

THE LOGIC OF THE FUTURE¹

1. **How not to treat statements about the future**
2. **How to treat statements about the future**
3. **Why statements about the future have no truth-values**
4. **Objections and responses**
 - (i) Present evidence for the past, present evidence for the future
 - (ii) ‘Even-if’ entailments are a problem for statements about the past, too
 - (iii) How can one maintain ‘x will happen’ whilst denying ‘x will happen even if y does’?
 - (iv) Empirical observations are irrelevant to logic, which is normative rather than descriptive
 - (v) WILL-statements *are* all about the future, deep down
 - (vi) WILL is radically ambiguous
 - (vii) English grammar is too parochial to be of philosophical interest
 - (viii) Common usage sometimes applies the word ‘true’ to statements about the future
 - (ix) Truth-value links require statements about the future to have truth-values
 - (x) Why can’t statements about the future have a third, intermediate truth-value?

1. **How not to treat statements about the future**

It is now commonplace to treat statements about the future as logically on a par with factual claims about the present and the past. The most recent explicit statement of this attitude I’ve found is this:

“As I see it, propositions about the future work in exactly the same way as propositions about the present, though with one extra and important difference... We have to wait for the future... While we are waiting, time passes, and the future comes, in the sense that what has not yet happened does happen. And that is enough to make the proposition expressed by a future-tense sentence just as true as any regular proposition expressed by its corresponding present-tense sentence.”²

More often than not, the attitude is merely implicit in the way philosophers treat statements about the future – e.g. formalizing them as $F(P)$, where P is a present-tensed or ‘tenseless’ proposition.

But surely statements about the future are never claims of *fact* about the future. For claims of fact are made by speakers who take themselves to be causally connected to the relevant facts³ – that is, speakers who take it that their beliefs are as they are *as a result* of how the facts are – and I take it as uncontroversial that human beings simply do not have this kind of connection to the future.

Accordingly, the entailments of statements about the future are not the same as those of claims of fact (propositions). This difference – this *logical* difference – is not widely recognized, so it is worth spelling out. Note first that if P entails Q , then asserting P *ipso facto* commits a speaker to Q .

Propositions are self-standing with respect to truth: if P is true, then it is true no matter what else is true. Hence P entails P -even-if- Q . \langle Brian is in his study \rangle entails \langle Brian is in his study even if he died yesterday \rangle .⁴ \langle Napoleon spent a restless night before Waterloo \rangle entails \langle Napoleon spent a restless night

¹ The thesis I advance and defend in this chapter takes its cue from the largely unappreciated work of Vic Dudman.

² Jonathan Westphal, ‘The Future and the Truth-Value Links: A Common Sense View’ (2006), pp. 8-9.

³ In this chapter, I am not yet concerned with mathematical, tautological, or otherwise non-contingent statements.

⁴ I write $\langle S \rangle$ for the message most obviously encoded by the sentence S – the ‘natural interpretation’ of S . The vital sentence-message distinction, trampled over by all those who ascribe truth and falsity to sentences instead of propositions, is intelligently recommended by Dudman in ‘Vive la Révolution’ (1989), pp. 591-92.

before Waterloo even if he later claimed not to have done. \langle Bush invaded Iraq *entails* \langle Bush invaded Iraq even if Saddam offered him oil. In each case, the first commits its advocate to the second.

By contrast, \langle Bush will invade Iran *does not entail* \langle Bush will invade Iran even if Ahmadinejad ceases uranium enrichment. \langle Blair will spend a restless night before the next election *does not entail* \langle Blair will spend a restless night before the next election even if he takes Valium first. \langle Brian will be in his study tomorrow *does not entail* \langle Brian will be in his study tomorrow even if he dies this evening. In no case does the first statement commit its speaker to the second. (This much is an empirically verifiable fact about the way dialectic proceeds.)

So we should not treat statements about the future as logically on a par with factual claims about the present and the past.

2. How to treat statements about the future

Our clue to an alternative logic for statements about the future comes from *grammar*.⁵ It is not news to grammarians that the English verb WILL is not the marker of a future tense; morphologically, it is a modal auxiliary, exhibiting the same formal behaviour as the modals WOULD, SHALL/SHOULD, CAN/COULD, MAY/MIGHT, MUST, and OUGHT TO.⁶ Could there perhaps be some common semantic ground between statements involving verbs of this grammatical class?

One way to see that WILL does not mark a future tense is to observe the behaviour exhibited by WILL-statements about the future under the (presumably content-preserving) operation of reported speech. Suppose I say 'Brian will be in his study tomorrow'. The next day, my speech is reported like this: 'Mark said that Brian *would be* in his study today.' But if the role of WILL in my speech was to locate Brian's being in his study in the future, much as the past-tense WAS would have located it in the past, then surely the report would instead just be: 'Mark said that Brian *is* in his study today.'⁷

Another way to see that WILL does not mark a future tense is to notice that WILL-statements need not be about the future at all. 'My washing will be ready by now'; 'That will be the postman'; 'He will have gone to the library'; 'Napoleon will have spent a restless night before Waterloo.' This should puzzle those who take WILL to be the marker of a future tense.⁸ Note also that these WILL-statements about the present and the past exhibit the same peculiar entailment behaviour as those about the future. (\langle My washing will be ready by now *does not entail* \langle My washing will be ready by now even if the machine is broken, and so on.)

I submit that WILL marks *judgement-hood* instead of futurity: WILL-statements are not claims of fact but expressions of imagination, expectation, surmise, conjecture, and the like. Moreover, I submit that this is the common semantic ground between statements involving modals, as evidenced by the substitutivity of WILL with other modals to give other judgements: 'My washing should be ready by now'; 'That could be the postman'; 'He may have gone to the library'; 'Napoleon might have spent a

⁵ I should emphasize that this is grammar in the ordinary sense, not Wittgensteinian 'grammar' (whatever that may be).

⁶ See e.g. F. R. Palmer, *Modality and the English Modals* (1990), §1.1. NEED and DARE also qualify but are less common.

⁷ This argument is given by Dudman in 'A Popular Presumption Refuted' (1992), pp. 431f.

⁸ It should, but it seems not to. On p. 398 of 'What If? Questions about Conditionals' (2003), Dorothy Edgington calls it 'interesting' that 'we use the future tense when we are inferring something about the present ... [or] about the past'.

restless night before Waterloo'; 'My washing ought to be ready by now'; 'That must be the postman'. These statements do not all have identical modal import, of course, but none of them registers a fact in the way that 'That is the postman' does. The notion that WILL marks judgement-hood rather than futurity also explains the otherwise puzzling behaviour of WILL-statements in reported speech.

Statements about the future are merely a special case of these non-factual judgements, as we often make judgements about the present and the past as well. The difference is that although we never have cognitive access to the future, we do sometimes have cognitive access to the present and the past (either second-hand or via our own perception or memory). That explains why our language has evolved present and past tenses with which to make factual claims, but no analogous future tense.

We already have a well-developed logic of propositions. What we need now is a fuller account of WILL-statements, and indeed of other modal statements – that is, an account of JUDGEMENTS. While there is much that needs to be said in such an account, I will restrict myself here to the limited claim that statements about the future, unlike propositions, do not have truth-values.⁹

3. Why statements about the future have no truth-values

My principal argument for the claim that statements about the future have no truth-values is that otherwise they would have the standard entailments of propositional logic, contrary to §1 above. For if \langle Brian will be in his study tomorrow \rangle is true, then it is true no matter what else is true.

A further motivation is that if – as argued above – statements about the future are not claims of fact, there is no obvious reason why they should be evaluated in terms of correspondence with the facts, whether somehow in advance or when the facts are in. The judgement \langle Brian will be in his study tomorrow \rangle should instead be evaluated with reference to the thinking that underlies it; surely nobody would think that it could be underwritten by anything more substantial.

Finally, an incidental pay-off from treating statements about the future as having no truth-values is that it silences the thought that we can prove determinism by logic alone. For if it is now *true* that Brian will be in his study tomorrow, how can Brian's future whereabouts be as yet undetermined? (My relief here rests not on a presumption of indeterminism but on the feeling that a logical proof of determinism would simply be too quick.)

4. Objections and responses

(i) Present evidence for the past, present evidence for the future¹⁰

In order to think about the future, we study evidence available to us in the present. You construe this as a lack of access, and thus a block to our making factual claims about the future. But exactly the same is true of the past.

The evidence we have for factual claims about the past is of a fundamentally different kind from the evidence we have for thinking about the future because of the temporal direction of causality.

⁹ I should also say, by way of advertisement, that my broader thesis is that *no* judgements have truth-values.

¹⁰ This objection was raised in a seminar on 'IP' given by Bob Hargrave, Amyas Merivale and myself in Hilary 2006.

In ideal cases, the evidence we have for a factual claim about the past exists in the present *because* that claim is true, i.e. as a result of the actual occurrence of what we think happened. My evidence for the claim that I had Weetabix for breakfast yesterday is that I remember eating Weetabix for breakfast yesterday; ideally, I have this memory *because* I had Weetabix for breakfast yesterday. My evidence for the claim that Bush invaded Iraq is that the newspapers tell me that Bush invaded Iraq; ideally, they tell me this *as a result of* Bush's invasion of Iraq. My evidence for the claim that Brian is in his study is that I can see Brian in his study; ideally, I have this perception *because* Brian is in his study.

In no case does the evidence we have for a thought about the future exist in the present *because* of anything in the future. The dust-cloud is not moving at a certain speed *because* the column will be here in an hour's time. Ahmadinejad is not defying the UN *as a result of* Bush's 2007 invasion of Iran. Blair is not in trouble *because* he will spend a restless night before the next election.

What grants us access to the past is that, in ideal cases, the past itself is causally responsible for the evidence we have for it.¹¹ What denies us access to the future is that in no case does this happen for the future.

(ii) 'Even-if' entailments are a problem for statements about the past, too¹²

You say that anyone who makes a factual claim P is thereby committed to P-even-if-Q. But my claim that Napoleon was defeated at Waterloo doesn't commit me to <Napoleon was defeated at Waterloo even if all the history books are wrong>.

It is a noteworthy feature of all worrisome 'even if' clauses that can be attached to factual claims about the past that they impugn the speaker's supposed causal connection to the past fact. Even if all the history books are wrong? Even if there is a conspiracy afoot? Even if your memory is faulty? Even if your eyes need testing? Even if the world sprang into being five minutes ago? These are all worrisome because they invoke sceptical hypotheses of one sort or another.

Perfectly ordinary even-ifs are not troubling for the speaker. Yes, I had Weetabix for breakfast today even if there were cornflakes in the cupboard too. Yes, Napoleon was defeated at Waterloo even if he was a master tactician. Yes, Bush invaded Iraq even if Saddam offered him oil. I don't care about any of these things (says the speaker) because what I am telling you is true, however it came about.

In these perfectly ordinary cases, the speaker readily accepts his commitment to P-even-if-Q. But sceptical hypotheses have a different effect; if all the history books are wrong, the speaker thinks, then perhaps Napoleon *wasn't* defeated at Waterloo after all. Hence the objection.

The vital point to notice is that in worrisome cases the speaker is troubled by a sceptical hypothesis *into questioning P itself*. That is, he cannot reject P-even-if-Q *whilst at the same time maintaining P*. So all the objection does is to make it even more obvious that P *does* commit its speaker to P-even-if-Q. (That is precisely why the speaker's commitment to P wavers as he entertains a sceptical Q. If the

¹¹ 'Ideal' may be an unfortunate choice of terminology, as it suggests that these cases are rarely attainable – a suggestion which is an affront to memory, perception and testimony as sources of knowledge. Perhaps 'standard' would be better.

¹² This objection was raised by Dorothy Edgington in a seminar on Logic & Language that she gave with Timothy Williamson in Michaelmas 2005.

objector had his way, the response to any sceptic would be a rather unsatisfying one-liner – ‘Of course I have two hands, but that doesn’t mean I have two hands even if I’m a brain in a vat.’)

(iii) How can one maintain ‘ x will happen’ whilst denying ‘ x will happen even if y does’?

Given what you’ve just said, it must be possible on your account to maintain, say, ‘Bush will invade Iran’ whilst denying ‘Bush will invade Iran even if Ahmadinejad ceases uranium enrichment’. Presumably you think this can be done simply by maintaining that Ahmadinejad won’t cease uranium enrichment. In that case, why can’t I maintain that Napoleon was defeated at Waterloo whilst denying that Napoleon was defeated at Waterloo even if the history books are all wrong, simply by maintaining that the history books aren’t all wrong?

Compare ‘The history books aren’t all wrong, but if they are...’ and ‘Blair won’t take Valium before the next election, but if he does...’. The first is nonsensical, because it purports at the same time to affirm the proposition $\neg Q$ and to treat Q as true. The second, by contrast, is intelligible, because the judgement that Blair won’t take Valium is not *contradicted* by ‘he does’ (whatever that might mean).¹³

That is why we can (and frequently do) maintain both that x will happen and that it won’t if y does. I can maintain in the same breath and without contradiction that it won’t rain tomorrow, that we’ll have a wonderful picnic, and that if it does rain tomorrow we won’t have a wonderful picnic.

(iv) Empirical observations are irrelevant to logic, which is normative rather than descriptive

It may well be an empirically verifiable fact that dialectic DOES proceed as if statements about the future didn’t commit their speakers to corresponding ‘even-if’ statements, but that doesn’t mean that dialectic SHOULD proceed that way – after all, surely part of the remit of logic is precisely to identify and correct hidden errors in everyday reasoning.

This objection opens up a fundamental question about the purpose and methodology of logic. I don’t want to go into this here, though I will point out that logic has to take some of our actual reasoning practices for granted in order to get off the ground. Instead, my response is to call the objector’s bluff. Presumably he thinks that statements about the future *should* commit their speakers to corresponding even-if statements – for instance, that my innocuous statement that Brian will be in the library tomorrow *should* commit me to the peculiar idea that he will be in the library tomorrow even if he takes the day off for once, not to mention the ghoulish idea that he will be there tomorrow even if he dies this evening. Given that nobody ever holds anyone to such commitments, why should the objector think this? As an error theorist, he shoulders the burden of proof.

(v) WILL-statements *are* all about the future, deep down¹⁴

¹³ For a more detailed version of this argument, together with real-life examples of the form ‘ x won’t happen, but if it does...’, see Dudman, ‘Three Twentieth-Century Commonplaces about ‘IP’ (2001), p. 122; see also his ‘Against the Indicative’ (1994), §3. (Incidentally, the absurdity of ‘P, and if not P...’ explains why an *ex falso quodlibet* inference from P and $\neg P$ to an arbitrary Q via ‘if not P then Q’ cannot actually be made: the putative reasoner has no coherent posture.)

¹⁴ I found this suggestion in Eve Sweetser, *From Etymology to Pragmatics* (1990), p. 55: ‘In [“He will be home by now; I just saw the lights go on”] the person is or is not at home, in the present; the *will* is of future discovery or verification – “if we check, we will find out that he is home.” When an action is in the future, of course, its occurrence is automatically only knowable or verifiable in the future. But the epistemic use of *will* is an extension from the *will* of actual futurity [e.g. “He will be home in three hours”] to purely epistemic futurity: the actual event is not in the future, but only its verification.’

When you say ‘My washing will be ready by now’, ‘That will be the postman’, and ‘He will have gone to the library’, what you really mean is something like ‘My washing will turn out to have been ready by now’, ‘That will turn out to have been the postman’, and ‘He will turn out to have gone to the library’. It is your verification of a certain present or past truth that lies in the future, and that is why we use WILL in such cases.

There is something suspicious about any claim that when we say x we really mean y – especially when y seems to mean something quite different from x , as is the case here. There is something suspicious about lightning refutations, too, but consider ‘The cat will be in a superposition of states by now.’ In any case, we need not rely on the eccentricities of quantum physics. It makes perfect sense to say ‘Napoleon will have spent a restless night before Waterloo, though of course we’ll never be able to verify that he did.’ (Compare the absurdity of ‘Napoleon spent a restless night before Waterloo, though of course we’ll never be able to verify that he did.’) This attempt to salvage the futurity of WILL – presumably motivated by the dogma that WILL *must* mark a future tense – founders on the observation that the future verification of the relevant present or past truth is a quite separate matter.

(vi) WILL is radically ambiguous¹⁵

The word WILL does different things in ‘Bush will declare war on Iran’ and ‘My washing will be ready by now’: in the former it marks the future tense of ‘declare’, while in the latter it merely indicates a reasonably inferred conclusion.

English does, of course, contain some ambiguous words, but it would be lazy methodology to cry ambiguity at the first sign of a puzzle. My response to this objection is threefold.

(a) Positing the ambiguity of WILL would not solve the problem (posed in §1 above) of the logical entailments of statements about the future; nor would it explain why creatures with access only to the present and the past would be so bold as to present their visions of the future as fact.

(b) Suppose a poor conversationalist is heard to say the following outside a launderette: ‘My washing will be dry in 5 minutes’ time... My washing will be ready in 1 minute’s time... My washing will be ready by now... My washing will have been ready 1 minute ago... My washing will have been ready 5 minutes ago.’ This person is surely saying the same thing over and over again, merely updating it to keep up with the clock. On the objector’s view, by contrast, such a speaker must switch at the moment of truth to saying something else using a different verb – an idea I find highly implausible.

(c) I believe a positive account can be given which explains both statements as judgements (reliant upon imagination, expectation, surmise, conjecture) rather than claims of fact (i.e. propositions).

In sum, a resort to ambiguity here would be (a) unhelpful, (b) unconvincing, and (c) unnecessary.

(vii) English grammar is too parochial to be of philosophical interest¹⁶

¹⁵ I have found this notion more common in conversation than in print, where the use of WILL to talk about the past and the present is usually just ignored. One recent exception is Edgington, who writes (2003, p. 398): ‘The future tense typically plays two roles which are usually coincident: it indicates that we are speaking about the future; and it indicates that we are making a prediction or inference. It is interesting to note when these roles come apart.’

¹⁶ This sentiment is very much in the air, but occasionally finds explicit expression. See e.g. Hugh Mellor’s endorsement of an expression of it by Frank Ramsey in ‘How to Believe a Conditional’ (1993), p. 240.

Even if English has no future tense, French/Latin/Greek/Mbongo does, which is surely a problem for your thesis (especially as the debate over future contingents has been conducted primarily in Latin and Greek). More generally, philosophy shouldn't be hostage to contingent matters of grammatical fact.

This objection opens up a fundamental question about the role that grammar can and should play in philosophy, but for present purposes we needn't go into that question *at all*, because the modal status of WILL is not the crux of my argument – the role that grammar plays here is merely heuristic. I began by opining that creatures with no access to the future are unlikely to make claims of fact about it, and tied this in with the peculiar entailment behaviour exhibited by WILL-statements about the future – which itself is sufficient to show that these statements do not obey propositional logic. In search of a positive account of the logic of the future, I noted that English grammar displays a disparity between WILL-statements about the future and claims of fact about the present and the past, and at the same time an affinity between WILL-statements about the future and judgements about the present and the past. This observation naturally led to the thought that WILL-statements about the future might instead be classified together with judgements about the present and the past. Finally, I provided a grammar-independent motivation for this classification by giving a brief unified explanation of such statements as expressions of imagination, expectation, surmise, and conjecture, and suggested that a positive account of the logic of the future should be sought along such lines.

English-speaking philosophers are fortunate to have such a clear grammatical demarcation between propositions (expressed in primary-pattern sentences) and judgements (expressed in secondary-pattern sentences).¹⁷ In various other languages, statements about the future are made using an inflected form of the verb rather than a modal auxiliary like WILL. These inflected forms are usually labelled 'future tenses' – hence the specific objection about French/Latin/Greek/Mbongo.

My response is as follows. I have argued that we should rid ourselves of the unthinking supposition that English WILL-statements about the future – commonly called 'future-tensed' by philosophers – are claims of fact. The destructive argument relies not on the peculiarities of English grammar, but on the logical behaviour of statements about the future (which is explained by our epistemic lack of access to the future). As such, it is not vulnerable to entrenched grammatical terminology. The objector would need to show that in such languages 'future-tensed' statements obeyed the same logic as present-tensed and past-tensed statements, so that (for example) ⟨There will be a sea-battle tomorrow⟩ would commit a Greek to ⟨There will be a sea-battle tomorrow even if a storm drives the Persians out to sea tonight⟩. I must confess my suspicion that foreigners are just as human as the English, and so never find themselves in a position to report information from the future either, but a conclusive response awaits an analysis of dialectical commitments in each of these languages.

Here I can promise only a limited study of statements involving the 'future tense' in Latin;¹⁸ Greek may have been the language in which the problem of future contingents as we know it was born, but Latin was the language in which it was discussed in the 14th century by men like Peter Auriol.

¹⁷ See Dudman (1989), p. 592: 'Subject-predicate sentences (*simple* sentences, for short) divide into those whose predicates contain a finite inflectional form of a verb and those whose predicates contain a secondary auxiliary followed by the base of a verb: 'The Countess *hates* Sir Jasper'; 'The Countess *would hate* Sir Jasper'. F.R. Palmer assigned them to the *primary pattern* or the *secondary pattern* accordingly. ... *Secondary auxiliaries* are inflectional forms of *modals*'.

¹⁸ Why the persistent scare-quotes? Because my embryonic thought (which may prove stillborn) is that the Latin future might be better called a *mood*. Incidentally, in the study here advertised I intend to make use of Suzanne Fleischman's monograph *The Future in Thought and Language: Diachronic Evidence from Romance* (1982).

(viii) Common usage sometimes applies the word ‘true’ to statements about the future¹⁹

If someone says ‘Brian will be in his study tomorrow’, I might reply ‘That’s true.’ So your claim that statements about the future can’t be true or false is at odds with common usage.

I use ‘true’ and ‘false’ in the technical philosophical sense in which it applies to propositions alone; what can be true or false in this sense is a subset of what normal people call true or false. Normal people might say ‘That’s true’ in response to ‘Why would a billionaire need to make any more money?’, but philosophers are not thereby moved to ascribe truth or falsity to questions. Notice also that no one who dissented in either of these situations would ever reply ‘That’s false.’

(ix) Truth-value links require statements about the future to have truth-values²⁰

If yesterday someone said ‘Brian will be in his study tomorrow’, and today Brian is indeed in his study, then yesterday it was true that Brian would be in his study tomorrow. This is no different to any other truth-value link, such as that between the truth today of ⟨Brian is in his study today⟩ and the truth tomorrow of ⟨Brian was in his study yesterday⟩. Why else would we say that certain predictions have ‘come true’?

Truth-value links hold between propositions, the bearers of truth and falsity. I have argued that statements about the future are not propositions – in which case, it was *not* true yesterday that Brian would be in his study tomorrow, because that was not the sort of thing that could be true.

The originator of this objection, Michael Dummett, admits the possibility of ‘denying that we have any future tense for which the truth-value links hold – what we may call a genuine future tense, that is a true dual of the past tense.’²¹ This is of course the position for which I have argued above. Dummett himself is sceptical: ‘[someone who takes this line] cannot be content with arguing that we do not in fact employ the genuine future tense in our language: he must maintain that such a tense would be unintelligible; we could not understand what it would be to have such a tense in the language. This, in the face of the fact that many would maintain that we already have it, is a case difficult to sustain.’ I have argued in (vii) against treating the lack of a future tense in English as a parochial matter, but I will say a little here about the intelligibility or otherwise of such a tense.

To introduce a formal notation for something is not yet to understand it. In a recent contribution to the literature on future contingents we read: ‘Obviously, proposition (3) [Dr Foster will go to Gloucester] is to be analysed as follows: (3*) F(Dr Foster goes to Gloucester).’²² This attempt at an analysis – not an uncommon one, judging from the ‘obviously’ – might be thought to circumvent the problem that English has no future tense. For if we can understand (3*) as a proposition, then we can understand what it would be to have a future tense in our own language – and then, *mirabile dictu*,

¹⁹ This objection may seem rather facile – hence my short shrift – but it is the sole reason that the author of my opening quotation, Jonathan Westphal, gives for his assumption that statements about the future have truth-values (2006, p. 1).

²⁰ This objection comes from Michael Dummett, *Truth and the Past* (2004), pp. 83-85. It is taken up by Westphal (2006), who concludes (p. 9): ‘Dummett’s delineation of the notion of the truth-value link does us a great service, because it shows that relations between propositions expressed by tensed sentences are not peculiar to those using the future tense... From this point of view there is no reason to single out propositions expressed by future-tense sentences for special treatment.’ Westphal seems to have missed Dummett’s suggestion of just such a reason, which I quote below.

²¹ Dummett (2004), p. 85.

²² Craig Bourne, ‘Future Contingents, Non-Contradiction, and the Law of Excluded Middle Muddle’ (2004), p. 126.

we philosophers can add this piece of notation to our dialect! But not so fast. ‘In my opinion, such truths should be drawn from notions rather than from notations.’²³ Or to put it another way, this piece of notation requires an *interpretation*. And I’m afraid the obvious candidate is: \langle Dr Foster will go to Gloucester. \rangle ²⁴ The moral here is that expressibility in natural language is not an optional extra.

Now, we do indeed talk of predictions ‘coming true’. I would like to say two things about this:

(a) As with (viii), that we do not talk of predictions ‘coming false’ suggests that it might not be truth in the technical philosophical sense which is at work here.²⁵ Dreams can come true, but philosophers are not thereby moved to ascribe truth or falsity to dreams.

(b) If we take it seriously, the locution suggests not that the statement *was* true when it was made, but that it has *become* true now that the facts are in. Under examination, however, this notion proves to be untenable. Someone said yesterday that Brian would be in his study today; but what is true now is not that Brian *would* be in his study today, nor even that Brian *will* be in his study today, but rather that Brian *is* in his study today; therefore the original statement has not itself become true.²⁶

(x) Why can’t statements about the future have a third, intermediate truth-value?²⁷

Statements about the future (at least, contingent ones) are, as you say, neither true nor false. But if we grant them a third, intermediate truth-value – ‘neutral’ or $\frac{1}{2}$ – then we can incorporate them into a trivalent propositional logic. For instance, we can give the conjunction \langle Bush invaded Iraq and he will invade Iran \rangle the truth-value $\frac{1}{2}$.

It is extraordinary that the desire to give all statements truth-values should result in the creation of a new truth-value for those statements which are neither true nor false. (Somehow the phrase ‘deferred success’ springs to mind.) Why not just say that they are neither true nor false?²⁸

My response to this proposal is that since \langle Bush invaded Iraq \rangle is a proposition and \langle Bush will invade Iran \rangle is a judgement, and since the logic of propositions is different from the logic of judgements, we should treat \langle Bush invaded Iraq and he will invade Iran \rangle not as a logical *conjunction* (obeying which logic?) but as a *concatenation* of two messages of quite different kinds.

The immiscibility of the two logics can best be seen with putative *disjunctions* between propositions and judgements. Trivalent logics assign a truth-value (I) to \langle Bush invaded Iraq or he will invade Iran \rangle , but I cannot see why a speaker would offer that proposition and that judgement as *alternatives*.

²³ Carl Gauss, *Disquisitiones Arithmeticae* (1801), §76: ‘At nostro quidem iudicio huiusmodi veritates ex notionibus potius quam ex notationibus hauriri debebant.’

²⁴ Note incidentally a further peculiarity of Bourne’s analysis: ‘the present-tense proposition that *Dr Foster goes to Gloucester* has a determinate truth value – it is either true or false depending on whether there is a present fact that Dr Foster goes to Gloucester to make it true’ (p. 126). But \langle Dr Foster goes to Gloucester \rangle is a *habitual* proposition; the present-tense proposition that Bourne should instead want to correspond to the WILL-statement is \langle Dr Foster is going to Gloucester \rangle .

²⁵ We do talk of predictions being ‘falsified’; but even if this is supposed to vitiate my (a), it will not withstand my (b).

²⁶ It may help to compare the case of WILL-statements about the present and the past. If I say ‘Brian will be in his study (now)’, I may well be *right*. But if I am right, it will be because Brian *is* in his study, not because he *will be* in his study.

²⁷ A trivalent logic has often been ascribed to Aristotle – firstly by Jan Łukasiewicz in ‘On Three-Valued Logic’ (1920) and most recently by Bourne (2004). The first published demurrals on Aristotle’s behalf, so far as I know, was Ronald Butler’s ‘Aristotle’s Sea Fight and Three-Valued Logic’ (1955) – an article which unfortunately fell on stony ground.

²⁸ Perhaps the idea is that statements about the future are presently in limbo, waiting to become true; but then cf. (ix)(b).

In general, since a proposition is a claim of fact and a judgement is an expression of imagination, conjecture etc., it is hard to see why speakers would offer *any* heterogeneous pair as alternatives.

*Objector's response: John F. Kennedy once memorably said 'I think the Secretary has indicated today, or if he hasn't he will, that we are going to do everything we can to sustain our international agreements on wheat and to prevent dumping, and all of the rest.'*²⁹ *How does that square with what you've just said?*

Well spotted. Kennedy obviously has no idea whether or not the Secretary has given his speech yet. As a man whose words are being recorded for posterity, he wants to be very careful about what he commits himself to. In saying 'or if he hasn't he will', he retreats from the overstated claim (already neutered by 'I think', as it happens) that the Secretary has in fact made the indication today.

I suggest that the real disjunction here is to be revealed in a decompressed version of a statement like Kennedy's: either x has happened or it hasn't happened; and if it hasn't happened it will happen. So the disjunction here is between propositions after all. My hidden-step analysis would also apply to an even more compressed version of a Kennedy-type statement: x has happened, or it will happen. Despite initial appearances, then, Kennedy was not offering a heterogeneous pair as alternatives.

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²⁹ In a press conference given on May 22nd 1963.