Scuola Dottorale di Ateneo

Graduate School

Dottorato di Ricerca in Filosofia

e scienze della formazione

Ciclo 29

Anno di discussione 2017

Future Contingents and the

Assertion Problem

Tesi di dottorato di Alessio Santelli

Matricola: 956068

Coordinatore del dottorato:

Prof.ssa Maria Emanuela Scribano

Supervisore del dottorando:

Prof. Luigi Perissinotto

Acknowledgements

I wish to express my deepest gratitude to my main supervisor, Andrea Iacona, who, almost eight years ago now, introduced me to the problem of future contingents. From that moment on, I benifited greatly from his continuous support and immense competence on this topic. His guidance helped me in all the time of research and writing of my dissertation. I could not have asked for a better supervisor.

Over the past three years, I also had the privilege of being part of the LOGOS group in Barcelona. There, I have been more than lucky to work under the supervision of Sven Rosenkranz. His suggestions, comments and advice have contributed enormously to clarify my ideas and shape my own view about future contingents.

I'm also indebted to Samuele Chilovi and Francesco Gallina who helped me develop many aspects of my proposal. Sam has the power to see problems where others think they've found solutions, whereas Francesco has the gift of making things always clearer than you can do. My thanks go also to Giuliano Torrengo who read a first draft of the thesis and gave positive comments about it.

During my stay in Turin, I had very helpful conversations with Fabrizio Calzavarinis and Stefano Caputo. I'm also grateful to Fabrizio Cariani for his detailed comments on Chapters 2 and 4. His feedback have significantly improved both of them.

Back in Venice, I had the fortune of being supervised by Luigi Perissinotto whose help made my research much easier to manage. I also would like to thank Simone Gozzano with whom —while I was in L' Aquila— I enjoyed excellent conversations about questions regarding the intersection between metaphysics and epistemology.

A very special thank you is due to Alessandro Conti for many illuminating discussions about Ockham's philosophy and, more generally,

on the (crucial) role it played in the Middle Ages. Last, but not least, I wish to thank Beatrice who patiently supported me during the last three years. Had it not been for her intense dedication, I would have probably not accomplished this task.

Abstract

This work is about the problem of future contingents. More specifically, it focuses on how to make sense of assertions about events whose outcome is still indetermined. The problem can be outlined as follows. Suppose that nothing that has transpired so far made it inevitable that a sea battle will take place tormorrow. That is to say, it is objectively (as opposed to epistemically) possible that a sea battle will occur and it is objectively possible that it won't. Now, let us imagine that someone today asserts "there will be a sea battle tommorow". How should you evaluate such an assertion if, as we may presuppose, in some possible histories branching out of the present moment it will be true that tomorrow there is a sea battle, whereas in some others will be false —and none of these histories can be privileged over the others?

According to a venerable tradition that goes back at least as far as Aristotle, in order to secure the openness of the future future contingents must be considered neither true nor false. The underlying though here is that if a future-tensed sentence presently had a truth-value, then the future would be inevitable —contrary to what one might believe.

In light of this, the Assertion Problem may be seen as the result of two main assumptions taken together. The first is that, because of indeterminism, future contingents lack a truth-value. The second is that, given their truth-valueless, future contingents cannot be correctly assertable. However, since we do assert future contingents all the time, we are left with the problem of how to account for this apparent contradiction.

Several attempts have been made to give an answer to this puzzle, either by arguing that, albeit truth-valueless, future contingents are indeed assertable, or by rejecting the Aristotelian thesis altogether. The present work examines the three most representative accounts of

the first kind —namely, Thomason's supervaluationism (1970), Belnap's double-time reference semantics (2001, 2009) and MacFarlane's relativism (2003, 2014)— and concludes that none of them is able to provide a persuasive answer as to why we comfortably assert future contingent statements.

The dissertation is structured in five chapters. In Chapter 1, after having introduced the problem of future contingents, I show how each of the theories mentioned formalize Aristotle's intuition that future contingents are neither true nor false. As suggested earlier, such a formalitation exploits the idea that the contingency of the future must be somehow grounded on the existence of many possible future branches —none of them picked out as *the* future branch. Accordingly, these theories are also dubbed *Branching-time* theories (BTT).

In Chapter 2, I first outline an argument to the effect that no future contingent is correctly assertable, and then consider what Thomason would say if were he asked to take a stand on this issue. The upshot, in brief, is that supervaluationism does not offer those vantages for which it was designed. In Chapter 3, I focus on Belnap's proposal and I illustrate why his account fails to provide a satisfactory response to the argument. In Chapter 4, I explore MacFarlane's account of assertion and I show how both of his alternative approaches suffer from different but very serious problems.

In Chapter 5, I explain why all the *BT*-theories examined fail to solve the Assertion Problem. Adapting a well-known objection raised by Gareth Evans (1985) to tensed sentences, I argue that the reason of their failure lies in the very assumption that makes the branching picture so attractive, namely, that in the absence of a privileged history future contingents cannot be true (false) as of the time of their utterance. As I attempt to demonstrate, this assumption is less solid than expected since it leads to consequences that are far less plausible than those that

BT-theorists are keen to avoid.

With this in mind, I introduce the so-called *Thin Red Line theory* (*TRL*-theory) and I suggest that it is the only theory now available at the philosophical market which can adequately solve the Assertion Problem. However, it can only do so at the cost of dismissing the Aristotelian solution. For this reason, I conclude that to dissolve the puzzle regarding the assertion of future contingents we should be prepared to reject the thesis that future contigents are to be deemed neither true nor false as of the time of the utterance.

Contents

Chapter 1

The problem of future contingents

1.1 Introduction

Future contingents are statements that predict future contingent events (states of affairs, facts or actions). To say that an event is *future* is to say, perhaps unsurprisingly, that it is neither past nor present. Instead, to say that an event is *contingent* is to say that it could not happen — i.e., that it is neither necessary nor impossible. "Matteo Renzi will win the election" could be regarded as an example of a future contingent statement[1].

However, since the antiquity, philosophical considerations about the nature of time have motivated certain semantic treatments of such statements which in turn have led to the conclusion that the future is predetermined, and consequently that, contrary to what might be

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[1]Terminological concern: in this work "necessary" must be understood as "historically necessary" or "inevitable". It is inevitable what holds in all possible continuations of the present state of affairs. Historical necessity expresses instead the intuition that what is not necessary (i.e., unsettled) at one time may be necessary (i.e., settled) at a later time: the flowing of time thus makes necessary what has already happened in the sense just outlined. For this reason, the modality at stake is also called "diachronic" for instance by von Wright [34], p. 9.

expected, future contingents are logically impossible. In effect, as we shall see in a moment, it is possible to demonstrate that the future is settled by simply appealing to logical (and very plausible) principles. In light of this, it may be argued that *The Problem of Future Contingents* concerns how to assign a definite truth-value to such statements without having to assume that the future is predetermined[2].

More specifically, the problem of future contingents arises from the famous Aristotelian argument according to which the principle of bivalence entails fatalism. Fatalism, of course, is an umbrella term and it is difficult to pin down. Presumably, there are sevaral views which deserve to be subsumed under that term. In spite of this, though, it is generally acknowledged that fatalism refers to the doctrine that "whatever happens happens with (some sort of) necessity". So understood, fatalism also implies that human beings have no freedom, either in the sense that our actions are causally inefficacious or in the sense that, albeit causally efficacious, thery are not freely performed[3]. The argument, suggested by Aristotle in *De Interpretatione IX*, can be reconstructed as follows, for any sentence 'p':

(1) Either 'p' is true or 'p' is false

(2) If 'p' is true then it is necessary that p

(3) If 'p' is false then it is impossible that p

(4) Either it is necessary that p or it is impossible that p

Notice that the argument is valid insofar as (1), together with (2) and (3), entail (4). Therefore, in order to refute its conclusion one has to refute at least one of its premises. Moreover, the argument may also be seen

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[2]For simplicity, I am going to assume that words like "predetermined", "settled", "fixed", "closed", are connected to the same meaning. So, I shall use them interchangeably.

[3]See Rice [27] for a detailed discussion of these issues.

as a way of showing that determinism is true, at least if determinism is framed as thesis that the state of the world at any time, together with the laws of nature, *causally* entail the existence of only one possible state later than it. Thus, by rejecting the above argument, one is also implicity assuming that the the word is indeterministic and therefore that the future is "open"[4].

Now, suppose we replace 'p' with the likewise famous Aristotelian future contingent sentence

(5) There will be a sea battle tomorrow

and my friend Jan today utters (5). As far as we know, tomorrow it is possible that there will be a sea battle, although it is possible that there will not be one.This suggests that the sea battle, that is, the event we are concerned with, is contingent in so far as it is something that could not happen. However, things start to become more complex if we consider that (5) is arguably either true or false as well as the two following sentences

(6) There is a sea battle today
(7) There was a sea battle yesterday

The reason why such a consideration causes troubles can be spelled out simply by noting that, if (5) had a truth-value today, the foregoing argument would forces us to conclude that the sea battle tomorrow will be necessary or impossible. The silent assumption behind this line of thought seems to be that if a future-tensed sentence *presently* has a truth value, then the future is necessary.

According to a widely shared reading of *De Interpretatione IX*, Aristotle would escape from such a conclusion by rejecting the validity of

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[4]See Hoefer [8] where a similar definition of determinism is adopted. Final *caveat*: even if fatalism and determinism are clearly independent thesis, as long as both imply that what happens is inevitable, they can be used as synonymous.

bivalence: since the presumption that (5) is either true or false leads to the implausible consequence that the sea battle tomorrow will be un-preventable, there is no other option but to give up the presumption. To be a little more precise, we can formulate Aristotle's reasoning by *contraposition* as follows: if future-tensed sentences have semantic value, then the future is inevitable, but the future is not inevitable; therefore future-tensed sentences must be neither true nor false. Although the difficulties concerning the interpretation of Aristotle's *Chapter IX* are very well known, this is the reasoning that most the interpreters nowadays attribute to the Stagirite[5].

However, one might argue that Aristotle did not actually reject bivalence but simply restricted its validity. This suggests that he would have probably regarded past and present tense sentences as bivalent and so necessarily true or necessarily false. In such a case, Aristotle would then be a future-indeterminist but a past- and present-determinist. This is quite plausible. Yet the point is still that, as far as future contingent statements are concerned, he seems to claim that bivalence does not hold. If so, this suffices for calling "Aristotelian" both the aforementioned solution and its purported variant. Thus, following a common tradition I will call such a solution the *Aristotelian solution* to the problem of future contingents.

In the contemporary debate about future contingents, there are at least two ways to formally characterise the Aristotelian solution. The first is Łukasiewicz's *Three-Valued Logic*. Without going into too much detail, Łukasiewicz has argued that it is possible to reject bivalence by introducing a *third* truth-value. Such truth-value, *indeterminate*, must be applied to sentences concerning the future. This means that not only (5), as uttered now, receives the truth-value 'indeterminate' but also its negation

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[5]For an alternative interpretation, see Hintikka [10] and Whitaker [35].

(8) There will not be a sea battle tomorrow

in that today there is no fact of the matter determining that the sea battle is going to take palce tomorrow or not[6].

However, the problem is that if the negation of an indeterminate sentence is also indeterminate, it follows that within Łukasiewicz's trivalent logic one can not consistently reject bivalence without also rejecting the law of excluded middle. In other words, on his approach, a disjunction made out of two indeterminate disjuncts such as

(9) Either there will be a sea battle tomorrow or there will not be a sea battle tomorrow

will also get the value 'indeterminate'. This is a direct consequence of the Łukasiewicz's conviction that logical connectives, as in two-valued logic, must be truth-functional. More particularly, the truh table of negation, on Łukasiewicz's system, says that $\sim p$ is indeterminate if p is indeterminate, while that of disjunction says that $p \vee q$ is indeterminate if p and q are both indeterminate. So, it follows that (9) is indeterminate either:

Table 1: *Truth table for Negation*

p	$\sim p$
1	0
½	½
0	1

[6]See Łukasiewicz [15] pp. 122-123.

Table 2: *Truth table for Disjunction*

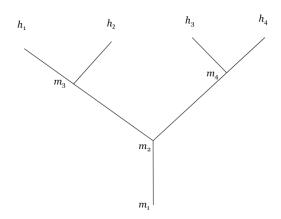| p	q	$p \vee q$
1	0	1
½	½	½
0	1	1

First appeareances notwistanding, such a logical outcome looks implausible. Perhaps Aristotle himself would have considered the rejection of excluded middle inadmissible. After all, *Fp ∨ F~p*, to borrow Thomason's words, "has the force of a tautology", therefore must be necessarily true. That is, (9) expresses the straightforward thought that tomorrow, despite being incapable of knowing what will actually happen and independently of any consideration about whether or not the future is settled, either there will be a sea battle or it will not. *Tertium non datur*.

1.2   The Branching picture of time

If Łukasiewicz's interpretation of Chapter *IX* is off the table, since it misrepresents Aristotle's intuition that (9) would be true today (as opposed to indeterminate), it seems that the only thing left is to sacrifice bivalence but preserve excluded middle. This is exactly the strategy endorsed by three different contemporary approaches defended by Richard Thomason (1970), Nuel Belnap (1994, 2001) and John MacFarlane (2003). In what follows, I will look at each of them in turn.

However, at least two things need specification before we move on. The first is that, despite being alternative and equally legitimate ways to formalize the Aristotelian solution, all these competing theories are based one the assumption that the best way to make sense of the con-

Fig. 1: *Branching time*

tingency of the future consists in adopting the intuitive idea of time as *branching* or *forking* — where the core conjecture is that indeterminism entails branching[7].

More specifically, on the branching picture of time, the indeterministic conception according to which there is not just one but many possible ways things might go in the future is commonly exemplified by means of a tree-like diagram: looking backward from any point (i.e., moment) on the tree there is only one linear, unchangeable past, whereas, looking forward, the future starts branching into a set of equally possible partially overlapping branches — none of them identified as *the* future branch (Fig. 1). All the theories which share this view, including those mentioned above, are normally dubbed *Branching-Time* theories (BTT).

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[7]It is crucial to observe, however, that such a conjecture has been severely questioned in particular by Lewis [14] pp. 201-209 and, more recently, by Rosenkranz [29] and Iacona [12] pp. 41-44. Note also that the first extensive description of this new conception of time is due to J. L. Borges. See his story "The Garden of Forking Paths" (1941).

Now, suppose again that at some moment I utter (5) and that nothing that has transpired so far made it inevitable that tomorrow there will be a sea battle. The future is genuinely (i.e., ontologically) open if there are branches on which a sea battle will take place tomorrow and others on which a sea battle will not take place tomorrow — and no branch is *privileged* over the others. The underlying thought here is that if were we to posit such a branch, then time would be linear (i.e., not branching) and hence the future would be as closed as the past. Another way of putting this is that, in the presence of ontic indeterminism, "there is no fact of the matter" picking out one history as the *actual* history — the one containing the course of events that is actually going to happen. The history in question is what Belnap and Green (1994) have called *Thin Red Line* (TRL).

As it has been emphasized by Peter Øhrstrøm (2009, pp. 19 f.), the view that there is such thing as the "actual" future was first held by William of Ockham. In terms of Ockham's theological *weltanschauung* this means that all future contingents are either true or false and that God, unlike human beings, foreknows their truth-value which will depend on what happens in the *true future*, as Ockham called it, namely the future part of the actual course of events.

The second thing that must be clear is that the branching picture is just a metaphoric representation of temporal reality and, as such, does not provide any particular treatment of future contingent statements. As it well known, the first systematic attempt to formalize semantically all the relevant intuitions generally combined with the branching picture is the so-called *Ockhamist* semantics (OC), advanced by Arthur N. Prior in his seminal book "Past, present and future" (1967), and inspired by some ideas of Ockham (more on this in the next section). Prior's Ockhamist semantics has proved to be so versatile that virtually all the semantic approaches proposed so far for dealing with the

branching framework are, to some extent, inspired by its analysis of future contingents. For this reason, it will be useful to introduce and then describe the Ockhamist semantics in more detail because, in doing so, I will have all the basic notions and formal tools needed to properly assess all the *BT*-theories mentioned earlier.

1.3   Ockhamist semantics

In order to give a rigorous characterisation of future contingents within an indeterministic setting, Prior developed the branching time structure suggested to him by Saul Kipke in a letter dated September 3, 1958 (cf. Prior, 1967, pp. 27-29 and Øhrstrøm and Halse, 1995, pp. 189-195). Formally speaking, a *Branching time structure* (BT_S) is a couple $\langle M, < \rangle$ where M is a non-empty set of moments and $<$ is a tree-like partial (i.e., asymmetric and transitive) order relation defined on M which is usually meant to satisfy the two following conditions:

- Backward linearity

  $\forall m, \forall m_1, \forall m_2 \, [(m_1 < m \wedge m_2 < m) \supset (m_1 < m_2 \vee m_2 < m_1 \vee m_1 = m_2)]$;

- Historical connection

  $\forall m_1, \forall m_2, \exists m_3$ s.t. $m_3 \leq m_1 \wedge m_3 \leq m_2$.

In addition, such a relation connects moments to form *maximal chains*, also called *histories*. Without doubt, that of a history is the essential notion if we want to represent temporal reality as a tree-like, *BT*-structure. In particular, a history, *h*, is a maximal subset of *M* linearly ordered by $<$, thought of as a complete possible course of events running indefinitely along the whole tree. The set of all histories is called *Hist*. One

particular property of *Hist* is that it gets smaller as time goes on, that is, the flowing of time towards the future substantially reduces the number of possibilities that were available at earlier times.

Notoriously, a theory of this kind has been articulated and well defended by Storrs McCall (1976). On McCall's view, the various "dead" branches are lopped off, as it were, by the *objective* temporal becoming. However, this should not be taken to imply that *BT*-frames are incompatible with the alternative conception according to which the flowing of time is *not* objective. Quite the contrary, *BT*-frames often appeal to the familiar *B*-theoretic (and hence static) temporal relations, expressed in a tenseless language, where temporal becoming is understood as a mind-dependent (i.e., subjective) property[8].

The formal language capable of managing the interaction between time and modality in line with Prior's insight will be the standard language of propositional logic, *L*, equipped with the temporal operators *F* ("It will be the case that") and *P* ("It was the case that") and the modal operator $\diamond$ ("It is possible that"). From these basic connectives we can introduce their natural duals: *H* ("It has always been the case that": $\sim P\sim$), *G* ("It is always going to be the case that": $\sim F\sim$) and finally $\square$ ("It is settled that": $\sim\diamond\sim$). The boolean connectives ($\vee, \supset, \wedge, \sim$) are defined as usual. A valuation function, *V*, gives a truth-value to each sentence letters ($p, p_1, p_2...$) at each moment in BT_S. By adding such a valuation function to the BT_S we obtain a *branching time model*, **M**, formed by a BT_S and *V*.

At any rate, the essence (and the novelty) of OC is that the truth of a future-tensed sentence must always be relativized to a moment as well as to a history to which the moment belongs. Otherwise future contingents receive no interpretation at all. In substance, contrary to what happens in standard (i.e., linear) tense logic where a tensed

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[8]See, for instance, Borghini and Torrengo [3] p. 5.

sentence is true or false just in case it is true or false at the moment of utterance, OC prescribes that each future-tensed sentence must be evaluated with respect to a *pair* whose elements are *two* different parameters: a moment, m, and a history, h, passing through m (m/h for short to indicate that $m \in h$). The notion of truth this semantics proposes is thus *history-dependent* in the sense that what is true not only depends on the moment in which the sentence is uttered but also on the history selected as the value of the history parameter.

More concretely, the basic idea that Prior's Ockhamist semantics wants to model is that for any moment m there may be at least two possible histories, h_1 and h_2, both passing through (and branching at) m, in which a future contingent such as (5) may receive two different valuations depending on whether we decide "to look at" h_1 or h_2. That is, under the hypothesis that h_1 contains a sea battle while h_2 does not, (5) will be true at m/h_1 but false at m/h_2. The significant of this should now be clear. If the openness of the future requires a plurality of overlapping histories but no history can be privileged over the others, the truh-value of a future-tensed sentence may vary at the varying of the history parameter. That is why on this semantics a truth-value can only be assigned, as Prior (1967, pp. 126-127) puts it, "arbitrarily" or "prima-facie".

Thus, given this rather peculiar points of evaluation, the formal semantic clauses for OC are recursively defined as follows — where "**M**, $m/h \vDash_{Ock} \alpha$" is to be read "the formula α is (Ockham) true **M** at m/h pair":

Definition 1
- **M**, $m/h \vDash_{Ock} p$ iff $V(m, p) = 1$;
- **M**, $m/h \vDash_{Ock} {\sim}\alpha$ iff $m/h \nvDash_{Ock} \alpha$;
- **M**, $m/h \vDash_{Ock} \alpha \wedge \beta$ iff **M**, $m/h \vDash_{Ock} \alpha$ and **M**, $m/h \vDash_{Ock} \beta$;
- **M**, $m/h \vDash_{Ock} P\alpha$ iff $\exists m'\, (m' < m \wedge$ **M**, $m'/h \vDash_{Ock} \alpha)$;

- $\mathbf{M}, m/h \vDash_{Ock} F\alpha$ iff $\exists m' \, (m < m' \wedge \mathbf{M}, m'/h \vDash_{Ock} \alpha)$;
- $\mathbf{M}, m/h \vDash_{Ock} \Diamond\alpha$ iff $\exists h' \, (m \in h' \wedge \mathbf{M}, m/h' \vDash_{Ock} \alpha)$;
- $\mathbf{M}, m/h \vDash_{Ock} \Box\alpha$ iff $\forall h' \, (m \in h' \supset \mathbf{M}, m/h' \vDash_{Ock} \alpha)$

This theory has many logical properties. In particular, it validates some plausible principles, such as $p \supset PFp$ and $p \supset \Box p$, which should be accepted according to Ockham. More precisely, as Øhrstrøm (2009 pp. 24-26) argues, the fact that $p \supset PFp$ and $p \supset \Box p$ both hold it is what makes OC an Ockham-inspired semantics. However, it has to be noted that Ockham would accept as true the second principle — i.e., the so-called "principle of the necessity of the past" — only if p, as Prior (1967, p. 124) famously has it, did not contain any "trace of futurity". That is to say that, according to Ockham, $p \supset \Box p$ is valid only if F does not occur in p.

1.4 Supervaluationism

With this in mind, we are now in position to turn our attention to *supervaluationism*. Supervaluationism is considered one of the most influential semantic approaches through which one can reject bivalence but preserve excluded middle. Originally elaborated by Bas van Frassen (1966) to deal with vague terms and further developed by Richard Thomason (1970), this theory, while maintaining the Ockamist framework, takes the supposition that there are some possible histories in which (5) is true and others in which it is false as a sufficient reason for making (5) neither true nor false — where this must be understood not in the sense that (5) has a third truth-value, as in Łukasiewicz' system, but that it *lacks* a truth-value. It is thus common to define (5) as *gappy* because supervaluationism, contrary to Łukasiewicz's trivalent logic, allows for truth-value gaps. In effect, one might ask, how can

(5) be true today if a peacefull tomorrow is possible (at least as far as sea battles are concerned)? The only way in which (5) could be true, supervaluationists would add, is that in which (5) is *super*true, that is, true in *all* possible histories. On this approach, then, bivalence is not valid. On the other hand, thought, excluded middle holds. Indeed, *pace* Łukasiewicz, (9) comes out true *simpliciter* (i.e., true in every possible history) since at any given moment, *m*, for all possible histories passing through *m*, either tomorrow there will be a sea battle or there won't be. Truth *simpliciter*, defined as "truth at a moment", is thus what makes supervaluationism a real alternative to the Ockhamist semantics[9].

Perhaps Aristotle himself would have supported this view. At least, this is what Thomason may have thought when he states (1970, p. 291) that his account "coincides with the view of previous philosophers on truth and future tense. Here, Aristotle is the man who comes first to mind: his 'sea battle passage' is, at first glance anyway, in very good accord with the modeling of the future tense propounded here"[10].

However, as is well-known, supervaluationism preserves excluded middle by making ∨ not truth-functional. That is to say that, on this view, a disjunction made out of two future contingents can be true even if neither of its disjuncts is true. But this seems wrong. In addition, it is widely held that supervaluationism has unpalatable logical outcomes since its semantics is such that, while $\Box\alpha$ is a logical consequence of α, '$\alpha \supset \Box\alpha$' is not a logical truth. As Williamson (1994, p. 152) has it, "supervaluations invalidate our natural mode of deductive thinking"

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[9]In Belnap and Green [1] p. 374, a future-tensed sentence that is true (false) *simpliciter* is called "moment-determinate" meaning that it is settled true (false). Note also that the semantics which Prior called *Peirciean* is another account that takes future contingents to be moment-determinate, although on this view all future contingents are false (See, in particular, Prior [25] pp. 128-132 and also MacFarlane [19] pp. 213-218).

[10]Of course, it may be doubted whether Thomason's system is in fact an accurate representation of what Aristotle really said in the *De Interpretatione IX.* Be that as it may, I will not try to settle that question at this juncture.

in that, on this theory, we cannot validly infer '$\alpha \supset \Box \alpha$' even if $\Box \alpha$ does follow from α.

As we have seen, an essential aspect of this theory is that a future-tensed sentence cannot be true (or false) without also being true (or false) on all possible histories. This means that the notion of *super*truth, by being a universal quantification over all the histories passing through m, translates what in the Ockamist semantics can be taken to express necessity and impossibility. More generally, a tensed formula is *super*true at a moment m if and only if it is Ockham-true on all histories passing through that moment. Another way of putting this is that (5) is neither *super*true nor *super*false, albeit it is either Ockham-true or Ockham-false. The formal semantic clauses for Supervaluationism are thus as follows:

Definition 2
- $\mathbf{M}, m \vDash_{Sup} \alpha$ iff $\forall h$ (if $m \in h \supset \mathbf{M}, m/h \vDash_{Ock} \alpha$);
- $\mathbf{M}, m \nvDash_{Sup} \alpha$ iff $\forall h$ (if $m \in h \supset \mathbf{M}, m/h \nvDash_{Ock} \alpha$)

As Thomason (1970, p. 274) notes, his account validates the same intuitive formulas which are also valid according to OC. This should come with no surprise, though, since supervaluational semantics may be considered, at least to some extent, as a parasitic variant of OC.

1.5 Belnap's account

As mentioned earlier, the Ockhamist set-up can be developed in more than one way and Belnap's account is certainly one of them. In "Indeterminism and the Thin red Line" (1994), Nuel Belnap and Mitchell Green retain the original Ockhamist semantics and define future contingents as being *historically open*. Saying that future contingents are historically open amounts to saying that they are neither *closed by constancy* nor

closed by the context of use[11]. Being "not closed by constancy" basically means that the truth-value of a future contingent is not constant as the history of evaluation varies, whereas being "not closed by the context of use" means that the context in which a future contingent is uttered cannot supply a privileged history for evaluating its truth-value. The first of the two conditions reflects the priorian notion of "prima facie" assignment used in the Ockhamist semantics. The second, instead, holds because of indeterminism. More particularly, although on the branching picture it is plausible to assume that the context of utterance determines a unique moment, the moment of utterance, it cannot also determine a unique history, *the* history of the context of utterance, since in an indeterministic partial ordering there will be many equally possible histories containing that very moment.

As Belnap and Green (1994, p. 378) note, if neither of the two aforementioned conditions are satisfied, then a future contingent, by being historically open with respect to the history parameter, is not evaluable in the same way in which an open formula such as "x is brindle" is not evaluable unless an assignment parameter is provided. A standard way of providing an assignment in the latter case would be that of bounding the free variable with a quantifier in such a way as to restrict the range of its possible values. Barring that, it seems that both future contingents and open formulas are not truth-evaluable.

However, as the authors strongly suggest, such an analogy does not make justice to what seems to be an intuitive difference between the two statements in terms of *assertability*, namely that, while by uttering "x is brindle" we are not making any assertion but just producing noise, so to say, "there is no radical defect in asserting a typical future-tensed sentence" (1994, p. 377). What grounds such a significant difference? A

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[11]In Belnap *et al.* [2] "closed by constancy" is remaned "closed by independence", while "closed by context" becomes "closed by initialization".

typical answer to this question is to say that history-open sentences, due to the passage of time, will get a set of history parameters supplied and consequently will sooner o later be evaluable. By contrast, assignment-open sentences will be doomed to remain truth valueless no matter how things will go in the future. (I will return to this point in the Chapter 3).

The thesis that, in the presence of indeterminism, future contingents are not evaluable in some sense matches the Aristotelian intuitions about the sea battle. One might also think that such a conviction entails that future contingents lack a truth value. However, first appearances notwithstanding, this does not seem to be the case. In fact, *contra* Thomason, Belnap and Green claim that it would be wrong to introduce gaps in truth value. As they (1994, p. 377) put it:

> If a sentence is neither closed by context nor closed by constancy, it has no truth value save relative to the parameter in question. This is not to say that open sentences have some third truth value or third special status. It is a mistake to think of open sentences as introducing "truth value gaps". As a preventative against this mistake, it is healthy to intone that "given a context, open sentences in fact *always* have a truth value — once a suitable parameter value is supplied."

Admittedly, what the authors say in this passage does not square well with the notion of openness usually adopted within branching: the intuition that future contingents have no truth value can be interpreted either in the sense that future contingents have a *third* truth value (Łukasiewicz) or that future contingents are *gappy* (Supervaluationism). However, if neither of the two options is attainable — as the authors claim — it becomes quite difficult to understand what

the expression "no truth value" is supposed to mean when applied to future-tensed sentences. Furthermore, it must be noted that if future contingents are true or false "once a suitable parameter value is supplied" it is unclear why future contingents should not, after all, be considered as closed by the context of utterance[12].

In any case, independently of the considerations just sketched, what the quoted passage seems to convey is that Belnap and Green do not endorse a supervaluational treatment of future contingents. By refusing to admit gaps in truth value and assuming that, once the history parameter is provided, future contingents can be deemed true or false — without being necessarily true or false — they also take for granted that the notion of truth does not collapse on that of *super*truth. This means that Belnap and Green do not share the intuition that future contingents must be true *simpliciter* — conceived as "true at a moment". Following Prior, they are instead apt to think that a moment alone does not supply enough information to establish whether future contingents are true or false. As is now familiar, to accomplish that task we need a further relativitation to histories as well.

On the other hand, the distinction between truth and *super*truth allows excluded middle to be true *simpliciter*. On their approach, it is indeed easy to see that at any moment, m, (9) is necessarily true since it is true on all histories passing through m.

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[12]See Rosenkranz [28] section 'Fixing and determining' for a similar complaint.

1.6   MacFarlane's Relativist semantics

The last account I will consider is the relativist approach put forward
by John MacFarlane in his well-known paper "Future Contingents and
relative truth" (2003). According to MacFarlane, it is possible to solve
the problem of future contingents by abandoning the "orthodox as-
sumption that truth for utterances is non-relative" (2003, p. 322).

In order to see more clearly what MacFarlane has in mind, let us
suppose again that the future is open in the sense that it is now not
determined whether there will be a sea battle tomorrow. According
to MacFarlane, if asked today whether (5) is true, our intuition would
probably be that of saying that (5) is neither true nor false, since (5)
is true in some but not all possible futures. This is what he calls
"the indeterminacy intuion" (2003, p. 323). Now, suppose that after
24 hours you find yourself somewhere on the coast watching the sea
battle. On that basis, it seems that we would be strongly inclined to
say that (5) was already true yesterday when uttered. This is what he
calls instead "the determinacy intuion" (2003, p. 323).

MacFarlane argues that these two intuitions are in conflict only if
utterance truth is meant to be *absolute*, that is, only if the truth of an
utterance does not vary with respect to different contexts. However,
since a proper account of future contingents must respect both the
intuitions, we should be ready to make room for such transition in truth
value. MacFarlane shows how to achieve this result by relativizing
utterance truth to a *context of assessment* — in such a way that the
same utterance will have different truth-value with respect to different
contexts of assessment. More precisely, the truth of an uttered future-
tensed sentence must be relativized not only to the contex of utterance,
u, but also to the context of assessment, a, where $u < a$.

Idealizing, as MacFarlane himself suggests, both the context of ut-

terance (u) and the context of assessement (a) as moments and assuming
that there are many histories passing through u, a future contingent will
have to be evaluated with respect to all the histories passing through
that moment *and* the moment of assessment. This means that the role
of a is that of isolating the set of histories at which the future contin-
gent, uttered at u, has to be assessed. Moreover, since a is a "mobile"
parameter, a context of utterance can be associated with more than one
context of assessment. Adapting MacFarlane's definition (2003, p. 331)
we can give the truth conditions of a tensed formula along these lines:

Definition 3

- $F\alpha$ is true (false) at u and at a iff $F\alpha$ is true (false) at every m/h
  such that m is the moment of u, h passes through m and, if $a > m$,
  through the moment of a as well.

From this definition, we obtain exactly what MacFarlane desires. In-
deed, if we identify both the moment of utterance u and the moment
of assessment a with m_0, and assuming that $F\alpha$ stands for (5), it follows
that (5) is neither true nor false, since we must look at all the histo-
ries passing through a and in some of them (5) is false. Therefore (5),
uttered today, it is neither true nor false as assessed today.

On the other hand, suppose that m_1 and m_2 are moments later than
m_0 that lies on two different histories, respectively h_1 and h_2, and that
(5) is true at m_1/h_1 but false at m_2/h_2. Now, assuming that u is m_0
and a is m_1, it turns out that (5) will be true at u and a since we have
to look at only h_1 as only h_1 passes through m_0 and m_1. This means
that (5), uttered today, is true as assessed tomorrow if there is a sea
battle tomorrow. Instead, if u is m_0 and a is m_2, it turns out that (5)
will be false at u and a since we have to look at only h_2 as only h_2

passes through m_0 and m_2. This means that (5), uttered today, is false as assessed tomorrow if there is no sea battle tomorrow.

To sum up what has been said so far, the future-tensed sentence "There will be a sea battle tormorrow" will get the following truth values depending on which context of assessement we decide to consider:

- neither true nor false as assessed from m_0;
- true as assessed from m_1;
- false as assessed from m_2.

It is worth noticing that MacFarlane's proposal bears a very close resemblance to supervaluationism in that both of them take future contingents to be neither true nor false as assessed today.

What instead distinguishes the two is that we receive different verdicts when we evaluate future contingents from the vantage point of tomorrow. That is, while on the former we get that (5) is either true or false as assessed from tomorrow, on the latter we can not accomodate any transition in truth value because standard semantics compels the view that, if a tensed sentence such as (5) was neither true nor false as assessed yesterday, it can not later (i.e., today) acquire a new truth value. Another thing that MacFarlane's account shares with supervaluationism (and with Belnap's proposal as well) consists in the fact that excluded middle holds, since (9) is true on all histories passing both through u and a.

Although all the *BT*-theories reviewed so far show how to formally express the Aristotelian solution of the problem of future contingents, it should be pointed out that there may be other legitimate and compelling ways of doing that. However, a comprehensive examination of (potential) alternative accounts is beyond the scope of this work.

Indeed, my primary interest was simply to offer an analysis of those approaches which can be defined "Aristotelian" in the sense specified in § 1.1 and, as far as I can tell, the three *BT*-theories discussed before can be fairly considered as the most prominent options in the market.

Chapter 2

Asserting future contingents

2.1 The Assertion Problem

As we have seen in the previous chapter, the branching picture of time represents one of the most promising way to make sense of the Aristotelian intuition that, in order to secure the openness of the future, future contingents are to be deemed neither true nor false. However, despite its apparent merits, it seems that if we take the branching picture "seriously", as MacFarlane is fond of putting it, it turns out that we are no longer capable of explaining a very pervasive phenomenon, that is, why we happily *assert* future contingents statements.

The problem of making assertion of future contingents within an indeterministic settings — sometimes also called the *Assertion Problem* (AP) — can be outlined as follows. It would seem perfectly legitimate to assert, for instance, that "it will rain tomorrow" even though tomorrow's rain is a contingent event. However, in the absence of an actual history, so the thought goes, it may be difficult (if not impossible) to understand which truth-value such an assertion should take and whether it in fact is accurate if, as branching has it, there is a possible history branching out of the moment of utterance containing a moment on which it rains tomorrow, and another possible history branching out

of the moment of utterance containing instead a moment on which it does not rain. On these grounds, then, how can we possibly assert that it will rain tomorrow if the semantics built on the branching picture forces us to say that the future-tensed sentences are neither true nor false as assessed from the context of utterance?[1]

More generally, there seems to be a dissonance, so to say, between the semantics advocated by *BT*-theorists and the way in which we usually make assertions (predictions) about the future. It originates from the fact that, according to a fairly standard account of assertion, in order for an assertion to be normatively correct its content must be true. That is, it is frequently assumed that assertion is subject to a *truth* norm which can be stated along these lines:

Truth Norm (T):

One must: Assert that p only if p is true[2].

Given (T), we take assertions to be correct only if they are true. But since on the branching picture future contingents are considered neither true nor false and so *un*true, it is easy to see that in making assertions about what we take to be an open future we eventually incur in an evident infraction of the Truth Norm. So, asserting future contingents within the branching framework turns out to be incorrect. One way to corroborate this inference is to claim that there are cases in which we take assertions to be incorrect, for instance when they fail to

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[1]Although I am speaking as if the "assertion problem" were a unitary phenomenon, I do not intend to suggest that this is the case. Notoriously, the first usage of the expression "assertion problem" can be traced back to Belnap and Green (1994). A partially modified version of the same problem can be found in Belnap *et. al* (2001) and in Perloff and Belnap [23], while a "normative" version is due to MacFarlane [19] *Ch.* 9).

[2]Other accounts where truth is conceived as the norm of assertion are offered in Dummett [4], Williams [36] and Grice [7]. See MacFarlane [19] p. 101, for a similiar definition of the truth norm.

express a determinate content. Suppose that someone says "that car over there is red" but it turns out that there is no car in the vicinity. In this case, many would say that since there is no referent for "that car" the assertion fails to express a content and therefore it is incorrect. Adapting this case to future contingents and assuming the truth norm, it takes little reflection to see that *BT*-theorists will end up judging assertion of future contingents as incorrect. Of course, this is in stark contrast with our everyday practice because we ordinarily assert future contingents even in those cases in which we intuitively take the future to be ontologically unsettled. In other terms, we comfortably accept sincere (i.e., true) assertions of future contingents without postulating any future determinacy. This in turn suggests that the openness of the future may, after all, be compatible with future contingents being true or false. Can *BT*-theorists explain these data?

To help ensure clarity, we can also formulate the assertion problem by means of the following argument:

(P1) One must: assert that p is only if p is true;

(P2) If p is a future contingent, then p is neither true nor false;

(C) If p is a future contingent, then p is not assertable.

Even in this case, the argument appears to be valid in the classical sense in which the truth of the premises guarantees the truth of the conclusion. (P1) and (P2) taken together lead to the conclusion (C) that we are not entitled to assert future contingents — provided that the branching picture entails that no future contingent is true (at the moment of its utterance). To be sure, this is not the only way of showing that assertion of future contingents may be problematic. Fabrizio Cariani (ms), for instance, gives an argument along these lines: (P1) Normatively correct assertion of p made by uttering A in c requires

that A be true in c; (P2) A is true in c only if A is settled (i.e., true at all objectively possible futures) in c; (P3) A is not settled in c; (C) [Therefore] Asserting *p* by uttering A in c is not normatively correct.

One might expect that the two versions would disagree in some significant sense, for instance by having different normative consequences. However, it turns out that they do not. After all, to say that it is not normatively correct to assert future contingents because they are untrue is to basically say that one must not assert future contingents. So, it seems to me that the difference between the two arguments just boils down to a terminological difference.

Importantly, note also that the argument I have given takes part of its inspiration from the considerations advanced by Gareth Evans. In his well-known article 'Do Tense Logic Rest upon a Mistake?' (1980), Evans in fact suggests that the correct practice of making assertions compels the view that the (in)correctness of a given utterance should depend exclusively on the time the utterance is made and not on the time of its possible evaluation (I will discuss this point partly in Chapter 3 and more extensively in Chapter 4).

That said, the task of this and the following chapters is to explore how *BT*-theorists might react to the aforementioned argument. More particularly, the question I will be considering may be put as follows: what would happen if *BT*-theorists, who take for granted that no future contingents can be true, were asked to take a stand on whether it really makes sense to assert future contingent statements?

Intuitively, there seem to be only two options available. The first is to bite the bullet and *accept* (C). This means that, in addition to being valid, the argument would also be correct. But then *BT*-theorists would clearly owe us an explation as to why it seems that we do assert (true) future contingents. As noted earlier, this is the essence of the assertion problem. The second option is to *reject* (C) instead, and

therefore to admit that future contingents are indeed assertable. In such a case, though, something should be said about (P1), as the first premise clearly states that truth is a precondition for assertability and, as is now familiar, no future contingents can be true according to *BT*-theorists. In other words, under the hypothesis that (P1) is to be rejected, we need to understand under what conditions one is permitted to assert future-tensed sentences. Arguably, both of the options are open to *BT*-theorists. But whichever options we take, bad consequences ensue.

To illustrate more vividly such consequences, let us restate the point made so far as a dilemma: either future contingents are assertable or not. If they are *not*, and so the argument goes through, then it seems that *BT*-theorists would not be able to explain why we commonly make predictions with the force of assertion. If instead they are, then *BT*-theorists should be prepared to somehow revisit (P1). Presumably, this is the most plausible line to take for a *BT*-theorist. The only alternative would in fact be that of giving up (P2), that is, giving up being a *BT*-theorist altogether. But it is clear that in this case the cure would be even worst than the disease. So, I think that no *BT*-theorists should go down this road.

Having clarified that, in what follows I will consider how supervaluationism could respond to this puzzle by discussing both the horns of the dilemma. To this end, I shall first explore what consequences Thomason would face in accepting (C) and then move on to assess what would happen in case he decided to pursue the second horn of the dilemma, that is, to reject (C). And of course if it turns out that neither of its horns is particularly appealing, one might rightly cast doubts on the overall attractiveness of the supervaluationist package.

Before getting into this, however, it must be noted that Thomason's works, as far as I can tell, do not contain any specific answer to the assertion problem, at least as it has been sketched so far. Consequently,

what I am going to offer is just an hypothetical, and hopefully plausible, reconstruction of his position on these issues.

2.2 Supervaluationism's First Option

As a *BT*-theory, supervaluationism entails that no future contingent is genuinely assertable, because the truth norm forbids to assert statements that are neither true nor false. One way of seeing how peculiar supervaluationism may turn out to be if coupled with the truth norm, is to consider the following scenario. Imagine that there is a very low probability, say 5 per cent, that it won't be sunny tomorrow. In this case, most of us would be willing to assert "it will be sunny tomorrow". However, on the supervaluational account such a prediction would not be permissible even given such a tiny chance of rain. On this view, in fact, the only case in which a future-tensed sentence could be correctly asserted is one in which its truth is settled.

To see why, recall that according to supervaluationists a sentence is true only if it is *super*true, that is, true in every possible histories. That being so, it follows that one will be warranted in asserting a future-tensed sentence only if the sentence asserted is determinately true at the moment of utterance, that is, just in case the choice of a history rather than another as the value for the history parameter will in no way affect the truth-value of the sentence asserted. Now, given that on the branching picture the context of utterance cannot determine a unique history, but at most a class thereof, it is not up to choose which particular history should be used in evaluating a given prediction. Accordingly, supervaluationists would urge us to look at all of the histories that overlap at the context of utterance. And since at that context no future contingent will be settled truth or false, we would force to bite the bullet and embrace (C): no future contingent is correctly

assertable.

No doubt, this is the most natural conclusion one might reach if both (P1) and (P2) are to be maintained. However, it is also quite problematic because, as we have seen, it goes against the intuition that there are assertions whose content is contingent. What is more, there seem to be no positive reason to believe that if such assertions were true, as the truth norm demands, their outcome would be inevitable. In this respect, consider the following scenario. Suppose that the weather forecast indicates a very high probability of rain tomorrow in Turin. So, after having checked her data, the announcer asserts:

(10) It will rain in Turin tomorrow

Now, although everyone knows how quicly the weather might change over the course of 24 hours, it seems nonetheless reasonable to take (10) as correct. And more importantly, in considering (10) correct, we do not also believe that the future is closed with respect to the whether in Turin. Rather, we are willing to accept that it may unfold in unpredictable ways. In other words, even if (10) is true nothing prevent us from thinking that it will be possible that it won't rain. Again, this should suggest that we consider the future to be open and yet (10) to be correctly assertable[3].

Attempting to meet this objection, supervaluationists could either find some other way to justify their skeptical intuion that future contingents have unassertable contents, or reject (C) and so opt for a *weaker* account of assertion, presumably one in which the conditions of assertability for future contingents do not require assertion being subject to the truth norm. It is to the latter task that I am now turn my attention.

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[3]See Hattiangadi e Besson [9], pp. 11-12 for a discussion about this issue.

2.3 Supervaluationism's Second Option

As I said, the best way for a supervaluationist, and more generally for a *BT*-theorists, to make assertion of future contingents permissible (in such a way that the resulting account remains compatible with future-tensed senteces being neither true nor false) is to give up (P1). That is, instead of saying that the truth norm is the norm of assertion, super-valuationists might say that assertion is actually governed by a weaker norm such as, for instance, the *belief* norm:

Belief Norm (B):

One must: Assert that *p* only if *p* is believed to be true.

According to this norm, if a speaker believes for instance that (5) is true, then her assertion of "There will be a sea battle tomorrow" will turn out to be correct. And it is clear a speaker can legitimately believe that a future contingent such as (5) is true, even if (5) happens to be, say, neither true nor false. On this view, then, a *BT*-theorist would be allowed to assert future contingent statements, while maintaining her semantic view untouched[4].

This approach, however, faces at least two problems. The first is that it is compatible with the following (and rather undesirable) scenario. Suppose that a speaker today assert (10) even if TV forecast announces "no rain in Turin tomorrow". Suppose also that tomorrow it actually rains. Now, according to the belief norm, if the speaker takes (10) to be true, it follows that she was entitled to assert that it would rain, despite the fact that the weather forecast indicated as virtually certain that it

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[4]See Lackey [13] for a recent defence of the view that the norm governing assertion is reasonable belief. See also Hattiangadi and Besson [9] pp. 19-21 for a discussion about whether *BT*-theorists can actually adopt norms that differ from the truth norm.

wouldn't. Surely something has gone wrong. Indeed, although the speaker did make a prediction about the future, and although such a prediction, in the end, turned out to be true, it is quite controversial that she was justified in asserting what she asserted, since the truth of her prediction was grounded simply on a lucky guess and not on well supported evidences. The second problem is that if a supervaluationist adopted the belief norm, then she would be forced to say that she believes that (5) is true in all possible histories. But this is clearly questionable. After all, it might be argued that having the belief that a future contingent such as (5) is true does not amount to having that belief in all possible future histories. That is to say that, in asserting (5), we are not entertaining the belief that (5) is necessarily true. More generally, it seems that the inference from "I believe that 'it will be the case that p' is true" to "I believe that necessarily it will be the case that p" is not legitimate[5].

Let's take stock. We have looked at two ways in which supervaluationists could make sense of the argument we have formulated in §2.1, and found each of them wanting. In particular, we have seen how both the horns of the dilemma lead to unpalatable consequences that supervaluationism is unable to avoid. For this reason, I submit that supervaluationists cannot account for the assertability of future-tensed sentences. Having said that, in the next chapter I will examine Belnap's solution to the assertion problem.

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[5]Relatedly, suppose that I believe that (10) is true. If so, the belief norm will entail that I am correct in asserting (10). However, if we also assume that I am indeterminist, *sensu* Thomason, it follows that I will end up believing something that I also believe being false. So, once again, this is a conclusion which most of us would not be prepared to accept.

Chapter 3

Belnap's alleged solution to AP

3.1 Belnap's double time reference semantics

Here is how Belnap *et al.* (2001, p. 141) describe what they take to be the "assertion problem":

> Crudely put, 'the assertion problem,' as we call it, arises because given indeterminism, it would seem as if future-tensed statements 'have no truth value'. [...] The reason that this is a problem is that it seems to make sense to assert a predictive statement even in the face of indeterminism. Since, however, such a statement 'has no truth value,' how can it make sense to do so?

According to Belnap *et al.*, it is possible to offer a *pragmatic* solution to this puzzle. It can be summarized by saying that, albeit utterances of future contingents are in a strict sense neither true nor false, assertions of future contingents will nevertheless be *vendicated* or *impugned* with respect to a moment/history pair (m/h) after what is predicted has actually occurred or not. In any case, in order to better appreciate their view, let us return to the (putative) difference between open formulas like "x is brindle" and future contingents such as

(5) There will be a sea battle tomorrow

The point was essentially that, although both the statements are not truth evaluable at the moment of use, only future contingents (open with respect to the history parameter) are meaningfully assertable (cf. §1.5). Indeed, while no one could deny that it makes perfect sense to assert a future contingent, it seems that if I were to assert a sentence such as "x is brindle" (open with respect to an assignment parameter) I would literally assert nothing. So, one might ask, where does such a substantive difference come from? According to Belnap *et al.* (2001, p. 175), the answer is that in the case of assertion "the content of "*Will*:(the coin lands heads)" differs in principle, and not just technically, from that of "x_1 is brindle." For the content of "*Will*:(the coin lands heads)," unlike that of "x_1 is brindle", *is the sort of thing that can be borne out or not, depending upon what comes to pass*" (emphasis added).

Though this passage is far from being completely clear, the idea conveyed seems to be that between "*Will*:(the coin lands heads)" and "x_1 is brindle", only the former will sooner or later be truth-evaluable courtesy of the passage of time. That is to say that, in virtue of the temporal becoming of the universe, one will eventually be in position to settle, at least in some cases, only the question of whether future contingents were true or false at the time of assertion. On the contrary, no future state of the world will settle the question of whether "x_1 is brindle" was true or false when uttered.

A clarification is needed. The claim that only in the future we will be able to confirm whether the content of a future contingent was true or false is not an interesting thesis, not even less a philosophical one, unless one is willing to endorse, as McCall (1976) for instance does, a "dynamic" (branching-time) model where propositions can change their truth value across time. One way of understanding this thought

is to assume that "sometimes facts exist that do not always exist", i.e. that facts are *tensed*. So, for example, the fact that makes (5) true can exist tomorrow but not today. Note, importantly, that if one adopts a model in which facts are so understood, one is accordingly apt to think that *eternalism* — that is, the view according to which "always all facts always exist" — is therefore false.

On a dynamic model, one might thus make sense of the intuion that, due to the passage of time, (5) — albeit truth-valueless yesterday — has become either true or false today. The point, however, is that Belnap *et al.* cannot embrace such a conception because they employ a "static" model, one in which the passage of time is just a "subjective illusion", and so does not have any robust metaphysical role. Therefore, it would be wrong to convey the idea that, as time goes by, future-tensed sentences become truth-evaluable. It would also be wrong to say, for instance, that events can gain or lose their temporal properties (the so called "A-properties") or that histories caese to exist, since static models are tipically committed both to a *timeless* theory of truth (where the truth-value of a sentence do not vary at the varying of the temporal perspective from which we look at it) and to an eternalist ontology (according to which there is no ontological difference between the past and the future).

That being said, Belnap *et al.* (p. 175) articulate the difference between future contingents and open sentences with respect to assertability as follows:

> Time will tell whether we arrive at a moment at which the truth-value (at the moment of assertion) of "*Will*:(the coin lands heads)" becomes settled — and whether we do or not determines whether the person who asserted "*Will*:(the coin lands heads)" is vindicated or impugned. On the other hand, finding an object that is

> brindle gives us no guidance whether or when one who purports
> to assert "x_1 is brindle" is vindicated or impugned.

According to this line of reasoning, vindication and impugnment will always occur at the moment in which the truth value of what is asserted becomes settled. Until that moment, nothing can be said about the truth-value (i.e., the content) of our predictions. This suggests that the evaluation of an assertion made about events that are still indeterminate must always be deferred to a moment later than the moment at which the assertion occurs. So, if indeterminism holds, it is mandatory that any account of assertion will have to include two distinct moments, namely the moment at which the assertion is made *and* the moment at which the evaluation of the very same assertion becomes possible. This is the gist of the double time reference semantics.

With this general framework in place, we are now in position to properly assess Belnap's strategy for avoiding the assertion problem. In particular, I will discuss how Belnap might respond to our previous argument by exploring both the horns of the dilemma already considered in the case of supervaluationism. And because Belnap *et al.* appeal to the notions of vindication and impugnment, our discussion of their proposal will start by focusing on them.

3.2   Vindication and Impugnment

Although vindication and impugnment play a central role in Belnap *et al.*'s account, their meaning is not fully specified. It is in fact reasonable to presume that vindication and impugnment are ambiguous between two different readings. On one hand, one might think that vindication and impugnment are *metaphysical* notions. This interpretation essentially rests on the fact that both notions are somehow related to the

intuion that the content of the assertion will eventually be *made true* or *made false* by what happens in the future. This is reasonable enough. What is more is that this seems quite close to the view Belnap *et al.* have in mind: an assertion of (5) made today gets vindicated (impugned) if, and only if, the way things are tomorrow will make (5) true (false) — where this should be taken to mean that the way things are tomorrow will *ground* the truth or the falsity of (5). Thus, more generally, it migh be contended that the requirement that the truth (or falsity) of a future contingent will be somehow grounded in events or facts that are yet to come, it is enough to retrospectively vindicate or impugn an earlier assertion of the very same sentence.

On the other, following Paula Sweeney (2015), vindication and impugnment might instead be regarded as *epistemic* notions. If this were the case, then vindication or impugnment of assertion could occur "in relation to pragmatic features that have nothing to do with what appears true (false) at the moment of assessment. One can be excused for making assertions that are false and be culpable for making assertions that are true. [...] Vindication occurs when an assertion is justified, despite the proposition expressed being false, and impugnment occurs when an assertion is unjustified, despite the proposition expressed being true." (2015, p. 6).

A crucial feature of this view is that vindication and impugnment might occur regardless of what happens on the history at which the assessment of a given prediction is supposed to take place. In other words, Sweeney's main worry is that if vindication and impugnment were epistemic notions, there would be no compelling reasons to believe that being vindicated (impugned) entails being true (false).

Although it may at first seem harmless, I suspect that Belnap *et al.* would not be willing to accept such a consequence. Indeed, it seems that Belnap *et al.* would avoid saying that, in asserting (5), one will in

principle be (epistemically) vindicated even from the perspective of a history where the sea battle did *not* occur. It would be equally odd to say that one will be (epistemically) impugned even in the case in which the sea battle *did* occur. Were Belnap *et al.* to say something like that, they would no longer be in position to insist that it is the *truth* of the proposition asserted that can vindicate an earlier assertion of a future contingent. Parallel considerations will clearly hold in case of falsity.

Of course, one may doubt whether Sweeney's interpretation is on the right track. In particular, it might be contended that vindication and impugnment do not have the sort of reading which Sweeney seems to presuppose. Perhaps the prevailing reading is that of advocated by Belnap and his co-workers. Therefore, they may be right in thinking that vindication and impugnment are after all metaphysical notions. In any case, in what follows I will not settle this question and stick to Belnap *et al.*'s interpretation.

Before passing on to discuss Belnap *et. al.*'s proposal in more detail, however, it may be important to draw attention to what Belnap *et al.* say shortly after the quoted passage. In particular, the authors point out that their semantic account can be applied not only to assertions but also to conjectures (p. 175). The worry, as I understand it, is that their solution to the assertion problem, being too general, cannot distinguish between the various members of the assertive family. But this looks bad. After all, assertions and conjectures are different speech-acts with different normative properties.

To overcome this problem, Belnap *et al.* try to fine-tune their account by showing that, within the assertive family, assertion is the speech-act with the *highest* expectation of justification. More accurately, in order to secure the distinction between assertion and conjectures, Belnap *et al.* suggest that "one who asserts A, in addition to being vindicated or impugned at certain moments, is also obliged to respond at any

future moment at which there is an appropriate challenge having the form "How do you justify that claim?" There is, in contrast, no such requirement on one who conjectures A." (p. 175).

Belnap *et al.*'s response seems to be that, while in asserting a proposition a speaker commits herself to provide, if appropriately challenged, a justification for what she has asserted, in making a conjecture this kind of requirement is absent. Tipically, a more appropriate challenge to a conjecture would be to ask whether the speaker has any reason at all for her conjecture. This also explain why assertion is usually meant to express a belief in such a way as that it would be senseless to assert that *A* without also believing that *A*. By contrast, it wouldn't be so odd if one said "*A* but I don't believe that *A*" when *A* is put forth as a conjecture.

Is such a move explanatorily satisfactory? Hardly. To better see why, imagine that I am about to flip a coin and before doing that I assert "The coin will land heads". According to Belnap *et al.*, if, in this situation, someone were to challenge me by asking "How do you know that it will?" I would be committed to provide reasons for what I have asserted. The fact, however, is that it would impossible for me to justify my claim since, obviously, no one knows what will actually happen, that is, whether the coin will land heads or tails.

The upshot is thus that the normative constraints for assertion of future contingents posed by the authors will be constantly violated. Note also that this would hold regardless of whether the future is open or not. Therefore, unless one finds another way to make sense of the distinction between making an assertion of a future-tensed sentence and making a conjecture — a requirement that any account of assertion for future contingents should satisfy — Belnap *et al.*'s proposal is bound to be defective.

Having said that, let us go back to the main task of this chapter,

namely that of considering how Belnap could react to our previous argument. As in the case of supervaluationism, I will discuss what would happen if Belnap *et al.* decided to accept or reject (C), respectively. Let us then look at the first option.

3.3 Belnap's First Option

As is now familiar, from the assumption that the argument advanced in §2.1, in addition to be valid, is also correct, it follows that future contingents are unassertable. To be sure, this is the most reasonable thing to say if one shares the intuition that the openness of the future requires future contingents being neither true nor false (P2), and assume the correctness of the truth norm (P1). However, since we felicitously make predictions "even in the face of indeterminism"— as Belnap *et al.* themself admit — the question to be addressed is precisely whether Belnap *et al.* can account for this phenomenon. In other terms, the issue at stake is whether one can accept (C), while nonetheless maintaining that it makes perfect sense to assert sentences that at the moment of their use are truth-valueless.

As we have seen, in order to solve this puzzle Belnap *et al.* appeal to the notions of vindication and impugnment. More particularly, the authors suggest that all that *really* matters for assertion of future contingents is not that their content must be semantically evaluable at the moment of use but that it will eventually be vindicated or impugned depending on whether the sentence asserted is borne out or not. It is as if Belnap *et al.* would have us note that, independently of any consideration about the correctness of our argument, there is a clear sense in which future-tensed sentences are assertable anyway.

What is behind this line of thought is probably the conviction that predictions can play both an informative and explicative role in conver-

sation even without being true or false. Therefore, at least according to such a view, it seems we are not obliged to give truth values to the content of our predictions at the time at which they are uttered. This perspective is well explained by Green (2014, p. 156) as follows:

> Without a settled truth value, predictions can still be entered into conversational common ground. Once that is done, the contents of such predictions can then be treated as true *whether or not they currently have a truth value*. For instance, my prediction among my fellow parched hikers that we will find water around the hill to the east, *can be accepted as true whether or not it in fact is*, and once so accepted we may act as if it is true by marching eastward (emphasis added).

An essential aspect of Green's view (arguably shared by all *BT*-theorists) is that one might explain the plausibility of making assertions about an open future without having to appeal to a privileged future (TRL). It would indeed be enough to commit oneself in such a way as that the prediction will turn out to be right or wrong depending on how the future unfolds. I will call this account of assertion "Assertion*". In the light of the foregoing, it might be suggested that Assertion* should not be seen as a way of explaining in what sense assertion of future contingents are permissible (we know that the argument sketched in §2.1 forbids that). Rather, Assertion* may be regarded as a way of explaining why it is pragmatically reasonable to make predictions about an open future. Therefore on this view, there is a sense in which the assertion problem, at least as it has been articulated so far, ceases to be a problem that needs to be faced.

Despite its apparent attractiveness, Assertion* can be challenged for at least two reasons. The first is that, contrary to what one might expect,

Assertion* has undesirable metaphysical consequences. Green argues that a prediction "can be accepted as true whether or not it in fact is". As I understand his claim, Green is not ruling out the possibility that the content asserted might in priciple be true or false at the context of utterance. To say this, however, is to basically say that (P2) could be false. Another way of putting this is that since Assertion* can in principle be compatible with the falsity of (P2), it follows that Assertion* can also be made at work even in a framework without branching. But that would be completely bizzare. After all, we are working under the hypothesis that (P2) and (P1) are both true, and their being true categorically excludes the existence of a TRL (at least according to *BT*-theorists anyway). Thus, it seems that no *BT*-theorists would be willing to adopt an account of assertion according to which there might be a chance, however tiny, that assertions of future contingents are true or false when uttered. But since Assertion* can allow that, it has to be rejected.

Is there anything that Belnap *et al.* could say in reply? One natural response is as follows. Althought it may be conceded that vindication and impugnment are compatible with future contingents being true or false, that, by itself, cannot be a strike against their proposal. The reason is that Belnap *et al.*'s account is also perfectly compatible with the further assumption — which they of course share — that future contingents are truth-valueless. Once this is appreciated, it should not be surprising that there is no residual objection that still needs to be answered.

Never mind whether one is moved by this sort of considerations, I think that Belnap *et al.*'s response is not persuasive. To see why, note that in order to meet our criticism Belnap *et al.* should first concede that future contingents will somehow change from being neither true nor false (as of the time of assertion) to being either true or false (at

a later time). The problem, once again, is that Belnap *et al.* — given their commitment to a tenseless reading of "is true"— cannot account for this phenomenon. After all, according to a such a reading the truth of a proposition is in no way relative to time. If so, it is not enough to simply *postulate* that future contingents are assertable because they will, sooner or later, become true or false. To put it starkly: since Belnap *et al.*'s account of assertion excludes any transition in truth-value for future contingents, it seems they are forced to conclude that such sentences will be doomed to remain truth-valueless no matter how things turn out.

The second challenge, articulated by Malpass and Wawer (2012), has instead a more technical nature. According to Malpass and Wawer, the problem with Assertion*, roughly, is that it gives bad results when it comes to the task of assigning a truth value to the history parameter underlying Ockamist semantics. Rather than present it in detail, let me quote the passage that well captures their criticism. Talking about Belnap *et al.*'s proposal, Malpass and Wawer make the following interesting comment:

> To us, this move to pragmatics seems to be no help. We are concerned with the way that truth-values are given to predictions of future contingents in Priorian-Ockhamism. The basic problem is that utterances occupy single moments but many histories. Since we have to have both to ascribe a truth-value to a prediction (according to Priorian-Ockhamism), there are many non-trivial ways in which we can evaluate a given prediction. It can be true and false, at the same time, that there will be a sea battle tomorrow. Appealing to pragmatics is just to change the subject, in our opinion. It is as if Belnap et al. would have us consider the pragmatics of assertion involved in "a-asserts-'The coin will land

heads'" while what we should actually be concerned with is the
semantics of "The coin will land heads." (p. 124)

What Malpass and Wawer's quote seems to suggest is that Asser-
tion* is unsatisfactory because it fails, among other things, to give us
the right order of priority when we try to understand how the history
parameter works. To be more precise, Malpass and Wawer object that
in dealing with the assertion problem one does not commit herself to
make sense of the (supposed) connection between a speaker and his
audience, as Belnap *et al.* somehow demand, nor does she try to ex-
plain when a speaker can be vindicated or impugned. Rather, since
"there are many non-trivial ways in which we can evaluate a given
prediction", what she tries to do when she asserts a given future con-
tingent is to understand how to assign a truth value to the proposition
it expresses.

In other terms, it is because a future-tensed sentence possesses a
truth value that we take assertions of future contingents to be intelligi-
ble. This means, more generally, that the intelligibility of the practice
of assertion depends on the fact that the propositional content of our
predictions is true or false at the time in which the prediction is ut-
tered. Notice, interestingly, and more importantly for our purpose,
that this is precisely what Evans contends. This suggests that Belnap
et al.'s account of assertion, by allowing that future contingents can be
assertable even if they are not true, is unable to meet Evan's challenge
according to which, in making assertions, a speaker aims to speak the
truth already at the context of utterance.

3.4   Belnap's Second Option

Perhaps there is no need to endorse Assertion*. Perhaps, it might be thought, in order to provide a coherent response to the assertion problem, Belnap *et al.* should simply reject (C). And since Belnap *et al.* are *BT*-theorists, the only way to do so consists in rejecting (P1).

This move would then open up at least two alternatives. The first consists in following the supervaluationist and adopting a weaker norm of assertion, such as the *belief* norm. In this way, one may attempt to show that assertions of future contingents are permissible given that one can believe that *p* is true (and so assert that *p* will be the case) even if *p* is, in fact, neither true nor false. Firts appeareances notwithstanding, this option won't work. Indeed, it takes litte to see that, in pursuing this strategy, Belnap *el at.* would run into the same sort of difficulties that supervaluationists ran into.

The second is to resort, once again, to the notions of vindication and impugnment. As we have already noted, the strategy in this case would be to say that, although assertion is not subject to the truth norm, future contingents are nevertheless assertable in that they will be vindicated or impugned with respect to a moment/history pair. On this approach, one might coherently deny the argument given in §2.1 without giving up (P2). So, the main concern of this section is the issue of how an adequate account of assertion can be provided if (C) is rejected.

As we have seen, on Belnap *et al.*'s view vindication and impugnment seem to have a metaphysical *status*. According to this interpretation, one gets vindicated or impugned depending on what is going in the future. More accurately, Belnap *et al.* (2001, p. 174) explain when a speaker is vindicated or impugned as follows:

α's assertion of A at a moment, m, is vindicated or impugned on a history, h, *as of the moment of assertion* (provided A is assignment-closed), according as $\mathbf{M}, m, a, m/h \vDash A$ or $\mathbf{M}, m, a, m/h \nvDash A$.

Two things need specification. First, the constraint that A must be assignment-closed forbids to assert open sentences such as "x is brindle". On the contrary, it allows to assert A if A is a future contingent, since assertion, as Belnap *et al.* (2001, p. 174) claim, "consitutes a way of closing the history parameter—not indeed semantically (the semantics of the asserted sentence is unchanged), but pragmatically, by the very act of assertion". Second, even if we know that the (in)correctness of an assertion can be settled only later than the moment of assertion, that is, when the content of the assertion is made true or false, one is vindicated or impugned as of the time of the utterance. This means that although in making an assertion about events not yet determined one must wait for vindication or impugnment, both of them are attributed to a speaker only retrospectively.

The problem, however, is that this way of making sense of assertion is unpalatable. Indeed, to say, for instance, that an assertion of (5) will be correct or incorrect only tomorrow does not, stricly speaking, rules out the possibility that (5) was *already* true or false when uttered. In general, it seems that nothing in the assumption that the (in)correctenss of an assertion occurs only later (i.e., when its truth value becomes settled) rules out that the sentence asserted was "closed by the context of use". It is evident, though, that no *BT*-theorist would be willing to accept such an outcome — unless one is willing to accept that the asserted future-tensed sentence has somehow changed its truth from being truth-valuesless to being true or false. But this, as widely noted, is something that Belnap *et al.* would — and to my mind, should — clearly reject on the ground that, in saying that, one would be committed to

the existence of a privileged future.

The upshot of this last section is thus that even under the assumption that (C) must be rejected, and hence that future contingents are not correctly assertable, Belnap *et al.*'s proposal — despite initial appareances to the contrary — leaves unsolved the problem of making sense of assertions that, as of the time of the utterance, are supposed to be neither true nor false.

Chapter 4

MacFarlane's solution to AP

4.1 Assertion as commitment to truth

As we have mentioned earlier, MacFarlane's account of future contingents assumes that the Aristotelian solution is correct: if the future is open, future-tensed sentences are to be deemed neither true nor false as assessed at the moment of their use (m_u). However, contrary to the standard semantics, MacFarlane suggests that future contingents may be either true or false if assessed at a later moment (m_a).

As noted, MacFarlane calls the former "indeterminacy intuition" while the latter "determinacy intuition", and his account, by rejecting the assumption the utterance-truth is absolute — i.e., the assumption that the truth value of an utterance does not depend on the context from which the utterance is being assessed — purports to show precisely how to account for this transition in truth-value.

Of course, a legitimate question would be whether it really makes sense to assert future-tensed sentences that, as of the time of the utterance, are truth-valueless. In other words, how should we evaluate an assertion of

(5) There will be a sea battle tomorrow

if there is a possible future branching out of the moment of utteracence in which a sea battle does take place, and another possible future in which the very same battle does not take place? As MacFarlane (2014, p. 201) puts the point:

> On the branching picture, it seems, there is no such thing as *the* future—yet we make claims about the future all the time. For example, I said ten days ago that it would be sunny today. It is sunny, so it seems my assertion was accurate. But how could it have been accurate if, as the branching picture has it, there were both rainy and cloudy branches ahead of me when I made it?

MacFarlane's passage expresses the worry that the rejection of the absoluteness of utterance-truth (i.e., the fact that there cannot be an actual future) clashes with providing a plausible account of assertion. More specifically, MacFarlane concedes that his relativism about future contingents is unable to meet Evans' challenge. To borrow Evans' words, relativism represents "the revolutionary idea that the evaluation of an utterance as correct or incorrect depends upon the time the evaluation is made (and so the evaluation varies)" (1985, p. 348). Evans' core objection is thus that it is inappropriate to consider an assertion as correct at one time but incorrect at a later time. He states (pp. 349-50) it as follows:

> Just as we use the terms 'good' and 'bad', 'obligatory' and 'permitted' to make an assessment, once and for all, of non-linguistic actions, so we use the term 'correct' to make a once-and-for-all assessment of speech acts.... if a theory of reference permits a subject to deduce merely that a particular utterance is now correct but later will be incorrect, it cannot assist the subject in deciding what

to say, nor in interpreting the remarks of others. What should we aim at, or take others to be aiming at? Maximum correctness? But of course, if he knew an answer to this question, it would necessarily generate a once-and-for-all assessment of utterances, according to whether or not they meet whatever condition the answer gave.

Let us see how MacFarlane tries to solve this puzzle. In 'Future Contingents and Relative Truth' (2003), MacFarlane suggests — following Robert Brandom — that to make an assertion is to make a certain kind of commitment towards the truth of what is asserted (even if the truth in question is relative). He states it as follows:

> What is it, then, to make an assertion?... One commits oneself to the truth of the sentence asserted (at its context of utterance). But what kind of a commitment is this?... I suggest that one is committed to producing a justification, that is, giving adequate reasons for thinking that the sentence is true (relative to its context of utterance and the asserter's current context of assessment), whenever the assertion is challenged. (p. 334)

The intuion here seems that if the assertor recognizes in a later prospective that what she asserted is not justified (or untrue), she is committed to retract her assertion. Back to our example: if someone is shown that the future is undoubtedly open, then she must withdraw her assertion that tomorrow there will be a sea battle.

MacFarlane's reply, in substance, exploits the idea that assertion should not be characterized in terms of a specific norm (though MacFarlane somehow recognizes something like a truth norm for assertion) but rather in terms of certain kind of commitments that speakers un-

dertake in making assertions. In particular, the commitment at stake consists in producing a justification whenever the assertion is challenged.

However, as we have seen in §3.2, if one believes that the future is open the strategy of providing a justification turns out to be inappropriate. Indeed, how can we possibly be obliged to give adequate reasons for thinking that an assertion of (5) was true or false if, at the time it was made, we were not in position to know what the future would bring? Notice that the impossibility involved in this case is not (only) epistemical but deeply methaphysical. That is, at m_u we are not in position to know whether there will be a sea battle tomorrow *because the way things are at m_u* does not permit any knowledge of what will happen tomorrow[1].

A natural consequence of MacFarlane's approach is thus that a *BT*-theorist must always be insincere or irrational when she utters a future contingent. To see this, imagine that you assert (5) and that the future is presently unsettled. Now, since you are a *BT*-theorist you are also committed to the thesis that future contingents are neither true nor false as assessed at the moment of their utterance, and this, in turn, makes you believe that (5) is not true at m_u — and yet you assert (5). But what is the point of asserting something you believe is untrue? That is, would it not be irrational to provide reasons for thinking that tomorrow there will be a sea battle if you believe that (5) is not true today?[2]

In light of this, it may be said that even assuming MacFarlane's privileged norm of assertion, that is, a norm according to which one must assert that p only if p can be adequately (or reasonably) justified, it turns out that a *BT*-theorist will never be justified in beliving that an

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[1]Obviously, note that one might not be in position to know how the future will unfold even if the universe were deterministic

[2]See Hattiangadi and Besson [9] for a discussion about this issue.

assertion of (5) is true given that she also implicitly believes that (5) is untrue at m_u.

4.2   Assertion and the Truth Rule

Interestingly — and perhaps not indipendently of the considerations just sketched — in his 2014 book *Assesment Sensitivity*, MacFarlane seems to have somehow modified his previous account of assertion as committment to truth by explicity assuming the following, *stronger* norm of assertion:

Truth Rule: At a context c, assert that p only if p is true at c[3]

Notice that in this case no mention is made of any epistemic notion of justification. Thus, if we identified c with the context of use m_u, then it takes little to conclude that, from the premise that future contingents are neither true nor false as assessed at m_u, *plus* the Truth Rule, assertions of future contingents are systematically non permissible: one is never allowed to assert future contingents because they are never true when uttered. The fact, however, is that MacFarlane *does* believe that there are assertions whose content is contingent. More accurately, he seems to be concerned with what Isidora Stajanovic (2014, p. 38) has called the "normative question", namely, the question of what conditions an *assertion* of a future-tensed sentence must fulfil in order to be rationally warranted.

Note, however, that according to Stajanovic there is also a "descriptive question" - i.e., the question of what conditions an *utterance* of a declarative future-tensed sentence must fulfil in order to count as an assertion. On her view, Belnap *et al.* are concerned with this alternative question. She also argues that those who deal with the AP do

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[3]See MacFarlane [19], p. 101.

not usually make a clear-cut distinction between them. I tend to agree with Stajanovic's diagnosis. In effect, it corroborates the hypothesis (adopted here) that there are different versions of the AP[4].

Faced with the difficulty of solving the "normative question", MacFarlane adopts what we might call a *clarification strategy*. Basically, the idea is that if I assert a future contingent such as "The train will arrive in Turin at 4pm" and someone challenges me — for instance by saying that I should not be so sure because, for all we know, there might be a strike or an engine damage and therefore the train might be late — I must *clarify* what I meant by conceding that what I in fact asserted was that I would arrive at 4 pm except "unforeseen circustances" or that I would *probably* arrive in Turin at 4 pm[5].

As MacFarlane (2014, p. 231) argues, the clarification strategy allows us to say that

> [...] although the relativist view predicts that we should not assert future contingent propositions, it does not predict that we should not make assertions using sentences whose literal contents are future contingents. For we can quite reasonably use such sentences *to assert propositions that are not future contingents* — propositions about what is likely, or about what will happen barring unforeseen circumstances. (emphasis added)

Arguably, the task of the clarification stategy is to make explicit the implicit (or intended) content future contingents possess. Unfortunately, though, the implicit content expressed by the proposition, MacFarlane claims, is *not* itself contingent. This means that even if you assert that p, and p is (literally) a future contingent, what you are actually asserting is something that, at m_u, is true and therefore settled — at least according to a *BT*-theorist.

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[4]See in particular fn. 1, p. 21.
[5]See MacFarlane [19], p. 231.

On MacFarlane's view, then, one would even be entitled to con-
clude that there are no assertions of future contingent contents at all.
In other terms, contrary to what might be expected, the clarification
strategy would forces us to *deny* the open future intuion on the ground
that it only permits to assert what will inevitably take place. (Equiva-
lently, the clarification strategy would only permit to make unavoidable
predictions)[6]. But this clearly goes against the whole project of making
assertions of future contingents permissible. Moreover, on such a view
the implicit content of any future contingent turns out to be sistemat-
ically different from its literal meaning. This line of thought certainly
enables a *BT*-theorist to accept the truth norm but it is highly coun-
terintuitive. Indeed, although the clarification strategy is a common
practice, it does not seem so pervasive: natural speakers do not always
clarify what they mean by their predictions. So, despite all the efforts,
it seems that the assertion problem still stands.

It may be also worth noticing that MacFarlane proposes, though
probably not endorses, another strategy to make future contingents as-
sertable. Such a strategy consists in weakening the relativist semantics
in such a way that "instead of a necessary and sufficient condition for
truth, it provides only a sufficient condition for truth and a sufficient
condition for non-truth" with the result that some cases will come
out indeterminate (2014, p. 232). For this reason, MacFarlane calls this
alternative semantics *Indeterminate Relativist Postsemantics* (IRP).

The idea which inspires IRP is that given, for instance, the assertion
"I will arrive in Turin at 4pm" and a context in which its truth-value is
unsettled, it is possible to reasonably class the proposition it expresses
as not determinately true but also not determinately not true as used
at and assessed from m_u. This suggests that, contrary to what hap-

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[6]As MacFarlane [19], p. 230, himself recognizes, such a problem also afflicts Su-
pervalutationism and Peirceanism and, more generally, all the views that take future
contingents to be untrue.

pens with the original relativist approach where the aforementioned future contingent should not be asserted, the modified semantics leaves it indeterminate whether "I will arrive in Turin at 4pm" ought to be asserted at m_u. As MacFarlane (p. 232) argues, the semantics so modified will certainly "not satisfy those who think that asserting a future contingent can be determinately permissible. But it may assuage those who simply rebel at the idea that asserting a future contingent is always impermissible".

MacFarlane's proposal is surely able to block the conclusion that one is never allowed to assert future contingents but it is extremely *ad hoc*. After all, the role of *IRP* "simply" consists in making the Truth Rule *silent* with respect to the question of whether one is permitted or not to make assertions of future-tensed sentences. In addition, it has to be noted that MacFarlane' strategy does not provide any answer to the "normative problem", that is, the problem regarding those conditions that rationally permit to assert future-tensed statements. First appareances notwithstanding, then, MacFarlane's attempt to reconcile his relativist semantics with a compelling account of assertion for future contingents fails, hence the prohibition of asserting future contingents within an indeterministic setting still holds.

Chapter 5

Ockamist's solution to the Assertion Problem

5.1 Thin Red Line

5.2 Conclusion

Bibliography

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