F_2, F_3 (*de re as* objects of the kind *F*).

Fifth Question:

(5) Can one meaningfully ask about the *necessity* of a species constitution *de re*?

This means asking why reality has exactly the necessities *de re* with regard to species constitution that it does. This means asking why the species *F* is constituted by the features F_1, F_2, F_3 so that the corresponding conditional necessities are present.

A “why” question regarding a necessity aims to trace a necessity back to something else. However, this has to be a necessity (for logical reasons), so the problem only shifts. The structure of necessities may explain each other, so that we understand more when looking at the structure than when considering the individual necessities. So, we are referred back to our understanding of an overall theory of reality. This regression concerns our understanding, not the dissolution of the existence of the ultimate necessities of the species constitution *de re*. We seem to have reached a limit to understandable regression. It seems we have to say:

(6) Necessities are *ultimate* facts – that is exactly what constitutes necessity.

Question (5) about the necessity of *de re* necessities of the species constitution makes no sense.

Nevertheless, there seems to be an intuition about ultimate facts that asks:

(7) Couldn't there have been a differently constituted reality (that is, one with *different necessities*)?

What does “could have been” mean in (7)? What modality does this refer to? If it is a question of possibility and necessity in the *previous* sense, then again there is only the iteration of modalities: Necessities, insofar as they are (precisely) necessities, are necessarily necessary (in a language framework), so they cannot be otherwise. *De dicto* necessities could be different *de re* if we could successfully *speak another language*, which seems to be possible, at least in part. The question of the extent to which the semantics (i.e. not the historically contingent grammar and phonology) of our language is contingent is also not trivial. Adequate *de dicto* necessities cannot be different in the sense of what was said above: the underlying necessities are (just) necessary.

Is there another – higher level – necessity in the context of (7)? If some such necessity exists,

the *de re* necessities of reality – and also any necessary existants – are *not necessarily necessary without* further ado. The question of their necessity arises again. Their necessity, even in the sense of higher-level necessity, does not have to be ruled out, but it has to be argued for, then.

As a rule, modal metaphysicians do not care about such arguments or such an argument pattern. Because in metaphysics – that is, not only in semantics – they posit a concept of necessity of type **S5**, in which all iterations coincide ($\Box\alpha \supset \Box\Box\alpha$, $\Diamond\alpha \supset \Box\Diamond\alpha$).⁸

This means that question (7) is simply rejected. If one does not see question (7) as obviously nonsensical, one sees the commitment to metaphysical **S5** modalities as a non-trivial commitment. One may very well dispute that our *semantic* intuitions about *semantic* necessity, in which case most semanticists argue in favor of an **S5** modality, can be extended to metaphysical necessity – at least one can doubt that they can easily be extended to metaphysics.

Our best theory and the presupposed linguistic framework may need to be expanded to include such a higher-level concept of necessity – or we now understand that we and the intuition behind (7) have always operated with such a concept. The linguistic framework includes a second concept of necessity (the higher level, non-tautologically iterated one). The best theory must now also justify why the necessities *de re* of reality are also necessities *de re* in the sense of the second concept of necessity.

Now you can guess what question this development is leading to:

(8) Can the rise to new questions of necessity be repeated?

Answer: Only if question (7) cannot be repeated at the next level as question (7') is there any prospect of a conclusive answer to the question of the inevitability of necessities. But why should this be so? The intuition articulated in (7) will also be able to motivate such an ascent into ever-further necessities. A negation of (8) or a defusing of it in the sense that this progression is argumentatively harmless would have to be based on a pattern of argumentation, the understanding of which entitles us to either cancel the progression entirely or to understand it as an epiphenomenon in the modalities. We have to face a non-trivial question of modality iteration [see §17].

Concerning necessary properties of any objects we may sum up: The statement

⁸ For instance, Plantinga in *The Nature of Necessity*. See also his *Does God Have a Nature?*

(9) a is necessarily F_1 .

can be analyzed in various ways. In an adverb construction, “necessarily” has a narrow scope (in the predicate):

(10) $a \square_{\text{ADV}} F_1$.

with an adverbial operator “ \square_{ADV} ”. In contrast, one can relativize the predication to the existence of a :

(11) $\square (a \text{ exists} \supset a \text{ is } F_1)$

This typically expresses the relative (metaphysical) necessity related to a sortal. (11) is if F_1 is part of the definition of a sortal F true in all possible worlds, since in the worlds in which a does not exist, the antecedent is false and the material conditional is therefore true. And a exists – as an object of its sort F – only if the sortal applies to a , i.e. also “ F_1 ”. Relative necessity allows us to say that an object has necessary properties. (10) will be false if either singular terms are eliminated in favor of descriptions with existence claims or if, in a free semantics, statements with non-referring singular terms are not necessarily true, but rather not-true.

In (10) one can also give “necessarily” scope to the entire statement, *de dicto*:

(12) $\square (a \text{ is } F_1)$

If singular terms can be non-referential or are eliminated, (12) must not be true as soon as “ a ” does not refer, rather (12) will be false. In such an analysis the truth of (12) presupposes the necessary existence of a . If a necessarily exists, then (9), if it is true, which it will be in the case of a sortal component, is necessarily true in the *absolute* sense.

§10 *Natural Laws and Natural Necessity*

Among the regularities obtaining in the world science identifies some as natural laws. A natural law states a connection between properties (in certain circumstances) which is either exceptionless or captured in affixed probability. Such connections are not as ephemeral as many in other regularities. Natural laws may even explain such other regularities by reduction to a natural law and the corresponding causes, or by reduction of a statistical correlation to a common cause. Some of these natural lawlike connections are codified in the definitions of sortal predicates [cf. §14], others are not. Such connections are thus transformed into *semantic*

necessities. Given a list N of natural laws not codified in definitions one can define for a language L a notion of ‘natural necessity’ as

$$(\Box_N) \quad \alpha \text{ is natural necessary} \stackrel{\text{def}}{=} \vdash_{L+N} \alpha \text{ and } \not\vdash_L \alpha$$

i.e. if N is added as an axiom to the language framework what can be derived as a theorem is at least natural necessary and if it can be derived only thus it is exactly natural necessary. Because the right part of the *definiens* is not decidable in the general case, being exactly natural necessary is not decidable in the general case either.

This natural necessity may be expressed by a sentential operator “ \Box_N ”. This operator comes with its own modal logic, a ‘non-normal’ modal logic. Obviously, a (T)-Axiom holds in the *extended* language:

$$(T\Box_N) \quad \Box_N \alpha \supset \alpha$$

Also a (K)-Axiom of distribution holds:

$$(K\Box_N) \quad \Box_N(\alpha \supset \delta) \supset (\Box_N \alpha \supset \Box_N \delta)$$

Given the definition of “ \Box_N ” the rule of Necessitation cannot be part of \Box_N -logic as derivable semantic necessities are not by their derivability natural necessities, quite the opposite.

Iteration with respect to natural necessity is hardly comprehensible: it is no natural law that some natural law obtains, even if it is true by nature that α has to be true, *this* has not to be true by nature. So, for instance,

$$(S4\Box_N^*) \quad \Box_N \alpha \supset \Box_N \Box_N \alpha$$

should not be an axiom, and the definition of “ \Box_N ” does not by itself demand it. In analogy to semantic modal iteration principles one may argue: a natural law α is true in all natural law worlds (i.e. those worlds where the natural laws are kept fixed), so it is a natural law that α is a natural law as $\Box_N \alpha$ is true in all these worlds. However, modal iteration even with respect to semantic modalities turns out to be ambiguous and thereby problematic, as we will see. With respect to “ \Box_N ” a semantics supporting iteration should be avoided. “True by nature” applies to sentences expressing connections between properties (in certain circumstances), i.e. referentially to some connection in the world, *de re*. Natural laws are about natural properties not about natural laws. In contrast, semantic laws (total or partial definitions and conventions)

constitute a linguistic framework, regulating the employment of terms of a language. If the truth of α is semantic necessary this rests in semantic conventions, so – to a limited extend – we may say: *given the constitution* of that language the semantic necessity of α is itself not semantic contingent and might be expressed by an iterated modality in that very language.

“ \Box_N ” and its notion of natural necessity poses no problem for Updated Logical Empiricism or modal fictionalism. Empiricists – prominently Hume – have denied but need not deny lawlike natural causal connections between properties, captured in special sentences. The introduction of “ \Box_N ” and corresponding talk of ‘natural necessity’ precedes within the typical methods available to Logical Empiricism. Especially, no controversial new metaphysical background assumptions beyond the existence of properties etc. are required. “ \Box_N ” is a weaker companion to “ \Box ”. The presence of both allows to distinguish between what is possibly true (in one language) from what is possible according to natural laws (due to the accepted theories expressed in that language). Both literature as well as (scientific) thought experiments rely on this distinction.

§11 *Deconstructing Rigid Designation*

Insofar as reality is not determined, the past could have been different and the future can be one way or another. These possibilities can be understood as 'natural law possibilities' (possibility in the light of the laws of nature) and a corresponding term and operator " \Diamond " (or " \Box_N ") can be defined. Our everyday planning and assumptions about what could have been and what might be refer to such possibilities. Given the semantic definitions of a language L_1 (total or partial definitions of expressions through analytical connections or Meaning Postulates), scenarios can be described in L_1 that even lie outside the scope of natural law possibility. These are often found in literature. Such possibilities are semantic possibilities (possibilities in the light of a language's meaning system), which corresponds to the usual use of " \Box " and " \Diamond " [as discussed above §§6 – 13].

It is doubtful whether, beyond or between these two concepts of possibility (and necessity), there is a need for a further concept of 'metaphysical possibility', understood as genuinely different from the other two.

Sentences like

(13) Water is necessarily H₂O.

are considered paradigms of metaphysical necessity. However, these sentences can be understood without assuming a new kind of modality. If we introduce the term “water” in a reference fixing definition (‘baptism’) as a “substance of this chemical constitution” and then discover – perhaps later, i.e. empirically – that this constitution can be specified as “H₂O”, then due to our *semantic conventions* (regarding reference determination and “chemical constitution” and corresponding practices of (re)identification), “water” only refers to H₂O. (13), therefore, refers back to a combination of our linguistic practices and the properties of reality. In this *deflationist sense* one can speak of 'metaphysical possibility/metaphysical necessity', but this does not include any metaphysical laws of its own alongside the natural laws and semantic conventions.⁹

If the language L₁ allows (partially) to speak appropriately about reality and contains sentence

(14) $(\forall x,y,z)(x = y \wedge y = z \supset x = z)$

then reality also behaves in such a way that identity is transitive (and correspondingly co-referential expressions can be substituted for each other in many contexts). This is a feature of reality.

Many examples of 'metaphysical necessity' revolve around the concept of identity. However, the identity of objects has to be understood as relative to sortal predicates: an object belongs to a sort as long as it exists and this may be linked to methods of re-identification [cf. §14]. 'Identity' therefore refers back to our linguistic ontology of 'objects'. Pieces of reality are what they are. If they don't change, they will stay as they are. Introducing this as a genuinely *further* modality 'metaphysical possibility/metaphysical necessity' brings more modal-theoretical confusions than clarifications.

The 'metaphysical necessity' associated with identity is the conditional necessity associated with sortal predicates [see §14], i.e. ultimately a *semantic* necessity. If we had specified “substance of this color and taste” when baptizing water, then presumably (given the usual 'Twin Earth' stories) water would not necessarily be H₂O, which shows that the definition is

⁹ The usual 'Twin Earth' narrative goes like this: Earth and Twin Earth exist *at the same time*, and then it seems plausible, given our baptism of water, that water is necessarily H₂O, while there is no water on Twin Earth. However, if Twin Earth is a counterfactual alternative to our Earth, then it could have turned out for *us* that water was XYZ, so not necessarily H₂O, and thus, even without a Twin Earth somewhere, water is not necessarily necessary H₂O.

the basis from which we derive 'metaphysical necessity', and not the other way around. The properties $F_1 \dots F_n$ that make up a sortal generally constitute an object's identity within the framework of what is necessary/possible according to natural law. Sortals for beings beyond the universe presumably do not arise from natural law modalities (of this universe), but presumably from either purely semantic modalities – or from supernatural modalities, that is, modalities in the light of the laws of the supernatural – if such exist. However, laws of the supernatural, if they exist, especially if any area of the supernatural were law-like at all, are no more metaphysical laws than natural laws are metaphysical laws – or just as much, given the indirect role explained above in a deflationist theory of metaphysical modalities. Corresponding religious-philosophical theses and arguments require less a theory of metaphysical modalities than an explanation of corresponding supernatural sortal predicates.

One major argument for metaphysical necessity has been the theory of rigid designation of proper names and natural kind terms.¹⁰ There are some linguistic intuitions that proper names and natural kind terms are used as rigid designators. One may doubt that they are. Once we restrict the descriptive content to the content employed in the reference fixing situations (say, in the case of a proper name to 'the human being born at time t at place p '), almost all intuitions of rigidity can be covered by a proper name with minimal semantic content. A reference fixing postulate will integrate proper names then into the ersatzist model of possible worlds. Natural kind terms can be treated similarly, where additionally there is linguistic evidence for at least partial decomposition by meaning postulates [cf. §14].

Nevertheless, let us, for the sake of the argument, assume that such assignments of minimal content are not feasible and there is the phenomenon of rigid designation. Does this commit us to a metaphysical necessity beyond semantic necessity?

No, it does not. This can be seen in the way rigidity is introduced into the language, given a proponent of rigidity bothers to outline this. Rigidity is enforced by Kripke by postulating that we look only at possible worlds *after* we have the reference of proper names and natural kind terms fixed, i.e. others worlds are not possible at all.¹¹ That is a way of restricting the set of possible worlds or the set of models. Linguistic ersatzism restricts the set of possible worlds or the set of models by enforcing the axioms including meaning postulates. The same effect meaning postulates achieve could be achieved by forsaking meaning postulates but

¹⁰ Classically in Kripke's *Naming and Necessity* and Putnam's "The meaning of 'meaning'".

¹¹ Cf. Kripke, "Identity and Necessity" and *Naming and Necessity*.

disregarding all models or possible worlds that would render something satisfiable or possible that we do not consider so for the language under construction. The two methods are (with respect to true modal statements generated) equivalent. Forsaking meaning postulates but restricting the set of models or possible worlds results in sentences mirroring the forsaken meaning postulates to be true in all – remaining – possible worlds or models, i.e. to be necessary true. Proponents of rigid designation proceed exactly this way (excluding models or possible worlds that semantically interpret a proper name or natural kind term differently to its given interpretation in the actual world). Given the restrictions on enforcing rigidity some sentences are found to be necessarily true. This is perfectly acceptable as a way of modelling and there may be good reasons for enforcing some rigidity. We have, however, here a variant of enforcing semantic rules. Rules of rigid designation if we want to have them are semantic rules. So, the consequences of them are semantic necessities. No metaphysical necessities are found. If talk of corresponding ‘metaphysical necessities’ was meant only as a short form of talking about special semantic necessities, Logical Empiricists would not complain as one may explicate the very term “metaphysical necessity” in this way. This, however, is not the way the debate is conducted or talk about corresponding ‘metaphysical necessity’ is defended or introduced. That debate needs some deconstruction in the manner just outlined.

§12 *Iterated Modalities*

If we make a distinction (like Descartes in his *Philosophical Letters*) between the human conceptual system and the logical laws that limit it, and the conceptual system of the divine mind, which we cannot see, with logical laws granted by God, which we also know, but also a super-logical scope that goes beyond them, which makes completely different laws of logic conceivable for God, then all considerations about strict necessity are only relative to our – limited – conceptual system. This may be sufficient for argumentation among human persons, since our arguments are aimed at them. However, no metaphysical conclusions can be drawn from this to a non-humanly relativized realm.

Arguments that make assumptions about the human conceptual framework or the spectrum of possible individual linguistic conceptual frameworks can be an opportunity to reflect on the limits of human understanding and thinking. The idea that our conceptual framework may have limits does not show that it has them. And if he has them, little can be said about them, especially not that they concern a specific (metaphysical) problem. A specified and restricted

claim of this sort must seemingly itself concede reliable meta-epistemic capacities. In the case of modalities, however, the very idea of human limitations and the contingency of human nature casts doubt on iterated modalities referring to language frameworks themselves. What seems necessary to us – or is necessary in our conceptual system – does not have to be necessary. What then remains consistent is a *modal metaphysical agnosticism*.

If modalities can be iterated, this can be understood as meaning that “necessarily true” applies to sentences relative to a semantic language framework. However, it is not necessary that we use *this* linguistic framework, so the 'necessarily true' sentences of this framework need *not* be necessarily 'necessarily true'.¹²

Talk about the possibility of a *different* linguistic framework must take place within a linguistic framework. There are three variations of this approach:

1. We distinguish between the language frame we are talking about and the language frame by talking about its modalities. If it is a hetero-lingual meta-frame, a hierarchy of such frames builds up in which the most recently used frame is not reflected.
2. We distinguish between *relative* necessity (of a linguistic framework) and *absolute* necessity beyond all linguistic frameworks – perhaps even the limits of what is humanly conceivable. The alethic modalities of a language (“□”) may then be **S5** modalities. And one may also assume that the absolute modalities (“◻”), insofar as their absoluteness excludes further alternatives, are **S5** modalities. This means that we assume:

$$(15) \quad \Box\alpha \supset \Box\Box\alpha$$

$$(16) \quad \Box\alpha \supset \Box\Box\alpha$$

What you have to avoid, however, is mixing up these modalities, that is:

$$(17) \quad \Box\alpha \supset \Box\Box\alpha$$

3. Are these, on the other hand, statements of a self-referential linguistic framework that can be used as its own framework for meta-considerations, and which we may think of as the human universal meta-framework (i.e. which does not overcome *the* limits of

¹² This does not exclude the possibility that there are sentences that are necessarily true in every comprehensive and humanly possible linguistic framework [cf. §4]. What these could be is a – difficult – transcendental philosophical question. It is particularly problematic whether these include theological statements, say about the nature of God.

what is humanly conceivable towards 'absolute' modalities), then no modal-logical reduction principles *like S4 or S5* apply.

The meaning of “red” and “coloured” may determine that

(18) Everything that is red is colored.

is a necessary truth. Certainly, the meaning of “language” or “21st century English” does not determine that

(19) We speak this language/21st century English.

is a *necessary* truth. Corresponding semantic principles justify from (18):

(20) Necessarily₁ everything that is red is colored.

However, since (19) is not necessarily true, they do not justify:

(21) Necessarily_? necessary₁, everything that is red is colored.

This means that a Necessitation rule may not be applied to statements with modal operators, or only when they are instances of propositional tautologies. Corresponding modal logics could be **S1** or **S2**.¹³

In summary, the above considerations boil down to the following points:

- (i) There is *no independent metaphysical necessity*: corresponding ways of speaking go back to the *semantic conditional necessity*, which in particular entails the semantics of sortal predicates.
- (ii) Since definitions (including those of sortal predicates) are supposed to be adequate to reality, the conditional dependencies in the definition of adequate sortal predicates correspond to structural facts (of reality), which can be understood as modalities *de re*.
- (iii) Since reality could presumably be different and we could speak a different language – and would have to if reality were constituted differently – the definitions of the best linguistic framework are also presumably *not necessarily the way they are*. While something is necessarily *relative to* a definition, establishing that such a

¹³ Cf. on all these modal logics: Hughes & Cresswell, *An Introduction to Modal Logic*; Cresswell, “The completeness of S1 and some related systems”; Chellas & Segerberg, “Modal Logics in the Vicinity of S1”.

definition exists, even if it co-constitutes a language, is establishing a contingent fact!

- (iv) While *semantic necessity allows for iterated modalities within a linguistic framework* – in particular given the usual truth condition for " \Box " ('true in all possible worlds') and universal accessibility of all possible worlds – there is the question of *semantic necessity* in the sense of (iii) *from the outside perspective of a linguistic framework*, from which perspective iterations do not make sense (it is semantically necessary in German that everything that is red is colored, but it is not semantically necessary in German that it is semantically necessary in German that . . . – this iteration *makes no sense* because it mixes linguistic levels: *establishing* a definition itself is not definitionally necessary).
- (v) The logic of internal semantic necessity may (according to the explanations in (iv)) correspond to logic **S5**, the logic of external semantic necessity either does not allow confusion between absolute and relative necessity or may correspond more to a logic like **S1**.
- (vi) The talk of necessity as an attribute of God either makes inadmissible metaphysical use of the inner semantic necessity **S5** or the corresponding (cosmological) arguments are hanging in the air because of the admissibility of the questions concerning external semantic necessity.