Frege: Question 2

Wylie Breckenridge

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"I call the number four the denotation of '4' and of '2^2', and I call the True the denotation of '3 > 2'" (Frege, The Basic Laws of Arithmetic, Vol. I, § 2, his emphasis). Is this a harmless assimilation?

The assimilation, I take it, is of sentences to singular terms, made by claiming that the relation between a sentence and its truth value (if it has one) is identical to the relation between a singular term and the object that it denotes (if it denotes one). I will argue that this is a harmless assimilation, not because the relations are similar enough to allow them to be harmlessly taken as identical, but because they are, in fact, identical.[1]

This is apparently contrary to popular opinion. Peter Sullivan, for example, says, "No one needs to be persuaded that Frege went wrong in merging sentences with singular terms in a single logical type," and adds, "It seems that we can *see* that Frege went wrong."[2] And Michael Dummett, at the end of a long discussion of the matter, talks of "the erroneous nature of Frege's later doctrine that a sentence is a complex name of a truth-value."[3]

But the disagreement is only partial. In some of the ways that Frege merged sentences with singular terms I agree with Sullivan that he went wrong, and so too I agree with Dummett that Frege was wrong to think of sentences as names. But I will argue that Frege was right to think that the relation between a true-or-false sentence and its truth value is identical to the relation between a denoting singular term and its denotation, and that he was right to assimilate sentences to singular terms on that basis.

I

We must be more careful than I have been in my opening remarks to correctly specify the relations that Frege claims to be identical. In particular, we must be careful to distinguish between (i) making claims about a certain relation, and (ii) using that relation to pick out some objects in order to make claims about some *other* relation that those objects stand in.

Which relation does a denoting singular term stand in to its denotation? 'The denoting relation', is the obvious answer. But we must be careful. Which relation do I stand in to my mother? The *son of* relation is one, but there are others: the *younger than* relation, the *opposite sex of* relation, the *same nationality as* relation, and so on. So too, the *denoting* relation is one relation that a denoting singular term stands in to its denotation, but there are others that some denoting singular terms also stand in: the *naming* relation, the *referring to* relation, and the *standing for* relation, to mention just three. There is no such thing as *the* relation that a denoting singular term stands in to its denotation.

But perhaps these are all just the same relation. Perhaps, at least, *denoting* just is *referring to*. However, it is natural to think that '$AU' denotes a particular currency, but not natural to think that it refers to that currency, and if this is right then *denoting* cannot be *referring to*. I believe, in fact, that we understand these to be four distinct relations. *Naming* is not *denoting*: 'The

[1] Unless otherwise indicated, I use 'name' in the way that we commonly do, rather than in Frege's more inclusive sense. I take the class of singular terms to include names and definite descriptions (but not sentences). I shall call a sentence that is true or false a 'true-or-false sentence', and a singular term that denotes an object a 'denoting singular term'. I will ignore ambiguous and context-sensitive sentences, and take truth and falsity to be properties of sentences, rather than of sentence uses.

[2] Sullivan (1994), p. 476. His emphasis in the second quotation.

[3] Dummett (1981a), p. 429.

Prime Minister' denotes Tony Blair, but it does not name him. *Naming* is not *referring to*: 'The Prime Minister' refers to Tony Blair, but it does not name him. *Naming* is not *standing for*: '$AU' stands for a particular currency, but it does not name it. *Denoting* is not *standing for*: 'Inc.' stands for the word 'Incorporated', but it does not denote it. Finally, *referring to* is not *standing for*: '$AU' stands for a particular currency, but it does not refer to it.[4]

Perhaps these examples are not sufficiently persuasive, but I am confident that for anyone true to their intuitions persuasive examples can be found. Perhaps there are logical connections between some of them - perhaps, for example, if an expression names an object it follows that it also denotes that object. But this does not show that *denoting* is *naming* (i.e. that they are identical relations). (After all, if Bill is a son of Ben then it follows that Bill is a child of Ben, but *being a son of* is not the same relation as *being a child of*.) Perhaps it is convenient and harmless from time to time to think of one relation as another - for example, to think of the *denoting* relation as the *naming* relation. But this does not show that *denoting* is *naming*. And perhaps the four relations coincide in the case of some expressions (i.e. the expression stands in one of them to a certain object if and only if it stands in all four of them to that object). But that is consistent with them being distinct relations. The fact remains that for every set of two of these four relations there is an expression E and an object O such that E stands in one relation to O but not the other, and from this it follows that the four relations have different extensions and are thus distinct.

Not only are these four distinct relations that a denoting singular term might stand in to its denotation, but some denoting singular terms stand in more than one of them. In fact, any name with a bearer stands in all four to that bearer: it names, denotes, refers to, and stands for it. Thus, there is no such thing as *the* relation that a denoting singular term stands in to its denotation. It might also be that there is no such thing as the relation that a sentence stands in to its truth value (if it has one). The upshot is that we must be careful about which claim it is that Frege is making. It cannot be that *the* relation that a true-or-false sentence stands in to its truth value is the same as *the* relation that a denoting singular term stands in to the object that it denotes (as I loosely put it in my opening remarks), because there are no such things (at least not in the second case). As I understand it, it is that there is *some particular* relation which obtains between a true-or-false sentence and its truth value, and between a denoting singular term and the object that it denotes.

Just because such a relation, if there is one, obtains between every denoting singular term and its denotation, it does not follow that it must be the *denoting* relation. There is, for example, a relation that obtains between every man and his mother that is not the *son of* relation - the *younger than* relation is one. So if Frege claims that there is a certain relation that obtains between every true-or-false sentence and its truth value and between every denoting singular term and its denotation, we should not conclude that the relation he has in mind is the *denoting* relation. Nor should we conclude that it is the *naming* relation, or the *referring to* relation, or the *standing for* relation. It might be any one of these, or any of an infinite number of other possibilities. We should not conclude, that is, that he is claiming that sentences name, or denote, or refer to, or stand for their truth values (if they have one). But nor should we not.

II

Frege's claim, as I understand it, is that there is a certain relation that obtains between '4' and 4, between '2^2' and 4, and between '3 > 2' and the True. More generally, it obtains between any denoting singular term and its denotation, and between any true-or-false sentence and its truth

[4] It might also be that referring is not something that expressions do, but something that people use expressions to do, in which case there is an even more fundamental difference between *referring to* and the other three relations: it would be a three-place rather than two-place relation.

value.[5] The relation that Frege has in mind he talks about using the word 'Bedeutung': that to which an expression stands in this relation he calls the *Bedeutung* of the expression.[6] He calls it the *Bedeutung* of the expression, so he takes this relation to be a *function* on expressions. And he allows that an expression may not have a *Bedeutung*, so he takes the function to be possibly only partially defined. I will sometimes use the expression 'the *Bedeutung* relation' to talk about this relation (if in fact there is one), sometimes the expression 'the *Bedeutung* function' to talk about this relation *qua* function, and sometimes the expression 'the *Bedeutung* of …' to talk about one of the relation's relata or one of the function's values.

Frege was right to think that there is a function whose values on '4', '2^2' and '3 > 2' are, respectively, 4, 4, and the True: the function {('4', 4), ('2^2', 4), ('3 > 2', the True)} is one, for example.[7] And he was right to think, more generally, that there is a function whose value on any denoting singular term is its denotation, and whose value on any true-or-false sentence is its truth value. Call such a function a *Frege function*. There is a function on sentences, call it T, whose value on any true-or-false sentence is its truth value; and there is a function on singular terms, call it D, whose value on any denoting singular term is its denotation; then the function {(E, T(E)): E is a sentence} ∪ {(E, D(E)): E is a singular term} is a Frege function. So there *is* a Frege function. But the interesting questions are these: which function did Frege have in mind, is it a Frege function, and, if so, is it a philosophically significant or interesting one?

So which function is this *Bedeutung* function that Frege had in mind? In the previous section I mentioned four distinct relations that a denoting singular term might stand in to its denotation: it might name, denote, refer to, or stand for it. If we set aside ambiguous and context-sensitive expressions, then we can take each of these relations to be a function on expressions. If one of *these* is the function that Frege had in mind, then he was mistaken to think that it is a Frege function, because none of them is. None of them, for instance, obtains between '3 > 2' and the True. It seems to be a property of the *naming* and *referring to* relations, as we normally understand them, that if an expression names or refers to an object then we can use the expression to talk about that object. So, if '3 > 2' names or refers to the True, then we ought to be able to say things like, '3 > 2 is a truth value', '3 > 2 is the True', and '3 > 2 is not 4 = 5'. But these just don't seem to make sense. And if there is anything that '3 > 2' denotes or stands for then, intuitively, it is not the True, but the fact or state of affairs that 3 is greater than 2. Moreover, it is natural to think that if '3 > 2' and 'grass is green' denote or stand for anything then they denote or stand for different things. Anyone who claimed that they both denote or stand for the same thing, the object the True, would seem to not understand the *denoting* or *standing for* relations. In fact, nor would anyone who claimed that they denote or stand for an object rather than a fact or state of affairs. Of course, it might be difficult for us to give an account of what facts or states of affairs are, or we might find that such notions are incoherent or trivial. But until we are given good reason to think otherwise, our position should be that '3 > 2' does not name, refer to, denote, or stand for the True, and likewise for any other sentence and its truth value.

It might seem from what he says that Frege took the *Bedeutung* relation to be the naming relation. He *calls* sentences 'names' and uses them like they are: in *The Basic Laws of Arithmetic* he says, "I say: the names '2^2 = 4' and '3 > 2' denote the same truth value;"[8] in

[5] He also claims that it obtains between a predicate and the concept, if any, that it stands for, and more generally between a functional expression and the function, if any, that it stands for. I shall be saying something about functional expressions, but here I am specifically concerned with singular terms and sentences.

[6] 'Bedeutung' has been translated as 'denotation' in the passage quoted in the question.

[7] Here I am thinking of a relation as a set of ordered pairs, and of a function as a relation that has no two distinct members with identical first coordinates.

[8] Frege (1967), p. 35.

'Introduction to Logic' he says, "A sentence proper is a proper name;"[9] and in 'Function and Concept' he says, "[I]n $(2^2 = 4) = (2 > 1)$ we have a correct equation."[10] In fact, he calls anything a 'name' that is capable of having a *Bedeutung*, that is, of standing in the *Bedeutung* relation to something, which suggests that he takes that *Bedeutung* relation to be the *naming* relation.[11] But even though he *calls* them 'names', and even though he uses sentences as though they are names, we should not conclude that he takes the *Bedeutung* relation to be the *naming* relation. As we understand it, if N is a bearing name then N^'='^N is a true sentence.[12] Frege *does* take it that if S is a true-or-false sentence then S^'='^S is a true sentence (as the third example above shows). But he also takes incomplete expressions to be names, and does *not* allow that if an incomplete expression E has a *Bedeutung* then E^'='^E is a true sentence. Thus, Frege took it that there are incomplete expressions that stand in the *Bedeutung* relation to a function but not in the naming relation to that function (as we understand it), so he took it that the *Bedeutung* relation is not the naming relation (as we understand it). This is not to deny that he took sentences to be names, which it seems that he did. It is just to deny that he took the *Bedeutung* relation to be the naming relation.

What other functions might Frege have had in mind? In his discussions of the matter, he often appeals, more or less explicitly, to the following two principles:

(Ba) If '… e …' is an expression that has 'e' as a part, and if '… f …' is the expression obtained by replacing 'e' by 'f', then if 'e' and 'f' have the same *Bedeutung* then '… e …' and '… f …' have the same *Bedeutung*.[13]

(Bb) If '… e …' is an expression that has 'e' as a part, then if 'e' has no *Bedeutung* then '… e …' has no *Bedeutung*.[14]

(This is not his terminology.) These conditions involve the notion of a 'part' of an expression (we might also say: 'constituent'), of which I will assume we have a clear enough grasp for present purposes. Just let me say that by 'part' I mean a semantically significant or logically significant sub-expression, so that the singular term 'The capital of England' has, as parts, the functional expression 'The capital of' and the singular term 'England'; the sentence 'grass is green' has, as parts, the singular term 'grass' and the predicate 'is green'; and the sentence 'grass is green and snow is white' has, as parts, the sentences 'grass is green' and 'snow is white', and the logical connective 'and'.

If Frege took the *Bedeutung* function to be *the* function that satisfies principles (Ba) and (Bb), then he was mistaken, because there is no unique such function. It is, for example, consistent with them both to take the *Bedeutung* of an expression to be the number of letters that it has (ignoring spaces), and also consistent with them both to take the *Bedeutung* of an expression to be the number of parts that it has, and these define distinct functions ('grass is green' and 'snow is green', for example, have a different number of letters but the same number of parts, however we count the parts).[15]

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[9] Frege (1997c), p. 297.

[10] Frege (1997a), p. 137.

[11] Among which he includes what we would call proper names, definite descriptions, functional terms, predicates, relational terms, sentences, and so on.

[12] By "N^'='^N" I mean the expression obtained by concatenating the name N with the symbol '=' and the name N.

[13] Frege might say that '… e …' and '… f …' are obtained by completing the same incomplete expression by 'e' and 'f', respectively.

[14] A correct formulation of these principles should, I think, involve string concatenation, as did the formulation of some claims in the preceding paragraph. For present purposes, these will do.

[15] Note that if 'Bedeutung' is understood in either of these two ways than every part of an expression has a *Bedeutung*, and hence condition (Bb) is trivially satisfied.

It appears from what he says in places that Frege took the *Bedeutung* function to be the function that satisfies principles (Ba) and (Bb), *and* is also such that the *Bedeutung* of a denoting singular term is its denotation. He seems to think that these conditions determine what the *Bedeutung* of other categories of expressions are, or at least that the *Bedeutung* of a true-or-false sentence is its truth value. In 'On *Sinn* and *Bedeutung*' he writes:

> We have seen that the *Bedeutung* of a sentence may always be sought, whenever the *Bedeutung* of its components is involved; and that this is the case when and only when we are inquiring after the truth-value. We are therefore driven into accepting the truth-value of a sentence as constituting its *Bedeutung*. (157)

And in 'Introduction to Logic':

> It follows that there must be something associated with a sentence which is different from the thought, something to which it is essential that the parts of the sentence should have *Bedeutung*. This is to be called the *Bedeutung* of the sentence. But the only thing to which this is essential is what I call the truth-value - whether the thought is true or false. (297)[16]

But if this is indeed what Frege took the *Bedeutung* function to be then he was mistaken, because, again, there is no unique such function. Let's restrict our attention to singular terms and sentences, and take the *Bedeutung* of a denoting singular term to be its denotation. Let S be any sentence. Let the *B-Class* of S be defined as follows: if S has no singular term as a part, or at least one singular term as a part for which there is no object that it denotes, then S has no B-Class; otherwise, the B-Class of S is that class of sentences such that S' is an element of the class if and only if S' can be obtained from S by replacing any one singular term that is a part of S by a codenoting singular term.[17] Then it is consistent with both (Ba) and (Bb) to take the *Bedeutung* of a sentence to be its B-Class, if it has one. Moreover, this is distinct from taking the *Bedeutung* of a sentence to be its truth value, because 'George Bush is the President' and 'Tony Blair is the Prime Minister' have the same truth value but different *B-classes* ('George Bush is George Bush' is an element of the first, but not an element of the second).

Ernst Tugendhat has suggested that this is the wrong way to read Frege. He argues that Frege took the *Bedeutung* function to be the function that satisfies principles (Ba) and (Bb), and is such that the *Bedeutung* of a true-or-false sentence is its truth value.[18] That is, Tugendhat suggests that rather than taking the *Bedeutung* of a denoting singular term to be its denotation and using (Ba) and (Bb) to determine the *Bedeutung* of sentences, Frege took the *Bedeutung* of a true-or-false sentence to be its truth value and used (Ba) and (Bb) to determine the *Bedeutung* of singular terms. But if this is what Frege took the *Bedeutung* function to be then he was mistaken, because, again, there is no unique such function. If we take the *Bedeutung* of a true-or-false sentence to be its truth value, then if it is consistent with both (Ba) and (Bb) to take the *Bedeutung* of a denoting singular term to be its denotation, then it is equally consistent with them both to take the *Bedeutung* of a denoting singular term to be the ordered pair of its denotation and Carfax Tower.[19]

Whatever Frege's position on the these matters, these points are clear: (i) that he took the *Bedeutung* of a denoting singular term to be its denotation, (ii) that he took the *Bedeutung* of a

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[16] Actually, in these passages Frege is only appealing to principle (Bb). He appeals to principle (Ba) in nearby passages to argue that if a sentence has a *Bedeutung* then it cannot be the thought that it expresses (i.e. its sense).

[17] This is very similar to, and inspired by, a suggestion made by Ernst Tugendhat. See Tugendhat (1970), p. 181.

[18] Tugendhat (1970). Tugendhat suggests that on this understanding of Frege the term *truth-value potential* would be an appropriate translation of 'Bedeutung'.

[19] Tugendhat actually acknowledges this problem in a footnote. See p. 181, f. 1.

true-or-false sentence to be its truth value, and (iii) that he took the *Bedeutung* function to satisfy principles (Ba) and (Bb). In this he was mistaken, not, this time, because there is more than one such function, but because there is *no* such function.

There are a number of ways to make the point. Dummett has argued that there is a tension between (Bb) and the claims (a) that the *Bedeutung* of a denoting singular term is its denotation, and (b) that the *Bedeutung* of a true-or-false sentence is its truth value.[20] I am more concerned by a tension between (Ba) and this second claim (b). The tension arises because sentences can themselves be parts of sentences, in such a way that the truth value of the containing sentence depends upon more then just the truth value of the contained sentence.

Propositional attitude reports seem to be like this. 'George believes that grass is green' and 'George believes that water is H_20' might have different truth values, even though the second is obtained from the first by replacing 'grass is green' by a sentence with the same truth value. If the *Bedeutung* of a true-or-false sentence is its truth value then we have here a straightforward violation of (Ba). But Frege explained this problem away by claiming that in such intensional contexts an expression's *Bedeutung* is not its customary *Bedeutung* but rather its customary sense. The idea is that what 'grass is green' contributes to the truth value of 'George believes that grass is green' is not its truth value but its customary sense, so that we can replace it by any sentence with the same customary sense without a change in truth value. This shows, Frege took it, that in this context the *Bedeutung* of 'grass is green' is its customary sense. While I disagree with the details of his solution I agree with Frege that intensional contexts are not the problem that they appear to be, as I have argued elsewhere.[21]

I think, however, that there is an unavoidable problem with sentences embedded in modal contexts. 'Necessarily, grass is green' and 'Necessarily, water is H_20' have different truth values, even though the second is obtained from the first by replacing 'grass is green' by a sentence with the same truth value. It seems that Frege cannot explain this problem away so successfully. What 'grass is green' contributes to the truth value of 'Necessarily, grass is green' is not its truth value, but nor is it its customary sense, for while it is true that we can replace 'grass is green' by any sentence with the same customary sense without a change in truth value, it is also true that we can replace 'grass is green' by any sentence that expresses something necessarily equivalent, even though some such sentences differ from it in sense ('grass is green and 2 + 2 = 4', for instance). So it would be too strong to claim that the *Bedeutung* of 'grass is green' in 'Necessarily, grass is green' is its customary sense. But Frege has nothing else to appeal to. And I cannot see a way of dissolving this problem for modal contexts by adapting my proposed dissolution of the problem for intensional contexts.

III

I think that there *is* a philosophically interesting Frege function - one whose value on a denoting singular terms is its denotation, and whose value on a true-or-false sentence is its truth value. But, as I argued in the previous section, it cannot be the *naming* relation (function), the *denoting* relation, the *referring to* relation, or the *standing for* relation, nor any function determined by principles (Ba) and (Bb). So which function do I have in mind?

I will point to it. Imagine being asked to 'evaluate' these expressions:

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[20] See Dummett (1981a), ch. 12, and Dummett (1981b).

[21] See Me (2003). Actually, I argue that indirect speech contexts are not the problem that they appear to be. But the arguments can be modified to apply to intensional contexts in general. The key result would be that the content sentence of a propositional attitude report is not a part of the report (in the appropriate sense of 'part').

(E1) 4
(E2) Pegasus
(E3) 2^2
(E4) The Prime Minister
(E5) The greatest prime number
(E6) 3 > 2
(E7) Vulcan has three moons.

I think that anyone who understands the expressions can make sense of the request, and will find it natural to give something like these responses:

(R1) 4
(R2) There is no such thing
(R3) 4
(R4) Tony Blair
(R5) There isn't one
(R6) True
(R7) False

It might seem strange to be asked to evaluate proper names like '4' and 'Pegasus', but I suggest that that is because we find the request trivial rather than senseless (much like being asked which day of the week is Tuesday). And perhaps for some the natural response to (E2) is 'Pegasus', or to (E7) is 'There's no such thing as Vulcan,' or 'It has no truth value.' Either way, the point is this: there is a function here that we are grasping and applying to the expressions, whose value on a singular term is the object that it denotes, if it denotes one, and whose value on a sentence is its truth value, if it has one. That is, there is a Frege function here. Moreover, it is a philosophically interesting one, because we have a pre-philosophical grasp of it (I have asked pre-philosophers to evaluate (E1)-(E7), and they give responses along the lines of (R1)-(R7)). This function, call it the *evaluation* function, is the function that I have in mind.

But is this is the function that Frege had in mind? I want to say that it is, and reach my intended conclusion: that he was right to claim that there is a certain relation, the *Bedeutung* relation, that obtains both between a true-or-false sentence and its truth value, and between a denoting singular term and its denotation. But then I am committed to saying that he was wrong to claim both (Ba) and (Bb), because the evaluation function is a Frege function and so, as I argued above, cannot satisfy both (Ba) and (Bb). But (Ba) and (Bb) are claims of central importance to his philosophy of language. Surely, then, it is more charitable to claim that this is *not* the function that Frege had in mind, that the one that he did have in mind is such that both (Ba) and (Bb) are true, and that he was just wrong to think that its value on a true-or-false sentence is its truth value (or, perhaps, that its value on a denoting singular term is its denotation).

I want to conclude by suggesting that there are functions *C* and *V*, such that the evaluation function, call it *E*, is the composite function $V(C)$ (that is, if e is an expression then $E(e) = V(C(e))$), and that even though *E* does not satisfy (corresponding versions of) (Ba) and (Bb), *C* does. If that is right, then we might be able to understand Frege in this way: by the *Bedeutung* function he means the evaluation function, *E*, which does not, contrary to his claim, satisfy (Ba) and (Bb); but it has a component *C* that does, and if Frege had distinguished the two he might not have mistakenly tried to make the *Bedeutung* function do the work in his philosophy of language that should really be done by *C*. These are significant claims, and they require detailed justification. But in the space remaining, I will do nothing more than show which functions they are that I have in mind for *C* and *V*. I hope that in so doing the claims will become at least plausible.

Just as Frege appealed to an intuitive difference between sentences like 'Ateb is Ateb' and 'Ateb is Afla' to justify his distinction between sense and *Bedeutung*,[22] I think that we can appeal to an intuitive difference between certain other expressions to justify the introduction of a third semantic feature of expressions and, in turn, a function defined on them.

There is something the same and something different about the sentences '$2^2 = 4$' and '$2 > 1$'. Frege allows only two things to be associated with a sentence - a sense (the thought that it expresses), and a *Bedeutung* (its truth value, if it has one). What is the same about these sentences, Frege would claim, is that they have the same truth value, and what is different about them is that they express different thoughts. But I think that Frege's notion of sense is too fine a tool to use to explain the difference here. For consider the sentences:

(S1) Hesperus is a planet
(S2) Phosphorous is a planet
(S3) $3 > 2$

There is a sense in which (S1) and (S2) are the same but in which (S1) and (S3) are different. But Frege cannot explain why. He must say that (S1) and (S2) are the same in the sense of having the same truth value, because he would say that they have different senses, and he only has the notions of sense and truth value to appeal to. But since (S3) also has the same truth value as (S1) he is forced to say that (S1) and (S3) are the also the same in that sense. He has to deny that there is any sense in which (S1) and (S2) are the same but in which (S1) and (S3) are different. Intuitively that is wrong. What we want to say is that (S1) and (S2), unlike (S1) and (S3), express the same proposition, or express the same truth conditions, or stand for the same state of affairs, or express the same fact. This feature of (S1) - (S3) suggests that we need to recognise something other than the sense and truth value of a sentence. Whatever this something else is, it at least determines a certain function from possible worlds to truth values, possibly only partially defined. Let me call this the *content* of the sentence (without intending 'content' to be understood in any particular one of its existing technical senses). Then we have a function, call it the *content* function, whose value on a given sentence is the content of the sentence.

Similar remarks can be made about singular terms. For consider:

(T1) The star that Hesperus orbits
(T2) The star that Phosphorous orbits
(T3) The Sun

There is a sense in which (T1) and (T2) are the same but in which (T1) and (T3) are different. But Frege cannot explain why. He must say that (T1) and (T2) are the same in the sense of having the same denotation, because he would say that they have different senses, and he only has the notions of sense and denotation to appeal to. But since (T3) also has the same denotation as (T1) he is forced to say that (T1) and (T3) are the also the same in that sense. He has to deny that there is any sense in which (T1) and (T2) are the same but in which (T1) and (T3) are different. Intuitively that is wrong. What we want to say is that in every possible world (T1) and (T2) codenote (although what they codenote may vary from world to world), whereas there is a possible world in which (T1) and (T3) do not (Hesperus might not have orbited The Sun). This feature of (T1) - (T3) suggests that we need to recognise something other than the sense and denotation of a singular term. Whatever this something else is, it at least determines a certain function from possible worlds to objects, possibly only partially defined. Let me call this the *content* of the singular term. Then we can extend the content function introduced above to singular terms, by taking its value on a singular term to be the content of that term.

[22] See Frege (1997d), pp. 320-1.

The content function is distinct from the evaluation function (values of the content function on sentences, for instance, are functions from possible worlds to truth values, whereas values of the evaluation function on sentences are truth values). But the content function is a component of the evaluation function. For let the *actual value* function be a function defined on functions defined on possible worlds, such that: if *f* is a function on possible worlds, then the actual value of *f* is the value of *f* at the actual world. Let *C* be the content function, and let *V* be the actual value function. Then $E = V(C)$. These are the functions that I have in mind.

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