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Substitution: What Are Singular Terms, and Why Are There Any?

> I start out from judgments and their contents, and not from concepts . . . I only allow the formation of concepts to proceed from judgments. If, that is, you imagine the 2 in the content of judgment $2^4 = 16$ to be replaceable by something else, by (-2) or by 3 say, which may be indicated by putting an x in place of the 2: $x^4 = 16$, the content of possible judgment is thus split into a constant and a variable part. The former, regarded in its own right but holding a place open for the latter, gives the concept '4^{th} root of 16' or 'the individual 2 falls under the concept "4^{th} root of 16" or "belongs to the class of 4th roots of 16"'. But we may also just as well say '4 is a logarithm of 16 to the base 2'. Here 4 is being treated as replaceable and so we get the concept 'logarithm of 16 to the base 2': $2^x = 16$ . . .
>
> And so, instead of putting a judgment together out of an individual as subject and an already previously formed concept as predicate, we do the opposite and arrive at a concept by splitting up the content of a possible judgment.
>
> FREGE, "Boole's Logical Calculus and the *Begriffsschrift*"

I. MULTIVALUED LOGIC AND MATERIAL INFERENCE

1. Three Challenges for Inferential Approaches to Semantics

The theoretical structure being explored here is animated by commitments both to a *deontic pragmatics* and to an *inferential semantics.* The first means that the states to be investigated, the original bearers of intentional contents, are to be understood normatively—more particularly as species of *commitments* and *entitlements.* The phenomenalist account of deontic statuses such as commitment, in terms of scorekeeping with the socially complementary deontic attitudes of *attributing* and *undertaking,* is offered as a way to begin filling in such an approach to pragmatics. The second theoretical commitment means that the *contents* that determine, in context, the deontic *significance* of adopting or altering a deontic status, or of performing a contentful act, are to be understood as broadly *inferential* roles. The content must, in context, fix the circumstances in which one would be entitled to adopt or undertake a commitment with that content and must fix the appropriate consequences of undertaking such a commitment. Employing an expression with that content then involves endorsing

the inferential commitment from those circumstances of entitlement to those consequences of commitment. The description of the game of asserting, of the inferentially articulated practices that confer assertible, that is, propositional, contents on states, acts, and utterances in virtue of their roles in that game, and the account of logical vocabulary as distinguished by its expressive task of making explicit as assertible contents precisely the inferential commitments that determine those roles, are offered as a way to begin filling in such an approach to semantics. This chapter continues the inquiry into inferential notions of semantic content.

There are three topics that would seem to pose special explanatory difficulties for attempts to understand semantic content in terms of proprieties of inference. First, the functional involvements that could plausibly be taken to be responsible for the conferral of such contents relate conceptually contentful deontic states not only to each other but also to the nondiscursive environment. Perception and action, as entries to and exits from the discursive realm, are governed by practical proprieties every bit as important as, and irreducible to, those governing purely inferential moves within that realm. So significant have the entries and exits seemed that each has been taken, by some empiricists and by some pragmatists in turn, to be the sole source of content for intentional states—to the exclusion not only of inferential articulation but of each other. How can a broadly *inferential* approach incorporate the aspects of semantic content conferred by the *non*inferential aspects of such entries and exits?

Second, the notion of content as inferential role seems naturally adapted to account only for *propositional* content, for it is only commitments with contents of this category that can play the role of premise and conclusion in inferences. But the sentences that express propositions typically have significant parts that are not sentences, which do not express propositions, and so which cannot serve as inferential premises and conclusions. Yet these subsentential expressions certainly ought to be said to be contentful, in virtue of what Dummett calls the "contribution" they make to the propositional contents expressed by sentences in which they occur. How can a broadly inferential approach to semantic content be extended from the grammatical category of sentences, the only sort of expression directly involved in inference, to various subsentential categories such as singular terms and predicates? For in the absence of contents corresponding to these categories, it would not be possible to understand important sorts of inferences, paradigmatically those codified explicitly by the use of identity and quantificational logical locutions.

Third, when the semantic theorist seeks to express conceptual contents explicitly, and so to reason about them—for instance when a question has arisen concerning how a certain remark should be interpreted—the semantic vocabulary employed includes, not only the logical locutions that have been construed as making *inferential* relations explicit, but also *representational*

locutions that should be understood as making referential relations explicit. Such locutions make it possible to say what someone is talking about, what is being referred to, what a belief is of or about, or what would make it true. How can a broadly inferential approach to semantic content account for the representational features of content that are expressed explicitly by means of such locutions?

The first of these prima facie difficulties has already been addressed (see Chapter 4). Although entry and exit moves are not themselves inferential moves, neither the noninferential acknowledgments of doxastic commitments that proximally terminate perceptual entries (as distinct from mere differential responses) nor the acknowledgments of practical commitments that noninferentially initiate actions (as distinct from other performances) can be understood apart from the role they play in the game of giving and asking for reasons, most directly as premises for cognitive reasonings, and as conclusions of practical reasonings, respectively. Perceptual reports are to be distinguished from mere reliable differential responses generally by their liability to demands for justification and their utility in providing justifications for other claims. Actions are to be distinguished from behavioral performances generally by their responsibility to assessment and deliberation concerning the inferentially articulated responsibilities they incur and discharge. So not only do perceiving that a content is true and acting so as to make it true involve endorsement of the inferential propriety of the move from the circumstances in which one is entitled to produce such a performance to the consequences one becomes committed to thereby, but those circumstances (of action) or consequences (of perception) themselves are inferentially significant.

The third of the cited challenges to an inferential approach to semantic content concerns its explanatory adequacy to the phenomena that make representational approaches to semantic content attractive and unavoidable. This is the most important and difficult issue. The general strategy for responding to it that is pursued here is to attempt to explain, in terms of the inferentially articulated social scorekeeping practices that institute discursive deontic statuses, what is expressed by the central sorts of representational semantic locutions. Where this can be done, the result is an account of what the theorist is *saying* when making claims about what represents what. Chapter 5 began this discussion by explaining the use of 'true' and 'refers' or 'denotes' (and so one crucial sense of 'represents') in terms of *anaphoric* links between expression tokenings. Chapter 8 completes the official treatment of representational locutions by specifying in discursive scorekeeping terms what it is to use locutions to make propositional-attitude ascriptions *de re*. This is the trope that makes it possible to specify what we are talking or thinking *of* or *about*, what objects our beliefs are directed at. This is the essential use in virtue of which expressions are properly interpreted as expressing attributions of ofness or aboutness in the intentional or semantic sense.

Both the discussion of what it is for a belief or claim to be of or about an object, or to be true of an object, and the discussion of 'refers', however, require that the inferentialist account of conceptual content be extended to subsentential expressions, paradigmatically singular terms and predicates. So the treatment of what is expressed by the central, explicitly representational locutions requires that the second challenge to the inferentialist order of semantic explanation be addressed. This should come as no surprise. For although some semantic thinkers (Davidson and Stalnaker are recent examples) conceive representational relations as obtaining in the first place between propositionally contentful intentional states and facts or states of affairs, they are in a distinct minority. Most representationalists have not taken the pragmatic priority of the propositional to entail a corresponding priority in the semantic order of explanation of conceptual contents. The more common position holds that the notion of representation is to be understood, to begin with, in terms of the representation of *objects*, particular things, and their properties and relations. According to this way of thinking, the basic representational bonds—in terms of which, for instance, the capacity for propositional representation, the capacity to represent possible states of affairs, is to be accounted for—are taken to be those linking represented objects to object-representings and represented properties to property-representings. If something like this turned out to be correct, adequate explanations of the function of attributions of representational purport and success could not be conducted entirely at the level of propositional contents.

There is an interaction between one's choice of semantic primitives (inference or representation) and one's choice of grammatical categorial primitives (sentences, or terms and predicates). The interaction is motivational rather than strictly conceptual, though—it is not that commitment to one semantic order of explanation entails commitment to a particular categorial order of explanation, or vice versa. Leibniz, who may serve as a paradigm for pre-Kantian inferentialists generally, begins his account with concepts standing in essentially inferential relations of inclusion to one another. Propositional contents are reached only by suitably combining these independently contentful items. So semantic inferentialism can coexist with a bottom-up categorial strategy.[1]

Conversely, semantic representationalism is compatible with a top-down categorial strategy, which takes the fundamental sort of content to be propositional. Representing states of affairs, purporting to represent facts, need not be thought of as semantically decomposable. If the propositions represented are thought of, for instance, as sets of possible worlds, there would seem to be no necessity to continue by explaining the capacity to represent these things in terms of more primitive capacities to represent objects or properties.[2] Talk of objects and object-representings and properties and property-representings would then proceed in terms of role in propositions and proposition-representings (as it does for Kant).

The bottom-up categorial strategy is obliged to explain propositional se-

mantic contents at some point, however, for these are the contents expressed by sentences, the only expressions with which, as Wittgenstein says, one can make a move in the language-game. Failure to ascend to an account of such contents would disqualify a theory as a semantic theory, for it would sever that theory from any account of the use of linguistic expressions or the significance of beliefs. It is precisely the role it plays in explaining the proprieties of the use of linguistic expressions or the possession of intentional states such as belief that qualifies something associated with those expressions as a semantic content. Dually, the top-down categorial strategy is obliged to explain the subpropositional contents expressed by subsentential expressions such as singular terms and predicates. Failure to descend to an account of such contents would doom a theory to explanatory inadequacy, for it would then be able to make no sense of the connection between saying something (expressing a proposition) and talking about something (characterizing an object). While these two ought not to be identified at the outset, the latter phenomenon is too central to our understanding of what we are doing when we talk and think simply to be ignored. Unless it accounts for the possibility of representing particular objects, a semantic theory will not address the concerns that many have taken to define its topic. The relation between these categorial strategies may be compared in this regard to that between inferentialist and representationalist commitments to fundamental semantic concepts. Each reductive order of explanation must account for the notions treated as primitive by the other, or independent accounts must be offered of each sort of primitive, together with a theory that specifies how they collaborate.

2. *Freestanding and Ingredient Contents*

The conclusion is that any account of the representational character of propositionally contentful states, acts, and utterances is obliged to offer a reading of singular reference (the representation of particular objects) and of property-representation. For the link between belief and particular objects is a sort of paradigm of representational directedness. Offering such a reading requires looking at subpropositional contents and the way in which one expression can occur as a semantically significant component in another. The only sort of contentful expressions that have been officially discussed so far are sentences (and a very special sort of sentential operator). So it will be well to begin by considering the concept of sentential embedding in general: how the content of one sentence can contribute to the content of a compound sentence in which it is embedded as a semantically significant component. Starting with the special case in which the only subsentential components considered are themselves sentences has the advantage that this grammatical category can already be specified and understood in terms of another aspect of its use, its directly inferential significance in expressing assertional commitments. Thus a sense can be given to the question, What is the relation

between the sort of content relevant to this fundamental assertional and inferential use of sentential expressions and their derivative use as (in general) unasserted components of assertible sentential expressions? With a grip on this relation it will be possible to move on to consider the contents of expressions whose *only* use is as unasserted components of sentences, paradigmatically singular terms and predicates.

The primary job of a concept of semantic content, it has been emphasized, is to account for the pragmatic significance of the states, performances, and expressions that are understood as exhibiting such contents. The more specific theoretical commitments that have been forwarded so far are intended to fill in notions of content and significance that can satisfy this basic principle. These subordinate endorsements include the practical and normative understanding of those significances in terms of deontic states, the social-phenomenalist understanding of those deontic states in terms of discursive scorekeeping by adoption of socially perspectival deontic attitudes, the idea that the sort of practice or use to begin with is linguistic, the idea that linguistic practice is distinguished by its government of assertional performances, the idea that assertional uses are essentially inferentially articulated, and the idea that inferential involvements correspond to propositional contents.

Frege builds a basic structure of semantics and pragmatics into his system from the beginning, distinguishing accounts of the significance of judging, under the heading "theories of force," from accounts of the contents judged, under the heading "theories of content." As part of his specification of the task of the theory of content, Frege recognizes that expressions can be contentful not only in the sense that a certain force can be attached to their utterance but also in the sense that their occurrence expresses something about the content, in the first sense, of sentences in which they appear.[3] As Dummett puts the distinction:

> In speaking of sentences themselves there are two different ways in which we may regard them; and these may give rise to two distinct notions of [content]. On the one hand, we may think of sentences as complete utterances by means of which, when a specific kind of force is attached, a linguistic act may be effected: in this connection, we require that notion of [content] in terms of which the particular kind of force may be explained. On the other hand, sentences may also occur as constituent parts of other sentences, and, in this connection, may have a semantic role in helping to determine the [content] of the whole sentence: so here we shall be concerned with whatever notion of [content] is required to explain how the [content] of a complex sentence is determined from that of its components. There is no a priori reason why the two notions of [content] should coincide.[4]

It is this second notion, and its relation to the first, that is the current topic.

The technical terms Dummett introduces to capture the two dimensions

of sentential content that Frege discerned are "freestanding sense" and "ingredient sense." Each of these indicates an explanatory role that the notion of content as truth conditions has been thought to play: settling, in context, what the assertor of a freestanding (unembedded) sentence with that content thereby becomes committed to, and settling, in sentential context, the freestanding content of a compound sentence in which it is an (embedded) ingredient. Understanding these relations is particularly important from the point of view of a strategy, such as the present one, that seeks to work backward from notions of commitment and inference to notions such as truth conditions and representation. How should the notion of ingredient content be understood, and what does it have to do with talk about truth?

To begin with, it may be pointed out that in the passage above, where the bracketed word 'content' has been inserted, Dummett writes "truth-value." He is discussing Frege, and in the semantics of Frege's extensional logic, the concept of truth-value plays both sorts of role. Truth is what matters for the force of assertions of freestanding sentences. For it is what is preserved by good inferences, in particular the inferences that are good in virtue of their logical form—the ones Frege is codifying. Furthermore, possession, by a logically compound sentence, of the property preserved by logically good inferences is determined by the truth-values of its component sentences. When the same formal apparatus is maintained as much as possible—consistent with letting different notions play these two roles—the result is classical multivalued logic.

3. *Multivalued Logic*

The standard way of presenting these semantic ideas is as part of a bottom-up compositional definition of logical connectives, and of the validity of compound sentences formed by their use. The semantics is provided by a generalization of truth tables, defined not over Frege's two (truth) values but over many, perhaps an infinite number. Corresponding to each n-ary syntactic compounding device is a function mapping n-tuples of values assigned to component sentences onto the value assigned to the compound sentence in which they are components. These functions are most easily visualized in the form of the familiar sort of table:

!	[*1]	[2]	[3]
[*1]	1	2	3
[2]	1	3	3
[3]	2	3	1

According to this table, for instance, an interpretation that assigns p the value [2] and q the value [3] must assign $p!q$ the value [3].

Since the original role played by the notion of truth-value is being bifur-

cated, it is best not to beg questions by continuing to employ it for one or the other of these notions. The values in the set {[1], [2], [3]} may be called *multivalues*. One or more of the multivalues is distinguished or *designated* (indicated by the '*' attached to the multivalue [1] in the table). A compound formula is valid in virtue of its form in case it is assigned a designated value no matter what multivalues are assigned to its component sentences.

Designatedness here indicates whatever the force-relevant notion is, for instance truth or, more generally, what is preserved by good inferences (which might in another context be some sort of commitment or entitlement). According to such a scheme, an interpretation assigns each sentence two sorts of value: as designated or not, and as having a certain multivalue.[5] The designatedness value includes everything that matters for the pragmatic significance of the freestanding uses of the sentence (to which assertional force can be attached) as far as it is represented by this formal apparatus. Differences between sentences that are assigned the same designatedness value (in the example, designated or not designated) are significant at all only insofar as they affect the designatedness of compounds containing them. The two undesignated multivalues in the example differ in that substituting one for the other changes not only the multivalues but the designatedness of some compounds containing them.

The standard, bottom-up direction of explanation exploits this apparatus to move from an antecedent set of multivalues that can be associated with sentences, and from functions antecedently associated with compounding devices, via a notion of designatedness, to attributions of formal validity. The same apparatus, however, can be exploited in the service of the converse, top-down direction of explanation. Then the move is from antecedently understood attributions of material designatedness to assignments of multivalues to sentences and of functions to compounding devices. The essential principle is that if two sentences have the same multivalue, then substituting one for the other never changes the designatedness of any compound sentence in which they can appear as components. This is what is meant by saying that the multivalues express the contribution a sentence makes to the designatedness value of compounds containing it.

Since any sentence can be regarded as a degenerate compound containing itself, it follows from this principle that two sentences with the same multivalue must have the same designatedness value. This is what justifies the usual procedure—embodied both in the standard tabular way of setting out semantic definitions of connectives in multivalued logic and in the definitions that generalize it to semantic matrices—of treating multivalues, rather than sentences, as what take designatedness values. Turning the basic principle around, two sentences can be treated as having the same multivalue just in case substituting one for the other never changes the designatedness value of a compound sentence in which one appears as a component. In this way, sentences are assimilated into co-multivalue classes—and so taken as

sharing their ingredient contents—accordingly as their intersubstitution as components of compound sentences preserves the designatedness values of those compounds. Lindenbaum can be understood as employing an extreme form of this strategy in his mechanism for constructing, from the set of theorems of a logic meeting certain general conditions, a matrix of multivalues and compounding functions defined over them that would validate just those theorems, by identifying multivalues with equivalence classes of logically interderivable sentences, and designatedness with theoremhood. There is no guarantee that this procedure will not end up with an infinite number of small equivalence classes (as it does in the standard Lindenbaum algebra for the propositional calculus).

How finely the ingredient contents are individuated by this substitutional test depends on the expressive power of the language, specifically on what sentential embedding contexts and embedded sentences are discerned in it. Strictly speaking, substitutional assimilation according to multivalues or ingredient contents is always relativized to a class of embedded sentence occurrences, and so to a class of sentential embedding contexts. It is not implausible that in natural languages, for any two lexically distinct sentences, there is some context in which substitution of one for the other can affect the assertional designatedness of the compound sentence resulting from such substitution. For instance, '*S* now thinks (or wishes) that *p*' is quite discriminating. This fact need not rob the substitutional form of analysis of its usefulness, for relative to various restricted classes of contexts, important assimilations are brought about nonetheless. Indeed, the partial ordering on sentential contexts that is brought about by looking at proper-inclusion relations among the multivalue equivalence classes they generate can contain interesting information about the semantic relations between those compounding devices.

Two embedding contexts can generate the same multivalues (in case they sort possible embedded sentences into just the same equivalence classes), or one can cut finer than another. Suppose, though, that every sentential embedding context that is discerned yields a different way of carving up the embedded sentences into equivalence classes, in a crazy-quilt of overlapping classes exhibiting no substantial identities or inclusions. In that case there would seem to be no theoretical advantage to discerning the semantically significant occurrence of one sentence in another. Occurrence of a sentential expression as a lexical part or syntactical subunit of another sentence is neither necessary nor sufficient to make it appropriate to discern the semantically significant occurrence of one sentence in another. The theorist may discern such occurrences where there are no lexical sentences, as with an embedded expression such as 'Kant's claim about Aufklärung and responsibility', or may deny them where there are, as Quine would do with direct quotation of sentences uttered. Discerning subsentential structure is enlightening only insofar as the assimilation of embedded sentences shows how the

capacity to use the embedded sentences, together with the capacity to use some of the embedding sentences, could generalize to a capacity to use the compound sentences with arbitrary embedded components.

It is worth considering a somewhat different, but closely related, point that Dummett makes, in connection with an approach to linguistic theorizing he associates with Wittgenstein:

> One way in which these passages from Wittgenstein may be taken is as rejecting the whole idea that there is any one key idea in the theory of meaning: the meaning of each sentence is to be explained by a direct characterization of all the different features of its use; there is no uniform means of deriving all the other features from any one of them. Such an account would have no use for any distinction between sense and force: while it could admit some rough classification of sentences, or particular utterances of sentences, according to the kinds of linguistic act effected by means of them, it could cheerfully regard the totality of such types of linguistic act as unsurveyable—as Wittgenstein does—and would not need to invoke the classification of linguistic acts in its accounts of the meanings of particular sentences . . . The difficulty with such a theory is to see how it could do justice to the way in which the meanings of sentences are determined by the meanings of the words which compose them. The great strength of a theory which admits something as the key concept for the theory of meaning—at least a theory which is as developed as that of Frege—is that it displays a plausible pattern for the determination of the meaning of a sentence by the meanings of the constituent words . . . If nothing is to be taken to be a key concept, then we are once more without any conception of what the meaning of a word, as opposed to that of a sentence, is taken to be.[6]

The idea is that understanding a word need consist only in understanding the contribution it makes to the sense or content of sentences containing it. From there, the speech-act theory is to explain how that content contributes to the force or significance of various sorts of performances involving it. Otherwise, understanding the word requires mastery of the contribution it makes to all of the different acts that can be performed by means of it.

What underlies the analogy

$$\begin{array}{rcl} \text{force} & : & \text{sense} \\ (\text{or pragmatic significance} & : & \text{semantic content}) \\ & :: & \\ \text{sentential content} & : & \text{subsentential content} \end{array}$$

is the thought that each variety of significance a performance can have sorts sentences that may be uttered with that force or significance into content-equivalence classes accordingly as intersubstitution preserves it. Unless dif-

ferent kinds of force or significance sort sentences into content-equivalence classes in the same way, no theoretical advance is made by discerning contents in addition to significances. Just so with assimilation of subsentential components preserving the content (or significance) of sentential compounds.

It was said above that although Frege is the first to take seriously the requirement that some aspect of semantic content determines the contribution a contentful expression makes to compounds in which it occurs as a component, nonetheless in the semantics for his logic he employs one notion, truth-value, to play both freestanding and ingredient roles. He there codifies inferences that depend only on the logical form of the sentences involved, and not on their material or nonlogical content. For these purposes he finds that it is possible to treat truth- (or commitment-) preservation not only as necessary for goodness of inference but also as sufficient. Thus for the inferences codified by his classical conditional, not only is designatedness preserved by good inferences, but any inference that preserves designatedness is a good one. For this compounding device, the two-valued conditional, sameness of designatedness value (which does duty here for freestanding content) is sufficient for sameness of multivalue (which does duty here for ingredient content). In this sentential context, the force-relevant content determines the role of sentences as components as well.

Designatedness-functional contexts such as this may be said to embed *homogeneously* with respect to designatedness values, since those values are all that matter in determining the contribution made by an embedded sentence to the designatedness value of the whole (that is, they can serve as multivalues). This term is used to mark off one of the several distinct senses sometimes attached to the expression *extensional.* Whether or not a sentential context is homogeneous in this sense concerns the relation between designatedness values and multivalues. It is quite independent of any specific conceptions of what plays the role of the immediately pragmatically relevant freestanding content. That role could be played by an antecedent concept of truth values or (looking ahead) by a concept of truth conditions.

Truth is preserved by good inferences of a certain important class. That class can be thought of as corresponding to deductive inferences, provided the notion is broadened beyond the concern with formally good inferences that is traditionally tied up with the notion of deduction. (Here the principle that a good inference never leads from premises that are true to a conclusion that is not true is being thought of as only a necessary condition on the goodness of inferences.) The inferences in question are just the commitment-preserving ones, ('committive inferences', for short). The pragmatic force of freestanding utterances of the expressions that can take truth-values of the sort preserved by good inferences (that is, sentential expressions) is assertional commitment, overtly acknowledged by, and so appropriately attributed to, the utterer. If the inference in question is a good one of this sort,

then to be committed to the premises is to be committed to the conclusion. No further understanding of the notion of truth-value in its role as designatedness value is required in order to proceed to the assimilation of sentences into multivalue equivalence classes.

Start with any set of concomitantly attributed or undertaken commitments to claims, some of which are expressed by sentences that are sententially compound (in that substitution for sentences that occur as their components makes sense). Then assign to two sentences the same componential value or multivalue (relative to that set of commitments and that compounding vocabulary) just in case substituting one for the other never turns a sentence expressing a claim in the set of concomitant commitments into a sentence expressing a claim that is not in that set. It follows that if two sentences are componentially equivalent, then they have the same designatedness value—the commitments in question include either both of them or neither.

To recap: The sort of content that has been considered here previously is the broadly inferential content that determines the correct uses of freestanding sentential utterances, paradigmatically the significance of asserting them. Content understood in this way can be associated only with expressions whose freestanding use has a pragmatic significance. It is not available as an interpretation of the contribution made by the occurrence of essentially subsentential expressions, such as singular terms and predicates. Following Frege and Dummett, a further sort of sentential content, 'ingredient' content, has been discerned, corresponding to the role that sentences can play as components of compound sentences. Although freestanding content may play the role of ingredient content (in homogeneous contexts), in general the latter is not reducible to the former. Ingredient contents are a sort that can coherently be attributed to expressions functioning only as components of assertible sentences, although so far only the contents to be associated with sentential sentence components have been considered. In the usual synthetic use of contents as multivalues, to define logical connectives, one begins with contents of this sort and determines designatedness values and, eventually, formal validity by their means. But the same apparatus can be exploited analytically, to move down from a notion of formal validity (as Lindenbaum does) to the assimilation of sentences according to their componential roles or, as has just been seen, from a notion of material designatedness (for example as assertional commitment) to multivalue equivalence classes. The mechanism whereby a simple notion of ingredient content (multivalue) is extracted from a simple notion of freestanding content (designatedness value) is purely substitutional. Two expressions are assimilated as making the same contribution to compound sentences in which they occur relative to some property of freestanding sentences just in case substituting one for the other never changes an embedding sentence from one that has the property to one that does not. As concern shifts to material, rather than formal, issues,

validity ceases to be the key notion, and designatedness comes to the fore, as the topmost property with respect to which substitutional invariances are assessed. The route to the notion of semantically significant occurrences of subsentential expressions, then, goes through the notion of substitution.

II. SUBSTITUTION, SENTENTIAL EMBEDDING, AND SEMANTIC ROLES

1. Substitution and Subsentential Content

Frege's notion of *substitution* is the key to appreciating the characteristic theoretical role played by concepts of semantic content. This point begins to emerge when it is noticed that in the story just told, the relations between designatedness and multivalue, on the one hand, and between validity and designatedness, on the other, are of the same general sort. The fundamental pragmatic status that a notion of content is to help keep track of is that of assertional or doxastic commitment. As the previous chapter argued, this is a notion sufficiently intimately tied to that of truth claim that whatever sort of content ends up accounting for the pragmatic significance associated with that status for that reason has credentials as explicating one important dimension of truth talk.

Given the general understanding of the relation between material and formal proprieties of practice that has been urged earlier, the concept of the formal logical validity of claims should be treated as derived from that of material assertional commitment. The means of derivation are straightforwardly *substitutional:* A (logically) valid claim is one, first, that is designated (to which one does or ought to undertake or attribute commitment) and one, second, that cannot be turned into an undesignated claim by any substitutions restricted to a special class of vocabulary. In the case being considered, the nonlogical vocabulary consists just in the component sentences, from which the compound sentence is conceived as resulting upon the application of a logical sentential connective. If a sentential context is not valid, in that not all substitutions preserve designatedness, then it may be substitutionally homogeneous (designatedness-functional), provided that substitution within codesignatedness classes preserves designatedness. If not, then intersubstitution within multivalue classes, substitutionally heterogeneous with respect to designatedness, by definition will preserve designatedness. Valid claims are just those special sentential contexts with respect to which the multivalue substitutional equivalence class assimilates all sentences. Ordinary claims—which are not valid with respect to substitution for components generally, nor with respect to codesignated components—are valid with respect to substitution for component sentences by sentences sharing a multivalue. The same substitutional structure is responsible for moving up from material assertional commitments to assertional validity and moving down

from material assertional commitments to multivalues or ingredient contents.

If logically valid sentential contexts are just those that assimilate all sentences into one single multivalue equivalence class, what is their special interest? They are of interest because the way those valid contexts are compounded out of other, nonvalid ones has much to teach about those nonvalid contexts, which include the basic sentential connectives. Any metatheory that identifies a logic with the set of its theorems is committed to understanding the semantics of logical expressions only insofar as it is expressed by the capacity of those expressions to enter into assertionally valid combinations. As was pointed out in Chapter 2, Dummett correctly argues that this is an unduly restrictive view of the subject matter of logic.[7] He would identify that subject matter by reference not to the theorems characterizing a logic but to its derivability relation. For classical Boolean logic these two notions are equivalent, but in general the theorems need not settle the derivability relation. He shows how the apparatus of multivalues can be applied in the definition of valid inferences, and not just in the definition of valid claims. He is concerned with defining validity from antecedent sets of multivalues, that is with the synthetic rather than the analytic use of this substitutional machinery. And since his topic is logical validity, he is concerned only with formal, and not with material, inferences. But the point he makes carries over to the analysis of material inferences and the derivation of a notion of material ingredient content, where its real significance becomes apparent.

A move from material assertional commitment as designatedness to material inferential commitment as designatedness corresponds to the move Dummett recommends from formal assertional validity to formal inferential validity as the notion with respect to which substitutional equivalence is assessed. The suggestion is to look at inferential commitments and correctnesses of inference instead of, or as well as, looking at assertional commitments and correctnesses of claims. A condition on the individuation of sentential contents as inferential roles can be generated from the notion of goodness of inferences by considering two sequential applications of the methodology of substitution that generates multivalues from the designatedness of compound sentences. Extending Frege's usage, two claims can be said to have the same inferential content just in case substitution of a token of the one type for a token of the other never turns a good inference into one that is not good, no matter whether the sentence appears as a premise or as part of the conclusion of the inference.

This principle does not depend on the existence in the language in question of sentential operators producing compound sentences in which other sentences are embedded. An inference here can be thought of as a pair of sets: of premise claims and of conclusion claims. Inferences can be treated as themselves a sort of compound in which sentences can appear as embedded

components, and such inferences can be classified as 'designated' (good) or not. If attention is restricted to inferences involving only freestanding occurrences of sentences, the equivalence classes of claims defined by preservation of goodness of inference on intersubstitution within the class may be called 'freestanding inferential contents'. Inferential contents so defined are generated just the way multivalues are, except that instead of looking at the designatedness of compounds such as conditionals as what must be preserved by substitution, one looks at the goodness of inferences. They are the products of the first application to the analysis of inferences of the substitutional methodology suggested by multivalues. The result is just what Frege defined as "begriffliche Inhalt" (conceptual content) at the beginning of the *Begriffsschrift*, as discussed in Chapter 2.

Component conceptual contents can then be defined by a second application of the substitutional methodology that introduces multivalues—this time to a case where what must be preserved on substitution is not the designatedness of compound sentences but their inferential contents, which were constructed substitutionally by the first application of the analogy with multivalues. The result is to put into play two concepts of broadly inferential content: contents as the inferential potentials of freestanding sentential utterance (including both their employment as premises and as conclusions of inferences), on the one hand, and contents as the contribution a sentence makes to the inferential content of compound sentences in which it appears as a component, on the other. This latter sort of content, which may be called the 'component content' of a sentence, arises from considering substitution within compounds, rather than within inferences. Putting the two definitions together, it follows that two sentences have the same component content if and only if substitution of one for the other as embedded components of any compound sentence never turns from good to not good an inference in which the compound sentence appears freestanding. Assimilating sentences accordingly as their intersubstitution in inferences preserves the material goodness of inferences yields freestanding content equivalence classes, and assimilating them accordingly as their intersubstitution in sentential compounds preserves freestanding content, yields component or ingredient content-equivalence classes. On the side of assertional commitments and proprieties, beginning with material designatedness of compound claims yields one level of further substitutional assimilation, namely multivalues. On the side of inferential commitments and proprieties, the substitutional machinery can be applied twice—once to yield a notion of freestanding inferential content, and once again to yield a notion of component inferential content. (It is irrelevant for this contrast that in either case the top-level material notion, whether assertional or inferential, can also be used substitutionally to define notions of formal validity.)

The first step in generating the inferential hierarchy of substitutional levels of content was made by noticing that Frege's substitutional definition

of equivalence of conceptual contents from material goodnesses of inference is analogous in structure to the definition of equivalence of multivalues from truth-as-designatedness, that is, material goodnesses of claims. The main adjustment required for this analogy is that inferences must be treated as a kind of context in which sentences can appear embedded, as premises and conclusions, and which as a whole is assessable according to its correctness. The second application of the substitutional machinery is more closely analogous to the assertional designatedness-multivalue paradigm in that only substitution within compound sentences in which other sentences occur as components is envisaged. It is less closely analogous to the paradigm than the first step in that what is preserved as the test of assimilation (corresponding to multivalue equivalence in the assertional paradigm) is in the inferential case not an on/off property, designated or not designated, but possession of a certain freestanding inferential role or value—of which there are many, perhaps infinitely many. It is by way of preparation for this point that the initial account above of the relation between designatedness and multivalues speaks of intersubstitution within multivalue classes as preserving designatedness *value*, even where this just means preserving designatedness.[8] The substitutional conceptual machinery as such is indifferent as to whether what is preserved is membership in a single class (the designated ones), alike for all compound sentences whose components are being varied, or membership in whichever element of some partition the compound sentence whose components are being varied belongs to. That there is no technical difference does not mean, however, that there is no difference in the explanatory value of applying the technical machinery.

Dummett robustly acknowledges the requirement that a notion of semantic content qualifies as such only by its relevance to the pragmatic significance of acts, for which asserting serves as a prototype. He is concerned to argue that this requirement means that the substitutionally topmost level of interpretation, the level of designatedness, must be two-valued or on/off, since what must ultimately be settled is whether an assertion is or is not correct (assertible).[9] As a general point, this seems dubious—perhaps a normative pragmatics need not be founded on the application of the dichotomy correct/incorrect to performances such as assertions. The discursive score-keeping account offered here is substantially more complex, as not only are commitment and entitlement distinguished, but track is kept of which are undertaken and which attributed—all articulating various ways in which a claim or an inference can count as correct. Again, thinking of pragmatic status as what must be preserved upon intersubstitution of sentences sharing a semantic content may be too narrow a formal paradigm—perhaps semantic contents can determine the correctness of material inferences without having for that reason to be conceived as preserved by good inferences.

Whether or not this on/off requirement could be shown to apply to semantic interpretation generally, there is a sense in which it is satisfied by the

inferential hierarchy that is here laid alongside the assertional one that Dummett considers. The topmost notion there is the goodness of inference, which can be thought of as a yes/no, correct/incorrect, two-valued affair: of designatedness rather than 'designatedness values'. This is because, though the purely substitutional machinery does not require it, the topmost notion in these hierarchies is a pragmatic one, as Dummett urges; furthermore, the sort of pragmatics being pursued here is one of deontic status and social attitude (commitment and entitlement, attributing and undertaking), and these are conceived as either characterizing an individual or not. The three-leveled inferential hierarchy shows, though, that the assessments of correctness that generate this two-valuedness at the top need not be directed in the first instance at sentences. When one starts with inferences, sentences are assimilated into many inferential role-equivalence classes, not simply into those that are designated as correct and those that are not.

2. *Two Concepts of Extensionality*

The assertional interpretive hierarchy—of designatedness as substantive assertional commitment and multivalues as equivalence classes of component sentences intersubstitutable saving the designatedness of compounds—gave rise to a natural notion of extensionality for sentential contexts as consisting in componential homogeneity. In this sense a context is extensional if the multivalue equivalence relation need cut no finer than the codesignatedness classes. How does the componential notion of extensionality apply to the inferential interpretive hierarchy? Since sentences are not inferences, the relation between designated inferences and the inferential roles of freestanding sentences cannot be homogeneous. It cannot strictly be that all one needs to know about freestanding sentences in order to assimilate them in such a way that intersubstitution within the resulting classes will preserve goodness of inference is whether or not they are good inferences, for they are not inferences at all. It will be necessary to look elsewhere for an analog of this sort of extensionality at the top level of the inferential hierarchy. At the lower level, when what is at issue is the relation between the inferential roles of sentences and their componential roles, however, a notion of extensionality as homogeneity does apply, since it is sentences in both cases that are assigned such roles.

A sentential context in which sentences can appear embedded as components is extensional in the sense of being componentially homogeneous just in case substitution of one claim for another with the same inferential role never alters the inferential role of the compound sentence containing them. It is a criterion of adequacy on semantically explicitating vocabulary—which has been picked out here as deserving to be called specifically *logical* vocabulary in virtue of playing that expressive role—that it generate embedding contexts that are inferential-role-functional or homogeneous in this sense.

Thus the inferential role of a conditional claim is to be settled by the inferential roles of its antecedent and consequent. Not all vocabulary is like this. In some of its uses, for instance, the inferential role played by the important, pragmatically explicitating expression '*S* claims that *p*' in some speaker's mouth depends not on the inferential role played by *p* for that speaker but on the role it is taken to play for *S*.[10]

Componential homogeneity is a concept that has application only within a substitutional hierarchy. There sentences are assimilated at the lower level, as associated with one sort of semantic interpretant, in case substituting one for another does not alter the assimilation at a higher level. That assimilation corresponds to association of another sort of semantic interpretant with sentences that depend in some way upon the sentences substituted for. A different sort of reducibility can be conceived in terms of the relations between the two-leveled hierarchy of assertional semantic interpretation and the three-leveled hierarchy of inferential semantic interpretation. A particularly strong bond between the assertional and the inferential orders would be forged if the designatedness of sentences determined the designatedness of inferences involving those sentences. The topmost assertional level of interpretation (committed/not committed) would then assimilate sentences into inferential-role equivalence classes, and assertional multivalues would coincide with inferential component contents. Commitment to the goodness of inferences would be preserved by substitutions for premises and conclusions, provided those substitutions preserve assertional commitment.[11]

Notice that the concept of multivalue is not equivalent to that of component content unless never turning a designated claim into one that is not designated is sufficient for never turning a good inference into one that is not good. Since in any case preserving designatedness is a necessary condition of a good inference, sameness of component content will guarantee sameness of multivalue, but not in general vice versa. Multivalues capture the contribution that component sentences make to only the designatedness-functional inferences involving the compounds they are embedded in. Commitment to the goodness of an inference in this sense of goodness is what is expressed by the assertion of a classical two-valued truth functional, so-called material conditional. In connection with assessments of the formal correctness of certain kinds of logical inferences, treating preservation of assertional commitment as sufficient as well as necessary is not an entirely useless strategy, as Frege shows. But the principle it embodies is simply false if applied to genuinely material inferences, whose correctnesses constitute the possession of material content by the assertible sentences that appear as their premises and conclusions.

That inferential commitments should be determined (in this substitutional sense) by assertional commitments regarding their premises and conclusions—which is an interhierarchy rather than an intrahierarchy relation—is, however, another sense that has sometimes been associated

with the notion of extensionality. Dummett, in the chapter in which he discusses the distinction between truth-value as designatedness and truth-value as ingredient or multivalue, considers the tension in Frege between two conceptions of Bedeutung. In one sense this technical term is used just to mean something like 'semantic role', defined by substitutional assimilations. In another sense the relation between an expression and its interpreting Bedeutung is understood to be modeled on that between a name and its bearer. At this stage in the present exposition, names and bearers are not among the concepts it is officially permissible to pretend to understand. Sentences, and their pragmatic and semantic correlates—that is, assertional commitments and inferentially articulated propositional contents—are all that are onboard so far. But Bedeutung notoriously embraces not only particular objects as referred to by singular terms but also truth-values, taken by sentences. The analog at the categorial level of sentences, to the tension at the categorial level of terms between a substitutional notion of Bedeutung as semantic role and a representational notion of it modeled on the name/named relation, is the 'tension' between notions of content derived from the inferential hierarchy and those derived from the assertional.

For substitution within assertional codesignatedness classes to preserve inferential designatedness is only one way in which the assertional interpretants might determine the inferential ones. Another possibility is that two sentences might have the same freestanding inferential role in case they have the same multivalue or assertional component content. Whether or not this is so depends on the expressive resources of the language, on what sort of sentence-forming locutions it makes available. Where these resources include conditionals, since these codify inferential commitments as explicit assertional commitments, the assertional designatedness of conditionals will vary with substitution of antecedent for antecedent and consequent for consequent, unless the substituends share their freestanding inferential roles. Different kinds of conditionals may codify different classes of inferences, each of which defines a correlative substitutional notion of inferential role. Where the inferences corresponding to that role are expressible by conditionals in the language, assertional multivalues must cut as fine as freestanding inferential contents.

Of course, the assertional multivalues may partition the sentences into even smaller classes, as they will if the language permits compound sentential contexts interpretable as having the form '*S* believes that if . . . then *q*'. Whether or not the expressive resources of the language suffice to establish a general determination of freestanding inferential contents by assertional multivalues depends not only on what conditionals exist but on how they behave. If only finitary conjunction is available, for instance, assertional multivalues adequately represent freestanding inferential contents in general only if the language is compact. Again, if infinitary conjunction is available, it must be able to form 'enough' conjunctions, and so conditionals. In any

case, it is clear that the proper order of explanation runs from inferential role to assertional codifying locutions (such as conditionals), to a multivalue defined substitutionally with respect to assertions formed by the use of those locutions, not the other way around.

That is, one does not start with an intrasentential notion of assertional multivalue and then use that to define conditionals, and those to define inferences. Freestanding inferential contents must be defined as part of the same conceptual package as assertional designatedness. Inferential commitment must be considered along with assertional commitment. For it is its inferential role that determines what asserting a sentence commits and entitles one to, and what could commit or entitle one to it. Apart from such inferential involvements, an assertional commitment would be without content. The assertional hierarchy of interpretation should not be conceived as independent of and antecedent to the inferential one. It may be noticed, furthermore, that even if sameness of assertional multivalue ensured sameness of freestanding inferential content, it would not follow that it ensured sameness of inferential component content, unless sameness of freestanding inferential role were sufficient for sameness of inferential component content, that is, unless the inferential hierarchy were componentially homogeneous.

If for these reasons the material-inferential interpretive hierarchy should not be seen as derivative from the material-assertional interpretive hierarchy, what about the other way around? Within these substitutional hierarchies there is a definite sense to the claim that one sort of content 'determines' another. Assertional multivalues determine assertional designatedness in the sense that two sentences cannot have the same assertional multivalue and different designatedness values. It is this sense in which freestanding inferential contents determine inferential designatedness, and inferential component contents determine the freestanding ones. One cannot in the same sense ask whether inferential designatedness determines assertional designatedness, since there is no one sort of thing that can take both values. One can ask whether it is possible for two interlocutors to undertake or have attributed to them just the same inferential commitments but different assertional ones. Apart from commitment to conditionals, it would seem that this possibility ought to be allowed. Two scientists or two politicians might agree entirely about what would be true if certain conditions obtained but nevertheless have quite different beliefs about what conditions do in fact obtain. Though it is true that in classical two-valued logic, fixing the truth-values of all the conditionals (corresponding to inferential commitments, of a sort) determines the truth-values of all of the atomic propositions, this property is an embarrassment and provides further good reason to deny that the classic horseshoe means "if . . . then . . ."[12] Hypothetical commitments ought not to settle categorical commitments. Rather, inferential commitments determine assertional commitments only taken together with other assertional

commitments. They cannot do the job all on their own. When purely formal inferences are at issue, there is a purely formal sort of assertion (namely of theoremhood) for which such determination can be envisioned: given a formal derivability relation *M*, one can consider {*A*: ΦMA}, that is, the set of claims derivable from the empty set of premises. Of course the same set can be defined with respect to a material-inferential relation, but the resulting set of claims is not the only one compatible with the inferential commitments that generate it.

3. *Compositionality and Decompositionality*

The primary lesson that should be drawn from this discussion is that there is an intimate relationship between the notion of *semantic content* and the concept of *substitution*. That concept is one of Frege's grand themes, exploited everywhere in the official definitions of logical and semantic concepts. He is methodologically quite self-conscious about the importance of his substitutional approach—it is the basis for his technical concept of function, which in his most metaphysical writings he takes as an explicit topic for philosophical inquiry. Frege's earliest semantic and logical work introduces the concept of conceptual content in terms of substitutional behavior with respect to a kind of pragmatic significance: two claims have the same content if substituting one for the other never turns a good inference into a bad one. Goodness of inference is a pragmatic matter—in Fregean terms, a matter of force; in this paradigmatic case, it is a matter of the force of reasons. In the terms being recommended here, it is a matter of normative force, of deontic status, and so of social practice and attitude. However the pragmatic end is conceived, the route from pragmatics to semantics is that of assimilating expressions according to invariance (of pragmatic significance of some sort) under substitution. This same substitutional path that leads from inference to sentential conceptual content leads as well from the possession of freestanding inferential content by compound sentences to the possession of component-inferential content by embedded ingredient sentences and, as will appear in the rest of this chapter, from sentential content to the content of subsentential expressions such as singular terms and predicates. The substitutional way of working out a top-down categorial explanatory strategy is already implicit in the substitutional form taken by Frege's inferentialist approach to propositional content.

This *de*compositional methodology is what lies behind what is often called Frege's 'principle of compositionality'. According to that principle, the semantic interpretant associated with a compound sentence such as a conditional should be a function of the semantic interpretants associated with its semantically significant components. In spite of the way it is usually interpreted or exploited, this principle by itself is neutral between bottom-up and top-down categorial explanatory strategies. As Frege's own substitutional

understanding of functions indicates, the principle operates as a constraint on what it is for one expression to count as a semantically significant component of another, regardless of whether the compound is conceived as built up in the first place by operations on antecedently specifiable components or, conversely, the components are conceived as substitutionally precipitated out of antecedently specifiable compounds.

Typically, discussions of the compositional constraint are framed, not in terms of the generic notion of a semantic interpretant, as above, but in terms of the specific notions of sense and reference that Frege introduced in 1891. Standard sketches of the explanatory roles characteristic of those two semantic conceptions center on the following leading ideas:

1. The referent of a sentence is its truth-value, what must be preserved by good inferences.
2. The sense of a sentence is the thought it expresses, what is grasped by someone who understands it.
3. The referents associated with compound expressions are functions of the referents of their components.
4. The senses associated with compound expressions are functions of the senses of their components.
5. The sense of a sentence, together with how things actually are, fixes its referent, that is, its truth-value.

Great care is required in specifying just what commitments one is attributing to Frege under headings such as these, but the point to be made here concerns only gross structure. Again, if subsentential expressions were currently at issue, further doctrines would need to be included, most notably that the referent of a proper name is the object that sentences it occurs in are about, or on which their truth depends.

At the crude level of description expressed by these five dicta, it may be noted that there is a natural mapping of the substitutionally generated assertional and inferential semantic hierarchies onto the Fregean scheme of sense and reference. Corresponding to (1), assertional designatedness plays the role of truth-value as what must be preserved by good inferences. Corresponding to (2), what one must grasp in order to understand a sentence is conceptual content, the begriffliche Inhalt of the *Begriffsschrift*. Two claims are defined as having the same conceptual content in case substituting one for the other never turns a good inference into a bad one. If substitutions within compound sentences such as conditionals, appearing as premises or conclusions, are included (as the subsequent practice of the *Begriffsschrift* in fact does), then the restricted compositional principle (4) will obtain as well, for the ingredient inferential contents of component sentences determine the ingredient inferential contents of the compounds they occur in quite generally. If the relevant substitutions are restricted to sentences playing freestanding roles as premise or conclusion, then what must be grasped is only freestand-

ing inferential content. In that case the restricted compositional principle (4) will obtain only for substitutionally homogeneous contexts of embedding, that is, where sharing an inferential role is sufficient for sharing a component inferential content. In any case, the corresponding restricted compositional principle on the side of reference, (3), will obtain only where assertional codesignatedness is sufficient for multivalue assimilation, that is, in assertionally homogeneous sentential contexts.

Frege is the first to investigate systematically the concept of the special sort of semantic value or content that an expression can have in virtue of its contribution to the semantic value or content of compound expressions in which it appears as a significant component. The latter notion arises in the context of a substitutional understanding of semantic contents in their relation to pragmatic significances generally. The distinction between freestanding and ingredient semantic contents is blurred, however, by the fact that both on the side of reference (which in one of its explanatory functions has been identified here with the hierarchy of assertional contents) and on the side of sense (which in one of its explanatory functions has been identified here with the hierarchy of inferential contents), Frege seeks to have *one* notion from each hierarchy play both sorts of role. (Attention is still restricted for the time being to sentential interpretants, so this means truth-values, on the side of reference, and thoughts, on the side of sense.) A less confining semantic metatheory answering to the same insights expressed in the compositional requirements (3) and (4) above is achieved if two different sorts of content—freestanding and ingredient—are distinguished, both within the (de)compositional hierarchy generated by the semantic interpretants immediately relevant to assertional force, and within that generated by the semantic interpretants immediately relevant to the inferential content that is asserted.

What about (5), the structural principle that sense determines reference? Does the inferential role (freestanding or ingredient) of a sentence determine its assertional designatedness value? In one sense, clearly not, insofar as inferential agreement among interlocutors need not entail assertional agreement. In another sense, though, it does. Since the inferential role of the sentence determines what an assertor is committed to by it, one interlocutor cannot licitly assign to two sentences the same inferential role and different assertional designatedness values. The most interesting sense of this question, however, is neither of these. It is rather whether inferential contents determine assertional commitments in a way analogous to that in which truth conditions are understood to determine truth-values in the familiar conceptions of sentential semantics that take their cue from the later Frege's willingness to specify the senses expressed by sentences in terms of their truth conditions. Characteristic of these conceptions is an understanding of truth conditions as supplying one sort of sentential content: meaning as intension, as defining a function, which given a world or set of facts, deter-

mines the truth-value of that sentence (relative to that world or those facts). Model theory and formal intensional semantics provide representationalist, bottom-up implementations of such an understanding.

The role being played by truth-values in this sort of story is that of assertional designatedness. In the rival scheme being developed here, that role is played by the notion of assertional commitment. The notion of free-standing inferential content, which is derived substitutionally from that of inferential commitment (or designatedness of inferences), is, like that of content as truth conditions, intended to specify the content of sentences in the sense of what it is that can be assertionally designated or true. The present question is whether and in what sense inferential contents can serve the function that truth conditions serve, of determining, together with the facts, truth-values-as-designatedness-values. Can the contents substitutionally extracted from the pragmatic status of inferential commitment be construed as related to those substitutionally extracted from the pragmatic status of assertional commitment as intension to extension?

There is a sense in which inferential contents, together with the facts, determine what is true (assertionally designated). Thus component contents may be seen as corresponding on the inferentially intensional side to multi-values on the inferentially extensional, that is assertional, side. Component contents, which determine inferential contents, can thus be thought of as expressing the contribution sentences make to the truth conditions-as-intensions of compounds containing them. Further consideration of the issue must be postponed until Chapter 8, because it cannot be pursued while continuing to suppress the additional level of analysis at which the deontic status of assertional commitment (designation) is resolved into social attitudes, which are explicitly relativized as to attributor and attributee.

When loose talk of deontic status is replaced by careful talk about deontic social attitudes, the essential clues will be seen to be that facts are just true claims, and that taking-true is just asserting. For each interlocutor, the inferential contents associated with anyone's sentences, together with the facts, determine which of those sentences express truths. The facts consulted in each case are the claims the attributing interlocutor takes to be true (that is, endorses) or acknowledges assertional commitment to. If inferential commitments, and so inferential contents, were uniform across a community, the determined truths and the determining facts would in every case coincide (though unless assertional commitments were also uniform, they would vary from attributor to attributor). But this is an extraordinary and degenerate sort of case, one that bears the same relation to the fundamental situation of communication involving the practice of truth assessment that a community in which assertional commitments are universally shared bears to the fundamental situation of communication involving the practice of assertion. The full story of how the inferential content attached to an expression by an interlocutor affects the proprieties of truth attributions by others, and espe-

cially the role played by (what are treated as) the facts, of how not only sentential but subsentential sense determines reference, is presented in Chapter 8 as the centerpiece of an account of the significance of representational idioms for semantic theories.

4. Summary

Dummett explicitly distinguishes the explanatory role played by freestanding and ingredient contents and recognizes Frege's accomplishment in conceiving of the latter. He also explains the relevance of multivalued logic to these two notions of semantic content by pointing out that the two notions of truth-value in play in such logics—what have been called here 'designatedness' and 'multivalue'—ought to be understood just as versions of freestanding and ingredient content, respectively. These insights of Frege and Dummett have been applied and extended here by conjoining them with three further theoretical orientations. First, the substitutional apparatus that induces the distinction between levels of content is applied *analytically,* or in a top-down categorial direction, rather than *synthetically,* or in the bottom-up categorial direction of explanation that has dominated logic and semantics since Frege. Second, where standard treatments focus exclusively on the pragmatic goodness of *asserting,* to generate a top-level notion of truth-value as assertional designatedness, attention has been drawn here as well to the pragmatic goodness of *inferring,* to assign inferential roles to sentences, on the basis of which ingredient contents can then be defined substitutionally. Dummett recommends a move like this in understanding multivalued logics, under the heading of shifting from concern with logical validity to concern with logical derivability, from formally good claims to formally good inferences.

Finally, and perhaps most important, the substitutional mechanism that relates designatedness to multivalues is applied to *contents* rather than to *forms.* It provides a general semantic structure answering to material commitments and endorsements and the proprieties they induce, not merely to formal ones. On the assertional side, assertional commitments generally are considered at the top level, not just formally validated theorems. On the inferential side, material-inferential commitments are considered at the top level, not just formally valid inferences. Furthermore, this shift from the formal to the material is extended down the substitutional hierarchy—not just from pragmatic significance to freestanding sentential semantic content, but from such content to the ingredient contents that matter for the behavior of sentences as components in compound sentences. So the sentential compounding devices that can be considered are extended from purely formal vocabulary such as the conditional to any materially contentful sentential context in which other sentences can appear embedded as components (embedded as components in the sense that they can be substituted for). The

account that emerges adds another piece to the puzzle concerning the relations between logic and semantics, a piece that dovetails with the semantically expressive view of the distinctive task of logical vocabulary.

The problem with which this discussion began is generated by the fact that concepts of *semantic content* must, to deserve that appellation, play a role in determining the *pragmatic significance* of producing an utterance or adopting a state that exhibits such content. However, direct assertional and inferential significance attaches only to sentences, and furthermore only to sentences appearing freestanding, that is, as asserted or as premise or conclusion of an inference. Introducing the notion of substitution provides a model of a sort of indirectly assertional or inferential significance that the subsentential occurrence of an expression can have. This sort of content can be associated with sentences occurring as significant components in other sentences, rather than freestanding in an assertional or inferential way. Once this sort of ingredient content has been introduced into one's semantic theory, however, it becomes available to be associated also with expressions that (unlike sentences) can occur *only* as parts of assertible sentences. So the notion of *substitution* and substitutional content—which have been used here to cash out the notion of the 'contribution' the occurrence of a sentential component makes to the freestanding content of compound sentences it appears in—makes available a route into the assignment of broadly assertional and inferential contents to expressions of *sub*sentential grammatical categories, such as singular terms and predicates, to which the concept of freestanding content does not apply. The rest of this chapter is devoted to considering the sort of semantic interpretant that can be substitutionally associated with such expressions.

A bonus arising out of this line of thought is that, while remaining entirely at the level of sentences, and while eschewing any appeal to notions of reference or representation (what Dummett calls "the semantic model of the name/bearer relation"), it has been shown how to make sense of the notion of extensionality of an embedding context. Dummett is wrong to say: "If the notion of reference were introduced in the first place simply as that of the semantic role of expressions of different kinds, without an appeal to the name/bearer relation as prototype, then, at the outset, we should have no inclination to distinguish intensional from extensional contexts, or to treat the former separately; on the contrary, there would be a natural presumption in favour of a uniform semantic treatment for all contexts."[13] In fact, two different (though related) senses have been specified in which a context may be called 'extensional'. One has to do with substitutional homogeneity, that is, the sufficiency of assimilations of sentences according to their freestanding role to serve as assimilations of sentences according to their ingredient role. The other has to do with the sufficiency of concepts of content extracted from the *assertional* substitutional hierarchy of freestanding and ingredient contents to do duty as concepts of content in the *inferential* substitutional

hierarchy of freestanding and ingredient contents. It is in this sense that an inference—thought of as a context in which sentences can appear as premises and conclusions—(and hence also the conditionals that makes that sort of inference propositionally explicit) can be called 'extensional'. The clues provided by these ways of conceiving extensionality will be exploited later in discussing the relations between *inferential* and *referential* semantics.

III. SUBSENTENTIAL EXPRESSIONS

1. *Singular Terms*

What conditions on the use of an expression are necessary and sufficient for it to be functioning as, or playing the role of, a singular term? What sort of expressive impoverishment is a language condemned to by not having anything playing that sort of role? The answers to these questions may seem straightforward, at least in the large. Singular terms are linguistic expressions that refer to, denote, or designate particular objects.[14] The point of having something playing this role in linguistic practice is to make it possible to talk about particular objects, which, together with their properties and relations, make up the world in which the practice is conducted.

The first of these claims may be accepted without accepting the order of explanation presupposed by the transition from the first claim to the second. To begin with, it may be questioned whether the concept *particular object* can be made intelligible without appeal to the concept *singular term.* Frege, for instance, implicitly denies this when in the *Grundlagen* he explains the ontological category of particular objects, to which he is concerned to argue numbers belong, in effect as comprising whatever can be referred to by using singular terms, to which linguistic category he argues numerals belong. Again, it may sensibly be doubted whether the concept of singular reference is itself sufficiently clear to serve as an unexplained explainer. If it is not, then the responses offered above provide not so much answers to the questions they address as recipes for turning a suitable theory of reference into such answers. Insofar as one is sanguine about the prospects for such a theory, this of course is no bad thing. But it is important to be clear about what such a theory must account for in order to be serviceable in this explanatory context.

It is not enough, for instance, to explain only *successful* reference. For put somewhat more carefully, the first answer forwarded above must be that singular terms are expressions that, in Quine's useful phrase, "*purport* to refer to just one object."[15] The qualification expressed in this slogan by the use of 'purport' has two different functions: to acknowledge the notorious possibility that a name or a definite description may *fail* in its referential bid, as 'the most rapidly converging sequence' (or 'the square root of 2', as opposed to 'the positive square root of 2') does, and to exclude *accidentally* singular

expressions such as 'natural satellite of the earth', which succeed at unique signification, though they do not profess it. Ruling out possibilities of failure would require either omniscience on the part of those speaking the language or unacceptable restrictions on the formation of definite descriptions from predicates.

Quine is suspicious of the full-blooded notions of representational purport implicit in intentional idioms, and the echoes in his phrase are a reminder of his desire to explain much of what they might be thought to explain by appeal to more austere linguistic analogs. For singular referential purport, in the sense he appeals to, need not be an intentional affair. As Quine is quick to point out, "Such talk of purport is only a picturesque way of alluding to the distinctive grammatical roles that singular . . . terms play in sentences." The real task is to specify this role. Explanatory ground is gained by appeal to the principle Quine states only in the presence of such an account. That story, however, would offer a direct answer to the question, What is a singular term? one that does not appeal to (but on the contrary can itself be used via Quine's principle to help explain) the dark and pregnant notion of referential or representational purport. It is such an account that the remainder of this chapter aims to provide.

A further reservation concerning the line of thought about singular terms just considered has to do with the part the concept of singular terms is envisaged as playing in an account of the use of a language as a whole. Of particular importance is the relative explanatory priority of the category of singular terms with respect to the category of sentences. Semantic theories typically do not treat expressions of all grammatical categories equally. It is not just that different sorts of semantic interpretants are assigned to sentences, say, than to singular terms. In addition, some of those assignments of interpretants are considered basic, while others are derived from them. These latter are expression kinds whose semantic interpretation proceeds by appeal to the semantic interpretation of other sorts of expressions. A familiar example is broadly Tarskian compositional theories, which appeal to primitive assignments (perhaps relative to an index, such as a context or a model) of particular objects to atomic singular terms and of sets of those objects to atomic predicates in order to generate interpretations for sentences compounded out of them (and, along the way, to compound terms and predicates).

A contrasting direction of explanation is exhibited by broadly Fregean functional-categorial grammars and their corresponding semantics. These are less restrictive, both syntactically and semantically, than the Tarskian ones, in that any categories can be chosen as basic, not just terms and predicates, and any sort of interpretants can be associated with items of those categories, not just objects and sets of objects. A general mechanism is provided whereby (an infinite number of) further grammatical categories can be derived from the basic ones, and categorially appropriate interpretants supplied for expressions of those categories.

Suppose, as is usual, that singular terms (T) and sentences (S) are chosen for the basic categories. Then the derived category of (single-place) predicates ($T \rightarrow S$) is understood to consist of expressions that combine with a term to yield a sentence, as 'writes' combines with 'Frege' to give 'Frege writes'. Adverbs, such as 'carefully', are expressions that combine with predicates to produce further predicates. They are $(\{T \rightarrow S\} \rightarrow \{T \rightarrow S\})$s, taking 'writes' into 'writes carefully', for instance.[16] Exactly corresponding to this infinite syntactic hierarchy of derived categories is a semantic one, which turns arbitrary assignments of kinds of semantic interpretant to expressions of the basic categories into assignments of kinds of interpretant to expressions of the derived ones.

The general rule is that the semantic interpretant of an item of derived category ($X \rightarrow Y$) is a function taking arguments of the kind semantically associated with the category X into values of the kind semantically associated with the category Y. So if singular terms were associated with objects, and sentences with sets of possible worlds, then predicates would be assigned functions from objects to sets of possible worlds, and adverbs would be assigned functions from functions of that kind to functions of that kind. The functional mechanism is completely indifferent as to the interpretation of the primitive categories—singular terms could as well be associated with recognizability conditions, and sentences with assertibility conditions. It would then be settled automatically that quantifiers, as $(\{T \rightarrow S\} \rightarrow S)$s, must be semantically interpreted by functions taking functions from recognizability to assertibility conditions into assertibility conditions.[17]

2. *Subsentential Expressions and Projecting the Use of Novel Sentences*

In these two schemes for deriving the interpretation of some categories from the interpretation of more basic ones, sentences appear either as a derived semantic category or as a basic category on a par with singular terms. But it has been argued (under the heading of the pragmatic, and therefore semantic, priority of the propositional) that sentences are more special than this—that expressions of other categories count as having semantic content at all only insofar as they contribute to the content of sentences. The pre-Kantian tradition took it for granted that the proper order of semantic explanation begins with a doctrine of concepts or terms, divided into singular and general, whose meaningfulness can be grasped independently of and prior to the meaningfulness of judgments. Appealing to this basic level of interpretation, a doctrine of judgments then explains the combination of concepts into judgments, and how the correctness of the resulting judgments depends on what is combined and how. Appealing to this derived interpretation of judgments, a doctrine of consequences finally explains the combination of judgments into inferences and how the correctness of inferences depends on what is combined and how. Kant rejects this. One of his

cardinal innovations is the claim that the fundamental unit of awareness or cognition, the minimum graspable, is the judgment. For him, interpretations of something as classified or classifier make sense only as remarks about its role in judgment. In the *Grundlagen* Frege follows this Kantian line in insisting that "only in the context of a proposition [*Satz*] does a name have any meaning."[18] Frege takes this position because it is only to the utterance of sentences that pragmatic force attaches, and the explanatory purpose of associating semantic content with expressions is to provide a systematic account of such force.

That is, a further presupposition of the direction of explanation embodied in the answers forwarded above is that by saying what some expression represents (or purports to represent), one has thereby said how it ought to be used. As those candidate answers acknowledge, the category of singular terms whose nature and utility is being inquired into here is a *semantic* category. Associating objects (concrete or abstract) with expressions amounts to *semantic* interpretation of the expressions only if that association figures in the right way in accounts of how it would be correct to *use* them. Semantic properties and relations of expressions are distinguished from other sorts by the role they play in explaining the circumstances under which it is correct to use those expressions to perform various speech acts, and the appropriate consequences of so using them. Syntactic theory is concerned only to formulate rules determining what expressions are well formed, that is, can appropriately be used to perform standard speech acts. So it may group 'something' and 'everyone' in with 'the longest sentence in the A edition of Kant's first *Kritik*' and 'Aristotle'. Semantic theory ought nonetheless to distinguish the first two expressions from genuine singular terms, in virtue of the very different sorts of contribution their occurrence makes to the pragmatic significance of an utterance in a particular context.

Since semantics must in this way answer to pragmatics, the category of sentences has a certain kind of explanatory priority over subsentential categories of expression, such as singular terms and predicates. For sentences are the kind of expression whose freestanding utterance (that is, whose utterance unembedded in the utterance of some larger expression containing it) has the pragmatic significance of performing a speech act. Declarative sentences are those whose utterance typically has the significance of an assertion, of making a claim. Accordingly, there is available a sort of answer to the question,

What are sentences, and why are there any?

that is not available for any subsentential expression—namely, sentences are expressions whose unembedded utterance performs a speech act such as making a claim, asking a question, or giving a command. Without expressions of this category there can be no speech acts of any kind, and hence no specifically linguistic practice.

From this point of view it is not obvious why there should be subsenten-

tial expressions at all. For they cannot have the same sort of fundamental pragmatic role to play that sentences do. As a result, they not only cannot have the same *sort* of semantic content that sentences do, they cannot even have semantic content in the same *sense* that sentences do. Sentences have pragmatic priority, in that they are the category of expressions whose use constitutes linguistic practice. Accordingly, it is sentences whose proper deployment must be determined, in context, by associating semantic interpretants with them.

From this perspective, it is necessary to ask a question more general than that of the subtitle of this chapter:

What are subsentential expressions, and why are there any?

Given the pragmatic priority of sentences, why should other semantically significant categories be discerned at all? Sentences are assigned semantic contents as part of an explanation of what one is doing in asserting them, what one claims, what belief one avows thereby. But the utterance of an essentially subsentential expression, such as a singular term, is not the performance of this sort of speech act. It does not by itself make a move in the language game, does not alter the score of commitments and attitudes that it is appropriate for an audience to attribute to the speaker. Accordingly, such expressions cannot have semantic contents in the same sense in which sentences can. They can be taken to be semantically contentful only in a derivative sense, insofar as their occurrence as components in sentences contributes to the contents (in the basic, practice-relevant sense) of those sentences.

So if, with Davidson, one takes the semantic interpretation of linguistic expressions to be an aspect of the intentional interpretation of behavior—assigning truth conditions to sentences according to the beliefs they express, and assigning truth conditions to beliefs and desires so as to make possible the explanation and prediction of behavior as largely rational for one who has beliefs and desires with those contents—then one ought to follow him as well in taking the *only* constraint on an assignment of denotations to subsentential expressions to be that it makes the truth conditions come out right. That is, one ought not to take there to be some independent notion of primitive denotation for such expressions that constrains or even determines the assignment of truth conditions.[19] The Tarskian technical apparatus is indifferent to whether it is exploited philosophically in the compositional, bottom-up direction Tarski originally envisaged or in the decompositional, top-down direction Davidson recommends. If one starts with the interpretation of subsentential expressions, then the primacy of the category of sentences in the linguistic practice one aims ultimately to account for provides sufficient motivation for moving up, compositionally, to generate truth conditions. What needs explanation is not this move but the concept of primitive denotation that provides its starting point. By contrast, if, because of their

pragmatic priority, one begins rather with the semantic interpretation of sentences, what is the motivation for decomposing them so as to interpret subsentential expressions as well? Why recognize the semantically significant occurrence of expressions of any category other than sentences?

Frege begins one of his later essays with this response: "It is astonishing what language can do. With a few syllables it can express an incalculable number of thoughts, so that even a thought grasped by a human being for the very first time can be put into a form of words which will be understood by someone to whom the thought is entirely new. This would be impossible, were we not able to distinguish parts in the thought corresponding to parts of a sentence."[20] The ability to produce and understand an indefinite number of novel sentences is a striking and essential feature of linguistic practice. As Chomsky has since emphasized, such creativity is the rule rather than the exception. Almost every sentence uttered by an adult native speaker is being uttered for the first time—not just the first time for that speaker, but the first time in human history. This high proportion of sentential novelty appears in surveys of empirically recorded discourses and becomes evident on statistical grounds when one compares the number of sentences of, say, thirty or fewer words, with the number there has been time for English speakers to have uttered, even if we never did anything else.[21] "Please pass the salt" may get a lot of play, but it is exceptionally unlikely that a sentence chosen at random from this book, for instance, would ever have been inscribed or otherwise uttered elsewhere.

The point is often made that individual speakers in training are exposed to correct uses only of a relatively small finite number of sentences and must on that basis somehow acquire practical mastery, responsive and productive, of proprieties of practice governing an indefinitely larger number.[22] The need to explain the possibility of projecting proper uses for many sentences from those for a few is, however, not just a constraint on accounts of language learning by individuals. For what is of interest is not just how the trick (of acquiring practical linguistic competence) might be done, but equally what the trick consists in, what counts as doing it. As just remarked, the whole linguistic community, by the most diachronically inclusive standards of community membership, has only produced (as correct) or responded to (as correct) a set of sentences that is small relative to the set of sentences one who attributes to them a language is thereby obliged to take it they have somehow determined the correct uses for. The idea that there is a difference between correct and incorrect uses of sentences no one has yet used involves some sort of projection.

There are a number of ways in which the use of a smaller number of sentences might determine the use of a larger number. If the alternative populations of sentence uses one is seeking to project to are sufficiently constrained, a small sample may suffice to determine which population is being sampled—for instance if no two of the candidate populations have any

subsets larger than n members in common, then a sample of that size will suffice to distinguish them. On the syntactic side, Chomsky follows this strategy in proposing that the reason grammar is learnable is that the final grammars available to the human learner are so severely constrained that the 'evidence' provided to such a learner in the form of sample grammatical sentences will in this way pick one out. On the semantic side, if there were relatively few in some sense possible constellations of correct usage for indefinitely many sentences, then specification or practical mastery of the correct use of a relative handful of them might well determine (in theory or in practice) the use of the rest—as ethologists have taught us that the most elaborate canned behavioral routines can be triggered by the occurrence of a few ordinary events.

Still, before resorting to the heroic postulation of the sort of structure that could make projection comprehensible even in the absence of subsentential structure (where sentences are individuated the way numerals are, for instance), it would seem the better part of valor to follow Frege in taking seriously the fact that the sentences we are familiar with do, after all, have parts. A two-stage compositional strategy for the explanation of projection would take it that what is settled by proprieties of use governing the smaller, sample set of sentences, which is projected, is the correct use of the subsentential components into which they can be analyzed or decomposed. The correct use of these components is then to be understood as determining the correct use also of further combinations of them into novel sentences.[23] The linguistic community determines the correct use of some sentences, and thereby of the words they involve, and so determines the correct use of the rest of the sentences that can be expressed using those words. By learning to use a relatively small initial sample of sentences, the individual learns to use the words they involve and thereby can learn to use all the sentences that can be formed out of those words by recombining them.

The need to project a distinction between proper and improper use for novel sentences provides the broad outlines of an answer to the question, What are subsentential expressions for? or Why are there any subsentential expressions? But what *are* subsentential expressions, functionally? According to the two-stage explanatory scheme, there are two sorts of constraints on the correct use of subsentential expressions, corresponding to their decompositional and compositional roles respectively. Their correct use must be determined by the correct use of relatively small subset of the sentences in which they can appear as components, and their correct use must collectively determine the correct use of all the sentences in which they can appear as components. In the passage cited above, Frege points out that this semantic projection of what he calls "thoughts" depends upon the possibility of syntactically analyzing the sentential expressions of those thoughts into elements, which can then be recombined to form novel sentences, expressing novel thoughts.

The key to the solution Frege endorses is the notion of *substitution.* For the first, or decompositional stage, sentences are to be analyzed into subsentential components by being assimilated as substitutional variants of one another—that is, related by being substitutionally accessible one from another. Regarding two sentences as substitutional variants of one another is discerning in them applications of the same function, in Frege's sense. In the second, or recompositional stage, novel sentences (and their interpretations) are to be generated as applications of familiar functions to familiar substitutable expressions. Familiar sorts of substitutional variation of familiar classes of sentences result in a host of unfamiliar sentences. This substitutional clue to the nature of subsentential expressions and their interpretation is pursued in what follows.

IV. WHAT ARE SINGULAR TERMS?

1. Syntax: Substitution-Structural Roles

What are singular terms? The question has been posed from the point of view of someone who understands (or is prepared to pretend to understand) already what it is to use an expression as a sentence but who admits to puzzlement concerning the distinctive contribution made by the occurrence of singular terms in such sentences. One way to get into this situation (that pursued in Chapter 3) is to begin with a pragmatics, an account of the significance of some fundamental kinds of speech act. A line can then be drawn around the *linguistic* by insisting that for the acts in question to qualify as *speech* acts, the fundamental kinds must include *asserting.* A general pragmatic theory then specifies for each speech act the circumstances in which, according to the practices of the linguistic community, one counts as entitled or obliged to perform it, and what difference that performance makes to what various interlocutors (the performers included) are thereby entitled or obliged to do. Assertional performances (and thereby specifically linguistic practices) are in turn picked out by *inferential* articulation—namely by the way in which the pragmatic circumstances and consequences of acts of asserting depend upon the inferential relations of ground and consequent among sentences. The category of sentences is then defined as comprising the expressions whose (freestanding or unembedded) utterance standardly has the significance of performing a speech act of one of the fundamental kinds. A pair of sentences[24] may be said to have the same pragmatic potential if across the whole variety of possible contexts their utterances would be speech acts with the same pragmatic significance (Fregean force).

Frege's notion of *substitution* can then be employed again to define subsentential categories of linguistic expression. Two subsentential expressions belong to the same syntactic or grammatical category just in case no well-

formed sentence (expression that can be used to perform one of the fundamental kinds of speech act) in which the one occurs can be turned into something that is not a sentence merely by substituting the other for it. Two subsentential expressions of the same grammatical category share a semantic content just in case substituting one for the other preserves the pragmatic potential of the sentences in which they occur. (Where sentences can occur embedded in other sentences, of course they too can be assigned semantic contents as well as pragmatic significances and potentials.) Then the intersubstitution of cocontentful subsentential expressions can be required to preserve the semantic contents of the sentences (and other expressions) they occur in, according to the structure laid out in the first two sections of this chapter. In this way, the notion of substitution allows both syntactic and semantic equivalence relations among expressions to be defined, beginning only with an account of force or pragmatic significance. The relations differ only in the substitutional invariants: expressions assimilated accordingly as well-formedness is preserved by intersubstitution share a syntactic category; those assimilated accordingly as pragmatic potential is preserved share a semantic content.

There are three sorts of roles that expression kinds can play with respect to this substitutional machinery. An expression can be substituted *for*, replacing or replaced by another expression, as a component of a compound expression. An expression can be substituted *in*, as compound expressions in which component expressions (which can be substituted for) occur. Finally, there is the substitutional frame or remainder: what is common to two substituted-in expressions that are substitutional variants of each other (corresponding to different substituted-for expressions). '$q \rightarrow r$' results from '$p \rightarrow r$', by substituting 'p' for 'q'. (In this example the expressions that are substituted in, '$p \rightarrow r$' and '$q \rightarrow r$', are sentences, and so are the expressions substituted for, 'p' and 'q'.)[25] The substitutional frame that is common to the two substitutional variants may be indicated by '$\alpha \rightarrow r$', in which 'α' marks a place where an appropriate substituted-for expression would appear.

Being substituted in, substituted for, or a substitutional frame are the *substitution-structural roles* that (sets of) expressions can play. The relation *being a substitutional variant of* obtains between substituted-in expressions, which must accordingly already have been discerned. Substitutional variation is indexed by pairs of expressions that are (substituting and) substituted for, which accordingly also must be antecedently distinguishable.[26] Substitution frames, by contrast, are not raw materials of the substitution process; they are its products. To discern the occurrence of a substitution frame—for instance '$\alpha \rightarrow r$' in '$p \rightarrow r$'—is to conceive of '$p \rightarrow r$' as paired with the set of all of its substitutional variants, such as '$q \rightarrow r$'. These are available only after a substitution relation has been instituted. For this reason, being substituted for and being substituted in may be said to be *basic* substitution-structural roles, while being a substitution frame is a (substitutionally) *derived* substitution-structural role.

Frege was the first to use distinctions such as these to characterize the roles of singular terms and predicates. Frege's idea is that predicates are the substitutional sentence frames formed when singular terms are substituted for in sentences.[27] One of the features that Strawson finds important in distinguishing singular terms from predicates follows immediately from this characterization in terms of substitution-structural role: namely that predicates do, and singular terms do not, have argument places and fixed adicities.[28] But it is clear that playing the substitution-structural roles of substituted for and frame with respect to substitutions in sentences is not by itself sufficient to permit the identification of expressions as singular terms and predicates, respectively. For, as in the schematic example of the previous paragraph, what is substituted for may be sentences, rather than singular terms, and the frames exhibited by substitutionally variant (sets of) sentences thereby become sentential connectives or operators, rather than predicates.[29] It will be seen, though, that the substitution-structural roles do provide important necessary conditions for being singular terms and predicates.

Why not think of predicates also as expressions that can be substituted for? If "Kant admired Rousseau" has "Rousseau admired Rousseau" as a substitutional variant when the category substituted for is terms, does it not also have "Kant was more punctual than Rousseau" as a substitutional variant when the category substituted for is predicates? Indeed, does not talk about predicates as a category of expression presuppose the possibility of such replacement of one predicate by another, given the substitutional definition of 'category' offered above? It does. Though either notion can be used to assimilate expressions accordingly as it preserves well-formedness of sentences, however, it is important to distinguish between *substituting* one expression (of a basic substitution-structural kind) for another and *replacing* one sentence frame with another. These differences are discussed in detail in Section V below. A few brief observations suffice here.

To begin with, it should not be forgotten that the frames on which the latter sort of replacement operates must themselves be understood as products of the former sort of substitution operation. Whatever items play the substitutionally derivative roles, for instance of sentence frames, can be counted as *expressions* only in an extended sense. They are more like *patterns* discernible in sentential expressions, or sets of such expressions, than like parts of them. A sentence frame is not a prior constituent of a sentence (though its occurrence may be marked orthographically that way) but a product of analyzing it, in particular by assimilating it to other sentences related to it as substitutional variants, when one or more of its actual constituents is substituted for. As a result, relative to such an analysis a sentence can exhibit many occurrences of expressions that can be substituted for, but only one frame resulting from such substitutions. A further difference, which is also a consequence of the substitutionally derivative status of sentence frames, is that replacing sentence frames, or more generally discerning substitutional variants in the second, wider sense, which involves replacement

of derived categories, requires matching argument places and keeping track of cross-referencing among them.[30] This has no analog in substitution for expressions of substitutionally basic categories. Thus although replacement of derivative expressions is sufficiently like substitution for basic expressions to define syntactic equivalence classes of expressions, they differ in ways that will later be seen to be important.

2. *Semantics: Substitution-Inferential Significances*

Raising the issue of the inferential significance of the occurrence in a sentence of some kind of subsentential expression shifts concern from the syntactic consequences of substitutional relations to their specifically semantic significance. Syntactic substitutional categories are defined by specifying which substitutions preserve sentencehood—where being a sentence is understood as having a pragmatic significance of its own, in that its freestanding utterance standardly counts as performing a basic speech act, paradigmatically making an assertion (overtly and explicitly acknowledging a doxastic commitment). Semantic substitutional contents can be defined by specifying which substitutions preserve the basic feature or features of sentences, in terms of which the pragmatic theory explains the proprieties of their use—namely the significance of the various speech acts they can be used to perform. This might be truth, justification, assertional commitment, or entitlement to such commitment (or whatever), as discussed in Sections I and II.[31]

Inferences that relate substitutionally variant substituted-in sentences as premise and conclusion, whether or not their goodness consists in the preservation of some semantically relevant whatsit, are called *substitution inferences.* An example is the inference from

> Benjamin Franklin invented bifocals

to

> The first postmaster general of the United States invented bifocals.

The premised sentence is substituted *in,* and a singular term is substituted *for,* to yield the conclusion. Because Benjamin Franklin was the first postmaster general of the United States, the inference from the premise to its substitutional variant is truth preserving: in the appropriate context, commitment to the premise involves commitment to the conclusion.

The substitution inference above *materially involves* the particular singular terms that occur (and are substituted for) in it. The particular predicate is not materially involved. For it is possible to replace that predicate with others without affecting the correctness (in this case, status-preservingness) of the inference. Thus if "α invented bifocals" is replaced by "α walked," the substitution inference from

Benjamin Franklin walked

to

The first postmaster general of the United States walked

will be correct under the same assumptions as the original. The predicates of concern are complex predicates, not simple ones. As such, they cannot be substituted for in a strict sense—they are substitution frames, playing a derived substitution-structural role. But a suitable notion of replacement of one sentence frame by another can be defined in terms of substitution for expressions playing basic substitution-structural roles.

The idea of replacing substitutional frames permits, for instance, substitution instances quantified over in "Anyone who admires someone admires himself," such as

Rousseau admires Montaigne, and Rousseau admires Rousseau

to appear as *frame-variants* of

Rousseau writes about Montaigne, and Rousseau writes about Rousseau,

when "α admires β, and α admires α" is replaced by "α writes about β, and α writes about α." The notion of substitution inference may be broadened to include inferences whose conclusion results from the premise upon replacement of a substitutional frame or pattern it exhibits by another. That is, the conclusions of inferences to be called 'substitution inferences' may be either frame-variants or strict substitutional variants of the premises (corresponding to basic and derived substitutional variation). Examples would be the inference from "Benjamin Franklin walked" to "Benjamin Franklin moved," and from "Benjamin Franklin walked" to "The inventor of bifocals walked," respectively.

The substitution inferences (in this broad sense) in which singular terms are materially involved differ in their formal structure from the substitution inferences in which predicates are materially involved. This difference provides another way of distinguishing the characteristic role of singular terms from that of other subsentential expressions, paradigmatically predicates. The point is noted by Strawson, who observes that predicates, but not singular terms, stand in "one-way inferential involvements." If the inference from "Benjamin Franklin walked" to "The inventor of bifocals walked" is a good one, then so is that from "The inventor of bifocals walked" to "Benjamin Franklin walked." Substitutions for singular terms yield reversible inferences. But it does not follow that the inference from "Benjamin Franklin moved" to "Benjamin Franklin walked" is good one, just because the inference from "Benjamin Franklin walked" to "Benjamin Franklin moved" is a good one. Replacements of predicates need not yield reversible inferences. Substitution inferences materially involving singular terms are de jure sym-

metric, while all predicates are materially involved in some asymmetric substitution inferences (though they may be involved in some symmetric ones as well).

One way to think about this difference is that where the goodness of a substitution inference is defined by its preservation of some semantically relevant whatsit, reflexivity and transitivity of those inferences is guaranteed by the nature of the preservation relation. The stuttering inference from p to p preserves any status that p might be accorded, while if the inference from p to q preserves that status, and that from q to r preserves it, then so must that from p to r. The symmetry of the relation, however, is assured neither by its status as an inferential relation nor by its holding accordingly as some status of the premise is preserved or transmitted to the conclusion.[32] Predicate substitution inferences may be asymmetric, while singular-term substitution inferences are always symmetric.

So singular terms are grouped into equivalence classes by the good substitution inferences in which they are materially involved, while predicates are grouped into reflexive, transitive, *a*symmetric structures or families. That is to say that some predicates are simply inferentially weaker than others, in the sense that everything that follows from the applicability of the weaker one follows also from the applicability of the stronger one, but not vice versa. The criteria or circumstances of appropriate application of '. . . walks' form a proper subset of those of '. . . moves'. Singular terms, by contrast, are not materially involved in substitution inferences whose conclusions are inferentially weaker than their premises.[33] To introduce a singular term into a language one must specify not only criteria of application but also criteria of identity, specifying which expressions are intersubstitutable with it.

Each member of such an inferential interchangeability equivalence class provides, symmetrically and indifferently, both sufficient conditions for the appropriate application and appropriate necessary consequences of application, for each of the other expressions in the class.[34] So, when the material substitution-inferential commitments that govern the use of singular terms are made explicit as the contents of assertional commitments, they take the form of identity claims. Identity locutions permit the expression of claims that have the significance of intersubstitution licenses. Weakening inferences, the one-way inferential involvements that collectively constitute the asymmetric substitutional significance of the occurrence of predicate expressions, are made assertionally explicit by the use of quantified conditionals. Thus "Benjamin Franklin is (=) the inventor of bifocals" ($t = t'$) and "Anything that walks, moves" $[(x)(Px \rightarrow Qx)]$.[35]

3. *Simple Material Substitution-Inferential Commitments*

The substitution inference from "The inventor of bifocals wrote about electricity" to "The first postmaster general of the United States wrote

about electricity" is a material inference. Since the inventor of bifocals is (=) the first postmaster general of the United States, it is a good inference (as is its converse). This last remark is worth unpacking a bit. Part of my associating the material content I do with the term 'the inventor of bifocals' consists in the commitment I undertake to the goodness of the substitution inferences that correspond to replacements of occurrences of that term by occurrences of 'the first postmaster general of the United States' (and vice versa). (This point is independent of the availability within the language of identity locutions permitting this substitution-inferential commitment to become explicit in the form of an assertional commitment.) That commitment has a general substitution-inferential significance, which is to say that the particular material inference endorsed above is correct as an instance of a general pattern. That same material-substitutional commitment regarding "the inventor of bifocals" and "the first postmaster general of the United States" governs also the propriety of the inference from "The inventor of bifocals was a printer" to "The first postmaster general of the United States was a printer," also that from "The inventor of bifocals spoke French" to "The first postmaster general of the United States spoke French," as well as a myriad of others. So one simple material substitution-inferential commitment regarding two expressions determines the correctness of a great many substitution inferences materially involving those expressions, across a great variety of substituted-in sentences and residual sentence frames, of which '. . . wrote about electricity' is only one example.[36]

Also, the substitution inferences to and from "The inventor of bifocals was a printer" are determined by all the simple material substitution-inferential commitments (SMSICs) that link the expression 'the inventor of bifocals' with another. Not all occurrences of those expressions, however, have their substitution-inferential significances determined in this way. For instance, that the inventor of bifocals is the first postmaster general of the United States does not settle the propriety of the substitution inference from

> The current postmaster general of the United States believes that the first postmaster general of the United States was a printer

to

> The current postmaster general of the United States believes that the inventor of bifocals was a printer.[37]

These observations motivate the discrimination of certain occurrences of an expression, in a syntactic sense of 'occurrence', as in addition semantically significant occurrences of it. A subsentential expression has a syntactic occurrence as a component of (is exhibited by) a sentence just in case it is replaceable by other expressions of its category (either in the original sense of being substituted for or in the secondhand sense appropriate to expressions

of substitutionally derived categories), saving sentencehood. (Syntactic categories are interreplaceability equivalence classes, since replacement is reversible and preservation of sentencehood symmetric.) For an occurrence of an expression in this syntactic sense to count also as having primary substitution-semantic occurrence in a sentence, the substitution inferences to and from that sentence, in which that expression is materially involved, must be governed (their proprieties determined) by the set of simple material substitution-inferential commitments that link that expression with another.[38]

How do SMSICs relating subsentential expressions settle the correctness of the substitution inferences in which the sentences exhibiting primary substitution-semantic occurrences of those expressions figure as premises and conclusions? According to a general pattern. A material substitution-inferential commitment regarding A and A' is a commitment to the effect that for any B such that AB is a sentence in which A has primary substitution-semantic occurrence, the inference from AB to $A'B$ is good. Likewise, a material substitution-inferential commitment regarding B and B' is a commitment to the effect that for any A such that AB is a sentence in which B has primary substitution-semantic occurrence, the inference from AB to AB' is good. Five points may be noted concerning this structure relating substitutional commitments to substitutional inferences.

First, *all* of the substitution inferences in which a sentence such as AB figures as premise or as conclusion are determined according to this pattern by all of the SMSICs dealing with expressions having primary substitution-semantic occurrences in AB (which might, but need not, be just A and B). Second, responsibility for those proprieties of substitution inferences to and from a sentence is apportioned between the various subsentential expressions having primary occurrences in it, with the SMSICs dealing with a particular expression responsible for the inferences in which that expression is materially involved. The content (determiner of material proprieties of inference) of each expression is represented by the set of SMSICs that relate it to other expressions. Only the collaboration of all of the SMSICs corresponding to subsentential expressions having primary occurrence in a sentence settles the correctness of the whole set of substitution inferences it appears in as premise or conclusion. Third, a consequence of this division of labor in the determination of the correctness of material inferences (assigning aspects of it to different sorts of expression) is that material-inferential roles are determined thereby for novel compounds of familiar components. So even if no one has ever encountered the sentence $A'B'$, the SMSICs cited above determine a commitment to the propriety of the inference from AB to $A'B'$. Other SMSICs already in place may in the same way license the inference from $A'B'$ to $A''B'$, and so on. Accumulating the content (what determines material proprieties of inference) to be associated with subsentential expressions in the form of substitutional commitments regarding pairs of expressions, then, permits the projection of material proprieties of substitu-

tion inference involving a potentially large set of novel sentences from the proprieties involving relatively few familiar ones. Fourth, on this model it is clear how to understand additions to or alterations of content. For when I discover or decide (what would be expressed explicitly in the claim) that the inventor of bifocals is the inventor of lightning rods and thereby undertake a new simple material substitution-inferential commitment, the substitution-inferential potentials both of sentences in which these expressions have primary occurrence and of others substitutionally linked to them are altered in determinate and predictable ways. Fifth, for the same reason, it is easy to understand what is involved in introducing new subsentential vocabulary, as expressing novel contents. Such vocabulary will make exactly the same sort of contribution to the strictly inferential contents of sentences that the old vocabulary does, as soon as its use has been tied to that of the old vocabulary by suitable SMSICs.

The criteria of adequacy responded to by these five points jointly constitute the *point* of discerning semantically significant subsentential structure, once the pragmatic, and so semantic, priority of sentences is acknowledged. Against the background of this sort of understanding of the semantically significant decomposition of sentences into their components, the formal difference between the material-substitutional commitments governing singular terms and those governing predicates becomes particularly striking. The SMSICs that determine the material-inferential significance of the occurrence of singular terms are symmetric: a commitment to the correctness of the inference that results from substituting A' for A is also a commitment to the correctness of the inference that results from substituting A for A'. The set of SMSICs that determine the material-inferential significance of the occurrence of any predicate, by contrast, include asymmetric ones. From this point of view, what is special about singular terms is that the simple material substitution-inferential commitments relating pairs of terms partition the set of terms into equivalence classes. This is what it is for it to be (particular) objects that singular terms purport-to-refer-to. An equivalence class of intersubstitutable terms stands for an object. It follows from the substitutional definition of the object-specifying equivalence classes of terms that it makes no sense to talk of languages in which there is just one singular term (*pace* 'the Absolute' as Bradley and Royce tried to use that expression), nor of objects that can in principle only be referred to in one way (by one term). The SMSICs that confer material-inferential content on predicates, by contrast, do not segregate those expressions into equivalence classes, and so do not confer a content that purports to pick out an object. The asymmetric structure conferred on the material contents of predicates is quite different.

There are, then, two fundamental sorts of substitution-inferential significance that the occurrence of expressions of various subsentential categories might have: symmetric and asymmetric. The claim so far is that it is a necessary condition for identifying some subsentential expression-kind as

predicates that expressions of that kind be materially involved in some asymmetric substitution inferences, while it is a necessary condition for identifying some subsentential expression-kind as singular terms that expressions of that kind be materially involved only in symmetric substitution inferences. These paired necessary semantic conditions distinguishing singular terms from predicates in terms of substitution-inferential significance (SIS) may be laid alongside the paired necessary syntactic conditions distinguishing singular terms from predicates in terms of substitution-structural role (SSR). The suggestion then is that these individually necessary conditions, symmetric SIS and substituted-for SSR, are jointly sufficient to characterize the use of a kind of expression that distinguishes it as playing the role of singular terms. In the rest of this work, the expression 'singular term' is used to signify expressions that play this dual syntactic and semantic substitutional role. It is to whatever expressions play this role that the argument is addressed.

V. WHY ARE THERE SINGULAR TERMS?

1. Four Alternative Subsentential Analyses

Here is an answer to the question, What are singular terms? They are expressions that are substituted for, and whose occurrence is symmetrically inferentially significant. The question, Why are there any singular terms? can now be put more sharply. Why should the expressions that are substituted for be restricted to symmetric inferential significance? What function does this arrangement serve? What expressive necessity enforces this particular combination of roles?

It is clear enough why the use of a substitutional scalpel to dissect sentential contents into subsentential components requires distinguishing expressions substituted for from substitutional frames. But why should any sort of subsentential expression have a symmetric SIS? And if some sort for some reason must, why should it be what is substituted for rather than the corresponding substitutional frames? Why should not both be symmetrically significant? The argument developed in the rest of this chapter is an attempt to answer these questions, and so in the specified sense to answer the question, Why are there singular terms?

What are the alternatives? They are structured by the previous pair of distinctions, between two sorts of substitution-structural syntactic role and between two sorts of substitution-inferential semantic significance. The possibilities are:

(i) substituted for is symmetric;	substitutional frame is symmetric
(ii) substituted for is asymmetric;	substitutional frame is symmetric

(iii) substituted for is asymmetric;	substitutional frame is asymmetric
(iv) substituted for is symmetric;	substitutional frame is asymmetric

The final arrangement (iv) is the one actualized in languages with singular terms. One way to ask why this combination of syntactic and semantic roles is favored is to ask what is wrong with the other ones. What rules out the combinations (i), (ii), and (iii)? What sort of consideration could? The strategy pursued here is to look at the constraints on the expressive power of a language that are imposed by each of those varieties of complex substitutional roles.

The first alternative is a good place to begin, for it is fairly easily eliminated from contention. The semantic point of discerning subsentential structure substitutionally is to codify an antecedent field of inferential proprieties concerning sentences by associating material contents with recombinable subsentential expressions so as to be able to derive those proprieties of inference and to project further ones, according to a general pattern of substitution-inferential significance of material-substitutional commitments. But the substituted-in sentences whose inferences are to be codified themselves stand in "one-way inferential involvements." The goodness of an inference may require that when the conclusion is substituted for the premise(s), some status (doxastic or assertional commitment, truth, and so on) is preserved. But the converse replacement need not preserve that status. Substitution inferences are not always reversible, saving correctness. Conclusions are often inferentially weaker than the premises from which they are inferred. A restriction to sentential contents conferrable by exclusively symmetrically valid material inferences is a restriction to sentential contents completely unrecognizable as such by us. But if both substituted-for expressions and the substitutional frames that are the patterns according to which they assimilate substituted-in sentences are significant only according to symmetric SMSICs, then asymmetric inferential relations involving substituted-in sentences can never be codified as substitution inferences materially involving subsentential expressions, and so licensed by the SMSICs regarding those expressions. Since the inferences to be codified include asymmetric ones, either the substituted-for expressions or the substitutional frames, or both, must be assigned asymmetric substitution-inferential significance.

The other two alternatives, (ii) and (iii), are alike in assigning the substituted-for expressions asymmetric substitution-inferential significance. If a good reason can be found for ruling out this combination of syntactic and semantic substitutional roles, then the employment of singular terms and their corresponding sentence frames will have been shown to be necessary. For if it can be shown that what is substituted for must have symmetric substitution-inferential significance, then since by the argument just offered the expressions playing some substitution-structural role must be asymmet-

ric (besides the substituted-in expressions), it will follow that the substitution frames must permit asymmetric substitution. Just this combination of roles has been put forward as characteristic of singular terms and predicates.

The first task addressed (in Section IV) was to answer the question, What are singular terms? The answer that has emerged is that they are expressions that on the syntactic side play the substitution-structural role of being substituted for, and on the semantic side have symmetric substitution-inferential significances. The second task is to answer the question, Why are there any singular terms? by presenting an explanation of why the inferential significance of the occurrence of expressions that are substituted for must be symmetric (and so segregate expressions materially into equivalence classes whose elements accordingly jointly purport to specify some one object). It takes the form of an argument that certain crucial sorts of expressive power would be lost in a language in which the significance of substituted-for expressions was permitted to be asymmetric.

2. *The Argument*

What is wrong with substituted-for expressions having asymmetric inferential significances? An asymmetric simple material substitution-inferential commitment linking substituted-for expressions *a* and *b* is a commitment to the goodness of all the inferences that are instances of a certain pattern. Where *Pa* is any sentence in which *a* has primary occurrence, the inference from *Pa* to *Pb* (the result of substituting *b* for *a* in *Pa*) is a good one, though perhaps its converse is not. The point of discerning primary occurrences of substituted-for expressions depends on these generalizations, for they provide the link that permits the projection of proprieties of substitution inference, based on associating particular substituted-fors with material contents in the form of determinate sets of simple substitution-inferential commitments relating their use to that of other substituted-fors. Whether the generalizations that animate asymmetrically significant substitutional commitments regarding substituted-fors make sense or not depends on the contents expressed by the sentences substituted in, and it is this fact that in the end turns out to mandate symmetric substitutional significances for what is substituted for. To see this, consider three ever more radical ways in which the generalizations associated with simple material substitution-inferential commitments might fail to obtain.

First, suppose there were sentences *Qa*, *Qb*, *Q'a*, *Q'b*, such that the inference from *Qa* to *Qb* is a good one, though the converse is not, and the inference from *Q'b* to *Q'a* is a good one, though the converse is not. Then although *Qb* results from *Qa* by substituting *b* for *a*, and correspondingly in the case of *Q'α*, so that *a* and *b* have syntactic occurrences in these sentences, *a* and *b* cannot be admitted as having primary substitution-semantic occurrence in these contexts. For there is no simple material substitution-inferen-

tial commitment determining the substitution-inferential potential of those sentences. No symmetric SMSIC governs those inferences, since they are not reversible. But no asymmetric SMSIC governs them either, since such a generalization can at most license either the inference from *Qa* to *Qb* as a replacement of *a* by the inferentially weaker *b*, or the inference from *Q'b* to *Q'a* as a replacement of *b* by the inferentially weaker *a*, but not both. There need be nothing anomalous about such a situation. *Q*α and *Q'*α are inferentially complementary frames with respect to *a* and *b*. This precludes codifying substitution inferences involving those expressions in terms of SMSICs relating them, because the generalizations that would be appropriate to *a* and *b* with respect to *Q*α are different from and incompatible with those that would be appropriate with respect to *Q'*α. The only cost of not being able to discern semantically primary occurrences of *a* and *b* in these contexts is that some of the good substitution inferences involving them are not captured by the material contents associated with *a* and *b*. This is no different than what happens in other cases where one ought not to discern primary substitution-semantic occurrence, for instance in "*S* believes that *Qa*."

For the next step, suppose that *Q*α and *Q'*α behave in this inferentially complementary fashion for every pair of substitutional variants in which they appear. That is, suppose there were a pair of predicates *Q*α, *Q'*α such that for any substituted-for expressions *x* and *y*, if the inference from *Qx* to *Qy* is a good one, but not the converse, then the inference from *Q'x* to *Q'y* is not a good one. The presence of such a pair of predicates would block the possibility of the substitution-inferential generalization that would be required to give a substitutional commitment asymmetric significance, no matter what substituted-for expressions it involves. This situation would preclude discerning primary substitution-semantic occurrences of *any* substituted-for expression, in sentences exhibiting the substitution frames *Q*α and *Q'*α. Again, the only cost is that certain proprieties of substitution inference, the ones that involve those frames, will not be projectable based only on the material contents associated with subsentential expressions, crystallized in sets of relational SMSICs.

Finally, in order to see how one might argue against admitting asymmetrically significant substituted-for expressions, strengthen the supposition yet again and consider what happens if there is a general recipe for producing, given any frame *Q*α, a frame *Q'*α that is inferentially complementary to it, in the prior sense. That is, each *Q'*α is to be so constructed that whenever the inference from *Qx* to *Qy* is good, but not vice versa (intuitively, because *y* is inferentially weaker than *x*, the way 'mammal' is inferentially weaker than 'dog'), the inference from *Q'y* to *Q'x* is good, but not vice versa, for any substituted-for expressions *x* and *y*. Such a situation precludes discerning any primary substitution-semantic occurrences of any substituted-for expressions. For there are no syntactic occurrences of any substituted-for expressions whose substitution-inferential significance is correctly captured by an

asymmetric SMSIC (the symmetric ones are not currently at issue). For an asymmetric substitution-inferential commitment relating *a* to *b* governs inferential proprieties via the generalization that for any frame *Pα*, the inference from *Pa* to *Pb* is a good one, though not in general the converse.

Under the hypothesis being considered, no matter what particular instance *Pα* is chosen, it is possible to construct or choose a complementary predicate *P'α* for which only the complementary pattern of substitution-inferential proprieties obtains. In the presence of a recipe for producing for arbitrary substitution frames other frames that are inferentially complementary to them, then, no proprieties of substitution inference can be captured by asymmetric SMSICs, and so no primary substitution-semantic occurrences of substituted-for expressions corresponding to them. The upshot of this line of thought, then, is that the existence of asymmetrically significant substituted-for expressions is incompatible with the presence in the language of expressive resources sufficient to produce, for arbitrary sentence frames, inferentially complementary ones. To explain why substituted-for subsentential expressions have symmetric substitution-inferential significances, which on the current understanding is to explain why there are singular terms, then, it will suffice to explain what sort of expressive impoverishment a language is condemned to if it eschews the locutions that would permit the general formation of inferentially complementary sentence frames.

When it has been seen that the particular constellation of syntactic and semantic roles characteristic of singular terms is necessitated by the presence in the language of vocabulary meeting this condition, it becomes urgent to see what locutions make possible the production of arbitrary inferentially complementary frames, and how dispensable the role they play in linguistic practice might be. What locutions have this power? Examples are not far to seek. The one to focus on is the *conditional.* Because conditionals make inferential commitments explicit as the contents of assertional commitments, inferentially weakening the antecedent of a conditional inferentially strengthens the conditional. "Wulf is a dog" is inferentially stronger than "Wulf is a mammal" because everything that is a consequence of the latter is a consequence of the former, but not conversely. But the conditional "If Wulf is a mammal, then Wulf is a vertebrate" is inferentially stronger than "If Wulf is a dog, then Wulf is a vertebrate." For instance, everything that combines with the first conditional to yield the conclusion that Wulf is a vertebrate also combines with the second to yield that conclusion, but not conversely. Again, endorsing all the inferences from sentences exhibiting the frame "α is a dog" to the corresponding "α is a mammal" does not involve commitment to the goodness of the inferences from sentences exhibiting the frame "If α is a dog, then α belongs to an anciently domesticated species" to those exhibiting the frame "If α is a mammal, then α belongs to an anciently domesticated species." Instances of the first conditional are true claims expressing correct inferences, while instances of its substitutional variant are

false conditionals expressing incorrect inferences. Quite generally, let Qa be a particular sentence in which the substituted-for expression a has primary occurrence, and Qb be a substitutional variant of it, and let r be some other sentence. Then $Qa \rightarrow r$ is a sentence in which a has primary occurrence, and the symbol $Q'\alpha$ may be introduced for the sentence frame associated with its occurrence, writing the conditional above as $Q'a$. If a is inferentially stronger than b, asymmetrically, then the inference from Qa to Qb is good, but not its converse (Wulf is a dog, so Wulf is a mammal).[39] But if that is so, then the inference from $Q'a$ to $Q'b$ cannot be good, for inferentially weakening the antecedent of a conditional inferentially strengthens the conditional.

This last formulation suggests another example. Inferentially weakening a claim inside a negation inferentially strengthens the compound negation. If the substitution inference from Qa to Qb is good but the converse not, then the substitution inference from $\sim Qa$ to $\sim Qb$ cannot be good. Embedding as a negated component, like embedding as the antecedent of a conditional, reverses inferential polarities. The conclusion is that any language containing a conditional or negation thereby has the expressive resources to formulate, given any sentence frame, a sentence frame that behaves inferentially in a complementary fashion, thereby ruling out the generalizations that would correspond to asymmetric simple material substitution-inferential commitments governing the expressions that are substituted for in producing such frames.

3. *The Importance of Logical Sentential Operators*

The conditional and negation are fundamental bits of logical vocabulary. Is it just a coincidence that it is logical sentence-compounding locutions that permit the systematic formation of inferentially inverting sentential contexts? The sentence q is inferentially weaker than the sentence p just in case everything that is a consequence of q is a consequence of p, but not vice versa (consequences are not preserved but pruned). It is an immediate consequence of this definition that inferentially weakening the premises of an inference can turn good inferences into bad ones. The defining job of the conditional is to codify inferences as claims (make it possible to express inferential commitments explicitly in the form of assertional commitments). It is essential to doing that job that embedded sentences that can play the role of premises and conclusions of inferences appear as components—antecedents and consequents—in the conditional. The contexts in which component sentences occur as antecedents accordingly must be inferentially inverting. Notice that this argument presupposes very little about the details of the use of the conditional involved. It is enough, for instance, if the conditional has the designated (semantic or pragmatic) status in case the inference it expresses preserves the designated status. As the defining job of the conditional is to codify inferences, that of negation is to codify incompatibilities. The negation of a claim is its inferentially minimal incompat-

ible—$\sim p$ is what is entailed by everything materially incompatible with p.[40] These underlying incompatibilities induce a notion of inferential weakening: "Wulf is a dog" incompatibility-entails, and so is inferentially stronger than, "Wulf is a mammal" because everything incompatible with "Wulf is a mammal" is incompatible with "Wulf is a dog" but not vice versa (incompatibilities pruned, not preserved). It follows that incompatibility-inferentially weakening a negated claim incompatibility-inferentially strengthens the negation. "It is not the case that Wulf is a mammal" is incompatibility-inferentially stronger than "It is not the case that Wulf is a dog," just because "Wulf is a mammal" is incompatibility-inferentially weaker than "Wulf is a dog." Thus negation also enables the formation of arbitrary inferential complements. It was argued in Chapter 2 that what makes both conditionals and negation, so understood, specifically logical vocabulary is that the material inferences and material inference-inducing incompatibilities, of which they permit the assertionally explicit expression, play a central role in conferring material contents on prelogical sentences. It is a direct result of this defining semantically expressive function that they form semantically inverting contexts.

Since it is the availability of such contexts that rules out asymmetrically significant substituted-for expressions, it follows that a language can have either the expressive power that goes with logical vocabulary or asymmetrically substitution-inferentially significant substituted-for expressions, but not both. It is leaving room for the possibility of logical locutions that enforces the discrimination of singular terms (and as a consequence, of predicates) rather than some other sorts of subsentential expression. This conclusion would not be surprising if the logical vocabulary in question were that employed to make explicit the substitution-inferential relations in virtue of which singular terms and predicates can be assigned distinct material contents. For, as has already appeared, the symmetrically significant SMSICs associated with singular terms can be made assertionally explicit with the use of identity locutions, and the asymmetrically significant SMSICs associated with predicates can be made explicit with the use of quantificational locutions (together with sentential logical vocabulary). But like all logical locutions, the use of these presupposes, and so ought not be appealed to in trying to explain, the material contents of the nonlogical expressions that are explicitated. In short, the use of identity and quantificational locutions presupposes singular term and predicate use. So of course any language whose use is sufficient to confer on expressions the significance of such locutions must already have in play the symmetric and asymmetric SMSICs associated with nonlogical subsentential expressions, and the expressions whose use they governed will be singular terms and predicates respectively.

But these are not the logical locutions appealed to in the argument against asymmetrically significant substituted-for expressions. On the contrary, the only logical locutions required for that argument are those whose roles are

definable solely in terms of the behavior of *sentences*, before any sort of subsentential substitutional analysis has been undertaken. The argument does not depend on any particular features of the sentential contents that are available to begin with, determining the proprieties of material inference that provide the targets for substitutional codification in (implicit or explicit) SMSICs. All that matters is the availability of the expressive power of logical sentential connectives.

There is of course no absolute necessity that such vocabulary be available in a language. It would be a mistake to conclude from the true premise that something can be thought of as *propositionally contentful* only in virtue of its relation to proprieties of *inferential* practice, to the conclusion that such practice must be *logically* articulated. Such a move depends on the formalist error of assimilating all correctnesses of inference to logical correctness of inference, thereby denying the possibility of material, content-conferring inferential proprieties. Material proprieties of inference are antecedent to formal proprieties in the order of explanation, because to say that an inference is valid or good in virtue of its K form (for instance logical form) is just to say that it is a (materially) good inference, and it cannot be turned into one that is not good by replacing non-K (for instance nonlogical) vocabulary by (syntactically cocategorial) non-K vocabulary. There is nothing incoherent about a language or stage in the development of a language in which the only vocabulary in play is nonlogical.[41] But insofar as the material contents associated with substituted-for expressions are introduced and modified in units corresponding to asymmetrically significant SMSICs involving those expressions, the language containing them is not just in fact bereft of the expressive power of logical vocabulary, it is actually precluded from acquiring it (until and unless the offending subsentential semantic structure is reorganized). That is a reason not to have substituted-for expressions behave this way semantically, even in languages in which logical locutions have not yet been introduced.

Having to do without logical expressions would impoverish linguistic practice in fundamental ways. The use of any contentful sentence involves implicit commitment to the (material) correctness of the inference from the circumstances of appropriate application associated with that sentence to the consequences of such application. Introducing conditionals into a language permits these implicit, content-conferring, material-inferential commitments to be made explicit in the form of assertional commitments. This is important at the basic, purely sentential level of analysis for the same reason it becomes important later at the subsentential level, when identity and quantificational locutions can be introduced to make explicit the SMSICs that confer distinguishable material-inferential content on subsentential expressions. In each case, once made explicit in the form of claims, those content-conferring commitments are brought into the game of giving and asking for reasons. They become subject to explicit objection, for instance by

confrontation with materially incompatible assertions, and equally to explicit justification, for instance by citation of materially sufficient inferential grounds. The task of forming and nurturing the concepts we talk and think with is brought out of the dim twilight of what remains implicit in unquestioned practice into the daylight of what becomes explicit as controversial principle. Material contents, once made explicit, can be shaped collectively, as interlocutors in different situations, physically and doxastically, but in concert with their fellows, provide objections and evidence, claims and counterclaims, and explore possible consequences and ways of becoming entitled to assert them. Logic is the linguistic organ of semantic self-consciousness and self-control. The expressive resources provided by logical vocabulary make it possible to criticize, control, and improve our concepts. To give this up is to give up a lot.[42] Yet, it has been argued, it is a direct (if unobvious) consequence of leaving open the possibility of introducing such inferentially explicitating vocabulary that the subsentential expressions that are substituted for will be singular terms, and their corresponding sentence frames will be predicates, as judged by the symmetric and asymmetric forms of their respective substitution-inferential significances.[43]

VI. OBJECTIONS AND REPLIES

1. *Are Singular Terms Symmetrically Substitution-Inferentially Significant Substituted-Fors?*

Before pursuing further the significance of this result, it will be well to look a little more closely at the argument that has been offered for it. There are several sorts of objection it might elicit, which call for different sorts of clarification. The argument went like this. Singular terms and predicates were distinguished, as essentially subsentential expressions, by the coincidence of a particular syntactic substitutional role with a particular semantic substitutional role. Singular terms are substituted *for*, and the significance of an occurrence is determined by the content associated with it in the form of a set of *symmetric* simple material substitution inferential commitments linking that term to others. Predicates are substitutional sentence *frames*, and the significance of an occurrence is determined by the content associated with it, in the form of a set of *a*symmetric simple material substitution inferential commitments linking that predicate to others. So to ask why there are singular terms is to ask why these two sorts of substitutional roles coincide as they do.

The possibility that both what is substituted for and the resulting sentence frames might have symmetric substitutional significance is dispatched by the observation that the sentences displayed by this analysis as substitutional variants of one another stand in asymmetric substitution-inferential relations to one another. So the question, Why are there singular terms?

reduces to the question of why syntactically substituted-for expressions have symmetric rather than asymmetric substitution-inferential significances. For a substituted-for expression to have such a significance is for the contribution it makes to the substitution-inferential potential of sentences in which it occurs to be articulated as a set of SMSICs relating it to other expressions. An asymmetric SMSIC relating t to t' dictates that for any sentence Pt in which t has primary substitution-semantic occurrence, the inference from Pt to Pt' is a good one, though not conversely, where Pt' is a substitutional variant of Pt resulting from it by substituting t' for t. It was then pointed out that any language expressively rich enough to contain conditional or negating locutions—in short any language equipped with the conceptual resources of elementary sentential logic—precludes the existence of any such asymmetrically significant SMSICs governing substituted-for expressions. For those resources suffice to ensure that whenever, for some sentence frame $P\alpha$, the inference from Pt to Pt' is a good one but not conversely, there is another sentence frame $P'\alpha$ such that the inference from $P't'$ to $P't$ is a good one but not conversely. It follows that in such languages discerning asymmetrically significant substituted-for expressions would codify no inferences at all, permit no assignment of material content, in the form of a set of SMSICs, to any substituted-for expression. This way of combining syntactic and semantic substitutional roles is accordingly ruled out, and only that actually instantiated by singular terms and predicates remains. Thus the availability of the expressive capabilities of sentential logic dictates that subsentential substitutional analysis discern singular terms and predicates, rather than some other fundamental subsentential categories. It will be helpful to consider some different kinds of objection that might arise to this argument.

One potentially vulnerable premise is the definition of singular terms (and so of predicates) relied upon. The key final move in the argument, invoking the expressive power of logical locutions to form new sentences (and so new sentence frames) purports to show only why expressions that play the syntactic role of substituted-for must play the semantic role of being symmetrically substitution-inferentially significant. It might be denied that this result (for the moment treating the argument as successful) shows anything of importance about singular terms. For it might be denied that the syntactic and semantic substitutional roles that have been identified as characterizing this subsentential category of expression pick out its fundamental properties.

This complaint can be subdivided. It might be denied that the dual syntactic-semantic substitutional role attributed to singular terms is one they actually play—that is, that playing that dual role provides at least a necessary condition for expressions to be functioning as singular terms. This seems a difficult line to pursue. Singular terms are substituted for in sentences, generating derivative substitutional sentence frames. These two roles are clearly discriminable by the fact that the resulting frames have fixed possibilities of combination with substituted-for expressions (fixed adicities), always being

exhibited by sentences with the same number of substituted-fors,[44] while those latter expressions are subject to no analogous constraint. Of course, singular terms can also play the role of the expression that is substituted in. Thus there can also be expressions of the derivative category of singular term frames, such as "the father of α," which are substitutional patterns according to which singular terms can be assimilated.

This much is not special to substituted-for expressions. There is no reason "α wrote about ß" cannot be understood as a one-place sentence-frame frame, for instance that exhibited by sentence frames such as "α wrote about Rousseau" and "α wrote about Kant," as well as its playing the role of two-place sentence frame exhibited by any sentences exhibiting any of those one-place frames.[45] Sentences, in virtue of the direct pragmatic (paradigmatically assertional) significance of their use, are the original substituted-ins, the ones that get the whole substitution-analytic enterprise off the ground. Subsentential expressions are pragmatically significant, and so semantically contentful only in a substitutionally indirect sense (for instance, it is only via their substitutional relations with other expressions that they can be said to stand in inferential or incompatibility relations). Thus the fact that they can be substituted in, in no way qualifies the characterization of singular terms as substituted for. By contrast to the case of sentences, it is only because terms can play the latter syntactic substitutional role that they can play the former one.

Alternatively, one might argue that playing the semantic substitutional role of being governed by symmetrical SMSICs does not provide a necessary condition for a substituted-for expression to be a singular term. Here there are two possible cases. The claim might be that some terms are governed by *a*symmetrical SMSICs, or it might be rather that the use of some genuinely occurring singular terms is not governed by SMSICs at all.

For a first try at constructing singular terms that stand in one-way, or asymmetrical, inferential relations, one might consider definite descriptions of the following form: (the *x*)[*Dx*] and (the *x*)[*Dx*&*Fx*]. This, however, will not provide a counterexample to the symmetry claim. To generate such a counterexample, it would have to be the case that in general either

(1) *P*((the *x*)[*Dx*]) entails *P*((the *x*)[*Dx*&*Fx*]),
and not always vice versa

or

(2) *P*((the *x*)[*Dx*&*Fx*]) entails *P*((the *x*)[*Dx*]),
and not always vice versa.

But (1) does not hold because an object may qualify as (the *x*)[*Dx*] without thereby qualifying as (the *x*)[*Dx*&*Fx*], namely in those cases in which it is not also *F*. Description (2) does not hold because an object may qualify as (the *x*)[*Dx*&*Fx*] without thereby qualifying as (the *x*)[*Dx*], namely in those cases

where, though only one thing is both *D* and *F*, more than one thing is *D*. These correspond to failures respectively of the descriptive and definiteness conditions on the applicability of definite descriptions.

2. *Asymmetrically Substitution-Inferentially Related Singular Terms?*

Seeing where this sort of prospective counterexample falls down suggests a much more serious prospect.[46] Consider the relation between pairs of terms such as 'Benjamin Franklin' and 'Benjamin Franklin, who was a printer'. Anyone who is committed to the claim:

Benjamin Franklin, who was a printer, invented lightning rods

is thereby committed to the corresponding claim:

Benjamin Franklin invented lightning rods,

but not everyone who is committed to the second claim is thereby committed to the first. In particular, anyone who has no opinion about whether Benjamin Franklin was a printer, or who denies that he was, can endorse the second without the first.

Such examples point out that there is a kind of term-forming operator that, given a term *t*, produces a compound term of the form '*t*, who (or which) Φs, which systematically induces asymmetric substitution inferences relative to the first. The existence of such a recipe for producing terms from terms requires a genuine restriction in the scope of the claims made about terms so far. The example shows that there are some pairs of terms and some sentence frames such that substitution inferences relating those terms in those sentence frames are asymmetric. Acknowledging the existence of such cases, however, does not require relinquishing any claims on which the preceding argument relies.

As a preliminary, it may be noticed that the asymmetry pointed to here involves only relations to compound terms of a special form, and not terms generally—by contrast to predicates, *all* of which stand in one-way inferential involvements to other predicates that are *not* formed from them at all, never mind in a particular way. Again, the formation of terms of the form *t*, who Φs presupposes the existence of terms not of that form, which can appear in the ordinary predications of the form Φ*t*, from which these special compound terms are formed (of course, *t* could itself be of the form *t'*, who Ψs, but it cannot in principle be terms of this form all the way down). Thus the existence of terms that behave this way is parasitic on the existence of terms that do not.

But the point of central importance is that, as could be deduced already from the argument concerning recipes for generating logically compound predicates that reverse inferential polarity, it is *not* the case even for these

special pairs of terms that their substitution-inferential significance is governed by asymmetric SMSICs. To be so governed involves suitable substitutional variants standing in one-way inferential involvements for *all* predicates. And someone who is committed to the claim:

> It is *not* the case that Benjamin Franklin, who was a printer, invented lightning rods

is *not* thereby committed to the claim:

> It is *not* the case that Benjamin Franklin invented lightning rods.

Anyone who denies that Benjamin Franklin was a printer but who believes he did invent lightning rods can endorse the first claim but not the second. A similar point will hold for sentence frames formed from conditionals in which the terms in question appear in the antecedent. Thus pairs of terms of the form ⟨*t*, and *t*, who Φs,⟩ fail to be *systematically* asymmetrically substitution-inferentially significant in the way predicates are. So the symmetric and asymmetric *patterns* of substitution-inferential significance can still be appealed to in distinguishing the category of singular terms from that of predicates.

The restriction of asymmetric significance to some sentential contexts points up that these cases belong in a box with asymmetric inferences such as that from:

> The skinniest person in the room can't fit through the narrowest door

to

> The fattest person in the room can't fit through the narrowest door,

which are also not reversible.[47] These examples clearly turn on interactions between the predicates used to form definite descriptions and those involved in the sentence frame in which the description is embedded. Just by their nature, such asymmetries do not generalize across sentence frames generally and so have no systematic significance of the sort appealed to in the substitutional account of the difference between singular terms and predicates.[48]

3. *Symmetrically Substitution-Inferentially Related Expressions That Are Not Singular Terms?*

The second possible form of complaint about the necessity of the semantic condition of symmetrical substitutional significance stems from the observation of expressions that intuitively seem to be singular terms but that do not play a symmetric substitutional role. Consider occurrences of

expressions that function syntactically as singular terms, that is, that are intersubstitutable, saving sentential well-formedness, with substituted-fors that also have primary substitution-semantic occurrences.[49] The semantic significance of those occurrences could be of any of four different kinds. First, they might be primary substitution-semantic occurrences. In that case, which of the substitution inferences the expression is materially involved in are taken to be good or correct is governed by the SMSICs undertaken by the primary assessor of those inferences—typically, us (who are discussing them). These are the occurrences here treated as characteristic and fundamental.

Second, at the other end of the spectrum, there can be occurrences of what are syntactically singular terms that are semantically inert, for instance appearances in direct quotation, or that are unprojectable, such as the 'it' in "It is raining." The right thing to say about these seems to be that they are singular terms merely in a syntactic sense—that is, syntactically substitutable for full-blooded singular terms—but not functioning semantically as singular terms. The proposed substitutional definition of the dual functional role of singular terms explicitly leaves room for this sort of occurrence.

Third, in between primary substitution-semantic occurrences and semantically accidental occurrences, are what may be called secondary semantic occurrences. These have a systematic semantic significance for the propriety of inferences, and it is determined by a set of (symmetric) SMSICs. But they fail to qualify as primary substitution-semantic occurrences because the SMSICs relevant to the assessment of the propriety of inferences in which the expressions are materially involved are not the SMSICs associated with the one assessing those inferences. The central examples are occurrences in opaque positions in propositional attitude ascriptions. Thus my assessment of the propriety of the inference from "Carlyle believed (or acknowledged commitment to the claim) that Kant ascribed to each of us a duty to make ourselves perfect and others happy" to "Carlyle believed (or acknowledged commitment to the claim) that the author of *Dreams of a Spirit-Seer* ascribed to each of us a duty to make ourselves perfect and others happy" does not depend on whether, according to me, Kant is the author of *Dreams of a Spirit-Seer*; that is, it does not depend on the SMSICs that govern my primary uses of those expressions. But it is governed by some (symmetric) SMSICs—namely those I attribute to Carlyle, rather than those I undertake myself (that is, take to be true).

The definition of singular term in the full-blooded sense could be sharpened so as to acknowledge explicitly the possibility of secondary semantic occurrences. Since these are defined by government by (symmetric) SMSICs, such a clarification, qualification, or emendation is entirely in the spirit of the original proposal. The only kind of occurrence of expressions that syntactically qualify as singular terms that would be troublesome to the definition offered is if there should be a fourth sort of occurrence, intermediate between secondary semantic occurrences and semantically accidental ones.

These would be occurrences that were systematically significant for the goodness of inferences involving sentences they occur in, but not according to the pattern of government by SMSICs (symmetric or not). It is hard to know what to say about this possibility, in the absence of a specific candidate. The response to such a candidate ought to be to try to show that that role, like that of secondary semantic occurrences of singular terms, presupposes and is built on their primary role as governed by symmetric SMSICs. The possibility of a counterexample from this direction cannot simply be dismissed, though.

4. *Does the Definition of Singular Terms Offer Sufficient Conditions?*

A more promising line of attack might seem to be to focus on the sufficiency rather than the necessity of the characterization—to accept that singular terms do play the dual syntactic and semantic substitutional role attributed to them, but to deny that specifying these roles by itself suffices to pick out singular terms. Here the idea might be that there are other, genuinely central or essential roles of singular terms that are not derivable from those substitutional roles already mentioned, in that there could be expressions that satisfied the substitutional criteria but did not qualify as genuine singular terms through failure to play the genuinely critical roles. For instance, it might be noticed that the referential, rather than the inferential, role of singular terms has been ignored. This objection may be responded to in two ways—concessively and aggressively.

The concessive response would be to acknowledge that the characterization of singular terms omits features that may turn out to be essential, so that that characterization does not suffice to pick out singular terms. It may immediately be pointed out, however, that such an admission would not be very damaging to the argument presented. For that argument still goes through for an important class of expressions, call them 'ralugnis mrets', which contains singular terms as its most prominent proper subset. Even if this class should turn out to be substantially wider than that of singular terms, the question, Why are there any ralugnis mrets? would still be a fundamental one and would have to be addressed as the first part of an explanation of why there are singular terms. For that question would then assume the form "Why are there ralugnis mrets that also have the additional discriminating feature *F* (the hypothetical specific difference required to distinguish singular terms within the broader class of ralugnis mrets)?"

The aggressive response, though, is more interesting and potentially more satisfying. It is to attempt to derive the remaining features of singular-term usage from the dual substitutional characterization of them as symmetrically and substitution-inferentially significant substituted-for expressions. (Recall the suggestion earlier that having its substitution-inferential significance

determined exclusively by symmetric SMSICs can help provide an analysis of purporting to refer to or pick out one and only one object.) The explanatory strategy to which the present work (in particular, Part 2) is conceived as a contribution is to try to explain the referential and representational relations linguistic expressions stand in by appeal to the inferential, substitutional, and anaphoric relations they stand in. (These are three successive levels of analysis of material-sentential contents, each one of which presupposes the prior levels.) This is an ambitious undertaking, to be sure, and one this chapter does not make it possible fully to assess, since the substitutional relations discussed here provide only some of the necessary raw materials. Any difficulties of principle that arise in pursuing it will be forces pushing toward the concessive, rather than the aggressive, response to objections to the sufficiency of the characterization of singular terms.

But it would seem to be good Popperian methodology to adopt the strongest, most easily falsifiable, apparently sustainable commitment, to see where it falls down. In this case, concrete reason to be pessimistic about deriving the remaining representational properties would be concrete information about the missing feature *F*, which must be added to the substitutional characterization of singular terms to make it sufficient to pick them out within the wider class of ralugnis mrets. Detailed pursuit of the aggressive explanatory enterprise requires two further discussions: of anaphoric commitments that link unrepeatable tokenings and explain how anaphoric inheritance according to such links determines which SMSICs govern the use of those tokenings, and of how those links are made explicit in the form of *de re* ascriptions of propositional attitude. (*De re* ascriptions, such as "Carlyle believed *of* or *about* the author of *Dreams of a Spirit-Seer* that he ascribed to each of us a duty to make ourselves perfect and others happy" are the primary locutions with which we discuss representational relations. They permit us to talk about what people are talking about, and so provide a suitable explanatory target for an account of representational properties of linguistic expressions.)

5. *Can the Same Argument Be Used to Show That Sentences or Predicates Must Have Symmetric Inferential Significances?*

Another line of attack would be to object that the argument cannot be correct, for if it were, it would prove too much. For, it might be asked, why cannot one apply exactly the same considerations used to show that substituted-for *terms* must have symmetric inferential significances in order to show that *sentences* must have symmetric inferential significances? Sentences can be substituted for, as well as substituted in; they can appear as antecedents of conditionals or as negated; but their occurrences have an *a*symmetric inferential significance. Why does this not show that there must

be some defect in the argument purporting to show that there cannot be asymmetrically significant substituted-for expressions in a language containing logically expressive locutions? It does not because, unlike singular terms and predicates, sentences are not essentially subsentential expressions. Since sentences can occur freestanding, possessing pragmatic significance all on their own, their semantic content is not to be understood exclusively in terms of the contribution their occurrence makes to the inferential behavior of compound sentences in which they occur as significant components.

Sentences have a directly inferential content, since they can play the role of antecedent and consequent in inferences. Essentially subsentential expressions such as singular terms and predicates, by contrast, have an inferential content at all only in a substitutionally indirect sense. The inferentially articulated pragmatic significance of asserting a sentence is asymmetric already in the direct sense, since swapping premises for conclusions does not in general preserve the correctness of inferences. Considered just as expressions that are substituted for in other expressions—that is, just as embedded expressions—sentences need only be sorted into equivalence classes of various sorts, accordingly as they are symmetrically intersubstitutable preserving pragmatically important properties of the compound sentences in which they are embedded. This is exactly the procedure that was employed in Sections I and II, which investigated just such embedded occurrences of sentences and the sorts of subsentential sentential content they involve. Because the same sentences that stand in one-way inferential involvements as freestanding also are sorted into equivalence classes as substituted for, those equivalence classes can accordingly then be sorted into asymmetric families.

But this is entirely a consequence of their roles as premises and conclusions, and there can be no analog of this role for essentially subsentential expressions. As the discussion in the opening sections shows, the way to move from the sort of content associated with freestanding uses of sentences to that associated with embedded uses is broadly substitutional in nature. But it does not take the form of government by simple material, substitution-inferential commitments, which is all that is available for essentially subsententially occurring expressions. In Section II two sorts of sentential context of embedding for sentences were distinguished as inferentially 'extensional' in different senses, accordingly as intersubstitutabilities that preserve pragmatic statuses are determined by the freestanding assertional and inferential behavior of the component sentences, respectively. Both of these notions of extensional context depend essentially on how the expressions that occur in those contexts behave freestanding. Thus these notions do not apply to essentially subsentential expressions. Yet it is only by conflating them with the related but distinct notion of primary substitution-semantic occurrence (exclusive government by SMSICs), which applies to essentially subsentential expressions, that it could seem that the argument used to

forbid asymmetric significance of essentially subsentential substituted-for expressions would forbid it also to substituted-for sentences.

The objection was that the argument that essentially subsentential substituted-for expressions cannot have asymmetric substitution-inferential significance proves too much, for if good it would also show that sentences, which can also be substituted for, cannot have asymmetric substitution-inferential significance. That objection can be seen to fail because it ignores the further semantic resources available for expressions that are inferentially significant in a direct sense, as well as the substitutionally indirect one that the argument addresses. This immediately suggests a further objection that would not be vulnerable to this sort of response: to modify the previous objection by appealing to predicates, rather than sentences, to try to show that the argument for the symmetric significance of substituted-for expressions would prove too much. For predicates are essentially subsentential expressions, and the argument acknowledges that they do have asymmetric substitution-inferential significances, even in languages that have conditionals and negation in them. Although they are not expressions that are substituted for—indeed, as substitution frames, they are defined explicitly by their contrasting and complementary syntactic substitutional role—it must nonetheless be conceded by the argument that it makes sense to talk of predicates being replaced. For the semantic substitutional characterization of predicates as having the indirect inferential significance of their occurrence determined by families of asymmetric SMSICs presupposes such a notion. Why does not the argument from the expressive necessity of inferentially inverting sentential contexts to government of essentially subsentential substituted-for expressions by symmetric SMSICs go through equally well for essentially subsentential, merely replaceable, expressions—in particular, predicates? This is really another way of asking what role is played in the argument by the fact that the essentially subsentential expression involved is syntactically categorized as substituted for, and not as a substitution frame.

The argument was that for the simple material, substitution-inferential commitments associated with singular terms to govern not only occurrences in logically atomic sentences but also occurrences in embedded, inferentially inverting, logically articulated sentences, the significances associated with expressions by those commitments must be symmetric. Since asymmetric sentential substitution inferences are to be projected on the basis of the substitutional decomposition of sentences into compounds of essentially subsentential expressions, it follows that the other, derived, substitutional syntactic category—sentence frames—must be governed by SMSICs having asymmetric significance. It is now objected that there must be something amiss with this argument, for not only terms but predicates are recognizable when embedded in the antecedent of a conditional, or inside a negated sentence. So how is it possible for their occurrence to have asymmetric significance?

Here it is important to keep clearly in mind the distinction between substitutionally defined sentence frames and the predicate-letters or other expressions used as marks for them. Predicates, as substitution frames, are defined to begin with as equivalence classes of sentences, those that can be turned into one another by substitution for expressions of the substitutionally basic category.[50] '*P*α', as a one-place sentence frame has been represented here, stands for such an equivalence class. Suppose it is the class of which "Carlyle wrote *Sartor Resartus*" and "Ruskin wrote *Sartor Resartus*" are members, because substitutional variants of the 'Carlyle' ↔ 'Ruskin' sort. But "If Carlyle wrote *Sartor Resartus,* then Carlyle had an ambiguous relationship with Hegel" is not obtainable as the result of substituting terms for terms in these sentences. It is not a member of the equivalence class denoted by '*P*α'. In short, while the term 'Carlyle' has primary semantic occurrence in the conditional, as well as in its antecedent, the sentence frame "α wrote *Sartor Resartus*" has primary syntactic, as well as semantic, occurrence only in the antecedent (when freestanding), and not in the conditional as well. This is reflected in the fundamental difference between *substituting* for an expression and *replacing* it, as those words have been used here. What is replaced is always a frame associated with the whole sentence.[51] Thus although there is a sense in which a sentence can exhibit more than one sentence frame—for instance, "Carlyle wrote *Sartor Resartus*" exhibits not only "α wrote *Sartor Resartus*" but also "α wrote ß"—it is not in general possible to replace one of them, resulting in a sentence that still exhibits others of them. By contrast, a sentence may contain many occurrences of different substituted-for expressions, and substitution for one of them by and large results in sentences in which the rest still occur.[52] Thus frames have adicities, and substituted-fors do not.

It is a joint consequence of the requirement that primary semantic occurrences of either substituted-for expressions or of substitutional frames must have asymmetric significances, and the requirement that anything that has primary semantic occurrence both in freestanding sentences and embedded in inferentially inverting contexts such as negations and the antecedents of conditionals must be governed by symmetric SMSICs, that substituted-for and substitutional frames cannot both have primary semantic occurrence (the kind whose significance is governed by the SMSICs associated with the expression) in those embedded contexts. It is a consequence of the substitutional definition of sentence frames that they do not have primary occurrence in those contexts. This is not to say, of course, that no connection can be recognized between "X wrote *Sartor Resartus*" and "If Carlyle wrote *Sartor Resartus,* then Carlyle had an ambiguous relationship with Hegel" (if that were so, it would not be possible to state modus ponens without equivocation). On the contrary, the former is a frame exhibited by freestanding occurrences of the sentence that appears as antecedent in the latter conditional. Logical vocabulary produces inferentially inverting contexts because of its expressive role in making explicit inferential and incompatibility relations

among sentences. That same role guarantees that the contribution made to the use of a logical compound by the occurrence in it of component sentences is determined by the freestanding inferential role of those component sentences, which is what is being made explicit.[53] Thus the only contribution the predicate occurring in the antecedent need make to the projection of a semantic role for the conditional is to help project the semantic role of the antecedent as a freestanding, unembedded sentence. This much, however, is settled by discerning primary semantic occurrences of the predicate (replaceable ones whose significance is governed by SMSICs) only in the antecedent as a freestanding sentence. Thus in fact no semantic projectability is lost by refusing to discern in conditionals occurrences of the sentence frames exhibited by their antecedents.

6. *Why Must It Be Possible to Substitute for Singular Terms in Logically Compound Sentences?*

Offering this response to the objection naturally elicits a question as rejoinder: Why not treat occurrences of singular terms this way? That is, why not treat them as having their significance determined by the two-step process of examining first their contribution to the freestanding use of sentences and then the contribution of that freestanding use to the use of logically compound sentences in which they occur? The basic argument shows that both syntactic substitutional kinds of essentially subsentential expression cannot be taken to have primary semantic occurrence in conditionals; and it has been shown that, as defined, sentence frames do not. But what is the warrant for the asymmetry in treatment of the two syntactic substitutional sorts? Why see even terms as having primary semantic occurrence in conditionals, as well as in their antecedents? Asking this question makes it possible to highlight what is in some sense the heart of the difference between substituting for substitutionally basic subsentential expressions and replacing substitutionally derived sentence frames. There is an expressive reason for insisting on discerning primary semantic occurrences of singular terms in logically compound sentences, of which conditionals are paradigmatic, which has no analog for predicates.

To say that 'Carlyle' can play the role of substituted-for expression in "If Carlyle wrote *Sartor Resartus*, then Carlyle had an ambiguous relationship with Hegel" as well as in "Carlyle wrote *Sartor Resartus*" is to say that 'Ruskin', for instance, can be substituted for it in that context, to yield *conditional* substitutional variants, such as "If Ruskin wrote *Sartor Resartus*, then Ruskin had an ambiguous relationship with Hegel." These conditional substitutional variants define a conditional substitution frame: "If α wrote *Sartor Resartus*, then α had an ambiguous relationship with Hegel." The question accordingly becomes, What is the special virtue of discerning such frames? To yield the result in question, it must be a virtue that does not correspondingly attach to discerning the second-order conditional 'frames'

that would result from assimilating conditionals that were variants under replacement of first-order frames occurring in their antecedents—what might be symbolized in the example by "If $\Phi\alpha$, then α has an ambiguous relationship with Hegel."

The virtue in question is an expressive one, namely that conditional sentence frames must be discerned if the conditional locution that is used to make explicit material-inferential relations among sentences is to be able also to make explicit material substitution-inferential relations among sentence frames.[54] The material content associated with sentence frames, in virtue of which discerning expressions playing that essentially subsentential substitutional role contributes to the projectability of material-inferential contents for novel sentences, can be factored into simple material substitution-inferential commitments relating frames to other frames. When these content-conferring commitments remain implicit—that is, do not take the form of assertional commitments—they determine the significance of replacing one frame by another. When they are made explicit as the contents of logically articulated sentences, it is as quantified conditionals. It is a necessary condition of introducing quantificational locutions that one be able to discern the conditional sentence frames that are the quantificational substitution instances. In a language that has the logical expressive resources supplied by quantifiers, a typical predicate SMSIC might be made explicit as follows: (x)[if x is a whale, then x is a mammal]. Even in a relatively expressively impoverished language, one that still lacks the subsentential quantificational logical locution, if it has the sentential logical expressive resources supplied by the conditional, then the ability to project the semantic contents of novel material conditionals requires the ability to discriminate the substitutional variants that make up the conditional sentence frame "If α is a whale, then α is a mammal." That is, in a language containing a conditional, mastery of the material inferential content associated with the logically atomic frame "α is a whale" requires being able to assimilate conditional sentences into frame-equivalence classes accordingly as they are mutually accessible by substitution for expressions of the basic substitutional syntactic category. It is this mastery that may then be made explicit in the form of quantified conditionals.

The picture that emerges, then, is that substituted-fors and substitution for them (substitution mappings indexed by them) must be discerned in order to define frames in the first place, and again in defining replacement for them. Frames need to have material contents associated with them in order for singular terms to do so because projection requires the cooperation of both. Furthermore, logical frames are needed in order to make explicit the material contents associated with singular terms because identity locutions are such frames. *Conditional* (and negated)—that is, logically compound—frames are needed to make explicit the material substitution inferential and incompatibility contents of frames. Conditional sentence-frames—formed by assimilat-

ing conditionals according to accessibility relations defined by substituting for various basic essentially subsentential expressions—are required in order to codify explicitly the SMSICs that govern nonlogical first-order sentence frames.

There is no comparable necessity to be able to distinguish logically compound second-order frames by assimilating conditionals according to replacement of substitutionally derivative first-order frames in antecedents. Doing so is not required in order to codify and express explicitly the material contents either of singular terms or of first-order frames.[55] So essentially subsentential substituted-for expressions must be taken to have primary semantic occurrence in conditionals, as well as in the sentences embedded in those conditionals. For the corresponding conditional sentence frames articulate the substitutionally indirect, material-inferential contents governing the significance of primary semantic occurrences of nonlogical sentence frames. This reason does not analogously require that sentence frames be taken to have primary semantic occurrence in logically compound sentences.

Since it has been shown that discerning primary semantic occurrences of an expression both in the nonlogical sentences whose content is explicitated and in the inferentially inverting logical sentences that explicitate them requires that those occurrences be governed symmetrically by SMSICs, and that either frames or substituted-for expressions must be governed asymmetrically, it follows that frames and substituted-for expressions cannot both be taken to have primary semantic occurrence in logically compound sentences. Taken together, these arguments show why it is substituted-for expressions, and not the resulting substitutionally derivative sentence frames, that have the pattern of primary semantic occurrence across logically atomic and logically compound sentences that requires government by symmetric simple material substitution-inferential commitments. Since singular terms are essentially subsentential expressions that play the dual syntactic substitutional role of being substituted for, and the semantic substitutional role of having a symmetric substitution-inferential significance, this explains why there are singular terms.

7. *Can the Substitutional Significance of the Occurrence of a Subsentential Expression Be Determined in Different Ways for Different Contexts?*

One final objection should be considered. This stems from the thought that the inferential patterns associated with SMSICs are too rigid. Why should it be required that *all* of the primary occurrences of subsentential expressions have their significance determined by a SMSIC in the *same* way? If this requirement is relaxed, it seems that there is a way to evade the argument against the possibility of asymmetrically substitutional commitments governing expressions that are substituted for. Suppose, then, that the

terms *a* and *b* are linked, not by a symmetric relation of intersubstitutability that could be made explicit by an assertible substitution license in the form of an *identity* $a = b$ (defining an equivalence class), but by an asymmetric relation of *domination* that could be made explicit by an assertible substitution license in the form of an *inequality* $a > b$. When this possibility was considered above, it was insisted that the significance of such a relation be that for *all* predicates or sentence frames $P\alpha$, if Pa then Pb, but not necessarily vice versa. The suggestion being considered now is that this requirement be relaxed.

Suppose that the logically atomic predicates are sorted into two classes, according to their *inferential polarity*. If $P\alpha$ has *positive* inferential polarity, then if Pa, then Pb, but not necessarily vice versa, just as before. By contrast, if $P\alpha$ has *negative* inferential polarity, then if Pb, then Pa, but not necessarily vice versa, under the same assumption that $a > b$—that is, that *a* dominates *b*. It may turn out (but on the assumption being considered it need not) that all the logically atomic sentence frames have positive polarity. In any case, as the crucial step in the overall argument shows, there will be some logically compound sentence frames that have negative polarity. If $P\alpha$ has positive polarity, then $\sim P\alpha$ and $P\alpha \rightarrow r$ have negative polarity. To keep track, one might express all the logical compounds in disjunctive normal form and count the number of negations the term placeholder α is within the scope of. If it is odd, the polarity of its proximal logically atomic frame is reversed by the whole context; if even, that original polarity is retained.[56] Now it seems that it is possible to project substitution-inferential proprieties for logical compounds on the basis of an asymmetric relation of domination between expressions that are substituted for, by projecting the polarities of those compounds and applying the generalization that is appropriate for the polarity of the compound in each case. Although there is no *single* generalization specifying the significance of a certain asymmetric SMSIC of the sort demanded, there will be a *pair* of them, of just the sort demanded, one for each of the two polarities.[57]

If the suggestion that asymmetrically significant substitutional commitments governing the inferential significance of the occurrence of expressions that are substituted for can be accommodated in this way could be made to work, it would be devastating for the overall argument that has been offered here. It will not work, however, and something further can be learned from seeing why not. The general response is straightforward. Such a procedure will work as offered only if all predicates are one-place, including logically compound ones. If not, the polarity of a predicate can be different in different argument places. Thus $Pa \rightarrow Pb$ will have opposite polarities for the two argument places—one in the antecedent and the other in the consequent. The two-place predicate $P\alpha \rightarrow P\beta$ will not be sorted, then, into either polarity class by the procedure outlined above, and its inferential proprieties will accordingly not be determined by either pattern corresponding to the domination relation between *a* and *b*.

One might try to overcome this difficulty by assigning polarities not to *predicates* or *sentence frames* but to *argument places*. Then, assuming that the underlying frame $P\alpha$ has positive polarity, in $P\alpha \rightarrow P\beta$, the α position will have negative polarity, and the β position will have positive polarity. But this proposal will still not determine what should be said about the inferential relations between $Pa \rightarrow Pa$ and $Pb \rightarrow Pb$ in the case where $a \rangle b$: the first argument place has negative polarity and is being weakened by the substitution of *b* for *a*, so on that basis it should be the case that the overall claim is being strengthened inferentially by the substitution, while the second argument place has positive polarity and is being weakened by the substitution of *b* for *a*, so on that basis it should be the case that the overall claim is being weakened inferentially by the substitution.

Even if it is possible to fix up the proposal so as to deal with this difficulty, there is another that is decisive. One can take a sentence with two terms occurring in it at argument places of different polarities and form from it a *one-place* predicate or sentence frame: $P\alpha \rightarrow Q\alpha$, which can be represented as $R\alpha$. In this sentence frame, α has both positive and negative polarity. This is fatal to the scheme suggested for keeping track of polarities to permit projection of substitution-inferential proprieties in the face of asymmetrically significant substituted-for expressions.

Why not, then, exclude from the range of projection predicates that would require being assigned to each or neither of the polarities? Because these predicates are expressively essential. They are the ones that are required to codify the inferences involving predicates, for instance in the way that will eventually be made explicit by the use of quantifiers to bind conditional predicates ("Whatever walks, moves"). Thus the proposal cannot be carried through and poses no threat to the overall argument presented here.

VII. CONCLUSION

The title of this chapter asks a double question: What are singular terms, and why are there any? The strategy of the answer offered to the first query is to focus on substitution. The fundamental unit of language is the sentence, since it is by uttering freestanding sentences that speech acts are performed. Thus sentences are fundamental in the sense that it is coherent to interpret a community as using (its practices conferring content on) sentences but not subsentential expressions, while it is not coherent to interpret any community as using subsentential expressions but not sentences. But in fact there are good reasons why any community that uses sentences should also be expected to use subsentential expressions, indeed subsentential expressions of particular kinds.

The notion of substitution provides a route from the discrimination of the fundamental sentential expressions to the discrimination of essentially subsentential expressions. To carve up sentences substitutionally is to assimilate

them accordingly as occurrences of the same subsentential expressions are discerned in them. Such a decomposition is accomplished by a set of substitution transformations. The functional significance of discerning in a sentence an occurrence of one out of a set of expressions that can be substituted for is to treat the sentence as subject to a certain subclass of substitution transformations relating it to other, variant sentences. So the expressions that are substituting and substituted for can be used to index the transformations.[58] Two sentences are taken to exhibit the same substitutional sentence frame in case they are substitutional variants of one another—that is, are accessible one from the other by substitution transformations. These substitutional assimilations define two basic substitution-structural roles that essentially subsentential expression kinds could play. The first half of the answer to the first question, "What are singular terms?" is, then, that *syntactically,* singular terms play the substitution-structural role of being substituted *for,* while predicates play the substitution-structural role of sentence frames.

The second half of the answer to that question is that *semantically,* singular terms are distinguished by their *symmetric* substitution-inferential significance. Thus if a particular substitution transformation that corresponds to substituting one singular term for another preserves some semantically relevant sentential status (commitment, entitlement, truth, or whatever) when only primary occurrences are involved, no matter what the sentence frame, then the inverse transformation also preserves that status, regardless of frame. By contrast, every sentence frame is involved in weakening inferences where there is some other frame such that replacing primary occurrences of the first by the second always preserves the relevant sentential status, no matter what structure of substituted-for expressions is exhibited, while the converse replacement is not always status-preserving. Because the simple material substitution-inferential commitments that articulate the semantic content associated with singular terms are symmetric, their transitive closure partitions the set of singular terms into equivalence classes of intersubstitutable substituted-for expressions. It is in virtue of this defining character of their use that singular terms can be said to "purport to refer to just one object."

The full answer to the question, What are singular terms? is then that singular terms are substitutionally discriminated, essentially subsentential expressions that play a dual role. Syntactically they play the substitution-structural role of being substituted *for.* Semantically their primary occurrences have a *symmetric* substitution-inferential significance. Predicates, in contrast, are syntactically substitution-structural *frames,* and semantically their primary occurrences have an *asymmetric* substitution-inferential significance. This precise substitutional answer to the first question supplies a definite sense to the second one.

To ask why there are singular terms is to ask why expressions that are

substituted for (and so of the basic substitution-structural kind) should have their significance governed by symmetric commitments, while sentence frames (expressions of the derivative substitution-structural kind) should have their significance governed in addition by asymmetric commitments. The strategy pursued in answer to this question is to focus on the use of logical vocabulary to permit the explicit *expression*, as the content of sentences, of relations among sentences that are partly constitutive of their being contentful. To say that subsentential expressions are used by a community as substituted-fors and substitution-structural frames is to say that the contents conferred by the practices of the community on the sentences in which those expressions have primary occurrence are related systematically to one another in such a way that they can be exhibited as the products of contents associated with the subsentential expressions, according to a standard substitutional structure. The problem of why there are singular terms arises because that structure need not, for all that has just been said, assume the specific form that defines singular terms and predicates.

But suppose the condition is added that the sentences whose proper use must be codifiable in terms of the proper use of their subsentential components is to include (or be capable of being extended so as to include) not only logically atomic sentences but also sentences formed using the fundamental sentential logical vocabulary, paradigmatically conditionals and negation. This condition turns out to interact in intricate ways with the possibility of substitutional codification of sentential contents by subsentential ones—ways that when followed out can be seen to require just the combination of syntactic and semantic substitutional roles characteristic of singular terms and predicates. So the answer offered is that the existence of singular terms (and so of their complementary predicates) is the result of a dual expressive necessity. On the one hand, the material-inferential and material-incompatibility commitments regarding sentences must be implicitly substitutionally codifiable in terms of material-inferential and material-incompatibility commitments regarding the subsentential expressions that can be discerned within them or into which they can be analyzed, if the contents of novel sentences are to be projectable. On the other hand, those same commitments regarding sentences must be explicitly logically codifiable as the contents of assertional commitments, if the contents of nonlogical (as well as logical) sentences are to be available for public inspection, debate, and attempts at improvement. It is these two expressive demands, each intelligible entirely in terms of considerations arising already at the sentential level, that jointly give rise to the structure of symmetrically significant substituted-fors and asymmetrically significant substitution-structural sentence frames that defines the functional roles of singular terms and predicates.

The argument presented here may be called an *expressive deduction* of the necessity of basic subsentential structure taking the form of terms and predicates. A language must be taken to have expressions functioning as

singular terms if essentially subsentential structure is (substitutionally) discerned in it at all, and the language is expressively rich enough to contain fundamental sentential logical locutions, paradigmatically conditionals (which permit the assertionally explicit expression of material-inferential relations among nonlogical sentences) and negations (which permit the assertionally explicit expression of material-incompatibility relations among nonlogical sentences). The only way to combine the presence of logical vocabulary with a subsentential substitutional structure that does not take the term/predicate form is to preclude the formation of semantically significant logically compound sentence frames, by denying substituted-for expressions primary occurrence in logically compound sentences. The expressive cost of this restriction, however, is also substantial.

Unless sentence frames formed by substitutional assimilation of logically compound sentences are already available, it is not possible to introduce logical vocabulary (in the case of singular terms and predicates, identity and quantificational locutions) that will do for the commitments articulating the contents of subsentential expressions what the conditional and negation do for the commitments articulating the contents of sentences—namely express them explicitly in the form of assertional commitments. To put the point otherwise, the expressive power of sentential logical vocabulary derives in part from the interaction between a direct and a substitutionally indirect mode of making explicit the commitments that articulate sentential contents. The direct mode permits the formulation as the content of assertional commitments—of inferential commitments, for example. Without the expressive capacities provided here by conditionals, reasons could be demanded and debated for premises and conclusions, but not for the material inferences whose correctnesses are part and parcel of the content of those premises and conclusions. The substitutionally indirect way of making explicit the commitments that articulate sentential contents is by making explicit the commitments that articulate the contents associated with the subsentential expressions into which they can be analyzed, which commitments regarding subsentential expressions implicitly codify the same commitments regarding sentences that can also be made explicit directly. If a language has sentential logical vocabulary suitable to play both sorts of explicitating role, then its subsentential structure is obliged to take the specific form of singular terms and predicates.

Logical vocabulary has the expressive role of making *explicit*—in the form of logically compound, assertible sentential contents—the *implicit* material commitments in virtue of which logically atomic sentences have the contents that they do. Logic transforms semantic practices into principles. By providing the expressive tools permitting us to endorse in what we say what before we could endorse only in what we did, logic makes it possible for the development of the concepts by which we conceive our world and our plans (and so ourselves) to rise in part above the indistinct realm of mere tradition,

of evolution according to the results of the thoughtless jostling of the habitual and the fortuitous, and enter the comparatively well-lit discursive marketplace, where reasons are sought and proffered, and every endorsement is liable to being put on the scales and found wanting. The expressive deduction argues that subsentential structure takes the specific form of singular terms and predicates because only in that way can the full expressive benefits of substitutional subsentential analysis—codifying material correctnesses implicit in the use of sentences in material correctnesses implicit in the use of subsentential expressions—be combined with those afforded by the presence of full-blooded logical vocabulary of various sorts, performing its task of making explicit in claims what is implicit in the practical application of concepts.

In other words, languages have singular terms rather than some other kind of expression so that logic can help us talk and think in those languages about what we are doing, and why, when we talk and think in those languages. The full play of expressive power of even purely sentential logical vocabulary turns out to be incompatible with every sort of substitutional subsentential analysis except that in which essentially subsentential expressions playing the substitution-structural role of being substituted for have symmetric, substitution-inferential significances, and those playing the substitution-structural role of sentence frames have asymmetric, substitution-inferential significances. For to play its inference-explicitating role, the conditional, for instance, must form compound sentences whose antecedent substitution-position is inferentially inverting. Only symmetrically significant expressions can be substituted for, and so form sentence frames, in such a context. That is why in languages with conditionals, subsentential structure takes the form of singular terms and predicates.

In the opening paragraph of Section III it was pointed out that the principle that singular terms are used to talk about particular objects can be exploited according to two complementary directions of explanation. One might try to give an account of what particulars are, without using the concept *singular term*, and then proceed to define what it is to use an expression as a singular term by appeal to their relations to particulars. Or one might try to give an account of what singular terms are, without using the concept *particular*, and then proceed to define what it is for something to be a particular by appeal to their relations to expressions used as terms. (It should of course be admitted that in either case the talking about relation will require substantial explanation, though that explanation may have to look quite different depending on which explanatory strategy it is conceived as abetting.) The answer presented here to the question, What are singular terms? does not appeal to the concept of objects. So it provides just the sort of account required by the first stage of the second (Kant-Frege) strategy for explaining the concept of objects.

It is not the business of this chapter to pursue the later stages of that

direction of explanation, nor, therefore, to argue for its ultimate viability. But it is worth pointing out here that in the context of this order of explanation, to explain why there are singular terms is in an important sense to explain why there are objects—not why there is something (to talk about) rather than nothing (at all), but rather why what we talk about comes structured as propertied and related objects. "The limits of language (of that language which alone I understand) means the limits of my world."[59] To ask the question, Why are there singular terms? is one way of asking the question, Why are there objects? How odd that the answer to both should turn out to be: because it is so important to have something that means what *conditionals* mean!

Appendix I: From Substitutional Derivation of Categories to Functional Derivation of Categories

In functional-categorial grammars of the sort Lewis discusses in "General Semantics," one starts with some basic categories and defines derived categories by functions whose arguments and values are drawn from the basic categories, and from the derived categories already defined. Thus where singular terms (T) and sentences (S) are the basic categories, predicates, ($T \rightarrow S$), are defined syntactically as functions taking (ordered sets of) terms as arguments and yielding sentences as values. Semantically, they are interpreted by functions taking (ordered sets of) whatever sort of semantic interpretant is assigned to terms as arguments and yielding as values whatever sort of semantic interpretant is assigned to sentences. Items of the basic categories play the roles of arguments and values of the functions associated with items of the derived categories. Items of derived categories of course play the roles of functions, but they also can serve as arguments and values of other functions.

These three roles correspond to substitution-structural roles. To play the role of value of a function is to be an expression that is substituted in. To play the role of argument of a function is to be an expression that is substituted for. To play the functional-categorially derivative role of a function is to be a substitutional frame—that is, a substitutionally derivative role. The triadic division of substitution-structural roles is accordingly orthogonal to that of functional-categorially basic and derived categories, in that derived categories, for instance, play all three substitution-structural roles. The two sorts of structure are nevertheless intimately related. The substitutional syntactic structure is a way of thinking about and constructing the functional-categorial syntactic structure (and thereby the corresponding semantic one).

The substitutional construction corresponding to a functional-categorial

hierarchy standardly generated by using sentences and terms as basic categories begins with sentences and substitutional transformations relating them. The sentences act as expressions to be substituted in, corresponding to the values of predicate functions. As to the expressions that are substituted for, they correspond to the indices of the substitution transformations. If they are, like the sentences substituted in, antecedently distinguishable, then the facts concerning which transformations remove occurrences of which terms, and which produce occurrences of other terms, can be used to index the substitution transformations, assigning to each a set of pairs of substituted and substituting terms. If only the transformations and not the term occurrences are given, then the sentences substituted in can be indexed by the substitution transformations that apply nontrivially to them, in order to determine what terms occur in them. Each transformation is then assigned a pair of sets of sentences—those it applies nontrivially to, and those it nontrivially results in. (A nontrivial substitution transformation is one that results in some sentence different from that to which it is applied. Intuitively, a transformation will apply nontrivially to a sentence only if one or more of the expressions it substitutes for occurs in the sentence.) In either case, predicates as sentence frames are defined as equivalence classes of substitutionally variant sentences.

Depending upon how the substitution transformations are conceived, it may take some special effort to see to it that a proper equivalence relation is defined from these substitutional accessibility relations. Thus if substitution for t needs to replace all occurrences of t, then it need not be the case that wherever substituting t' for t in s yields s', that substituting t for t' in s' yields s. This failure of immediate symmetry is evident if one substitutes 'Hegel' for 'Kant' in "Hegel wrote about Kant"—the converse substitution will not recover the original sentence from "Hegel wrote about Hegel." Similar phenomena afflict transitivity. These may be resolved either by defining substitutional accessibility in terms of the symmetric and transitive closures of these basic substitutional relations or by permitting partial substitutions in the base relation, at the cost of making each transformation one-many instead of one-one. For present purposes, it does not matter which route is adopted.

Defining sentence frames as equivalence classes of substituted-in expressions in this way suffices to determine their role as functions that apply to sets of substituted-in expressions. Applying the function to such an argument is just selecting some of the substitutionally variant sentences contained in the equivalence class, depending upon which substitution transformations apply nontrivially to it. This is another way of saying that selecting the right substitutionally variant instance depends on what substituted-for expressions occur in it. It may be noticed that at this stage, nothing corresponding to the order of arguments for a predicate function has been distinguished; no way has been supplied to tell the difference between "Brutus killed Caesar"

and "Caesar killed Brutus." These are recognizable as distinct members of the equivalence class that may be denominated "α killed β." But each of them is a result of applying that frame to the unordered set {'Brutus','Caesar'}. This is patently insufficiently discriminating for the purposes of codifying inferences; this point holds even before quantifiers, for it concerns the antecedently important implicit proprieties of inference that will be made explicit as the contents of assertions with the aid of quantifiers. So (to stick to the simplest sort of substitution inference) "Brutus killed Caesar" follows from "Brutus killed Caesar" but not from "Caesar killed Brutus." Finer discrimination is thus required.

This requirement should come as no surprise, if for the moment one thinks about substitution transformations in functional-categorial terms, rather than the other way around. Basic substitution transformations are $(T \rightarrow T)$s, functions substituting one term for another, which induce $(S \rightarrow S)$s. But it is seen in the body of the chapter that codification of simple inferences by substitution requires consideration not only of the inferential significance of substitution for terms but also of the inferential significance of replacement of predicates. This operation corresponds categorially to a function from predicates to predicates (hence inducing one from sentences to sentences), namely to a $((T \rightarrow S) \rightarrow (T \rightarrow S))$.

Understanding such an operation requires understanding predicates, $(T \rightarrow S)$s, not in their role as functions or frames but in their role as arguments and values of higher-order functions. (It is here that the connection Dummett rightly perceives between complex predicates and quantification emerges, for quantifiers are of course $((T \rightarrow S) \rightarrow S)$s.) For, in addition to their role as functions, the full-fledged derivative categories $(X \rightarrow Y)$ of an unrestricted functional-categorial grammar can also serve as arguments for further, higher-order derived categories, such as $((X \rightarrow Y) \rightarrow Z)$, and as values of such categories as $(Z \rightarrow (X \rightarrow Y))$. Talk of playing the role of argument and value is, in substitutional terms, talk of playing the substitutional roles of being substituted for and substituted in. The analog to being substituted for, for substitutionally and functionally derivative sorts of expressions, has been called here 'replacement'. Supposing that replacement can be defined, the role of sentence frames as values of functions—that is, as expressions that can themselves be substituted in (and therefore be understood as the result of broadly substitutional relations)—will follow straightforwardly. No new considerations are introduced by this further role, however, so it is not further considered here.

Defining replacement of one sentence frame by another is a more complex affair. This is the analog for substitutional frames of substituting one expression for another, which underlies the inference for instance from "Brutus killed Caesar" to "Brutus injured Caesar." (This is a propriety of practice that, in idioms expressively rich enough to count as logically articulated, can be made explicit in the principle $(x)(y)[(x \text{ killed } y) \rightarrow (x \text{ injured } y)]$.) It is with

respect to this operation that sentence frames must be individuated as finely as complex predicates, and not just as simple ones. Replacing "α killed β" by "α injured β" requires keeping the argument places straight. At this point structure is required that has no analog whatsoever at the level of simple substitution for basic expressions.

Understanding substitution for basic expressions requires that sentences be assimilated into equivalence classes corresponding to frames. Replacement of one substitutionally derivative frame by another requires not only those equivalence classes but a mapping from one to another that has special properties. In particular, there must be a bijection mapping the two equivalence classes onto each other so as to preserve the substitutional relations within each class. With respect to such a mapping, replacement of one predicate by another in a sentence exhibiting it then results in the element of the replacing equivalence class that is the image under that mapping of the first sentence. An example will make clear what is intended.

The set of sentences corresponding to "α killed β"—call it *S*—has the form {"Brutus killed Caesar," "Brutus killed Brutus,""Caesar killed Brutus,""Caesar killed Caesar," "The noblest Roman killed the conqueror of Gaul," . . .}. The set of sentences corresponding to "α injured β"—call it *S'*—has the form {"Brutus injured Caesar," "Brutus injured Brutus,""Caesar injured Brutus,""Caesar injured Caesar," "The noblest Roman injured the conqueror of Gaul," . . .}. The trouble is that these are unordered sets. Since at lower levels the occurrences of terms have been distinguished, it is already possible to specify that the result of replacing "α killed β" by "α injured β" in "Brutus killed Caesar" must be an element of *S'* in which the terms 'Brutus' and 'Caesar' both occur. So "Caesar injured Caesar" and "The noblest Roman injured the conqueror of Gaul" are ruled out. But nothing said so far makes it possible to choose between "Brutus injured Caesar" and "Caesar injured Brutus."

What is required is that the set *S* of sentences corresponding to "α killed β" be put in one-to-one correspondence with the set *S'* of sentences corresponding to "α injured β," so that h("Brutus killed Caesar") = "Brutus injured Caesar," h("Caesar killed Brutus") = "Caesar injured Brutus," and so on. Then to replace "α killed β" by "α injured β" in "Brutus killed Caesar," one simply applies the function h. The formal criterion of adequacy for a function h to be able to play this role is that:

> *If* $h(s) = s_1$ and if Sub (s, s_2, t, t')
> (that is, s_2 results from s by substituting t' for t),
> *then* there must exist an s_3 such that Sub (s_1, s_3, t, t') and
> $h(s_2) = s_3$.

In the example, since Sub ("Brutus killed Caesar," "The noblest Roman killed Caesar," "Brutus," "The noblest Roman"), this means that if h("Brutus killed Caesar") is "Brutus injured Caesar," then there must be some sentence,

namely "The noblest Roman injured Caesar," such that it is the case both that h("The noblest Roman killed Caesar") is "The noblest Roman injured Caesar," and that Sub ("Brutus injured Caesar," "The noblest Roman injured Caesar," "Brutus," "The noblest Roman"). The notion of frame replacement makes sense only where such a mapping h has been defined from substitutional variants that are elements of one substitution-frame equivalence class to those that are elements of another.

Of course it is clear from this example that if there is one such mapping, there may well be others. For instance, h' could satisfy the condition if h'("Brutus killed Caesar") = "Caesar injured Brutus" instead of "Brutus injured Caesar." Selecting a substitution-structure preserving isomorphism h suffices to define the operation of predicate replacement that is employed in the semantic discussion of substitution inferences in the broad sense, which involves not only substituting for basic expressions but replacing substitutionally derived ones. This is all that is appealed to in the argument of this work.

To define the full functional-categorial hierarchy of derived categories, however, not only must frames be replaceable, but sentence-frame frames must be definable from them. This is part of playing the role of argument for higher-level functions. If the notion of predicate replacement is to be extended so as to be fully analogous to substitution for basic expressions (as the argument does not require), further structure still is needed. In particular, for this syntactic operation, one must be able to assimilate substituted-in expressions (sentences) accordingly as the same sentence-frame frame is exhibited—what "Kant admired Rousseau, and Kant wrote about Rousseau" has in common with "Kant lived longer than Rousseau, and Kant had a shorter name than Rousseau" and "Kant wrote more than Rousseau, and Kant wrote more carefully than Rousseau." Defining equivalence classes of sentences accessible from one another by replacing predicates with predicates requires more than the pairwise isomorphisms required to define replacement of predicates in the first place. It requires a set of such isomorphisms that link all the interreplaceable predicates into an equivalence class. This can be formulated as a requirement on a set of pairwise replacement-defining substitution-preserving isomorphisms. A structure $\langle R, H\rangle$ is a replaceability equivalence structure, in case:

1. $R = \{P_i/\text{each } P_i \text{ is a predicate of the same adicity } n\}$ and
2. $H = \{h(P_i, P_j)/P_i, P_j$ are elements of R, and $h(P_i, P_j)$ is a substitution-preserving isomorphism between P_i and $P_j\}$, and
3. H is reflexive, symmetric, and transitive over R, in that:
   (a) $h(P_i, P_i)$, an identity relation, is an element of H
   (b) $h(P_i, P_j)$ is the inverse of $h(P_j, P_i)$
   (c) $h(P_i, P_k)$ is the composition of $h(P_i, P_j)$ and $h(P_j, P_k)$.

Conditions (a), (b), and (c) need to be specially stipulated because of the potential multiplicity of isomorphisms mapping P_i onto P_j, and so qualifying

to be included in H as $h\langle P_i, P_j\rangle$. This means that specifying such a structure amounts to picking one complex predicate from the set of those associated with each given simple predicate. Each structure $\langle R, H\rangle$ permits the definition of predicates as objects in the full-blooded sense of substituted-for expressions. Thus invariants of substituted-ins, across replacement within these classes R, as defined by the associated set of mappings H, permit the definition of genuine derived categories of higher-order sentence frames resulting from replacement of predicates. These same constructions of frames, by assimilation of substituted-ins, and of substituted-fors out of derived frames of lower levels, will be repeated at each level to generate the full hierarchy of functional categories.

Appendix II: Sentence Use Conferring the Status of Singular Terms on Subsentential Expressions—An Application

In Section IV of this chapter, an account is offered of what it is to use expressions as singular terms and predicates. That account is couched in terms of substitution-inferential relations among sentences. One consequence of the argument is accordingly that a theorist who analyzes some target system of linguistic practices by discerning the use of expressions as singular terms and predicates is obliged to show how that analysis is supported by appropriate features of the use of the sentences that contain them. The substitution-inferential structure described here puts substantial constraints on sentential practices, which must be satisfied if they are to be claimed to be sufficient to confer on subsentential components the semantic significance of singular terms and predicates. Where these constraints are not observed, erroneous conclusions will be drawn.

A prominent instance is what is often made of Quine's famous 'gavagai' example, from Chapter 2 of *Word and Object*. The example is forwarded as an argument for the thesis of the indeterminacy of translation. The significance of the example is typically understood to lie in its promise of a general recipe for generating alternate translation schemes by reindividuation. Specifically, wherever there is a 'straight' translation scheme, rendering a target-language sortal 'gavagai' by home-language sortal K, for instance 'rabbit', it is possible to produce a distinct and competing scheme that renders it instead by something that individuates more finely (or less, but it will suffice here to concentrate on the finer discriminations), for instance 'undetached rabbit part' or (temporal) 'rabbit stage'. The point is to be that since sentences are the smallest linguistic units that can be used to make a move in the language game, the evidence of linguistic practice directly constrains only the interpretation of sentences. This leaves considerable slack in how responsibility for the use of those sentences is indirectly apportioned between the subsentential linguistic units the theorist chooses to discern. The

considerations advanced in the body of this chapter do not provide reason to quarrel with the general conclusion but do give reason to quarrel with this example.

The idea is that what get construed in the straight translation scheme as predications addressed to singular terms governed by the sortal 'rabbit' are construed by the derived translation scheme as predications addressed to singular terms governed by the sortal 'undetached rabbit part'. Thus "There is a large rabbit" becomes something like "There is an undetached rabbit part of a large contiguous collection of such parts." As Quine indicates, "This is the same rabbit as that one" becomes "This undetached rabbit part belongs to the same contiguous collection of such parts as that one." The strategy is to take what appear to be sentences about rabbits, which predicate ordinary properties of them, as instead sentences about rabbit parts, which predicate of them gerrymandered properties involving the contiguous wholes they belong to.

From the point of view of the present analysis, the difficulty with such a derived scheme is that if the sentences as it construes them are to count as genuinely using some expressions as singular terms invoking parts, there must be some predications of them that do not address them solely through the wholes in which they appear. Not all the predicates that appear in the derived translated language can be of the sort that result from the recipe for retranslating what appear as predicates on the straight translation. That is, the use of sentences as translated must be governed by some symmetric simple material substitution-inferential commitments—which license substitutions of one part term for another—while insisting on a finer discrimination than that of their belonging to the same contiguous whole. These will be the symmetric SMSICs that could be (though they need not be) made explicit in the derivative translation by the use of genuine identity locutions such as "This is the same undetached rabbit part as that one." These will govern substitution inferences involving genuine predicates of undetached rabbit parts. Thus if the predicate P meant ". . . is a broken foot," a symmetric SMSIC governing terms a and b will license indifferently the inference from Pa to Pb and vice versa. It will be a commitment to the identity of the undetached rabbit parts a and b. It is one of the fundamental commitments of the present analysis that unless their use is such as properly to be governed by such symmetric SMSICs, a and b are not genuine singular terms. The point then is that derived translations of what are construed in the straight translation as predications applying to rabbits will not serve as contexts permitting genuine identity commitments regarding undetached parts.

This point can be seen intuitively, without appeal to the technical notion of simple material substitution inferential commitments. If 'gavagai' is to be construed as a genuine sortal, the language containing it must contain the apparatus needed to individuate the items it sorts. It must have a use for some notion that appears in the language as translated by the derived scheme

as 'same gavagai'. But the reindividuative strategy of construing apparent references to wholes as references to parts offers no assurance that the language being translated can be taken to have the apparatus needed to distinguish parts. Consider the suggestion that 'gavagai' means 'undetached organic molecule contained in a rabbit'. The natives presumably cannot identify and individuate molecules, and no amount of gerrymandering of their actual linguistic practice could construe it as already containing sufficient apparatus to do so.

The example of a reindividuative derivation of an alternative to the straight translation seems to work only because the theorist, working in a metalanguage rich enough to contain the full individuative and referential apparatus needed to make some expressions mean 'undetached rabbit part', or even 'undetached organic molecule contained in a rabbit', *stipulates* that a native expression is to be understood as used in the way such expressions are used. What the present considerations show is that this possibility does not ensure that the uses of the sentences attributed to the natives are themselves sufficient to *confer* that significance on the subsentential expressions they employ.[60] The result is a substantial asymmetry between the languages attributed to the natives on the straight construal and the derived construal. The straight construal attributes an autonomous language, in the sense that the use of the sentences attributed to the natives suffices by itself to make the subsentential expressions mean what they are taken by the theorist to mean. By contrast, the derived construal attributes a language that is not autonomous, in the sense that using the sentences in the way the natives are taken to is not enough to make the subsentential expressions mean what they are taken by the theorist to mean. Since no natural language could be like this—only an artificial language whose use is stipulated in some richer metalanguage could be—the straight construal is clearly theoretically preferable.

Thus the considerations advanced here concerning what it is for sentences to be related by substitution inferences in such a way that they count as containing occurrences of singular terms and corresponding predicates puts constraints on the theorist's discrimination of subsentential structure generating the use of sentences. These constraints are not satisfied by the proposed retranslations by reindividuation that would render what can be understood as 'rabbit' by 'undetached rabbit part' or 'rabbit-stage' (and dual considerations will apply to schemes that would move up to the less finely individuated 'rabbit-hood', rather than down to more finely individuated sortals).

To say this is to take issue with one (prominent) argumentative strategy, not with the indeterminacy thesis as such. For one thing, the present account begins with proprieties, including inferential proprieties, of the use of sentences, not with Quine's spare foundation of patterns of irritation of sensory surfaces (of theorist and native). Again, there are many other ways into indeterminacy not addressed by these conferral considerations, most notably

those Davidson develops involving the possibility of trading off attributions of beliefs and desires attributed to individuals, and the meanings attributed to their utterances. However, the fundamental point of this chapter has been to disagree with Quine's claim (offered at *Word and Object*, p. 53, as a lesson of the 'gavagai' example) that "terms and reference are local to our conceptual scheme," that "the very notion of term" is "provincial to our culture."