

On Semantic and Ontic Truth

Abstract:

It is argued that we should distinguish ontic truth—the True—that Frege claimed is *sui generis* and indefinable, from the semantic concept, for which Tarski provided a definition. Frege's argument that truth is not definable is clarified and Wittgenstein's introduction of the distinction between saying and showing is interpreted as an attempted response to Frege's rejection of the correspondence theory. It is argued that conflicts between realism and Dummettian anti-realism result from their proponents not thoroughly distinguishing between the two closely connected ways of thinking about truth. Last, the distinction is used to clarify and endorse the Fregean claim that all true sentences indicate the True, identified as ontic truth.

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i. Tarski and Frege

My aim in this paper is to characterise an ambiguity in our naïve concept of truth and to argue for the fruitfulness of keeping it in mind, for, it will be argued, central conflicts over the nature of truth dissolve once it is recognised. Specifically, participants in the realist/anti-realist debate focus on different aspects of the truth concept, thus talking past each other. The ambiguity begins to emerge when we consider two apparently conflicting claims concerning truth. Famously, Frege proposed in his 1918 paper, 'Der Gedanke' that 'the content of the word "true" is *sui generis* and indefinable' (Frege 1997c, 327). Yet, in 1933, Tarski showed how to define truth in a formal language, and later summarized and developed his views in 'The Semantic Conception of Truth and the Foundations of Semantics' (Tarski 1944). So, it initially appears that Tarski refuted Frege. Already one might wonder, however, whether these two philosophers were genuinely engaging with each other.

Indeed, there are those who assert that Tarski's definitions can have no bearing on Frege's claim. 'Tarski showed how to define a truth predicate for a number of well-defined languages, but his definitions do not, of course, tell us what these predicates have in common' so Tarski's truth predicates fail to capture the general concept of truth (Davidson

1990, 285, 296).¹ This assertion, as here reiterated by Davidson, was made earlier by Dummett, who argued that the Tarskian truth definition does not tell us what the point of introducing the predicate ‘is true’ is; Tarski, he claimed, does not offer a substantive theory of truth (Dummett 1958–59). Nevertheless, as Davidson goes on to argue, Tarski does attempt to characterise an intuitive concept of semantic truth, and in doing so assumes our grasp of that intuitive concept. Could his definition of this concept already presuppose the *sui generis* and indefinable truth that Frege had in mind? In what follows, I suggest that a closer look at Tarski’s truth definition shows that the concept of truth is ambiguous. For reasons that will become apparent I will call the two truth concepts, ‘semantic’ and ‘ontic’ truth. Tarski defined semantic truth, but his definition presupposed ontic truth. Davidson himself noted that contemporary clarifications of the concept of truth fall into two broad categories, one makes truth epistemic or theory dependent, the other is realist and insists that truth is something objective and ‘evidence-transcendent’ (Davidson 1990, 298). Recognising the distinction between semantic and ontic truth explains this tendency. Those who focus on the semantic concept tend to develop epistemic theories, those who focus on the ontic version tend to be realists. However, since the semantic and ontic concepts of truth are not alternatives, but two elements within the intuitive concept of truth, defenders of the epistemic and realist theories turn out to be talking past each other. We need a theory which respects both semantic and ontic truth. This is available once we recognise that what Tarski did was to

¹ Not everyone agrees with this assessment. Since the semantic concept of truth is defined as a relation, Tarski’s method, which is to show how to specify the relevant relation for various languages has been argued to amount to a characterization of the general concept (Smid 2014). I am sympathetic to this view, without agreeing that it was a successful non-circular characterization.

give a definition of semantic truth, which presupposes an intuitive grasp of ontic truth, the *sui generis* and indefinable truth concept. Furthermore, we can do justice to both of the apparently conflicting epistemic and realist intuitions, by adopting a version of Frege's realist account of truth, according to which ontic truth is what is indicated by any sentence to which the semantic concept truly applies. The epistemic aspects of truth are then accounted for by recognising that it is in virtue of the thought it expresses that a sentence indicates the True.

ii. Semantic Truth

Tarski himself claimed that the ordinary concept of truth is ambiguous and clarified that what he was offering was a definition of the semantic concept. Semantics, he characterized as 'a discipline which, speaking loosely, *deals with certain relations between expressions of a language and the objects* (or "states of affairs") *"referred to" by those expressions*' (Tarski 1944, 345). More generally, we can say that semantics deals with relations between the expressions of a language and the entities, whatever they are, that are indicated by those expressions. I prefer this more general characterization because it allows for the possibility that predicates indicate functions, not objects, and, as Frege claimed, that sentences indicate the True or the False, rather than states of affairs, so it does not presuppose what kinds of entity will be assigned to the expressions of a language, in a fully developed semantics.²

To clarify, semantic truth, as Tarski defines it, is a property of sentences. 'True' is a metalinguistic predicate that applies to sentences when they stand in a certain relation to something else. Since Tarski is offering a recipe for deriving a definition of truth for a formal language, the sentences of which can be recursively specified, he is able to build up a recursive definition of truth for such languages. He assumes that there is no context

² Adopting the practice of translating *bedeuten* and its cognates with 'to indicate' and its cognates, as recently recommended by (Green 2020).

sensitivity with regard to truth and that the simple sentences of the language, on which the recursive definition depends, are either true or not true. This might make one wonder whether this does not already provide a reason for thinking that his method of showing how one can construct a definition of truth for a formal language cannot be applicable to the wider concept of truth, applicable to natural languages, that is assumed by Frege. In natural languages it is not sentence types that are true or false. Rather, particular utterances or inscriptions of sentences, in the context in which they are used, can be assessed for truth or falsity. This has led some to claim that it is not sentences that are the bearers of truth or falsity, but that truth or falsity attaches to what is said by an utterance, sometimes called the proposition or thought expressed by it. Indeed, this is a view that Frege himself appears to endorse in at least one place (Frege 1997c, 327; Künné 2008, 6–7).

The interpretation of the circularity argument developed here requires that Frege spoke inaccurately when he said that it is thoughts that are true or false. All he needed to say was that an utterance of a sentence is true or false in virtue of the thought it expresses. This thought will depend on the senses of the words used and features of the context. Utterances or inscriptions of sentences are then the bearers of truth or falsity, in virtue of the senses of the words used and the context in which they are uttered. One advantage of this move is that it allows us to treat senses, not as obscure abstract objects that themselves have truth properties, but rather as those properties of words which, in certain circumstances, result in the utterances made up of those words, having the further property of being true or false. Here, and in what follows, I am using the term ‘property’ in the sense of ‘causal power’, and not identifying properties, thought of as causal powers, with the semantic values of predicate expressions. What it is for a word, such as ‘mermaid’ or ‘tomcat’, to have a particular sense, in a language, is for it to have the property of bringing to the minds of those speakers of the language, who understand these words, certain features that things must have in order for it to

be true of them that they are mermaids or tomcats. Many philosophers have therefore identified senses, not with the causal powers of words to stimulate such recognitional capacities, but with the subjective sensation of having such a capacity, the ‘idea’ in the mind. Frege clearly resisted any such move. By identifying senses with properties of words, we remain faithful to his anti-psychologism, while also respecting the intuitive connection between understanding an utterance and the consciousness of knowing what would have to be the case for that utterance to be true. By interpreting Frege in this way, as more consistently accepting that truth bearers are utterances or inscriptions of sentences, rather than thoughts, the validity of his argument for the indefinability of truth, as it pertains to ontic truth, will become apparent.³

Famously, Tarski proceeded to lay down as a criterion of adequacy for a definition of the semantic concept of truth, that it should deliver equivalences of the form,

³ An anonymous comment on an earlier draft of this paper was, ‘If a sentence is true in virtue of expressing a thought, the thought itself must have a semantic property’. Suppose we say, ‘A cheese is smelly in virtue of emitting a gas.’ This implies that the gas must be smelly, but it does not detract from the fact that the cheese has the property of being smelly, it just explains how it manages to have this property. Similarly, if the sentence is true in virtue of expressing a thought, then the thought itself must be true, but, in this case, the thought’s being true amounts to no more than the sentences which express it being true. Although, in the case of the gas, we can perhaps identify the gas, capture it and explain why it is smelly, in the case of the thought, it is not an independently existing stuff, but merely a way of speaking of a property that diverse sentences share. It is important to the argument offered here that the truth bearers in question are meaningful sentences, not thoughts or propositions, as assumed in Soame’s critique of Frege’s argument (Soames 1998, 21–9).

(T) *X is true if, and only if, p.*

In these equivalences, he says, ‘p’ is replaced by any sentence of the language to which the word “*true*” refers, and ‘X’ replaced by a name of this sentence (Tarski 1944, 344). It is worth noticing that Tarski (or his translator) is here using ‘refers’ in an odd fashion, since one would not usually say that ‘true’ refers to a sentence. What I take him to intend is that ‘p’ is replaced by an expression of the language, to which the concept of truth can appropriately be applied, and X is replaced by a name of this sentence. Which expressions of a language are appropriately deemed to be true or false might have first to be specified syntactically, as a supplement. Tarski then points out that, if one wishes to avoid the semantic paradoxes, truth can only be adequately defined for a formal language in which a clear distinction is maintained between the object language and meta-language. We need not go into the details of his method for generating (T) sentences. Suffice to say that ‘... is true’ is defined in terms of another notion, which he calls ‘satisfaction’, but which is closely related to ‘... being true of ...’. Objects satisfy sentential functions. Thus, Melbourne satisfies ‘... is in Australia’ if it is true of Melbourne that it is in Australia. To avoid the circularity implicit here, Tarski’s method simply specifies which objects satisfy the simplest sentential functions and then offers a recursive procedure for constructing the satisfaction conditions of more complex functions (Tarski 1944, 353). But it is questionable whether this procedure does genuinely avoid circularity. ‘Truth’ is defined in terms of ‘satisfaction’, but if we specify that the objects Paris and Moscow satisfy the primitive sentential function, ‘... is in Australia’ the extension of ‘... is true’ will be wrong, given the current meanings of these expressions in English. It will only be correct if the sentential function is true of the objects indicated. While Tarski defines truth in terms of satisfaction, in the *Grundgesetze* Frege effectively defines satisfaction in terms of truth. This, according to Dirk Greimann, explains why, ‘from a Fregean point of view, Tarski’s definition of truth in terms of satisfaction’ is entirely circular,

thus succumbing to the failure which Frege claimed that any attempted definition must face (Greimann 2020, 222; Hornsby 1997, 6; Greimann 2000). In a vein more charitable to Tarski, I argue that Tarski's definition is not entirely circular. Semantic truth is defined by him in terms of ontic truth, but any attempt to define ontic truth would be circular. Thus, Hornsby's suggestion that Frege's argument implies what she calls the 'identity theory' of truth fails, since semantic truth is not identical with ontic truth.

Those who argue that Tarski's definition is not circular note that the inference from the truth of, 'Sea water is salty' to the truth of "'Sea water is salty" is true' is immediate, so that the assertion that the sentence is true does not take us beyond the assertion of the sentence (Dummett 1973, 443; Soames 1998, 21–9). Since the content or thought 'Sea water is salty' does not explicitly contain the predicate 'is true' it appears that a non-circular definition has been offered. Because Frege distinguishes within the sentence a predicative and an assertoric element, he does not see things in this way. He divides the content 'Sea water is salty' into the thought 'Sea water's being salty' and the potential judgement that this thought is true. The thought is the thought that things are a certain way. The judgement is the judgement that they are that way. Things being a certain way is what I call ontic truth. So, despite superficial appearances, the thought, 'Sea water is salty' involves ontic truth, in terms of which semantic truth is defined.

iii. Frege's argument

Frege's argument is framed as a critique of any attempt to characterize truth as correspondence but can be generalized to apply to any attempted definition of truth (Ricketts & Levine, 1996; Sluga, 2007, pp. 4–5). He says,

But could we not maintain that there is truth when there is correspondence in a certain respect? But which respect? For in that case what ought we to do in order to decide

whether something is true? We should have to inquire whether it is true whether an idea and a reality, say, corresponded in the specified respect. And then we should be confronted by a question of the same kind and the game could begin again (Frege, 1997c, 327).

Schematically, we can set this out as follows,

Suppose that we claim that,

1) 'p is true' is equivalent to 'the relation C holds between p and Tmp'

or

1') p is true if, and only if, C holds between p and Tmp

where Tmp is whatever p is taken to stand in the correspondence relation to. We could call it, the truth maker for p. This is that entity, whatever it is, in virtue of which p is true, or to which it corresponds. Now the question will arise, is it true that the relation C holds between p and Tmp? Substituting in 1') gives,

2) 'C holds between p and Tmp' is true if and only if, C holds between, C holds between p and Tmp, and Tm(C holds between p and Tmp).

More perspicuously, replacing, 'C holds between p and Tmp' with P, we have,

2') P is true if, and only if C holds between P and TmP.

We thus either generate an infinite regress, or our definition is circular because, at some point, we simply assume that we know what it is for it to be true that the correspondence relation holds between the sentence and whatever makes it true.⁴ Frege treats his argument as generalizable. For, for any proffered definition of truth of the form,

⁴ There has been some rather pointless debate as to whether Frege is claiming that any definition of truth involves circular reasoning, or an infinite regress. As interpreted here, he is

“p” is true iff p stands in R to Tp,

where Tp is whatever is taken to make p true, the question will arise, ‘is it true that p stands in R to Tp’, and this itself will, according to the account, only be the case if a further relation obtains between ‘p stands in R to Tp’ and T(p stands in R to Tp). His point is simply, that to assert that a relation holds between an expression and some entity that makes that expression true, is to assert that it is the case that this relation holds, and so to presuppose the concept of truth.

We can apply this insight to Tarski’s truth definition. Each (T) sentence provides a partial definition of truth, for a single sentence of a language, in terms of an equivalence relation.

3) ‘Melbourne is in Australia’ is true iff Melbourne is in Australia.

We can spell this out as the relation of ‘being made true by’, holding between the sentence and what that sentence says. There are, in fact, two ways of identifying circularity here. First, we are assuming that we know what it is for it to be the case that ‘Melbourne is in Australia’ stands in the relation of being made true by Melbourne’s being in Australia. Secondly, as Greimann observed, we have assumed a grasp of its being true of Melbourne that it is in Australia, the existing of the circumstance that makes the sentence true. We have assumed the grasp of a relation’s existing and of its being true of something that it is such and such. We have defined semantic truth in terms of the more fundamental concept, ‘ontic truth’, which is closely related to the ‘being true of’ assumed in the concept of satisfaction, used by Tarski in his truth definition.

arguing that a potential infinite regress can only be halted by assuming that one grasps the concept, ‘being true’, to be defined, and so by offering a circular account.

In a recent discussion of Frege's indefinability argument Greimann asks what it is that is indefinable according to Frege, a question that he sets up by asking after the *definiendum* that purportedly can't be defined (Greimann 2020). I have assumed that the *definiendum* is the metalinguistic predicate, 'is true' and that Frege's claim is that any definition of this predicate will assume a grasp of what it is for something to be the case, which can't be further defined. The situation is that which is evident in Frege's definition of the horizontal in *Grundgesetze*. He defines — as a sign that expresses the concept of 'being true'; ' — Δ is the True when Δ is the True, and is the False when Δ is not the True' (Frege 2013, §5). The concept 'being true' is explained in terms of what the sign ' Δ ' indicates, when it indicates the True. So, the True corresponds to what is the case, or ontic truth in my analysis above. Greimann objects to this interpretation since, interpreted thus, the definition of semantic truth is not circular (Greimann 2020, 75). He concludes that, as he had earlier argued, the *definiendum* in question is the judgement stroke (Greimann 2020, 86; Greimann 2015). Indeed, Frege does say that judgement is 'quite peculiar and incomparable' (Frege 1997b, 159). It is characterised by him as 'a transition from a thought to a truth-value.'. Judgement is explained in terms of a thought being recognised as indicating either the True or the False, or as a movement from thought to the recognition of what is indicated by it. The horizontal defines the concept of truth in terms of the True, the judgement stroke marks the transition from considering whether the concept applies to a content, to judging that it does. Certainly, judgement is recognition of a thought's indicating the True, so judgement inherits an element of indefinability from the indefinability of the True. But it is the True, which I have been calling, 'what is the case' which is indefinable. This thesis emerges in the transition from the logic of the *Begriffsschrift* to that of the *Grundgesetze* and Frege's reasons for making it become evident in his objections to Wittgenstein's picture theory and the latter's attempt to counter those objections.

iv. Aristotle, Frege, and Wittgenstein

Any philosophical observation worth its salt has historical antecedents. Famously, Aristotle claimed that ‘To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true’ (Aristotle 1941, 1011b25-27). This sentence is quoted by Tarski and claimed by him to amount to a statement of the correspondence theory of truth (Tarski 1944, 343). In Aristotle, as in Tarski’s definition, there is a transition from saying (saying truly or uttering a true sentence) to being. To speak truly is to *say* of what is that it *is*. Despite objecting to the correspondence reading of it, Frege accepts this Aristotelian orientation (Lopes dos Santos 2020, 123). We can explain what it is to speak truly, but in doing so we assume that we know what it is for things to be one way rather than another. Ultimately, ‘we are compelled to make judgements by our own nature and by external circumstances’ (Frege 2013, xvii). Judging is recognising what is, being as it is. It is this notion, things being a certain way, that I call ontic truth, and it is ontic truth that I claim Frege had in mind, when he said that truth is *sui generis* and indefinable. The True is the ontic truth that is indicated by any true sentence.

Wittgenstein, I argue, also implicitly recognised this distinction, when he claimed that ‘the sentence shows how things stand with it, when it is true. And it says, that it stands thus with it’ (Wittgenstein 1961, 4.022). In what follows I read the passages in the *Tractatus* that result in this conclusion as implicitly responding to Frege’s critique of the correspondence theory. The actual relationship between the genesis of Wittgenstein’s views and Frege’s discussion of correspondence in the essay, ‘Thought’ is somewhat obscure. After Wittgenstein had sent Frege a copy of the *Tractatus* during 1917–18, Frege mentioned this essay in a letter to Wittgenstein, commenting that he, Frege, would never have shared Wittgenstein’s thoughts relating to what is the case, to facts, and object-states (‘was der Fall ist’, ‘die Tatsache’, and ‘der Sachverhalt’) had he not read Wittgenstein’s work, and

expressing his incapacity to understand exactly what Wittgenstein intended to distinguish by using these three different expressions, which are in German, as in English, more or less synonymous (Schmitt 2003, 25).⁵ So, it would seem that Frege saw the essay ‘Thought’ as containing material relevant to explaining why he could not agree with the picture theory developed by Wittgenstein (Perrin and Narboux 2020, 35). Frege and Wittgenstein had met earlier, and Wittgenstein had impressed the older man as a serious thinker, so it is reasonable to also see Wittgenstein’s ideas as an attempt to develop a version of the correspondence theory that is immune to the objections articulated by Frege.

Frege’s objection to correspondence truth assumes that the sentence is something in the world, so that the relation that is purported to hold between the sentence and whatever the sentence corresponds to, is also a worldly relation. Thus, the question can always arise whether this relation holds. Wittgenstein, similarly, treats sentences as part of the furniture of the world. He says, 1.1, ‘The world is a totality of facts, not things’ [Die Welt ist die Gesamtheit der Tatsachen, nicht der Dinge] and 3.14, ‘The sentencesign is a fact’ [Die Satzzeichen ist eine Tatsache].⁶ Taken together these two claims imply that sentencesigns are part of the world. He also says, 3.11, ‘We use the perceptible sign (spoken- or written-sign

⁵ Although the standard translation of ‘Sachverhalt’ is ‘state of affairs’ the translation, ‘object-states’ suggested by Schmitt does seem to capture Wittgenstein’s intentions better (Schmitt 2003).

⁶ Although the standard translation of the *Tractatus* renders ‘Satz’ as ‘proposition’ this appears to me to be unfortunate, since ‘proposition’ is now more often used for the meaning of a sentence, not the sentence itself. In 3.1-3.144 Wittgenstein is clearly using ‘Satz’ as Frege, whom he mentions (3.143), would have done, as the sensible expression of a thought (3.1).

etc.) of the sentence as the projection of the possible situation' [Wir benützen das sinnlich wahrnehmbare Zeichen (Laut- oder Schriftzeichen etc.) des Satzes als Projektion der möglichen Sachlage], reinforcing the idea that sentences are signs that are part of the world. Nevertheless, although he accepts, with Frege, that sentences are part of the furniture of the world, he suggests that Frege was misled when he took sentences to be complex names (3.143). Wittgenstein insists on there being a deep logical distinction between sentences and names. To develop his claim that 'We make for ourselves pictures of facts' [Wir machen uns Bilder der Tatsachen], he turns sentences into articulated entities in which the names (which he calls simple signs) are configured in such a way as to correspond with the configuration of the objects in the situation pictured (3.21). So, by 4.01 he can say, 'The sentence is a picture of reality' [Der Satz ist ein Bild der Wirklichkeit]. It is at this point that he introduces the language of showing, saying, 4.022, 'The sentence shows its sense. The sentence shows how things stand with it, when it is true. And it says, that it stands thus with it' [Der Satz zeigt seinen Sinn. Der Satz zeigt, wie es sich verhält, wenn er wahr ist. Und er sagt dass es sich so verhält]. So, we come to the conclusion, 4.024, 'To understand a sentence means to know what is the case when it is true' [Einen Satz verstehen, heißt, wissen was der Fall ist, wenn er wahr ist]. A sentence thus shows what has to be the case in order for it to be true.

Correspondence, on this view, is something that shows itself, in virtue of our understanding the sentence. The question of whether it is true that the picturing relation holds between the sentence and the rest of reality is pre-empted by the claim that the sentence shows how things must be for it to be true. The regress that Frege identifies stops. It stops, however, with the assumption that one can simply recognise what has to be the case in order for the sentence to be true. But this ontic sense of truth, truth that shows itself, remains assumed and unexplained. The idea that being 'shows' or 'reveals' the truth will have to be interpreted broadly. 'The cheese is smelly' may be true, but the smelliness of the cheese is

not something that one sees, one smells it. Nevertheless, if the sentence is true, then the world, or being, or what is, does, in the region of the cheese, reveal itself to be a certain way, at least to those creatures or instruments that have the capacity to detect this smelly property.⁷ ‘The wool is soft’ is true in virtue of a property that can be felt rather than seen. It may be questioned whether a truth such as ‘ $2+3=5$ ’ can ‘show’ or ‘reveal’ itself. Yet, in the sense intended, it does so. For existence is found to be such that everywhere, where two membered collections of things are combined with three membered collections of things, the result is a five membered collection. The sentences that are true point to the way things are.

v. Benefits of distinguishing semantic from ontic truth

Recognising the distinction between semantic and ontic truth explains the tendency for accounts of truth to fall into two kinds, epistemic and realist. Realists insist that what is the case is independent of us. Being is and is something to be explored. Anti-realists suggest that the semantic predicate ‘is true’ has the same effective extension as ‘is [ideally] assertible’ so that it has a certain relativity to our recognitional capacities.⁸ The first, I claim, have in mind ‘ontic’ truth, the second ‘semantic’ truth, so no genuine dispute emerges. Nevertheless, I hope to show that distinguishing the two notions helps to illuminate a middle way developed by Frege, so that one can accommodate what is correct in the realist intuitions without being forced to adopt classical logic.

⁷ Those familiar with Martin Heidegger’s *Being and Time* may recognize a similarity to his notion of truth as the revealing of being (Heidegger 1962, I.6.44(a), 260).

⁸ The anti-realist allows that a gap can open up between truth and assertibility, but identifies truth with ideal or justified assertibility, in the perfected theory of the world.

The way in which the realist and the anti-realist end up arguing at cross purposes, in virtue of their emphasizing different notions of truth, is particularly clear in Michael Devitt's response to Michael Dummett's anti-realism (Devitt 1983). Devitt identifies the locus of Dummett's argument as residing in the nature of the truth conditions of sentences. He attributes to Dummett the premise that,

A. The Realism dispute is the dispute about whether statements have realist (evidence-transcendent) or only verificationist truth conditions. (Devitt 1983, 74)

In opposition to this he characterizes Realism as the doctrine,

R. Common-sense physical entities objectively exist independently of the mental. (Devitt 1983, 76)

Devitt is correct to recognize that, as Dummett is thinking of it, truth is a semantic notion. It is because he assumes that what we are interested in is the semantic concept that Dummett is able to reject Frege's argument for the indefinability of truth so easily (Dummett 1973, 443). As Devitt assumes, and Geimann also points out, we can determine whether sea water is salty without considering any semantic properties of sentences (Greimann 2020, 75). Dummett concludes that Frege has failed to show that any definition of the semantic concept will be circular. Yet, as has been argued, since Frege is committed to understanding the truth that sea water is salty as equivalent to, 'Sea water's being salty=the True,' truth, at least ontic truth, is presupposed.⁹ Although he rejects the circularity argument, Dummett argues that Tarski's

⁹ Dummett deems Frege's claim that true sentences are names of the True to be a 'gratuitous blunder' (Dummett 1973, 184). His dismissal of Frege's idea that true sentences indicate the True has been shown to result from a failure to understand Frege's logical notation (Landini 2012, 29–33; Green 2015). His easy dismissal of Frege's circularity argument flows from this failure.

biconditionals are uninformative and asks for a substantive account of the meaning of ‘is true’ (Dummett 1958–59). It is because he is interested in the application conditions of the predicate, ‘... is true’, as it is used by speakers of a language, that he is led towards anti-realism. For speakers, when they understand a sentence, must be able to recognize, in principle, the circumstances under which the sentence would be true, and this results in the identification of truth with ideal verifiability. Devitt is simply latching on to a different notion of truth, when he insists that truth involves existence and is not a semantic notion.

In effect, Devitt recognises this, for he moves from R, which captures his realist ontology, to a characterization of what he calls, realist truth, which has a good deal in common with Wittgenstein’s *Tractarian* account. Truth, he claims is dependent on ‘genuine reference relations between words and objective reality’, which he captures thus,

RT. Physical statements are true or false in virtue of: (i) their objective structure; (ii) the objective referential relations between their parts and reality; and (iii) the objective nature of that reality. (Devitt 1983, 77)

One could describe this as Devitt’s realist characterization of semantic truth, since it attempts to explain the truth or falsity of statements (at least those about the physical world) in terms of the existence of features of reality and the existence of referential relations between signs and those features of reality. Devitt claims that this definition is neutral with regard to the ontological status of reality (‘*it says nothing about the nature of the reality that makes those statements true or false*’) and so, he concludes, Dummett’s premise A is false (Devitt 1983, 77). He insists that no conclusions relating to ontological matters can follow from considerations of semantic truth.

This conclusion is far too quick. Seeing why illuminates Frege’s reasons for thinking that a realist, as he certainly was, should eschew attempts to characterize semantic truth in terms of the existence of a relation between the objective structure of statements and the

objective structure of reality. For, suppose we consider the ‘objective’ structure of statements. I take ‘a statement’ to be what is said by an assertoric utterance of a sentence (written or spoken) in a context. The structure of a statement presumably depends on the structure of the sentence (possibly as interpreted in the context of utterance) which is used to make it. Now, it has to be admitted that the objectivity of the structure of a sentence (or the statement it makes) is rather different from the object existence of common-sense material entities. Sentence structures are dependent on human decisions to use words in certain ways. Even if we are physicalists, we have to acknowledge that sentence structures differ between languages. The connections that are forged between the structures of the sentences of a language, and the perceptible or imperceptible, non-linguistic structures that are associated, in the minds of competent speakers, with utterances of those sentences, are very much mind and human dependent. ‘Rose arose’ can say in one context, that a girl called ‘Rose’ got up, and while ‘Arose the rose’ might equally say this, in a different context it will be an imperative that demands that a flower be sprayed. The structure of sentences is only objective, relative to a set of human conventions, which determine how the sounds or marks out of which they are constituted should be interpreted. The ‘objective referential relations’ between the parts of sentences and reality are equally relative to a language, time, and sets of human intentions. We can use ‘Rose’ to refer to a girl, a red setter, a yacht, or many other things. We can use ‘arose’ to talk about the movement of suns, of moons, of people, and sentiments, as well as the activity of spraying, the elevation of sound, the improvement of a reputation. To know which bit of the objectively existing reality is relevant to the truth or falsity of a sentence that is uttered, one has to know, or guess, a whole lot about the use that can be made of the words uttered, and their conventional or perhaps metaphorical meanings. The features of reality that are pertinent don’t stand out independently of the meanings that are recognizably intended in a communicative situation. Observations such as these can

easily result in the conclusion that the reality with regard to which we are capable of making judgements is a projection of the structure of the language in which we express those judgements. They lead naturally towards nominalism, linguistic relativity, and other forms of anti-realism.

Dummett is no old-fashioned idealist. He accepts the core intuition behind RT, that is, that sentences are things of this world and that if a statement made by a sentence is true, then there must be some ‘feature of objective reality’ in virtue of which it is true (Dummett 1976, 89).¹⁰ There must be something in the world that verifies or falsifies the sentence. He then argues that there are a number of sentences of the form, $p \vee \neg p$ where, because we do not have either a verification or falsification of p , there is no reason to believe that there is an ‘objective feature of reality’ which makes either p or $\neg p$ true, and so we have no reason to be confident in the truth of excluded middle or in the principle of bivalence. Among the sentences that pose problems for bivalence are undecidable statements in mathematics, many future tense contingents, a large class of counter-factual conditionals, and possibly statements about the past. He therefore proposes a form of anti-realism, somewhat different from traditional idealism, which involves abstaining from accepting bivalence. Using the distinction between ontic and semantic truth, one can characterize his diagnosis of the unthinking acceptance of bivalence and classical logic as a fault that involves a realist projection, from presuppositions based in thinking about being, onto intuitions concerning semantic truth. This projection goes in the opposite direction to that assumed by the nominalist. The realist accepts that things either are or are not a certain way. Properties either are or are not instantiated at places. Being is a plenum. There are no gaps in reality. If there is

¹⁰ Hornsby rightly identifies this commitment to correspondence truth as at the origins of Dummett and Wright’s anti-realism, (Hornsby 1997).

doubt as to whether or not a predicate applies, this will be because the meanings of the words used are imprecise or our knowledge is defective. Things are, and are determinately one way or another, independently of us. But from these intuitions concerning ontic truth, the realist illegitimately concludes that it holds of semantic truth, a property of sentences, that every well-formed, meaningful statement is either true or false. But this, Dummett argues, is a realist illusion.

His early paper 'Truth' argued that the sentences of the Tarskian T-schema do not offer a substantive concept of truth, so he attempted to give substance to the concept of truth, by exploring the circumstances in which we are justified in applying it (Dummett 1958–59). Just as the specification,

“... is a volcano” is true of an object if and only if the object is a volcano’

is empty unless one demonstrates, or gives an account of, how one is to determine of an object whether or not it is a volcano, Dummett argued that the T sentences are empty, unless one specifies how one determines whether or not a sentence is true. Since one determines whether a sentence is true or false by verifying or falsifying it, his suggested explication of the semantic predicate, ‘is true’ makes it relative to our capacity to recognize truth, and results in the conclusion that what is, comes into being as we probe, making truth epistemic. This was the quasi-idealist conclusion that Devitt could not stomach. One can therefore characterize Dummett’s position as being that bivalence, a thesis that pertains to semantic truth, is not justified by RT, according to which semantic truth is a relationship between sentences and an independently existing reality.

The distinction between semantic and ontic truth also serves to bring out the ambiguity in principles of truth making, such as ‘every truth has a truth-maker’. This looks highly plausible if we have semantic truth in mind. It expresses the same intuition as that captured in RT. Semantic truth is a relation between sentences and things in the world. It is a relation

between language and being. But if we have ontic truth in mind, the idea that every truth has a truth maker is highly problematic. The ontic correlate of the truth making relation that pertains for semantic truth has been called ‘grounding’. But grounding does not have the same intuitive plausibility as semantic truth making. Why should the way things are always depend on something else? What lies behind the intuition that the flexibility of the rubber band, for instance, is made true by the physical properties of the rubber molecules out of which the band is made? What is the ‘made true by relation’ here? Why not say that calling the rubber band flexible, and describing the properties of its molecules, are just two different ways of describing the same feature of reality, one in terms of macro-properties, the other in terms of micro-properties? It may be that the micro-properties help explain the macro-properties, but neither represents the other, neither is in any clear sense more ontologically fundamental.

vi. Frege’s non-correspondence account of truth

In the previous section we saw how, even within a realist ontology, the correspondence idea results, on the one hand, in a drift towards anti-realism, while, on the other hand, this anti-realism tends to be countered by realists, with an illegitimate projection of intuitions concerning ontic truth onto assumptions relating to semantic truth. In this last section I argue that Frege’s mature, non-correspondence understanding of the True, as what is indicated by all true sentences, offers a way of preserving the bivalent assumptions that result from thinking of truth in the ontic mode, plus the anti-bivalent intuitions that result from thinking about truth in the semantic mode, without these latter intuitions having any troubling ontological consequences.

Frege’s mature, non-correspondence truth concept is implicit in the *Grundgesetze* and in the articles that he wrote clarifying his ideas for a more general, philosophical audience.

The concept of being true, as we saw, is captured by the horizontal, which takes any truth to the True and any non-truth to the False. The False is explained as failure to indicate the True, the True is simple and unanalysable. It is easiest to see how Frege reached this conclusion by contrasting his developed views with those of the *Begriffsschrift*. In his earlier work his logical system had just one predicate, ‘...is a fact’ which applied to terms— nominalized sentences such as ‘the violent death of Caesar in Rome’ or ‘5’s being less than 7’ (Frege 1970, 12–13).¹¹ He thought of this predicate as applying to contents and assumed that contents are structured entities and are what sentences are about. But his attempts to clarify his ideas resulted in his ultimately distinguishing, within the notion of the content of a sentence, thought and truth value. Although we don’t have details of the reasoning that actually motivated him, his comments to Wittgenstein are suggestive.¹² He had struggled with facts and decided that they were confused beasts. He tried to convince Wittgenstein of this by criticizing the opening sentences of the *Tractatus*. Wittgenstein claimed that, 2. ‘What is the case, the fact, is the obtaining of object-states’ [Was der Fall ist, die Tatsache, ist das Bestehen von Sachverhalten]. Frege asks, why not just say, every fact is an object state? Are there object states that do not obtain? Is every combination of objects an object-state? In response to 2.011, which says that it is essential to things that they can be components of object states, Frege asks whether this does not imply that things are also components of facts, and if so, are not things part of the world after all? If Vesuvius is a component of an object

¹¹ Spinney has suggested that it is only late in his career that Frege adopted the view that ‘sentences were a species of complex proper name’ (Spinney 2018). But in fact, in both his *Begriffsschrift* and *Grundgesetze* Frege’s ‘sentences’ are a species of complex proper name, in the first instance they name contents, in the second, truth values.

¹² See also (Beaney 2007).

state, then are the components of Vesuvius part of the fact? But while it is a fact that Vesuvius is a volcano, it is very strange to think of the lava that Vesuvius contains, as part of this fact (Schmitt 2003, 23–4). Frege had recognized that, while sentences and the contents that they express, are constructed out of elements, it is a fallacy to think of the truth of a thought as involving correspondence with something that mirrors in its structure the way that sentences are constructed out of elements. Rather, ‘judgements are distinction of parts within truth values’ (Frege 1997b, 159). The thought expressed by a sentence, if true, indicates the True, but each thought does so by distinguishing within the True different elements. This idea, which has been vigorously resisted by Wittgenstein and Dummett, is illuminated if we understand ‘the True’ to be capturing the ontological aspect of truth. That is, if we understand Frege as claiming that all true sentences have one thing in common, they indicate what is, though they do this in different ways.

Frege’s path to this conclusion can be easily understood through the consideration of complex singular terms. ‘3+4’ has a complex sense, made up of the component senses of ‘3’, ‘+’, and ‘4’. Equally, ‘8-1’ has a complex sense, made up of the senses of ‘8’, ‘-’, and ‘1’. While ‘3+4’ and ‘8-1’ both indicate the same number, 7. Yet, 7 is not a part of the sense of either of these expressions, rather, it is the value, in the first instance, of the plus function applied to 3 and 4, and in the second, of the minus function applied to 8 and 1. Sentences also have senses which are constructed out of the senses of their components. The sense of ‘Vesuvius is a volcano’ is made up of the senses of ‘Vesuvius’, ‘is’, and ‘a volcano’. This sentence says something true, it indicates the True, but Frege says, truth is not a component part of its sense (Frege 1980, 163). Rather, truth is the value which is the result of applying the function ‘being a volcano’ to Vesuvius.

The laws of truth, according to Frege, are the fundamental laws of being, or of what is the case, which he calls, ‘the True’. They apply in all fields. If we have two sentences which

indicate what is, then their conjunction will also indicate what is. If we have a sentence that indicates what is, then its disjunction with any sentence will still indicate what is. A sentence with a clear sense will either indicate what is or fail to do so. And there are certain relations between pairs of sentences such that, in one case, if one of them indicates what is, the other must fail to do so, or in another, if one indicates what is the case, then so must the other. All that is important for a large subsection of logical reasoning is the truth or lack of truth of sentences. That is, whether or not they indicate the True. If one thinks of truth ontologically, and introduces into one's language a sign for not, which transforms a sentence that indicates the True into one that fails to do so, while transforming a sentence that fails to indicate truth into one that does, then one has a basic bivalent logic.

Frege's way of thinking about this is a little unusual. Because he takes the True to be an object, he defines the horizontal, which captures the concept of being true, for all objects (Frege 2013, §5; Cook 2013, A5–6). He allows, for instance,

— $5 =$ the False

He ends up with a bivalent logic, since negation is a function that takes the False to the True.

— $\neg 5 =$ the True

One can think of this as saying 5's not being the True is the True. It may appear that his comments in §10 of the *Grundgesetze* suggest that a somewhat different meaning attaches to the horizontal. There he says that 'the function $\xi = (\xi = \xi)$ has the same value as the function — ξ for every argument' (Frege 2013, §10). To non-Fregean eyes $5 = (5 = 5)$ may look as though it expresses a truth, not a falsehood. One must remember, however, that according to Frege, $(5 = 5)$ indicates the True, so $5 = (5 = 5)$ does not indicate the True. Frege here identifies the True with $\hat{e}(\text{---}e)$ the extension of the concept being true and the False with the extension of the concept not being self-identical $\hat{e}(e = (x \neq x))$. So, I suggest that we interpret the True as the totality of what is, while the False is nothing. Falsity as a property of sentences, on this

view, is failure to indicate what is, equally, it is indicating nothing. Interestingly, this way of reading the True and the False is in accord with the tradition of using 1 and 0 as the two truth values. The True is the Parmenidean One, the False, Nothing.

vii. The True

Frege claims that truth is *sui generis* and indefinable and, faithful to this insight, he never explains what the True is. Above, I have identified the True with the totality of what is the case or with being, in a sense, being unfaithful to Frege, while at the same time assuming that ‘being the case’ and ‘being’ are so fundamental that they are indefinable. But this identification brings new questions in its wake. Frege’s logic accepts an identity between ordinary singular terms such as ‘Julius Caesar’ and nominalized sentences such as ‘the violent death of Caesar in Rome’, which are both referring expressions that can flank the identity sign. ‘The violent death of Caesar in Rome’ is, in effect, turned into a non-asserted sentence by the insertion of the horizontal.

— the violent death of Caesar in Rome,

This says, ‘the violent death of Caesar in Rome’s being true’, while to get an assertion, the vertical judgement stroke has to be added.

|— the violent death of Caesar in Rome

In Frege’s logic the assertoric function of the copula in ordinary language sentences is assigned to the vertical, and it is only when it is attached that we get ‘The violent death of Caesar in Rome is true.’

But, if one interprets the True as I have suggested, Frege’s assumption that ordinary singular terms don’t indicate the True can seem like an inconsistency. Why not interpret,

— Julius Caesar

As a way of indicating the True? ‘Julius Caesar’s being true’ is a way of considering whether Julius Caesar exists.

|— Julius Caesar

Would then say, ‘Julius Caesar is true’, equally, ‘Julius Caesar exists’.

That Frege did not adopt this convention suggests that he did not fully follow through the idea that sentences are names. Although they are treated as terms, they are a special kind of term, one that has the right kind of structure to be either true or not true, to indicate something that might either be or not be the case. In order to mark this, we should think of them not so much as names of events, along the lines of ‘the violent death of Caesar in Rome’, as nominalised sentences, ‘Caesar’s being violently killed in Rome’, so that,

— Caesar’s being violently killed in Rome

Says, ‘Caesar’s being violently killed in Rome being true’. It’s being true is its being the case. Ordinary singular terms can’t be the case, although their indicating something that is, that is, referring, is analogous to the relation that can hold between a sentential term and reality, that is, being true.

A number of advantages follow from this way of thinking. These are that one keeps the intuition that semantic truth is a relation between language and being, but one is not saddled with negative facts. ‘It is not the case that Socrates was a woman’, if it is true, indicates what is the case, just as much as ‘Socrates was a man’ does, but they do so in different ways, in virtue of the different thoughts expressed. Every true sentence is made true by the totality of what is, but different sentences are made true in different ways, depending on the thought expressed. Another advantage is that we capture the source of the intuition that the semantic notion of truth should be bivalent. Sentences either succeed or fail to succeed in indicating what is.

Despite this, the picture offers a natural way in which one can be an ontological realist, without privileging bivalence. Frege notes that the transition from thought to truth value is analogous to that from sense to reference. The relationship between truth—thought of as a property of sentences—and ontic truth is analogous to that between reference—thought of as a property of singular terms—and existence. “‘Santa Claus’ refers’ attributes the property of referring to a name. The name only has this property if Santa Claus exists. But while referring is a property of names, existing is not a property of Santa Claus, even if Santa Claus does exist. Similarly, “‘Santa Claus exists’ is true’ attributes the property of being true to a sentence. The sentence only has this property if Santa Claus exists. But while (semantically) being true is a property of sentences, (ontologically) being true is not a property of Santa Claus’s existing, even if Santa Claus exists. In both cases we have semantic properties (properties of words) that correspond to no properties of things. Rather, the semantic properties of words depend on the relationship between the words and the world. That is to say, what exists, in the case of names, and what is the case, in the case of sentences.

Although the identification of falsity with failure to pick out what is the case captures the origins of our bivalent intuitions, there is no need, given this picture, to insist that the semantic concept of truth must conform to the principle of bivalence. Truth thought of as indicating what is the case, is compatible with the recognition that there are different ways in which a sentence may fail to pick out the True. Sometimes an object is indicated, and it is claimed to fall under a concept which does not apply to it. Sometimes, a singular term fails to pick out an object. In the first case, the negation of the sentence will clearly be false, in the second, this is not so clearly the case. Considerations such as these have led to the development of three valued logics. These are completely compatible with the realist assumption that the world of common-sense material objects is as it is independently of us, so long as we recognize that the semantic concept of truth applies to sentences. Sentences can

fail to indicate what is in rather different ways, consequently, to make negation behave nicely, we may want to recognize different forms of falsity. This is quite compatible with a commitment to the mind independence of being. Similarly, we might prefer a semantic concept that allows for vagueness in our thought, or undecidability in our concepts. If, ‘... is true’ is an honorific that applies to sentences when they indicate what is, there is no reason to expect that it will clearly apply or fail to apply to every sentence of the language. Our thought, expressed in language as it has evolved, is vague. Our language does allow the expression of undecidable thoughts. Our singular terms sometimes fail to indicate any existing thing. So, a realist about ontic truth need not accept that a bivalent semantic truth concept is the only legitimate one.

To conclude, semantic truth is a property of sentences which they possess in virtue of the thoughts expressed and the way things are in the world. Thoughts are structured. The thought that is conveyed by a sentence in a context has a structure that depends on the senses of the expressions that are parts of the sentence, plus the way they are put together, and the context of utterance. Senses are properties of the parts of sentences, in virtue of which they convey and express thoughts. These properties are dependent on us, our linguistic conventions and passing intentions. In virtue of the meanings that we have assigned to words, some of these sentences latch on to the way the world is, they are true, they indicate what is. But it is only the correspondence theory of truth that encourages us to conclude that therefore the world has a mind dependent structure that mirrors that of the sentence. This is not to say that the world is not structured, only that there is no reason to assume that projections of the concepts we have crafted are clearly ‘objective structures of reality’ that exist quite independently of our linguistic practices. Clearly, for language to be useful as a medium of communication, there must be some correlations between perceptible features of reality, and the application conditions of terms. Yet the history of cultures demonstrates that such

correlations are highly culturally variable. This does not detract from the fact that ontic truth, what exists, the fundamental structures of reality are independent of us.

Frege's way of thinking allows us to say that, in so far as facts are thoughts that are true, and thoughts are properties of sentences articulated in a language that depends on us, facts are not entities that exist completely independently of the mental. Reality, what is, is not a totality of facts, as Wittgenstein claimed, rather facts are thoughts, ways of being given the True, or what is. Thoughts are not subjective ideas but can be grasped by people in virtue of the senses that have been assigned to words. Nevertheless, being, or what is actual, which is what we indicate with true sentences, does exist quite independently of the mental. The correspondence theory of truth entices us to project the structure of thought onto reality, but we should resist this. We should keep separate the way that we think about reality and what it is in itself. Every true sentence indicates the one objective universe that is, but many do it in different ways. Our ways of thinking about the world do depend on the criteria of application that we (that is our society, culture, and language group) have developed, but this should not make us think that reality depends on us, as the correspondence theory tempts us to do. So, we can admit that thoughts are structured by us, without succumbing to idealism. Semantic truth, the property of sentences can be defined, but ontic truth, which includes the pertaining of the 'is made true by' relation that may hold between a sentence and reality, is *sui generis* and indefinable.

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- Aristotle. 1941. "Metaphysics." In *The Basic Works of Aristotle*, edited by Richard McKeon. 682–926. New York: Random House.
- Beaney, Michael. 2007. "Frege's use of Function-argument analysis and his introduction of truth-values as objects." In *Essays on Frege's Conception of Truth*, edited by Dirk Greimann. 93–123. Amsterdam: Brill.

- Davidson, Donald. 1990. "The Structure and Content of Truth." *The Journal of Philosophy* 87 (6): 279–328. <https://doi.org/https://doi.org/10.2307/2026863>.
- Devitt, Michael. 1983. "Dummett's Anti-Realism." *The Journal of Philosophy* 80 (2): 73–99. <https://doi.org/https://doi.org/10.2307/2026236>.
- Dummett, Michael. 1958–59. "Truth." *Proceedings of the Aristotelian Society* LIX: 141–62. <https://doi.org/https://www.jstor.org/stable/4544609>.
- . 1973. *Frege: Philosophy of Language*. London: Duckworth.
- . 1976. "What is a Theory of Meaning? (II)." In *Truth and Meaning: Essays in Semantics*, edited by Gareth Evans and John McDowell. 67–137. Oxford: Clarendon Press.
- Frege, Gottlob. 1970. "Begriffsschrift, a formula language, modeled upon that of arithmetic, for pure thought." In *Frege and Gödel*, edited by Jean van Heijenoort. 1–82. Cambridge, Mass.: Harvard University Press.
- . 1980. *Gottlob Frege: Philosophical and Mathematical Correspondence*. Translated by Hans Kaal. Edited by Brian McGuinness. Oxford: Basil Blackwell.
- . 1997a. "Letter to Husserl, 24.5.1891." In *The Frege Reader*, edited by Michael Beaney. 149–50. Oxford: Basil Blackwell.
- . 1997b. "On Sinn and Bedeutung." In *The Frege Reader*, edited by Michael Beaney. 151–71. Oxford: Basil Blackwell.
- . 1997c. "Thought." In *The Frege Reader*, edited by Michael Beaney. 324–45. Oxford: Blackwell.
- . 2013. *Basic laws of arithmetic: derived using concept-script: volumes I and II*. Translated by Philip A. Ebert and Marcus Rossberg. Oxford: Oxford University Press.
- Green, Karen. 2015. "Dummett on Frege on Functions." In *Dummett on Analytic Philosophy*, edited by Bernard Weiss. 174–94. Houndsmills, Basingstoke: Palgrave.
- . 2020. "Indicating a translation for *Bedeutung*." *History and Philosophy of Logic* 41 (2): 114–27. <https://doi.org/10.1080/01445340.2019.1673690>.
- Greimann, Dirk. 2015. "Is Tarski's Definition of Truth Circular from Frege's Point of View?" *South American Journal of Logic* 1 (1): 163–78.
- . 2000. "The Judgement-stroke as a truth-operator: A new interpretation of the logical form of sentences in Frege's scientific language." *Erkenntnis* 52 (2): 213–38. <https://doi.org/https://doi.org/10.1023/A:1005594724745>.
- . 2020. "What exactly is the Content of Frege's Thesis of the Indefinability of Truth?" In *New Essays on Frege's Logical Investigations*, edited by Denis Perrin and Jean-Philippe Narboux. 71–88. São Paulo: Nonada.
- Heidegger, Martin. 1962. *Being and Time*. Translated by John Macquarrie and Edward Robinson. Oxford: Basil Blackwell.
- Hornsby, Jennifer. 1997. "Truth: The Identity Theory." *Proceedings of the Aristotelian Society* 97: 1–24. <https://doi.org/https://www.jstor.org/stable/4545250>
- Künne, Wolfgang. 2008. "Frege on Truths, Truth and the True." *Studia Philosophica Estonica* 1 (1): 5–42. <https://doi.org/https://doi.org/10.12697/spe.2008.1.1.02>
- Landini, Gregory. 2012. *Frege's Notations: What They Are and How They Mean*. Houndsmills, Basingstoke: Palgrave Macmillan.
- Lopes dos Santos, Luis Henrique. 2020. "Frege: Judgement, Truth and Facts." In *New Essays on Frege's Logical Investigations*, edited by Denis Perrin and Jean-Philippe Narboux. 121–41. São Paulo: Nonada.
- Perrin, Denis, and Jean-Philippe Narboux, eds. 2020. *New Essays on Frege's Logical Investigations*. São Paulo: Nonada.
- Schmitt, Richard. 2003. "Frege's Letters to Wittgenstein about the *Tractatus*." *The Bertrand Russell Society Quarterly* 120: 13–31.

- Smid, Jeroen. 2014. "Tarski's one and only concept of truth." *Synthese* 191 (14): 3393–3406. <https://doi.org/https://doi.org/10.1007/s11229-014-0450-1>.
- Soames, Scott. 1998. *Understanding Truth*. Oxford: Oxford University Press.
- Spinney, Oliver Thomas. 2018. "Priority and Unity in Frege and Wittgenstein." *Journal for the History of Analytical Philosophy* 6 (5): 1–25. <https://jhaponline.org/>.
- Tarski, Alfred. 1944. "The Semantic Conception of Truth: and the Foundations of Semantics." *Philosophy and Phenomenological Research* 4 (3): 341–76.
- Wittgenstein, Ludwig. 1961. *Tractatus Logico-Philosophicus*. Translated by D. F. Pears and B. F. McGuinness. London: Routledge & Kegan Paul.