USE OF THESES

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ANTI-REALISM: THE MANIFESTATION OF SEMANTIC KNOWLEDGE

by

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Except where otherwise acknowledged,
this thesis represents my own original work.

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ABSTRACT

Realistic views are fashionable. In this thesis, I defend a view opposed to realism, which Dummett calls "anti-realism". My defence of anti-realism depends on the assumption that a theory of meaning should explain how speakers understand one another. The theory should therefore describe linguistic abilities in terms of communicable features of linguistic practice: those which are exhaustively manifest in use. I call this the manifestation argument.

In the first chapter, I apply the manifestation argument not only to theories of meaning which yield specifications of the content of sentences of a language (I.2), but also to theories which aim primarily to define linguistic behaviour as a species of intentional activity (I.3). The manifestation argument tells against the realist assumption of verification transcendent truth: that there may be truths which speakers could never be in a position to verify (I.2.3, I.3.3). However, holistic theories are exempted from the anti-realist argument. Alternative characterisations of realism are also mentioned (I.4).

Dummett's theory of meaning is tailored to ensure that knowledge of meaning can be manifested. I endorse this account, with minor modifications (II.1-II.5). The revisionary consequences of the account are, I think, more extreme than Dummett supposes (II.6). Dummett takes Intuitionism in mathematics to be the paradigm of an anti-realist account of meaning (III.1-III.2). Two accounts of the meaning of the intuitionist logical constants are discussed. The first, which Dummett prefers, is in terms of canonical proof conditions (III.3-III.4); the second is an intuitionist analogue of a Tarski style truth definition (III.5). I argue that the former is required for justifying the intuitionist account, even though the latter adequately captures the intuitionist notion of truth.

Chapter IV concerns the motivation of the manifestation argument (IV.1). I discuss the acquisition argument for anti-realism used by Dummett; namely, that it must be possible to acquire a grasp of the meaning of a sentence of a language from experience of its use (IV.2). I suggest that the manifestation argument is prior to the acquisition argument. I argue that anti-realism need not be reductionist (IV.4), and that vagueness suggests a modification of the manifestation argument.

When intuitionism in mathematics provides the model of a theory of meaning for natural language, various notions of assertibility replace that of provability. Dummett considers conclusive verifiability (V.2) and falsifiability (V.3). Both fail to provide an acceptable account of negation, and do not allow for those assertions of natural language evidence for which is inconclusive (V.4). I take conditions of verification and falsification to determine meaning (V.5).

The intuitionist analogy is applied to time in Chapter VI. I discuss the analysis of temporal modification (VI.2), and argue that tensed sentences involve indexical reference to time (VI.3). This
suggests a generalised anti-realism about spatial and personal indexicals, which I reject (VI.4). I also reject Dummett's treatment of tense-links, but endorse a modified anti-realism about time (VI.5).

I conclude with a discussion of holism. According to Dummett, holistic theories are objectionable because they are not molecular (VII.1). There are three strands in Dummett's notion of molecularity, and I discuss the role of each in rejecting varieties of holism (VII.2-VII.4). Dummett has doubts about anti-realist molecular theories which I dismiss, but I argue that the anti-realist cannot explain what I call 'radical' meaning change (VII.5).
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Each chapter, which is labelled with a Roman numeral, is divided into section and subsections, labelled with Arabic numerals. I refer to sections of the essay using those numerals: thus I.1.1 refers to chapter I, section 1, subsection 1. When I refer to a section within a chapter, I omit the Roman numeral for that chapter: thus 1.1 in Chapter I refers to I.1.1.

I have adopted Dummett's (1977) use of &, v, →, ¬, ∀, and ∃ for the intuitionist logical constants. Classical constants are ., V, ∨, ¬, () and E. When I wish to allow both classical and intuitionist readings of the logical constants, I employ the intuitionist constants. I do so at III.3 and III.5. In Chapter V, I use the intuitionist constants for a variety of readings of the falsification calculus, and for a non-intuitionist negation. I do not think that the ambiguity causes confusion.
INTRODUCTION

It is not difficult to understand sentences in a language one knows. It is harder to explain in what understanding consists. One way of doing so is to describe what a speaker must know in order to understand sentences of a language. Theories of speakers' semantic knowledge have assumed that speakers know what would make sentences of a language true, or that speakers know what would justify the assertion of sentences of a language.

According to Dummett, the first of these alternatives is a characteristically realist account of meaning. He uses the "colourless term" (1978, p.145) anti-realism for the second. Dummett defends anti-realism on the grounds that an adequate account of speakers' abilities to understand one another must ensure that understanding is exhaustively manifest in their linguistic behaviour: a form of argument which I call 'the manifestation argument'. A realist supposes that sentences might be true although their assertion could not in principle be justified. In that case, Dummett argues, speakers could not manifest their understanding of those sentences.

Dummett draws the startling consequence that we must not only reject realism, but that we must also revise our classical logical practices. We cannot assume that every sentence is either true or false, for we might never be in a position either to justify the assertion of a sentence or show that it is false. Moreover, if we accept that a sentence is false just if its negation is true, we can no longer assume that either a sentence or its negation is true.
In this thesis, my aim is to examine the manifestation argument and its consequences. I shall defend anti-realism. Anti-realism must be distinguished from other theories which are opposed to realism. It differs from traditional idealism in so far as it is based on semantic, not epistemological, premisses. The anti-realist rejects the claim that there are truths which could not in principle be justified. Nevertheless, those truths which can in principle be justified are truths about the objective world. There should be no inclination to treat publically assessable truths as any less true of the world than the traditional realist would suppose.

Anti-realism is not intended to be a species of relativism. The anti-realist may admit that the truths a speaker can express are limited to those which could be justified in a language which he understands. But reality is not determined by the truths which a particular speaker, or group of speakers, can justify. The limitations on truth which the anti-realist sets are determined by the abilities of speakers of any language to justify their assertions. For example, the anti-realist rejects realism about the past because it is impossible to move at will into the past in order to justify past tensed assertions. Again, the anti-realist rejects a platonist interpretation of infinite totalities because we cannot scan an infinite totality in a finite time and justify assertions about it. Truth is relativised only to human limitations on assessing truth value, not to a particular language or society.

Logical positivism is more closely related to anti-realism than either idealism or relativism. Logical positivists, like the anti-realist, insist that it must be possible to verify or falsify meaningful assertions. However, the anti-realist differs from logical
positivists in allowing that a sentence may be meaningful, although there is no way guaranteed to verify or falsify it. A past tensed statement may not now be verifiable or falsifiable, but a verification or falsification might arise. In that case, the anti-realist regards the sentence as meaningful, but neither true nor false. The anti-realist does not require a reduction of meaningful sentences to those the truth value of which is guaranteed to be decidable.

Dummett first defended anti-realism of this type. Accordingly, a large part of this essay concerns the details of his views. In what follows, I shall indicate briefly how they relate to my own attitudes. Dummett employs the manifestation argument to reject realist accounts of the content of sentences of a language. In the first chapter, I suggest that the manifestation argument also applies to conventional and intentional theories of meaning. In that chapter, I also characterise theories of meaning according to whether they aim to provide a conceptual analysis of 'meaning' or to yield specifications of the content of sentences of a particular language.

This distinction enables me to discuss what is, I think, one of the most confusing aspects of Dummett's work. He argues that assertion, conceived of as a conventional activity, provides the evidence for a theory of meaning. I shall suggest that Dummett takes the conventions of linguistic behaviour to describe the concept of meaning, since those conventions are common to speakers of all languages. The assertibility conditions of sentences of a particular language determine their content. Although I disagree with Dummett on many of the details of an account of assertibility conditions, I think that his approach is essentially correct. The most crucial respect in which I differ from Dummett is that I think that truth is defined by
conditions under which assertions of any kind, including ethical and vague assertions, are correct. I argue that the notion of truth so defined must be used in the explanation of the assertibility conditions of complex sentences. Assertibility must, then, distribute over the logical constants. Dummett sometimes contests this claim.

My discussion of Dummett's extensive writings on Intuitionism is superficial, and is designed to emphasise those aspects of intuitionist logic which Dummett adopts for a theory of meaning for natural language. Dummett's rationale for intuitionism is that it ensures that knowledge of the meaning of sentences involving quantification over infinite domains is manifestable. Undecidability in mathematics arises solely from such quantification. In this regard, natural language differs from mathematics since atomic sentences of natural language may be undecidable.

Dummett draws analogies between a natural deduction system for intuitionist logic, and requirements on an account of the meaning of logically complex sentences in natural language. I agree with Dummett that canonical proof conditions for complex sentences, having properties analogous to introduction laws for constants in a natural deduction system, give the meaning of the intuitionist logical constants. However, I think, unlike Dummett, that the disquotational specifications given by an intuitionist analogue of a Tarski style theory do so too, although I agree with Dummett that the disquotational theory cannot justify intuitionist logic. I am chary of accepting a further analogy with natural deduction systems which Dummett proposes. He suggests that we can treat the grounds and consequences of sentences of natural language as resembling the introduction and elimination laws for logical constants, and as
independently specifiable in much the same way.

Dummett generally presents the argument for anti-realism in terms of speakers' knowledge of meaning. This is how I have formulated the argument at the beginning of this introduction. But I shall argue in Chapter IV that this is a misleading way to express the manifestation argument. The manifestation argument is essentially an argument that semantic knowledge can be attributed to speakers only if it is manifested in their behaviour. It is not primarily an argument about knowledge of meaning. Furthermore, I think Dummett's claim that there is an alternative route to anti-realism based on considerations about how linguistic abilities are acquired is mistaken. I reject refutations of anti-realism which concentrate on the reductive character of anti-realism, and those which point to extension by analogy as a justification of our realistic practices.

In the fifth chapter, I discuss the application of the intuitionist analogy to natural language. I argue that there are insuperable difficulties with an intuitionist style negation in natural language. Dummett suggests an alternative falsificationist account of meaning for sentences of natural language, but the account of deducibility he adopts is unsatisfactory. I also reject probabilistic semantics for sentences of natural language, although the observation which motivates such semantics - that there are many sentences of natural language which can never be conclusively verified or falsified - is correct. I take conditions of verification and falsification to determine the meaning of sentences of natural language. Dummett rejects this account, but I think that his reasons are unconvincing. The account remedies the defects of an intuitionist style negation, and suggests how we might deal with assertions.
evidence for which is essentially inconclusive.

Dummett takes the unusual view that the past may not be real while the present and finitely distant future are. He also claims that the content or meaning of sentences of a language must be relativised to a time. I argue that these two views are inconsistent. In Chapter VI, I endorse Dummett's anti-realism about the past, but reject the relativisation of meaning to time. In doing so, I adopt an analysis of tensed sentences which treats tense in terms of indexical reference to times. Dummett prefers to treat tensed sentences as involving temporal operators. His arguments for this analysis are not compelling.

Finally, I turn to Dummett's remarks about holism. These are again rather confusing. I attempt to disentangle the elements of his notion of molecularity. Molecularity is a property which Dummett thinks is desirable in a theory of meaning, and which holistic theories lack. A molecular theory has at least the three following properties: it yields determinate meanings for every sentence of a language, it yields publicly manifestable meanings for every sentence of the language and the meaning of every sentence can be expressed in terms of sentences no more complex than itself. By identifying these properties, I am able to determine which feature of molecularity various types of holism reject, and to employ arguments separately against them.

I think that Dummett's concern that an anti-realist molecular theory cannot explain the informativeness and necessity of deductive argument is baseless. But there are worse difficulties for anti-realism than Dummett recognises in accounting for the related phenomenon of the informativeness of technological change. Certain
technological changes so alter the procedures of determining truth value in a language that the anti-realist must treat them as changing the meaning of sentences in the language. This means that the anti-realist cannot explain such changes. Moreover, the anti-realist must admit, in this case, that truth is relativised to the means of determining truth value at a stage of scientific enquiry. So, despite my earlier remarks, anti-realism appears to be a species of relativism. I do not think that this is a bad thing, but it is certainly not a feature of anti-realism as Dummett advocates it.

I make no apology for concentrating as I have on Dummett's presentation of anti-realism. I am convinced that the manifestation argument is correct, and that it provides strong reasons for doubting our realist conceptions of the world. I would apologise for the tentative nature of my conclusions, were it not that I believe that tentative conclusions are the best that can be drawn.
CHAPTER I

TWO TYPES OF THEORY OF MEANING

Introduction

It is a cardinal doctrine of realism that there may be truths about the world which those who investigate it might never be in a position to recognise as obtaining. An anti-realist rejects this doctrine, either in general or for certain classes of truths about particular features of the world. There are various reasons why one might choose to adopt anti-realism. I shall be concerned with the justification of anti-realism on the basis of arguments as to the nature of an acceptable theory of meaning. Evidently an argument of this type depends on how a theory of meaning is formulated. I shall assume that theories of meaning are an attempt to describe and explain the linguistic behaviour of speakers. There are at least two conceptions of how that task might be fulfilled, each taking as fundamental a distinctive project. We need to distinguish:

A. Theories of meaning which provide a specification of the meaning of well formed sentences of a particular language. Such theories attempt effectively to define a relation between sentences of a language and their contents. I shall call theories of this type 'content-specifying' theories.

B. Theories of meaning which primarily provide a conceptual analysis of the notion of 'meaning', as it applies to any language, and perhaps to non-linguistic communication. It is common to think this task is achieved by a theory which defines conditions under which
sentences of any language are understood. I shall call theories of this type 'conceptual' theories of meaning.1

Theories of either sort are inadequate unless they provide some means of fulfilling the task taken to be fundamental to the other. A content-specifying theory should define contents which reflect the general character of meaning which a conceptual theory seeks to analyse. It may be possible to relate sentences of a particular language to the length of their typed inscriptions, for example, but this would not provide acceptable content specifications. On the other hand, a conceptual analysis of meaning should supply an account of how the general notion of meaning accrues to sentences of a particular language.

In this chapter, I shall consider how the distinction applies to various accounts of meaning. I take theories of meaning in the Fregean tradition to be exemplars of the first approach, and intentional theories of meaning to be exemplars of the second. I shall discuss how theories of each sort accommodate the alternative conception. I do not mean to suggest that there are not other accounts which fulfil either purpose, or that there may not be ways of reconciling the two approaches which I have not canvassed. In each case the theories I discuss are motivated by the primary aim of the

1. The distinction between A and B is drawn explicitly in Davies (1981), Sainsbury (1980), Strawson (1970) and Taylor (forthcoming) used by Lewis (1969), Schiffer (1972) and Peacocke (1976). Dummett (1975b) contrasts a modest theory of meaning (A type) with a full blooded theory of meaning on similar lines. Schiffer argues for the priority of B type theories, and suggests ways of incorporating a B type theory in his preferred approach. Lewis defines a B type central notion of convention. Sainsbury argues that a B type theory need not involve a truth conditional specification of meaning, while Taylor argues that it must. Davies and Peacocke attempt to show how content specifications can supply a theory meeting the aims of type B, when a theory meets certain constraints.
type they exemplify, and appear naturally to fulfil that aim.

Dummett (1973, pp.468-70; 1975, pp.5-7) has identified the argument against realism in a theory of meaning with what I have called the manifestation argument. I shall provide a preliminary account of that argument early in the chapter. The argument is applied to Fregean and intentional theories of meaning. In the final section of the chapter, I turn to other characterisations of realism. I discuss Dummett's alternative criterion for realist theories: that they allow that every sentence of a language is either true or false, and its relationship to the manifestation argument.

1. Linguistic Abilities

Theories of meaning seek to describe and explain the linguistic behaviour of speakers. Abilities are attributed to speakers in terms of which their dispositions to utter sentences of a language and to react to those of others are explained. Content-specifying theories attribute to speakers the fundamental ability to recognise the content of their own and others' utterances. Intentional theories hope to locate the general notion of meaning by attributing to speakers the ability to recognise the psychological attitudes speakers express, and take others to be expressing, in uttering sentences of a language. The attribution of recognitional abilities is in each case intended to explain the dispositions speakers evidently do have.

It might be thought that linguistic abilities are purely dispositional, and that it is unnecessary to attribute to speakers recognitional abilities of any sort. The explanation of linguistic

2. Devitt (1980, pp.14-18) explicitly argues for such a view, in the context of Dummett's anti-realist critique. One interpretation of Quine at, for example, (1953, 1960) suggests that this is his view.
abilities, like the explanation of how to water-ski that a training manual provides, may attribute abilities to speakers, knowledge of which is neither necessary nor sufficient for the possession of the relevant dispositions. Those abilities would then not be recognitional. In order to explain linguistic abilities we need not attribute to speakers the ability to recognise content.

There are constraints on the attribution of abilities to speakers, whether they are conceived as dispositional or recognitional. These constraints are the basis on which the manifestation argument is applied.

1.1 The Manifestation of Linguistic Abilities

Dispositions of any sort are attributed on the basis of their manifestation in behaviour. It would be a mistake to attribute dispositions for which there was no evidence in behaviour. Moreover, parsimony should be obeyed in any attribution of abilities, on the basis of which the dispositions are explained. The weakest set of abilities sufficient to explain the behaviour is to be preferred.

There is a further constraint on the attribution of linguistic abilities. Language is a medium of communication. If a theory of meaning aims to describe the communicative competence of speakers, it should show how it is possible that the abilities it attributes to speakers suffice for communication. Propriety should be obeyed in any attribution of abilities, in so far as the abilities must be suitable to explain communicative practices. This is not to deny the role of, say, a neurophysiological account of linguistic abilities. It is merely to say that that account would not, in itself, provide a theory of communicative practice. A theory of meaning which attributes
abilities to speakers which are not both displayed in behaviour and such as to show how speakers can communicate, fails to explain the communicative practices of speakers. A dispositional description of linguistic abilities, for example, should not attribute abilities which are not exercised, and should show how such abilities suffice for communication.

Versions of the second of these constraints can be found in Frege (1956) and in Wittgenstein (1953). Frege argues that meaning could not be a matter of "ideas", since speakers share and communicate using meaningful expressions. He introduces a category of objective thoughts, determined by the content of sentences of a language. Frege's argument is that thoughts must be communally available for recognition by speakers, if communication is to be possible.

Wittgenstein (1953, I §258 and passim) has a stronger argument. An attribution of a psychological attitude requires criteria of application which are ultimately public, since if we had no such criteria there would be no way of determining whether an attitude were of a given type. If linguistic abilities are recognitional, then criteria for the correct application of those abilities must be public. Where linguistic abilities are thought to be purely dispositional the criteria for when those dispositions are correctly exercised must also be public.

Dummett employs both constraints when he says

the meaning of such a statement cannot be, or contain as an ingredient, anything which is not manifest in the use made of it, lying solely in the mind of the individual who apprehends that meaning... (1975, p.6)

If the ability to discern meaning is to be communicable, and have public criteria of correctness, then those criteria must consist in a
feature of the use made of the sentence. It is this argument I call the manifestation argument. I shall discuss it further in Chapter IV, but I shall here apply it to both content-specifying and conceptual theories of meaning.

2. Content-Specifying Theories

Frege developed an account of the content of sentences of a language. He suggested that a theory of meaning had two components—a theory of reference and a theory of sense. The theory of reference associates extralinguistic entities with linguistic expressions, while the theory of sense describes the knowledge of speakers which constitutes their mastery of those expressions. Frege took the references of sentences to be truth or falsity, and the references of singular terms to be objects. The theory of reference assigns a reference, a semantic value, to every syntactically discriminated expression of the language. The theory discerns structure in the complex expressions of the language and assigns references to expressions on the basis of references assigned to their parts, in such a way that the reference of the expression is a function of the reference of its parts. If two expressions have the same reference, then the substitution of one by another in a complex expression does not alter the reference of the complex expression.

Sense was for Frege a cognitive notion, which he introduced to solve the problem of informative identity statements. The sense of an expression is the mode of presentation of its referent: how the referent is thought of. The reference of a complete sentence is its

3. This account of Frege's views derives from Dummett's (1973) exegesis. References to Frege are (1950, esp. p.x; 1952, pp.62-63, 89-90; 1964, esp. §§1-4; §32).
truth value, and its sense the thought with which it is associated. To know the sense of a complete sentence, it suffices to know the truth conditions of that sentence. The sense of a singular term is its mode of presentation. Knowledge of the sense of a singular term consists in knowledge of its contribution to determining the truth conditions of sentences in which it is contained. The theory of sense assigns a sense to every meaningful expression of the language. The sense of a complex expression is a function of the senses of its parts, and is such that if two expressions have the same sense then substitution of one for the other in a complex expression does not alter the sense of that complex expression.

The theories of sense and reference together provide content-specifications for indicative sentences of a language. Speakers' linguistic abilities are explained in terms of their knowledge of the sense of expressions in a language: of, that is, the mode of presentation of the referent of those expressions. Frege's theory, in which the fundamental linguistic abilities of speakers consist in their ability to recognise the truth conditions of sentences of the language they speak, has been developed in various ways.

2.1 Developments of Frege's Theory

Tarski (1956) showed how to formulate a finitely axiomatised theory of truth for a language L, in a suitably expressive metalanguage. Certain, perhaps infinitely many, biconditional consequences of the axioms - called T-sentences - namely those of the form

S is true iff p
(where 'S' is a structural descriptive name of a sentence in the object language, and 'p' its translation in the metalanguage) serve implicitly to define 'true-in-L', in terms of the basic notion of satisfaction of sequences. We can derive an explicit definition of 'true-in-L'. Axioms are provided for each expression the syntax discerns as primitive and for the modes of composition discerned.

Davidson (1967) proposes that such a Tarski type theory of truth for a natural language supplies an empirical theory of meaning for it. Consequences of the favoured form are taken to be testable. In an adequate theory all such consequences are true. The infinite pairing of object language truths with the truths of the metalanguage should ensure that the right hand side yields the truth conditions of the object language sentences.

It has been suggested that such a theory provides a Fregean theory of sense for a language. The axioms specify the sense of subsentential expressions of a language, and they, together with axioms for the modes of composition, serve to define the sense of every sentence of the language in terms of a central semantic concept — here satisfaction. Attribution of knowledge of the theory or of knowledge equivalent in its exercise to knowledge of the theory to speakers will, it is hoped, serve to explain speakers' linguistic abilities. On this account a theory of sense consists in an adequate theory of reference which meets certain constraints.

4. For example Platts (1979), McDowell (1976, 1977a) Wiggins (1980). Strictly speaking, views of this type take the notion of truth to be specified by the best theory of interpretation for a language, where interpretation is making sense of speakers. Such a view is implicit in Davidson (1967, 1973, 1974) and is discussed at greater length in VII.3.
One virtue of such a theory lies, as Davidson (1965) has emphasised, in the partial solution of a cognitive problem. It goes some way to show how speakers can understand a potentially infinite number of sentences. It does so on the assumption that the model provided by the theory is isomorphic to the cognitive structure of speakers: for in that case the finite axioms give a route from a finite number of abilities to the ability to understand an indefinitely large number of sentences. We may replace the requirement of finite axiomatisation by that of effective axiomatisation, and expect theories meeting the latter requirement to inherit this virtue. Moreover, we do not need to talk of infinite numbers of sentences in order to justify our preference for theories which discern structure. Davies (1981a) justifies that requirement by observing that the knowledge speakers have of meaning depends on structure. If speakers know the meaning of a sentence in virtue of their familiarity with the use in other contexts of expressions it contains, then their knowledge depends on discerning structure in the sentence concerned. Moreover a theory of this type is supposed to yield an explanation of the validity of inferences, in terms of the essential semantic structure of sentences and of the general clauses for the logical constants contained in them.

The difficulties for such a theory lie in the cognitive problem Frege remarked. For if the theory is to be a theory of Fregean sense then it must not license the substitution of co-referential terms. Yet the theory is extensional and cannot, without development, fail to license such substitution. Further constraints on the theory may be applied. Constraints on the procedures of radical interpretation are intended so to fix the meanings of sentences that substitution of co-referential terms is legitimate only if licensed by attribution of
rational propositional attitudes to speakers. A theory of this type may fail, however, to exclude certain consequences which do not provide meaning specifications. We might hope that the infinite pairing of sentences of the object language with their metalinguistic meanings somewhere serves to exclude, as T-sentences, the true sentence:

'Grass is green' is true iff snow is white

but it is not clear how the theory should exclude

'Grass is green' is true iff grass is green and if

\[ 2 + 2 = 4 \text{ then } 2 + 2 = 4 \]

Various modifications may be introduced. One might claim that meaning specifying T-sentences are those for which there is a canonical proof procedure which uses just the axioms relating to the primitive expressions and modes of composition discerned in the object language sentence. One might, on the other hand, hope the propositional attitude constraints would suffice to meet this difficulty.

A theory of this type defines the abilities of speakers relative to a particular language. The general conceptual notion of meaning is revealed by the constraints on the procedures of radical interpretation. Davidson (1974) argues that we cannot determine what is meant by sentences of a language without simultaneously determining the propositional attitudes of speakers. He fixes on an attitude towards sentences, 'holding true', as the basic data in terms of which one begins the procedure of radical interpretation. Interpreters assume that speakers 'hold true' very largely the sentences that they themselves believe. This is the principle of charity. Suspicion that this procedure might not determine a general notion of truth arises when one questions the role of 'true' in 'holds true', for 'true' is

not semantically inert in that phrase, as Peacocke (1976, p.163) remarks.

The class of logical truths admitted by such a theory will depend on the syntax discerned by the theory and the logic admitted for the metalanguage. This involves no commitment to classical logic, for if the logic for the metalanguage is intuitionist we can derive Tarski type equivalences for which the logic for the right hand side is intuitionistic. We may still call such a theory, with suitably explicated base clauses, a theory of sense.

Dummett (1973) prefers a theory of sense which derives from the Fregean account of senses as modes of presentation. The theory of sense he describes takes the sense of a complete sentence to consist in the means of determining its truth value, and the sense of subsentential expressions to consist in their contribution to the means of determining truth value. In particular, the sense of a singular term is the means of determining its referent, or its mode of presentation, and the sense of a predicate the means of determining whether or not the predicate holds of the referent. According to Dummett, the behaviour of speakers in determining the truth value of sentences is common to speakers of all languages, and provides the conceptual notion of meaning (II.1). In this regard, his theory differs from Davidson's. Dummett also requires that means of determining truth value should be such that speakers could exercise them. He argues that this ensures that linguistic abilities are manifest in use, and that it yields a non-classical logic.

If a fine discrimination between modes of presentation can be achieved, we may hope to find a distinction in sense between any two expressions towards which differing cognitive attitudes are possible.
Dummett therefore requires that "if someone knows the sense of two words, and the two words have the same sense, he must know that they have the same sense" (1973, p.95). According to Dummett, it cannot be a matter of discovery that two expressions have the same sense. Knowledge of sense, Dummett thinks, is manifested in the ability of speakers to determine the truth value of sentences of a particular language, in such a way as to guarantee that whenever one knows the sense of two expressions then one knows whether they are the same. It is not clear that Davidson's account of meaning fulfils Dummett's requirement. It appears that Davidson might assign the same referent to two co-referential terms, while speakers may fail to recognise that they are co-referential. I shall suggest that denotation clauses for referring expressions provide modes of presentation meeting Dummett's constraint.

Fregean theories provide content specifications for indicative sentences of a particular language. Speakers' linguistic abilities are taken to consist, in part, of abilities to discern the sense of utterances. If such theories are to describe the linguistic dispositions of speakers of a particular language, they should also provide an account of the content of non-indicative utterances in that language. Moreover, the manifestation argument has it that the ability to recognise sense should be explained in such a way that its exercise has public criteria of correctness. Fregean theories should give an account of the manifestation of the ability to discern content.

In fulfilling these two requirements, Fregean theories can be expected to provide an account of the concept of meaning. For, in saying how knowledge of content is manifested in behaviour, one would
provide a general account of what it is to understand a sentence.

2.2. A Theory of Force

Frege introduced an approach to an account of non-indicative sentences, and of the manifestation of semantic knowledge, when he distinguished the content of an utterance from the force with which it is uttered. For he argued that some non-indicative sentences had the same content as indicative sentences, and that the activity of assertion should count as the manifestation of the ability to recognise content.

When Frege introduced the assertion sign, he said

As a constituent of the sign \(\vdash\) the horizontal stroke combines the symbols following it into a whole; assertion, which is expressed by the vertical stroke at the left end of the horizontal one, relates to the whole thus formed. The horizontal stroke I call the content-stroke. (1950, p.3)

At this stage he had not specified whether the assertion stroke applied to asserted content or unasserted content. For he said "the symbol \(\vdash\) is the common predicate of all judgements" (1952, p.4).

Frege later remedied the difficulty when he suggested that

two things must be distinguished in an indicative sentence: the content, which it has in common with the corresponding sentence question, and the assertion. (1956, p.294)

He took the common content to be the unasserted sense defined by the truth conditions of the sentence. A sentence question and an assertion differ in force. When a speaker understands

The kangaroo paw is in flower,

or Is the kangaroo paw in flower?

he understands two things: the content, which the two share, and the different force with which that content is expressed in each. We can
provide a uniform account of the content of the two, and of the way force operators of a particular type modify content. The former generalisation allows us to say that 'kangaroo paw' has the same sense in both sentences since its contribution is to the same content, while the latter enables us to explain one aspect of the creativity of language use. For speakers who are able to understand utterances with a certain content, and have the ability to interpret a force operator, are able to understand utterances whose content they have never previously encountered associated with such a force operator.

Frege's account of content, or sense, is truth conditional. He thinks that truth conditions are specified by indicative sentences. So, he says, "the truth claim arises in each case from the form of the declarative sentence" (1950, p.64). If this were correct, it would be necessary to provide an indicative transform for each type of non-indicative sentence in order to specify content. Frege has shown how we might do so for sentential questions, but thinks that imperatives do not have truth conditions. He says "I shall not call the sense of an imperative sentence a thought." (1956, p.293) If this is correct there would be no uniform account of the role of 'kangaroo paw' in

Pick that kangaroo paw!

and in indicative sentences, which would be absurd.

Linguists have suggested, however, that imperatives are derived from indicatives of the form

You pick that kangaroo paw!

since only second-person reflexives ('yourself', 'yourselves') can occur in imperatives. A Fregean could adopt this analysis, for in this case it is obvious what the indicative transform of an imperative
is. Other difficult cases, such as non-sentential questions ('How are you?' or 'When are you leaving?') would be assigned a content related to correct sentential response.

This method correlates indicative content with sentences in various grammatical moods. There are various other proposals for assigning content to non-indicatives. One proposal is to describe content in terms of the sentence radical 'that-clause' for sentences in each mood. Another proposal is that derived from linguistic arguments suggested by Ross and elaborated by Lewis (1971, p.207). The content of non-indicatives is treated as equivalent to that of their performative analogues, so that

When are you leaving?

has the content of

I ask if you are leaving at t. (for some time, t)

Such transforms have an advantage over accounts which specify sentence radicals in terms of a 'that-clause', in that they are adaptable for such cases as

Congratulations!

which have no plausible 'that-clause' transform. However, performatives appear not to be truth-conditional. Lewis suggests that we stipulate that performatives are true if uttered. We could then treat the performative analogues truth-conditionally, and incorporate mood into a theory of content. But questions and commands are not obviously self-referential, while their supposed transforms are. Moreover Ross's argument suggests that we should treat assertions in a similar fashion. Every indicative assertion would thus have the form 'I assert that p' (or in Ross's language 'I say that p'). In this case, the linguistic act which manifests a grasp of content could not be counted as assertion. For if 'I assert that p' is not equivalent
in content to 'p', the content of the latter could not be that of an assertoric use of 'p'. If, on the other hand, the content of 'p' was equivalent to that of 'I assert that p', there will be a regress: for 'I assert that p' is equivalent to 'I assert that I assert that p' and so on.

Davidson (1979) suggests we treat non-indicatives paratactically, so that

Is the kangaroo paw in flower?

has the content of two sentences, the second referring to the first.

The kangaroo paw is in flower.

I ask that.

Each sentence has a truth condition, but the combination has none. Presumably the analysis of

When are you leaving?

might be

There is a time such that you are leaving then.

I ask which time. 6

These analyses do not yet meet the question of the manifestation of semantic knowledge. We attribute to speakers abilities to discern the indicative transforms of indicative sentences, to treat non-indicatives as performatives or to understand non-indicatives paratactically. But we have not yet described how the ability to recognise content, or to discern the complexities of its modifiers, is manifest in behaviour. The manifestation of these abilities, labelled pragmatic, is left unspecified.

6. McGinn (1977) proposes an operator analysis of non-indicatives within a Davidsonian theory. Force operators are treated on the lines of a clause for negation. I do not discuss his proposal here, since it is susceptible to the same objection I raise for paratactic accounts of mood.
In Frege's account, the ability to recognise content is primarily manifested in the activity of assertion. Frege (1956, p.294) conceived of assertion as deriving from the mental act of judgement, itself consisting in the advance from the apprehension of the objective thought to the recognition of its truth. We might conceive of other forces in a similar fashion: asking a sentential question, for example, would consist in the outer correlate of the move from grasping the thought to wondering whether it were true. In the context of the manifestation argument, Frege's conception appears misguided. The interior act of recognising the truth of a thought must be parasitic on the activity of assertion, if Wittgenstein's arguments are correct.

According to Frege (1964, §32), assertion does not alter the truth conditions of an indicative sentence: it has the effect of designating the truth conditions as those that obtain, or of making a claim that the sentence is true. On a Fregean conception, as here described, force never modifies truth conditions. Assertion must be seen as the act of endorsing the content of an indicative sentence, an act which occurs when an indicative is used in isolation. Yet that act is evidently not one which invariably accompanies the utterance of an indicative sentence. Rising intonation in

It is raining?

generally gives an indicative sentence the force of a question. Stress on 'is' in

Is it raining?

gives an apparent question the force of an assertion. The interrogative form is here used as a truth claim. There is no invariant connection between grammatical mood and force.
However, it would be a mistake to think there is no connection between grammatical mood and force. Unless there were some connection it would be remarkable that speakers can properly interpret written remarks, where intonation and further linguistic and non-linguistic context is not available. I shall argue in II.2 that we can treat grammatical mood as a conventional indicator of force. Here we may rest with the claim that grammatical mood is a *prima facie* indicator of force. In particular, utterance of a sentence in the indicative is, all else being equal, assertoric. Assertions so defined are the linguistic acts in which speakers primarily manifest their grasp of content. It is then hoped that the concept of meaning is determined by the description of the assertoric behaviour of speakers of any language. That behaviour is supposed invariant between particular languages, and provides the basis in an account of understanding.

But to specify assertion in this way is not yet to say how grasp of the content is manifested. Dummett (1973, pp.318-320) makes the point vivid; he remarks that a language in which a truth predicate, a negation operator, and the familiar force operators are identified, could equally be interpreted as a language with a falsity predicate, and force operators for denial and so on. The two are quite equivalent, and a substantive difference in the behaviour of speakers using true, rather than false, sentences is needed to locate the role of truth conditions in a theory of meaning. This is what Dummett aims to supply in his account of assertoric behaviour. Dummett suggests that it is the ability of speakers to justify their use of assertoric sentences which manifests their grasp of content. It is in the context of an account of assertion of this sort that the manifestation argument can be used to reject realism.
2.3 Realism and Manifestation in Fregean Theories

I have characterised realism as allowing the possibility of verification transcendent truths. In Fregean theories which attribute to speakers the ability to recognise the truth conditions of sentences of a particular language, realism consists in the view that sentences may have truth conditions which transcend the abilities of speakers to recognise whether they obtain. A realist of this type allows that a sentence may have a sense determined by its truth conditions, even though its truth value could not, in principle, be determined.

A realist Fregean theory is susceptible to the manifestation argument. Speakers are attributed the ability to recognise the sense of a sentence, even though the ability could not be exhaustively manifest in behaviour when the sentence is one whose truth value could not in principle be determined. For if assertion is the activity in which grasp of sense is manifested, then in asserting a sentence a speaker claims that its truth conditions obtain. Yet, when the sentence is attributed verification transcendent truth conditions, those truth conditions could not be shown to obtain. In that case, there could be no public evaluation of the correctness of an assertion. The Wittgensteinian requirement, that there must be public criteria for the application of the ability to recognise content, would not be fulfilled.

Two assumptions are required to apply the manifestation argument to realist Fregean theories in this way. The first is that a Fregean theory should attribute to speakers the ability to recognise content. The second is that speakers manifest their grasp of content in the activity of justifying their assertoric use of sentences. The rejection of realist Fregean theories on the basis of the
manifestation argument can be avoided by denying either premiss.

One way of avoiding the conclusion is to provide a different solution to Dummett's request for a substantial distinction between the use speakers make of true, as opposed to false, assertions. That distinction could be seen as a distinction arising from a constraint on content-specifications: that content so defined is answerable to the general conceptual location of meaning. The conceptual location is taken to be specified by conditions under which speakers correctly ascribe propositional attitudes to others on the basis of their utterances, and suitably tailor their own utterances to the propositional attitudes they wish to express. Conceptual theories aim to describe conditions of this sort.

3. Conceptual Theories of Meaning

It is natural to think that we have some purchase on the conceptual location of the notion of meaning if we are able to specify when it is that speakers communicate successfully. It is natural too, though less compelling, to concentrate on particular instances of communication. In such an instance, where communication is verbal, a speaker means something by or in his use of an utterance and communicates successfully if his audience is able to infer what he meant by it. If it were possible to specify the communicative intentions of a speaker then an account of successful communication might be derived.

Intentional theories of meaning take these observations as their starting point. On this view, what a speaker (at a time and place) means by his utterance is fundamental and meaning is specified in terms of the communicative intentions the speaker has in such an
instance. Meaning is then ascribed, derivately, to sentence types. As Loar puts it,

Semantics is part of propositional attitude psychology, and stands or falls with it. (1976, p.139)

The semantic knowledge such theories attribute to speakers is thus essentially the ability to recognise the communicative intentions of other speakers, and the ability to express their own.

Evidently communication exploits regularities in what is meant by the utterance of particular sentences on various occasions. Lewis provides a notion of convention intended to explain how speakers come to exploit regularities of meaning. He uses games of coordination, and specifies sentential meanings for a particular language in terms of the general conventions of linguistic behaviour. Although different in orientation from intentional theories, Lewis' account has a similar appeal to propositional attitudes. He says, of a speaker,

We can specify his beliefs, without mentioning the sentences he accepts. (1975, p.27)

Intentional theories appeal to a notion of convention in specifying content.

3.1 Intention

An intentional theory of meaning derives an account of content from an account of what is meant by a speaker on an occasion of use. As Schiffer says

It is essential to the programme of providing an account of utterance types in terms of a basic account of S-meaning that S means by uttering x is not at all determined by what is uttered. (1972, p.64)

We begin with a general account of what a speaker S means something by or in an utterance token x directed at an audience A. He does so iff he uttered x intending
1. that x has a feature F
2. that the audience A thinks that x has F
3. that A infers, at least in part from the fact that x has F, that S's primary intention is:
4. that S's utterance of x produces a certain response r in A.
5. S does not intend that A should be deceived about S's intentions.7

We may then go on to define what S means by utterance x in terms of the type of response evoked in A. So for example we might define

\[ S \textit{s-means} \text{ that } p \text{ by or in an utterance } x \text{ iff } S \text{ uttered } x \text{ intending } 1, 2, 3 \text{ and } 5 \text{ of above, and } \]
\[ 4' \text{ that S's utterance of } x \text{ produce in A a belief that } p. \]

Similarly for commands, we can define

\[ S \textit{s-commands} \text{ that } p \text{ by or in an utterance } x \text{ iff } S \text{ uttered } x \text{ intending } 1, 2, 3 \text{ and } 5 \text{ of above and } \]
\[ 4'' \text{ that S's utterance of } x \text{ produce in A an intention to bring it about that } p. \]

and so on. Perhaps 4' is too strong. One can mean that p without intending that A believe p, in part because one might know that A already believes that p and in part because the propositional attitude of belief is too strong. One can mean what one says in an examination answer without intending the examiners to believe it. 'Actively entailing' in place of 'belief' in 4' meets both objections.

The final clause of the definition is intended to rule out counter-examples involving higher order deceptive intentions. Such counter-examples fulfil clauses 1 to 4, but would not be considered

7. This is a paraphrase of Grice's original formulations in (1957) and (1969) and Schiffer's in (1972). My discussion is directed mainly at Schiffer's formulation although the definition here derives from Grice.

8. Schiffer (1972, ch. III) divides speech acts into two classes. The types are those in which S means that p and S means that A was to \( \psi \). In this case questions fall into the second class. There is nothing in the formulation here presented which is incompatible with Schiffer's claim. Davies (1981) presents an account close to that above, and specifies s-meaning, s-commanding and s-asking.
cases of meaning. Examples rely on situations in which S intends a response of a certain sort, intending also that A should not recognise the former intention, but that A should respond appropriately for other reasons. The difficulty arises not so much because such cases are not plausibly cases where something is meant, but rather because in these cases the definition fails to specify correctly what is meant.

This is an instance of a quite general difficulty with the intentional programme. The intuition which supports intentional theories is that what a speaker means by (or in) his utterance of a token is a matter over which he has final say. But, as the proviso against hidden intentions shows, no account of communicative intentions suffices to determine what is meant, unless it allows that those intentions are ultimately public; such that the speaker and hearer recognise the intentions in question and recognise that they are so recognised.

Schiffer (1972, p.30) suggests that a condition which makes explicit the requirement that speakers' intentions and the audiences' reasons for responding are mutually (and correctly) recognised by speaker and hearer be given in place of the final clause. But it would then not seem plausible to say that it is the communicative intentions of a speaker at a time which determines what is meant by utterances in a language. For among the features of an utterance mutually recognised by speakers of a language is its strict and literal content. If Schiffer's claim that what is meant is not at all determined by what is uttered is to be fulfilled, strict and literal content must be defined in terms of the propositional attitudes which give rise to strict and literal content.
In order to avoid this objection, the strict and literal content of an utterance of a sentence is defined as what is meant when that sentence is uttered with full conventional force. An account of convention is hoped to achieve the reduction to propositional attitude psychology which direct specification of intentions fails to provide.

3.2 Convention

Conventions, according to Lewis, are regularities in behaviour allowing of alternative regularities, knowledge of the consequences of which, common to those party to the convention, sustains their interest in continuing to conform to the convention, and preferring others so to conform. 'p' is common knowledge between A and B if A knows that p, (K_A p), B knows p, (K_B p), K_A K_B p, K_B K_A p and either so on for higher order intentions, or such that A does not disbelieve K_A p and B does not disbelieve K_B p and so on (Lewis, 1975, pp.5-6).

According to Lewis, conventions arise as solutions to certain sorts of coordination problems. In a situation in which it is in the interests of agents to coordinate their actions, but no particular course is more likely than another to meet the preferences of agents in the situation, we have a coordination problem. A convention arises if one choice of a solution to a coordination problem leads to its subsequent choice. In the absence of the chance to communicate about their choice, agents have good reason to continue to choose as before although an equally good alternative is available. Each is most likely to expect the other to expect him so to persist and so on.

A convention may thus arise in a coordination situation even though no explicit agreement is possible. The model describes agents coordinating their actions as a consequence of their knowledge of past
performances, of their preferences and of their expectations as to others' preferences. Convention is thereby reduced to propositional attitudes of a particular sort.

Lewis applies this model to the account of linguistic convention. The difficulty in the linguistic case is to determine what are the actions that linguistic conventions coordinate. Lewis suggests that

\[ \text{a language L is used by a population P if and only if there prevails in P a convention of truthfulness and trust in L, sustained by an interest in communication.} \]

(1975, p.10)

This replaces an earlier definition which spoke only of truthfulness (Lewis, 1969, p.177). On the later conception speakers are taken to coordinate their actions at a time by aiming at speaking truly and listening trustingly. 'Actions' in this case must include such things as a hearer believing what a speaker says. Such coordination is unlike the simple signalling cases Lewis considers, for there is no direct consequence of successful coordination at a time, other than the truth of hearers' beliefs. It seems that we need an account of the consequences of true, as opposed to false, beliefs. I shall consider the difficulties of such an account in the next section.

On Lewis's suggestion, a sentence has a certain meaning in a population P iff it has that meaning in a language used by P, and it is true for P iff it is true in a language used by P (1975, p.10).

This looks circular. A sentence is true for P iff it is true in a language for which there prevails a convention of truthfulness and trust in that language by that population. But a convention of truthfulness is simply a convention to utter only true sentences. For Lewis, this is not a difficulty - the convention of truthfulness is properly formulated as a convention to utter what one believes. Conventions in this sense are to be defined in terms of propositional
attitude psychology.

Commands and acts of other non-assertoric force are dealt with as special cases of conventions of truthfulness. A speaker is truthful with respect of the imperative mood if he tries to act in such a way that an appropriately uttered command is made true in a language used by P (Lewis, 1975, p.14). Lewis (1975, pp.22-23) denies that there could be a convention that a sentence has a certain meaning, for such a convention could not be a solution to a coordination problem. For speakers do not act to bestow meanings nor form beliefs in terms of meanings to be bestowed. But speakers do coordinate their actions by attributing force to utterances. Just as evidence of conventions of truthfulness and trust consists in the consequences in the behaviour of those who adhere to them, so there may be behaviour consequent on conventions pertaining to utterances of a certain force.

If we allow that there might be separate conventions for each force operator, and that the central case of conventional meaning arises in cases of s-meaning, we can take Lewis's account to yield an account of the conventional meaning of expressions, as intentional theories require. Applied to our account of s-meaning (s-commanding, and perhaps s-asking), we might say that in certain circumstance, namely when an utterance is uttered with full conventional force, the content s-meant (s-commanded or s-asked) by an utterance determines the content of that expression. Now, we have observed in 2.2 that grammatical moods, when used with full conventional force, are prima facie indicators of force. From the class of utterance-types of a language, we distinguish subclasses of those utterances in the indicative (or the imperative or the interrogative) mood and provide a correlation between elements of those subclasses, in one of the ways
discussed in 2.2. We may then say that:

An utterance type $u$ in the indicative has conventional content that $p$ iff there is a convention in $P$ to $s$-mean that $p$ by utterances of $u$ (and a correlated utterance type $u'$ in the imperative has conventional content $p$ iff there prevails a convention in $P$ to $s$-command that $p$ by utterances of $u'$ and so on).

An account of $s$-meaning ($s$-commanding... ) yields strict and literal content just in case the feature $F$ in the original definition is that there is a regularity in a population to use utterances of $u$ ($u'$...) to $s$-mean ($s$-command... ) that $p$. On this view, assertoric behaviour consists of those acts of $s$-meaning which are fully conventional. It seems that we have here determined meaning specifications in a theory whose primary aim is to analyse the conceptual notion of meaning.  

A theory like this must accommodate the fact that speakers of finite abilities can understand utterances they have never previously encountered. There are two routes intentional theories might take to explain how speakers understand a potentially infinite number of sentences. First, they might rely on the familiar Tarski type specifications, together with an account of the role of semantic notions in an intentional theory. So, for example, we could adopt Tarski type recursion to define

$$u \text{ is true iff } p$$

for every utterance type of language. We employ a schema for the application of the semantic vocabulary approximately as follows:

there prevails in $P$ a convention to utter $u$ only if by uttering $u$ one $s$-means that $p$, and $u$ is true iff $p$.

The theory would then be able to predict that speakers can understand

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9. Davies (1981, Ch.I) provides a similar account of the role of conventions in the intentional framework, and also mentions modifications, which I shall not here discuss.
previously unencountered utterances.

This will not justify the intentionalist claim that semantics is reducible to propositional attitudes, for it affects no such reduction. This is evident in the final clause of the definition which uses purely semantic notions. Moreover the account yields infinitely many characteristic communicative intentions with respect to what is s-meant, s-commanded and so on. Speakers' abilities to recognise others' (and their own) communicative intentions are not finitely based. An alternative proposal might be:

For any utterance type u of L, there prevails a convention ...

But this does not help, for in that case speakers are attributed knowledge of infinitely many conventions.

Nevertheless, we might hope to provide a finite base for the conventions in question, on the basis of which we could explain speakers' abilities as abilities to infer what complex intentions - or conventions - are expressed by an utterance, on the basis of less complex intentions. So, for example, we might attribute to speakers knowledge that

If it is a convention in P that if S utters A he thereby s-means that p, and it is a convention in P that if S utters B he thereby s-means that q, then it is a convention in P that if S utters A & B he thereby s-means that p and q.10

On the basis of this definition, a speaker of finite abilities may reason to infinitely many conventions of s-meaning.

But there are difficulties in providing such an account for the quantified sentences of a language: for that account requires us to discern predicational structure. We cannot use the fact, if it is one, that there is a convention in P to refer to an object by using a

10. Peacocke (1975) gives this proposal, and raises the problem it was designed to solve.
term, and a convention to refer to a property by using a predicate to describe a finite base for atomic and quantified sentences. For the resulting convention for an atomic sentence: that an object correlated by convention with the term has the property correlated by convention with the predicate, does not mean the same as the corresponding atomic sentence. The difficulty is that the context 'It is a convention in $P$ that ...' is opaque. A similar difficulty would occur for any account with directly defined intentions to refer to objects, and intentions to predicate properties. 11

However, intentionalists need not regard this as a reductio of their theories. For, according to them, the interest of semantic notions resides merely in their ability to explain intentional behaviour. We may admit that no direct definition of reference and satisfaction for atomic sentences can be given in intentional terms, but we may treat theories which do so as theoretical constructs for explaining logical consequence in a theory of meaning defining the conceptual location of meaning.

Platts (1979, p.98) thinks that there is a general objection to intentionalist theories of content which would vitiate the manoeuvres here considered. Since most sentences are never uttered, they are never accompanied by communicative intentions at all. To explain the meaning of potential utterances in terms of the intentions which could

11. Schiffer (1972, p.162) attributes this observation to Loar. Taylor (forthcoming) has exhaustively explored means of deriving a recursive theory in the intentional programme, and concludes that such accounts cannot adequately represent the propositional attitudes speakers manifestly have. If the referential clause is in a transparent context, sentences towards which speakers have different propositional attitudes are allocated the same content, unless there are restrictions on the relation of reference or the proof theory. Such restrictions cannot, he argues, be justified by the propositional attitude speakers have.
or would accompany them, is surely tacitly to appeal to the content of the sentences which would be uttered. This objection is met in part by treating linguistic abilities as defined in terms of the segment of the language actually used by speakers. Loar (1976, pp.158-160) does so. Creativity of language use is explained by appeal to the intentions with which speakers actually do utter sentences, and their potential intentions towards just those sentences sharing subsentential elements with those actually used.

3.3 Realism and Manifestation in Intentional Theories

Theories which analyse the conceptual notion of meaning as consisting in the specification of appropriate communicative intentions attribute to speakers the ability to recognise communicative intentions, and to recognise the complex preferences and expectations which sustain the conventions of language. We can apply the manifestation argument to both types of recognitional ability.

Consider first Lewis' account of convention. Speakers are attributed knowledge of conventions of truthfulness and trust in the language of their population. As Lewis (1969, p.183) admits, such knowledge must be in sensu diviso, not in sensu composito. For speakers do not literally know the machinery which describes a possible language. Rather, they know conventions of language in so far as their expectations and preferences are as the convention predicts. But this concession is not sufficient to meet the manifestation argument. For the explanatory clause in the definition of convention has it that speakers conform to a convention because they know that others conform. Yet conforming consists in possessing certain preferences and expectations. The manifestation argument
suggests that the private expectations and preferences of other speakers provide a reason for a speaker to conform to a convention only if those expectations and preferences are manifest in use. The behaviour of those who adhere to a convention must exhaustively manifest the beliefs we attribute to them. A convention of truthfulness and trust in a particular language, for instance, is justifiably attributed to a population only if their actions show that they try to speak truly and accept others' remarks on trust.

The manifestation argument applies to intentional adaptations of convention in a similar way. Speakers are attributed abilities to recognise the conventional communicative intentions of other speakers. In the central case, of s-meaning, where the intended response is a belief, speakers know that an utterance of type u is conventionally used to produce the belief that p. In knowing the convention, speakers must, it seems, possess the concept of the relevant belief. Hence speakers are attributed the ability to recognise in what possession of a belief consists. Yet, if the criteria of application of the possession of such beliefs is to be suitably public, we should expect that the possession of beliefs can be exhaustively manifest in behaviour.

At least one way of meeting this demand is to require that speakers can be attributed the concept of a particular belief when they are able to tell that a belief is correct, by justifying it. Such an account is, intuitively, anti-realist - for the beliefs so attributed to speakers could never be verification transcendent. An account of beliefs which allows that speakers may have a belief which is correct, but which they could not justify would, on this view, be intuitively realist. For in that case a verification transcendent
belief would be attributable to speakers. Such a realist view would attribute to speakers beliefs which could not be manifest in the behaviour of justifying beliefs, and hence offends the manifestation argument.

The connection here drawn between realism and the manifestation argument will be challenged by those who advocate treating intentions characteristic of utterances of a certain type as a constraint on the attribution of a theory of meaning, formulated in the familiar Tarskian fashion, to a population of language users. Rather than regarding semantics as reducible to the psychological, the constraints so imposed are regarded as conditions for the correct application of a scheme of holistic explanation. Peacocke (1976; 1979), for example, proposes that an interpreted language (one for which a Tarski type theory of truth has been provided) should be constrained by the attribution of propositional attitudes licensed by general principles of the theory. A language is the actual language of a population if utterances of a certain type are taken by that population to be prima facie evidence that the beliefs, desires and intentions of speakers are those which conventions of the use of utterances of that type would predict.

In such theories, the manifestation of linguistic abilities cannot be located either in the activity of assertion, or in the


13. McDowell (1981) suggests that we can allow that assertion is the activity manifesting grasp of content. However he supposes that it suffices for such manifestation that speakers can redescribe others’ utterances as acts of 'saying that p', where the act is spelt out paratactically. Evidently this account is not susceptible to the manifestation argument except at the level of justifying an attribution of truth theory to a population.
activity in which a belief is justified. We might suspect such theories on the grounds that while they attribute to speakers abilities to infer from an utterance to the attitudes of which it is prima facie evidence, yet those abilities are manifested only in speakers' abilities to act rationally on such an inference. Rational action of precisely the same type could be a consequence of a speaker interpreting utterances as prima facie evidence of other propositional attitudes, or of attitudes of another content. But that suspicion serves only to locate the characteristic holism of the explanation of linguistic abilities: a holist claims that alternative explanations of this sort are always available. We should note, however, that it is a feature of theories of this type that speakers cannot be said to recognise the content of utterances or the intentions of others in uttering sentences. To ascribe an utterance a content on a particular occasion of use is to claim that an adequate scheme of holistic explanation for the language of the speaker yields such a content. To ascribe a speaker propositional attitudes of a certain sort, on the basis of his utterance, is justified only by an account which makes such attitudes part of the best description of the speaker's intentional behaviour.

Such theories may be realist: for they may allow that there are verification transcendent truths. But the manifestation argument has no direct application to the holistic conception. Those who prefer to meet the manifestation argument directly will attempt to specify linguistic abilities which are exhaustively manifest in use, independently of a scheme of holistic explanation. This is Dummett's course. I shall turn to a theory of meaning based on his views. Before doing so, I shall discuss very briefly two further conceptions of realism.
4. **Realism and Theories of Meaning**

I have briefly sketched the connection between content specifying and conceptual theories of meaning, and have described the verification transcendent conception of realism appropriate to each. In each case the manifestation argument was employed to throw doubt on a realist conception, although, in each case, ways of avoiding this connection have been noted. I have assumed that the cardinal doctrine of realism is the commitment to the possibility of verification transcendent truths. I shall discuss two other characterisations of realism. The first, which treats realism as a doctrine about the existence of objects, is quite alien to Dummett's account. The second view treats commitment to Bivalence and to the Law of the Excluded Middle as characteristic of realism. This a view which Dummett has frequently defended.

4.1 **Realism about Objects**

Realism about truth is the view that certain sorts of truths exist independently of the abilities of speakers to establish them. This is the view I have characterised as a belief in the possibility of verification transcendent truth. Realism about objects consists in the claim that objects exist independently of the abilities of those who investigate them to attribute such existence. We might expect that realism about objects amounts to realism about the truth of an existence claim and hence reduces to realism about truth. Those who propose to characterise realism as an attitude about objects require some account of speakers' abilities to attribute existence

14. Devitt (1980) argues that realism is a thesis about objects, not about truth. Dummett (1975) argues against such a view.
which does not beg the question in this way.

Evidently, realism about objects and realism about truth are not unrelated. If one subscribes to realism about objects and grants that properties determinately either apply to objects or not, one allows that there may be truths about objects which cannot be established. Indeed, Frege's (1950, p.x) dictum that a word has reference only in the context of a sentence has been taken to imply that realism about truth is essential to a statement of realism about objects. For the ontological status of objects will be a feature of the class of accepted truths which refer to those objects. It then appears that realism about objects is less fundamental than, and properly expressed by, realism about the truth of statements.

However, Frege's principle can be interpreted in a weaker fashion. What his principle might be taken to show is that questions of meaning mediate ontological and logical questions. In this case, it would be possible to envisage reasons for adopting or rejecting verification transcendent truths about objects of a particular type because of particular features of those objects. So, for example, one might regard the lack of causal interaction between the objects of mathematics and those who talk about them as a reason for adopting an anti-realist account. If a metaphysical argument of this type were available it might then be possible to accept realism about objects, and not about truth, or vice versa.

The topic of this essay is realism about truth, conceived in terms of verification transcendence. Ontological questions will be considered only in so far as they bear on this topic. In this context, content-specifying and conceptual theories of meaning rule similarly on the realism about objects: they are realist about
objects just if they allow verification transcendent truths about them.

4.2 Bivalence

One who subscribes to Bivalence for sentences of a particular type allows that every sentence is determinately either true or false. To hold the Law of the Excluded Middle (L.E.M.) is to hold that 'A v ~A' is universally applicable to such sentences. Bivalence and L.E.M. are evidently not equivalent as characterisations of realism, and neither is equivalent to the characterisation I have taken as fundamental — namely, verification transcendence. 15 Dummett takes subscription to Bivalence and to L.E.M. to be the hallmark of realism.

Certainly, subscribing to L.E.M. is tantamount to accepting Bivalence only in the context of an account of meaning in which truth distributes over disjunction, and the negation of 'A' is true just when 'A' is false. For example, one may deny L.E.M. in an account of inference invoking more than two truth values. If the designated value does not commute with negation, such a theory need not accept Bivalence. For, on such a view, there may be sentences which are neither true nor false, but take a third truth value. L.E.M. may be denied, while, since the third truth value is properly regarded as a variety of truth or falsity, Bivalence is accepted. Such a theory may be realist about truth if it allows that truth may outrun the capacity of speakers to establish truths.

It then appears that subscription to Bivalence is a more fundamental characterisation of realism than L.E.M.. But realism characterised by Bivalence is not yet equivalent to verification transcendent realism. Consider, for example, the logical positivists, who accepted Bivalence yet claimed that all verification transcendent truths were meaningless. Bivalence and realism are in this case independent. It is only is when Bivalence is accepted in a theory of meaning and applies to sentences for which there is no method guaranteed in principle to determine their truth value, that Bivalence and verification transcendence coincide.

However even this conclusion has been challenged. McDowell (1976) argues that in a Tarski-style theory of truth, for which the proof theory is intuitionist, Bivalence might be rejected but verification transcendent truths allowed. For the intuitionist rejection of Bivalence is best read as a disinclination to assert verification transcendent truths, not as an inclination to reject them. Conversely, Wright (1981, pp.48-49) argues that accepting Bivalence is not yet tantamount to the claim that there are verification transcendent truths. For it is intuitionistically invalid to argue from the claim that there is no method guaranteed in principle to determine truth value, to the claim that there are verification transcendent truths. Subscribing to Bivalence for such sentences leads to verification transcendent realism only when it is assumed that for every true sentence there is something in virtue of which it is true. If so, there must be truths which are verification transcendent when Bivalence holds for sentences for which we have no means guaranteed to determine whether they are true or false.
Dummett's criterion applies to Fregean theories of content, which attribute to speakers the ability to recognise content. One who allows that truth value may transcend our powers to determine truth value, will allow that the principle of Bivalence is generally applicable, even for those sentences whose truth value we are unable to determine. To reject Bivalence for such sentences is to reject the claim that verification transcendent truths have a recognisable content which is specified in terms of truth conditions.

According to Dummett, it cannot be the transcendent truth conditions of such sentences of which speakers have knowledge. It is, rather, the conditions under which such sentences can be recognised to be justified: the assertibility conditions of sentences. The anti-realist replaces truth conditions that are transcendent, by recognisable assertibility conditions. If truth distributes over the constants, it will then be necessary to revise certain of the inferences classically regarded as acceptable: in particular those based on L.E.M. Rejection of L.E.M., then, is a consequence of a particular positive view of how a theory of meaning should be expressed.

Where the ability to recognise communicative intentions is attributed to speakers, the manifestation argument can be applied, as it was in 3.1 and 3.3. But it is not clear that the manifestation argument rules that Bivalence is the hallmark of realistic intentional theories. For we might expect a realist about intentions to allow that intentions outrun the ability of speakers to recognise that those intentions are fulfilled. But he may deny that content, so defined, need be Bivalent. On the other hand, the anti-realist about intentions may claim that intentions cannot outrun their recognisable
fulfilment, while insisting on Bivalence in an account of content.

Realism and Bivalence in intentional theories can be connected directly via the notion of convention, as they were in 3.3. Intentional theories attribute to speakers knowledge that an utterance of a certain type can be used to produce, in the central case, a particular belief. Hence knowledge of conventions presupposes the concept of belief. Intentional theorists must allow that speakers know in what an arbitrary belief consists.

On this view a realist version of knowledge of an arbitrary belief, 'p', has it that the belief that p is that belief which is correct iff 'p'. The anti-realist account, on the other hand, takes the belief that p to be that belief which is justified iff 'p'. Now on the realist version, speakers must be attributed knowledge that it is a convention that an utterance type, u, can be used to produce a belief which is correct iff 'p'. We can define, for an arbitrary sentence, S,

S is true, if the belief it can be used to produce is correct,

If speakers grasp the conventions they know that

u is true iff p.

On the anti-realist view, speakers are attributed knowledge that an utterance type, u can be used to produce a belief which is justified iff p. We might put the anti-realist version, for intentional theories as for Fregean theories, as defining an assertibility predicate:

S is assertible if the belief it is used to produce is justified

so, u is assertible iff p.
Under translations of this sort, the realist who allows that there may be correct beliefs which could not be justified will accept Bivalence, while acceptance of Bivalence will be tantamount to claiming that beliefs which could not be guaranteed to be justified may yet be correct. To accept the second translation and reject Bivalence suggests an anti-realist conception. Conversely an anti-realist who, on the grounds of the manifestation argument, rejects the possibility of unjustifiable correct beliefs, and accepts the second translation, will not accept that Bivalence has universal application.

Those who endorse holistic theories will challenge this identification. When a theory of force and content is justified only in so far as it makes sense of the behaviour of speakers propositional content may, for reasons of simplicity, be treated as Bivalent while beliefs are regarded as not outrunning the abilities of speakers to justify them holistically. In particular, evidence for the attribution of beliefs will consist only in the behaviour whereby speakers manifest the possession of the beliefs. However, a generalised assumption of Bivalence may be justified by simplicity in the account of content.

The use of adherence to Bivalence as the hallmark of realism is not straightforward. It is justified only in the context of certain further assumptions about the form of a theory of meaning. Moreover, as the application to Fregean and intentional theories should make apparent, the manifestation argument applies to precisely those theories which attribute to speakers the ability to recognise content. When such recognitional abilities are not attributed to speakers neither the manifestation argument, nor the criterion of Bivalence,
have direct application.

I have argued that an adequate theory of meaning must provide both content specifications and a conceptual account of meaning. Application of the manifestation argument suggests that theories which fulfil these aims should not assume a realistic conception of the world; if, that is, they are not holistic. When the manifestation argument is accepted in this context, there is good reason for preferring a theory which does not assume Bivalence. Dummett's theory of meaning should be seen as an attempt to fulfil both purposes, and to meet the manifestation argument directly.

5. Conclusion

I have considered a variety of theories of meaning, classified according to whether they aim primarily to specify content or to give an account of the concept of meaning. I suggested that an adequate theory of meaning should fulfil both aims, and attempted to show how theories of each type might fulfil the aim characteristic of the other. Content-specifying theories can give a conceptual analysis of meaning when supplemented by a theory of force. Conceptual theories can give an adequate account of the content of sentences of a particular language when they are supplemented with an account of the conventions which make the language the actual language of a population.

My major aim in this chapter has been to show how the manifestation argument throws doubt on verification transcendent conceptions of the world. I have argued that grasp of the content of a sentence or of the belief it expresses must be exhaustively manifest in behaviour and that verification transcendent contents and beliefs
cannot be. If the manifestation argument is correct, we are forced to adopt an anti-realist stance.

Holistic theories have been explicitly excluded from this conclusion, but I have postponed discussion of them until Chapter VII. With those theories as exceptions, I have endorsed Dummett's criterion of Bivalence as the hallmark of realism, both for content-specifying and conceptual theories of meaning. I hope to have established that there is a case for preferring a theory of meaning which meets the manifestation argument, and fulfils both of the aims of a theory of meaning.
Introduction

A theory of meaning that meets the two aims of Chapter I should supply both content-specifications for individual sentences and an account of the connection between these specifications and the general notion of meaning which shows how grasp of content is manifest in the behaviour of speakers. In this chapter I propose that linguistic behaviour be described in terms of the behaviour which counts as an appropriate reaction to utterances of various types. I argue that assertion is the central case for a description of linguistic behaviour. Speakers know the conventions of assertion: they know, that is, that reactions of a certain sort are appropriate to an assertion. Assertions can be challenged and defended in certain ways: the situations in which an assertion is justified define its content.

I shall argue that a speaker understands a sentence of a particular language if he knows how to justify its assertion. He understands an atomic sentence if (roughly) he can justify the application of the predicate to the object(s) referred to in the sentence and he understands a complex sentence if he is able to justify it on the basis of abilities to justify its components. Moreover, assertion is a conventional act common to all languages. When knowledge of the meaning of sentences is represented in terms of procedures of this kind, the manifestation challenge is met directly.
Dummett has argued that the conventions of assertion do not allow of an intermediate case in which an assertion is neither correct nor incorrect. I shall question his argument. Finally, I remark on the revisionism apparently consequent on accepting a theory of meaning based on the conditions under which sentences can be correctly asserted.

Although these arguments are developed in the context of criticism of some of Dummett's remarks the account given here is intended to be faithful to Dummett's conception of a theory of meaning.

1. Dummett's Reconciliation

In a theory of meaning such as that presented by Dummett, (1973, ch's 10,13; 1975, pp.74-104), the connection between the two aims of a theory of meaning distinguished in Chapter I is particularly direct. According to Dummett, a theory of meaning consists in a theory of reference, specifying the semantic values of all expressions of the language; a theory of sense, specifying the knowledge speakers have of expressions of the language; and

a supplementary part giving a uniform means of deriving, from that feature of any sentence determined by the central part, every aspect of its use. (1976, p.75)

The "central part" is the theory of sense and reference. The "supplementary part" is a theory of force in Frege's sense. The theory of force legitimates the attribution of semantic knowledge to speakers in so far as it shows how the abilities identified by the theory of sense are manifested in the linguistic behaviour of speakers.
Assertion is the linguistic practice which serves as the behavioural basis of an account of sense. Dummett (1959, pp.142-3; 1973, pp.295-298, p.320) illustrates the problem of the application of speakers' abilities to recognise that sentences are true, by an analogy with a game of chess (I.2.2). Just as there might be languages which differ from each other only in the specification of true as opposed to false sentences, so there are games which differ from chess only in what counts as winning. The rules of chess (or of a language) are not sufficient to characterise the game (the language) since the rules do not explain the interest of players (speakers) in winning (speaking the truth). In order to understand the rules of chess, one must know not only what the winning positions in chess are but also the point of reaching such a position. Similarly, to understand the use of a language one must know why speakers aim at speaking truly. It will not suffice merely to describe the truth conditions of sentences. An account is needed of how speakers use those sentences they regard as true. 1

Dummett turns to behavioural and intentional notions.

The class of true sentences is the class the utterance of a member of which a speaker is aiming at when he employs what is recognisably the assertoric use.

(1973, p.320)

He hopes to derive the semantic notion of truth conditions from its

1. McDowell (1981, §6) suggests that in asking for an account of winning in chess which would make the activity comprehensible to one had no antecedent conception of games, Dummett asks too much. Similarly in asking for an account of 'truth' Dummett fails to see that the class of 'true assertions' admits of no definition suitable for those who have no antecedent grasp of the concepts expressible in the language to be described. If McDowell were correct, there would be no way of locating of the general concept of meaning, other than the (holistic) constraints on a theory of interpretation. I reject that suggestion, but discuss it further in IV.1.3 and VII.3.2.
application. For this purpose the class of assertions must be
specified, to determine the truth-evaluable class and the particular
aims speakers have in their use of utterances of that class. Since
the aims of speakers must themselves be manifested in behaviour, he
defines the latter in terms of the former (1.3.1). Dummett envisages
that an account of assertion will fulfil the requirement of providing
the conceptual location of meaning.

This supplementary part of a theory of meaning, which
connects the central notions, here those of truth and falsity, with the actual use of sentences in speech, will to a large extent be invariant from language to
language, and it is this fact which accounts for the
independence of these notions from particular
languages. (1973, p.460)

Dummett is not alone in the search for a behavioural basis for a
to a large extent be invariant from language to
language, and it is this fact which accounts for the
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Dummett is not alone in the search for a behavioural basis for a
theory of meaning. Quine's behavioural criteria of assent and dissent
for radical translation are introduced for similar reasons, as is
Davidson's use of 'holding-true'. Disagreement arises over the
interpretation and range of acceptable evidence. Quine, for example,
would argue that the evidence available does not suffice to attribute
knowledge of meaning to speakers. We must rest with dispositions to
use. Those Davidsonians who prefer to regard the general notion of
meaning as provided by constraints on the attribution of meaning
specifications would, of course, reject such an approach.

2. Conventions of Behaviour

Dummett says

The correct approach is to consider utterances as
conventionally demarcated into types, by means of the
forms of linguistic expression used, and then to
inquire into the conventions governing the use of
various types of utterance. (1973, p.302)

2. Those, that is, to which I refer in 1.2.3, 1.3.3. and Fn.12,
Ch.I.
Dummett envisages an account of "the actual use of sentences in speech" which treats of such use as conventional. Evidently, the notion of convention here required is not that of 1.3.2, for that conception is not directly manifestable. Appropriate conventions would be those adherence to which is explicitly manifest in behaviour, and which are exhaustively described in terms of behaviour.

But Dummett's approach at first seems misguided, for he appears to have ignored the distinctions between grammatical mood and force, at least if we interpret the "forms of linguistic expressions" as the grammatical moods. For there is no invariant regularity between grammatical mood, and the use to which sentences are put (1.2.2). I suggest that Dummett's approach can be defended. Understanding always involves grasping the conventions regularly associated with utterances in that mood, but understanding an utterance in a particular mood may also involve grasping further conventions. When a speaker utters 'It's raining?' with a rising intonation, understanding his utterance involves understanding both the conventions of assertion and the modification effected by the intonation. Thus it need not be said that a convention of assertion is not in force. This argument is analogous to Dummett's (1973, pp.310-11) claim that an actor's declamations are no less assertive than the everyday uses of tokens of that type. They are governed by further thespian conventions. 3

However not all modifications of the force regularly associated with a mood are as tractable as rising intonation or the conventions of acting. Interpretation of the force of an utterance depends on an apparently limitless number of contextual features. Certain

3. I here disagree with the common view, that an actor is pretending to assert, as least if pretending to assert does not involve asserting, simpliciter.
utterances, such as ironical ones, often appear to depend for their force on an ambiguity as to the contextual features which are counted relevant. But the manifestation argument suggests that either speakers are able to recognise the force of an utterance by some feature manifest in its use or its force remains indeterminate. If the force can be specified, then we can determine how the central conventional force is modified.

The characteristic communicative intentions accompanying speech acts of various forces could not define the conventions in question. The actor and the ironist do not intend their interlocutors to believe, or entertain, the strict and literal content of their utterances. The approach I have attributed to Dummett replaces communicative intentions with an account which takes as central the types of reaction a hearer may legitimately make on the basis of an utterance of a certain mood. An act of one mood may well license behaviour of a particular type, while further features of context show that this sort of behaviour is inappropriate. In attributing knowledge of conventions of the appropriate reaction, we can allow for modifications admitted by further conventions. Adherence to conventions is explained in terms of the behaviour it licenses. Speakers manifest in their behaviour that they recognise the conventions by reacting appropriately.

When conventions are defined this way, it will be an open question as to how many types of linguistic act are counted as conventional. Hints, boasts and ironical utterances may be classed as assertions which require for their interpretation knowledge of certain supplementary conventions. Gricean principles may serve to explain some modifications. Grice's theory is expressed in outline at 1975,
He argues that conversation is a species of a cooperative activity, governed by principles of cooperation. Among such principles are maxims of relevance, informativeness and so on. When maxims of relevance are apparently flouted, it is natural for speakers to seek for an alternative interpretation of what is said. "Conversational implicatures" arise when an argument based on the flouting of a conversational maxim provides an interpretation of what is said. Conversational implicatures of this sort are cancellable. Other, conventional, implicatures are not. In either case, interpretation rests on public features of utterances: the explicit conventions of conversation and their flouting. We can employ Grice's theory to explain why conventions associated with the mood of utterances may be modified. Moreover, we could claim that in certain situations conventions arise from persistent use of conversational implicatures of various sorts, so that what had been a conversational implicature becomes conventional.

There is, for example, a wide class of utterance types in English which are interrogative in form but carry the force of a request or command. Among such 'polite requests' are

Can you pass the salt?
Will you pass the salt?
Could you pass the salt?
Would you pass the salt?
Would you mind passing the salt?
I wonder if you'd mind passing the salt?

and so on. Syntactically, these are certainly questions. The appropriate response is however to pass the salt, as it would be for a request. We need not call such a class requests, save derivatively. We can argue that utterances of this class, when uttered in circumstances in which the answer is commonly known to the speaker and his audience, offend Gricean maxims of relevance and conversational
cooperation. Speakers are enjoined to interpret them as best they can. A convention may then arise to interpret them as requests.

Perhaps the use of these forms is idiomatic. Or perhaps each instance of a polite request is explained by the Gricean maxims on that occasion. On either account understanding of the forms is parasitic on an understanding of the central assertoric convention.

The general strategy is this. When a mood is used with force other than that conventionally associated with it, we explain that use either by displaying the form of argument whereby the speaker and the audience come to interpret the utterance that way, or by appeal to arguments of that sort which are so entrenched in practice that they supply further conventions. Rising sentence intonation is a conventional way of using an indicative to ask a question. Polite requests are less conventional; there are familiar forms of joke which turn on treating such requests as questions. Such jokes play on the strict and literal meaning of sentences, as in

Could you pass the salt?
I could, but ....

Some ironical uses are atrophied. For example

You're a fine friend!

Creative irony and metaphor are not. Speakers interpret ironical uses afresh, on the basis of context, their knowledge, and so on. However the interpretation cannot rely on any ironic or metaphorical communicative intentions of the speaker which could not be recognised

4. Searle discusses such "indirect speech acts" in (1979, ch.2). He argues that whenever an utterance fails to fulfil principles of conversational cooperation, the audience takes the speaker to question the preparatory or sincerity conditions of an act of the type meant. Ability to pass the salt is a preparatory condition for a request. That analysis is good for my purpose only if we adopt Searle's speech act view. It will be apparent in the next section that I reject one feature of this account.
by others. Rather, it depends on publicly recognisable features of context, and publicly acceptable reasoning, which modifies the central conventional act expressed by an utterance. If this were not so, meaning would not be communicable.

There is a problem for an account of this sort. Speakers are attributed an ability to recognise the force of an utterance regularly associated with the grammatical mood although, when a convention to interpret that utterance with another force is present, that ability will not be exercised. How can polite requests, for example, be interpreted on the basis of Gricean implicatures, when, since the convention has become idiomatic, those implicatures are not invoked? Perhaps it might be replied that speakers are not unaware of the strict interpretation of polite requests. (Witness the jokes.) But speakers need not always be aware of the implicatures. Whenever speakers use a grammatical mood to convey a content with force differing from that conventionally associated with it, an explanation of the preferred sort must be available if the manifestation argument is to be met. Therefore, we must put at the centre of an account of force those grammatical moods which are regularly used to express a certain force.

On such a conception, understanding an utterance involves grasping both its content and its force. It is irrelevant to object to this view, as Davidson does, that

Quite often we understand the utterance in all relevant respects, except that we do not know whether it is an assertion. (1979, p.12)

and to cite examples, such as certain sentences in romans-a-clef, which are ambiguous as to force and content. In the first case, we allow that the utterance is an assertion, and understood as such,
despite failure to recognise further conventions. We would not allow that such utterances are fully understood in such a case, unless the force were fully grasped. For the second, we will say that full understanding of *roman à clef*, involves both understanding the strict and literal (assertoric) force of sentences of the novel, and seeing that the conventions are here modified by further conventions.

Refinements to this rough model of linguistic conventions are clearly required. They would be useless if assertion could not fulfil the purpose of being the central behavioural manifestation of semantic knowledge. The question I now wish to ask is whether assertoric force is central.

3. Assertion as the Central Linguistic Act

If assertion is taken as the central manifestation of linguistic knowledge, we derive from it a semantic concept, such as that of truth conditions, to play the role of a content-specifying relation in a theory of meaning. Other types of force are defined in terms of the conventional acts they might be used to achieve, in a regular fashion depending on their contents. Assertion is the linguistic act conventionally associated with the indicative. We hope to achieve simplicity and explanatory power by treating all linguistic acts in terms of the semantic concept defined by assertion. But that simplicity and explanatory power would be met by a theory which discerned identical content in sentences of various force, yet took content to be defined by, say, the fulfilment conditions of commands, rather than the conditions under which an assertion was correct. It would be circular, in the present context, to argue that assertion is the act which manifests grasp of truth conditions, for it is precisely
the grasp of truth conditions we seek now to define.

In his discussion of assertion Dummett (1973, ch.10) recognises that this question might arise. I shall discuss several of his remarks about the class of assertions in which he apparently intends to define the class. We might hope that an adequate definition would answer the request for a justification of why assertions have a particular central role. I think his suggestions are either circular, or unsatisfactory.

Dummett has several remarks which may be taken as a definition of assertion. He suggests that

Assertions are distinguished in being governed by the convention that we should try to utter only those sentences whose descriptive content holds good. (1973, p.356)

Just as Searle's (1979, p.12) recent characterisation of assertives as speech acts whose direction of fit is 'words to the world' is powerless to distinguish assertions without semantic notions, since it presupposes a conception of how words in sentences fit the world, so is Dummett's criterion which requires that "descriptive content" determinately either hold good or not, independently of the assertoric use of the expressions. Surely the phrase "descriptive content holds good" presupposes the semantic notions Dummett hopes to define?

Dummett also remarks that assertion is the least formalised linguistic act. The type of response appropriate to an assertion is not so clearly determined as that for say, commands. He says that assertions have two sorts of consequence:

My adherence to an assertion ... makes a difference to what happens in two ways: by the consequences of its expression ... and by its consequence in my actions, which are consequences in virtue of the interior act of adherence. (1973, p.353)

This criterion does not distinguish assertions. An utterance of
Do not kill!

restrains the speaker's actions as much as those of his audience. Moreover, we can imagine cases in which someone's unuttered command to himself constrains his further actions but has no public expression.

Perhaps the contrast which Dummett has in mind is this. In making an assertion, a speaker enjoins his audience to entertain a belief and also expresses his own beliefs. If the audience knows that the speaker does not believe what he asserted, then they will not be inclined to hold or entertain the belief that is expressed. In commanding, a speaker also enjoins his hearer to act (or entertain acting) in a certain way, and expresses an intention that the audience should so act. But the conventions of command require that an audience fulfil a command even if the speaker is known to lack the relevant intentions. The army officer who is known not to desire that his commands be fulfilled would be in the right to reproach a subordinate who did not attempt to fulfil the command even though both the officer and the subordinate recognise that the officer is insincere.

However, we can imagine a situation in which the fact that an audience knows that a speaker does not believe what he asserts does not dissuade them from believing it. If, for example, an ideologically unsound teacher was forced to expound doctrines which he did not believe but which his students had other reasons to accept, they may believe his assertions. The case seems to be analogous to one in which the officer conveys commands from a higher authority, which his subordinate obeys in order to fulfil that authority's desire.
We might attempt to define an asymmetry between commands and assertions of the following type: the first are characterised by their role in getting people to do things, the second by their role as expressions of mental attitudes and as vehicles for conveying information. But it is not clear that even if there were such an asymmetry it would be of use to those who require a distinction between assertoric force and all other types of force. For, if the asymmetry is such that neither class can be reduced to the other, then we must abandon the attempt to derive an account of content from one type of speech act alone. If a reduction is possible, there is no a priori reason to think that either class is primary.

Perhaps the primacy of assertion is a result of the primacy of one of its characteristic roles. However, the use of assertions to convey information, like their possession of descriptive content, cannot non-circularly define a class of assertions. For if we are to rule out commands as informative, we will require a semantic characterisation of information. Dummett does make one claim in support of the primacy of those speech acts which can be used to express mental attitudes. He suggests that the interior analogue of assertion, judgment, is central to an account of linguistic practice. Judgment involves the weighing of evidence and the accepting of inferences. A language which lacked a speech act primarily used to express mental attitudes would be impoverished. Commands, for example, have no interior analogue which could give rise to the practices of weighing of evidence, or the personal concept of judgment. Getting people to do things is a purely social practice (Dummett 1973, p.363).
This claim is difficult to assess in the context of Dummett's
What makes it possible for me to have such an intention is the existence of a general convention endowing the utterances of certain sentences... with a certain significance. (1973, p.300)

Dummett need not be interpreted here as claiming that we cannot attribute any intentions in advance of a theory of meaning for a language. He may mean that we cannot attribute finely discriminated intentions in advance of such a theory. In either case, if we conceive of mental acts as parasitic on linguistic conventions, this prevents us from using the primacy of the mental acts which an assertion expresses as a reason for taking assertion as the central manifestation of linguistic knowledge. Moreover, unless it is possible to give an account of belief independently of the notion of truth, it seems that judgment amounts merely to attribution of truth and falsity. If the class of assertions is to be used to delimit the class of truth evaluable sentences, then it would be circular to base an account of assertion on the notion of judgment.

Dummett fails to give an account of assertion in terms of the "descriptive content" of the mental acts accompanying assertion which justifies appeal to assertion as the behavioural base for a theory of meaning. This is because in using semantic notions to define assertion his definitions are circular. But he does discuss one suggestion which appears to avoid the circularity. Dummett says:

assertions are those utterances which can be used to deceive i.e. to lie, and which can also occur (perhaps deprived of some sign of assertoric force) as constituents of complex sentences. (1973, p.356)

Deception is either circular (since dependent on a notion of truth) or inadequate (as there are deceptive commands) as a definition of the class of assertions. But the second criterion appears more fruitful. Any adequate theory of meaning must give an account of complex
sentences in terms of its constituents. If the constituents of complex sentences are to be interpreted as assertions, when used in isolation, then assertion has a central role.

This latter claim Geach (1975, p.255) calls the "Frege point": the claim that an indicative can occur now asserted, now unasserted, without a change of meaning. But the Frege point alone is not sufficient to guarantee that it is unasserted assertions, and not merely indicative sentences which are used as antecedents of conditionals. Certainly, there seems little prospect of an explanation of conditionals which appeals to interrogative or imperative antecedents. Hence the indicative appears to play a central role. This claim can only be used in support of the primacy of assertion when placed together with the claim that assertion is the conventional act associated with the indicative.

Dummett (1973, pp.354-359) clearly has qualms about this latter identification. He expresses them by asking whether antecedents of conditionals are always truth evaluable. He suggests that a wider class than assertions - including 'quasi-assertions' - can be used as antecedents of conditionals. The wider class contains all utterances for which speakers may have an interest in eliciting agreement. Within this wider class are ethical statements and perhaps single case probability statements. It might be argued that although ethical statements can be used as antecedents of conditionals they have a sense which is not determined purely by their truth conditions. Dummett (1973, pp.356-7) thinks the feature of quasi-assertions allowing their use as antecedents of conditionals is the fact that people agree and disagree about them, justify their acceptance and act on them. He assumes therefore that people can agree and disagree over
matters for which a question of truth does not arise and likewise justify quasi-assertions on grounds other than truth. This means that the application of the Frege point cannot be used to distinguish assertions suitable for a definition of truth.

It is at this point that Dummett turns to an explicitly circular definition of the class of assertions. He suggests that genuine assertions are those

the criterion for whose justification coincides with that for the truth of the thought which constitutes its sense. (1973, p.359)

Dummett here explicitly defines assertion in terms of the notion of truth. Dummett cites this definition as appropriate for a theory in which "we know the sense of a sentence when we know what it is for it to be true" (1973, p.358), and contrasts such theories with verificationist accounts of sense. But the circularity will reappear in any theory which distinguishes genuine and quasi-assertions. For, if speakers justify and defend their use of quasi-assertions, then a substantial difference between this behaviour, and the behaviour involved in verifying genuine assertions, is required in order to specify the class of assertions. To say the latter class may be evaluated with respect to truth or objective correctness will involve, in this context, a circular appeal to semantic notions.

It is evident why Dummett wishes to distinguish genuine and quasi-assertions. He wishes to distinguish the class of assertions to which assent is, in general, an objective matter and not something for which the subjective opinion of speakers may be used in justification.

5. Peacocke (1976, pp.165-166) remarks the circularity, but does not remark that Dummett was talking of truth conditional theories. Dummett explicitly so refers in (1973, p.358).
But at the level of conventional acts, how should we distinguish that class? Crispin Wright suggests the following:

A declarative sentence expresses a genuine assertion if it is associated with communally acknowledged conditions of acceptability in such a way that a sincere unwillingness to assert to it when such conditions are realised, and the agent is in a position to recognise as much, convicts him either of misapprehension about the nature of the circumstances presented to him or of a misunderstanding of the sentence. (1980a, pp.448-9)

In the present context, the appeal to conditions being realised must also be seen as circular. It is natural then to suspect that the 'objectivity' of the class of genuine assertions must also be seen as a circular characterisation of that class.

One way out of the impasse is to allow that both genuine and quasi-assertions give rise to a notion of truth. Assertions may be counted correct on evidence which is more or less conclusive. Quasi-assertions are assertions for which justification may not be communal. Nevertheless, I suggest, every well formed indicative sentence of a language may be used to express an assertion, and it is the conditions under which the assertion of an indicative sentence is correct which determines its meaning. If it is necessary to explain the correctness conditions of complex sentences of any force in terms of the conditions defined by the component indicative sentences, then the complex sentences invoke conditions under which those indicatives would be correctly asserted.

I need now to define under what conditions an assertion is correct, in such a way that I do not invoke the semantic notions to be defined. Dummett provides the beginnings of such an account when he talks of the activities characteristic of the use of genuine and quasi-assertions — acting on assertions, and justifying them.
4. Conventions of Assertion

Dummett (1973, p.362) classifies theories of meaning according to whether the account is one which correlates assertions with the grounds justifying their use or whether it is one which takes the consequences of assertions as specifying their meaning. The consequences of a linguistic act may be either the appropriate reactions of speakers, or the purely linguistic consequences, measured by the inferential connections of the content of that act. Dummett, I think, equivocates between these two interpretations. In some places the first interpretation seems most natural (1973, pp.354-358, pp.362-363), in others the second (1973, pp.453-457; 1975), while in others he appeals to both interpretations. So he says

Crudely expressed, there are always two aspects of the use of a given form of sentence: the conditions under which an utterance of that sentence is appropriate, which include, in the case of an assertoric sentence, what counts as an acceptable ground for asserting it; and the consequences of an utterance of it, which comprise both what the speaker commits himself to by the utterance of it, and the appropriate response on the part of the hearer, including in the case of assertion, what he is entitled to infer from it if he accepts it. (1973, p.396)

Consequences of the second sort are considered in later chapters. But it is plausible that we can use communicative consequences of the first sort to provide the basis of a theory of meaning which avoids the circularity of definitions cited in the last section.

If assertoric behaviour is to serve as the basis for an account of semantic notions it is necessary to define "what counts as an acceptable ground" independently of semantic notions. If we could specify an acceptable assertion in terms of the behaviour consequent on use of an assertion, then that purpose might be fulfilled. Assertions are subject to challenges of various sorts. A speaker may
defend his assertion, either successfully—in which case he need not withdraw the assertion; or unsuccessfully—in which case he must.

We should expect that whenever a speaker is not forced to withdraw his assertion, his audience will endorse his assertion. (This is certainly so if we set aside problematic cases, such as ethical and other quasi-assertions.) A speaker, in asserting a sentence, makes a claim that he is able to defend his assertion, against challenges of an appropriate sort.

An obvious difficulty with this idea is that I have specified that challenges to assertions must be on appropriate grounds. There is again a danger of circularity, for the appropriate grounds appear to be just the truth relevant grounds. An assertion may be challenged on the grounds that it is tactless, or obvious, and withdrawn on those grounds. Yet it may still be true. Dummett (1973, p.449; 1976, pp.84-85; 1979, p.127) suggests that we distinguish appropriate challenges as those in which the objection is entirely met when the speaker withdraws his assertion. A tactless assertion is still objectionable, even though it has been withdrawn. On this view, speakers primarily manifest their grasp of the content of sentences of a language in the act of withdrawing their assertions. In this sense, there is a certain primacy to the behaviour consequent on incorrect assertion.

We now have to hand what Dummett requires of an account of assertion. Dummett wishes to define the class of true sentences as the class at which speakers aim in using assertions. We define the class of assertions as indicative sentences used in isolation, and the conditions under which an assertion is correct in terms of the conditions under which it can be defended against challenges. Correct
assertions are those for which all appropriate challenges can be met. Speakers who employ the indicative in isolation aim at correctness. The class of true sentences is then equivalent to those of correct assertions.

On this view, truth arises from activities of dispute of various kinds. But the interest of speakers in asserting correctly cannot be seen as simply an interest in winning disputes. For if one is able to justify assertions in an appropriate way then acting on those assertions will be successful. Consider a society in which speakers assert, unchallenged, 'She is a witch.', and others endorse this assertion. Should we not, by the definition above, call this assertion correct? In order to allow that it is not correct, we need to claim that 'She is a witch.' could not be appropriately justified. It is then necessary to stipulate how assertions are to be justified. Dummett's theory of assertibility conditions provides such a stipulation.

He gives an account of assertion in terms of the knowledge which would suffice for justifying an assertion. He talks in terms of the abilities of speakers to recognise states of affairs. We can interpret this in terms of recognitional abilities which would guarantee the possession of a defence against challenges. According to Dummett, a speaker understands a sentence if he is able

(i) to recognise those states of affairs justifying his assertion: i.e. those states of affairs in which he would never be forced to withdraw his assertion,

or

(ii) to recognise those states of affairs in which he would have to withdraw his assertion. (1976 pp.115-126)

(The two are not equivalent, in non-Bivalent logics.)

Dummett argues in favour of the second course from the primacy of incorrect assertion. He thinks it yields a falsification theory of
meaning distinct from an assertibility theory. I discuss a falsification theory of meaning in V.3.

Dummett attributes to speakers the ability to recognise states of affairs. The account meets the manifestation challenge directly just in case every state of affairs justifying an assertion (or forcing its withdrawal) is recognisable. This is not to say that sentences cannot be understood if they are not justified (or falsified), or indeed, if there is no way guaranteed decisively to justify (falsify) them in a finite time. It is to say that whenever a sentence is justified (falsified) it must be possible to show that it is.

The account is intended to define a notion of objective correctness. A speaker may be justified in his use, although others are aware of further evidence which would force the withdrawal of the assertion. That assertion is counted incorrect. For a speaker, in asserting a sentence, claims to be able to justify it to others. As Dummett says

Any workable account of assertion must recognise that an assertion is judged by objective standards of correctness, and that, in making an assertion, a speaker lays claim, rightly or wrongly, to have satisfied those standards. (1976, p.83)

The notion of objective correctness may need modification for quasi-assertions; but again even quasi-assertions require defence.

Putnam has remarked on the social character of language use, calling it "the division of linguistic labour" (1975, p.227). His point may be translated into the claim that speakers can understand and justifiably assert sentences, even though they may not be aware of their justification. Speakers often rely on the abilities of experts to defend the assertion. This does not vitiate the claim that the assertion is, in general, a claim to objective correctness; or the
claim that speakers, in asserting, make a pledge that they can justify their assertions.

To attribute to speakers abilities to justify their assertions as their central linguistic abilities is not to say that these abilities exhaust the use of assertions. It is rather to claim that these abilities identify the central feature of the use of assertions in which speakers manifest their grasp of content. They define a central notion for content-specifications. From content determined in this fashion we hope to account for the variety of uses of assertions, and of other types of utterances of a language, in a uniform fashion. Davidson calls "the autonomy of linguistic meaning" (1975, p.17) the fact that sentences having a particular strict and literal content and grammatical mood can be put to various linguistic and extralinguistic purposes. We do not need to deny that linguistic meaning is autonomous, in claiming that some feature of practice determines content.

In this section I have tried to show how assertoric behaviour can provide the behavioural basis for the notion of truth. An argument of this sort is, I think, implicit in Dummett's discussion of theories of meaning. The role of assertibility conditions in a theory of meaning is to serve as the manifestation of grasp of content. Assertibility conditions have this role because the assertoric behaviour of speakers is central to an account of content.

4.1. From Correct Assertion to Truth Conditions

A theory which defines the class of true sentences in terms of the conditions under which assertions are correct is obliged to provide an account of the correctness conditions of complex
assertions, and an account of the contribution of subsentential expressions to determining the conditions under which assertions in which they occur are correct. This was the project Dummett announced in his early article, "Truth".

We no longer explain the sense of a statement by stipulating its truth value in terms of the truth value of its constituents, but by stipulating when it may be asserted in terms of the conditions under which its constituents may be asserted. (1959, p.161)

Since the conditions of correct assertion have been taken to define the notion of truth, this is a misleading way to express the project. The sense of a statement is explained by stipulating its semantic value in terms of the semantic values of its constituents, just as it is in classical Fregean theories. The designated semantic value is determined by the conditions of correct assertion, but is intended to yield truth values. The question is whether Bivalence holds of every assertion under that definition of a truth value.

Dummett thinks that Intuitionism in mathematics provides a model of a theory of meaning meeting the manifestation challenge. The provability of a mathematical statement defines the conditions under which it may be correctly asserted. A mathematical statement is provable if there is an effective means of proving it. The conditions under which a logically complex statement is provable depend on the conditions under which its components are provable. To ensure that this is so, the Intuitionist account of the role of logical constants differs from the classical one. Classically acceptable inferences are not counted generally valid by the intuitionist. Among others, L.E.M., Double negation elimination and certain quantificational laws are rejected.

6. Dummett (1978, p.xxii) also has qualms about his earlier remarks. But this is because he wishes to admit a distinction between assertibility and truth.
The analogue for natural language would be to define conditions for correct assertion in terms of recognisable conditions sufficing for speakers to justify their assertions conclusively (to verify them), or conditions under which speakers could show their assertions not falsified. Dummett talks of those recognisable states of affairs sufficient for speakers to verify their assertions, or show them not falsified. On his view the sense of a singular term consists in an effective means of determining its referent, while that of a predicate consists in a means of establishing that it holds of an object, or of determining that it does not hold. He explains the conditions under which complex assertions are correct in terms of their components in the intuitionist pattern, when the central notion is verification; and in a distinct non-classical way, when the central notion is falsification.

The conception of truth determined by assertibility conditions will be one for which every instance of the equivalence thesis holds. However as Dummett (1959; 1973, ch.3) has often argued we can no longer expect the equivalence thesis to define the relevant notion of truth. This does not mean that one who defines truth in terms of assertibility conditions has to deny that an adequate theory of meaning should yield every instance of the Tarski type equivalences. For to insist on the use of assertibility conditions is not to deny that truth has a central role in a theory of meaning, but rather to specify truth directly in terms of the behaviour of speakers which gives rise to it. This behaviour is identified as the conventional act of assertion. Truth conditions defined by conditions of assertibility are opposed to classical truth conditions in a theory of meaning not so much in their treatment of recursiveness (since assertibility conditional theories, as we shall see in III.5, can
avail themselves of a Tarskian account of recursion); but in their treatment of the relationship between the grasp of meaning and its manifestation by speakers in their use of sentences of a language.

One way of describing this dispute might be to put the issue between classical truth conditional and assertibility conditional theories of meaning as a dispute about the account of '¢' in the schema derived from a theory of meaning:

S is ¢ iff p

where 'S' is translated by 'p' and '¢' has the general features of the truth predicate. Both assertibility and classical truth theorists may allow that the requisite '¢' is an empirical notion: one which is determined by the behaviour of speakers with regard to the sentences of their language. And according to both theories, that notion will be recursively specified, so that every sentence of the language will be accorded a content uniformly specified by the right hand side.

According to the assertibility theorist, however, those general constraints on '¢' offered in a Davidsonian theory do not exhaust what is required of a truth predicate. For every sentence of a language, grasp of the relevant meaning specification must be manifestable in the behaviour of speakers. Accordingly we cannot assume that the logic for a theory of '¢' specification is classical.

Dummett does not view the matter this way. He suggests that it is far from being a trivial matter how the notion of truth within a theory of meaning in terms of verification is to be explained (1976, p.116), and he urges that there may be a notion of truth distinct from assertibility, even within a theory of meaning in terms of assertibility conditions (1978, p.xxii). The distinct notion of truth need not be realistic, Dummett thinks, but is required to explain the
assertibility conditions of complex sentences of natural language. The topic of the final section of this chapter will be whether we can, in the context of the manifestation argument, allow for a distinct notion of truth. First, I shall consider a very general argument about assertoric conventions suggested by Dummett.

5. **Bifurcation**

Dummett says

In order to grasp the content of an assertion, we have to know in what circumstances the assertion is to be judged correct and in what incorrect. If the assertoric sentence is neither ambiguous nor vague, then these sets must be disjoint and exhaustive. They must be exhaustive, at least, in the sense that there are no circumstances the recognition of which would entitle us to say that no further information would determine the assertion as correct or incorrect: if there were, the assertoric sentence would have only an indefinite i.e. partially specified sense... In making an assertion, a speaker wishes to be understood as excluding certain possible states of affairs and allowing for the possibility of others: and, if his assertion had a determinate content, it must stand determinately in one or other relation to each possible state of affairs. (1973, pp.417-418)

I shall call the argument the 'bifurcation' argument: the claim that assertions divide the world into just those states of affairs in which the assertion is correct, and those in which it is incorrect. In this passage Dummett argues that if sense is to be determinate, then assertions cannot be neither correct nor incorrect. (We should note that this argument is not yet a defence of Bivalence, since the logical principles required to move from the claim that an assertion cannot be neither correct nor incorrect to the claim that every assertion is either correct or incorrect are intuitionistically

7. Dummett introduced the argument in (1959, pp.149-152), and it can be found in (1973, pp.301-302, pp.320-323, pp.412-422; 1976, pp.117-123; 1978, pp.xiv-xix). 'Bifurcation' is a barbarism I have adopted for simplicity.
invalid.) When sense or content is determined by the activities of assertion, Dummett needs to establish that the conventions of assertion could not allow of an intermediate outcome. This is, indeed, Dummett's strategy. He argues that the conventions of assertion make it impossible that an assertion is neither correct nor incorrect.

Dummett is concerned to reject cases in which assertions such as those containing non-referring singular terms are taken to be neither correct nor incorrect, even when all the evidence is in. Such assertions are, according to Dummett, simply incorrect. We may wish to distinguish two ways an assertion is incorrect, so that in one case the negation of the original assertion is true, in the other it is not. The distinction drawn on this basis arises only in the context of a semantic theory. At the level of the primitive act of assertion there is no such distinction. For example, if we wish to stipulate that the negation of a sentence is true just when its assertion is incorrect, for the purpose of a smooth semantic theory, then we will not want to call assertions containing non-referring singular terms incorrect. We might label such assertions as 'meaningless'; perhaps because they fail to fulfill presuppositions of correct assertion. Dummett argues that such distinctions, imported to provide a smooth description of practice, are not and cannot be essential to the description of assertoric practice. Presupposition could not be essential to the description of language, since presupposition must itself be explained in terms of the notions of truth and falsity a description of assertoric practice was intended to establish.

Can an appeal to the primitive act of assertion be justified in this context? It has been argued that the central role of assertion in an account of linguistic behaviour is derived from the necessity of discerning a class of assertions for the descriptions of complex sentences. If the account of conditions of correctness of complex sentences depends on counting some assertions as neither correct nor incorrect, why should that feature not be reflected in the conventions governing assertion?

One way of defending the bifurcation argument is not open to Dummett. McDowell (1976) argues that apparent assertions containing non-referring singular terms are not genuinely assertions at all. Genuine assertions cannot be neither correct nor incorrect; but it is possible to preserve a smooth account of the sentential operators by ruling that in certain cases apparent assertions have no strict and literal content. The conception of a theory of meaning to which McDowell appeals is holistic. He thinks that assertion is not a "casually observable phenomenon" (1976, p.52); it is an act the attribution of which is mediated by theoretical questions. So he says:

 Alleged general truths about assertion, announced in advance of systematic theories for particular languages, cannot survive if not preserved, for some language, by a systematic theory adequate on all other counts. (1976, p.53)

As McDowell (1981, §3) suggests, his view is one in which there is no requirement that knowledge of content be manifested in behaviour, other than in the ability to redescribe others' utterances as instances of 'saying that...'. Evidently this is alien to Dummett's account of assertion, which is designed to provide a behavioural account of assertion. There is no evidence in the
behaviour of speakers which could justify our attributing to sentences containing non-referring proper names no content at all, since speakers may as well assert and defend (unsuccessfully) assertions of such sentences, as they do genuine assertions.

However, speakers are willing to assert the negations of sentences containing referring singular terms, while the negations of sentences in which singular terms do not refer are not assertible. It appears that we could define a linguistic act, denial, which was appropriate in just those conditions in which the negation of a sentence was assertible. If we allowed that denial was a linguistic act on the level of the activity of assertion, which served to define content together with assertion, then we could admit that the subsequent behaviour of speakers in denying or withholding verdicts on the negation of an asserted sentence is an act manifesting grasp of content.

Frege in "Negation" (1952, pp.117-135) argues against treating denial - "negative assertion" - as a separate linguistic act. If denial is an act defining grasp of the negated sentence, then we should need to specify the role of negated sentences in complex sentences independently of the definition in terms of denial. For there is no act of denial associated with negated sentences in conditionals; negation in these cases must be treated as a functional expression - a sentential operator - contributing to the sense of the clause in which it occurs. To allow a separate act of denial would lead to a multiplicity of rules of inference, and an unnecessary duplication in analysis.
A further argument against the proposal of an independent specification of assertion and denial might be urged. If linguistic knowledge is to be given a uniform explanation, then that explanation should be in terms of one feature of use. If, for example, both practices of assertion and denial serve to constitute the central notion of a theory of meaning, the explanation of speakers' ability to understand previously unencountered utterances would not be uniform. We would then be unable to predict on what basis previously unencountered utterances are interpreted by speakers.

It is not clear that these arguments are decisive against the use of assertion and denial conditions to define an acceptable account of the content of a linguistic act, nor that a definition of this type might not still allow that assertions 'bifurcate' states of affairs. For we might define logically complex sentences in terms of the conditions of both sorts. Loss of simplicity in that definition might be offset by descriptive adequacy.

To treat sentences containing non-referring singular terms in this fashion is not illuminating. For it has little advantage over an account which distinguishes between ways in which assertions can be false. In particular it does not provide an account of the content of such sentences which help to explain their use as assertions. But the prima facie availability of this option suggests that Dummett's bifurcation argument is incomplete.

He does, however, defend the argument directly in terms of the conventions of assertion. He contrasts the conventions of assertion with those of betting.

If the race is run, the black horse will win.

9. H. Price (1981) gives an account of this sort. I also prefer an account along these lines (V.5).
may be interpreted as a conditional bet or a bet on a conditional. When the antecedent is not fulfilled, these two have distinct consequences. On a conditional bet, the bet is abandoned where the race is not run. If the bet is a bet on a conditional, the bet is won when the race is not run. The distinction between bets of the two types arises because ordinary bets have two distinctly specifiable consequences; a win or a loss. Conditions under which a bet is not won are not equivalent to those conditions under which it is lost. For the bet may be abandoned. There is room for a third outcome for bets: they may be won, lost, or abandoned.

Dummett (1959, p.151) suggests we could imagine a society who had such a distinction for commands. A reward would be owing on

If the race is run, bet on the black horse!

when the race is not run. Were the command a command on a conditional, but not if it were a conditional command. But, in fact, our practice draws no such distinction. An ordinary command is characterised by conditions of only one sort: those under which it is complied with are just those under which it is not disobeyed. There is no room for a third verdict.

According to Dummett, assertions are like commands and not like bets. They cannot be neither correct nor incorrect. He claims that the conventions of assertion allow for no intermediate verdict. But this claim needs justification. For, as Dummett (1973, p.302) admits, assertions do not have specific consequences in the way that bets and commands do. As noted in 3, Dummett takes the consequences of assertion to consist in both the consequences of its expression and consequences following from the interior act of acceptance (1973, p.353). But consequences of these sorts do not rule out the
possibility of consequences of an assertion being neither correct nor incorrect.

Dummett evidently requires a general notion of the point of an assertion. An assertion, I suggest, contributes to the success of behaviour. If we interpret Dummett as implicitly invoking some such account of the role of assertions, we can explain his question whether there is a place for a convention that determines, just by the meaning of an assertoric utterance of a certain form, that when all the relevant information is known, the speaker must be said to have been neither right nor wrong (1978, p.xviii), and his response that there is not. If Dummett intended to argue that speakers do not use a convention of assertion in which assertions are neither correct nor incorrect, his conclusion would be questionable. Speakers' behaviour is, in fact, ambiguous at this point, as Dummett (1974a, p.487) admits. Surely we could justify conventions which allowed the intermediate case, on the basis of simplicity? If, however, we interpret the argument as a claim that assertions have a role in linguistic behaviour only in so far as they contribute to success, then we may say that correct assertions lead to success, while incorrect assertions lead to failure. There appears to be no intermediate case. If an assertion is not correct, it will lead to failure. Dummett's use of the contrast between 'right' or 'wrong' suggests that he may have had an argument of this type in mind.

The appeal to success is not, I think, decisive. If there are assertions evidence for which is essentially inconclusive, then there is a question whether such assertions are to be regarded as determinately successful, or not. It would be possible to regard speakers as evaluating their assertions as approximately correct, and more or less likely to lead to success. In such cases, we might
suggest, there would be room for an intermediate verdict, in which an assertion is neither correct nor incorrect. Were it found on empirical grounds that speakers acted on assertions as they would if their assertibility conditions were neither conclusively correct nor incorrect, it would appear that speakers can manifest a grasp of assertions which are neither correct nor incorrect.

The quotation at the beginning of this section suggests what Dummett's attitude to assertions of this type might be. The bifurcation argument is conditional on the premiss that sense is determinate, and explicitly excludes vague and ambiguous assertions. If the argument of 3 and 4 is correct, Dummett has no right to this premiss. For assertion is the conventional act correlated with the indicative, and sense is determined by that act. Sense is determinate if the conventions of assertion yield determinate content; if not, it is not. It is evident, moreover, that many apparent assertions of natural language cannot be conclusively determined as true, or as false. If Dummett hopes to define truth in terms of the assertoric behaviour of speakers, he should accommodate such assertions, and not put them to the side.

I shall argue that speakers manifest a grasp of degrees of correctness in using vague assertions (IV.5). In such cases, Bivalence fails at the level of atomic assertions, and the bifurcation argument would be mistaken. One way to account for those assertions of natural language evidence for which is inconclusive would be to adapt them to the model of vague assertions, and give a probabilistic semantics for them. I do not think that we can do so within the constraints of the manifestation argument (V.4.2), and shall advocate an account of the meaning of such assertions in terms of conditions of
verification and falsification (V.5). I shall suggest that assertions explained in this way are never neither correct nor incorrect, so that bifurcation is obeyed.

One consequence of care with the bifurcation argument should be obvious. Dummett does not use bifurcation in defence of Bivalence; but the argument is employed to throw doubt on the interpretation of rejection of Bivalence which allows that assertions may be neither correct nor incorrect. If my scruples are justified, then we might expect that more cases than Dummett contemplates involve failure of Bivalence. In particular there may be atomic assertions which are not Bivalent. This is a case which the bifurcation argument rules out: for once we accept bifurcation, only the presence of compounding devices can give rise to the failure of Bivalence. It is this claim of Dummett's which I deny. In the next section, I shall urge that a theory of meaning meeting the manifestation argument might have other revisionary consequences which Dummett does not recognise.

6. The Origin of the Realistic Notion of Truth

Theories of meaning in terms of assertibility conditions are intended to be explanatory of practice. Linguistic knowledge is relativised to the epistemic reach of speakers in order to meet the manifestation argument, and thereby to allow such an explanation. The insistence on the notion of objective correctness is in harmony with the manifestation argument; for it is supposed that the measure of epistemic reach must be public, not private. But the assertibility theorist insists that a theory of meaning could be revisionary of practice. If we are to explain speakers' practices, speakers must be taken to be able to recognise the standards of objective correctness.
Yet much of commonly accepted practice appears to be governed by transcendent notions of truth.

According to one who advocates assertibility conditions in a theory of meaning, such practices are therefore misconceived. On this view speakers unreflectively and illegitimately use sentences the assertibility conditions of which they could not recognise. There is, clearly, a certain perversity in this attitude. To suggest that there are practices which are incoherent, while identifying content as deriving from a feature of practice, is at least contrary. But one who supports the manifestation argument, and the conclusion that assertion is the central feature of use which determines content, is committed to just this claim. Such a person will suggest that it is possible to explain why realistic practices arise. However they will be not be regarded as justifiable.

I want to conclude this chapter by introducing some examples which will recur later in the thesis. These examples may be seen in two ways: either as a reductio of the assertibility theory of meaning, or as a convincing illustration of why speakers adopt realistic practices. They indicate at the very least, the extent of the revisionism to which the assertibility theorist seems committed.

According to Dummett, speakers assume a realistic notion of truth, having been misled by features of the language - in particular by certain modes of composition available in our language. He says

The genesis of a realistic notion of truth, namely of truth as distinguished from assertibility ... is the use of certain sentential operators, and particularly, the conditional. (1973, p.468)

He illustrates the claim with an example of the following kind. 10

1. I will go to Pakistan.
and

2. I intend to go to Pakistan.

have, when I am sincere, identical assertibility conditions. Yet

3. If I go to Pakistan, I will live in Hill Road.

and

4. If I intend to go to Pakistan, I will live in Hill Road.

evidently differ in their assertibility conditions. Dummett suggests that the assertibility conditions of 3. and 4. cannot be taken to be a function of the assertibility conditions of 1. and 2. In each case, the conditional appears to be a function of the truth conditions of the antecedents: for 3. invites us to think of the future truth of 1., as opposed to the present grounds.

If we allow that speakers have a clear conception of assertibility conditions for 3. and 4., and that they can presently distinguish those conditions, while not being in a position to distinguish 1. and 2., then this argument of Dummett's should surely be seen as a justification of a realist notion of truth in a theory of meaning. For a theory of meaning should allow that there is a route from the assertibility conditions of sentences to those of the complex sentences in which they occur. Preferably that route will consist in a function for each sentence forming sentential operator, a function which yields in a uniform fashion assertibility conditions of sentences formed with that operator. In general we should hope that the function should be well-behaved, so that if two sentences have the same assertibility conditions, then any function differing only in the replacement of one component sentence by another with the same

10. Dummett (1973, pp.448-450; 1976, §II). Similar, and equally metaphysically loaded, considerations arise in discussions of counterfactuals, among which (at least on one view of the future) 3. might be taken to fall.
assertibility conditions should also have the same assertibility conditions.

If, in identifying the sentential and quantificational operators of a language, we must appeal to realist truth conditions rather than assertibility conditions of component sentences—as appears to be the case with the conditionals 3. and 4.—then speakers of that language manifest a grasp of realist truth conditions in their grasp of the assertibility conditions of complex sentences. There seems no reason why the manifestation argument could not require of a theory of meaning that it discern realist truth conditions in this case.

Now we cannot meet the argument, for the particular case in question, merely by denying that 'If ... then' has a uniform explanation in 3. and 4., for if the language is to be learnable, we should have to motivate a distinction between 3. and 4. on the basis of some generalisation independent of the distinction. Without some such distinction moreover, modus ponens will lead to invalid arguments. For the invalid

If I go to Pakistan, I will live in Hill Road.

I intend to go to Pakistan.

Therefore, I will live in Hill Road.

would be counted valid if there were no such distinction. For where 1. and 2. do not differ in assertibility conditions, the second premiss is certainly true, if 'I will go to Pakistan.' is. We here appear to have an absurdity in an assertibility condition theory of meaning.

It then appears that Dummett's identification of the origin of the realistic notion of truth proves that it can be manifested in behaviour. But we should be careful of interpreting the argument this
way. For we assumed that there is a distinction in the assertibility conditions of 3. and 4. which could be manifest in behaviour, while there was no such distinction for 1. and 2. Alternatively, we might argue that 3. and 4. could not have manifestly distinct assertibility conditions, and hence that our practice of distinguishing them needs to be revised. For there appear to be no situations in which the speaker could show (at the time of assertion) that 3. could be true, and 4. not (or vice versa).

In fact, I think that the example, which depends on there being no distinction between 1. and 2. in primitive assertibility conditions, is not convincing. For it seems clear that there is an independently motivated distinction between the assertibility conditions of 1. and 2.. I may sincerely, on the basis of prophecy, or an extradition order, assert that I will go to Pakistan, while an assertion that I intend to do so would be unjustified. I may, that is, have reasons independent of my intentions for thinking that I will go to Pakistan.

Brandom (1976, p.141) has shown that the case can be reinstated with pairs of the following type.

5. I will go to Pakistan.
6. I foresee that I will go to Pakistan.

by suitably defining 'foresee' such that, however assertibility conditions are defined, 5. and 6. do not differ. There is some plausibility in the claim that we can distinguish the primitive assertibility conditions of 5. and 6.. Two reasons for claiming that there is a distinction would be that 6. assumes the speaker has the concept of 'foreseeing' which 5. does not and that the type of evidence appropriate for the assertibility of 5. differs from that
for 6.. Both suggestions are met by Brandom in his stipulation that 5. and 6. are assertible in precisely similar circumstances. In a theory of meaning which meets the manifestation argument, we cannot appeal to any further distinction in assertibility conditions.

Relative to the pair, there is, Brandom suggests, a class of truth inducing sentential contexts ("TISCs") for which assertibility conditions are properly seen as functions of the truth, not the assertibility conditions, of the components. Here, Brandom suggests, we can see the justification of a notion of truth as opposed to assertibility, in the practices speakers do use. Among TISCs are

If ... then ...
It will be the case that ...
I believe that ...
I think that ...
It is possible that ...

We should note that, by Brandom's criterion 5. and 6. are already TISCs, produced by future tensed and intentional operators. This suggests why we are in general reluctant to grant that 5. and 6. have identical assertibility conditions. The reluctance is reflected in the patent distinction in the assertibility conditions of

7. You will go to Pakistan.
8. You foresee that you will go to Pakistan.

and

9. It was the case that I would go to Pakistan.
10. It was the case that I foresaw that I would go to Pakistan.

For, if the predicates '...will go to Pakistan' and '...intend to go to Pakistan' have identical contributions to the assertibility
conditions of 5. and 6., they should be intersubstitutable in 7. and 8., and in 9. and 10. There is an inclination to say that, while 5. and 6. may be identical in their assertibility conditions for a speaker at a time, their conditions of objective correctness differ. We have evidence for this in the distinction between 7. and 8. and 9. and 10. If this were so, we need not suppose that TISCs are contexts which induce a realist truth predicate; they induce, rather, conditions of objective correctness.

This is how Brandon views the matter. He says that TISCs systematically discriminate between the content of an utterance (how it says things are) and any state of an utterer (what he is entitled to say, what he believes or desires). (1976, p.146)

He supposes that various notions of truth, realistic and not, might be induced by TISCs. Dummett frequently makes similar remarks about the distinction between a personal warrant for an assertion, and its objective correctness (1973, pp.449-450; 1976, p.116). Objective correctness, he appears to suggest, arises from the presence of sentential operators.

There are at least three reasons why, I think, we should be reluctant to accept this view of the matter. First, I suggested in 3 that it is precisely the role of assertibility conditions of component sentences in accounting for the assertibility conditions of complex sentences which justifies appeal to a truth-evaluable central notion in a theory of meaning. If the assertion conditions of complex sentences were not well-behaved functions of those of their components, as they are antecedently specified in an account of their meaning, then that argument would fail.
Secondly, as I have presented the conventions of assertion, the distinction between a personal warrant and the objective correctness already arises in the activities of dispute whereby meaning is specified. Hence the notion of a personal warrant appears to depend on that of objective correctness, rather than vice versa. It might be argued that the activities of dispute which I have supposed to give rise to meaning are already complex activities, and hence susceptible to Dummett's argument that they cannot be basic in specifying linguistic behaviour (Dummett, 1973, pp. 450-451). Now, although I think that this is the proper way to defend bifurcation, I do not think it should lead to the view that a personal warrant is the basic notion of assertibility. As the manifestation argument implies, a theory of meaning is an attempt to account for communicative practices, not for whatever private meanings we associate with our utterances.

Thirdly, if we accept that objective correctness is distinct from assertibility, we must admit that assertibility does not distribute over the logical constants. This is again a view which Dummett sometimes endorses (1976, p. 114). So to regard these sentences would be alien to the conception of a theory of meaning that meets the manifestation argument. For that argument requires that we should be able to show how a conception of conditions of objective correctness may be manifested. Each TISC, among which we should, by the evidence of 7. and 10., count 'You ...' and the past tense, must be so characterised that the theorist can show how the assertibility conditions of complex sentences containing the operators may be manifested. We cannot argue, as Dummett appears to, that there is a clear sense to the predicate '...will go to Pakistan' when used in the antecedent of a conditional, or in 7. and 9., without giving a
characterisation of the sense of those sentences. If the procedures for defending complex sentences are not well-behaved functions of those for their components, how do we manifest a grasp of the complex sentences? If we assume that we can characterise procedures for the complex sentences which are not well-behaved functions of those of their components, there seems no reason to suppose that it is the same predicate in the complex sentences and in, say, 5. and 6. We could then not argue that TISCs induce a notion of objective correctness of the sentence 'I will go to Pakistan.', for the assertion in isolation and when occurring in a compound would not be the same. If, on the other hand, we argue that the sentence must have the same meaning when used in isolation and in compounds - as would seem necessary if the language is to be learnable - then the complex sentences should have assertion conditions which are well-behaved functions of those of their components. If, indeed, 5. and 6. are indistinguishable, then complex sentences formed containing them must be so too.

It is evident that the manifestation argument construed this way leads to rejection of much of accepted practice. Dummett has questioned the realist account of temporal operators on such grounds. He wonders, that is, if the realistic notion of truth induced by pairs such as 9. and 10. could be legitimate: whether there could be genuine past tense which refers to past times in the future, and not to present traces. The question might arise too, for 7. and 8.: for this pair is realistically speaking, distinguishable, while, according to the assertibility theorist, the distinction could not be a function of the assertibility conditions of 5. and 6.. Whether or not the assertibility theorist must treat 7. and 8. as indistinguishable, then, depends on whether they are treated as having assertibility conditions which are a function of those of 5. and 6. respectively.
If, as I have argued, we must explain how the grasp of 7. and 8. is manifested, and if the grasp of 7. and 8. depends on an understanding of the predicates used in 5. and 6., then our practice of distinguishing 7. and 8. is mistaken. Of course, non-logical operators might differ from logical ones, but there is at least a case for revision of our practices with respect to 7. and 8. There is, it seems to me, an even stronger case for revision of our practices of distinguishing conditionals with 5. and 6. as antecedents.

Such revisionism is unpalatable. But if the considerations of the earlier sections of the chapter are correct, we ought not conclude that they provide a reductio of assertibility theories of meaning. Rather, they should be seen as posing a dilemma: either practice can be adequately explained in terms of a central notion of assertibility, in which case much practice appears illegitimate, or the explanatory role of a theory of meaning fails of its purpose. For it is only by connecting practice with the theory that the explanatory aim of a theory of meaning can be achieved.

7. Conclusion

Dummett claims that the semantic knowledge of speakers consists in their ability to tell when assertions are objectively justified or alternatively, when assertions are objectively falsified. I have suggested that this claim depends on treating assertion as a conventional activity, requiring defence against challenges. In this context, the concept of meaning is to be regarded as deriving from conventions of behaviour, while content is determined by the situations in which a particular assertion can be defended against challenges.
When Dummett's claim about the nature of semantic knowledge is based on an account of this sort, semantic knowledge is inherently manifestable. For we attribute semantic knowledge to speakers on the basis of their practices of defending and challenging assertoric uses, and those practices could not but be manifest in behaviour. Of course, we often make assertions which we do not defend. The claim is that the conventions of assertion are such that a speaker who makes an assertion is open to reproach if he or an expert could not defend it.

This account of a theory of meaning requires certain modifications to Dummett's views. First, ethical, vague and inconclusive assertions cannot in principle be distinguished from more standard assertions, since the conventions of the activities of defending them are indistinguishable from the conventional activities of defending other assertions. I argued that it is essential to justifying the claim that assertion is the central linguistic act that we treat ethical assertions in the same way as we treat all others, so that we can characterise assertions as those utterance-types which may be antecedents of conditionals. In this, I also diverge from Dummett. The cases of ethical and vague assertions lead to a further respect in which I differ from Dummett: we cannot assume, as Dummett does, that no assertion is neither correct nor incorrect. Finally, I have argued that the manifestation argument supports the assumption that the assertibility conditions of complex sentences are determined by those of their components when asserted in isolation. A consequence of this view is that the grasp of the meaning of many more of our commonplace complex sentences is unmanifestable than Dummett thinks.
Introduction

Intuitionists in mathematics give an account of the meaning of sentences of mathematics in terms of their conditions of provability. Epistemological and ontological considerations motivated traditional Intuitionism. Dummett (1975; 1977, ch.7) justifies intuitionism on semantic grounds. He has suggested that the intuitionist account of logically complex sentences provides a paradigm of a theory of meaning which meets the manifestation argument. Intuitionism in mathematics differs from classical platonism in the account of quantification over infinite domains. In consequence of this difference certain classically valid inferences are not counted valid. The meanings of the logical constants are determined by the conditions of provability of complex sentences, in terms of the provability conditions of their components. Some classically valid laws are rejected on the basis of such an account of the meanings of logically complex sentences.

There have been various formalisations of intuitionist logic, and semantics of various types have been provided. Dummett prefers a Gentzen style account in terms of the introduction and elimination laws for the constants in a Natural Deduction system. He hopes that a theory of meaning for the logical constants in terms of 'canonical proof' will meet the manifestation argument. I contrast this account with that provided in the intuitionist analogue of a Tarski type theory.
Throughout this chapter mathematical assertions are referred to simply as the sentences or statements of mathematics.

1. Infinite Totalities

Intuitionists rejected the classical platonist view that the objects of mathematics exist independently of the abilities of mathematicians to envisage or specify them. They took the objects of mathematics to be mental constructions. Intuitionists argued that the platonist conception of infinite totalities, in particular, was unjustified. According to the intuitionist, we must specify infinite totalities in terms of our conception or intuition of infinity. Infinity is potential infinity deriving from our intuition of the form of temporal succession. But the account is psychologistic. As Brouwer puts it: "intuitionist mathematics is inner architecture" (1969, p.84). Now, if the justification of intuitionism were of this type, it would be of little interest to one who subscribed to the manifestation argument. For intuitions are private epistemological items, and yet are here intended to determine the meaning of mathematical statements. A theory of meaning in terms of private items of this sort patently fails to meet the manifestation argument.

The intuitionist rejection of impredicative definition might also be seen as ontologically based. According to Russell (1910, p.36), generation of the paradox of class inclusion offended against the "vicious circle principle" in so far as it presumed well defined a specification of a totality containing members which can be defined only by quantification over that totality. The impredicativity of this specification might be interpreted ontologically, in which case it would be proper to argue that only if the totalities in question
did not exist independently of the specification given by the definition would there be a circularity. In this case, the intuitionist attitude to mathematical totalities could be seen as a premiss in the rejection of impredicative definitions.

However, the flaw in an impredicative definition is not ontological. Russell's "vicious circle principle" is best seen as a semantic principle which rejects, as not specifying a determinate totality, certain forms of definition. On this construal, the assumptions required for generating the paradox are that the class abstraction operator has unrestricted application, and that the objects produced by the operator must fall within the totality first specified. When the class abstraction operator is rejected on the grounds that its use leads to impredicative definitions of totalities, the first assumption is denied. But if 'class of ...' is taken to be a well defined notion whenever the totality of objects is well defined, then the second assumption can be rejected, and the paradox blocked. On this view, the paradox reveals that the abstraction operator defines objects not falling within the totality first specified. The notion of 'object', in its full intuitive meaning, must be regarded as indefinitely extensible.¹

On this interpretation, we do not prejudge the issue whether or not there is a non-circular means of specifying an impredicative totality - a totality containing members which can be specified only by quantification over the totality - but we preclude a definition of the totality which involves such quantification. There is, then, no specifically ontological character to the rejection of impredicativity, nor can we draw from the paradox an ontological

¹ Dummett argues for such a view at 1973, pp.530-534.
conclusion, outlawing the existence of totalities impredicatively specified.

Dummett (1975, pp.20-40; 1977, pp.383-7) considers one further argument from an ontological premiss to the rejection of classical logic. The objects referred to in mathematics may be regarded as having no existence independent of the actual construction of proofs about them. Mathematical objects then become not mental constructions but objects specified in proofs. It would then be possible to claim that mathematical statements are true only if they are actually proved to be true. But this view would suggest that all statements about infinite totalities must be rejected. For consider the claim that every natural number is either prime or composite. It would satisfy the ontological constraints only if every natural number were actually proved to be one or the other. Not only classical but much of intuitionist practice must be rejected. The intuitionist notion of potential infinity, for example, could not be justified.

So, if intuitionism is to be justified, it cannot be on ontological or epistemological grounds. Dummett employs instead the manifestation argument.

1.1 Intuitionism and Quantification

In order to justify intuitionism in mathematics, we need to turn to the intuitionist account of quantification over infinite domains. According to the intuitionist, the classical platonist account of primitive arithmetical statements in terms of their truth conditions is unobjectionable, for the truth conditions of such sentences can be

2. This is the claim of strict finitists. cf. Dummett's account of Yesinin-Volpin's views at (1973, pp.506-511; 1975a, pp.302) and Wright (1980a, p.117 ff).
recognised to obtain. Moreover, quantification over finite domains can be explained in terms of the classical platonist truth conditions of such sentences, for it is possible to check a finite domain and prove that the quantified sentence holds. But the intuitionist claims that sentences involving quantification over infinite domains cannot be regarded as analogous to quantification over finite domains. For the truth conditions of such sentences cannot be recognised to obtain when the domain is infinite in the same fashion as when the domain is finite. We understand such sentences in terms of the conditions in which they are recognised to obtain: the conditions, that is, under which they are proved. Conditions of this sort are publicly accessible: for the procedure of proving a sentence is one for which there are public criteria of correctness. Some constructivists in mathematics have outlawed all but finite domains of quantification, on the grounds that the meaning of sentences involving quantification over infinite domains would be unintelligible.\(^3\) The intuitionist, on the other hand, admits quantification over infinite domains, but claims that the meaning of sentences involving such quantification is determined by the conditions under which the sentences are provable. He rejects, of course, the transfinite and much of classical mathematics. I shall consider from now on the intuitionist attitude to those infinite totalities - in particular, totalities which may be correlated with the natural numbers, or the continuum - which are admissible for the intuitionist. Sentences about the transfinite the intuitionist regards as meaningless, since we could have no conception of the state of affairs under which they could be proved.

\(^3\) cf. fn.2. for one version of this view.
Both intuitionist and classical accounts may adhere to a Fregean syntax for quantified sentences. The quantifier variable analysis tells us the contribution of components to the truth, or provability, of the quantified sentence. According to the intuitionist, there is no justification for the platonist assumption that there is a determinate truth value for every quantified sentence whether or not a proof is available for it, or for its negation. For certain sentences involving quantification over infinite domains may be effectively undecidable.

No party to the dispute wishes to claim that understanding of a quantified sentence over even finite domains must consist in knowledge of how to determine the truth values of sentences in which the predicate applies to each object in the domain. In order for us to grasp a quantified sentence it is not necessary that the objects in the domain of quantification can be identified, and shown to satisfy or fail to satisfy the predicate. What is required is that the domain be specified, and that we have a conception of how the predicate applies to an arbitrary element of the domain. Platonism assumes that there is a determinate conception of infinite totalities, in terms of which we can define (infinitary) truth functions from truth values to truth values. The only possibilities for the value of the result are truth and falsity. According to the intuitionist, there could be no warrant for this assumption in the use made of quantified sentences where the domain is infinite. Only general methods of proof enable us to establish that quantified sentences are true or false, and where such methods are unavailable, there is no guarantee that the quantified sentence is either true or false.
According to the intuitionist, the meaning of a universally quantified sentence is determined by the condition under which there is a proof of that sentence. Such a proof would show how to establish that the predicate holds of any object in the domain. The proof of an existentially quantified sentence consists in a method of specifying a particular object in the domain and showing that the predicate holds of it. In each case, the quantified sentence is associated with a procedure which would be sufficient for its defence. The grasp of this procedure determines the understanding of the sentence. The intuitionist account of negation is specifically designed to ensure that the conditions under which a negation holds are also recognisable. According to the intuitionist, a proof of the negation of a mathematical sentence consists in a means of showing that the proof of that sentence would lead to an absurdity—say $0 = 1$, which we label $1$.

For decidable sentences, the conditions for proving a mathematical sentence are just those conditions that a platonist accepts. However, the platonist claims that a mathematical sentence has determinate truth conditions even when it is undecidable. So, for example, platonists may claim that Fermat's Last Theorem is either true or false in reality. According to the intuitionist, to understand Fermat's Last Theorem is to grasp what would count as a proof. This does not imply that there is either a proof of it or of its negation. The appropriate notion of truth in mathematics is determined by proof conditions and is not such that it can be assumed that every mathematical statement is Bivalent. There is no reason to think that Fermat's Last Theorem must be either true or false.
Intuitionism differs from platonism in the account of quantification over infinite domains, and consequently in the attitude to undecidable sentences. Following Dummett (1977, p.23), we call a domain decidable if we can decide, of every object, whether it belongs to that domain. Intuitionism in mathematics does not require that every domain be decidable, since a domain may be determined by any meaningful predicate. Fermat’s Last Theorem, for example, can be grasped although it is undecidable, since it involves only quantification over numbers. Finite domains may also be undecidable, but this is always a consequence of quantification over infinite finite domains. For example, the domain consisting of the extension of the predicate
\[ x = 0 \lor (FT \land x = 1) \] (where FT is Fermat’s Last Theorem)
has at most two elements and at least one element but it is effectively undecidable how many elements it contains.

1.2. Intuitive Explanations of the Logical Constants

Truth conditional accounts of the meaning of logically complex sentences of mathematics which assume every sentence of mathematics Bivalent must, according to the intuitionist, be replaced by an account in terms of the conditions of provability. According to the intuitionist, the practices in terms of which mathematicians manifest their grasp of mathematical sentences are the practices of proving those sentences, and the ability to prove a sentence determines its meaning.

The primitive sentences of mathematics are decidable; indeed, statements of elementary number theory are all identities. The conditions under which a complex sentence is said to be proved are as
follows:

A proof of \( A \& B \) consists in a proof of \( A \) and a proof of \( B \).

A proof of \( A \lor B \) consists in a proof of \( A \) or a proof of \( B \).

A proof of \( A \rightarrow B \) consists in an effective procedure which when applied to a proof of \( A \) yields a proof of \( B \).

A proof of \( \neg A \) consists in an effective procedure which when applied to a proof of \( A \) yields a primitive absurdity \( \perp \), having no proof.

A proof of \( \forall x Fx \) consists in an effective procedure which when applied to any object in the domain yields a proof of \( Fa \).

A proof of \( \exists x Fx \) consists in a means of specifying an object in the domain, and proving that \( F \) applies to it.

These definitions have the form of quantifying over constructions, or proofs, and can be read as having the form,

\[
\text{For all constructions } x, \ (x \text{ is a proof of } A \& B \text{ iff } x \text{ is a proof of } A \text{ and } x \text{ is a proof of } B)
\]

and so on.

So phrased, the explanations fall into two groups. Those for \( \lor \), \( \rightarrow \) and \( \neg \) talk of the existence of effective procedures. This appears to introduce an impredicativity into the definitions, since we define the totality of proofs of \( A \rightarrow B \), for example, in terms of procedures which themselves require appeal to the totality of proofs of \( A \rightarrow B \). We return to this question in III.4.

Relative to the intuitive explanations of the logical constants, it is evident that certain inferences which preserve platonist truth are not intuitionistically acceptable. Both L.E.M. (the law \( A \lor \neg A \)), and Double Negation Elimination (the law \( \neg \neg A \rightarrow A \)) are not generally valid, since there is no reason to hold every statement either provable or such that its proof leads to an absurdity, nor that a proof that it is absurd that a proof of \( A \) leads to absurdity guarantees the possession of a proof of \( A \). In intuitionist logic, we can derive D.N. elimination from L.E.M. for a particular
mathematical statement, but not vice versa. Note, however, that
\( \neg \neg (A \lor \neg A) \), which Dummett calls the law of the excluded third, and
\( A \rightarrow \neg \neg A \) both hold in intuitionist logic.

Corresponding to each of these classical laws there is a semantic
principle, the rejection or acceptance of which turns on the intuitive
explanations of the meanings of mathematical sentences in terms of
proof. Just as Bivalence is the semantic principle underlying the
rejection of L.E.M. so, in intuitionist terminology, stability is the
semantic principle underlying rejection of Double Negation
Elimination. Dummett labels tertium non datur the semantic principle
underlying justifications of \( \neg \neg (A \lor \neg A) \): that there cannot be a proof
that the assumption of \( A \lor \neg A \) leads to an absurdity.

Dummett argues that the intuitionist account, unlike the
classical, attributes to speakers abilities constituting their
understanding of the sentence which could be exhaustively manifest in
behaviour. The manifestation argument is here applied to mathematics
on the basis of two assumptions:

(i) that there is a central feature of the use of mathematical
sentences which governs their use in all contexts, and

(ii) that that feature is properly correlated with an ability to
prove mathematical sentences.

Each assumption may be challenged. The first is essential to the
revisionary consequences of the intuitionist account. For the
intuitionist insists that the valid arguments of mathematics are just
those arguments which preserve provability - or truth determined by
conditions of provability - from premisses to conclusion. Holists,
and those who wish to treat validity as conventional, 4 regard the

4. Priest (1980) and Wright (1980a), as remarked at VII.4, take this
view.
meaning of mathematical sentences as in part constituted by the valid arguments in which they occur. They therefore deny the first assumption.

Not only platonists, but holists of this type, may deny the second assumption. Platonists may allow that there is a central feature determining the meaning of sentences but deny that it is exhaustively manifest in use. Holists, on the other hand, may allow that the ability to prove mathematical sentences does manifest a grasp of them, but claim that that ability cannot be restricted to cases where the proof can be recognised to obtain.

2. The Formalisation of Intuitionist Logic

Heyting's axiomatisation of Intuitionist sentential logic takes as axioms:

\begin{align*}
\text{(A1)} & \quad A \rightarrow (A \land A) \\
\text{(A2)} & \quad (A \land B) \rightarrow (B \land A) \\
\text{(A3)} & \quad (A \rightarrow B) \rightarrow [(A \land C) \rightarrow (B \land C)] \\
\text{(A4)} & \quad [(A \rightarrow B) \land (B \rightarrow C)] \rightarrow (A \rightarrow C) \\
\text{(A5)} & \quad B \rightarrow (A \rightarrow B) \\
\text{(A6)} & \quad [A \land (A \rightarrow B)] \rightarrow B \\
\text{(A7)} & \quad A \rightarrow (A \lor B) \\
\text{(A8)} & \quad (A \lor B) \rightarrow (B \lor A) \\
\text{(A9)} & \quad [(A \rightarrow C) \land (B \rightarrow C)] \rightarrow [(A \lor B) \rightarrow C] \\
\text{(A10)} & \quad \neg A \rightarrow (A \rightarrow B) \\
\text{(A11)} & \quad [(A \rightarrow B) \land (A \rightarrow \neg B)] \rightarrow \neg A.
\end{align*}

based on Heyting (1956, pp.101-2). For the predicate calculus we append

\begin{align*}
\text{(A12)} & \quad \forall x Fx \rightarrow Fa \quad (\text{where } a \text{ is free for } x \text{ in } Fx)
\end{align*}
(A13) $Fa \to \exists xFx$ (where $a$ is free for $x$ in $Fx$)

The rules of inference are substitution, detachment and the following rules where $t$ does not occur free in $A$, and $t$ is free for $x$ in $Fx$; $Ft$ is formed by replacing every free occurrence of $x$ in $Fx$ by $t$.

- If $(A \to Ft)$ then $(A \to \exists xFx)$
- and if $(Ft \to A)$ then $(\forall x Fx \to A)$

Other axiomatisations are available. Note that in this system we can treat negation as a defined sign. Where is a primitive absurdity (say $0 = 1$),

$$\neg A \overset{df}{=} A \to \bot,$$

we can then take as an axiom

(A14) $\bot \to A$, with suitable alterations elsewhere.

The logical constants of the intuitionist system are such that if any two statements are determinately either true or false, then the classical truth tables hold for the expressions formed from intuitionist logical constants. However, intuitionism does not accept the classical assumption that every statement must be either true or false.

Note that while the classical logical conjunction, disjunction, implication and negation are interdefinable, the intuitionist are not (save for $\neg \land$ and $\bot$ which are interdefinable and $\to$ and $\lor$). This is evident from the failure of $(A \lor B) \to (\neg \neg A \lor B)$; $(\neg (A \& \neg B) \to (A \to B))$; $(\neg (A \& \neg B) \to (A \lor B))$ and $(\neg (\neg A \lor \neg B) \to (A \& B)$ (although $\neg (A \lor B) \leftrightarrow (\neg A \lor \neg B)$ holds intuitionistically). Note too, that it might be objected that (A10) and (A11) lack a natural intuitive basis, for they yield the paradoxes of strict implication. The intuitionist accepts the paradoxes, on the basis of his account of negation.
By translating a classical disjunction of A and B into intuitionist $\neg(\neg A \& \neg B)$, classical $A \supset B$ into intuitionist $A \rightarrow B$, and classical existential quantification into intuitionist $\exists x \exists f x$, and translating other classical constants by their literal intuitionist analogues, every classical thesis holds under the translation. A formula $A$ is provable in classical logic iff its transform $A^*$ under the translation schema above is intuitionistically provable. The right to left implication is straightforward, since $A$ and $A^*$ are classically equivalent. Left to right may be established via the observation that intuitionistically $\neg\neg A^* \rightarrow A^*$. The translation was originally given by Gödel, but he translated $A \supset B$ as the intuitionist $\neg(A \& \neg B)$. This version is Gentzen's (1935). 5

The following translation schema (also due to Gödel, 1933) shows intuitionist sentential logic equivalent to Lewis' $S_4$:

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<thead>
<tr>
<th>Intuitionist</th>
<th>$S_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\neg \neg p$</td>
<td>$\neg \neg p$</td>
</tr>
<tr>
<td>$p \rightarrow q$</td>
<td>$\neg p \lor \neg q$</td>
</tr>
<tr>
<td>$p \lor q$</td>
<td>$\neg p \lor q$</td>
</tr>
<tr>
<td>$p &amp; q$</td>
<td>$p &amp; q$</td>
</tr>
</tbody>
</table>

Various other modal transforms suffice to characterise intuitionist sentential logic, such as

<table>
<thead>
<tr>
<th>Intuitionist</th>
<th>$S_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\neg \neg p$</td>
<td>$\neg \neg p$</td>
</tr>
<tr>
<td>$p \rightarrow q$</td>
<td>$p \supset q$</td>
</tr>
<tr>
<td>$p \lor q$</td>
<td>$\neg p \lor q$</td>
</tr>
<tr>
<td>$p &amp; q$</td>
<td>$\neg p &amp; \neg q$</td>
</tr>
</tbody>
</table>

Others are discussed in Rescher (1968, p.19), in particular those

5. Mostowski (1965, pp.96-97) and Dummett (1977, pp.36-37) report these results.
deriving from Tarski and McKinsey (1948).

That classical logic can be shown to be a subsystem of intuitionist logic does not demonstrate that the two are commensurable. There is a distinction between intuitionist and classical universal quantification, despite their literal translation under * . Moreover, the intuitionist rejection of L.E.M. is not explained by the obvious failure of \( L_p \lor L\neg Lp \) (under the former translation into S4), nor by that of \( Lp \lor LL\neg p \) (under the second).

These remarks establish, at best, that the intuitionist account of the logical constants differs from the classical account. We might expect the formal semantics for intuitionist logic to make more precise in what that difference consists.

2.1. Semantics for Intuitionist Logic

We can see topological interpretations of intuitionist logic as a generalisation of the usual definition of satisfaction for classical logic. In the case of classical logic we choose the two element Boolean algebra to represent truth values. In the case of intuitionist logic, we choose a partially ordered set, \( S \), which is complete in so far it has a greatest lower and a least upper bound falling in \( S \). A model of intuitionist logic is determined by a set, \( I\#0 \), which is interpreted as a range of individual variables. Predicates are interpreted as functions with arguments in \( I \) and values in \( S \). A valuation is a mapping of the set of all variables and constants into \( I \), and of the set of \( n \)-place predicates into the set of functions with \( n \) arguments, where the variables range over \( I \), and the values over \( S \). Valuations for complex sentences are inductively defined, as in the classical case. In such a semantics, soundness and
completeness can be proved.  

A connection between the topological interpretation and the intuitive explanations of the logical constants can be made by considering interpretations of formulae relative to trees. Beth's (1959, §145) trees, for example, can be regarded as providing an account of the states of information in which complex sentences are verified, in terms of those atomic formulae which are verified at that state of information, as Dummett (1977, p.190) suggests. A similar account is given in terms of dialogue games, by Lorenzen (1967).

Dummett (1977, §7.2) suggests that Beth's trees do not supply what is required of a full intuitive explanation of an intuitionist account of meaning. We can illustrate the difficulty with universally quantified sentences. If we regard the nodes of a tree as representing states of information, and define truth at a node in terms of what is verified at nodes subsequent to it (in an appropriate branch), then we can allow that one might be in a state of information in which $\forall x Fx$ is true, while each instance is verified at some subsequent node in the tree. But, in order to make precise under what situations such a universally quantified sentence is true, it is necessary to quantify over (possibly an infinite number of) nodes. Hence, the Beth tree cannot be seen as representing the understanding of a universally quantified sentence in terms of what atomic sentences are true in a state of information. Further information, as to the subsequent verification of atomic sentences - determined by a possibly infinite structure - is required. So, Dummett suggests, the Beth trees do not specify in what the ability to prove or disprove mathematical sentences consists.

3. Systems of Natural Deduction

Dummett prefers to formalise intuitionist logic in terms of a natural deduction system, since he thinks that natural deduction systems provide a particularly perspicuous representation of the forms of valid reasoning. Moreover, Dummett draws analogies between the natural deduction systems he presents and the intuitive account of the meaning of the logical constants. These are analogies which Prawitz, in particular, has developed.

In a natural deduction system, the rules of inference are defined by a structural rule, and introduction and elimination rules for the logical constants. Predicates of the language are $F$, $G$, $H$, ... Free variables we call $a$, $b$, $c$, ..., bound variables $x$, $y$, $z$ ..., terms $t$, ... Logical constants are $\&$, $\vee$, $\neg$, $\exists$, and either $\top$ or $\bot$. Well formed formulae of the language are as usual, and called $A$, $B$, $C$...

A derivation is composed of sequents of the form $\Gamma:A$, where $A$ is a formula, and $\Gamma$ a finite (possibly empty) set of formulae from which $A$ can be derived. We say that $A$ is derivable from $\Gamma$ in a system $S$ ($\Gamma \vdash_S A$) iff there exists a proof in $S$ of which $\Gamma:A$ is the conclusion. When $\emptyset \vdash_S A$, then $A$ is provable in $S$.

The intuitionist natural deduction system, $N$, has the following rules.7

Axiom $\Gamma, A:A$

Structural Rule

\[ \frac{\Gamma:A \text{ where } \Gamma \subseteq \Delta}{\Delta:A} \]

('Thinning')

which we might express

\[ \Gamma:A \]
\[ \Gamma, B:A \]

7. Dummett (1977 ch.4) and Prawitz (1965 ch.I).
Introduction and Elimination Laws for the constants are as follows:

**Introduction**

| \( \Delta I \) | \( \Gamma : A \Delta : B \) | \( \Gamma , \Delta : A \& B \) |
| \( \Delta E \) | \( \Gamma : A \& B \) | \( \Gamma : A \& B \) |

| \( \forall I \) | \( \Gamma : A \) | \( \Gamma : B \) | \( \Gamma : A \lor B \) |
| \( \forall E \) | \( \Gamma : A \lor B \) | \( \Gamma : B \) |

| \( \exists I \) | \( \Gamma : F \) | \( \Gamma : \forall x F \) |
| \( \exists E \) | \( \Gamma : \exists x F \) | \( \Delta, F \Delta : C \) |

where \( \Delta \) does not occur free in \( \Gamma \) or \( \exists x F \)

| \( \forall F \) | \( \Gamma : \forall x F \) | \( \Gamma : \exists x F \) |
| \( \exists F \) | \( \Gamma , \Delta : C \) | \( \Gamma , \Delta : C \) |

t is free for \( x \) in \( F \)

Note that in the \( \forall \) and \( \exists \) rules \( F \) and \( F \) result from replacing every free occurrence of \( x \) by \( y \) and \( t \) respectively.
This system serves to define classical logic, when the following classical rule replaces Intuitionist ⊨E

\[ \vdash_{\text{CLASS}} \frac{\Gamma; \forall A}{\Gamma; A} \]

We can replace \( \forall \) and \( \forall E \) rules by rules for \( \bot \) (the constant false proposition), defining \( \neg A \equiv_{df} A \rightarrow \bot \)

\[ \frac{\Gamma; A}{\Gamma; \bot} \quad \frac{\Gamma; A}{\Gamma; A \rightarrow \bot} \quad \frac{\frac{\frac{\Gamma; A}{\Gamma; \bot}}{\Gamma; A \rightarrow \bot}}{\Gamma; \bot} \]

These rules may be formulated as a single rule for the classical and intuitionist logics, in the presence of the rule for '→'

\[ \frac{\Gamma; \bot}{\Gamma; A} \quad \frac{\frac{\Gamma; \bot}{\Gamma; A}}{\Gamma; A \rightarrow \bot} \]

We should note that the I rule for negation differs from other I rules in the system in that the premiss of the rule uses the constant to be introduced. The same holds of \( \bot \text{CLASS} \).

Prawitz (1965) has shown how to prove a normalisation result relative to \( N \) on the basis of an inversion theorem. The inversion theorem relates the introduction laws for a logical constant, allowing inference to a certain logical sign, to the elimination rule allowing inferences from formulae containing that sign. In a sense, an elimination rule is the inverse of the corresponding introduction rule. By applying an elimination rule one restores what would have been the case before applying an introduction rule. According to the inversion principle, it is unnecessary both to introduce and eliminate a formula. Any derivation doing so is equivalent to a proof which does not. So for example:
and so on. Moreover the Intuitionist 1 rule can be restricted to atomic sentences:

\[
\text{\textit{1} INT} \quad \frac{\Gamma : A & B}{\Gamma : A \land B}
\]

is equivalent to

\[
\text{\textit{1} INT} \quad \frac{\Gamma; : 1}{\Gamma : A \land B}
\]

Cases of this sort provide the base case of an inversion theorem. Further cases are those for which permutative reductions are necessary. Prawitz (1964, ch.II) and Dummett (1977, §4.5) give the proof in full. Prawitz states the inversion theorem:

If \( \Gamma : A \) then there is a deduction of \( A \) from \( \Gamma \) in which no formula occurs both as the consequence of an I-rule and the major premise of an E-rule. (Prawitz 1965, p.34).

(The major premise of an E-rule (in particular \( \exists E, \rightarrow E \) and \( \lor E \)) contains the connective to be eliminated.)

Prawitz has shown (1965) that every derivation, for intuitionist and classical systems using 1 rules and a definition for negation, can be transformed to a normal derivation in which no formulae are both introduced or eliminated at once. The subformula property follows for Prawitz's system: in a normal derivation of \( A \) from \( \Gamma \) only subformulae of \( A \) and \( \Gamma \) occur. Prawitz also remarks that, by stipulating that the inversion property holds for elimination laws, the introduction laws for constants specify the logic, and vice versa.

We should note that one of Dummett's frequently used semi-technical
terms has its technical applications in this context. Rules for a logical constant which are inverses are said to be in harmony. Furthermore, there is a connection between the subformulae property, and a notion Dummett applies to theories of meaning — namely molecularity (VII.1).

We cannot simply distinguish classical and intuitionist logic with respect to the inversion property. For inversion theorems are provable in both classical and intuitionist logics. Prawitz remarks (1965, pp. 34-35) on the difficulty of accommodating classical negation, and shows in particular, that the inversion theorem fails for classical negation characterised by \( \land \), and \( \lor \text{CLASS} \). For consider a proof of L.E.M.

\[
\begin{align*}
\text{vi} & \quad \vdash A \land \neg A, \quad A : A \\
\text{li} & \quad \vdash A \land \neg A, \quad A : A \\
\lor & \quad \vdash A \land \neg A, \quad A : \neg (A \lor \neg A) \\
\text{li} & \quad \vdash \neg (A \lor \neg A), \quad A : \neg (A \lor \neg A) \\
\text{li} & \quad \vdash \neg (A \lor \neg A) : \neg A \\
\text{li} & \quad \vdash \neg A \\
\lor & \quad \vdash A \lor \neg A \\
\lor & \quad \vdash \vdash A \\
\lor & \quad \vdash \vdash A
\end{align*}
\]

Here a formula — \( \vdash (A \lor \neg A) \) — is used both as a consequence of an application of an I-rule and as the major premise of a E-rule. However an inversion theorem can be proved for classical logic in the fragment containing \( \&, \rightarrow, \lor \) and \( \lor \text{CLASS} \): other constants can, in classical logic, be derived.

We should note that a somewhat similar difficulty arises with the I and E rules for intuitionist negation.

For the argument
although it can be transformed to the following simpler deduction:

\[ \neg \exists \Gamma, A : B \quad \Delta, A : \neg B \]

\[ \neg \exists \text{INT} \quad \Gamma, \Delta : \neg A \quad \Sigma : A \]

\[ \Gamma, \Delta, \Sigma : C \]

itself uses the \( \neg \exists \text{INT} \) rule. It might be argued that in the basic case, the transformed argument does not invoke \( \neg \exists \text{INT} \), since the joint holding of 'B' and \( \neg B \) may be a primitively recognisable absurdity. If this claim was intended to show that intuitionist negation was preferable to the classical negation, in the light of the inverse theorem, it would be indecisive. For it would be open to the classical logician to suggest that there is a primitive recognition of the truth of \((A \lor \neg A)\). However, if we accept the reduction step for \( \neg \exists \) and \( \neg \exists \text{INT} \) above, or use rules for the primitive absurdity, then all constants have appropriate inverses and a normalisation result follows.

To use the inverse theorem to assess rules for logical constants in this way is itself a questionable procedure. Why should we expect that rules for logical constants have inverses? If the introduction and elimination laws for a logical constant were taken to determine its meaning then we could justify the requirement. This was the point made by Belnap in reply to Prior's (1961) article in which Prior pointed out a difficulty in the assumption that any introduction and elimination laws for a logical constant could determine its meaning.
Prior argued that if it were possible to define the meaning of a logical constant this way, a constant TONK could be defined with the I rule for disjunction and E rule for conjunction. Such a constant would trivialise logic. For the following argument would be valid.

\[
\begin{align*}
\text{TONK I} & \quad P \\
\text{TONK E} & \quad P \text{TONK Q} \\
& \quad Q
\end{align*}
\]

This would be absurd. In order to avoid this conclusion, Belnap (1962) proposed that I and E rules can be taken to specify the meaning of a logical constant in the context of an antecedent characterisation of deducibility, such as that provided by the rules of natural deduction systems. The introduction of a logical constant extends the definition of well formed formulae to include $A \text{TONK} B$, and introduces TONK I and TONK E rules. New statements are then deducible. Belnap imposes Post's conservative extension requirement on the new connective. The new deducibility statements licensed by the I and E rules for the constant must not lead to the deduction of a new statement $A_1 \ldots A_n \vdash B$, not containing the connective, unless that statement is already provable in the absence of rules for the new constant. TONK is an illegitimate new constant in classical, intuitionist and any consistent logic, since it does not obey the conservative extension principle.

It is clear that this principle is related to the normalisation theorem mentioned above. If a new constant provides a conservative extension then, in any deduction which employs I and E rules for that constant, in the conclusion of which that constant does not occur, those I and E rules could be eliminated. There must then be a normalised form of the deduction in question, not using I and E rules
for the constant. Conversely, where a normalisation result applies to a system extended by a constant, the conservative extension principle holds. Now it is evident that only when an inverse theorem is provable for rules for the introduction and elimination of a constant could those rules specify the meaning. Hence, the obtaining of an inverse theorem seems essential for any account which hopes to specify meaning in terms of introduction and elimination laws for a constant.

But can we expect to specify the meaning of a logical constant by laying down appropriate introduction and elimination laws for it? It appears that we can do so, but it is not clear that we have thereby avoided the use of semantic notions in specifying meaning. For the rules of a natural deduction system are designed to take one from sequents with a certain semantic property, to others with that property. The conservative extension principle is also designed to ensure that rules for a new constant preserve deducibility, as defined in the original systems. Deducibility is that relation between premisses and conclusions which preserves the semantic property the system was designed to capture.

If this is correct, we should not expect to be able to justify intuitionist as opposed to classical logic on the basis of properties of a syntactic system. Justification follows rather from the account of the semantic property, in this case provability. Certainly, relative to a classical notion of truth, classical negation provides a conservative extension of the negation free fragment. However, relative to provability classical negation does not provide a conservative extension in so far as L.E.M. is provable, although neither disjunct may be. But it is only relative to the semantic notion of provability that the contrast can be drawn in this way.
However Dummett (1973a; 1975; 1977, §7.2) and Prawitz (1974; 1977) have applied the results and terminology of natural deduction systems to an account of the meaning of sentences of mathematics and natural language. Dummett argues for an analogical extension of notions whose primary application is syntactic.

4. Canonical Proof

I have suggested that semantics for intuitionist logic of the types considered in 2.1 do not justify intuitionist, as opposed to classical, logic. What appears to be required is an account which specifies precisely the intuitionist notion of provability. However, we cannot use the intuitive explanations of the logical constants to provide a definition of intuitionistically acceptable proof. The difficulty is this. Any account of intuitionistically acceptable proofs must allow that there are proofs which can be recognised to establish conclusions which do not have the form stipulated by the intuitive explanations. Dummett (1975, p.12; 1977, p.392) calls such proofs "indirect" proofs or "demonstrations": proofs which establish the conclusion on the basis of a complicated deductive argument, perhaps involving elimination rules. If we allow that demonstrations are valid, then it would be circular to use the intuitive explanations of the logical constants to define the intuitionistically acceptable proofs of a language. For, consider a case where we have a demonstration of $A \lor B$. That demonstration, together with a proof of $A$ and an application of *modus ponens*, provides an effective means of transforming a proof of $A$ into a proof of $B$. Evidently, the notion of a demonstration, rather than the forms stipulated by the intuitive explanations of the logical constants, defines the acceptable proofs.
Dummett (1977, pp.389-403) and Prawitz (1977) suggest that we attempt to meet the difficulty by distinguishing between 'canonical' proofs and 'demonstrations'. In acquiring and manifesting a grasp of logically complex sentences, speakers of a language need not thereby know all forms of proof of the statement. The 'canonical' proof, counted now as defined by the intuitive account of the meaning of the intuitionist constants, determines in what manifestation of the grasp of complex sentences containing them consists.

For example, in considering whether a given construction is a proof of \( A \rightarrow B \), we do not need to judge whether, when applied to an arbitrary proof of \( A \), it will yield a proof of \( B \). We need consider only proofs of a complexity that is determined by the complexity of \( A \). We need not assume, then, a grasp of the totality of proofs in interpreting a conditional: for the acceptable proofs will be just those determined by the complexity of the antecedent. We can appeal to this revised account of proofs of \( \rightarrow \) in the definition of 'intuitionistically acceptable proof'.

A similar account of the intuitionist negation is available. If asked in what recognition of a negation of \( A \) consisted, the intuitionist would argue that it consisted in the recognition that a proof of \( A \) led to a proof of a primitive absurdity. A canonical

8. If it were possible to specify constructive proof independently of the definitions of the logical constants we could avoid the difficulty. At least one such attempt fails. Kleene (1945) proposed an identification of the notion of construction with partial computable functions. Since these functions can be enumerated we may formally identify constructions with an integer. He then defines recursive realizability such that a natural number \( e \) realises a closed arithmetical formula. Kleene showed that all formulae provable in intuitionistic arithmetic are realisable by an arbitrary \( e \). The hypothesis that only intuitionistic formulae have this property has however been disproved (by Rose 1953).
proof of the primitive absurdity $0 = 1$ must be of a particularly simple kind. It is possible to possess the ability to recognise that there can be no proof of $0 = 1$, while yet lacking the ability to determine (in the extreme case) that intuitionist logic is consistent.

We can define canonical proof inductively:

There is a canonical proof of $S$ where $S$ is atomic if there exists a proof of $S$ within a given set of proofs.
There is a canonical proof of $A \& B$ if there is a canonical proof of $A$ and a canonical proof of $B$.
There is a canonical proof of $A \lor B$ if there is a canonical proof of $A$ or a canonical proof of $B$.
There is a canonical proof of $A \rightarrow B$ if there is an effective procedure which when applied to a canonical proof of $A$ yields a canonical proof of $B$.
There is a canonical proof of $\forall xFx$ if there is a procedure which when applied to a term $t$ yields a canonical proof of $Ft$.
There is a canonical proof of $\exists xFx$ if there is a canonical proof of $Ft$ for some specifiable $t$.
There is a canonical proof of $\neg A$ if there is a procedure which shows that the assumption that there is a proof of $A$ yields a proof of $1$. (Prawitz, 1977, p.26).

The existential quantifier of 'there is a canonical proof' must, of course, be read constructively in these definitions. It is a recognisable and decidable matter whether a particular proof is a proof of a particular mathematical sentence. It is not decidable whether there is a canonical proof of any particular type of mathematical sentence. The account of canonical proof conditions differs from the intuitive explanations of when mathematical sentences are provable in not presupposing an understanding of the constants.

Clearly 'canonical' is defined relative to a given set of proofs of the atomic formulae, but by placing a bound on the complexity of the proof of any particular sentence, we can explain why speakers need not recognise the correctness of the complete totality of proofs, before they grasp the particular proofs for the logical constants.
Dummett remarks

In fact, normalised natural deduction proofs provide an exact analogy for what is required of canonical proofs if the intuitionist explanations of the logical constants are to form a system free of conceptual circularity. (1977, p.396)

A canonical proof has an analogue in the subformula property, in so far as the canonical proof of a sentence consists of proofs of sentences only less complex than itself. Just as the introduction laws for a logical constant specify the weakest grounds for introducing it, so canonical proof conditions supply necessary and sufficient conditions under which complex sentences can be proved. An analogue of the normalisation results might then consist in a proof that every demonstration or indirect proof could be converted into a canonical proof.

Conditions of canonical proof of logically complex mathematical sentences are then taken to provide an account of the meaning of the intuitionist logical constants. The grasp of the meaning of complex mathematical statements is given by the conditions under which they are canonically provable, in such a way that grasp of the meaning of that statement is exhaustively manifest in the practice of proving it. By imposing on the class of acceptable proofs of a sentence a hierarchy, so that in understanding a sentence one needs only to understand proofs of a certain complexity, it is possible to use the notion of canonical proof to define the class of acceptable proofs. Moreover, in showing how the canonical proof of a sentence depends on grasp of the canonical proofs of its subformulae, we can explain how proofs of previously unencountered kinds can be understood.
The natural extension of this view is that conditions of canonical proof specify intuitionist truth conditions. This indeed appears to be Prawitz' (1977, p.3) interpretation. Dummett (1975, p.32; 1976, p.118) resists this interpretation, precisely because he feels the existence of demonstrations, or indirect proofs, gives rise to a distinction between what is intuitionistically true, and what is canonically provable. We should note that there is a prima facie incompatibility between Dummett's claim, and the analogy between canonical proofs and the normalised natural deduction systems. For if the account of canonical proof is to provide an adequate account of the meaning of the constants, then surely acceptable demonstrations must be just those which could, under suitable circumstances, be converted into canonical proofs? Hence, one is justified in the claim that there is a demonstration of a mathematical sentence only if one would be justified in claiming that there is a canonical proof. If this is so, there seems no possibility of a distinction between what is true, in virtue of there being a canonical proof, and what is demonstrable.

There is a further difficulty with the account of canonical proof. The introduction law for '+' specifies when $A + B$ can be introduced, in terms of specific proofs for $A$ and $B$. The definition of a canonical proof of $A + B$, however, allows that any effective transformation of a proof is acceptable. In order for the analogy with natural deduction systems to hold we appear to need a conception of effective procedures. This reintroduces the circularity in the specification of effective procedures. Now Dummett (1977, p.400) thinks we can meet this objection by allowing that, at a certain stage of mathematics, there could be a specification of the acceptable methods of proof, say, axiomatically. But this appears inconsistent
with the claim that methods of mathematical proof cannot be limited to proofs of a certain type.

Dummett (1977, p.401) suggests that the intuitionist should allow for the possibility of new methods of proof by regarding the totality of proofs as indefinitely extensible. At any stage of mathematical proof, the types of proof available in a language can be specified precisely, and the canonical proof procedures then determine the meaning of complex sentences. However the totality of proofs cannot be regarded as complete, at any stage. When new types of proof emerge the meaning of complex sentences, as specified by conditions of canonical proof, must also be seen to have changed. But at any particular stage of mathematical enquiry, the meanings of the logical constants are determined by the canonical proof procedures. I shall comment on this further at VII.5.

4.1 Grounds and Consequences

A further analogy with the natural deduction system is drawn by Prawitz (1977 pp.23-25, pp.30-31) and Dummett (1975, pp.11-13). Dummett contrasts theories which specify meaning in terms of the grounds on which use of a sentence is justified, and those which do so in terms of the consequences of the use of a sentence (II.4). When consequences are interpreted not as actions consequent on grasping the conventions of use, but as inferential consequences, the contrast seems to be precisely that between introduction and elimination laws for a logical constant. As Gentzen says "an introduction rule gives, so to say, a definition of the constant in question" while "an elimination rule is only a consequence of the corresponding introduction rule" (translated and quoted by Prawitz, 1965, p.33). An
elimination law appears to specify the strongest possible set of inferential consequences to be drawn from a logically complex sentence, just as the introduction law specifies its weakest grounds.

The analogy Dummett and Prawitz appear to have in mind is this. In a natural deduction system one could characterise a logical constant by laying down an introduction law for it, and specifying that the elimination law is the inverse of the introduction law. Equally one could characterise that constant by laying down an elimination law, and specifying that the introduction law is its inverse. Likewise, we could specify the meaning of a logically complex sentence either by specifying conditions of canonical provability, or in terms of the inferences that could be drawn from it. Underlying this analogy may be the thought that mathematicians manifest their grasp of complex mathematical sentences in two distinct features of their mathematical practice: recognising when the use of the sentence is justified, and drawing inferences from it. Just as mathematicians have command of both $I$ and $E$ rules for constants, and either, together with the inverse property, serves to define the other, so the practices which define the meaning of a mathematical assertion can be specified in two ways.

The status of the claim that elimination laws provide an alternative to introduction laws for specifying meaning is questionable, if the argument of 4 was correct. For the laws specify meaning within a well defined context of deducibility, where deducibility is that relation between sequents preserving a semantic property. Both introduction and elimination laws specify meaning only in the context of an antecedently given semantic notion. The practices which we invoked to justify appeal to canonical proof
conditions in specifying the meaning of the logical constants were the practices of proving a mathematical sentence. The alternative conception is that of drawing the consequences of a complex mathematical sentence. It is natural to think of inferential practices as justified, or appropriate, when the grounds for the complex sentence warrant drawing the consequences. But evidently this is not an alternative conception to that provided by canonical proof, since it appeals to the grounds justifying the use of complex sentences, which canonical proof conditions were designed to define.

One conception which provides a genuine alternative seems to be this. Just as we might take truth, intuitionistically conceived, to be determined by conditions of canonical provability, so we take the property which is not acquired, in passing from the consequences to the premisses of a valid proof, namely falsity, to define the central semantic notion of a theory of meaning. An account of this type would yield falsification conditions for complex sentences in terms of those of their components: an option Dummett considers, and which is discussed in V.3.

But this is not the contrast Dummett appears to draw between grounds and consequences. Rather, he hopes to specify canonical consequences, just as he specifies canonical proof conditions, by listing conditions under which such consequences can be drawn. If it was possible to provide such a specification, then we might stipulate that canonical proofs and canonical consequences must be in harmony, or in an analogous relation. That view is one Dummett often expresses in his discussion of holism, and I shall postpone my discussion of it, accordingly, until VII.5.2.
5. Disquotational Theories for Intuitionist Logic

When the logic of the metalanguage is intuitionist, a Tarski style recursive definition of an empirical notion of truth yields a predicate which validates intuitionist logic. In a theory of this sort — an I-theory — we can derive every instance of the equivalence

\[ S \text{ is I iff } p. \]

where 'p' in the metalanguage translates the object language sentence, 'S'. When the object language is contained in the metalanguage, the sentence mentioned on the left is that used on the right. In the I-theory we interpret the biconditional intuitionistically:

\[ p \leftrightarrow q \overset{\text{df}}{=} (p \rightarrow q) \& (q \rightarrow p) \]

So the biconditional holds if there is means of transforming a proof of 'S is I' into a proof of 'p', and vice versa. If we interpret 'I' as 'provable', suitable homophonic biconditionals are provable. Clauses for complex sentences resemble those familiar from the T-theory. So

\[ '\text{Not A'} \text{ is I iff not (A is I)} \]

which we read as the claim that a proof of A leads to an absurdity can be transformed into a proof that it is absurd that A is provable, and vice versa. In such a theory we cannot derive \((A \lor \neg A)\) or \(\neg \neg A \lor A\).

The I-theory appears to provide an alternative intuitionist account of the meaning of logically complex sentences to that provided by canonical proof. It preserves the virtues of the T-theory, in that it explains how speakers can understand a potentially infinite number of sentences. This an account of canonical proof is also able to do. But the I-theory might be seen as a means of directly stipulating the intuitionist account of the truth of mathematical sentences in terms

of the conditions of provability of mathematical sentences.

An I-theory is susceptible to an objection analogous to that for T-theories. We remarked that T-theories may be extensionally correct, although their theorems are intuitively unacceptable, because of the addition of conjuncts to the T-sentences. Now if

\[ S \text{ is I iff } p \]

then surely so is

\[ S \text{ is I iff } p \text{ and } q \]

where 'q' is an intuitionist logical truth? Intuitionists may adopt the solution mentioned at 1.2.1. Some supporters of Davidson suggest that the suitable T-theorems are those theorems whose canonical proof employs just the axioms and rules for expressions contained in the metalanguage. The intuitionist could make a similar claim.

Dummett has a general objection to the disquotational specification of meaning provided by such theories: that they fail to say in what command of the logical constants consists. He calls such meaning specifications "trivial" (1976, pp.107-110) and says

What is significant about a logical constant is not whether it is possible to construct a theory of truth so as to adopt a trivial axiom governing it, but, on the contrary, whether it is possible to derive a non-trivial axiom for it. (1976, p.109)

and goes on

While it is possible to adopt trivial axioms for the intuitionistic constants, the standard explanations of these constants yield axioms of a different kind, not stated in terms of truth, but in terms of proof. (1976, p.109)

If Dummett's objection is taken as an objection to the ease of formulating clauses for the logical constants in I-theories, it is misguided. It is clear, for example, that formulation of the clause

'A \text{ wa } B' \text{ is T(I) in Arabic iff } 'A' \text{ is T(I) and 'B' is T(I)}
requires a certain knowledge of Arabic. In the domestic case, the clause for 'and' is intended to represent just this knowledge.

The second quotation above suggests that Dummett thinks it is the determination of proof conditions which is objectionable in an I-theory. Undecidable sentences, he appears to suggest, could not be accommodated by trivial axioms. But there is a prima facie means of accommodating undecidable sentences. Where 'S' is undecidable

\[ S \text{ is I iff } p \]

will be adequate just in case the undecidability of 'S' is mirrored in the undecidability of the RHS. For if 'p' is undecidable, then 'S is provable' should also be undecidable, and while there could not be a proof that 'p' is undecidable nor could there be a proof that 'S is provable' is undecidable.

There is, however, another way of formulating Dummett's objection. We have observed that T and I theories attribute to speakers knowledge which is manifested in the abilities of speakers via principles that speakers try to assert truths (among other things). The formulation of the I and T-theories yield no substantial distinction between the different notions of truth they use. Certainly, justification of one or other theory could not depend on the formulation of the theory, for it was a requirement that both yielded theorems of a particular form. Questions of justification are then seen as antecedent to the formulation of a theory of a particular type. Whether a Tarski type meaning specification is intuitionist or classical depends on the logic of the metalanguage and the nature of the disquotational predicate. Dummett may be objecting to the impotence of theories so formulated to provide a justification of the logic of the object language. Moreover, the intuitive explanations of
the logical constants were used in explaining the clauses of the I-theory. Might we not claim that canonical proof conditions, which capture those intuitive explanations, provide the full explanations of the intuitionist logical constants?

Indeed, this appears to be the deepest ground of Dummett's objection to disquotational theories. He says:

If the intuitionist notion of truth can be explained only by a Tarski type truth definition which takes for granted the meanings of the logical constants, then the intuitionist notion of truth, and hence of provability, cannot so much as be conveyed to one who does not accept it already. (1975, p.30)

The virtue of the specification provided by canonical proof conditions is that they would convey the sense of the intuitionist logical constants to, say, a realist. For the stipulations would suffice to make it clear to the realist what content he should give to the intuitionist constants.

Now an account of meaning is not generally obliged to explain the meaning of sentences of a language in such a way as to make it comprehensible to those who do not grasp any of the concepts in the language (IV.1.2). But the intuitionist is required to justify the revision of classical practice he advocates, to a realist. The I-theory cannot achieve this purpose.¹⁰

Can we say that the disquotational predicate of the I-theory is that predicate which holds of mathematical sentences just when there are canonical proofs of them? In that case, we might say, the I-theory defines truth, intuitionistically conceived. Intuitionist truth, so conceived, distributes over the logical constants. But, if (with Dummett) we admit a distinction between demonstrations and canonical proof conditions, and take the former to define truth,
intuitionistically conceived, it is not obvious that truth distributes over the constants. For we may, on Dummett's hypothesis, possess a demonstration of, say, $\neg A \lor B$, while yet lacking a proof of either disjunct.

Dummett's distinction between intuitionist truth and conditions under which sentences are canonically proved is one I have already questioned. It appears to be one which, in this context, we might readily avoid. For if we have an intuitionistically valid demonstration of $\neg A \lor B$, then we have, in principle, means of finding a canonical proof. This distinction arises, as Dummett (1975, p.31) remarks, when we interpret the claim that there exists a canonical proof as significantly tensed. If we do so, we appear committed to the unjustified supposition that, at any time when we possess a demonstration, we also possess a canonical proof. Similar difficulties arise if we interpret the claim that there exists a canonical proof as the claim that a particular person possesses such a proof.

10. McDowell (1976, §§6,7) argues that what I have called an I-theory could serve to convey the sense of the intuitionist logical constants to a realist, since both classical and intuitionist accept the same disquotational clauses. The intuitionist should be regarded as restricting inferences to what is knowable. But, as McDowell admits, it will not be possible to regard intuitionist logical truths as true purely in virtue of the senses of the logical constants, if this case, although he may regard them as knowable purely in virtue of the senses of the logical constants. Surely, as a means of justifying the intuitionist logical constants this is inadequate? The realist will not yet understand why the intuitionist fails to draw the valid inferences he admits. Moreover, McDowell invokes the notion of knowability, in showing how the realist should understand the intuitionist. But it is surely a decidable matter whether 'S is knowable' - if 'S' is undecidable, it simply is not knowable that S, as things stand.
Mathematical statements are not significantly tensed. Nor, if the considerations of 1 were correct, should we specify their meaning in terms of a particular person's possession of a proof. So there seems to be no objection to allowing that truth, intuitionistically conceived, distributes over the logical constants. If this is so, then the disquotational predicate 'is provable' liberally interpreted as 'in principle provable', might be taken to specify truth, intuitionistically conceived. In that case, the I-theory does define the meaning of the intuitionist logical constants, although it does not justify their adoption, or provide an explanation of them for one who does not already understand them.

The I-theory should not be regarded as an alternative to an account of canonical proof. It must rather be regarded as a recursive specification of intuitionist truth conditions, the rationale of which consists in the account of canonical proof conditions.

6. Conclusion

I have followed Dummett in arguing that intuitionism in mathematics is an account of the meaning of mathematical sentences which ensures that the grasp of sentences involving quantification over infinite domains is manifestable. I have also endorsed Dummett's claim that canonical proof conditions for logically complex sentences determine the meaning of the intuitionist logical constants, and his claim that a recursive Tarski style theory couched in an intuitionist metalanguage does not serve the purpose of justifying intuitionist logic.
The points at which I differ from Dummett are particularly obvious if, anticipating later chapters, we consider intuitionism in mathematics as a model for a theory of meaning for natural language. One disanalogy between mathematics and natural language should be obvious: I have mentioned cases in which there is undecidability in natural language and yet which do not involve quantification over infinite domains (II.5). That disanalogy has played no part in this chapter, but will be discussed later.

I have argued that introduction and elimination laws for a logical constant do not determine its meaning, since the proper formulation of the laws requires a well defined context of deducibility. I have therefore been chary of accepting Dummett's appeal to an analogy with introduction and elimination laws in talking of the grounds and consequences of sentences of natural language. This question is raised again in the final chapter.

Moreover, I have argued against Dummett's view that demonstrations, or indirect proofs, give rise to a notion of truth which may be distinguished from that determined by canonical proof conditions. We can distinguish demonstrations and canonical proofs but the former are valid only if reducible to the latter. On my view, truth, intuitionistically conceived, is determined by conditions under which sentences are canonically proved, and hence it distributes over the constants, since canonical provability does. This is in accord with the argument of II.6 that assertibility should distribute over the constants. Furthermore, there is no objection to allowing that a disquotational theory in which the logic for the metalanguage is intuitionist and the disquotational predicate is read 'is provable', defines truth, intuitionistically conceived.
CHAPTER IV

MANIFESTATION, ACQUISITION AND REDUCTION

Introduction

In Chapter I, I employed the manifestation argument against verification transcendent realism in theories of meaning which attributed to speakers abilities to discern content, and to those theories which attributed abilities to recognise communicative intentions. Dummett's account of meaning in terms of assertibility conditions in natural language, and intuitionistically construed proof conditions in mathematics were described in Chapters II and III as motivated by the manifestation argument. In this Chapter, I shall discuss the foundations and consequences of the manifestation argument. In particular, I urge that it should not be seen as a consequence of epistemic considerations. I shall assume that anti-realism rejects verification transcendent truths and Bivalence.

Dummett presents the manifestation argument in tandem with the claim that the acquisition of semantic abilities must be explained in terms of features of use. I shall suggest that the manifestation argument is prior to the acquisition argument. Various arguments from analogy in support of a realist semantics fail to meet the manifestation argument, although they might explain how realist beliefs are acquired. Putnam has a different argument against what he calls "metaphysical realism", based on the Löwenheim-Skolem theorem. He argues for epistemic constraints on truth, which are not, I find, equivalent to those that the intuitionist suggests. Routley's
argument that epistemic constraints on truth lead to absurdity is questioned.

Arguments against anti-realism concentrate on the specifically reductive character of many of its formulations. Intuitionism in mathematics is not reductionist, but varieties of anti-realism about particular areas of the world have often taken the form of reductionism. When a theory of meaning takes assertibility conditions as central, the reductionism of the theory depends in part on the temporal, spatial and personal specification of assertibility conditions. There should be no temptation to locate an observational reductive class in an assertibility conditional theory of meaning. There is, however, a difficulty for the anti-realist model in accounting for one class of observation sentences - those in which vague predicates are used. I consider a realist account designed to meet the manifestation challenge, and an anti-realist response to that reply.

In this Chapter, I take undecidable sentences in mathematics and natural language to be those sentences for which there is no means guaranteed in principle to determine truth value.

1. Manifestation

One not very happy way of expressing the conclusion of the manifestation argument is that truth must be epistemically constrained. A similar constraint has been drawn from a variety of premises, and been thought to have a variety of corollaries. In particular, the possibility of sceptical doubt about what is meant has been thought absurd, and epistemic constraints on truth have been taken to avoid such absurdity. One interpretation of the
manifestation argument describes its motivation in a similar fashion. It would be absurd if speakers of a language could appear to know the meanings of sentences of a language, and yet misunderstand those sentences. A theory of meaning which eschews verification transcendent notions in specifying meaning avoids this absurdity by ensuring that the truth is, in Wright's phrase, "epistemically transparent" (1980a, p.199).

The infelicity of this description derives from the fact that Dummett (1975, pp.5-9; 1976, pp.68-70) employs the manifestation argument as a semantic argument. Epistemological constraints on truth are a consequence of semantic questions. Evidently the manifestation argument is an argument which issues in conclusions about knowledge of meaning; but it does not depend on a priori claims about either the psychology or the cognitive states of language users. I shall suggest an alternative account of the manifestation argument, and hence of the anti-realism consequent on it.

1.1 Semantic knowledge

When Dummett presents the manifestation argument, he does so in terms of the semantic knowledge that a theory of meaning attributes to speakers of a language.¹ He distinguishes force from content, and suggests that speakers must be attributed knowledge of the contents of sentences they use.² In employing the manifestation argument against realist accounts of content, Dummett can be interpreted as applying the two constraints on attribution of linguistic abilities cited in

1. See for example Dummett (1975, pp.5-9; 1975a; 1976, §I; 1979).
2. As remarked in 1.2.3, this conception is not universally accepted even within Fregean accounts. I remark on one alternative view in 1.3, and consider holistic explanation in VII.3.
1.1.2 - namely parsimony and propriety. The first enjoins us not to explain linguistic behaviour by attributing abilities, or in this case semantic knowledge, stronger in predictive power than the behaviour displays. The second constraint suggests that linguistic abilities, or semantic knowledge, must be so described as to be suitable for explaining communication. The second constraint implies that semantic knowledge must be manifest in use: the first, that it must be exhaustively manifest in use.

Dummett argues that semantic knowledge cannot be manifest just in the ability to paraphrase or provide verbal explanations of sentences of a language. For such abilities could not provide non-circular specifications of semantic knowledge. Dummett turns then to the practical operational abilities in which semantic knowledge is manifested: in particular, the activities of proving or justifying sentences of various types. He takes those practical abilities to be grounded in discriminatory recognitional skills. One who possesses the ability to tell when a mathematical sentence is proved or when an assertion is justified possesses, according to Dummett, semantic knowledge of the content of sentences.

In this context, it appears that parsimony alone can be employed to reject a realist conception of undecidable sentences. For there could be no means guaranteed to discriminate states of affairs in which such sentences if true are true or if false are false, yet the

3. A version of this constraint is put by Evans:
we should refrain from attributing to expressions of the languages we study semantic properties for which there is absolutely no evidence (1975, p.350),
and was generalised by Peacocke to attribution of concepts in a seminar given to the Department of Philosophy, Research School of Social Science, Australian National University, in September, 1981.
realist wishes to allow that such sentences are determinately either true or false. Now the realist denies that such sentences are provable; but the notion of truth the realist invokes is one which could not be exhaustively manifest in behaviour, since it could never be appropriately applied. Similarly, intuitionist scruples about quantification over infinite domains might be regarded as a consequence of the inability of speakers to discriminate states of affairs in which such sentences are true. Replacing truth conditions realistically conceived as the central notion of a theory of meaning by conditions of proof or assertibility would guarantee that speakers could effectively discriminate states of affairs in which sentences if provable are provable, or if provably not provable are so. Discriminatory abilities of these latter sorts are exhaustively manifest is use.

To present the manifestation argument in this way is misleading because it leaves open two sorts of realist response. The first is that adherence to L.E.M. or Bivalence for sentences of the disputed types precisely manifests a grasp of unverifiable truth conditions. Just as subscribing to L.E.M. is legitimated by the truth of a decidable sentence or of its negation, so, such realists claim, subscribing to L.E.M. for undecidable sentences shows that speakers have a conception of its realist truth conditions, although neither it nor its negation could be proved. Subscription to L.E.M. is the activity which manifests a realist conception of truth conditions on this view. The second naive realist response merely affirms that, whatever the discriminatory capacities of speakers, truth cannot be epistemically constrained. Such naive realists divorce the notion of truth from the (realisable) aims of speakers who attempt to speak the truth, and embrace scepticism. On such a view it is precisely the
reluctance of speakers to allow that recognisable truth constitutes absolute truth - whether for a particular class of sentences, or in a general global fashion - which manifests their conception of realist truth.4

What has been omitted is Dummett's appeal to Wittgensteinian considerations. The cluster of arguments about what it is follow a rule have the consequence that semantic knowledge must have public criteria of application. For if it did not, there would be no guarantee that semantic knowledge is consistent throughout a community. Without such a guarantee the concept of semantic knowledge is incoherent. The faults in the two realist responses above are that they invoke an ability to manifest a conception of realist truth conditions which could have no such public criteria of application. The first response does so by attributing to speakers a conception which is supposed to justify speakers' adherence to L.E.M. for undecidable sentences. But the conception could not both be manifest in behaviour and justify L.E.M. for those sentences. There is a crucial difference in this respect between decidable and undecidable sentences: in the first case speakers could justify their use of L.E.M., whereas in the second they could not. It is useless to claim that undecidable sentences have truth conditions of the same sort as those of decidable sentences, for there is no constraint on what would count as the same sort. In a holistic account, of course, adherence to L.E.M. may be justified by simplicity, and hence does not require semantic justification of the sort which is here problematic for the

4. One version of an argument to this effect can be found in McGinn (1979). He argues that our inclination to accept that sentences might be true, but not assertible, is evidence of a realistic conception. I think that the argument below suffices to refute his views.
realist. Similarly unless a holistic account is adopted, the naive realist conviction that scepticism about truth manifests a conception – however unverifiable – of absolute truth cannot be supported. For that conception would itself be incoherent unless it could be specified.

In the light of the rule following considerations, Dummett's anti-realist view can be seen as one which avoids incoherence in an account of semantic knowledge by ensuring that semantic knowledge is always manifestable. But that view still appears to be essentially epistemic. For the manifestation argument as presented above appears to be a consequence of the fact that it is semantic knowledge and not, say, semantic guesswork that a theory of meaning seeks to describe.

1.2 Implicit knowledge

Dummett has argued that a theory of meaning should represent the implicit knowledge speakers of a language possess. He argues that the purpose of representing implicit knowledge could not be met by theories – among which he originally classed disquotational theories – which are "modest" (1975b, p.102). Modest theories explain the mastery of the object language in terms of concepts of the metalanguage which correspond precisely to those of the object language. And that, he suggests, is no explanation at all. At times, Dummett (1975b, pp.106-114) speaks as if modest disquotational theories require supplementation by an account of the knowledge of the proposition expressed by the theorems (the T or I-sentences) of the theory. He appears to suggest that an adequate account of the propositional knowledge of speakers of a language will impel us to abandon realism.
This way of presenting the argument has been misleading, for it invites us to interpret the manifestation argument as resulting in a claim about the limits of propositional knowledge. Dummett (1975b, pp.127-133) admits that holistic disquotational theories need not be modest, but the relevant question at this point is whether an adequate theory of meaning must attribute propositional knowledge to speakers at all. In a later essay, Dummett describes his conception of a theory of meaning more precisely. He says that speakers of a language have practical knowledge, knowledge how to speak the language; but that is no objection to its representation as propositional knowledge; mastery of a procedure, of a conventional practice, can always be so represented, and, whenever the practice is complex, such a representation often provides the only convenient mode of analysis of it. (1976, p.69)

On this revised conception, a theory of meaning aims to describe speakers' practical knowledge by attributing to them implicit propositional knowledge. We might conceive of the attribution of propositional knowledge as an explanatory device. Dummett, after describing a theory of meaning in this way, says: "A theory of meaning is not a psychological hypothesis" (1976, p.70), and claims that a Martian or a robot speaker of a language, whatever his psychological or physiological organisation, would justifiably be

5. See, for example, Devitt (1980), who appears to interpret Dummett in this way.

6. Cro~hwaite (1979) discusses this question. She concludes that an explanatory account of meaning should attribute theoretical propositional knowledge to speaker. I cannot rehearse her arguments here, but it will become clear that I endorse her conclusion.

7. I do not regard this claim, or any of what follows, as incompatible with a view that linguistic abilities are recognitional, in the sense of I.1.1. For we can attribute recognitional abilities as an explanatory device. Phonemes, for example, have this role, for they can certainly not generally be recognised in isolation. Consider the /ʃ/ of 'sing'.
attributed knowledge of a theory of meaning for that language.

This claim is tendentious - for we might want to deny the attribution of such knowledge to beings which are not intentional. However, although a theory of meaning may not be a psychological hypothesis, it may be a cognitive hypothesis. Dummett's account of a theory of meaning as representing speakers' implicit propositional knowledge appears to treat a theory of meaning in just this way as a cognitive hypothesis. If so, the argument of the previous section must be reconsidered. The final interpretation of the manifestation argument in 1.1 suggested that "epistemic transparency" could be guaranteed by a certain description of linguistic abilities. Yet this seems to reverse the order of explanation, since we needed to assume that the semantic knowledge can be specified independently of linguistic abilities.

In II.3, I noted that Dummett's conception of the internal cognitive process of understanding is that its description is parasitic on the description of the linguistic conventions to which speakers adhere (Dummett, 1973, p.300). Surely a cognitive hypothesis about semantic knowledge should then be seen as parasitic on the appropriate description of behaviour? If so, there is no objection to regarding a theory of meaning as a cognitive hypothesis, as long as one admits that the cognitive hypothesis can be justified only by appeal to the explicit behaviour of speakers. In particular, the behaviour of speakers in justifying their assertions provides the evidence on which we base our cognitive hypothesis.

To present Dummett's argument in this way is not yet to label his position behaviourist - for there need be no presumption that there could be an explicit translation or reduction of the cognitive to the
behavioural. The view leaves open the possibility that attribution of cognitive states supervenes on the behavioural, or possibly on the physical, although Dummett would resist both physicalism and the holistic form of explanation characteristic of those who adopt such a view.⁸

If this is correct, it would be wrong to identify the motivation of the manifestation argument as a desire to avoid sceptical questions about whether speakers could know the meanings of the sentences they use. Rather, Dummett should be interpreted as arguing that semantic knowledge could not outrun its manifestation in the behaviour of proving, justifying or defending sentences.⁹ On this view, the attribution of practical knowledge to speakers can be justified only in the context of their displaying, in their linguistic behaviour, abilities which warrant such attribution. To describe such knowledge in propositional terms is to provide an explanatory framework, in terms of which speakers' actual abilities to interpret previously unencountered utterances, or to accept arguments as valid, is itself explained.

A view of this type appears to be compatible with a description of the relevant semantic knowledge in terms of an I-theory, as proposed in III.5. The I-theory was precisely designed to capture the intuitionist account of truth, by tailoring the disquotational predicate and the logic of the proof theory to an account of meaning in terms of canonical proof. The theorems of an I-theory might be

⁸ Davidson, e.g. at (1976, p.38) urges such supervenience. I comment briefly on this question again at 4, but do not intend any more than the suggestion of the possibility.

⁹ I am here suggesting the Dummett falls not into the second, but into the third class of anti-realists Wright discusses in (1980a, Ch.XII, esp. pp.226-7).
taken to display in what knowledge of the meaning of mathematical sentences consists, since it specifies when sentences are provable, in terms of the sentences of the metalanguage.

Since the I-theory is not holistically construed, it is a modest theory. It is important to distinguish three readings of Dummett's objection to such theories. On one reading, Dummett appears to reject a theory of meaning which does not provide necessary and sufficient conditions for the possession or acquisition of the concepts it seeks to explain. But Dummett does not conceive of the intuitionist explanation of mathematical sentences as providing conditions of that sort. He observes (1969, p.243) that there is no reason why the conditions under which a mathematical sentence is provable should be expressible in language any less complex than that in which it is itself expressed. Dummett's objection should not be construed as a rejection of non-reductionist theories.

There is another thesis of Dummett's which has been associated with his rejection of modest theories of meaning. In 1.2.1, I mentioned Dummett's principle that if two expressions have the same sense speakers of a language must know that they do. He employs the principle chiefly in discussion of the sense of singular terms. We can now see the justification for the principle. If a theory of meaning allocates the same sense to two expressions, on the basis of their contribution to the means of determining truth value of the sentences in which they occur, there could not be any justification for allowing that the two expressions are not known to have the same sense. For knowledge of meaning consists in (or more weakly, supervenes on) the practices of justifying sentences. However, to accept Dummett's principle is not to accept a description theory of
names. There is no reason why we might not represent the sense of a term by stipulating its referent: for that stipulation itself provides all we should require of a mode of presentation. Modesty in this sense is surely not objectionable.

Thirdly, Dummett may be objecting to the impotence of modest theories to justify the logic of the metalanguage. As I noted in III.5, this objection is well taken. Dummett envisages a supplementation of an I-theory by an account of canonical proof, or by an account of the knowledge in which grasp of the propositions expressed by the I-theorems consists. If we accept a supplementation of the latter type, then knowledge of the I-theorems does suffice for a description of the practical abilities of speakers of a language. For speakers are taken to know when sentences of a language are provable in terms of the provability conditions of sentences of a metalanguage which they are assumed to understand.

Now, Dummett requires that speakers know the propositions expressed by the theorems of the theory of meaning. If the earlier argument is correct, Dummett's requirement should be expressed as the requirement that speakers be attributed knowledge of a theorem only if they can exhaustively manifest that knowledge in their behaviour. This is guaranteed even in a modest I-theory by the use of 'provable' in place of 'is true'. I do not think that the modesty of I-theorems prevents the I-theory from fulfilling Dummett's requirement if it is considered in the context of the account of semantic knowledge of this section. So, despite the inadequacy of an I-theory in justifying an intuitionist logic, an I-theory could properly serve to provide an account of the meaning of mathematical sentences. The analogous disquotational account of assertibility conditions in natural language
should equally serve to give an account of the meaning of sentences of natural language.

The manifestation argument leads to the rejection of realist interpretations of sentences of various classes whether the preferred theory of meaning is an I-theory, or an account of canonical assertibility conditions. We can describe the dispute between realist and anti-realist over the reality of time and other minds, for example, on the model of the dispute between intuitionism and platonism in mathematics. In each case, the anti-realist can be seen to insist that the central notion of a theory of meaning should be one for which there is warrant in the behaviour of speakers, while the realist denies that this must be so. The anti-realist argues that the realist account of semantic knowledge, in terms of verification transcendent truth conditions, could not be justified by the behaviour of speakers in using sentences. According to this version of the manifestation argument, the theoretical central notion of a theory of meaning must be one which derives from use.

1.3 Rule following

Wittgenstein (eg. at 1953, §§143-150, §§185-200) argues that we are not justified in attributing to speakers grasp of a rule on the basis of which, say, they begin to expand an infinite decimal. For any finite part of that expansion could be consistent with many different rules. Wittgenstein concludes that the conception of a rule guiding the behaviour of speakers in this way is incoherent. I have suggested that Dummett's reaction to Wittgenstein's remarks can be interpreted as a claim that a theory of meaning is an explanatory hypothesis, which is justified in terms of the actual behaviour of
speakers in using sentences.

It has been suggested that the account of the manifestation argument in 1.2 is not faithful to Wittgenstein's conception of the rule following considerations. For he adopted an explicitly non-revisionary account of logic, whereas the position adopted here leads to abandoning Bivalence and L.E.M.. One analysis of why Wittgenstein would reject a revisionary theory proposes that the rule following considerations are offended by the attribution to speakers of implicit knowledge. For implicit knowledge is taken to guide practice in previously unencountered situations, whereas the rule following considerations suggest that this could never be so. If the rule following considerations had this consequence, it would be necessary to abandon all predictive theorising. Moreover, to interpret the rule following considerations in this way would be to ignore the possibility that implicit knowledge may be attributed to speakers on the basis of their actual behaviour in interpreting others.

Nevertheless, there is a certain perversity in the view of 1.2, in which an account of implicit knowledge, introduced in order to explain practice, may be revisionary of practice. For if the purpose of such an account is to explain practice, then surely it is correct only if it does so? However, the anti-realist claims that the practices he rejects are incoherent, since the activities in which grasp of content are manifest are absent for effectively undecidable sentences.

10. This view was put to me by P.M.S. Hacker in a tutorial.
McDowell (1976; 1977a; 1981) opposes this conception of a theory of meaning, and suggests that it offends the rule following considerations it was designed to meet. He argues that semantic knowledge is manifest in the activity of speakers in redescribing others' utterances as assertoric. Any stronger requirement is, he thinks, "nothing but the psychologism which Frege discerned" (1977a, p.182). As we remarked in 1.2, Dummett is opposed to psychologism. But McDowell thinks that only psychologism could prevent Dummett from accepting a non-revisionary account of the manifestation of semantic knowledge. However, even if one accepts McDowell's version of the manifestation of semantic knowledge, revisionary consequences might still follow. The ability to redescribe others' utterances as assertoric - or even as commands - must be itself exhaustively manifest in use. There is as much a principled difficulty in saying what redescriptions are correct, as in specifying the assertoric use itself. Equally, to say that another commanded that p, when 'p' is unfulfillable, is not to say something for which there are public criteria of correctness. McDowell's account of semantic knowledge is susceptible to the manifestation argument if it is not holistically construed.

McDowell's (1981, §§7-9) claim is that to employ the manifestation argument in this way is itself mistaken. He suggests that it is Dummett's requirement that theories of meaning should not be modest which leads Dummett to his revisionary conclusions. Moreover, he argues that Dummett's opposition to modesty is epistemic prejudice, informed by a search for firm foundations for semantic knowledge of the sort that Wittgenstein has shown us not to expect. If I am correct in thinking that rejection of modesty is not necessary to the application of the manifestation argument, then McDowell's
analysis seems questionable. Nevertheless, his substantive point applies equally to the conception of anti-realism mentioned at the end of 1.2. For he says

If we suspend our propensity to take one another at face value, we are confronted with such questions as this: supposing our awareness of someone's linguistic behaviour to date has run smoothly and without puzzlement, so that the behaviour conforms to a familiar pattern, how do we know that this was not a short stretch of a pattern which equally fits the behaviour so far, but which, over a longer stretch, we should find unintelligible? (1981, p.243)

The anti-realist of 1.2, like that of 1.1, provides an account of what speakers mean in terms of their abilities to justify sentences. McDowell suggests that such an account could not guarantee that, over long stretches of time, speakers' intentional behaviour might not unpredictably alter.

McDowell adopts a holistic view of the explanation of intentional action which is precisely designed to guarantee the intelligibility of intentional behaviour of this sort. A theory of meaning for an alien tongue is, in his view, one which so employs the principle of charity that it is adequate only if it makes sense of speakers (1977a, §1). A theory of meaning for the domestic case, on the other hand, shows how speakers "take one another at face value", by providing homophonic specifications of meanings which are adequate however the behaviour of speakers alters. This is not the place to evaluate such holistic theories. I shall further consider them at VII.3. But it is evident that the anti-realist will not accept that the aim of a theory of meaning is to make speakers' behaviour intelligible, when that is at the cost of obscuring genuine changes in meaning.
Consider, for example, a case in which, surprisingly, speakers of language begin to apply 'green' to objects that had previously been called 'blue', or to apply 'admirable' to atrocities. According to the anti-realist, the procedures which are used for determining the truth value of the new sentences genuinely differ from the earlier procedures: hence he will claim that there has been a change of meaning. Equally, when speakers begin to employ a term more widely than they previously did, the anti-realist will rule that there has been a modification of meaning. In such cases, the homophonic account above will not register a change in the theory of meaning — although there will be a change in the behaviour of speakers who use the language. McDowell's guarantee of intelligibility appears to be no guarantee at all — but rather a persuasive definition.

Wright (1980a, II.4, Ch.X-XII; 1981) also questions Dummett's appeal to rule following considerations. At times he suggests that the anti-realist mistakenly supposes that grasp of meaning is grasp of a determinate, consistent procedure for using sentences. This question he raises, in particular, for sentences containing vague predicates — a matter I shall consider in 5. He also suggests that the anti-realist, if he is to support revisionary views, must conceive of correct practice as an objectively assessable matter. For to judge a practice as correct one must appeal to standards which are not themselves manifest in practice. He opposes to the revisionary anti-realist a Wittgensteinian conception in which the validity of logical laws is a matter of stipulation, enshrined in the actual practices of speakers. Again, I postpone these questions (VII.4).
The anti-realist who wishes to apply rule following considerations need not accept all Wittgenstein's arguments. I shall henceforth assume the interpretation of 1.2, whether it accords with Wittgenstein's views or not.

2. Acquisition

I have based the arguments about the correct account of linguistic knowledge on the manifestation argument. Many have thought that a related argument, deriving constraints on the form of semantic knowledge from the process of acquisition of that knowledge is more effective. Dummett treats the argument from acquisition as an independent ground for rejection of a theory of meaning in terms of realistic truth conditions. I shall suggest that the acquisition argument is dependent for its application on the manifestation argument.

The acquisition argument claims that any account of linguistic knowledge which does not make apparent how that knowledge might have been acquired must be inadequate. Knowledge of meaning could not have been acquired other than in response to observable features of linguistic use. Features which are not observable could not suffice for the inculcation of linguistic practices. Entirely private features of linguistic use would be unlearnable. Moreover, semantic knowledge could not consist in verifiable knowledge, since one could not then explain the initial acquisition of linguistic abilities. In order to explain the acquisition of semantic knowledge, we must

11. Such as McDowell (1976; 1977). Dummett's arguments about particular cases of anti-realism are often based on the acquisition argument. He gives an acquisition based argument for anti-realism about the past (1969).
suppose that learners acquire sensitivity to the types of evidence which justify assertions.

We may suspect that this last argument is not independent of the manifestation argument. Any feature of use which is a legitimate candidate for the manifestation of semantic knowledge can be used in an explanation of how that use might be acquired. Conversely, if an account of how a particular concept might be acquired relies solely on observable features of use, then it must mention features that describe the abilities in which semantic knowledge is manifested.

However, the manifestation argument is the prior one. If there were an account of semantic knowledge sufficient to meet the manifestation argument, we should accept that account, even though we could not explain how such concepts were acquired. If, on the other hand, adequacy were claimed for an account of acquisition which could not be used to meet the manifestation argument, the account of acquisition would be counted inadequate as an explanation of communicative practice. The features whereby semantic knowledge was acquired would be counted irrelevant to the abilities of speakers to communicate.

Some, such as McDowell (1976, p.64; 1978, pp.134-140), have thought it possible to meet the anti-realist objections by showing how a realistic conception of sense for problematic areas might be acquired, although it could never be manifested. He suggests that speakers may acquire a realistic conception of, say, the past or other minds, by extension from cases in which knowledge of past truths or of other minds is non-inferential. His suggestion is that some such non-inferential knowledge is required for an account of the past and of other minds.
I am not here concerned with the premise of McDowell's argument. It is evident that, without further assumptions, this model of acquisition must be inadequate for any case in which the manifestation argument cannot be met. Consider, for example, attributions of pain. A learner is confronted with situations $S_1, \ldots, S_n$ in which, McDowell suggests, he has genuine access to the truth conditions of 'He is in pain' via the evidential support for the claim. McDowell supposes that this suffices for a learner to acquire a grasp of 'He is in pain' when all such evidence is lacking. But it could not. A learner would be merely confused if he were asked to apply 'He is in pain' in a situation $T$ similar in no recognisable respect to $S_1, \ldots, S_n$ in virtue of which he acquired the predicate, save that he is again asked to apply '...in pain'. Unless the manifestation argument can be met for $T$, appeal to the acquisition argument is ineffective. Thus, we cannot hope to meet the manifestation argument indirectly via the acquisition argument. Nor should we be concerned, once the manifestation argument is met, by further questions as to the route whereby semantic knowledge is acquired.

2.1 Analogy

It has been commonplace to reject both the manifestation and the acquisition arguments on the ground that they assume, what is not evidently the case, that the cognitive powers of speakers do not allow analogical extension. Those who appeal to analogy reject the assumption that speakers must be in a position to manifest their understanding in justifying assertions. They claim that speakers are in a position to manifest their understanding of sentences of certain classes and they gain a conception of realist truth conditions of sentences of the problematic classes by analogy.
The suggestion clearly is most plausible for acquisition by analogy. But, even if speakers have imaginative powers which enable them to conceive truth conditions of the problematic kind, we cannot say how those conceptions might be manifested in, or guide, the actual use to which speakers put their sentences. For there are no public criteria of when the imaginative extension is correct. Analogical extension provides an explanation of how speakers' realist beliefs might arise. It does not aid in the description of language as it is actually used.

It might be argued that any description of linguistic abilities sufficient to allow speakers dispositions toward sentences they have never and might never use already appeals to the type of unfulfilled ability required for analogical extension. However we do not need to attribute to speakers unrealisable dispositions with respect to what sentences could mean in order to explain the creativity of language use. We need only to attribute dispositions, evidence for which is exhaustively manifest in their use of sentences, to form other so far unrealised dispositions (1.3.2).

This reply is not yet sufficient to reject to the appeal to analogical extension. "Could we not" says Sklar in some way project an understanding throughout language, using its structural features as a guide to correct projection, from some fundamental basis acceptable to the verificationist? (1980, p.218)

The suggestion is that there is no more difficulty in using such structural projection than there is in the discernment of structure necessary for any theory of creative language use. We ought not to conceive such structural projection as yielding a grasp of the methods whereby an unverifiable statement by a being with superior powers might be verified. Rather the meaning of the sentences of the
probable classes is given by truth conditions of a particular projected form.

Now, certainly, we must allow that structural projection of this sort occurs in language. But there is a crucial difference between the structural projection necessary to explain the creativity of language use and that which yields recognition transcendent truth conditions. Sklar's argument can be reconstructed as the claim that whenever the meanings of 'Fa' and 'Gb' can be specified in a way that is acceptable to the verificationist, so too can those of 'Ga' (and 'Fb'), despite the failure of their truth conditions to be determinable. Sklar here denies that the manifestation argument need be met for every sentence in a theory of meaning, suggesting that the requirement is excessive.

If 'Fa' and 'Gb' are decidable, and 'Ga' is decidable, the structural explanation of the meaning of 'Ga' is acceptable to the anti-realist. If 'Fa', 'Gb' and 'Ga' are not decidable, then any structural projection determining the meaning of 'Ga' cannot lead from a grasp of decidable truth conditions to a grasp of undecidable truth conditions. In the crucial case, where 'Fa' and 'Gb' are decidable and 'Ga' not, there can be no feature of the structural projection which could be guaranteed to explain the meaning of, or yield realist truth conditions for, 'Ga'. For we have no determinate conception of what such meaning consists in. Although we may allow that in the two previous cases structural projection can determine the meaning of 'Ga', the third case is crucially different. Since, by hypothesis, the manifestation argument cannot be met, we have no test of the appropriate use of 'Ga'. The structural projection may be of various types projecting different features of the original sentences. In the
problematic case, we have no guarantee that the correct projection has been made. We are hence unjustified in treating the structural projection as of the same sort in this case, as it was when 'Ga' was decidable.

For example, it would be no help to one enquiring about the truth condition of 'He is in pain.' to be told that since he understands 'I am in pain.', and, say, 'He is ill.', he should immediately understand 'He is in pain.' said of another. There may, of course, be an argument of this form which shows that grasp of the two predications suffices for grasp of 'He is in pain.': but it would require more than mere appeal to structural analogy or indeed to any other analogy.\(^\text{12}\)

The intuitive attraction of arguments from analogy derives from the apparent clarity of such questions as

Is the universe 5-dimensional?

even when it is allowed that such a sentence might never be verified or falsified, and no evidence ever become available as to its truth or falsity. The suggestion is that our 4-dimensional universe might be just one of several 4-dimensional universes, consisting in cross sections of a 5-dimensional total universe, and yet that we could never be in a position to recognise that it is.\(^\text{13}\)

\(^\text{12}\) The obvious candidate for such an argument is the truth value link. According to truth value link realist, we acquire a conception of, say, others' pain, by grasping that they are in pain when it is for them as it is for us when we are in pain. It is clear that this begs, rather than answers, the worry expressed by the anti-realist: for we are required to know what it would be like for them to be in pain. (This point is further discussed in VI.4.1.)

\(^\text{13}\) This example is suggested by J.J.C. Smart (1981).
According to an anti-realist there is a clear sense to the predicate '...is 5-dimensional', derived from its use in mathematical models, and a clear sense to 'the universe'. One who advocates structural projection would regard that as sufficient for an account of the truth conditions of

The universe is 5-dimensional.

Yet structural projection can yield nonsense, as in Chomsky's "Colourless green ideas sleep furiously" (1957, p.15). We can of course attribute sense to such expressions, by metaphorical extension. We are inclined to regard the question

Is the universe 5-dimensional?

as having a determinate answer (in reality), despite our lack of means to determine the answer, just because the metaphor it invokes suggests how, in reality, the universe might be were it 5-dimensional.

We need not reject such metaphors as meaningless. But according to the anti-realist, the claim that

The universe might really be 5-dimensional although we could never establish that it is.

could not be true. For unless there were methods of determining how the metaphor was to be applied we could make no sense of it.

2.2 Success

Putnam (1978) has argued that the success of classical practice provides an empirical justification of realism. At times the argument, derived from Boyd, is phrased in terms of the success of scientific theories. But the success of scientific theories can be explained by the anti-realist, as long as success is recognisable success. He also suggests an argument of the following sort:

(1) x probably accepts S and
(ii) x probably rejects \( \neg S \)

Now, Putnam suggests, we can derive

(iii) x probably accepts whichever statement is true.

(1978, p.104)

The notion of 'truth' here, Putnam suggests, is realist in so far as it satisfies the Tarski criterion T, and is governed by classical logic. But the anti-realist may reply to this that not only classical logic can explain that success. We may, as has been remarked, take a truth definition meeting criterion T, but have an intuitionist logic. That notion of truth adequately captures the success Putnam remarks.

For, by intuitionist standards for decidable sentences, (i), (ii) and (iii) hold, while for undecidable sentences (i) and (ii) do not exhaust the possibilities. Yet, although in this case the argument from (i) and (ii) to (iii) cannot be counted valid, it could never be misleading. It could not, that is, lead from truth to falsity - but only from designated truth to an undesignated value.

There is an implicit appeal to analogy in this argument. For it must be the success of practices which have so far not yet been exercised which classical logic explains. That appeal to analogy the anti-realist regards as illegitimate.

2.3 Syntactic Analogy

Chomsky (1980, pp.109-119) argues that Dummett's appeal to the manifestation argument is fundamentally misconceived. His reasons are that the manifestation argument assumes that language is essentially social thus supposing that knowledge of language must have a certain form which we have no reason to think it should take.
Chomsky argues that the acquisition and manifestation of semantic knowledge need not be restricted to practical abilities whose exercise is recognisable. For, he argues, there is a mistake in limiting semantic knowledge to the behavioural. We can grant Chomsky his familiar point that the acquisition of semantic knowledge might be such as to require in speakers mental structures of a particular type, the possession of which could never be exhaustively behaviourally specified. But if, as I have argued, the acquisition argument is dependent on the manifestation argument, we should not expect thereby to have established that semantic knowledge cannot be exhaustively manifest in behaviour.

A crude reconstruction of Chomsky's views might be that, in order to explain acquisition of linguistic abilities, it is necessary to attribute complex mental structures to speakers. For example, we attribute an ability to speakers to provide the 'do' auxiliary to the main verb of negated and interrogative sentences, if that main verb has no other auxiliary. We say 'He goes.' but 'He doesn't go.' and 'Does he go?'; and 'He went.' but 'He didn't go.' and 'Did he go?' as Chomsky (1957, ch.7) remarks. An adequate explanation cannot be restricted to communicable features of utterances, but must count such sentences as coding information of an inaccessible and private nature. Furthermore, knowing a language consists in possessing structures of an appropriate sort. In this context, anti-realist scruples are unwarranted, for the cognitive content of sentences must outrun the recognitional abilities of speakers. We might label this view an argument from syntactic analogy.
But syntactic abilities, in the linguistic sense - the ability, for example, to treat certain sentences as well formed - are evidently less complex than semantic abilities, such as the ability to recognise content. And rules which generalise the syntactic observation as to the use of the auxiliary 'do' are justified within a grammar only in so far as the rules generate sentences with a clear sense. Chomsky so far has no argument against anti-realist scruples, since 'syntactic analogy', like semantic analogy, needs to explain the meanings of the sentences it supposes unproblematically specified.

Chomsky also suggests that semantic as well as syntactic abilities cannot properly be explained without appeal to complex cognitive structures. In this case, the relevant question is how Chomsky defines semantic abilities. He suggests that "to know a language is to be in a certain mental state comprised of a structure of rules and principles" (1980, p.51). Knowing the meaning of a sentence is knowing how those structures and principles apply to it. When mental states determine meaning there appears to be no reason why mental states should be recognitional, or, indeed, issue in any dispositions to behaviour. Verification transcendence is unobjectionable in a theory which allocates no role to truth at all.

In this case Chomsky's account of meaning fails to provide any explanation of how understanding a language, or another's utterances, could issue in behaviour or lead to knowledge of the world. Understanding is explained as a private mental act, manifested in the uttering of well formed sentences. But to explain such behaviour is not yet to explain how people understand one another. Explanation of the latter sort does depend on 'social' facts, and is a different enterprise from that Chomsky conceives as an explanation of knowing a
language.

3. **Epistemic constraints on truth**

Putnam has recently abandoned realism including the particular empirical realism mentioned in 2.2. He argues for epistemic constraints on the notion of truth, which he takes to be similar to the intuitionist constraints. He labels "metaphysical realism" the position for which truth is "radically non-epistemic" (1978, p.124). Metaphysical realists characteristically allow that the relation between a correct theory and the world transcends complete formalisation by its theorists. Putnam takes metaphysical realism to be incoherent, for he argues that there can be no unique relation answering to the transcendent notion of truth the metaphysical realist employs.

In a recent paper, Putnam (1980) applies the Löwenheim-Skolem theorem to the semantic theory for a natural language, and concludes that either truth must be epistemically constrained or that it is not uniquely specifiable. Putnam considers the observational vocabulary of a language, a set $S$ of observable things and events, and a (partial) valuation assigning correct truth values to the observational sentences in terms of elements of $S$. Now if a theory is consistent, there are models - even non-denumerable models - which give different interpretations to the non-logical constants. Putnam suggests that we can apply the Löwenheim-Skolem theorem to show that there are models of semantic theories for natural languages which are correct, but in which terms for material objects are differently interpreted.
We can use a similar argument against, for example, causal theories of reference or theories of the mental structure of human beings, for the Löwenheim-Skolem theorem equally applies to the sentences which express those theories. The manoeuvre is generally applicable, even against those who wish to claim that, since there is no deep distinction between the logical and non-logical constants of a language, we cannot treat the logical constants as guiding the construction of non-standard models.\textsuperscript{14} For it can be argued that this suggests that there are many more non-standard models than Putnam envisages.\textsuperscript{15} As Putnam says, "In short we can 'skolemise' absolutely everything" (1980, p.476).

Putnam's argument shows that metaphysical realist semantic theories can be faced with a dilemma: either reference is a recognisable relation, or it is not unique. Putnam suggests that Platonism and Intuitionism can equally avoid these conclusions. The first does so by positing "a mysterious faculty of 'grasping concepts'"; the second, by defining truth in terms of effective procedures in such a way that the question of which interpretation is intended cannot be raised. For in the latter case, the intended interpretation is defined by use, while in the former it is ineffable.

I argued in 1.2 that the manifestation argument is not primarily motivated by epistemic questions, but rather by questions as to the practices of speakers. Putnam's argument is based on questions of formal semantics; and Putnam thinks that it provides a justification of intuitionism as a theory of meaning - an account which he

\textsuperscript{14} Such as R. Farrell (1980).

\textsuperscript{15} As Farrell (1980, p.28) admits, remarking that the argument was suggested by D. Lewis and A. Smith (1980, fn.11).
nevertheless hopes to avoid. But Putnam's argument is weaker than the manifestation argument. For it issues in a dilemma, and one could embrace the second horn by allowing that reference is not unique. It is possible to interpret Quine (esp. 1974; 1975) and Davidson (1977) in this fashion. For by arguing that reference to objects is relative to the theory of interpretation or translation, and allowing that there may be no unique best theory, they apparently abandon the requirement that reference must be unique. Now such theories may not be metaphysically realist, but they are not yet intuitionist. The additional element of the intuitionist argument is the requirement that there be public criteria for the behaviour of speakers in recognising the content of sentences.

It may on the other hand be thought that if we accept the first horn of the dilemma, and attempt to guarantee that reference to objects is unique, then the strict finitism of III. fn. 2, rather than intuitionism, would result. For it might be argued that the guarantee that a particular interpretation is intended is only provided when a particular decision procedure is actually exercised. This is the characteristic thesis of strict finitism.

Putnam's argument cannot provide a route to an intuitionist theory of meaning independent of the manifestation argument. At best it displays one virtue of an intuitionist theory, in answering his argument.

3.1 Unknowable Truths

Routley (1980) presents a purported reductio of the claim that there can be epistemic constraints on truth. We can see his argument as an attempt to locate an absurdity in the manifestation argument.
itself. He adds to a weak modal system $S_0.5$, a function $K$, such that
$KA$ is a well formed formula where $A$ is, and which is interpreted
either as 'it is known that $A$' or 'someone knows that $A$' or, indeed,
'it is provable that $A$' or 'it is assertible that $A$'.

$S_0.5$ adds to classical sentential logic $S$, the postulates:

- $\Box A \supset A$
- $\Box(A \supset B) \supset (\Box A \supset B)$
- $\Box C$ where $C$ is a theorem of $S$.

Routley (1980, pp.101-102) assumes

- $A_0$ $q \supset \Diamond Kq$
- $A_1$ $Kq \rightarrow q$ (where $A \supset B = \text{df} \Box(A \supset B)$)
or $A_1^*$ $Kq \rightarrow \neg Kq$ (which follows from $A_1$)
- $A_2$ $K(q.r) \rightarrow (Kq.Kr)$

and derives, what he takes to be evidently false

- $p \supset Kp$, as follows

1. $\sim \Diamond(q \rightarrow q)$ from so
2. $\sim \Diamond(Kp \rightarrow \neg Kp)$ substitution
3. $Kp \rightarrow \sim Kp$ by $A_1^*$
4. $Kq.Kp \rightarrow Kq \rightarrow \neg Kq$ from 3
5. $\sim \Diamond(Kq \rightarrow Kq) \supset \sim \Diamond(Kq.Kq)$ from 4
   by $(A \supset B) \supset (\Box A \supset B)$
6. $\sim \Diamond(Kp \rightarrow K^{\sim}Kp)$ from 2 and 5
7. $K(p \rightarrow Kp) \rightarrow (Kp.K^{\sim}Kp)$ from $A_2$
8. $\sim \Diamond(Kp.K^{\sim}Kp) \supset \sim \Diamond(Kp \rightarrow Kp)$ from 7
   by $(A \supset B) \supset (\sim \Diamond B \supset \sim \Diamond A)$
9. $\sim \Diamond K(p \rightarrow Kp)$ from 6 and 8
10. $\sim (p \rightarrow Kp)$ i.e. $p \supset Kp$ from 9, $A_0$, def $\supset$

If, indeed, 10 were absurd, then Routley would have shown that no
theory of meaning would meet the manifestation argument. For $A_0$, with
'K' read as 'it is assertible that' appears to be just what the manifestation argument asserts: that if 'p' is true, it must be possibly assertible. In fact, I shall object to that claim. But, in any case, the argument is not intuitionistically valid. The specifically intuitionistically invalid move is that from

\[ \sim (p \land \sim Kp) \to p \supset Kp. \]

The intuitionist allows that if \( p \to q \), then \( \sim(q \land \sim Kp) \), but only the weaker conclusion, if \( \sim(q \land \sim q) \) then \( p \to \sim q \) is intuitionistically derivable.

According to the intuitionist \( p \to \sim Kp \) is true, and no reductio of their position. For if \( p \), then it certainly cannot be proved that the assumption that \( p \) is known or provable leads to absurdity. The intuitionist also allows that \( \sim(q \land \sim Kp) \) is acceptable whether 'K' is interpreted as 'known' or provable. We can intuitionistically endorse the claim that the assumption that \( p \), together with the assumption that \( p \) is not known, or provable, leads to absurdity.

This analysis of the intuitionistically questionable step in the argument does not, however, exhaust what an anti-realist would find objectionable. In order to clarify that question, it is necessary to distinguish a variety of possible anti-realist accounts of meaning, corresponding to various temporal restrictions on the notion of 'provability' or 'assertibility'. Consider, first, intuitionism in mathematics. It seems reasonable to allow that meaning is specified, by what is proved at any indefinitely distant time. So 'K' is read 'It is provable at some time...'. Then \( AO \) is acceptable, since certainly if \( p \) then, intuitionistically, \( p \) is possibly provable. Furthermore, the (in fact not validly derivable) conclusion of Routley's argument is also acceptable, since if \( p \), then \( p \) is
provable, or - reading the conditional intuitionistically - in any state of affairs in which 'p' is provable 'p' is provably provable, an uncontroversial claim.

If, on the other hand, we read 'K' as 'It is now proved... ', then A0 appears questionable, for 'p' may be provable, while its proof necessarily takes a lapse of time. So the unacceptability of 'p+Kp' is not surprising. Two other possible interpretations of 'K': as it is 'It is now, or will be provable that... ' and 'It is now or was provable that...' resemble the first and second cases respectively. We can use similar arguments for temporally restricted senses of 'knowable'.

Routley (1980, p.103) provides another argument that there are unknowable truths based on the axiom

\[ A_3. \quad \text{Eq}(q \cdot \sim Kq) \text{ (for some } q, q \text{ is true, but not known)} \]

\[ \text{to} \]

\[ 13. \quad \text{Eq}(q \cdot \sim \diamond Kq) \]

Clearly the intuitionist will, as Routley admits, reject this proof since the existential quantifier cannot be constructive either in the axiom or in the conclusion.

Routley (1980, fn.31) suggests that the following substitute for A3 might be used in an intuitionist version of the second argument:

\[ A_3'. \quad \top \forall p \top (p \& \top Kp) \]

on the basis of which we can reconstruct the argument

\[ 9'. \quad \top \top K (p \& \top Kp) \quad \text{as above} \]

\[ 10'. \quad \forall q \top \top K(q \& \top Kq) \quad \text{generalising} \]

\[ 11'. \quad \top \forall q \top (q \& \top Kq) \quad \text{from A3'} \]

\[ 12'. \quad \top \forall q \top [\top \top K(q \& \top Kq) \& (q \& \top Kq)] \quad \text{from 10', 11'} \]

\[ 13'. \quad \top \forall p \top (p \& \top \diamond Kp) \quad \text{instantiating} \]

This argument is indeed intuitionistically valid. But we must
distinguish the various readings of the argument. One who endorses the claim that if 'p' then 'Kp' will reject A3'. One who accepts A3' on the grounds, say, that what is now provable might not now be provable, may accept 13' as well. For if the assumption that
\[ \forall p \neg(p \land \neg Kp) \]
did not lead to absurdity nor would
\[ \forall p \neg(p \land \neg \neg Kp). \]
Again, no intuitionist would accept that one could locate the putative unknowable or unprovable truth.

Routley has another argument. He says that there must be unknowable truths, since the world is infinite and there are only finitely many finite knowers. An intuitionist construes the claim that there are infinitely many truths constructively, so that one could not derive the conclusion that there are unknowable truths. I suggest then, that Routley fails to show, in his argument, that epistemic constraints on truth are absurd. The argument employs modal and epistemic operators in a fashion the anti-realist should regard as confusing. However, his argument has forced me a variety of potentially reductionist anti-realist views of time. It is the reductionism implicit in certain anti-realist views which has most often seemed objectionable, and I shall accordingly turn briefly to that topic.

4. Reduction

A reductionist account of the meaning of sentences of a particular class defines the meaning of those sentences in terms of the meaning of those of another, purportedly more basic, type. The reduction may consist in a translation of each sentence of the class
to a sentence, or set of sentences, of the reducing class. If there are infinitely many sentences of both types and no effective means of correlating those sentences to be reduced with members of the reducing class, then there may be no effective translation. Nevertheless, the reductionist insists that the truth values of sentences of one type must be exhaustively defined by the truth values of sentences of the reducing class.

There are realist reductionist theories—such as physicalism. But reductionist theories of meaning characteristically take the form of denying the verification transcendence of sentences of a particular type by showing that they can be exhaustively translated into sentences which are decidable. Some behaviourists, for example, assume that truths about behaviour are decidable, and that truths about the inner realm are true in virtue of the overt behaviour in which inner acts issue, rather than covert inner facts. Rejection of behaviourism can be achieved by showing that the proposed translations are inadequate.

The question of whether intuitionism in mathematics is reductionist was raised in 1.2. It was then suggested that intuitionism in mathematics is not reductionist, in so far as it does not assume that the conditions under which a sentence is provable are any more simply stated than the mathematical sentences the meaning of which they define. A statement of canonical proof conditions does not provide an effective translation of a mathematical sentence to a set of states of affairs in which it is actually proved or disproved, for neither may exist. Rather the canonical proof conditions specify in what a proof of that sentence would, if it existed, amount to. An I-theory, if it is used to give the meanings of sentences, must also
be regarded in a non-reductionist fashion.

Nevertheless, there are two senses in which the intuitionist model of a theory of meaning might be taken to be reductionist. First, the account of 1.2 takes the behaviour of those who prove sentences of mathematics to specify conditions for the attribution of knowledge of the meaning of mathematical sentences. This has been seen as a form of behaviourism (by, for example, McDowell, 1981, §§7-8). We need not treat the intuitionist as a behaviourist, for he may regard his account as specific to semantic knowledge. Language is a medium of communication, and a description of understanding must show how knowledge of language could serve for communication. But there is no reason for a view of this type to deny that there are further mental acts - an impression of understanding, say - which are not manifested in communicative practices. Such mental acts could not, however, contribute to understanding.

Secondly, there is a possibility of a reduction of conditions of canonical proof or provability to conditions obtaining at a particular time, or within specified stretches of time, analogous perhaps to restrictions on the 'K' operator mooted in the previous section. I have suggested that such restrictions should not be endorsed by the intuitionist in mathematics. But Dummett (1969) endorses the claim that the assertibility conditions of past and future tensed statements of natural language consist in the present (and perhaps future) grounds for asserting them. Now this view need not be reductionist: first because there need be no translational reduction, but secondly because the present assertibility conditions for past and future tensed statements might be sui generis: of a particular type not equivalent to the assertibility conditions of present tensed
statements. That question, and its analogues for the assertibility conditions of sentence about other minds, and distant places, will be the topic of Chapter VI.

When intuitionism is taken as a model of an anti-realist theory of meaning, the meaning of sentences of the language will be determined by the conditions under which they are justified. As in mathematics, there are a variety of ways in which the sentences of a language may be justified and both inferential and inductive arguments might be employed. The anti-realist who follows the intuitionist model treats certain of the grounds whereby one might justify a sentence as canonical. Canonical assertibility conditions, then, determine the meaning of the sentence. As in the mathematical case, we might allow that the analogue of an I-theory serves to represent the semantic knowledge of speakers, in which case the assertibility conditions of sentences determine their meaning.

Assertibility conditions are naturally construed as conditions which specify procedures sufficient for justifying the sentences. For atomic sentences these will consist in procedures for locating an object and showing that a predicate holds of it. Assertibility conditions for complex sentences would then be construed on the intuitionist model: as determining those procedures for justifying the sentence which proceed by the most direct route, according to the modes of composition in the sentence. But, as the intuitionist analogy suggests, we should not expect that the atomic sentences of a language have any particular non-inferential or perceptually based specification. It is at this point that the intuitionist model for a theory of meaning differs from some versions of verificationism.
4.1 Observation and Theory

One verificationist dogma had it that there is a perceptually favoured class of sentences, verification of which is immediate and unproblematic. It is a familiar observation that the contrast between observational and theoretical aspects of the world drawn in such accounts is indefensible.

Churchland (1979, ch.1) provides examples of sentences which are, from our perspective, highly theoretical but which may nevertheless become observational for another community. He supposes that children are trained to respond, in observational situations, with expressions embodying conceptions of modern science. In place of the English observational predicates '...is sour', for example, they learn '...has a high concentration of hydrogen ions'. In such a community, observational predicates embody conceptions which are highly theoretical for us, and inferences mediated by theory for us, will appear to them direct consequences of their observations.

Churchland's example shows that what is non-inferentially justified by observation does not have application wider than within a single language. Even within one language, it is not obvious that the contributions of observation and theory to the meaning of a sentence can be discriminated. None of this, however, conflicts with anti-realism modelled on intuitionism in mathematics. The point can be made by comparing a truth conditional account of the meaning of the sentences of the language Churchland discusses with that proposed by an anti-realist.
Consider a translation from the variant English to our language. According to both assertibility and truth conditional theories, the procedures for determining the truth value of 'It has a high concentration of hydrogen ions.' resemble our procedures with respect to 'It is sour.' The two sentences are extensionally equivalent. Yet neither theory is obliged to treat the two sentences as synonymous. For although the sentence is observational, since the predicate will be applied solely on the basis of sensitivity to evidence, neither theory is obliged to treat '...has a high concentration of hydrogen ions' as simple or directly translatable into its own observation sentences. To discern structure in the observational predicates of an alien tongue is to register that certain inferences are directly valid for them, although they are not so for us.

For the anti-realist, evidence for the distinction between the variant observational predicate and our '...is sour' will consist in the fact that they are prepared to allow that the predicate is true of objects in situations where, for example, no one has tasted them, while we are not. A distinction in assertibility conditions between the two predicates can then provide the explanation of why certain inferences are valid for them, but not for us. Holistic accounts, on the other hand may allow that it is sufficient evidence for a distinction in meaning between the predicates that there is a distinction in the inferential powers of sentences containing them.

The anti-realist who adopts the intuitionist model of a theory of meaning differs from the realist in claiming that there are canonical procedures for determining truth value. According to the realist - and the holist - there are a variety of means for determining the
truth value of any particular statement. The realist claims that only
a truth conditional specification of the meaning of the statement
could provide a uniform specification of how those varieties of
procedures determine the truth value of the same sentence. However,
the anti-realist claims that if the means of determining truth value
are to have a determinate application specific procedures must be
counted as canonical. Alternative means of determining truth value —
like demonstrations in mathematics — are acceptable only if they could
be converted, in some sense, to the canonical procedures. If the
procedures cannot be so converted the anti-realist claims they are in
need of revision.

To put the matter this way is not to claim that the anti-realist
must adopt a reductionist attitude. To say that certain procedures
are the canonical means of determining the truth value of sentences of
a class is not to say that those canonical means must be of any
particular, basic type. The canonical means for establishing that
there are quasars, for example, will be both theoretical and
inferential. This is no objection to allowing, on the intuitionist
model, that the meaning of the claim that there are such particles is
established by those canonical means.

Indeed, if an I-theory, or its analogue for assertibility, can be
used to specify assertibility conditions of sentences, this point is
obvious. For assertion conditions can in that case be specified by
disquotational clauses which use the very sentence to specify its own
canonical assertion conditions. An account of this type is surely not
reductionist.
5. Vagueness

The existence in our language of observational predicates whose application is essentially vague provides deeper difficulties for the anti-realist of the type described above. Consider colour predicates. Their application is guided by observable features of the world. If we allow that a determinate recognitional capacity is associated with the use of each colour predicate, paradox results. For an account of recognitional capacities must allow that they are such as to license the attribution of the same colour predicate to any two patches of colour which are visually indistinguishable, so that it is true that if \( a \) and \( b \) are indistinguishable they are the same colour. Yet, paradoxically, there are arrangements of patches of colour in which contiguous patches are indistinguishable, but the extremes of which are differently coloured, so that the colour of one extreme is incompatible with the colour of the other. We can derive a contradiction, of the form of a Sorites paradox, on the basis of a conditional premiss that if two patches are indistinguishable they are the same colour, together with instances of the claim that two patches are indistinguishable, and applications of modus ponens.

The question of vagueness in language has recently been much discussed.\(^{16}\) It is the question of the impact of vague predicates on the manifestation argument which is of interest here. No feature of

16. Realist solutions to the paradoxes of vagueness are multitude. Burgess (1980), Platts (1975, ch.X), Peacocke (1981) and Quine (1981) have realist accounts sensitive to the manifestation argument. Dummett (1975a) introduced the topic in the anti-realist terms in which it is here presented, and Wright (1976) has elaborated on that problem. The account here proposed uses remarks derived from Burgess and Peacocke. My chief interest, in this short section, is not of course, to exhaust, or indeed solve the problem of vagueness. It is, rather, to investigate the impact of vagueness on the manifestation argument.
the use of vague predicates could, it seems, be both sufficient to explain the habits of application of those predicates, in so far as indiscriminable exemplars are labelled with the same predicate, and to avoid paradox. Yet the manifestation argument requires that there is associated with every sentence of the language a feature of their use guiding practice. In particular, we have associated with each sentence a canonical procedure for determining truth value.

In order to ensure that a theory of meaning for vague predicates is consistent, and meets the manifestation argument, we may reject either of the premisses of the argument producing the paradoxes. It is possible to deny, as Wright (1976) does, that the meaning of such vague expressions is given by a rule, knowledge of which suffices for mastery of their correct use. In the face of the evident abilities of speakers coherently to apply vague predicates, such as colour predicates, the requirement that a meaning specification should provide a rule for when the predicate is to be applied, should be weakened. Wright suggests that

The methodological approach to these expressions, at any rate, must be more purely behaviouristic and anti-reflective, if a general theory of meaning is to be possible at all. (1976, p.247)

In order to describe the behaviour of speakers in using vague predicates, Wright argues, we must abandon the requirement that it is governed by a coherent set of rules; or indeed that such use could manifest consistent semantic knowledge. The manifestation argument for such expressions, if it can be met at all, can be met only by citing how speakers react to the phenomena with which they are confronted.
We might, on the other hand, deny the inductive premise yielding the paradoxes as Platts (1979, ch.X does). It is allowed, in effect, that indiscriminable patches may not be treated equally as paradigms of a colour. In this case, a disquotational satisfaction clause for '...is red' is taken to supply the requisite rule governing the linguistic behaviour of speakers who are prepared to assent to, and assert, 'That is red.' when confronted by red objects. Platts denies, however, that the tendencies of speakers to apply the same colour predicate when confronted by indiscriminable patches can be explained by the rule.

To adopt this latter view is tantamount to denying that the application of apparently observational colour predicates can be determined from the kinds of experience produced by objects under standard conditions. For according to Platts there may be distinctive observational predicates, one paradigmatic, one not, which are accompanied by experiences not discriminably different from each other, but whose contributions to meaning specifications are distinct. It then seems that the manifestation argument is not met by his view, since it explains linguistic behaviour as flowing from rules whose application could not, by hypothesis, be recognised by the speakers who use them.

Elaborated versions of this view distinguish the cases in which objects are determinate satisfiers of predicates, and those which are not. At least one means of doing so is to distinguish the clauses representing the recognitional abilities of speakers in the theory of meaning, from the specification of the contribution that sentences containing vague predicates make to the complex sentences in which they occur. To block the paradoxes, we need to claim that there may
be non-discriminably different patches, which in a series lead to
discriminable difference. In this case, we can maintain *modus ponens*
by allowing that the conditional premises are not absolutely true.
Objects, it is supposed, have various degrees of particular colours.

The problem with this proposal for one who believes the
manifestation argument is that speakers are supposed to manifest a
grasp of conditionals which play no part in the canonical means of
determining truth value, in accepting or rejecting arguments of a
certain form. Were this proposal generally to apply then it appears
that the practice of speakers in accepting arguments from L.E.M.
should itself count as a manifestation of semantic knowledge of the
truth conditions of undecidable sentences, a move we rejected in 1.1.
According to the intuitionist model, the valid arguments of which a
sentence may be the conclusion are justified in terms of the central
canonical assertibility conditions. On the natural construal of the
canonical assertibility conditions of colour terms, they validate the
paradoxes.

The issue here is relevant not merely to the account of vague
predicates. Dummett remarks that certain theories of meaning allow a
distinction

between knowing the meaning of a statement in the sense of
grasping the content of an assertion of it, and in the sense of knowing the contribution it makes to
determining the content of complex sentences in which it is a constituent: let us refer to the former as
simply knowing the *content* of the sentence, and the latter as knowing its *ingredient* sense. (1973,
pp.446-447)

We might consider the conditionals discussed in II.6 as contexts
inducing the realist notion of truth. I argued that if the
assertibility conditions of conditionals are well-behaved functions of
the assertibility conditions of their components, a large range of
intuitively acceptable and distinct conditionals would have to be either identical in sense to one another, or else to be senseless. So, for example,

If I go to Pakistan, I will live in Hill Road.

and

If I foresee that I will go to Pakistan, I will live in Hill Road.

can be taken to fall into this category. In order to avoid this conclusion, we might claim that although the antecedents of the conditionals are identical in content sense (what was there called 'primitive assertibility conditions'), they differ in ingredient sense.

At first blush, there is no reason why the anti-realist should not accept a contrast between content and ingredient sense, so long as neither is explained in terms of recognition transcendent truth conditions. And, as was remarked in II.6, Dummett appears to accept this distinction. But the difficulty remains of how grasp of ingredient sense is to be manifested. In the case of vague predicates, the difficulty is to explain why certain inferences are invalid. If the canonical grounds of application of a colour predicate are observational then nothing in the description of those grounds could show why a paradox is not validly derivable. Merely to remark that they are invalid is of no help: for it then appears that the very practices of using vague sentences are incoherent. This is evident when we consider Wright's proposal that we avoid the paradoxes by treating speakers' grasp of vague predicates as not so much rule governed, but unreflective. Peacocke (1981, p.121) shows that a paradox can still be derived if it is allowed that a colour predicate 'C' applies to those objects a community agree in calling 'C'. The paradox is
If something reflects light of a certain wavelength, then everyone agrees in calling it 'C'.
If an object differs in wavelength of light reflected non-discriminably from something that is called 'C', everyone agrees in calling it 'C'.
So all visible objects are 'C'.

Dummett (1975), who introduced the current discussion of the paradoxes in these terms, concludes that observational predicates are incoherent and that the notion of the phenomenal is likewise incoherent. He then argues that one solution to the paradoxes is patently unacceptable: that which advocates abandoning Bivalence for colour predicates. For he says of an object which is not determinately orange

it is clear that, if a borderline case, the object will have to be on the borderline between being orange, and being some other particular colour, say red. ...the disjunctive statement, 'That is either red or orange', will be definitely true, even though neither of its disjuncts is. (1975a, p.309)

If he is correct, vague predicates supply a counter example to a generalised intuitionist account of the meaning of disjunctions for the disjunction will be true, although neither disjunct is. He argues that, since 'red' implies 'not orange', the truth of 'That is either orange or not orange.' is implied by that of the disjunction above. Hence, Dummett suggests L.E.M. holds for vague predicates, and where we interpret 'truth' as 'definitely true', Bivalence also holds.

We may, however, claim that grasp of the application of colour terms which is manifested in our use of observational predicates, should not be described in this way. At the level of practice, the borderline cases should not be regarded as justifying, as definitely true, 'That is either red or orange.' Such cases are not definitely true, and nor, in such cases, does Bivalence generally hold.
If we accept this claim, we could argue that we are justified in introducing degrees to which an observational predicate applies by the empirical data: in the degrees of certainty of speakers when confronted by patches of colour. In order to block the paradox, we must be able to show that speakers do treat non-discriminable patches as differing in colour. Evidence that this is so is given by speakers' behaviour with respect to series of such patches. As a speaker is confronted with more patches, his abilities to discriminate are refined.

In this case, we should need to distinguish between the degrees to which a particular colour sample instantiates a colour predicate, and the certainty of speakers in applying the predicate. The latter varies according with the range of instances available, while the former does not. We meet the manifestation argument by giving an account of a feature of practice, while avoiding paradox by attributing to colours degrees, the recognition of which is manifest only in the behaviour of speakers when confronted with series of patches. Data of this sort can justify our calling non-discriminable patches potentially different in colour. We can therefore reject the inductive premiss which leads to the paradox: that if two patches are non-discriminable, they are the same colour. But we do not need to assume that an appropriate account of the content of vague sentences must be Bivalent: for there are patches for which speakers' behaviour does not justify the claim that it is either red or not.

Vagueness in natural language suggests that we should modify the manifestation argument. We cannot associate a determinate recognitional capacity with each sentence of a language which will yield a decisive verdict whenever it is exercised. Nevertheless, we
can continue to allow that procedures for determining truth value are associated with vague sentences, in the fashion described in 1.2. We must simply admit that those procedures need not be decisive.

The failure of Bivalence for vague assertions is, accordingly, of a quite different type from the failure of Bivalence in intuitionist mathematics. It neither depends on the presence of quantifiers nor on the presence of compounding devices, but derives from the essential indecisiveness, or inconclusiveness, of the procedures for determining the truth value of certain assertions. In short, vague assertions may be neither definitely correct nor definitely incorrect. They provide counter-examples to Dummett's bifurcation thesis (II.5) - the thesis that no assertion can be neither correct not incorrect. Or at least they do so if my objection to Dummett's specific exclusion of vague sentences from the province of bifurcation is granted. It should now be clear why Dummett made the exception.

6. Conclusion

I have argued that a theory of meaning can justifiably attribute semantic knowledge to speakers only when that semantic knowledge is exhaustively manifest in their communicative practices. This is not a consequence of the claim that speakers would otherwise be unsure of what is meant by sentences of language. Rather, it is because semantic knowledge is attributed to speakers in order to explain their actual practices, and could not go beyond those practices. The manifestation argument is not based on epistemological grounds, nor on grounds derived from formal semantics. I have argued that the manifestation argument has more precise consequences than Putnam's argument for anti-realism, which he derives from the Lowenheim-Skolem
The manifestation argument is prior to Dummett's alternative argument for anti-realism, based on the acquisition of semantic knowledge. Epistemological claims about how we acquire semantic abilities cannot settle whether grasp of a sentence is manifestable. I have suggested that arguments from analogy are impotent against the manifestation argument, since analogical extension cannot explain what the sense of a sentence is. Although anti-realist theories may be reductionist, the manifestation argument need not have reductionist consequences. In particular, anti-realism is in no way committed to the view that we can reduce theoretical sentences to ones about sense-data.

Vagueness in natural language raises more profound questions about the applicability of the manifestation argument, and the anti-realism consequent on it. Nevertheless, I have argued that the anti-realist can provide a manifestable account of the content of vague sentences, if he abandons the requirement that semantic knowledge is manifested in the ability decisively to tell whether an assertion is correct. Only epistemological prejudice could justify that requirement in the face of speakers' obviously coherent use of vague sentences.

The manifestation argument is at the heart of anti-realism. However unpalatable its consequences, I think that we must accept the argument.
CHAPTER V

NOTIONS OF ASSERTIBILITY

Introduction

When intuitionism in mathematics is taken to provide a model for a theory of meaning, the notion of provability is replaced by various notions of assertibility. Dummett's preferred accounts talk of states of affairs under which an assertion is conclusively verified or conclusively falsified. Semantic knowledge is held to consist in recognitional abilities with respect to states of affairs that verify or falsify an assertion. In this chapter, I first consider conclusive verifiability, and the intuitionist account of disjunction and negation. Certain implausibilities in that model led Dummett to propose the falsification calculus. In such a calculus, the semantic knowledge attributed to speakers is the ability to recognise those states of affairs which refute an assertion. This calculus differs from the intuitionist verification calculus in the account of deducibility and hence yields a non-intuitionist but non-classical logic. I argue that the variant account of deducibility is unsatisfactory.

A third notion of assertibility, that of inconclusive assertibility is introduced. Among sentences of natural language having conditions of assertibility which are essentially inconclusive are those Wright has called "defeasible". I discuss defeasible assertions, and reject one argument for the application of classical logic to them. A variant account, based on conditions of verification
and of falsification is adopted, both for conclusive and defeasible assertions. Bivalence and L.E.M. fail on this account.

1. Intuitionism and Assertibility

Intuitionists in mathematics question the account of the meaning of mathematical assertions in terms of truth conditions, on the grounds that the truth conditional account of quantification over infinite domains cannot meet the manifestation argument. For finite domains, there is a decision procedure whereby speakers could check each member of the domain and ascertain that a predicate holds of it. Where the domain is infinite, there may be no procedure guaranteeing that the domain is exhausted. Intuitionists take the decision procedures specified by proofs of a certain preferred kind to determine the meanings of such mathematical sentences.

As the analogue of decidable assertions in mathematics, we may take assertions of which speakers are able decisively to determine the truth value in a finite time. An assertion of mathematics may fail to be decidable in this sense on the following counts:

(i) There may be a procedure available to speakers whereby they can verify an assertion if true, but not establish its falsity if it is false. For example, the intuitionist account of positive existentials over an infinite domain has it that they are true if a confirming instance can be specified in a finite time. It is not sufficient for the falsity of the assertion that no such instance can be found, since we may not be able to list the cases exhaustively. An apparent analogue in natural language is the sentence

There is intelligent life in the universe, outside our galaxy.¹

(ii) There is a procedure guaranteed to falsify the assertion if

¹ The example resembles one which Wright (1981, p.55) uses.
it is false, but not to verify it if it is true. Some universally quantified sentences have this feature, for example,

Nowhere in the universe is there intelligent life, outside our galaxy.

(iii) There is no procedure guaranteed to determine either truth value in a finite time, but a verification or falsification may arise, despite the lack of an effective procedure. Mathematical cases of this sort may arise when initial quantifiers of a mathematical sentence are of the form '$\forall x$' as in '$\forall x \exists y Gxy$'. Similarly, in natural language, attributions of dispositional properties might be verified or falsified, although no guaranteed procedure for determining either is available.

(iv) It is in principle impossible that falsifying or verifying instances might arise. In this case, in which it appears we would be justified (intuitionistically) in asserting $\neg A$ and $\neg \neg A$, and hence $\neg (\neg A \vee A)$, the intuitionist rejects the sentences as meaningless. Statements about the transfinite in mathematics have this status. Apparent candidates in natural language are sentences resembling Smart's (1981) "The universe is 5 dimensional." when we assume that it is conceptually impossible that such a sentence could be verified or falsified.

In adapting the intuitionist model for natural language, several dissimilarities between mathematics and natural language must be accommodated. First, we must distinguish two senses in which it may be in principle impossible to determine the truth value of a sentence. Cases which fall into class (iv) in mathematics are those for which it is logically impossible to determine the truth value of the sentences in question. The logical impossibility of a verification or a falsification arising will be the sole grounds for rejecting
mathematical sentences as meaningless. In natural language, there may be contingent reasons which bar us from verifying or falsifying sentences. If, for example, the only evidence for Nixon's having lied was contained on tapes which are now destroyed, then it is (contingently) impossible for us to verify or falsify the assertion that he lied. An assertion of this type should not be regarded as falling into class (iv) since, intuitively, there is no bar to our having a conception in what evidence for Nixon's having been a liar would consist. It belongs rather with cases of type (iii). Cases falling under (iv) are those for which a verification or falsification is conceptually impossible. If the conceptions which can be justifiably attributed to speakers are just those which could be exhaustively manifest in behaviour, then the conceptually impossible is what could not be manifested in behaviour. The fact, if it is one, that a conception of a 5 dimensional universe could not be manifest in behaviour provides our grounds for rejecting it as meaningless.

The second disanalogy between sentences of mathematics and those of natural language is evident in the example of the previous paragraph. The tensed sentences of natural language may be at one time decidable, and later not. In this they differ from mathematical sentences. Any account of meaning which adopts the intuitionist model must allow for the tensed sentences of natural language. Doing so, and providing an appropriate specification of what is conceptually impossible, raise difficulties for the most natural extension of the intuitionist notion of provability to natural language - namely, conclusive verifiability (IV.5). Before turning to that account, I note one further, and more radical, disanalogy between mathematics and natural language.
Dummett (1977, p. 20) says that we could imagine a society in which a mathematical statement embodies a claim that there is a plausible argument for what is stated, not a conclusive proof. Such a society would have a use for a concept of conclusive proof, but the conventions of mathematical assertion would not be appropriately described in terms of the possession of abilities to produce conclusive proofs. The practices of assertion may then not be properly captured by the procedures of proving mathematical sentences. Assertion in natural language resembles the alternative, not our actual, mathematical practice. In particular, partial confirmations of sentences of certain types may be a sufficient warrant for their assertion. Moreover there are cases in natural language for which conclusive verification is not, in principle, ever available. If there are such sentences in natural language, and if they are not to be counted as simply meaningless, then conclusive verification conditions cannot determine their meaning. I shall postpone discussion of this issue until 4; but I have already mentioned one class of sentences of natural language which may not be conclusively verifiable of falsifiable—namely vague assertions (IV.5).

2. Conclusive Verification

When conditions of conclusive verification play the central role in a theory of meaning, we may draw a distinction analogous to that drawn between conditions of canonical proof, and demonstrations. For there are indirect grounds which conclusively verify assertions. In this case, we might stipulate canonical verification conditions on the intuitionist model in the following fashion:

There is a canonical verification of an atomic sentence $S$ if $S$ is conclusively verified.
There is a canonical verification of $\text{AvB}$ if there is a canonical verification of $A$ or a canonical verification of $B$.

There is a canonical verification of not $A$ if $A$ cannot be verified - if, that is, the assumption of $A$ leads to absurdity.

and so on. We should then need to stipulate that indirect grounds are faithful to canonical verification conditions (VII.1). This is the course Dummett (1973a; 1975) most frequently adopts for a theory of meaning for natural language.

Alternatively, we might follow Wright (1981) in stipulating conditions under which an assertion is justified in a total state of information (TSI). Wright's notion of a TSI provides a perspicuous way of spelling out conditions under which a sentence is either canonically or indirectly verified or falsified. The definitions of canonical verification conditions can be read as quantifying over TSI's (III.4). Adapting his definitions, we might say

There is a conclusive verification of $\text{AvB}$ in a TSI if (a) there is a conclusive verification of $A$ in the TSI or (b) there is a conclusive verification of $B$, or there is an effective means of producing a TSI of one of the two previous types.

There is a conclusive verification of not $A$ in a TSI if a TSI in which $A$ is conclusively verified cannot recognisably be achieved, however the TSI is enriched.

and so on. Here the possibility of indirect grounds is accommodated by stipulating the indirect grounds in the definition of conditions for complex sentences: in particular, by allowing the enlargement or enrichment of TSI's so that a canonical verification is made available. Clearly, we must interpret enrichment here as a constructive enlargement of states of affairs, not brought about by stipulation, or by reference to what, unrecognisably, might be true.
Conditions specified in this fashion enable us to define an analogue of the I-theory for natural language, in terms of conditions of conclusive verification. Such an account depends on two assumptions: first that truth, determined by conditions of conclusive verification, distributes over the logical constants; secondly, that a suitable notion of meaning equivalence for conditions of conclusive verification is provided by the intuitionist biconditional. Wright has argued for the second of these. He says plausibly, to be justified in asserting \( P \) is justifiably assertible is to be justified in making an assertoric use of \( P \). (1976a, p.239)

But his proposal must be taken as the claim that grasp of the meaning of sentences consists in grasp of the conditions under which in principle one is justified in an assertoric use of a sentence. For there is little plausibility in the claim that the conditions under which one has a personal warrant for an assertion define its meaning. The possession of a personal warrant is a decidable matter, whereas the I-predicate, intuitionistically conceived, is not a decidable predicate. The proposal of the I-theory or its analogue for conclusive verification is that grasp of meaning can be expressed in terms of a correlation between conditions under which a sentence would be conclusively verified and those in which its assertoric use would be appropriate. Whenever one obtains, it is sufficient for the other. The central notion of the I-theory cannot be the decidable English predicate 'is assertible' (by me, now), as Wright's proposal appears to suggest. It must be the undecidable analogue of provability in mathematics - in this case conclusive verifiability. An I-theory describes the semantic knowledge of speakers in terms of their ability to recognise when sentences are conclusively verifiable in terms of the conditions under which their components would be verifiable.
In a recent article, Edgington (1981) argues that, at least for conclusive verification — or, as she says, conclusive assertibility ($A_c$) — there is no option but to accept an intuitionist account of the logical constants. She argues that if we accept

'S' is $A_c$ iff $S$

then, in virtue of the equivalence

'S' is true iff $S$

interpreted in terms of equivalence salva assertibilitate, we can derive

'S' is $A_c$ iff 'S' is true

We can then obtain, by substitution,

'A v B' is true iff 'A' is $A_c$ or 'B' is $A_c$

and 'Not A' is true iff 'A' is not $A_c$.

This immediately yields, Edgington claims, revisionary consequences of the intuitionist type. For not every sentence or its negation is conclusively assertible, so 'A v ¬A' cannot be generally true. However, Edgington surely reverses the correct order of explanation. If Double Negation Elimination holds generally in the metalanguage, then we can derive L.E.M. We would then have the counter-intuitive consequence that every sentence or its negation is assertible. Nevertheless this is a possibility which Edgington ignores. The revisionary consequences depend on the logic of the metalanguage, and the central notion of the theory which is taken recursively to stipulate the meaning of sentences of a language.

However, when conclusive verification is the central notion of a theory of meaning intuitionist logic certainly appears appropriate. For we are not generally in possession of a canonical conclusive verification of every sentence, or of its negation. So, we might understand sentences which are neither conclusively verified nor
falsified, but in that case neither they nor their negations are true. If the activities of conclusively verifying sentences determine their meaning, then there seems no warrant for the generalised assertion of L.E.M.

I shall consider the particular clauses for disjunction and negation, since they are crucial to the revisionism of an account in terms of conclusive verification. Many have thought that those clauses are themselves unacceptable. I shall endorse this conclusion for negation, but not for disjunction.

2.1 Disjunction

The most remarked counter-intuitive consequences of the generalised intuitionist account of disjunction arise when, for contingent reasons, all evidence for either disjunct of an assertion is lost. If I say

that's either a Kalashnikov or an Uzi.

having caught a fleeting glimpse of a submachine gun, and a subsequent explosion makes all further investigation impossible, does this mean that, however reliable I am in identifying submachine guns, I did not speak truly? It appears so, for neither I (nor a genuine expert) would be in a position so to transform the total state of information as it now is, as to determine which type of submachine gun it was. It might be thought that, since the explosion might conceivably not have occurred, there is only a contingent bar on establishing either disjunct as true. For, if the explosion had not occurred, I should have been able decisively to determine the truth value of the sentence. But, although the contingent availability of a means of determining the truth value of the sentence suggests that we can
conceive of what would verify the sentence, it does not yet suffice for a means of actually determining the truth value of the sentence. Hence we are not in a position to assert that the sentence or its negation is true, although the sentence is meaningful.

In reaction to a similar case, Dummett proposes that assertibility for past tense disjunctions does not distribute over disjunction. He says:

*We may wish to lay down that a disjunctive statement is conclusively established by a demonstration that an effective procedure would, if it were or had been applied at the time, yield or have yielded a verification of one or other disjunct.* (1976, p.114)

He suggests that the proposal would count as justified many instances of L.E.M. for past tensed assertions which, in the intuitionist model of conclusive verification conditions, fail. It may, however, also involve giving up further intuitionist laws - such as that if 'A→C', and if 'B→C' then '(AvB)→C'. But the proposal is questionable. For how, in the context of a conclusive verification account of meaning, are we to interpret a procedure which "if...it had been applied at the time...would have yielded a determinate verdict"? The subjunctive conditional is one which could never be conclusively verified.

Moreover, for cases of this sort, Dummett's proposal seems unnecessary. For we may reinterpret the disjunction of natural language - 'A or B' - as tantamount to '¬¬(AvB)'. '¬¬(AvB)' may be properly assertible, although neither disjunct is. To interpret the disjunction as having the force of its double negation in this sense is not arbitrary. The proposal is that our practices are properly so described. If, for example, evidence were to come to light that there were no Kalashnikovs in the area at the time, then the reinterpretation allows the inference to the double negation of 'That
was an Uzi.' The claim is that any stronger inference would be unjustified. This proposal maintains conditions of conclusive verifiability as central to a theory of meaning, while modifying its revisionary consequences.  

The point can be seen more clearly when we consider cases in which a practical consequence turns on the interpretation. Edgington (1981, pp.157-8) considers an interrupted card game in which it was inevitable that a particular player would win. She thinks that the conclusive verificationist's reluctance to admit that the player won is absurd. The intuitionist would indeed be reluctant to admit that the player won: for it would require the realistic assumption that there are only two end positions for the game, one of which would have eventuated. Nevertheless, suppose there was a bet on the outcome of the game. The intuitionist could explain why it is the player has a claim to have won the bet. The purported winner might argue that there could not be situations other than those in which he would win. His claim to have won would then consist in a claim that he could not have failed to win. So the intuitionist is not committed to the absurdity of the bet remaining unpaid. Indeed, to interpret the purported winner's claim this way explains the dispute which might arise over whether the bet should be paid.

2. This argument applies equally to Dummett's claim that when he remembers talking to Jean or Alice but cannot remember to whom he spoke, there is no objection to allowing that his knowledge was ultimately derived from one disjunct or the other having been true. If, in fact, there is now, and could be, no evidence on the matter, how could this claim be justified? Dummett says "the fact that incomplete knowledge is all that remains is beside the point" (1959, p.147). At least on the conclusive verification account, this claim is unjustified. But even so, we need not presuppose from assertions of the kind: 'It was not the case that I wasn't talking to Jean or Alice.', or their briefer transforms.
This account should be distinguished from a position advocated by Wright (1976a, pp.231-233) when considering a similar problem. He envisages a community who play "tribe chess": a game in which winning is determined by arbiters before a final winning position is reached. He suggests that the anti-realist can interpret the game so long as he says that the arbiters are guided by a conception of what could be recognised as a winning position. As a means of making the behaviour anti-realistically respectable, this suggestion fails. For the anti-realist might object that, by placing 'recognisably' in front of the undecidable 'position from which a player could allegedly win' to form a decidable predicate, Wright fails to give any account of what the recognisable winning positions are. We are invited to accept a counterfactual conditional of the form:

If the game had continued, a series of moves of type A might occur, and a particular player wins, or a series of moves of type B might occur, and that player wins, or ...

But there is no license, according to the generalised intuitionist account of disjunction, for asserting either disjunct. This is true even if we accept Wright's (later) stipulation of conditions under which disjunctions are true, which allows effective enlargements of a total state of information verifying either disjunct as sufficient grounds for the disjunction. For, in the envisaged case, the effective enlargement could not occur once the game is terminated.

Nevertheless, it might be argued that until the game was terminated the arbiters could have been guided by a non-recognition transcendent notion of a winning position. For they might simply have waited for the game to be played out: and this would have been an effective means of deciding who would have won the game. Similarly, we might say, we can attribute to speakers intentions which are not
recognition-transcendent, so long as they could be fulfilled (IV. 1.3).

If this argument were correct, there would be no objection to allowing that a particular player was in a position to win Edgington's card game at the time it was interrupted. That would, we might argue, be sufficient to guarantee that the bet should be won by the relevant player. But the difficulty with this argument is that it begs the question as to the decidability of past tense sentences. For, at the time that the bet was won, or after the tribe chess was terminated, it is the past-tensed analogues of the future tensed decidable sentences which are in question. We might grant that 'This player will win.' is decidable at a time, but will be in doubt as to whether 'This player was in a position such that he would win.' is later to be regarded as decidable. Dummett's concern about the transitory nature of decidability of tensed sentences is here strikingly obvious.

A realist would of course resist both Wright's account, and the suggested interpretation of disjunctions in terms of their double negations. He will insist that it is precisely the recognition transcendent account of disjunction, in which a disjunction may be true although neither disjunct can be recognised to be true, which we have in natural language. The considerations here adduced are intended merely to show that the intuitionist account of disjunction does not inevitably lead to absurdity.

But the interpretation relies on a clear understanding of negation, conceived on the intuitionist model. And this is so far lacking.
2.2 Negation

The generalised intuitionist account of negation assumes that there is a uniform style of justifying the negation of a sentence. It consists in a method of showing that if there were a proof of the sentence there would also be a proof of a primitive absurdity. As Dummett says:

'It is not obvious that, when we extend these conceptions to empirical statements, there exists any class of decidable atomic statements for which a similar presumption holds good.' (1976, p.112)

We lack an analogue of the specified set of acceptable deductive procedures in mathematics, and there appears to be no property which all and only false sentences of natural language have in common. Certainly the contingent sentences of natural language can be false, although it is not logically impossible that they could be true.

It does not help here to cite the disquotational

'Not A' is assertible iff 'A' is not assertible,

since we need an account of both negation and assertibility in the metalanguage. We stipulated the canonical proof conditions of a negated sentence in terms of the absurdity to which an assumption of the sentence led. This is not helpful either, for we need to know what sort of impossibility the assumption issues in. Wright's clause for negation is, as he remarks (1981, pp.51-52), also unilluminating. For we need to know in what the impossibility of those states of affairs arising which verify a sentence consists. It cannot merely be the contingent unavailability of states of affairs of a certain sort. For then the fact that, as it happens, all evidence that Nixon was a liar was destroyed would suffice to justify the claim that he was not. Yet, again, to say that a negation is true just if it is logically - or conceptually - impossible for evidence of a certain sort to arise
is too strong. For the negations of many contingent sentences are evidently both meaningful and assertible while those sentences are neither logically nor conceptually impossible.

At one stage Dummett suggests that we might define conditions under which a negation in natural language is assertible by specifying falsification conditions for each predicate of the language, stipulating only that it is (presumably conceptually) impossible that both a sentence and its negation are true. He proposes to regard the meaning of each statement as being given by the simultaneous provision of a means for recognising a verification of it, and a means for recognising a falsification of it, where the only general requirement is that these should be specified in such a way as to make it impossible for any statement to be both verified and falsified. (1976, p.112)

There is no obvious absurdity in this proposal. Speakers of finite abilities might learn both falsification and verification conditions for predicates of the language just as they are supposed to learn verification conditions alone. One natural extension of this account would involve separately specifying conditions under which sentences of a language are verified, and those under which they are falsified. In that case the clauses for negation mentioned above would not exhaust the specification of conditions under which a negation is assertible. On the contrary, meaning itself would be partly defined in terms of conditions under which the negation of the sentence was justified.

In fact, Dummett (1976, pp.117-118) does not adopt this proposal. He argues that it would be a reductio ad absurdam of a theory of meaning to allow two independent stipulations of the conditions under which a sentence was falsified and verified; at least if those stipulations jointly fix the content of sentences. For a sentence may
be neither verified nor falsified. He says:

It would then follow that a speaker might be neither right nor wrong in making an assertion; not wrong, because it could be shown that the sentence could not be falsified, but not right either because no way was known of verifying the sentence. This consequence would be fatal to the account since an assertion is not an act which admits of an intermediate outcome; if an assertion is not correct, it is incorrect. (1976, p.118)

Dummett here appeals to the claim— which I have labelled the bifurcation thesis (II.5) — that assertions cannot be neither correct nor incorrect. Assertions, he thinks, divide the world into just two sets of states of affairs — those in which they are correct, and the rest — in which they are incorrect. But he suggests that if the meaning of an assertion is defined by the conditions under which it is verified and those under which it is falsified, then the possibility arises that an assertion may be neither correct nor incorrect. This he thinks would be absurd.

I have already questioned whether we can use bifurcation as a premiss in an argument rejecting the failure of Bivalence for vague assertions (IV.5). Indeed Dummett's bifurcation argument appeared crucially incomplete as a reason for rejecting the possibility of a third outcome for assertions. In this context, however, Dummett's appeal to bifurcation simply fails to establish that we cannot use conditions of verification and falsification to determine meaning. For it appears that if an assertion was neither verified nor falsified, the assertoric use of a sentence would be simply incorrect; and equally the assertion of its negation would be simply incorrect. Dummett assumes that assertions are correct if and only if they are verified, and not incorrect if and only if they cannot be falsified. This assumption is evidently alien to the way he presents the
bifurcation argument (II.5). The assumption is not justified even when verification and falsification conditions define meaning. Such an account would naturally yield the stipulation that an assertion is correct if it is verified, incorrect otherwise; while its negation is correct if the assertion is falsified and incorrect otherwise. In that case, assertions could not be neither correct nor incorrect.

Nevertheless, it certainly lacks elegance to define content – or negation – in terms of conditions under which sentences are either verified or falsified. We must attribute to speakers the ability to recognise that each sentence cannot be both verified and falsified; while refraining from providing any general account of why this is so. Hence speakers must be able to recognise as many, or nearly as many, primitive incompatibilities as there are primitive predicates in the language. The proposal is not absurd, but nor is it obviously faithful to the practice of speakers. We suppose speakers behave as though in command of a general specification of negation.

Perhaps in part for this reason, and after rejecting his suggestion on the grounds of the bifurcation argument, Dummett turns to an alternative conception of a theory of meaning. He proposes to replace conditions under which a sentence is conclusively verified as the central notion of a theory of meaning by conditions under which sentences are conclusively falsified.

3. Falsification

Dummett's (1976, pp.123-126) falsificationist theory of meaning is an account which takes the conditions under which a sentence is refuted to determine its meaning. Just as the verificationist account takes speakers to manifest a grasp of meaning in the activities of
justifying assertions, so the falsificationist account takes the activities of demonstrating that assertions are decisively refuted to be the manifestation of semantic knowledge. In a theory of meaning for which Bivalence holds, the alternative falsificationist account of the manifestation of semantic knowledge does not alter the semantic theory. The same inferences are validated as in a verificationist account. In a theory for which Bivalence does not always hold, a distinction may arise. When semantic knowledge consists in a grasp of procedures sufficient to protect an assertion from decisive refutation, an assertion may be justified without there being a guarantee that a conclusive verification is available.

The distinction can be illustrated with respect to the Law of the Excluded Middle. When a sentence is effectively undecidable, and truth distributes over negation and disjunction, L.E.M. is not conclusively verifiable for that sentence since we cannot conclusively verify either disjunct. In the Intuitionist account we could never assert the negation of L.E.M. But in a falsification calculus, this may be sufficient grounds for allowing that L.E.M. is assertible, since there could never be a counter-example to an assertion of L.E.M.

Dummett thinks that there are good reasons for adopting a falsificationist theory of meaning. For he thinks that the notion of the incorrectness of an assertion is conceptually prior to that of its correctness. He introduced the argument in 1959 when he suggested that assertions are like commands, and not like bets, in admitting of only two outcomes (II.5). The linguistic act of command is best described in terms of the conditions under which it is disobeyed. The point may be put in terms of the consequences of the linguistic act of
a command. Disobedience to an appropriate command always gives the commander the right to impose a penalty, while obedience to a command may have no specific consequences. Similarly, one who utters an incorrect assertion is always open to blame, while correctness may not be sufficient for commendation (Dummett, 1973, pp.418-410). We noted this in II.4, when we saw that an assertion may be correct, yet objectionable on the grounds of tactlessness or irrelevance. Incorrect assertions must, Dummett suggests, always be withdrawn. In fact, there seems to be a possibility of a similar gap with incorrect assertions. A particularly tactful incorrect assertion - a white lie, say, - may not need to be withdrawn. But this does not vitiate Dummett's stronger point: that commendation or endorsement of an assertoric utterance is less specific than rejection. There is no simple linguistic act tied to the recognition of a state of affairs which justifies an assertion in the same way as the act of withdrawing an assertion is tied to the recognition of a state of affairs which is excluded by an assertion, making it incorrect.

Hence the description of the linguistic act of assertion is best given by the conditions under which it fails to be correct, rather than by its correctness conditions. This is true, in particular, of future tense assertions, for which an indefinite time may elapse before it can be shown to be correct. Just as "an expectation is more clearly characterized by what will disappoint it, than by what will fulfil it" (Dummett, 1976, p.124), so a future tense assertion is best described by the conditions it rules out, rather than those it admits. Moreover, for other types of assertions and, in particular, conditionals we have no clear conception of what would constitute their truth. Dummett (1976, p.85) suggests that this is because conditionals are not themselves generally used as antecedents of
conditionals. There may be a dispute about whether a conditional is true when the antecedent is false, but there is no such dispute about when it should count as incorrect. If the antecedent is true, and the consequent false, the conditional is definitely incorrect.

This battery of arguments in favour of the conceptual priority of incorrect assertion does not yet specify how the theory of meaning is to be described. One way to do so is to say that semantic knowledge consists in the ability decisively to defend an assertion against any purportedly falsifying challenge. A natural interpretation of this claim would be that such a decisive defence consists in the ability to produce a verification. If we say 'not A' is assertible just when 'A' is guaranteed never to be defensible against falsification, as would seem natural on such an account, we appear to have an intuitionist style negation.3

Evidently this is not what Dummett has in mind. He asks: "What more is someone saying when he makes an assertion than that his statement is not incorrect?" (1976, p.120) and answers that there is nothing. His falsification calculus defines semantic knowledge so that "We know the meaning of a sentence when we know how to recognise that it has been refuted" (1976, p.126). Semantic knowledge does not

3. That this is a natural view of a theory of meaning which specifies conditions under which an assertion is not incorrect - or is defensible - can be seen from Lorenzen's (1967) dialogue games. He specifies meaning in terms of conditions under which an assertion can be decisively defended by a proponent, in such a way as to yield an intuitionist logic. The assumption is that, in default of a conclusive defence by a proponent, an assertion is not true. A falsification version with theses like those of Dummett's calculus would allow that, in default of a conclusive refutation by the opponent, the assertion is true. This qualification must be made to Dummett's (1976, p.124) remark that a falsificationist account has an affinity with game theoretic semantics. Dummett mentions only Hintikka's (1973) game theoretic semantics, which in fact yield classical logic.
consist in knowledge of how to show that a correct sentence could not be falsified by an ideal being but rather in knowledge of how to show that it could not be falsified by someone of human capacities. We do not need to regard the conditions defining meaning as those conditions under which an assertion can be guaranteed never to be falsified, but rather as the conditions under which it is not, as it happens, now falsified.

Dummett has a further argument in support of a falsification theory of meaning of this type. In an account of meaning based on conclusive verification, a particular sentence may not be verified, yet not be falsified, since we hold open the possibility of a verification. So, for example, the verificationist suggests that we may hold open the possibility that there is intelligent life in the universe outside this galaxy without yet having a verification. But Dummett suggests that this is an empty expectation. For if we knew that we could not falsify the claim

the supposition that it will at some time be realised is consistent with any sequence of events over a finite interval, and therefore adds nothing. (1976, pp.120-121)

Dummett thinks that a falsificationist theory of meaning is preferable to the verificationist in this regard. But his argument is unconvincing. Consider the example. The double negation of the claim that there is intelligent life in the universe might be verifiable, while the claim itself might be provably not falsifiable — say, if we could prove that we could not be in a position to exhaust the universe. In that case, we could manifest our belief that we hold open the possibility of a verification. Of course, the intuitionist in mathematics does not allow for such cases. We could never falsify $\neg\neg A\rightarrow \neg A$ in intuitionist mathematics, whereas in this case we appear to
do so, since the sentence can never be verified while it is provably not falsified. Evidently, the example undermines Dummett's point: for the verificationist seems to be able to draw the distinction between states of affairs in which a statement would not be incorrect and those in which it is correct, which Dummett thinks is a distinction not manifested in the behaviour of speakers.

There is a further difficulty with Dummett's argument. According to the falsificationist, the claim that there is intelligent life in the universe outside this galaxy is true, since we have no falsification of it. The evident problem with this proposal lies in the interpretation of negation. For it appears that a corresponding slack arises between holding a sentence not to be falsifiable, and not yet falsified. In Dummett's account of falsification this gap does not, in fact, arise. The reasons for this will become evident in 3.2.

We might expect that L.E.M. could never be falsified in Dummett's falsification calculus, and hence that it is a law. So too, Double Negation Elimination will hold. On the other hand, if the negation of a sentence is true just when the sentence cannot fail to be incorrect the double negation of

There is intelligent life in the universe outside our galaxy.

would be a stronger claim than the sentence itself, since it would amount to the claim that the sentence could not be shown incorrect. For then '¬¬A' will be true if 'A' cannot fail to be true. Double Negation Introduction then might be questionable. Indeed, Double Negation Introduction is not a thesis of Dummett's falsification calculus.
Before turning to that calculus, I shall consider several interpretations of negation, and of the force of an assertion, in an account of meaning based on falsification conditions: for there are, in fact, many more options for a falsification calculus than the one Dummett adopts.

3.1 Negation and Falsification

One way of interpreting the claim that the meaning of a sentence is determined by the conditions under which a sentence is incorrect would be to provide a recursive stipulation of conditions under which a sentence is recognisably falsifiable. So, for the sentential operators we have:

'S' is falsifiable iff there is a refutation of S.
'A v B' is falsifiable iff 'A' is falsifiable and 'B' is falsifiable.
'A & B' is falsifiable iff 'A' is falsifiable or 'B' is falsifiable.
'¬A' is falsifiable iff 'A' is not falsifiable.
'A→B' is falsifiable iff if 'A' is not falsifiable, then 'B' is falsifiable.

We stipulate that an assertion is true iff it is not falsifiable, and inferences are valid if whenever the conclusion is falsifiable, so is one of the premisses (II.4.2).

L.E.N. would appear to be universally true, since it could not both be the case that 'A' is falsifiable and '¬A' is falsifiable. However, the law of non-contradiction, '¬(A & ¬A)', appears questionable. For if 'A' is undecidable then neither 'A' nor '¬A' is recognisably falsifiable, so that their conjunction is not
recognisably falsifiable. Hence, \( \neg(A \& \neg A) \) does not appear to be not falsifiable. Of course, we would not expect a counter-example to non-contradiction, but nor would we expect it to hold universally. The argument depends on two assumptions: that it must be recognisable whether an assertion is falsifiable, and that an assertion is correct only if it is recognisably not falsifiable. It might be thought that the manifestation argument justifies both, since grasp of content should be manifestable in response to recognisable situations.\(^4\) This thought would be mistaken, for while the manifestation argument suggests that unrecognisable falsification conditions could not be used to explain practice, we could distinguish two weaker readings of the assumptions above which would meet the argument.

So we might define

\[ \neg A \text{ is falsifiable iff } A \text{ is not recognisably falsifiable.} \]

In this case negation in the calculus would be read quasi-classically, so that whenever \( A \) is not falsifiable, \( \neg A \) is falsifiable. The negation of a sentence would then be falsifiable in the complement of those situations in which the sentence is falsifiable. Nevertheless speakers could manifest their grasp of negation so defined. We could then be assured that either \( A \) or \( \neg A \) is falsifiable. In effect we do not require that an undecided assertion has been decided not to be falsified, for its negation to be falsifiable.\(^5\)

On the other hand we might take the following weaker reading of when an assertion is correct:

\[ A \text{ is correct iff } A \text{ is not recognisably falsified.} \]

On this reading correct assertions will be all those assertions which

\(^4\) This use of 'recognisable' must be distinguished from the use of 1.1.2 where I talked of recognitional abilities with respect to content. I do not think the ambiguity is important.
are not incorrect: so that correct and incorrect assertions are complements. I shall consider each of the combinations of weak and strong negation and weak and strong correctness in turn.

When we adopt the weaker reading of correctness, \( \neg (A \& \neg A) \) will be correct, however we interpret negation. For when 'recognisably' has wider scope in the definition of negation, then when 'A' is undecidable, \( A \& \neg A \) may not be falsifiable. In this case \( \neg (A \& \neg A) \) could not be recognisably falsifiable either. So \( \neg (A \& \neg A) \) is correct. Note that this option may mean in such a case that both \( (A \& \neg A) \) and \( \neg (A \& \neg A) \) count as correct; when neither is recognisably falsifiable. In that case, L.E.M. holds generally.

5. This scope distinction can be made perspicuous by expressing refutation conditions in the style of Wright (1981). Let us say

There is a refutation of A in a TSI if A is refuted in that TSI, or any of its enlargements which could be effectively achieved.

then corresponding to the case when 'recognisably' has wider scope:

There is a refutation of \( \neg A \) in a TSI if A is recognisably not refuted in that TSI, or any of its enlargements;

and otherwise

There is a refutation of \( \neg A \) in a TSI if A is not refuted in that TSI, or any of its enlargements.

and together with the natural reading for conjunction

There is a refutation of \( A \& B \) in a TSI if A is refuted, or B is refuted, or there is an effective procedure for enlarging the TSI into one of the previous types.

This yields the expected results for non-contradiction.

6. Another way of specifying the weaker notion of correctness can be achieved by omitting the reference to effective enlargements in the specification of refutation conditions of the previous footnote. For, in that case, it would be correct to assert what is not falsified within a particular TSI. This has the effect of ensuring L.E.M. since we do not need to "hold open" future possibilities. This way of expressing the weaker notion of correctness may, for that reason, be closer to Dummett's intention.
In fact, this reading of correctness seems to me to be the only reading compatible with the stronger definition of negation and yielding what Dummett requires of a falsification calculus. For consider the previous definition of correctness, in which 'recognisably' has wider scope than negation, combined with the stronger negation clause. I suggested that there are cases in which 'A & ¬A' is not recognisably falsifiable, so that ¬(A & ¬A) is not recognisably falsifiable either. In that case, the stronger reading of correctness has it that neither 'A & ¬A' nor ¬(A & ¬A) is correct, since neither is recognisably not falsifiable. So one would not be correct in asserting this instance of L.E.M.. It would be natural — although, we shall find, not necessary — to suppose that this throws doubt on L.E.M., the universal holding of which the falsification calculus was designed to ensure. Indeed, intuitionist logic appears appropriate for this combination.

Consider now the weaker, quasi-classical, reading of negation, together with the specification of correctness conditions for which 'recognisably' has wider scope. If 'A' is undecidable, 'A' is not falsifiable, so ¬A is falsifiable. Hence 'A & ¬A' is falsifiable, so it appears that ¬(A & ¬A) is not falsifiable, and therefore apparently correct. But note that, in this case, 'A' is not recognisably not falsifiable (and nor is ¬A), so either ¬(A & ¬A) is not correct, and nor is '(A & ¬A)', and L.E.M. is questionable, or '(A & ¬A)' can be correct while neither conjunct is recognisably not falsifiable. Either L.E.M. fails, or correctness does not distribute over the constants.
Finally, consider the weaker negation and the weaker specification of correctness conditions. Non-contradiction holds. For only if a sentence is falsifiable, is its negation not - and vice versa. If their conjunction is falsifiable, its negation is not falsifiable and is therefore correct. But note that this version of the calculus is one for which there is no plausibility in the failure of Double Negation Introduction. Indeed, a calculus of this sort appears precisely to preserve Bivalence and yield a classical logic.

The upshot of this discussion is represented in the following table:

<table>
<thead>
<tr>
<th>Weak Negation</th>
<th>Strong (Recognisable) Negation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;\neg A&quot; is falsifiable iff 'A' is not recognisably falsifiable</td>
<td>L.E.M. holds; Non-contradiction holds. But it may be correct to assert contradictions.</td>
</tr>
<tr>
<td>'A' is correct if 'A' is not recognisably falsified</td>
<td>L.E.M. fails. Apparent collapse to Intuitionist logic.</td>
</tr>
<tr>
<td>Collapse to classical logic.</td>
<td>Either L.E.M. fails or correctness does not distribute.</td>
</tr>
</tbody>
</table>

There are only two live options for a falsification calculus which has the general logical principles outlined at the end of the previous section. They are the combination of strong negation with weak correctness, which has the counter-intuitive consequence that contradictory assertions may be correct; and the combination of weak negation and strong correctness, in which correctness does not distribute over the constants. This latter option is also counter-intuitive, since it amounts to drawing a distinction between
truth and assertibility of the sort I have previously questioned (II.6, IV.5).

In fact, when we turn to Dummett's falsification calculus, classification on these lines is not quite so simple.

3.2. Dummett on falsification

In a footnote Dummett (1976, p.126) describes a falsification calculus. Let \( f_A \) be the recognisable states of affairs such that \( A \) is falsified, \( \overline{f_A} \) the recognisable states of affairs precluding \( f_A \). Then

\[
\overline{f \cap \overline{f}} = \emptyset; \quad \overline{f \cup \overline{f}} = \overline{f}, \quad \text{since if } f \subseteq g \text{ then } \overline{g} \subseteq \overline{f}
\]

and

\[
\overline{f \cup g} = \overline{f} \cap \overline{g}; \quad \overline{f \cup g} \subseteq \overline{f} \cap \overline{g}
\]

He takes

\[
f_{\neg A} = \overline{f_A}, \quad f_{A \lor B} = f_A \cap \overline{f_B}, \quad f_{A \land B} = f_A \cup \overline{f_B}, \quad f_{A \leftrightarrow B} = f_B \cap \overline{f_A}
\]

The interpretation of the calculus appears, at first, quite straightforward; \( f_A \) and \( \overline{f_A} \) are disjoint, but not exhaustive, sets of states of affairs. The negation of \( A \) is refuted just when \( \overline{f_A} \) obtains: when, that is, \( A \) is recognisably not falsified. An assertion of \( A \) appears to be correct just when \( f_A \) does not obtain. But, as before, we obtain variant readings depending on the interpretation of negation and of correctness. We have, that is:

(i) 'A' is assertible iff 'A' is recognisably not falsifiable
Together with

'\neg A' is assertible iff 'A' is recognisably not assertible
for which neither 'A' nor '\neg A' will be assertible when
neither \( \overline{f_A} \) nor \( \overline{\overline{f_A}} \) obtains

(ii) 'A' is assertible iff 'A' is not falsifiable,

together with

'\neg A' is assertible iff 'A' is not recognisably assertible
for which both 'A' and '\neg A' will be assertible when
neither \( \overline{f_A} \) nor \( \overline{\overline{f_A}} \) obtains

(iii) 'A' is assertible iff 'A' is recognisably not falsifiable;

together with

'\neg A' is assertible iff 'A' is recognisably not assertible
for which L.E.M. appears to fail, since neither 'A' nor '\neg A' is assertible when neither \( \overline{f_A} \) or \( \overline{\overline{f_A}} \) obtains.

(iv) 'A' is assertible iff 'A' is not falsifiable

together with

'\neg A' is assertible iff 'A' is not assertible
for which all classical laws appear to hold.

I shall no longer consider options (iii) and (iv).\(^7\) Note that both (iii) and (iv) use a negation which differs from that of Dummett's calculus, in so far as \( f_{\neg A} \) is the complement of \( f_A \). We should need accordingly to adjust Dummett's clause for '→' if we wished to treat the sentential operators consistently. In that case

\[
f_{A\rightarrow B} = f_B - f_A.
\]

Dummett obviously intended negation in what I have called the strong sense.
Dummett takes deducibility in on such a theory to be such that

$$A_1 \ldots A_n \vdash B$$ whenever $$f_B \not\in f_{A_1} \cup \ldots \cup f_{A_n}$$

(so $$\vdash A \rightarrow B$$ may hold, although $$A \vdash B$$ does not). Theses of the system are

$$\neg \neg A \vdash A, \quad \vdash A \rightarrow \neg \neg A \text{ but not } A \vdash \neg \neg A$$

$$\vdash A \lor \neg A, \quad \vdash \neg (A \land \neg A)$$

$$\neg (A \land B) \vdash \neg A \lor \neg B,$$

$$\neg A \land \neg B \vdash \neg (A \lor B) \text{ but not }$$

$$\neg A \land \neg B \vdash \neg (A \lor B)$$

7. Very crudely, we might illustrate the four options by the following diagram. Consider the falsification conditions of '$A'$, '$\neg A'$ and '$\neg \neg A'$ and namely, $$f_A, \overline{f_A}, \overline{f_A}$$ respectively.

![Diagram](image)

Now it appears that there may be states of affairs in which none of the above falsification conditions obtain: since none of '$A$', '$\neg A$', '$\neg \neg A$ are recognisably falsified. I call them '$X$'. Then the sentences will be assertible on the various interpretations in these circumstances: where $$\neg f_A$$ is the complement of $$f_A$$ then the interpretations (i)-(iv) above are:

<table>
<thead>
<tr>
<th>A is assertible</th>
<th>Negation</th>
<th>$\neg A$ is assertible</th>
<th>$\neg \neg A$ is assertible</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) $$\overline{f_A}$$</td>
<td>$$f_{\neg A} = f_A$$</td>
<td>$$\neg f_{\neg A} = f_A$$</td>
<td>$$\overline{f_{\neg A}} = f_A$$</td>
</tr>
<tr>
<td>(ii) $$\neg f_A = f_A \lor (f_A \land \neg f_A)$$</td>
<td>$$\overline{f_{\neg A}} = f_A$$</td>
<td>$$\neg f_{\neg A} = f_A$$</td>
<td>$$\overline{f_{\neg A}} = f_A$$</td>
</tr>
<tr>
<td>(iii) $$f_A$$</td>
<td>$$\overline{f_{\neg A}} = f_A$$</td>
<td>$$\neg f_{\neg A} = f_A$$</td>
<td>$$\overline{f_{\neg A}} = f_A$$</td>
</tr>
<tr>
<td>(iv) $$\neg f_A$$</td>
<td>$$\overline{f_{\neg A}} = f_A$$</td>
<td>$$\neg f_{\neg A} = f_A$$</td>
<td>$$\overline{f_{\neg A}} = f_A$$</td>
</tr>
</tbody>
</table>
L.E.M. holds, so the first appears questionable. Non-contradiction holds, so the second does not look correct. However, it is the definition of deducibility which ensures that each of these laws is a thesis. For a thesis is one for which the falsification conditions are empty, while 'B' is deducible from 'A' only if the falsification conditions of the former are contained in those of the latter. An argument is valid if it is not refutable. The thought is presumably this: that one cannot be forced to withdraw the conclusion of an argument which could only be falsified if its premisses were. The peculiarity lies in the fact that a valid argument so construed could not possibly lead to an advance of knowledge. Deducibility by Dummett's definitions is naturally associated with the weaker notion of correctness - for all we can say of the assertible theses is that their falsification conditions are empty.

The peculiarity of the definition of deducibility is apparent particularly with respect to Double Negation Introduction. $A \to \neg \neg A$ fails, while $\neg A \to \neg A$. The reason is obvious from the definitions: while $A \to A$ holds only if $F_A \subseteq F_A$ (and this may fail), $A \to A$ is falsified when $F_A \cap F_A = F_A \cap F_A$ obtains, and this never occurs. But the asymmetry means that there may be true implications in the language, although one could not be sure that one could assert the consequent whenever one could assert the antecedent. There are thus logical laws which can have no substantive issue in behaviour.

Consider interpretation (ii) above. In the calculus, the law of non-contradiction holds. For consider the falsification conditions of $\neg (A \to \neg A)$: $F_A \cup F_A = F_A \cap F_A = \emptyset$.

Now this is not inconsistent with (ii). For by the weak definition of
assertibility, when 'A' is undecidable, 'A' may be assertible, '¬A' may be assertible, and therefore, by the expected laws for conjunction, 'A & ¬A' would be assertible. But '¬(A & ¬A)' would also be assertible (by the rule for negation). And so on. Although the interpretation (ii) purported to use a strong negation, the weak notion of correctness or assertibility makes the force of a negated assertion very weak. Indeed, we should properly read this clause

'¬A' is assertible iff 'A' may be falsified.

On this interpretation of assertibility in the falsification calculus, we cannot regard the fact that non-contradiction is a thesis of the calculus as having any pragmatic consequences. The principle 'Do not assert contradictions!' could not be regarded as generally holding. We are thus in precisely the reverse position to those who endorse para-consistent logic: for they deny the logical law, but accept the pragmatic principle. But when deducibility is defined as Dummett has it this should be no surprise. For in the envisaged cases one could not be forced to withdraw non-contradiction, nor indeed to withdraw contradictory assertions. I take it that this option is patently absurd.

Consider next the interpretation, labelled (i), in which L.E.M. appears to fail. L.E.M. is certainly a thesis, since the falsification conditions of 'Av¬A' are \( f_A \cap \bar{f}_A = \emptyset \). Now in order to accommodate (i) we must allow that there may be theses of the system instances of which are not assertible. But assertibility or correctness of assertions was defined by conditions under which assertions are recognisably not recognisably refuted, so it appears that interpretation (i) must involve a notion of correctness distinct from assertibility and, in its own terms, not recognisable. This
interpretation is not one which Dummett could be supposed to advocate.

There is, however, a way of using the specification of falsification conditions as in (i), to provide the basis of a theory of meaning, and also to ensure that correctness is a recognisable notion. The stronger notion of correctness suggests that theses should be recognisably not refuted so that theses of the system should be always assertible. Yet the notion of deducibility in the falsification calculus is one for which this is not so. In fact, the specification of correctness conditions in terms of (i) would naturally be associated with a stronger notion of correctness, and would lead to an intuitionist logic. This would, of course, involve abandoning Dummett's account of deducibility in the system. The falsificationist would thus explain the failure of logical laws, not in terms of the failure of, say, 'AνA' to be generally conclusively verified, but in terms of its failure to be generally recognisably not recognisably refuted. But the logic would mimic the intuitionist.

I think that Dummett intends an interpretation of the calculus of type (ii). For he insists that an assertion is correct if it is not incorrect. Moreover, Dummett's account of deducibility suggests that his intention was to specify an account of what I earlier called 'weak' incorrectness; where 'recognisably' has narrow scope in the specification of when an assertion is incorrect. When this notion of correctness is combined with Dummett's account of negation in a falsification calculus, it leads to the absurdity that the assertion of an undecidable sentence, and of its negation, are both correct. This does not yield a contradiction in the falsification calculus which Dummett presents: indeed, non-contradiction is a thesis. But the logical laws of the system do not provide the basis for pragmatic
principles, nor a guide to what it is proper to assert. This is itself a consequence of a notion of deducibility which has no apparent connection either with behaviour, or with the possibility of an advance of knowledge through deductive reasoning.

Alternative interpretations of the calculus fail to provide an account which both justifies the logic Dummett prefers for a falsification calculus, and is faithful to the generalised anti-realist view of meaning. Indeed, it appears that the best candidate for the theory of meaning based on falsification conditions is intuitionist.

3.3. Intuitionist falsification

When the falsification calculus is interpreted in the fashion specified by (i), and we adopt intuitionist logic, there seems to be little advantage in the falsificationist account of meaning over that...

8. I think there are further problems with the falsification calculus: in particular with the account of atomic and quantified sentences. Dummett says, of the falsificationist account of meaning that it should provide "an effective means of recognising, for any given object, a conclusive demonstration that the predicate ... does not apply" (1976, p.127). How should we interpret the ability to recognise that a predicate does not apply? It does not appear to be a recognitional ability at all. Moreover, the general account in terms of conditions under which one would be forced to withdraw a sentence does not seem necessarily to involve an ability to identify an object at all. Should we not say, instead, that an atomic sentence is assertible if there is an effective means of showing that the predicate does not fail to apply to any object of the appropriate sort? Unlike the interpretation Dummett offers, this has the odd consequence that 'The King of France is bald.' is assertible. But this consequence is little odder than the consequence that both 'The King of France is bald.' and its negation are assertible.
provided by a theory in terms of conclusive verification. Of course, if Dummett is right in thinking that incorrectness in an assertion is a more fundamental property than correctness, then the falsification account provides a better description of the assertoric behaviour of speakers. But there is little difference between the falsificationist account and the general account of assertibility offered in II.4. For I then argued that assertoric behaviour is correct when it could be justified against challenges. This captures Dummett's claims that incorrectness is more fundamental than correctness.

Moreover, interpreted intuitionistically, the falsification calculus appears to inherit the difficulties of the account in terms of conclusive verification. In particular, L.E.M. fails, while the negation of an assertion is still explained in terms of situations in which the assertion recognisably fails to obtain. A plausible account of negation for the contingent sentences of natural language is still to be found. I do not think that an account which has it that 'I A' is assertible iff 'A' is recognisably not recognisably falsified provides any clear account of when the negation of contingent sentences are true.

Indeed, a falsification calculus of the intuitionist type does not even meet the difficulty with effectively undecidable sentences for which Dummett urged the replacement. For just as

There is intelligent life outside our galaxy.

appeared to be neither correct nor incorrect, and such that we must always hold open the possibility that it will be verified, so

There is not intelligent life outside our galaxy.

appears, on the falsificationist view, to inherit this feature. While on the conclusive verification account of meaning, the former could
not be verified, on the falsificationist account the latter could never be falsified. Such a sentence is one for which we must hold open the possibility that it will be falsified. If I am correct in thinking that Dummett's problem for the verificationist is illusory, it will also be illusory for the falsificationist. But, in Dummett's terms, the objection to the falsification calculus holds.

It appears that when an intuitionist style falsificationist theory of meaning is adopted, the only change from the verificationist theory is that sentences which had fallen into class (i) of 1 fall into (ii), and vice versa. A falsification calculus of this sort explains the failure of classical laws in terms of conditions under which assertions are conclusively falsified, rather than those under which assertions are conclusively verified. According to the falsificationist 'Av \neg A' does not generally hold, since we cannot generally assume that either 'A' is not falsified or that \neg A is not falsified, for example. But the falsificationist explanation will, in every case, mimic the Intuitionist. The advantages of this version of the falsification calculus then appear to be merely cosmetic. In particular, the account of when negations of sentences are correct faces the problems already encountered for the intuitionist account.

4. **Inconclusive Assertibility**

I have interpreted both the verification and the falsification calculi as providing an account of meaning in terms of conditions under which sentences of the language are conclusively correct. This was so, even when I adopted the 'weak' interpretation of correctness for the falsification calculus, in which an assertion was (definitely) correct iff it was not recognisably falsified. For it was thus I
derived the absurdity that both a sentence and its negation were definitely correct. Yet, as I remarked in 1, there are sentences of natural language for which the model of conclusive correctness of assertoric behaviour is questionable. This fact might make us suspect another problem. The claim that there are conditions under which sentences of natural language are conclusively correct should be rejected.

Dummett (1976, pp.132-133) thinks that the description of the alternative mathematics in which assertions are justified by plausible reasoning, rather than by possession of conclusive proof, would not differ in the theory of sense from an orthodox intuitionist account. The distinction between the two mathematical practices should be ascribed to that component of the theory of force which describes when speakers - either personally or as a group - accept evidence of a certain strength as adequate grounds for an assertion. There are, however, two sorts of alternative mathematics. Dummett supposes that, while adopting weaker conventions of assertion, the alternative mathematicians nevertheless have a conception of conclusive mathematical proof. That conception would be manifest in the activity of proving mathematical sentences: itself made explicit, presumably, in a form of assertoric behaviour. There are then two conventional assertoric practices in the alternative mathematics - one backed by conclusive proof, and the other by plausible reasoning. The second of them could be interpreted as a conventionally modified form of assertion, along the lines of II.2, and therefore not altering the sense of sentences.9
The interesting interpretation of Dummett's alternative mathematics is one in which there is no assertoric practice which is tantamount to the claim that there is a conclusive proof. For in that case the conception of a conclusively verified mathematical assertion would no longer play any role in the description of mathematical practice. Natural language resembles the alternative mathematics in this sense. For there are many assertions of natural language for which we could not, in principle, decisively determine the truth value - at least when truth is realistically conceived - but which may nevertheless be assertible. Indeed, Dummett admits the possibility of cases of this type. He says that the anti-realist might allow that

the meaning of a statement is intrinsically connected with what we count as evidence for or against that statement; and there is nothing to prevent the statement's being so used that we do not treat anything as conclusively verifying it. (1978, p.162)

Apparent candidates for sentences of this type in natural language are those sentences the assertion of which can be fully justified even though there is no procedure for conclusively determining their truth values in a finite time. So, for example, we might treat vague predicates of natural language as having this feature: that there is no procedure for determining in a finite time whether a vague predicate definitely applies to an object of an appropriate sort or not. Many empirical sentences inherit this feature from the vagueness of the predicates either explicitly or

9. There is a possible alternative to this view, which involves distinguishing content and ingredient sense. We should say that, in order to explain when e.g., 'A→B' is plausible, we need to invoke the conclusive proof conditions of the antecedent. This would mean that there is no separate assertoric practice of conclusive provability: but that, nonetheless, conclusive proof conditions are used in the explanation of practice. This may well be what Dummett has in mind - but the distinction between content and ingredient sense is not one I endorse.
implicitly associated with their correct use.

If vague predicates were the only type of sentence of natural language for which the model of conclusive verification is questionable, the difficulty would be met by modifying a theory of conclusive verification conditions for a specification of when vague predicates in a language definitely, or indefinitely, apply to objects. We could then derive, fairly straightforwardly, a negation operator for vague sentences.

But natural language contains many more assertoric utterances for which evidence is essentially inconclusive than those explained by the presence of vague predicates. Inductive generalisations and assertions based on probabilistic reasoning might fall into this category. One way of describing the tensed sentences of natural language is to say that for past (and perhaps future) tensed sentences, we can never be in a position conclusively to determine the truth value of sentences, since past (and possibly certain future) times are in principle inaccessible. A view of this type suggests that the loss of evidence—say, Nixon's tapes—could no longer be regarded as a contingent matter. I postpone discussion of these issues until the next chapter.

Quasi-assertions might also be interpreted as assertions for which evidence is essentially inconclusive. I observed in II.3 that two competent speakers of a language might be in possession of identical evidence, yet disagree on whether an ethical assertion was correct. I have suggested that this should not mean that ethical assertions cannot be correct. One view of ethical assertions—which I shall not attempt to defend here—would be that, although there are

10. As Peacocke (1981, p.137) and Burgess (1980, Ch.VI) do.
objective conditions under which ethical assertions are correct, the assertibility conditions could never provide a conclusive warrant for their assertoric use.

4.1. Defeasible Assertions

Another feature leading to inconclusive assertibility conditions has been labelled, by Crispin Wright, "defeasibility" (1979, pp.293-294). The exemplar of this class discussed by Wright is ascription of pain to another. He suggests that evidence for the assertion of

John is in pain,

consists in criterial evidence for the application of '...in pain' - presumably behavioural criteria - together with "overturn" conditions. In grasping the use of '...in pain', speakers know that evidence for any ascription of pain might be inconclusive and refuted by further evidence. Nevertheless, defeasible assertions have conditions of application which are exhaustively manifest in use. Both the criterial, behavioural conditions of application of the predicates and the "overturn" conditions are recognisable. The difficulty with Wright's account is to specify what is known when one recognises that a defeasible assertion is assertible. It appears that knowledge of the content of such assertions is itself defeasible: so that speakers could not be said to know what they are saying.

Defeasible assertions differ from other inconclusive assertions in some respects, as Dummett (1978, p.xxxxvii) remarks. For mental predicates notoriously have unusual application conditions. The feature of defeasible assertions which I shall discuss is that they may at one time be fully justified, while later we discover that their
negation was, in fact, correct then. This feature arguably applies to statistical generalisations. It does not, at first blush, apply to tensed sentences, which can be decidable at one time, later not, but for which the negation of a once justified assertion is surely not ever assertible. I postpone these questions until Chapter VI.

Consider, for example,

John is in pain.

This sentence might be defeasibly assertible at one time (t), while at a later time (t') we discover that

John was in pain at t.

is not defeasibly assertible at t'. There are at least two ways an anti-realist might wish to describe a case like this. One is to accept that an assertion may be both correct and incorrect: in particular, by specifying what I called in 3.1 a 'weak' notion of correctness. We could say, that is, that the negation of a defeasible assertion is falsified just if the assertion is recognisably not falsified, but allow that the negated assertion is correct if it is not recognisably falsified. This 'weak' conception of correctness may be adapted to verification conditions. In this case we allow that

'A' is assertible iff 'A' is verified at any time

and 

'¬A' is assertible iff 'A' is not recognisably verified

We should then be obliged to admit that an assertion and its contradictory could both be true.

This description of the assertibility conditions of defeasible assertions is unattractive. For we are inclined to allow that while a justified defeasible assertion may later be proved to have been incorrect at the time of utterance, it could not have been both correct and incorrect at that time. It is evident, in any case, that
we do not need to interpret weak correctness in this way. We might adopt the view that an assertion is correct if it is at present verified: restricting, then, the TSI to the information available at a time (fn.6). In this case the content of defeasible assertions, and an account of what is known when such assertions are true, is restricted to a TSI at a time. We can be quite certain, at a time, of the content of a defeasible assertion. To say that an assertion cannot be both verified and falsified then amounts to the claim that it could not - at one time - be both verified and falsified.

'John is in pain.' uttered at $t$

and 'John was not in pain at $t$.' uttered at $t'$
might both be correct, but we should not be inclined to allow that they are contradictories, since they could never both be asserted in the same TSI.

This is tantamount to treating defeasible assertions in the fashion of interpretation (iv) of the falsification calculus, recast for verification. Recall that, on interpretation (iv), the use of both weak correctness and weak negation ensured that whenever an assertion is not assertible in a particular TSI its negation is assertible. This appears to be precisely how I have interpreted defeasible assertions. I suggest that this is ultimately an unsatisfactory solution - not because it appears to yield classical logic, but because it allows that the negation of a sentence may be assertible although we have no evidence that it is. Indeed, a suggestion of this sort appears directly committed to the counter-intuitive consequence that, lacking grounds for 'Nixon was a liar.' because the relevant tapes were destroyed, the negation is assertible.
Before turning to the account which I prefer, I shall discuss one proposal, based on a probabilistic semantics for defeasible assertions, which appears to yield classical logic.

4.2. A Justification of L.E.M. for Defeasible Assertions

Edgington proposes an account of conditions justifying defeasible assertions "to a certain degree" (1981, p.165). She suggests that rules governing such assertions issue in a classical, not an intuitionist, logic. Her account develops the probabilistic semantics proposed, for example, by Field (1977) and Putnam (1978). She regards understanding of an assertion 'A', whose justification is not conclusive, as given by "the primary grounds for its assertion" (1981, p.169). Note that this differs from my preferred account, labelled by her 'untidy', which treats degrees of justification as constitutive of the meaning of assertions. I shall argue that her solution presupposes realism, and that despite her arguments to the contrary, her account of the manifestation of semantic knowledge justifying L.E.M. is ultimately unsatisfactory.

Relative to her notion of justification, Edgington argues that disjunction should be interpreted in such a way that the justification of a disjunction is at least as great as, and generally greater than, the justification for either disjunct. The inequality will be strict for 'A\lor B' unless either 'A' or 'B' or their negations are conclusively assertible, or 'A\rightarrow B' or 'B\rightarrow A'. Disjunction, she suggests, is essentially a device for weakening one's assertion, making it more likely to be justified. She then adds a further clause: that where 'A' and 'B' are incompatible the justification for the disjunction is a strictly monotonic increasing function of the justification of
either disjunct, "as more information becomes available" (1981, pp.164-165). This further clause, we shall find, is crucial to her derivation of L.E.M.

Negation is also interpreted as a function from degree of justification, such that the degrees of justification of a negation \( \neg A \) increases (decreases) inversely with decrease (increase) of the degree of justification of \( A \). With negation and disjunction so defined \( A \vee \neg A \) must always take the maximal justification. The inverse relation allows us to say that the justification of \( A \& \neg A \) is minimal while, since \( A \) and \( \neg A \) are incompatible, \( A \vee \neg A \) must eventually be evaluated as maximal.

Now Edgington regards the justification of an assertion as the probability that its primary grounds obtain. Let us suppose there is no justification for either \( A \) or \( \neg A \). If Edgington allowed that we could specify the primary grounds for an assertion and for its negation independently, then it seems plausible that, in the envisaged situation, \( A \) and \( \neg A \) are equally likely. But there is no obvious reason to assume that the probability of each is \( \frac{1}{2} \). In effect, the assumption is that any enlargements of the present, indecisive state of affairs will justify each of \( A \) or \( \neg A \) precisely half of the time. That cannot be justified save on the realistic assumption of Bivalence. Evidently, the stronger rule for disjunction cannot help here: for a device for weakening commitment can only explain practice if commitment can be recognised to be weakened.

In fact, Edgington (1981, pp.168-9) argues that there is only one type of primary ground for assertions and that grounds for its negation cannot be separately stipulated. In this case, the only justification for thinking an assertion and its negation are equally
likely when there is no relevant evidence derives from the inverse law for negation. In effect, she defines negation in terms of the inverse law. So defined, negation is the probabilistic counterpart of 'weak' quasi-classical negation. She avoids the consequence that when there is no evidence for an assertion then its negation is assertible, by stipulating that each is equally likely in such a case. But, so defined, a negation may be assertible - or assertible to a certain degree - without its being recognisable that it is justified. Moreover, if negation is defined in this way, then Edgington needs to justify how we recognise the primitive "incompatibility" of a sentence and its negation both obtaining, for use in the stronger disjunction rule. It appears, in fact, that Edgington has simply defined a quasi-classical negation. It is not surprising that classical logic follows.

In fact, it is possible to construct probabilistic semantics without using a quasi-classical negation. Van Fraassen (1981) argues that we could reject the classical probability postulate for negation, yet treat disjunction and implication in a generalised intuitionist fashion, and hence obtain an intuitionist style probability theory. Doubts about the inverse principle suggest that if the anti-realist were to adopt a probabilistic semantics, it would be of van Fraassen's intuitionist type, and would not directly justify L.E.M. ..

There are evident advantages for the anti-realist in adopting a probabilistic semantics for defeasible assertions. For it would be possible to treat defeasible assertions as having determinate, if probabilistic, criteria associated with them, in terms of which speakers grasp their meaning. It would no longer be necessary to relativise the meaning of defeasible assertions to a TSI at a time.
Moreover if my arguments at II.5 were correct, there could be no objection to this view to be derived from the bifurcation thesis. For, although we should be committed to intermediate verdicts for defeasible assertions, those verdicts would define their meaning, in much the fashion Dummett himself seems to advocate.

However I shall not adopt an account of this type. This is because I cannot see how we should interpret the manifestation of probabilistic semantic knowledge. Suppose speakers' use of defeasible assertions implicitly involves assessments of probabilities. It is natural to correlate the correctness of those assessments with the frequency that an outcome of certain type occurs. It is difficult to see how the anti-realist would specify the outcomes, since defeasible assertions may never be conclusively correct or incorrect and may turn out not to be justified later, although they are justified at a time. I have argued that the correctness of defeasible assertions must be considered as assessed at a time. For this reason, I think it most likely that a probabilistic account could not be adapted to the purposes of a theory of meaning meeting the manifestation argument. I shall turn, therefore, to an alternative suggestion, which has the advantage of similarity to my proposal for an account of negation for conclusively verifiable assertions.

5. Conditions of Verification and Falsification

One difficulty in applying the intuitionist model to natural language derives from the account of negation. There is no uniform account of an intuitionist style negation when conclusive verification is taken as the central notion of a theory of meaning. The presence of sentences evidence for which is essentially inconclusive
exacerbates the difficulty of providing an adequate account of negation for natural language. For there is no justifiable uniform style of definition of negation for such sentences, either.

What then of Dummett's suggestion, mentioned at 2.2, that conditions of verification and of falsification might be employed in a theory of meaning? We have already seen reason to question his rejection of that suggestion: and he does not, in any case, explicitly rule out the possibility that conditions of this type might be used to define negation in a language (Dummett, 1976, p.117). The only objection to this suggestion I found to be justified was that it is inelegant. In the light of present difficulties, that objection appears to be derisory. Consider the following proposal:

'A' is assertible iff 'A' is verified.

'not A' is assertible iff 'A' is falsified.

We provide an account of complex sentences of a language in terms of when the components are verified, and their negations in terms of falsification conditions. We would then be able to use both verification conditions, specified on general intuitionist lines (save for negation) and falsification conditions, specified as in 3.1, to determine the content of sentences. In doing so, I suggest, we can avoid the difficulties of an account of negation in natural language. For we should be able separately to stipulate when a negation is true.

Let us first consider conditions of conclusive verification and falsification. Take a stipulation of verification conditions in the style of Dummett's falsification calculus:

\[ v_A \text{ are the recognisable states of affairs verifying } A. \]

\[ \overline{v}_A \text{ are the recognisable states of affairs precluding the occurrence of } v_A. \]

Then \[ v \cap \overline{v} = \emptyset, \overline{v} \subseteq \overline{\overline{v}} = \overline{v}. \]
Moreover \( \overline{v \cap w} = \overline{v} \cap \overline{w} \) and \( \overline{v \cup w} \subseteq \overline{v} \cap \overline{w} \nabla

Let us say \( v_{\neg A} = f_A \) along the lines of the alternative suggestion in which a negation is verified if the sentence is falsified.

Then

\[
\begin{align*}
    v_{A\&B} &= v_A \cap v_B \\
    v_{A\lor B} &= v_A \cup v_B \\
    v_{A\rightarrow B} &= f_A \lor v_B
\end{align*}
\]

11. I have adopted a clause for the conditional which is neither analogous to that provided by Dummett for the falsification calculus, nor intuitionist since, \( A+B \Rightarrow \neg A \lor B \) on these conditions. We should need to adjust Dummett's clause to \( f_{A+B} = v_A \cap f_B \) to keep the symmetry. This means however that the calculus is intuitionist only for negation, disjunction and conjunction. However since the conditionals are similar in the sentential calculus, I have ignored this complication. The alternative definitions for \( v_{A\&B} \) are \( v_A \cap v_B \) (corresponding to Dummett's falsification clause \( f_{A+B} = v_A \cap f_B \)) and \( v_A \cap f_B \) (for which the falsification conditions would be \( f_B \cap v_B \)). Neither of these is closer to an intuitionist style negation. My reasons for adopting the definition above are that it reflects what I required of the account of negation. Note that the conditional is assertible if and only if whenever the antecedent is not falsified, the consequent is verified. So, 'If Nixon was a liar, then he should be dismissed.' begging some questions about practical reasoning would be assertible, since 'Nixon was a liar.' is not falsified. This will disturb those who advocate relevance, but it seems close to the spirit of the intuitionist conditional.

On these definitions, the following diagram illustrates falsification and verification conditions. 'Y' is those states of affairs in which \( \neg A \) is not falsified, and \( \neg \neg A \) not falsified, 'Z' those in which \( \neg A \) is not verified and \( \neg \neg A \) not verified, and 'X' those states of affairs in which 'A' is neither verified nor falsified.
Combining verification conditions of this type with Dummett's falsification condition, we would naturally assume that

\[ v_A \subseteq \overline{f_A} \]

\[ f_A \subseteq \overline{v_A} \]

in order to fulfill Dummett's requirement that no assertion is both verified and falsified. We can show that this property is preserved for the recursive clauses. So, for example,

\[ f_{A \& B} = f_A \cup f_B \subseteq \overline{v_A} \cup \overline{v_B} \subseteq \overline{v_A \cap v_B} = \overline{v_{A \& B}} \]

and conversely,

\[ v_{A \& B} = v_A \cap v_B \subseteq \overline{f_A} \cap \overline{f_B} \subseteq \overline{f_A \cup f_B} = \overline{f_{A \& B}} \]

So, in general, we can establish that \( f \cap v = \emptyset \), since \( f \cap \overline{f} = \emptyset \), and \( v \cap f_A = \emptyset \).

Now the definitions above suggest that in general 'A' is assertible iff it is verifiable. In particular

'\neg A' is assertible iff \( v_A \) obtains

'\neg \neg A' is assertible iff \( f_{\neg A} \) obtains.

In order to restore symmetry, we might further adjust the clauses for verification and falsification conditions, so that \( f_{\neg A} = \overline{v_A} \). For in that case, we would have, as seems natural, \( v_{\neg \neg A} = f_{\neg A} = v_A \).

Conversely, we can define \( f_{\neg \neg A} = \overline{v_A} \).

If we take \( f_A \)'s not obtaining as equivalent to \( \overline{f_A} \)'s obtaining as we did for the so-called stronger correctness in 3.2, and \( v_A \)'s not obtaining to be equivalent to \( \overline{v_A} \)'s obtaining, the appropriate logic appears to resemble the intuitionist at least with respect to L.E.M. and Double Negation. Evidently L.E.M. may fail, since \( v_A \) and \( \overline{f_A} \) (or \( \overline{v_A} \)) do not exhaust the states of affairs, while Double Negation
Elimination fails, since $v_A$ may be a proper subset of $\overline{f_A}$ (or $\overline{\neg f_A}$). I adopt the stipulation that theses of the system are formulae instances of which are always assertible. So neither L.E.M. nor Double Negation Elimination are theses. In general, since there may be situations in which an assertion is neither verified nor falsified, Bivalence cannot be assumed.

To adopt this account of meaning is to allow that there may be independent specification of verification and falsification conditions for certain sentences of a language. It is not to deny that, in some cases—mathematical assertions, for example—we can define negation or falsification conditions in a uniform fashion. Nor is it to deny that classical logic may be appropriate for certain sentences of the language. It is, rather, to suggest an account of conclusively verifiable or falsifiable assertions which meets the manifestation argument while avoiding the difficulties of the intuitionist style negation. It is not necessary, on this account, to search for an appropriate sense in which a negation is assertible if a falsification could not arise, thereby falling short of an adequate account of the negations of contingent sentences, on the one hand, or making too many contingent negations true, on the other. 'Nixon was not a liar.' will, on this account, be assertible only if we have evidence that he was definitely not: and this the loss of all evidence does not provide. 'Nixon was not a liar.' will certainly not be Bivalent in this case.

Evidently, an account of this type is not suitable for defeasible assertions. For the falsification and verification conditions of defeasible assertions may intersect. Nevertheless, I think that the only prospect for an anti-realistically respectable account of
defeasible assertions will require an independent specification of conditions under which they are verified, and those under which they are falsified. For there seems little prospect of a uniform account of negation for such assertions other than the probabilistic conditions of 4.2.

One way of providing an account of defeasible assertions is to take seriously the observation that defeasible assertions are assertible only in a TSI at a time. We then adopt the weaker notion of correctness for them. But, by providing independent specifications of falsification and verification conditions, we avoid the extremely weak negation which earlier appeared problematic. Defeasible assertions cannot be both verified and falsified at a time. Moreover, if a defeasible assertion is verified at a time, its negation is falsified, and vice versa, while the negation is verified if and only if the assertion is falsified. We do not need to hold open the possibility of further enlargements, as we do with conclusive correctness conditions. So, although an assertion may, at a time, be neither verified nor falsified, \( \neg \neg A \) is equivalent to 'A', since in this case, \( v_{\neg \neg A} = P_A = v_A \). So we could prove L.E.M., in the fashion of III.3, by applying negation introduction to the consequences of \( \neg (A \vee \neg A) \). But in that case, it seems the negation introduction law itself should be questioned. For it involves the supposition that if a contradiction can be derived from the hypothesis that 'A', then 'not A' is itself assertible. Only the weaker conclusion, that 'A' is not assertible, appears justified for inconclusive assertions. I shall not further consider a logic of this sort, which would evidently differ from intuitionist, falsificationist, and classical logics. I note however that L.E.M. and Bivalence fail, while non-contradiction holds, since we have restricted verification and falsification to a
I conclude that although the proper account of conclusively and defeasibly assertible sentences of natural language is not a purely intuitionist account, it resembles the intuitionist account in throwing doubt on L.E.M. and Bivalence. Unlike the mathematical case, that doubt arises for the atomic sentences of the language, and not just from considerations about quantification.

There is a further conclusion to be drawn from an account of this sort. I have argued that the analogue of an I-theory serves to specify meaning, as long as the logic of the metalanguage is suitable for meaning specifications, and the disquotational predicate is read in terms of the appropriate central notion of the theory of meaning. When conditions of verification and falsification determine meaning, there is no analogue of an I-theory which could be used to determine meaning. This is not simply because the logic of the metalanguage is not intuitionist, for we could adjust the logic of the metalanguage to accommodate whatever logic is appropriate for the theory of meaning. It is because there is no longer one central notion in terms of which meaning is given, but two. We could, of course, recursively stipulate verification and falsification conditions for sentences of a language; but neither stipulation would uniquely specify the meaning of sentences of the language. Nevertheless, it would still be correct to say that assertibility conditions of sentences of a language specify truth, anti-realistically conceived. We must admit, however, that

12. Huw Price (1981) develops a somewhat similar calculus, in terms of conditions under which sentences are assertible and deniable, and thereby derives classical logic. I think his argument is susceptible to the objection to L.E.M. mentioned here — a fact he recognises. I am not convinced by his appeal to conditions under which one would disagree with a previous speaker's utterances.
assertibility is not a univocal notion.

For this reason, I shall prefer to talk of canonical assertibility conditions in later chapters. Canonical assertibility conditions for sentences of a language consist in verification conditions, as well as falsification conditions specifying when negated sentences are assertible.

6. Conclusion

This is an appropriate point at which to draw together some threads of the previous chapters. I have argued that semantic knowledge must be manifestable. I have, on the whole, endorsed Dummett's claim that in order to ensure that semantic knowledge is manifestable we might need to accept revision of our classical logical practices. In particular, I have argued that we are not justified in assuming that Bivalence and L.E.M. generally hold. Moreover, I have argued that provability conditions define the meaning of mathematical sentences, and that assertibility conditions define the meaning of sentences of natural language.

The major points at which I disagree with Dummett arise from the extension of the intuitionist model from mathematics to natural language. Unlike Dummett, I believe that vague and inconclusive assertions require modification of the intuitionist model. The best way to accommodate the former is, I think, to define their meaning in terms of conditions which do not decisively justify them, but justify them only to a degree. Assertions evidence for which is inconclusive require a different treatment. I have argued that conditions of verification and falsification at a time define the meaning of inconclusive assertions.
This modification of an account of assertibility conditions should be quite natural in the context of the manifestation argument as expressed at IV.1.2. On that view semantic knowledge is attributed to speakers on the basis of their actual behaviour in using sentences. If speakers' behaviour is best explained by attributing to them grasp of states of affairs which indecisively justify their assertions, or justify them at a time, then we should attribute semantic knowledge of that type.

Moreover, this account is compatible with the description of the conventions of assertion, as given in II.4 and II.5. There is no reason why we should require that the conventions of assertion make every assertion such that it could not be either definitely correct or incorrect, despite Dummett's claim to the contrary. And there is no reason why conditions of verification and falsification should not jointly determine the meaning of a sentence and of its negation, again in spite of Dummett's claim to the contrary.

This is as well. For I have argued that negation in natural language is not properly represented by the intuitionist negation. I have adopted falsification conditions as defining when a negated sentence is true not only for inconclusive assertions, but also for contingent, but conclusively verifiable (or falsifiable), sentences of natural language.

I have argued that Dummett's own proposed solutions for the difficulties raised by negation in natural language are quite inadequate. The falsification calculus yields an account of deducibility which is wildly implausible. I can see only two ways of interpreting the falsification calculus to avoid the implausibility. The first is only trivially distinct from the intuitionist account of
meaning. The second involves stipulating that assertibility does not distribute over the logical constants. The second option is one which Dummett raises when he considers past tense disjunctions in natural language, and is tantamount to drawing the distinction between truth and assertibility - or content and ingredient sense - which Dummett often contemplates. I do not think we can draw this distinction and also hope to meet the manifestation argument for complex sentences.

It might be thought that in adopting a theory of meaning in terms of verification and falsification conditions, I have myself drawn a distinction between content and ingredient sense. For falsification conditions are used to specify when complex sentences of a particular sort - namely negated sentences - are true. I do not think that the charge would be fully justified. It is precisely because negation cannot be treated as a well-behaved function of verification conditions of sentences that I have adopted the account of meaning in terms of verification and falsification conditions. But I would argue falsification conditions so defined differ from ingredient senses induced by operators such as the conditional. In particular, I think that there is an activity in which speakers manifest their grasp of falsification conditions, other than in asserting complex, negated sentences - namely, in rejecting or denying others' assertoric uses.

If falsification conditions so defined are regarded as inducing a species of ingredient sense, then they must be sharply distinguished from others; for a grasp of falsification conditions can be exhaustively manifest in use. It is this feature which is at the heart of an anti-realist theory, and to the lack of which I objected in accounts of complex sentences in terms of the ingredient senses of constituents. Certainly, I can see no reason to modify my claim that
the verification and falsification conditions of complex sentences must be well-behaved functions of those of their components.

We can summarise how these modifications to Dummett’s views affect the theory of meaning, by considering the types of undecidability which arise in natural language. In 1, I categorised the types of undecidability which might arise in natural language as corresponding to those allowed for in intuitionist mathematics. Whether we allow undecidability of types (i) and (ii) in natural language depends on how we construe the falsification conditions of sentences involving quantification over infinite domains. Dummett, as we noted in 3, objects to the intuitionist model on the grounds that it involves allowing that a sentence may turn out to be verified even though we can give no finite limit to the time such a discovery might take. I have questioned his objection. So, undecidability of types (i) and (ii) might arise.

Undecidability of type (iii) cannot in general be assessed as arising only from lack of a guarantee of a method of conclusively verifying a sentence. Rather, it will be seen as lack of guarantee that conclusive or inconclusive grounds sufficing to verify or falsify a sentence are available. Moreover, when falsification and verification conditions define meaning, Bivalence may actually be counter-exemplified. In these cases, we can assert the negation of L.E.M. My first argument against admitting transcendent-class (iv) sentences as meaningful employed the intuitionist principle of \(\forall \forall (Av\neg A)\). In natural language, this argument no longer applies. Nevertheless, the anti-realist is still committed to the claim that sentences for which we could not conceive a verification or falsification are meaningless.
Times - or certain stretches of time - have been thought to be unreal for many reasons. I shall be concerned with two of them. The first form of anti-realism about time supposes there is a metaphysical, ontological or epistemological difference between the present, and other times. The second form more closely resembles intuitionism in mathematics, in that anti-realism about time is taken to be a consequence of the undecidability of sentences involving reference to, or modification by, time. In particular, sentences about the remote and inaccessible past and those involving quantification over infinite stretches of time may be effectively undecidable, and hence realism with regard to those sentences unjustified.

Dummett (1969) adopts the second type of anti-realism about time. But he also appeals to the intuitive distinction between the present and other times (1969, pp.257-258; 1973, pp.382-400). I think that these two types of anti-realism about time are not compatible.

Associated with anti-realism about time of the first sort has been the claim that the analysis of tensed sentences should discern temporal operators. Dummett endorses this view. I shall argue that an operator analysis of time is neither necessary nor sufficient for anti-realism of the first sort. The appropriate analysis of tensed sentences discerns reference to times. I suggest an analysis which
explains tenses as involving indexical reference.

To formulate tensed sentences in this way suggests that if anti-realism of the first type about time is justified, then anti-realism about space and other minds is also justified. I reject one form of argument in favour of realism in all these areas - namely the truth value link. However, I argue that a generalised anti-realist view of this type is not defensible.

I argue that there are insuperable difficulties in providing an account of the meaning of tensed sentences which both meets the manifestation argument, and treats the present as metaphysically or epistemologically central. However, I shall endorse anti-realism about time, construed on the intuitionist model. That view does not involve the rejection of the objectivity of time.

1. Dummett's Anti-Realism about Time

Dummett applies the intuitionist analogy to sentences about temporally remote regions. In particular, he treats quantification over time on the intuitionist model. So he regards "A city will never be built on this spot" (1959, p.159) as undecidable - falling, that is, into class (ii) of V.1 - since it may not be verified in a finite time. Applied in this way, the intuitionist analogy suggests that we should think of the infinite structure of times constructively. We do not need to impugn the existence of times other than the present, but only of a completed totality of times. In this sense, the undecidability of tensed sentences precisely resembles that arising from quantification over spatial points, as seen in the example of
There is no intelligent life in the universe outside our galaxy.

I have remarked on Dummett's scruples about applying the intuitionist analogy to this case: on the grounds that to say such a sentence may be falsified without placing a limit on when it is falsified is to make a claim about the meaning of the sentence which could not be manifested in behaviour (V.3). I do not think his scruples are justified. Nevertheless, the intuitionist analogy applied to times - and, in particular, indefinitely distant future times - inherits this feature. We might suspect, therefore, that Dummett's anti-realism about time is not based solely on the analogy with the finite structure of time.

Indeed, Dummett is concerned to argue that past tense statements are undecidable because, although it is possible to verify or falsify them, we possess no effective method of obtaining either a verification of a falsification in a finite time (1973, p.469). Hence past tense statements are taken to fall into class (iii) of V.1. Dummett argues that the decidability of tensed sentences depends on whether present or future evidence suffices to decide them. I have already described (V.2.1) a case in which the present and future unavailability of decision procedures for a past tensed sentence inclines us to regard it as neither true nor false, and have argued that such cases are properly regarded as ones which are neither verifiable or falsifiable (V.5).

It is quite natural to extend the intuitionist analogy in this way. Although the availability of proofs in mathematics is, I suppose, an atemporal availability, it is obvious that the intuitionist allows that many mathematical sentences are decidable.
which would take time to decide. There is no objection to the decidability of a mathematical sentence being determined by procedures which could only be exercised in the future. Dummett's adaptation of the intuitionism to time inherits this feature. In arguing that past tensed sentences may be undecidable, Dummett's point is that there may be no decision procedure which guarantees that a past tense sentence would be either verified or falsified. For the past is past, and hence cannot be inspected in the sense that the present and future can be.

Anti-realism of this type differs from the anti-realism which supposes that there is a metaphysical, or ontological, gulf between the present and all other times. As Dummett says:

> the thesis thus relates the truth or falsity of past tense statements, whenever uttered, not to the evidence available for them at the time of utterance, but to the evidence that is now, or may later become, available for ascribing to those statements the property of being true when uttered. (1969, p.251-2)

If we endorsed anti-realism of the first type, Dummett's anti-realism would be incoherent. For it is natural to think, on that view, that only present evidence is available. Hence if a decision procedure takes time to exercise, we would have no guarantee that what was decided by the decision procedure is what was to be decided at the time of utterance. Put in the linguistic mode, a decision procedure which took time to exercise could only serve to verify or falsify

> It was the case that it would be the case that...

and not the assertion itself. 1

1. McGinn (1980, p.36) raises an objection to Dummett which is similar to the one presented here. Although I think that there is a tension between the two aspects of anti-realism in Dummett's thought, I do not think he can directly be accused of a translational reduction of this sort.
However, within the context of the generalised intuitionist position about time, this objection appears misguided. For the anti-realist of this type allows that sentences may be decided after a lapse of time; indeed, it is constitutive of the meaning of most assertions that a decision procedure could be extended over time. It would be a mistake to claim, on these grounds, that assertions all implicitly involve future or future past tenses. It would be an instance of what Geach has called the "cancelling out fallacy" (1962, p.61). Even if it were true that the decision procedure for a present tensed sentence was equivalent in its exercise to a decision procedure for a future past tense sentence, the two need not be equivalent in meaning. For the equivalence in decision procedure in that context does not guarantee their equivalence in every context.

Nevertheless, Dummett does appeal to theses which are naturally associated with anti-realism of the first, rather than the second, type. In the course of a discussion of the analysis of tensed sentences (1973, Ch.11), Dummett argues for an account which treats temporal modification in terms of operators on the grounds that truth must be relativised to time. Such a relativisation of truth to time implies a metaphysical gulf between the present and other times: for what could be a deeper distinction between the present and other times than that truth can only be predicated of statements at a time? Moreover, Dummett (1969) appeals to the relativisation of truth to time when discussing how the anti-realist is to accommodate the tense logical equivalences, which he calls the truth value links.

In this context, it is possible to charge the Dummettian anti-realist about the past with incoherence. For if the meaning of sentences - even present tense sentences - is determined by procedures
whereby one justifies their use, and those procedures take time to exercise, then the practices of justifying (or falsifying) a sentence show it verified (or falsified) at a time later than that at which the sentence we purport to define is uttered. But since truth is relativised to time, what would constitute a verification, or falsification, at a later time could not be used to define the meaning of a sentence at an earlier time.

This question has wider application than to the temporal cases mentioned here. In Chapter V, I endorsed the view that defeasible assertions must be regarded as verified (or falsified) in a state of information at a time. If it is incoherent to regard a verification (or falsification) procedure as relativised to a state of information at a time, then the existence of defeasible assertions in natural language indicates an apparent inconsistency in our practices.

Properly to assess these arguments, we must settle the question of analysis of tensed sentences. Many have thought that once this has been achieved, the metaphysical status of time is determined. I disagree with this view.

2. Operators and Terms

Associated with temporal anti-realism of the sort which concentrates on the centrality of the present, there has been a syntactic analysis of tensed sentences which treats the basic forms of temporal referring expressions as operators. Prior advocates this analysis, (eg. 1967, ch.I; 1968, ch.I). Dummett also adopts the operator analysis (1973, ch.II).
Prior's anti-realism about time is of a particular form. He argues that tenseless discourse cannot be adequately analysed in, or translated into, tenseless terms. On his view, the centrality of the present is reflected in the analysis of temporal operators as acting on present tense radicals, and in the implicit (vacuous) present tense operator acting as the outermost operator of any complete expression. The view extends to an ontological thesis: only spatially extended objects whose properties yield present tense truths are taken to be real.

The opposed realist view, advocated by philosophers such as Quine (1960, §52) and Smart (1968, ch.8), has it that sentences containing temporally indexical expressions are reducible to sentences containing singular terms for times either by appeal to the token reflexive 'this utterance', or to a non-indexical metalanguage. On this conception the distinction between the present and other times is not a metaphysical distinction. So, for example, the distinction might be regarded as merely epistemological and having, therefore, no impact on the truth conditions of tensed sentences. On this view, there are no metaphysical or ontological consequences to be drawn from the distinction: objects remote in time exist as do present objects.

I shall argue that the contrast between realism and anti-realism with respect to time is not adequately captured by the opposed analyses using operators and temporal referring expressions for any of the classes here considered. That is made evident by the availability of all the four permutations: realist operator and anti-realist operator analyses, and realist and anti-realist accounts which allow reference to times.
2.1 Operators

In a propositional tense logic, temporal operators 'F' and 'P' are added to the propositional calculus and read 'It will be the case that...' and 'It was the case that...'. An interpretation is given by assigning the propositional variables truth values relative to the elements of a set C, intuitively thought of as temporal instants. A binary relation 'R' is defined on elements of C, and read as 'later than'. Truth conditions of complex sentences are defined in terms of those of their components by relativising the usual rules for connectives to the elements of C. So, for example,

'FA' is true at a point a in C iff 'A' is true at some b in C with aRb.

Temporal operators 'FmA', 'PmA' are defined, and read

It will be the case in m units of time that A.
and
It was the case m units of time ago that A.

Corresponding to a classical realist view of time is a tense logic of this sort for which R is transitive, anti-symmetric and comparable, (for all a, b, in C, aRb or bRa). On alternative versions, in which R is not comparable, we may treat the structure as a tree, and branching at a point in C as representing future or past evolutions from that point. Paths through the tree represent possible courses of history.

When truth at a point in time is relativised to courses of history coinciding up to that time, then a variety of views about the reality and determinacy of the future can be represented by the laws which are validated according to the definitions. Dummett (1973, ch.11) proposes a variety of tense logics of this type: for which various tense logical laws are validated. Notice that tense logics of
this type, with laws such as

'A' is assertible at a under C iff for every C'

coinciding with C up to a, 'A' is true at a under C'

where C' coincides with C up to a iff every radical 'S' is true at a under C iff 'S' is true at a under C' (Dummett, 1973, pp.392-4),

are not designed to meet the manifestation argument. For the future operator

'FmA' is assertible at a under C iff for every C'

coinciding with C up to a, 'A' is true at a + m under C'.

allows that future tense sentences may be assertible — since determined, say, causally by the present situation — which could not be recognised to be so.

A further relativisation has been envisaged by Dummett (1973, p.395). He suggests relativising assertibility conditions not merely to the course of history up to the time of utterance of an assertion 'A', but also to the time of assessment of truth value. He defines

'A' ['FmA',('FmA')] is assertible when uttered at a and assessed at b under C iff for every C' coinciding with C up to b, 'A' is true at a [a+m (a-m)] under C'.

The function of the first relativisation in this definition is to fix the truth value of temporal indexicals in terms of the time of utterance, while the latter fixes truth value in terms of the time of assessment of truth value. Again, his definition is designed to represent varieties of determinism: we shall note in 3, however, that the anti-realist might adopt an analogue of this double relativisation.
In discussing anti-realism about the past, however, Dummett (1969, pp.254-256) adopts what is tantamount to an epistemological variant of the (ontological) courses of history. Anti-realism about the past is described in terms of courses of history recognisably compatible with present evidence. The topical or local anti-realist (Dummett's 'T') about the past allows that every sentence is either true or false at any particular point in every course of history compatible with the present: so, L.E.M. generally applies, ('PmAvPmA' and, further, Pm(Av\neg A)' are assertible). However, not every past tense sentence is recognisably either true or false - so Bivalence fails ('PmAvPm\neg A' may not be assertible). Evidently this is a paradigmatic case in which, by abandoning the distributivity of tense over disjunction, a general classical logic can be maintained without appeal to recognition transcendent notions. Or at least this is so if we accept that the failure of 'PmAvPm\neg A' does not contravene classical logic.2

The anti-realist view which insists on the centrality of the present is then naturally represented in tense logic by a view which allows branching pasts and futures, and takes what is true to be determined by, or relativised to, what is recognisably assertible at a time. The tense logics would then appear to have two desirable features:

1. The truth of past and future tensed sentences is determined in the light of the means speakers actually do use for establishing their truth and falsity.

2. Wright (1981, p.53) discusses the local anti-realist as an example of how classical logic could be saved, while Bivalence may actually be counter-exemplified. We should note, of course, that not all classical tense logical laws are preserved in this system.
(ii) Contrasts between realist and various anti-realist views turn on the logical laws licensed by the models. If distribution of the logical constants over temporal operators is not maintained, failure of classical logical laws may be avoided in such models, although not of classical tense logical laws.

Dummett's global anti-realist accepts an intuitionist logic for the propositional calculus. In that case we should not expect L.E.M. to hold for tensed sentences. Such an anti-realist would advocate a tense logic with an underlying intuitionist logic, but would regard the branching at a point as representing epistemically accessible possible past and future histories, compatible with information at that time. On this view, we should not expect 'A v $\neg$A' to hold, at any point: and the tensed analogues 'FmA v Fm $\neg$A', 'PmA v Pm $\neg$A' (as well as 'FmA v $\neg$FmA', 'PmA v $\neg$PmA') may fail, since all evidence may be lacking for either disjunct in each case. Dummett never specifies a particular tense logic for intuitionism, but we can see that, in general, the holding of Bivalence will be held to reflect the accessibility of evidence for all sentences, whether tensed or not. Rejection of L.E.M. will be characteristic of anti-realism about time only when the present-tensed analogues are decidable.

3. Dummett (1978, §7.3) does discuss an interpretation of Beth tree semantics for intuitionist logic as representing states of information at temporal stages but rejects that view on the grounds that it suggests that in any stage of information, say, adequate for 'VxFx', it seems that at a future stage 'Fa' is proved. It is not at all clear how Beth tree semantics could be adapted to tense logic. In fact, topological and tree semantics for intuitionist logic treat intuitionism as a form of tense logic. The difficulty for providing an intuitionist tense logic, then, appears to be that tense needs to be stipulated twice over.
Prior (1967, esp. ch.VIII; 1968 esp. ch's XI, XII) thinks that an operator treatment of time commits us to treating the basic temporal form as present tensed. He suggests that two typically anti-realist theses about time are consequent on acceptance of the operator view - the eschewal of times as objects, and the claim that only presently existing objects are real. He thus derives ontological conclusions from the operator view of time.

Operator treatments, in so far as they take truth to be assessed at an element of C, relativise truth to time. But Prior's further argument, that we must count the basic temporal forms as present tensed is more questionable. It is this thesis which is required for the two latter metaphysical consequences. Dummett, for example, says

> Whether we regard them as present tensed sentences, or as incomplete sentences awaiting the application of a (non-token-reflexive) temporal operator is unimportant. What matters is that the basic unit employed in the construction of sentences is something which has to be thought of as having different truth values at different times. (1973, p.390)

It might be thought that Dummett fails to recognise that only when we take incomplete sentences as completed by a token reflexive temporal operator do we achieve a genuinely variable truth value. For if the incomplete sentences are tenseless radicals, lacking in truth value, then there is no complete thought to take a different truth value at different times. If, on the other hand, the completion of the thought is achieved by non-token-reflexive temporal terms, then there is also no variable truth value. But Dummett is surely correct to remark that variable truth value, not present tense radicals, may be associated with the operator analysis. We can achieve that as well by taking the radicals as relativised to '5 days ago'. So the centrality of the present is not necessarily captured by operator views.
Moreover Prior's thesis that operator treatments of time avoid ontological commitment to times and to objects existing at times other than the present, is itself questionable. Truth is defined as truth at a point in a course of history. Semantics for a truth definition quantifies over times and, when R is not comparable, over courses of history. It is obvious that operator treatments of this kind do not immediately avoid reference to times, or to the objects existing at times other than the present. For they make essential use of non-present times, and objects existing at other times, to explain the meaning of tensed sentences.  

Whether or not this point is conceded, I hope to have established that the classical realist account of time, as well as a variety of anti-realist accounts, is compatible with an operator analysis of tense. So the operator analysis cannot be sufficient for anti-realism about time.

2.2. Reference to Times

When tensed sentences are analysed as involving reference to times, various analyses of the position of the temporal referring expression are available. I suggest (with many others) that where the operator view discerns n-place place predicates, the term view discerns n+1-place predicates with the second place for times. We may

4. I believe that Evans at one stage provided a Tarski type truth theory for temporally modified sentences which defines truth in terms of a basic operator 'whenever'. A view of this type might genuinely avoid commitment to times. Prior, on the other hand, might argue that the semantics for tense are purely algebraic, and do not commit one to times as objects. But the problem remains of how to provide an account of how speakers understand such quantification. I do not think the ontological question can be settled by a fiat.
allow token reflexive temporal referring expressions to take this place.  

On the account which treats temporal sentences as involving reference to times, and discerns n+1-place predicates where the operator view discerns n-place predicates, each of the tense logics here mentioned can be reproduced. Of course, contrasts between views of time which are represented as conflicting accounts of the validity of tense logical laws are reflected as conflicting axioms for temporal ordering in the semantics of a theory which allows reference to times. This is a small loss, in view of the necessity for supplying a semantics for tense logics. It is possible adequately to explain iteration of temporal operators on the term view since we can allow that the temporal referent of the referring expression is determined before the insertion in the argument place of the predicate. In effect, one provides axioms for terms taking the argument place of predicates in such a way as to ensure that those derived tense logical laws - for example, 'FmFnA' = 'Fm+nA' - are validated. I shall not discuss these axiom systems further, as the question with which I am concerned is not so much which tense logical laws are validated, but the possibility of a genuinely anti-realist account involving reference to time. Butterfield (1980) provides the axioms for the various tense logics in terms of accounts involving reference to times.

5. This is to deny Dummett's (1973, p.389) ridiculing of non-operator treatments of time, as analysing 'John is ill today' as 'John is ill and John is today'. The arguments he appeals to, based on the tense modifications of natural languages fail - Chinese and Finnish, I'm told, do not use temporal modification of the sort which is naturally represented by operators.
An anti-realist of the first type insists on the centrality of the present, relativising truth, as I have put it, to the present. By adding an individual constant 'now' to a language involving temporal reference we can accommodate this. We allow that temporal sentences involving token reflexive operators receive different truth values according to interpretations differing only in the assignment of times to the individual constant 'now'. Further relativisations may be accommodated by giving a truth definition relativised to interpretations differing according to the individual constant 'now', and the course of history - by introducing a further argument place to predicates (for courses of history) and perhaps further constants specifying which course of history is real.

To capture, in a formally satisfactory fashion, the distinctions made by temporal operators appears to be quite possible in a semantics which quantifies over times. Nevertheless, one who advocates the operator view might object that the point of the operator analysis has been missed. Prior, for example, might be expected to object to the metaphysical and ontological implications of a referential view of time, while the epistemological anti-realist might be expected to charge a referential account with failure to capture the essentially perspectival nature of our understanding of tensed sentences. I think that both objections would be misguided.

The dispute between realism and anti-realism is not an ontological dispute. The definitive thesis of realism about time consists not so much in the commitment to times as objects, as in the commitment to the determinate truth of tensed sentences. It is perhaps unsurprising that I see nothing in the operator analysis essential to anti-realism about time, once I have rejected the
ontological wording. But as I remarked at the end of the previous section, I doubt that the operator analysis dispenses with times.

The second, epistemologically based, objection I also reject. In part, this is because I shall suggest that the perspectival element of the use of tensed sentences can be adequately represented in an account of the sense of such indexical referring expressions as 'now'. In part, however, my reasons for rejecting the epistemological version of an operator analysis derive from the discussion of the manifestation argument at IV.1.2. I do not think that the manifestation argument is primarily an epistemological argument: nor do I think that an epistemological premiss: that we can only know present grounds for our assertions, is ultimately defensible. Some support for this dogmatic statement will be given in 5.1.

In what ensues, I shall not consider the variety of operator treatments of 2.1. In particular, those accounts of the temporal operators which involve failure of the distributivity of truth over the logical operators will be ignored. For those who adopt a distinction between 'content' and 'ingredient' sense, the failure of distribution is the obvious way of both maintaining anti-realist scruples, and allowing classical logic. I do not think that the local anti-realist, for instance, gives an adequate account of the negations of past tense sentences, for which I have already proposed an account.

3. Essential Indexicals

A theory of meaning for demonstratives - or the general class of indexical expressions - cannot use sentences containing these expressions to state their contribution to the truth, or assertibility, conditions of sentences in which they are contained.
For contextual information determines what, on an occasion of use, the demonstrative refers to. Moreover, if we accept Frege's view that sense is a cognitive notion we cannot merely stipulate that the sense of a demonstrative is determined by its referent on an occurrence of use.

The point is familiar. It is not just that one may have differing cognitive attitudes to 'I am C.', and 'C is C.', for that is true of names in general. It is rather that although 'I' evidently has a constant meaning or contribution to the content of expression types whenever it is used, and 'I' acts as referring expression on any particular occasion of use, neither feature appears to provide a Fregean sense for the expression. For if a demonstrative has a sense, and that sense is invariant between various uses, then the sense of the demonstrative cannot determine the atemporal Fregean thought expressed, since it does not determine when a particular utterance is true. If, on the other hand, we allow that the sense of a demonstrative is determined by a particular context, then a demonstrative generally has different senses on different occasions of use. Moreover, we cannot merely treat demonstratives as inessential features of practice - for, as Perry (1979) among others has emphasised, a grasp of demonstratives is required to explain action.

6. An account of demonstratives has been widely discussed. Some, such as Prior (e.g. 1968, Ch.II) argue in effect that a definition of their meaning might require an indexical metalanguage. Taylor (1980) uses the notion of a designated object in the metalanguage. The discussion here is aimed at the account of temporal indexicals. Perry (1977, 1979) and Evans' (1981) discussions have obviously influenced this one, but I am particularly grateful to Peter Roeper for his presentation of the first Fregean account of indexicals mentioned below.
'Now' is, in Perry's terms, an essential indexical, as are 'I' and 'here'. There appears to be no way of explaining the content or consequences of thoughts containing those expressions other than by specifying that those thoughts have a demonstrative indexical character. Indexicality is an ineliminable feature of our use of such expressions. It is in terms of this feature of tensed sentences that I shall explain their 'perspectival' character. This feature is shared by sentences containing spatial and personal indexicals.

There are several ways of accommodating essential indexicals within a Fregean framework, as characterised in 1.2. I shall mention two. On the view of sense presented by the anti-realist, the sense of a sentence is a means of establishing that sentence; whether conclusively or defeasibly. The sense of a referring expression consists of a means of identifying an object in such a way that the procedure associated with the predicate can be applied to it. When indexicals are treated as referring expressions, their sense consists in the means of identifying the referent. Now, for essential indexicals, those procedures are of a peculiarly direct type. In order to verify or falsify

The third object in the top row of the array is red.
I must first identify the third object by working through the array. In order to verify or falsify

I am hot.

no such preliminary identification procedures are required.

The anti-realist insists that sense is public: so the use of 'I' by any person must have a common sense. That consists in a procedure for identifying an object, namely a person, where the person identified may vary from one occasion to another. Similar
considerations apply to 'here' and 'now'. We should not expect that the sense of a sentence containing an essential indexical would be equivalent to that of other sentences in which the same predicate applies to the referent (on a particular occasion of use) when another name determines the referent.

This is a view with which Frege appears to disagree – both in so far as we have assigned a uniform sense to essential indexicals and in so far as we have denied that the sense of a sentence involving an essential indexical could be equivalent to that of a sentence not containing such an indexical. On the first, Frege says "everyone is presented to himself in a particular and primitive way, in which he is presented to no-one else" (1956, p.298). If this is taken to imply that there is no uniform sense for essential indexicals, then Frege's view is incompatible with the manifestation argument. For unless sense were shareable, and had public criteria of application, we could not attribute grasp of sense to speakers. However, the claim that there is a psychological variation between the ways speakers identify themselves is not inconsistent with the manifestation argument. The manifestation argument suggests only that such psychological variations should play no role in the account of understanding (IV.4).

Moreover, the notion of sense at which Frege gestures is one which the anti-realist can describe. Frege, in remarking that we are not presented to each other in the same way, appeals to an account of sense a particular utterance has on an occasion of use. When I say

I am hot.

my means of determining the truth value of my utterance are not available to anyone else. The anti-realist must allow such a notion of sense on an occasion of use. For he wishes to allow that the sense
of an utterance determines when it is true, and it is the sense of an indexical on an occasion of use which determines what object would have to satisfy the predicate if the sentence is to be justified.

On the second, Frege claims that one might have the same thought yesterday, expressed by using the indexical 'today', as one has today using 'yesterday'. He says:

> Although the thought is the same, its verbal expression must be different, so that the sense, which would otherwise be affected by the differing times of utterance, is the same. (1956, p.296)

The Fregean thought is then an equivalence class of senses of sentences, when sense consists in the sense on an occasion of use. I have argued that the anti-realist should admit a notion of the sense an utterance has on an occasion of use. It is a more delicate matter whether an anti-realist will admit that the thought expressed by a sentence on an occasion of use is the same as that of another with suitably adjusted indexical or non-indexical referring expressions uttered at a different time. For the equivalence itself appears to be an equivalence which could not be recognised to obtain on any occasion. Indeed, the anti-realist may be inclined to think that the equivalence between Fregean thoughts is illusory.

Evans' (1981) account of the meaning of demonstratives reconciles the Fregean views with the requirements earlier placed on a notion of sense for them. In effect, he defines a notion of sense on an occasion of use - and argues that the sense of a demonstrative is the mode of presentation of a referent. So the object referred to plays an essential role in the description of sense. Sense then varies from time to time, person to person. Evans allows that on this view, senses are not shareable but, he argues, senses are objective. For it is possible to define what utterances of sentences equivalent in sense
(according to the earlier view) have in common. Utterances of 'I am hot.', for example, share the property that they are true if one thinks of the object (oneself) as oneself, and that object satisfies '...is hot'.

Evans also defends Frege's view that if two distinct utterances on different occasions contain co-referential indexicals, the thought they express is the same. According to Evans, Frege did not aim to reduce the notion of sense to one of reference for such expressions. Rather, Evans suggests, Frege may have had the following idea in mind:

that, at least for temporal reference,

the changing circumstances force us to change in order to keep hold of a constant reference and a constant thought (1981, p.293).

Evans' view is that our conception of time is such that we could have no temporal thoughts unless we understood that persistence in the same belief requires an ability to change our words to express the identical thought. Furthermore, he presents an argument that a conception of space presupposes the ability to trace objects through space, identifying the same place differently according to one's position. On similar lines, it might be argued that the ability to have thoughts about oneself is parasitic on the ability to identify those thoughts with thoughts of others about you.

7. I here ignore one feature of Evans' account - namely, that the sense of referring expressions essentially requires that the referent exists. The anti-realist view of the sense of, say, 'I', on an occasion of use will preserve this feature - that 'I' has sense on an occasion of use only if the referent exists. So, with Evans (1981, p.286-7), it is necessary to allow that the sense of a referring expression need not be independent of whether the expression has a referent. However, our anti-realist need not endorse the claim that every referring expression has this feature. As Evans says (1981, p.281), it is not necessary to do so in order to explain indexicals.
Now at this stage the anti-realist account and that presented by Evans appear to be terminological variants. For we can define the following:

(i) the sense of complete expressions (on an occasion of use, as the world then is),
(ii) the content of the complete expression type,
(iii) the thought embodied in the use of a complete expression on an occasion of use.

Here, the anti-realist notion of sense corresponds to (ii), while Evans' derives from (i); and Evans' version of the common content corresponds to (ii), while the anti-realist allows (i) as sense on an occasion of use. The two accounts might, however, differ with respect to (iii). It is at this point that we return to the anti-realist scruples about time mentioned in 2.

According to Evans, there is a category of Fregean thoughts consisting of equivalence classes of utterances on occasions of use which do not have precisely the same sense, since the mode of presentation of referent and hence the content varies from one utterance to another, but which share the property of being true under just the same conditions. Now, if we consider temporal examples of this type, it appears that we can only identify such utterances as equivalent from outside any particular temporal perspective. Those anti-realists about time who insist on the centrality of the present, and wish - as I put it in 2 - to relativise truth to time, might deny that we have access to, or could assess, the equivalence of two thoughts of the same type:

'Today is fine.' uttered yesterday
and 'Yesterday was fine.' uttered today.

For according to an anti-realist of this type, there could be no
perspective from which both could be recognised as equivalent.

The anti-realist who admits a (i) type notion of sense may insist that the equivalence of senses of expressions on an occasion of use must be assessed at one time. He may be prepared to admit the equivalence of:

'Today is fine.' uttered yesterday and evaluated today

and 'Yesterday was fine.' uttered and evaluated today.

Hence, he could define equivalence classes of thoughts assessed or evaluated at one time. Utterances which are equivalent by this measure are neither equivalent in content - or sense, as the anti-realist conceives it - or in sense on an occasion of use. They are equivalent in virtue of the fact that procedures which would serve to verify (or falsify) one member of the class serve to verify (or falsify) every other. We can be guaranteed to reach a uniform verdict for each sentence. Equivalence classes of this sort I shall call non-Fregean thoughts. They differ from Fregean thoughts, as Evans presents them, in that the verification procedures, the equivalence of which is in question, are exercised at one and the same time.

An account of the meaning of tensed sentences which rejects the Fregean thoughts and replaces them with a category of non-Fregean thoughts appears precisely to capture what advocates of an operator view might call the 'perspectival' nature of thought consequent on our immersion in time. For, on this view, thoughts - the truth of which we aim in our assertoric practice - are essentially true in virtue of evidence or procedures for determining truth which are available at a time. In this sense, truth is relativised to time. Moreover, we appear to have an analogue of Dummett's double relativisation of truth to the time of utterance, and the time of assessment, in specifying
both a time of utterance and a time of evaluation. We invoke no notion of atemporal truth in allowing for non-Fregean thoughts.

Now this anti-realist model of an account of tensed sentences relies on two aspects of tensed sentences: the essential indexicality of 'now', and the inaccessibility of times other than the present. The first feature is one which tensed sentences have in common with spatially and personally indexical sentences. In the next section, I shall discuss the generalisation of the second feature.

4. A Generalisation to Space and Other Minds

Consider the equivalences:

'I am hot.' uttered and evaluated by X

'X is hot.' uttered and evaluated by me

and 'It is raining here.' uttered and evaluated there

'It is raining there.' uttered and evaluated here

One who generalised the anti-realist view of time to other minds and to space would reject these equivalences, putting in their stead their non-Fregean analogues:

'I am hot.' uttered by X and evaluated by me

'X is hot.' uttered and evaluated by me

and 'It is raining here.' uttered there and evaluated here

'It is raining there.' uttered and evaluated here

Now it might be wondered whether any anti-realist would endorse this generalisation. For as long as the predicate attributed to others is not an ascription of sensation, it is possible to establish the Fregean equivalences as true. There is no difficulty, in principle, in moving to distant places or assessing the temperature of others. (If one has doubts about the latter claim, and wishes to treat '...is
hot' as a sensation, then '...is Australian' will do as well.)

But notice that, if Fregean thoughts about time are rejected, then Fregean thoughts about space should also be questionable. For the procedures whereby one moves to another place, showing that 'It is raining there.' is equivalent to 'It is raining here.' evaluated there, themselves take time. Hence the evidence for the former would not be recognisably equivalent to that for the latter, if we accept that there are only non-Fregean temporal thoughts. This point is an instance of the difficulty mentioned in 1, in maintaining both what I called the centrality of the present, and the model of a procedure as determining meaning. Those difficulties will be further remarked in 4.2 and 5.8.

8. Dummett (1960; 1973, pp.387-389) rejects the generalisation of anti-realism for spatial predicates. One of his reasons for doing so, the inapplicability of an operator analysis of space, now seems faulty. He also urges the fact that most observational sentences apply to an object as a whole considered as it is at a particular time: although, of course, an object must be at a particular place when it is observed, the predicate is not to be taken as relativised to the occupancy of that place... Indeed the location of an object at a time is itself something that may be determined by observation. (1973, p.388)

It is surely correct that we are unwilling to relativise truth to space, and that our employment of observational sentences, in particular, gives evidence that speakers do not, in general, allow relativisation of truth to parts of spatially extended objects. As Dummett notes, we construe 'The river is \( \phi \) here, not- \( \phi \) there.' as referring to parts of the river, not to inconsistent properties of one spatially extended object. I think his remarks are justified, but I think that they need further explanation in the context of an anti-realist view of time. For the anti-realist might as well urge revision of our use of observational sentences, as of our use of tensed sentences. In particular, there is a certain plausibility in the view that even observation sentences must be assessed from a place, and no guarantee that after moving to another position, we have verified the same assertion elsewhere verified.
In the case of ascriptions to others of properties which are not psychological, there is a question whether the procedures used by the self can be identified with those used by others. I appear, after all, to have means of establishing that 'I am Australian.' which are not in principle available to others, in establishing that 'You are Australian.' holds of me. The consequences of self-ascription of properties differ from those of ascription of properties to others.

If the generalisation is justified, then the rejection of Fregean equivalences consists in insisting on the centrality not only of the present, but also of the local and the personal. The generalised anti-realist of this type claims that the evaluation of utterances is relativised not only to time but also to the position and the identity of the person evaluating sentences. Each sentence would be regarded as evaluated according to the spatio-temporal perspective and identity of the person who assesses truth value. As in the temporal case, the rejection of Fregean thoughts involves a relativisation of truth: in these cases, to the location and to the identity of utterer. Moreover, evidence, or grounds for an assertion would also be relativised: the grounds for an assertion would be regarded as assessable only from within a temporal, spatial and personal perspective. In this case, meaning, given by the canonical grounds for determining truth value, is also relativised to a temporal, spatial and personal perspective.

9. As Perry (1979) emphasises with his example of discovering that he was the shopper whose sugar was leaving a trail. Prior (1968, Ch.II) develops an operator analysis of personal pronouns analogous to tense logic, which would assimilate first person evaluations to present tense evaluations in this way.
This generalisation of the anti-realist view appears to yield a form of idealism which is patently incompatible with the Wittgensteinian requirement that there are public criteria for the correctness of assertoric practices. I think that this appearance is in fact correct, and provides a decisive reason to reject the generalisation. However, I shall first turn to a realist argument which is not sufficient to reject generalised anti-realism.

4.1 The Truth Value Link

One common form of realist argument against generalised anti-realism appeals to the truth value link. In effect, a realist of this type insists that command of a genuinely realist conception of other times, places and persons can be gained through recognition of the regularities in connection between the truth value of sentences about remote spaces and times and other minds, and those of the central unproblematic cases. So for example

'A at time t.' is true iff 'A at now.' is true at t
'A at place p.' is true iff 'A at here.' is true at p
'X ø 's.' is true iff 'I ø .' is true for X.

The truth value link realist supposes that these regularities in truth value suffice for the inculcation and manifestation of the grasp of the problematic sentences, in such a way as to ensure that, if the central cases are Bivalent, so too are the remote cases. However,

10. Dummett (1969, p.245) introduces this term, referring to the tense-links, in the context of the realist/anti-realist debate. McDowell (1977, pp.129-30) generalises the argument to ascriptions of psychological properties to others. Wright (1980, pp.114-115) gives an anti-realist reply to McDowell. He also discusses the anti-realist views of time at (1979, p.291, fn.5), and (with brief comments on the first person case) at (1980a, Ch.X).
although the sense of the quoted section is, by hypothesis, such that knowledge of it could be manifested, the anti-realist questions whether grasp of the meaning of unquoted portions of the right hand side could be manifested. It does not solve the difficulty merely to remark on the truth value links. The anti-realist may well admit that, even in the context of his notion of truth, the equivalences hold. The anti-realist denies that the truth value links could show a speaker how to understand a sentence being true for another, at another time, elsewhere in virtue of his understanding of an analogue for the self, here, now. How could the truth value links effect such transportation? It does not help to say

'X ø's at p, t.' is true iff it is for X at p, t as it would be for me here now if 'I ø.' were true, for it is the relevant sense of likeness which is in question.

This debate mimics that I have cited between advocates of Fregean and non-Fregean thoughts. For consider the equivalence of the Fregean type:

'X ø's at p, t.' uttered and evaluated by me here, now
'I ø here, now.' uttered and evaluated by X at p, t.

One who adopts Evans' account of indexicals allows that, although the two utterances differ in sense on the occasion of use, and in content, so that my means of evaluating 'X ø's at p, t.' differ from those of X, in evaluating 'I ø here, now,' yet the very same conditions or states of affairs make each true. This the anti-realist denies, arguing that we could not recognise or manifest a grasp of the equivalence in states of affairs. In effect, the realist allows that the perspective of evaluation is not relevant to the truth of the thought expressed by an utterance.
Of course, the anti-realist can allow non-Fregean equivalences, of the sort

'X φ's at p,t.' uttered and evaluated by me, here, now and 'I φ here, now.' uttered by X at p,t and evaluated by me, here, now

since the procedures which serve to verify the former, serve to verify the latter. But unlike the realist, the anti-realist cannot allow that these equivalences can provide an account of conditions verifying, say, my ascription of 'φ' to another considered from his perspective. For the equivalence yields

'I φ here, now.' uttered by X at p,t and evaluated by me

in which it is the verification procedure I employ, not the aperspectival truth conditions, which are defined.

Dummett appeals to the temporal non-Fregean equivalences in order to explain, in an anti-realistically respectable manner, how speakers grasp the temporal truth value links. So, he says:

The anti-realist will not in a year's time mean the same by 'absolutely true' as he now means by it...he cannot now say what he will in a year's time be saying... (1969, p.257)

in explaining why the existence of the truth value links does not ensure a realist interpretation of all past tense statements. The tense links, he supposes, and the equivalence in truth they express, must be relativised to the time of evaluation - the present. Meaning must also be so relativised. Underlying his argument is the thought that semantic knowledge, if it can be manifested, must be manifested at a time. To say, for example, that a sentence is forever true, cannot imply that it is true at another time (realistically conceived). It must itself be regarded as forever true from within a
temporal perspective. But, as we shall find in 5, the tense links so construed cannot be used to provide an explanation of the meaning of past tense statements in terms of their present analogues: for that is quite generally inadmissible on a non-Fregean account of the equivalences.

The generalised anti-realist adopts this attitude not towards only time, but also towards space and other minds, and must accept a similar consequence. When non-Fregean thoughts are used to explain the behaviour of speakers in accepting the truth-value links, those links cannot be employed to provide an account of the meaning of sentences about other minds, or assessed from another place.

4.2. Objectivity

One way of arguing against the generalised anti-realist view would be to say that, since truth is relativised to persons, there could be no public criteria for assessing the correctness of assertoric practices, so that the generalised anti-realist cannot meet the manifestation argument. But this is not obviously justified. Consider relativisation of truth to the person who evaluates truth value. Then it seems the anti-realist can meet the manifestation argument from publicity on at least two counts.

First, the generalised anti-realist will claim that the notion of objective correctness - as introduced in II.4 - is captured in the account he offers. All that the anti-realist insists on is that the correctness of an utterance at a time must be assessed by a speaker at a time and place. And this, the generalised anti-realist will insist, is quite consonant with the manifestation argument. For that argument is intended to ensure that conditions under which an assertion is
verified should be recognisable by those who issue and understand utterances. How else, the anti-realist will ask, should this be represented, save by relativising grounds to the person who assesses them? No particular speaker could literally assess correctness as another does: he would need to be in two minds at once.

Secondly, the generalised anti-realist claims that the relevant notion of publicity of sense is guaranteed by the account of content. For that account specifies those procedures in terms of which anyone would assess the truth value of

I am Australian.

applied to themselves. Of course, each person exercises those procedures differently: but the procedures themselves are public.

The first of these arguments raises the general question of the extent to which an anti-realist is justified in claiming that the theory of meaning he advocates allows for objectivity. According to intuitionism, as expressed by Dummett, the conditions under which mathematical assertions are verified are themselves regarded as objectively assessable. A mathematical proof, for example, is taken to provide grounds adequate for whoever assesses it to come to the same decision about the truth value of the sentence of which it is a proof. Of course, as the generalised anti-realist insists, each person who assesses the proof does so himself. In the case of mathematical proof this does not suggest a relativisation of meaning or truth to the person making an assessment. For each person's assessment of a mathematical proof will always yield the same verdict, if it yields one at all. In this sense, it is certainly an objective and decidable matter whether a proof is a proof of a mathematical sentence, or not.
Of course, even the intuitionist in mathematics will allow that speakers have various ways of assessing proofs. But that, he will suggest, does not affect the sense of mathematical sentences. The indexical sentences of natural language have the feature that they can explicitly involve reference to the distinctive procedures people use for identifying themselves and showing that they themselves have certain properties. But the perspectival element of natural language in this sense is adequately captured by the account of the sense on an occasion of use of an indexical expression: it need not involve any further relativisation of truth to person. What the generalised anti-realist proposes is, mistakenly, to transfer a feature of sense on an occasion of use of certain indexical expressions, to the account of the objective conditions under which assertions are correct. There should be no inclination for the anti-realist to accept the generalised anti-realist view of other minds.

Thus, the generalised anti-realist objection to Fregean equivalences appears spurious. For those equivalences do not purport to indicate identity in the very procedures a particular person uses on an occasion to establish a sentence as true. Rather, they purport to provide an equivalence in the grounds on which, for example, a particular person's assessment of truth value, and another's, are based. And this surely is the case for many sentences of natural language.

11. The question of objectivity is a large one. Crispin Wright (1980a, Chs.II, XI, and passim; 1981, pp.65-67), discusses it at length, objecting that the revisionary anti-realist invokes a recognition transcendent account of objectively correct practices (VII.4). At present my concern is simply to elucidate the notion with respect to non-Fregean thoughts.
For consider my utterance of

I am an Australian.

The procedures I use may well differ from those another uses for determining whether

C is an Australian.

is true of me. Yet, so long as the predicate '...is Australian' is not vague or inconclusive, my verdict and another's will be the same. Indeed, this is true for the application of the predicate '...is Australian' to anyone whatever.

This raises a question about the second generalised anti-realist response: that publicity in sense is adequately guaranteed by the account of content. An anti-realist regards the canonical grounds for deciding whether someone is Australian as determining the contribution to content of the predicate to every sentence in which it occurs. Suppose those canonical grounds are laid down by the Department of Immigration: then the generalised anti-realist will wish to allow that my procedure for evaluating myself and those for evaluating others as Australian are both faithful to the canonical grounds, in so far as the verdict of nationality is entirely determined by the canonical grounds (VII.1). Yet, as emphasised in the discussion of the truth value links, the generalised anti-realist denies that the meaning of 'You are Australian.' could be related to the procedures which I might use for verifying that 'I am Australian.' If he takes this seriously as a distinction between the canonical procedures of application of the predicate '...is Australian' to the self and to others, the generalised anti-realist appears to be committed to an ambiguity in his own use of '...is Australian' between the ascription of that property to others, and ascriptions to the self. Evidently, he is committed to such an ambiguity between his own and others' self
ascriptions of the property. So, despite his admission of a public notion of content, the anti-realist cannot maintain that there is a uniform publicly accessible account of the grounds of application of the predicate '...is Australian'.

The point of this argument may be made a little clearer by considering ascriptions of sensation to others. The anti-realist argument against the truth value links is most plausible if the predicate '∅' is '...in pain'. For in that case we must admit that there is no guarantee that one who self ascribes 'pain', and others who ascribe 'pain' to him, will always reach the same verdict. And, in that case, it does appear that there could be two entirely distinct types of canonical procedures, which each speaker employs for the application of the predicate '...in pain'. In the first person singular case, the canonical procedures are conclusive and inward looking; in the second and third person cases, defeasible and based on outer behavioural criteria.

The contrast between the two cases suggests that the generalised anti-realist is mistaken in rejecting all Fregean equivalences. The difference of perspective on which he insists is adequately reflected for predicates such as 'Australian' by the difference in the personal pronouns with which they may be associated. 'Australian' has a uniform contribution to content, and indeed to sense on an occasion of use. But on an occasion of use, utterance tokens of the type 'I am Australian.' may differ in sense, and an utterance of that type differs in content from 'You are Australian.' said of the same person. So the generalised anti-realist illegitimately assimilates genuine anti-realist scruples about psychological predicates, to a feature which any account of meaning, whether realist or anti-realist, must
allow. No realist, after all, would wish to claim that the procedures I and another use for determining we are Australian are identical. He merely wishes to claim that we must satisfy what are objectively the same conditions if we are both to qualify. This the anti-realist can readily admit, except when the predicates in question are psychological.

In the spatial case, the generalised anti-realist is committed to denying that the canonical grounds for assessing truths from even nearby places are identical to those for assessing truths from a particular perspective. Putting aside difficulties of remote regions of space, this attitude is at least counter-intuitive. First, we are inclined to admit that two speakers at slightly different places will reach the same verdict about decidable matters in their environment. Indeed, this seems to be a prerequisite of any account of meaning which allows joint assessments of the truth of observation statements, for example. But secondly, the canonical procedures for determining the truth value of

It is raining over there.

precisely involve moving to the place, and observing rain. Such procedures depend on, and must sustain, Fregean equivalences. Of course, we can observe rain in the distance; and make apparently perspectival spatial claims, such as:

The Brindabellas look blue from here.

But in the first case, the truth of the claim depends on our moving to assess truth value. There are, after all, mirages the existence of which the anti-realist will wish to explain. In the second case, we treat the spatially perspectival claim as responsible to the Fregean equivalent, and explained by such facts as that there are eucalypts on the slopes of the mountains. Our ability to move at will through
nearby space ensures the concordance in verdict the Fregean equivalence proclaim, despite the evident truth that, at any time, we view the world from a perspective.  

As in the first person case, however, there are claims which appear genuinely to involve relativisation to the place of assessment of truth value. We cannot move at will to determine the truth value of sentences about very remote regions, hundreds of light years away. It is in principle impossible to assess Fregean equivalences regarding such sentences, in part because the information that reaches us at a time is essentially information about events at a very much earlier time. So we could not have canonical means of assessing the truth value of sentences about very remote regions which involved moving. Nor could we ever recognise that, however the truth value of sentences assessed here is evaluated, it would yield the same verdict as an evaluation in the remote region.

It is clear that such cases derive their undecidability in part from the fact that information from distant regions takes time to reach us, so that even if we could move to them, we should never be in a position to assess what was earlier evaluated from a distance. Anti-realism about the past here reinforces a particular type of anti-realism about space.

12. There is a further point to be made here. Our very movements in space are shot through with the belief that after moving through a region of space, the decisions about truth-value made at a distance will remain constant. The remark introduces a wider range of questions as to the notion of objectivity and space, which I shall not attempt to encompass. (cf. Strawson 1959, Ch.II, and Evans' 1981 commentary).
However, by contraposition to the argument of 4 which suggested that the rejection of Fregean thoughts about time implied the rejection of Fregean thoughts about space, it might seem that if we accept Fregean equivalences for nearby regions of space, we should also accept them for at least the recent past. This is, indeed, a view I shall endorse.

5. Temporal Anti-Realism

There are two compelling reasons to adopt a non-Fregean account of the tense-links for one who accepts the manifestation argument. First, it seems that he will otherwise be forced to admit that the defeasible assertions of natural language lead to inconsistency in our practices. Secondly, a Fregean account of the tense-links apparently implies the attribution to speakers of a grasp of recognition transcendent truth conditions. To take the least controversial cases of this type: we may presently be in a position to say of a star that is many light years distant that events occurred there, without in principle ever being in a position to establish their present tense analogues. So we could have no guarantee that the verdict yielded by our present procedures for the past tense sentences would have held good for the present tense analogue, assessed light years ago.

These two reasons for adopting a non-Fregean account of the tense links are accompanied by what appears to be a compelling view of the manifestation of semantic knowledge. We cannot manifest our grasp of sentences except at a time. Nor can we recognise that procedures at various times yield the same verdict except at a particular time. Of course, anti-realists who adopt this view may wish to allow that the procedures which determine meaning take time to exercise. But
evaluation of those procedures occurs at a time. Consider, for example, the anti-realist who adopts what Wright calls "NF" (1980a, p.184) - now and future - anti-realism, as Dummett does. Such anti-realists can allow that present and future tense sentences may, if we rule out sources of undecidability not due solely to tense, be decidable. For suitable sentences of this sort may be decided either now or in the future, by waiting and seeing. But anti-realists of this type will argue that speakers recognise that a certain present state of information verifies or will verify (falsifies or will falsify) an assertion at a time; they do not recognise that a future state of information verifies (falsifies) a future tense assertion. Dummett says "Anyone who refuses to recognise this...is trying to think himself outside time" (1969, p.259).

Even the immediate past and future are inaccessible, according to this anti-realist view. Dummett (1960) urges the distinction between this case and the spatial case. Although we cannot literally evaluate an assertion from outside our spatial perspective, we can have a conception of spatial reality from outside any particular perspective. However, there is no transcending the temporal perspective from which we view the world.

This sketch of the motivation of temporal anti-realism does not yet provide an account of what the manifestation of the grasp of past, present and future tense sentences consists. I think this question raises a profound difficulty for the anti-realist about time. It is not so much the difficulty of explaining how a procedure may be exercised at a time when that procedure takes time. I think that if we abandon Dummett's epistemological slant and take semantic knowledge to be defined in terms of the procedures speakers actually use to
determine truth value there may be difficulties for an anti-realist theory of this sort. For procedures take varying lengths of time: if, for example, the canonical procedures for determining whether a future tense statement holds are to wait and see, then those procedures may take a considerable time. But the difficulty I wish to raise is one which applies both to the ability to recognise procedures as procedures for determining truth value, and the ability to exercise those procedures. The question is: in what does the manifestation of a grasp of past, present and future tense versions of one sentence consist, and how are they related?

5.1. Past, Present and Future

It is, I think, a condition of adequacy on an account of tensed sentences that temporal modifications can, in some fashion, be shown to apply to common contents. Now this may appear to be a condition the anti-realist can meet. For whatever the tense of a sentence, temporal information is incorporated as an argument to a predicate, itself commonly occurring in past, present and future forms. But, just as I suggested that there is a difficulty for the generalised anti-realist in allowing that procedures associated with non-psychological predicates between persons are indeed uniform, so there is a related difficulty for the temporal anti-realist.

The difficulty is one which follows from the reductionism implicit in relativising meaning to grounds that are available at a time. If the anti-realist is to avoid calling all but present tense sentences transcendent - and hence meaningless - he must specify how we evaluate the grounds of past and future tense sentences at present. It is natural to adopt the view that the grounds for past tense
sentences are the traces which are at present witness to their truth, and to advert to present tendencies for future tense sentences.

Consider the feature-placing sentences, 'Raining in the past.' 'Raining now.' and 'Raining in the future.' The anti-realist admits the non-Fregean tense-link:

'Raining in the past.' uttered and evaluated now,
is equivalent to

'Raining now.' uttered in the past and evaluated now.

Neither is equivalent to

'Raining now.' uttered and evaluated in the past.

So the anti-realist cannot provide an account of the procedures which relate the present tense sentence evaluated in the past and its past tense analogue evaluated now, as the realist will be inclined to.

Because of this 'Raining in the past.', 'Raining now.' and 'Raining in the future.' are not, even in principle, related. The anti-realist view of temporal modification allows that we might analyse each sentence as involving a temporal modification of the feature-placing sentence - or, more generally, of predicates. But it now appears that the analysis does not reveal a uniform sentence - or predicate - in occurrences of various tense. For, as the anti-realist view has so far been presented, we might as well have three distinct sentences

'Imber.', 'Raining.' and 'Pluit.', say,
correlated with the tensed sentences above.

Associated with the first sentence would be procedures for checking the world for present traces, with the second, procedures for checking the world for rain and with the third, procedures for determining present tendencies for rain. Now, for all the
anti-realist has so far said, those procedures might be entirely distinct. Yet, as is made apparent by the use of 'rain' in specifying what the relevant traces or tendencies are, there seems to be no prospect of determining the past tense or future tense uses without talking of past or future occurrences of what is presently called 'rain'.

We can compare the analogous case for other minds. If we have privileged access to our own sensations, and yet understand ascriptions of sensations to others in terms of the observable evidence we have of their sensations, then we might allow that learning the use of sensation vocabulary involves learning two sorts of procedure for each predicate: those for determining application to the self, and those for determining application to others. But an analogous view of tensed sentences, in which there are three sorts of procedure for every predicate, is less readily justified. First, there is only a finite number of psychological predicates for which we must contrast meaning in first person singular and second and third person cases. There is a potentially infinite number of predicates which may be in the past, present and future tense. So the task of the generalised anti-realist would be very much more complex in the temporal case than it is for mental predicates.

Secondly, there is good reason to believe that speakers who can understand present tensed sentences and have a general grasp of reference to past and future times are able to understand the past and future analogues of present tense sentences in virtue of those abilities. Or this is so when the past and future analogues are decidable. If the argument of IV.2.1 is correct, we can accept the observation that speakers are able to understand previously
unencountered past and future tensed sentences in virtue of their familiarity with the present analogues, without immediately adopting a fully realist position. For although speakers may have an ability to project their understanding of certain past and future tense sentences, that ability could not be properly specified if the past or future tense sentences were undecidable. Nevertheless, our inclination to allow that past, present and future analogues are related in this way surely tells against the non-Fregean conception of time.

Furthermore, Dummett's (1969, p.243) claim that there may be non-reductionist types of anti-realism suggests that he might endorse a theory which avoids the reduction of all evidence to present evidence. What then if we accept that it is possible to recognise the equivalences the Fregean tense-links assert? Would we not already be committed to realism about time? It appears so.

For example,

That was either a Kalashnikov or an Uzi.

would, if we admitted the tense-links quite generally, have to count as decidable. For its Fregean equivalent was decidable before the explosion took place. Moreover, defeasible assertions would have to be regarded as giving rise to contradictions, if the tense-links were admitted.

One solution is for the anti-realist to claim that the Fregean equivalences do not generally apply, and to argue accordingly for a revision of the tense-links. It is possible to be selectively anti-realist about the past. Whenever we are in a position to show that the verdict we now reach by whatever means in assessing a past tense sentence is equivalent to that which would earlier have been
reached for its present analogue, we have a right to the tense-links. But when, because of particular features of the predicates in question or of the situation, we cannot then we have no right to assert them.

Of course, such a view would necessitate abandoning certain tense logical laws. Dummett (1969, pp.256-257) evidently finds this consequence, and the rejection of the tense-links in their full generality, absurd. It is just for this reason that he adopts the non-Fregean conception of the tense-links. But the consequences of that view, in the context of the anti-realist view of meaning, are also absurd. I do not think that selective anti-realism about time, and the consequent failure of certain instances of the tense logical laws is any more absurd than the selective failure of Bivalence and of certain classical logical laws which Dummett urges. Surely, in the face of the problematic cases above, the anti-realist should urge revision of practice?

There remains the question of how speakers might manifest their grasp of temporal Fregean thoughts. Now it is evident that, as the anti-realist who insists on the centrality of the present sets up the problem, there could be no such manifestation. For every thought is, of necessity, evaluated at a time - even when it involves a temporal comparison. Just as I had the generalised anti-realist wonder what it would be for a thought to be evaluated by two minds at once, so the anti-realist of this type will ask how one could evaluate a thought at two times, at once. But, as in the former case, I suggest that there are two questions to be considered here: one, of the proper evaluation of the perspectival nature of our temporal thought, and the other of whether there is, in principle, a way of assessing two evaluations as having an equivalent verdict. The form of anti-realism
about time which insists on the centrality of the present treats evaluations at different times as in principle incomparable. And it is indeed a compelling view. But it is, it seems to me, one which is compelling only when we conceive of grasp of meaning in purely epistemological terms. If we replace that conception by an account of semantic knowledge determined by speakers' abilities to exercise procedures, then there is good reason to allow that grasp of tensed sentences is manifested over time. Utterances in the past tense genuinely refer to the past, while those in the future tense, refer to the future.

There is one welcome consequence of this view. When we allow that past and future tense sentences are equivalent to their Fregean analogues, we can avoid the extremely revisionary anti-realism of II.6. For we can allow that a statement about present tendencies and future occurrences differ in assertion conditions. We shall no longer be obliged to treat

I will go to Pakistan.

and

I foresee that I will go to Pakistan.

as equivalent in sense — for assertibility conditions of the former are genuinely in the future, whereas those of the latter, psychological though they may be, are in the present.

5.2 An Intuitionist View of Time

How should we regard the temporal reality of which we speak in using tensed sentences? One feature of the intuitionist analogy is suggestive — for, on that analogy, we think of times as an incomplete totality. We could not guarantee the decidability of

A city will never be built on this spot.
since even the Fregean equivalences will involve infinitary quantification. Dummett thinks that to call such a sentence undecidable is to attribute to speakers an ability — to hold open the possibility of a verification — which could not be manifested at a time. But that objection is, I think, groundless (V.3). The anti-realist about time, unlike the realist, should treat time as an uncompleted totality.

What then of assertions about occurrences on very distant stars? Should the anti-realist admit what is surely a recognition transcendent conception of occurrences on them, in virtue of the Fregean equivalences? I have argued that the anti-realist can be selective, as I suggested he should be about space and other minds. Certain regions of space and of time simply prevent our recognising Fregean equivalences to hold. So occurrences on distant stars in the distant past cannot be regarded as fully determinate.

I have suggested that we might adopt selective anti-realism about the cases of irremediably lost past evidence, and defeasible assertions. We may say that particular features of their use prevent the assertion of the tense-links. Indeed, this seems the natural way to generalise an anti-realist view of time: to allow that the tense-links do hold in some cases while denying that they must always hold. In that case, we should regard those particular aspects of reality as indeterminate as well.

I suggest, then, that even if we accept the Fregean equivalences and allow ourselves to think ourselves outside time, our view of time may be far from perfectly realist. Nevertheless, we should, in a sense, have regained time. For we should be allowed to admit that we can genuinely conceive of times other than the present — and conceive
of them not only from the present, but from their own temporal location.

6. Conclusion

I have argued that anti-realism about time may take two forms. The first form distinguishes sharply between the present and other times. Anti-realism of this sort can be supported by the epistemological version of the manifestation argument. The claim is that we could not manifest our understanding of sentences except at a time. I have rejected the interpretation of the manifestation argument as primarily an epistemological argument. Besides, I think that anti-realism about time based on this assumption leads to the absurd conclusion that past, present and future tense analogues of each other are not related in meaning.

The second form of anti-realism about time questions the realist model for past tense assertions for which evidence is completely lost, for defeasible assertions and for sentences involving quantification over infinite stretches of time. This form of anti-realism about time fits better with my interpretation of the manifestation argument, and is, I think, justifiable. Apart from Dummett's interpretation of the tense-links, this is precisely how he treats tensed sentences.

In order to reach these conclusions about tensed sentences, it was necessary to consider how such sentences should be analysed. The question has been confused by those who think that operator treatments of tense are exclusively suitable for an anti-realist account of time, and imply such anti-realism. I have argued against both claims. I have preferred an analysis of tensed sentences which discerns indexical reference to times. The question of whether an account is
realist or anti-realist then turns on whether the theory admits the Fregean equivalences.

Having analysed tensed sentences in this way, I naturally considered the analogous forms of anti-realism for other sentences involving indexical reference: in particular to the self, and to the local. In those cases, I came to the same conclusion as I later advocated for the temporal case. I think that there is no good reason to reject Fregean equivalences in general for tensed, spatially or personally indexical sentences. But, in certain cases, when we cannot show that the Fregean equivalences hold, we must reject them.
CHAPTER VII

MOLECULARITY AND HOLISM

Introduction

The anti-realist associates the procedures for determining the truth values of the sentences of a language with their meanings. Whether those procedures are conclusive or inconclusive, he insists that if a verdict is reached using those procedures, that verdict is recognisable, in so far as speakers are able to tell what the verdict is. There is, according to the anti-realist, no reason to insist that procedures be simple, for they may invoke inductive and deductive connections of various sorts. The anti-realist insists that procedures of a particular canonical sort for each sentence of a language determine, rather than are determined by, inductive and deductive connections of that sentence which are not canonical for it. The anti-realist does not wish to deny that the abilities of speakers in exercising procedures with respect to sentences of a language are interrelated. But there must be specific procedures for each sentence of a language if understanding is to be achieved.

A theory which allows that there is a determinate, although perhaps inconclusive, procedure associated with every sentence of the language is called molecular. Dummett suggests two further features of molecular theories, one of which requires that a feature of use is employed in specifying meaning, and the other which draws on the intuitionist analogy with canonical procedures for determining truth value. While the first of these features does not imply either the
second or the third, the third appears to imply molecularity of the first type.

Opposed to molecular theories of meaning are varieties of holistic theories. I can deal only very briefly with each. Quine argues for a rejection of molecularity of the first type. There is no determinate knowledge associated with every sentence of a language, for every sentence may be established by a variety of procedures, all of which contribute to its semantic import. The meaning of a particular sentence cannot be specified in advance of determining the semantic import of all the sentences in the language.

Davidson provides a further reason for questioning whether molecular theories of the type Dummett advocates are possible. According to Davidson, semantic knowledge is justifiably attributed to speakers only in the context of an explanation of their intentional actions. A theory of intentional action is not reducible to a theory based on behavioural evidence alone. In this context, we should not expect to fulfil the second requirement of molecularity, that meaning is given in terms of a feature of use.

Conventionalism about necessity can be seen as involving a rejection of molecularity of the third type. Conventionalism may be expressed in a quasi-Quinean fashion. If inferential connections of sentences in part determine their meaning, then we cannot expect to be able to give canonical assertibility conditions for complex sentences, in terms of those of their components. The Wittgensteinian attitudes to necessity, however, avoid the revisionary consequences of an anti-realist theory of meaning with a distinctive account of the force of necessary statements. I shall comment briefly on Crispin Wright's Wittgensteinian views.
In each case, the notion of molecularity serves to identify the distinction between anti-realism and other theories of meaning. I shall suggest reasons why we should not accept each of the theories of meaning mentioned above. My reasons are not intended as conclusive arguments against such theories. They are best regarded as attempts to spell out an anti-realist response to the challenges presented by such alternative accounts.

Dummett thinks that anti-realist molecular theories have a particular difficulty in accounting for the necessity and informativeness of deductive argument. He proposes to solve the difficulty with a further analogy with natural deduction systems for intuitionist logic. I question whether the difficulty Dummett discerns is genuine, and whether his solution is acceptable.

I argue, however, that the anti-realist comes up against a version of Dummett's difficulty in explaining meaning change. I propose an anti-realist criterion of radical as opposed to conservative changes of meaning, and suggest that the anti-realist account of radical meaning change is unsatisfactory.

1. Molecularity

Dummett talks of

The molecular conception of language under which each sentence possesses an individual content, which may be grasped without knowledge of the entire language.

(1973a, p.214)

He contrasts a molecular conception with theories which are atomistic; those, that is, which allow that speakers can grasp the sense of subsentential items in advance of grasping the sentences in which they occur. But he also wants to contrast molecular theories with holistic
theories, in which meaning is regarded as pertaining to entire theories. Molecular theories allow that speakers can grasp the sense of sentences in advance of understanding the entire language. Molecularity, so conceived, is suggested by an explanatory requirement. In order to explain speakers' linguistic abilities, we must attribute to them a grasp of a definite— if possibly vague or inconclusive— means of determining the truth value of particular sentences of the language. A molecular conception of language explains the abilities of speakers to use language on the basis of their ability to identify the sense or content of sentences. It is, essentially, a requirement that sentences have particular determinate senses, or that linguistic abilities are recognitional (I.1).

Dummett later mentions a slightly different requirement:

We may therefore require that the implicit knowledge which he [a speaker] has of the theorems of a theory of meaning which relate to whole sentences be explained in terms of his ability to employ these sentences in certain ways, that is, that the theory be molecular. (1976, p.72)

Dummett here urges a further restriction on theories of meaning: that they specify molecular content in terms of the abilities of speakers to use sentences. His reasons are the Wittgensteinian requirements of publicity which are employed in the manifestation argument (I.1.1, IV.1). It is apparent that this requirement differs from the requirement of molecularity of the first type. For there may be an account of the molecular grasp of sentences which is not exhaustively publicly manifest in use, while there might be an exhaustively public account of meaning which did not yield determinateness in sentence sense.
Associated with Dummett's writings in a further requirement on the appropriate formulation of molecular theories. He says that it is essential to the molecular view of language ... that we may distinguish among sentences according to their degree of complexity, when the representation of the meaning of any sentence never involves that of a sentence of greater complexity.

(1973a, p.217)

Dummett here appeals to the analogy with intuitionist natural deduction systems, and the account of canonical proof offered there. In III.4 I discussed the justification of a similar restriction on canonical proof. In intuitionist logic, we may distinguish 'informal' proofs or 'demonstrations' from those of the canonical kind: the latter have a distinctive form which explains the meaning of the logical constants, while the former are validated in terms of their reducibility to the latter. By so defining canonical proof, it is possible to avoid impredicativity in the explanation of meanings in terms of proofs. The definition of canonical proof involves imposing a hierarchy on proofs so that the complexity of the proof is measured by the complexity of the statement to be proved. If an informal proof of a statement is valid, it is replaceable by one whose complexity does not exceed the complexity of the statement. This notion of canonical proof is itself derived from an analogy with natural deduction system. The property that informal proofs can be reduced to proofs of a given complexity is analogous to the normalisation property of natural deductive systems, while the measure of complexity corresponds to the subformula property.

In the case of natural language, this third version of Dummett's constraint appears to have the form of a requirement on the abilities to exercise the procedures associated with each sentence of a language, in terms of which its meaning is given. Dependencies
between the abilities correlated with sentences of a language are asymmetric. An adequate theory of meaning associates canonical procedures with sentences of a language which do not require that speakers, in mastering that procedure, have antecedently mastered procedures more complex by some measure than itself. The most obvious measure of complexity, and that suggested by the intuitionist analogy, is a measure of logical complexity. I shall restrict discussion to such cases.

We can then distinguish at least the following three strands in Dummett's notion of molecularity, each of which is employed when he rejects holism.

(i) Determinateness of sense (or content)
(ii) Publicity of sense (or content)
(iii) Hierarchical ordering of senses of sentences, by a measure of their logical complexity.

I have suggested that (i) and (ii) are independent. (ii) and (iii)

1. Dummett gives the molecularity constraint wider application in such passages as "there is no reason why a theory of sense should not identify a speaker's grasp of the sense of each individual word with some specific ability of his relating to that word, say his grasp of some very specialised range of sentences containing that word" (1976, p.76). This suggests two other measures of complexity: one, giving a measure of the complexity of sentences, based on the non-logical operators of a language, and the other giving a measure, depending on the complexity the primitive predicates contained in the sentence. Neither is very plausible. The first assumes that we have an account of what Evans (1976, p.199) calls "structurally valid inference", and moreover that in order to understand complex sentences we must already understand those less complex sentences which can be inferred from them. The second is even more questionable: there seems little prospect of a bound on the complexity of procedures for establishing 'That is a quasar.' I shall ignore these cases.

I shall also ignore the argument Dummett (1975b, pp.136-138) most frequently uses in support of molecularity - namely the acquisition argument. This is because I believe that the manifestation argument is prior to the acquisition argument. I think that non-logical measures of complexity might be relevant to the acquisition of concepts. I doubt that they are relevant to their manifestation.
are also independent, since a theory of meaning could have a hierarchical ordering of senses determined by truth conditions grasp of which was not publicly manifestable, while it seems that there could be a theory of meaning which was not hierarchically ordered but in which grasp of meaning is exhaustively manifest in use. Moreover, we might provide a non-hierarchical ordering of determinate senses, so that (iii) does not imply (i). It is less clear that we could specify a hierarchy when there is no determinate sense for complex or simple sentences. I shall discuss the interrelationships between the three types of molecularity when I apply them to various holistic theories.

The anti-realist theory of meaning I have discussed in earlier chapters is certainly molecular in the first and second senses. Molecularity of type (i) is tantamount to the requirement that a theory of meaning attributes to speakers the ability to recognise the content of sentences (I.1). Anti-realist theories do so. A theory of meaning is molecular in sense (ii) if it ensures that grasp of meaning is manifestable. An anti-realist theory is designed to ensure that this is so. Molecularity of type (iii) is also a property of anti-realist theories as I have presented them. For any theory of meaning in which the meaning of complex sentences is a well behaved function of those of its less complex constituents will be molecular in sense (iii). Certainly, all recursive theories of meaning have this property, as well as those given in terms of canonical proof conditions.

Similarly, a theory which takes conditions of verification and falsification to determine meaning ensures that conditions under which complex sentences are verified or falsified is entirely determined by
the conditions under which its components are, and are well-behaved function of those conditions. Dummett argues that when conditions of verification and falsification define meaning, falsification conditions induce ingredient sense, since they define conditions under which the negation is true (1973, pp.419-421). If Dummett were correct, then an account of meaning in terms of conditions of verification and falsification would not be molecular in the third sense. For negation, at least, would not be a well-behaved function of the assertibility conditions of its components. But falsification conditions should not be seen as defining conditions under which a logically complex sentence is justified: the very difficulties with negation so conceived suggested their adoption (V.6).

Indeed, in the light of the contrast Dummett draws between content and ingredient sense, it is rather surprising that he endorses molecularity of the third type. For if the ingredient sense of an assertion is induced by its role in complex sentences, then ingredient sense is not molecular since it requires a grasp of more complex sentences in order to be manifested. Of course, Dummett might argue that molecularity of the third type applies to content only. But in that case, there seems no reason to insist that the content of complex sentences could not be explained in terms of complex ingredient senses of its constituents.

If molecularity of all these types is admitted, there must be an analogue of the intuitionist notion of an informal proof. For there are evidently means of establishing sentences as true which depend on logically more complex sentences. Dummett introduces such a notion in his contrast between 'direct' and 'indirect' means of establishing a sentence as true. Direct means proceed in accordance with the
components of the sentence and their modes of composition, while indirect means need not. I conclude, for example, that there are people next door directly, by observing people in the room next door; indirectly by hearing their voices and inferring on the basis of inductive and deductive grounds that there are. I shall restrict considerations to the deductive case.

An informal proof is valid just when it can be converted to a canonical proof of that conclusion, by a series of reduction steps (III.4). Similarly, we might say that an indirect procedure is justifiable when it can be converted to a direct proof. Let us call a deductive indirect procedure $\beta$ faithful to a canonical procedure, $\alpha$, for determining the truth value of a sentence $S$ just when the exercise of $\beta$, in a certain state of affairs, yields the same verdict as the exercise of $\alpha$ in that state of affairs and vice versa. $\beta$ will certainly be faithful to $\alpha$ when we can show by deductive argument that $\alpha$ and $\beta$ are equivalent.

Dummett (e.g. 1973a, p.214) adapts the technical proof theoretic notion of the conservative extension principle (III.3) to capture this notion of faithfulness in natural language. Indirect procedures should, he argues, provide only a conservative extension of canonical means of determining truth value. If so, we can be assured that an analogue of the technical notion of soundness holds for the procedures actually used for determining truth value. He (1975, pp.12-13) also adapts the technical proof theoretic notion of harmony, in this context.

Dummett (1973a; 1975) frequently appeals to the notion of faithfulness, or of conservative extension in his discussions of holism. But it applies only to theories which aim to supply
manifestable accounts of the determinate meanings of sentences. For if every inference in which a sentence may properly be employed serves in part to specify its meaning, then all acceptable procedures, inferential or canonical, will provide adequate grounds for asserting that sentence. Dummett's use of the conservative extension principle in this context has, I think, obscured the issue between holists and anti-realists. I hope that by distinguishing the three types of molecularity I shall more precisely identify where anti-realism differs from other theories of meaning.

It is clear that all the molecularity constraints must be fulfilled if a theory of meaning is to have revisionary consequences. For, as we noted in Chapter I, the manifestation argument (molecularity of type (ii)) has revisionary consequences for those theories of meaning which attribute to speakers recognitional abilities with respect to content - but it does not have such consequences for holistic theories. Throughout the thesis, I have noted that theories which are not molecular in sense (iii), and which appeal to a non-distributive notion of truth, may avoid revisionary consequences. Of course, I have argued that the manifestation argument supports molecularity in this sense (II.6). If that argument is correct, then the first two types of molecularity suffice for revisionary consequences.

I have argued that holistic theories avoid the manifestation argument. We are now in a position to assess holism.
2. Quine's holism

According to Dummett (1973a, pp.213-216; 1975, pp.8-9), Quine holds that we cannot master the use of any sentence of a language without antecedently having mastered each sentence of that language. He accuses Quine of rejecting molecularity of the third type mentioned above: that is, of denying that mastery of a language might be so structured that one grasps the use of sentences of some part of the language in advance of mastering the whole. Holism of this sort Dummett thinks patently incompatible with the actual way we do use sentences of a language.

But Dummett's complaint appears, at first, to be mistaken. Quine (1974, Ch. II) describes in some detail how speakers might acquire the complex sentences of a language in terms of their prior grasp of less complex sentences. So Quine, in effect, endorses a molecular theory of acquisition. Moreover, via the method of radical translation, Quine (1960, Ch. 2) shows how we might associate with each sentence of a language a particular mapping of sentences of an alien language onto those of our own which is molecular in the third sense.

Essentially, Quine rejects the determinateness of sentence sense, which I associated with molecularity in the first form. The method of radical translation cannot be regarded as providing any more than an idealisation of speakers' semantic knowledge. According to Quine, it would be a mistake to say that there are actual meanings associated with sentences of a language. In particular, Quine (esp. 1953, pp.37-46) argues that we cannot in principle distinguish the evidential support for a particular sentence, and the evidential support that a sentence may indirectly gain through its inductive and deductive relations with other sentences of a language. According to
Quine, there can be no particular evidence which would verify or falsify a single sentence of a language. We must treat such evidence holistically.

Now, in rejecting molecularity in the first sense, Quine rejects molecularity in the third sense. If there are no specific procedures for determining the truth value of sentences relative to evidence, then there could be no ordering of specific procedures. But, as Dummett (1974, p.352) observes, the very metaphor of "periphery" and "interior" (Quine, 1953, pp.42-44) suggests that certain observation sentences are more closely associated with evidential support from the world than others. So even when molecularity of the third type is construed as complexity in the ordering of primitive predicates of the language, Quine's model allows us to accommodate it.

Molecularity of the second type—namely, that molecularity which is implied by the manifestation argument—is rejected by Quine only if it is interpreted as the thesis that there must be determinate public criteria in terms of which assertoric use is assessed. But in a weaker sense, Quine (1960, §5, esp. p.39) would agree that we can attribute to speakers only dispositions to use language which are manifest in their behaviour. Quine (esp. 1960, pp.19-20; 1981, pp.90-91) differs from the anti-realist in allowing criteria, such as simplicity, to determine the appropriate description of those dispositions.

This is not the place for an exhaustive discussion of Quine. I shall here comment very briefly on those theses of Quine which may be taken to be incompatible with anti-realism as I have discussed it. At least two of his most celebrated arguments might be seen as undercutting the determinateness of sense which molecularity in the
first sense requires: his rejection of analyticity, and the thesis of the indeterminacy of translation.

2.1 Analyticity

Quine claims that there is no distinction in principle between the analytic and synthetic sentences of natural language. Certainly, it is impossible to distinguish the former as those truths which are true in virtue of meaning. "It is", Quine says, nonsense, and the root of much nonsense, to speak of a linguistic component and a factual component in the truth of any sentence. (1953, p.43)

Now, according to the account of meaning given here, the anti-realist should not be inclined, as some verificationists were, to allocate to all vacuously confirmed, or 'analytic' sentences the same meaning. According to the anti-realist, the sense of analytic sentences, like those of synthetic sentences, consists in the canonical procedures for determining truth value. Those procedures depend on the modes of composition of the sentence in question, together with the primitive referring expressions and predicates contained in it. Thus the procedures of determining truth value will vary from one analytic sentence to another.

Nevertheless, Quine's argument that we cannot distinguish the respective contributions of fact and of meaning in determining the truth value of a sentence is patently at odds with the anti-realist account of meaning. According to the anti-realist, each sentence of a language is associated with a particular procedure for determining truth value. It may be true that no sentence is immune to revision of truth value, and that, in the extreme cases, it is difficult to distinguish the factual and linguistic components of meaning.
According to the anti-realist, it must be possible to do so if understanding is to be achieved.

Consider, for instance, a dispute about the allocation of truth values to sentences containing the logical constants 'or' and 'not'. Evidence for the meaning we allocate to sentences consists, according to both Quine and the anti-realist, in the way speakers use sentences. Quine (1973, pp.75-78) thinks that the behavioural data is agnostic between intuitionist and classical accounts of meaning.

Notice that this claim appears to be at odds with Quine's denial that linguistic and factual components of meaning cannot be distinguished. For in a dispute over, say, the general applicability of L.E.M., Quine appears to suggest it is the meaning of the constants which is at stake. The anti-realist would agree. Quine would, presumably, insist that the dispute could not finally be seen as either a dispute about the facts, or one about meaning. But Quine takes as his data merely the behaviour of speakers in assenting to,

2. Quine gives the following verdict tables:

<table>
<thead>
<tr>
<th>p</th>
<th>\neg p</th>
<th>p \lor q</th>
<th>A</th>
<th>S</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>D</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
<td>S</td>
<td>A</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>D</td>
<td>A</td>
<td>D</td>
<td>A</td>
<td>S</td>
<td>D</td>
</tr>
</tbody>
</table>

where A = Assent, D = Dissent, S = Abstain. (1973, pp.75-78) or this is so, if we accept his remark that we can specify abstention at the centre of the tables (1973, p.78). In fact, these tables are not appropriate for intuitionist logic: since \neg(p \lor \neg p) may be evaluated S, according to Quine, whereas he intuitionist always evaluates it as A. The necessary adjustment is

<table>
<thead>
<tr>
<th>p</th>
<th>\neg p</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>S</td>
<td>S/D</td>
</tr>
<tr>
<td>D</td>
<td>A</td>
</tr>
</tbody>
</table>

or, as Quine had it, a '?' at the centre of the table for disjunction.
dissenting from or abstaining from complex sentences, given their assent, dissent or abstention from the components.

According to the anti-realist, Quine too narrowly construes the evidence. For we reason about the justification of logically complex sentences. In a dispute about the allocation of truth values to L.E.M., there is means for determining the type of disagreement at stake, by asking why L.E.M. is accepted or rejected. As Dummett (1974, §IV) observes, the very procedures of justifying our use of sentences, and of resolving disagreements about the allocation of truth values, provide evidence as to the meanings of those sentences. When such evidence is permitted, it becomes less obvious that matters of fact and meaning are indistinguishable. Indeed, the borderline between the two may be vague; but this does not mean there is no possibility of determining what features of use are features of meaning. 3

No doubt these remarks will not sway those who are convinced by Quine’s arguments. Moreover, the doctrine of indeterminacy of translation suggests that even if we could assign content or sense to sentences, the contents of sentences so defined would be, at best, one possible assignation. Another might be equally well justified.

3. There is an obvious parallel here between Dummett’s reaction to Quine’s thesis that there is no distinguishing fact and meaning, and Carnap’s response to that claim, when applied to analytic sentences. Against Quine’s argument that in certain situation any purportedly analytic statement could be revised, Carnap draws “a distinction between two kinds of readjustment in the case of conflict with experience, namely, between a change in the language, and a mere change in, or addition of, a truth value ascribed to an indeterminate statement” (1963, p.921). Dummett’s anti-realist would distinguish similarly - though on slightly different grounds - between the sorts of changes a recalcitrant experience might engender.
2.2 Indeterminacy

In arguing for the indeterminacy of translation, Quine (1960, ch. II) at times derives the doctrine from the impossibility of distinguishing matters of fact and meaning. At other times (1970), he derives indeterminacy from the view that theories are underdetermined by observation. Underdetermination might be thought to provide an independent ground for indeterminacy, save for Quine's later scruples. He says that underdetermination arises in the following situations:

for any one theory formulation, there is another that is empirically equivalent to it, and cannot be rendered logically compatible with it by any reconstrual of predicates. (1975, p. 322)

Quine thinks that underdetermination construed this way is not so self-evident a phenomenon as he had originally thought. For theories may appear to be underdetermined in this way, yet they may not be. It may be that we have so far failed to find a suitable reconstrual of predicates.

Nevertheless, we can see how, even without support from underdetermination, indeterminacy undercuts the anti-realist account of meaning. For Quine (esp. 1960, p. 27) supposes that it is possible that we cannot, even in principle, achieve a mapping between two theories or languages which correctly correlates each sentence of one with a sentence of the other. Even if it were possible to give a mapping, conforming to molecularity of the first and third types, between sentences of the two theories, the indeterminacy of translation between the two suggests that there is no fact of the matter as to the content of particular sentences. It would be mentalistic to suppose that we could specify the content of a sentences more precisely than the criteria of correctness for radical translation permit.
It should by now be clear why Dummett holds that Quine rejects molecularity in the third sense. We cannot even in principle assign a determinate content to sentences, save in the context of an indeterminate scheme of translation. Considerations which govern the imposition of such a scheme, such as simplicity and classical logic (Quine, 1960, §5, §13) are not, properly speaking, to be seen as fixing canonical procedures in terms of which speakers determine the truth values of particular sentences. There will be no question of requiring that valid arguments be faithful to canonical procedures of any sort. For the arguments admitted as valid must themselves be preserved in an adequate translation.

Nevertheless, Quine's account of meaning is far from being a realist account. In his later articles, there are strikingly non-realist conceptions. He argues that if there are empirically equivalent, logically incompatible theories, neither of which is better from our perspective, then we should regard each as equally true (1975, p.328). This must be objectionable to the realist, for he would wish to claim that one was true. Yet Quine's account is quite alien to the anti-realist conception presented here. For he denies that canonical procedures for determining truth value could specify the meaning of sentences of a language.

I cannot adjudicate the dispute between holism of Quine's type, and the anti-realist. But it seems to me that Dummett is justified in pointing to the very practices of scrutiny of the meanings of sentences of a language as evidence of determinateness of sense. When disputes arise about the truth values of sentences, speakers do attempt more closely to specify the meaning of sentences. They do, pre-theoretically, conceive of meaning as determinate. To say that we
could not, in principle, give any account of meaning is to deny the coherence of those practices of scrutiny and revision of meaning. It is possible that in attempting to specify the meaning of sentences of language canonically, we are attempting an impossible task. But I do not think that we should presume, without trying, that it is impossible.

3. Davidson's holism

Davidson suggests that we take a Tarski style theory of truth for a natural language as an empirical theory of meaning for it. The consequences of the theory are taken to be testable in the fashion described at 1.2.1. Evidence for the theory consists in the utterances of speakers. Such utterances, according to Davidson (1973; 1974), are evidence not just for the meanings of the sentences speakers use, but also for the beliefs and desires of speakers. In advance of providing an account of meaning we cannot finely discriminate between intentions (Davidson, 1973, p.315; 1974, p.312). Davidson suggests that, as a first step in fixing meaning, we ignore non-indicative moods, and locate those utterances a speaker "holds true" (1973, p.322; 1974, p.312). Then, on the hypothesis that speakers believe much as the interpreter does, we can proceed to solve simultaneously for beliefs and meanings (1974, pp.316-320).

The theory is holistic. Davidson suggests that a certain degree of holism was already implicit in the suggestion that an adequate theory of meaning must entail all sentences of the form 's means that m'. (1967, pp.308-9)

This implicit holism resembles that of Quine. Evidence for a theory does not confront the data piecemeal - a theory of meaning is
adequate, according to Davidson, only if it optimally fits the evidence. This type of holism leads to indeterminacy in the translation of physical predicates. But Davidson says "even if such indeterminacy were per impossibile eliminated the irreducibility of the mental to the physical would remain" (1974a, p.349). According to Davidson, there may be no unique adequate theory of interpretation because the method of interpretation appeals to principles of the interpretation of action. Those principles apply holistically. There can be no reduction of attributions of beliefs and meanings to the physical or to the behavioural, although those attributions supervene on the physical. The explanation of the mental is never adequate if given purely in behavioural terms.

Suppose that we accept the holism consequent on the irreducibility of the mental. Then a theory of meaning in which the meaning of sentences is determined by relating these sentences to the actual practices of speakers in justifying their assertoric use must be crucially incomplete. For whenever we provide a specification of the meaning of a sentence in terms of such procedures, we shall find that something has been left out - namely, the characteristic and ineliminable mental component in meaning. On this view it is a mistake to insist on molecularity of the second type, since the publicity of procedures for determining truth value could not be a criterion of adequacy on an account of meaning. For if it were we should indeed find that the theory failed properly to explain how speakers understand sentences.

When molecularity of the second type is relinquished, there can be no objection to classical logic. For, given the holism of the mental, we should be justified in using considerations of simplicity
in allocating a logic to a language. Moreover, given the irreducibility of the mental, there would be no reason to deny that speakers might comprehend truths which they could not establish. Unlike Quine’s holism, then, a theory of this type is realist, for verification transcendent truths are allowed. In later sections, I shall distinguish a view of this sort from Quine’s as realistic.

However, there is a clear sense in which Davidson’s account meets the molecularity constraint of the third type. For the senses of referring expressions and predicates are determined by clauses specifying their denotation and satisfaction conditions respectively, in accordance with the structure discerned by the theory. This plausibly approximates their contributions to the truth conditions of the sentences in which they are contained. The senses of logically complex sentences are in turn determined by the senses of their components and the modes of composition.

Moreover, such a theory allows the first type of molecularity, in so far as it provides a means of specifying the semantic knowledge associated with each sentence of a language, relative to a suitable theory of interpretation. Relative to such a theory of interpretation, we can specify a determinate sense for every sentence of a language.

3.1 Propositional Attitudes and Theories of Meaning

I have mentioned (I.2.1) one difficulty for a Davidsonian theory of meaning. How can it accommodate the fact that, if an adequate theory of meaning yields

\[ S \text{ is true iff } p, \]

then certainly it also yields
S is true iff p & q

where 'q' is a logical truth? We could even formulate axioms for a theory which allow the derivation of deviant T-sentences with non-tautologous added conjuncts. I have mentioned too, what I take to be the best response to these difficulties: to insist that there are canonical derivations of those consequences of the theory that specify meanings.

However, Davidson's proposed revision of the theory requires that "the totality of T-sentences should...optimally fit evidence about sentences held true by native speakers" (1973, p.326). This holistic constraint is intended to eliminate the deviant T-sentences. But it is not apparent how this constraint is to operate. For, when the deviant T-sentences are derived, there will be no sign in the infinite pairing of object language and metalanguage truths to indicate what is wrong.

One solution to this problem modifies Davidson's account of semantic knowledge. Davidson's view is that to understand a language it is not necessary for speakers to know a truth theory for it, but it is sufficient that they do (1974, p.309). Yet we may question even the sufficiency. One may have knowledge of a theory, and knowledge that the theory optimally fits the evidence, but fail to know whether the language in question is the actual language of a group of speakers, and hence fail to be able properly to interpret them. It has been suggested that it is only when an interpreted language is the actual language of a population that it captures semantic knowledge.

I have already considered theories which are designed to ensure that this is so. One suggestion is that a theory of meaning is the actual language of a population if and only if the propositional
attitudes it licenses the interpreter to attribute to speakers make sense of their behaviour (I.2.3, I.3.3.). Clearly, this project requires an account of the propositional attitudes which are licensed by the utterances of a particular mood (I.3.2), as well as a specification of canons of rationality. Such an association between propositional attitudes and utterances is taken to outlaw deviant T-sentences, on the grounds that we could not imagine a speaker rationally behaving in such a way that his utterances of 'S' should be interpreted by 'p & q' rather than just 'p'. We could not reasonably attribute to speakers the belief that 'The cat is on the mat and 2 + 2 = 4.' rather than just 'The cat is on the mat.' for instance. T-sentences license the attribution of propositional attitudes. If they turn out to be inexplicable, then the T-sentences do not belong to the actual language of a group of speakers.

Advocates of such further constraints on a theory of meaning take the evidence for the theory, and ascriptions of propositional attitude that it licenses, as a justification of the theory. Evidence, then, is internal to the theory: for, it seems, there is no discerning the relevant propositional attitudes, save in the context of an account of the meanings of the expressions used. It is then also a holistic theory. Indeed, I think that a holistic theory of this sort better represents the irreducibility of the mental than Davidson's own account. Since the irreducibility of the mental is crucial to the

4. Davies (1981, Ch. 1), Evans & McDowell (1976, intro.), McDowell (1976; 1977; 1981), Peacocke (1976), Platts (1980) and Wiggins (1980), all suggest variant further constraints of this type in a theory of meaning. In Chapter I and in IV.1.3, accounts of this type have been mentioned. I think such accounts provide one of the sharpest challenges to anti-realism. My remarks in the next section must be seen as a rather tentative reason for rejecting them.
rejection of molecularity of type (ii), I shall try to substantiate this claim.

3.2 Charity and Rationality

It is not clear to what extent Davidson would approve of such theories. We can see the propositional attitude constraints as a generalisation of "the principle of charity" which Davidson expresses: "I consider it a count against a theory of interpretation that it makes aliens wrong (by my account) about anything" (1974a, p.347). But he argues for the "autonomy" of linguistic meaning (II.4), and suggests that, via the attitude of "holding-true" (which he takes to be an attitude towards sentences) and the application of the decision theory method he advocates (1974, pp.312-316), he will be able to determine just such autonomous meaning.

Davidson, then, does not explicitly advocate the view of propositional attitudes adopted by certain defenders of his theory since he allows that a particular attitude, and not the totality of propositional attitudes can be used to specify meaning. But, in doing so, it may seem that he offends against the very principle of irreducibility he defends. For in allowing that the behaviour of speakers in holding sentences true can carry the entire weight of a theory of interpretation, he appears to reduce meaning to behaviour in just the fashion the irreducibility of the mental to the physical rules out. 5

5. Or as Peacocke (1979, p.179) puts it, in making this point with very much more sophistication: "quasi-reduce".
Of course, Davidson would argue that, while 'holding true' might be behaviourally specified, it need not be treated as reducing meaning. We can describe signing a cheque behaviourally, but this does not mean that signing a cheque is reducible to behaviour. However, Davidson employs 'holding-true' as the sole evidence for a theory of meaning. There seems little reason why, if we allow that the behaviour of speakers in holding sentences true is permissible evidence for a theory of meaning, we should not accept their behaviour in justifying the assertoric use of sentences, as Dummett suggests.

Those who generalise the principle of charity might equally generalise the sorts of evidence which we can use to establish theory of meaning. In particular, those theories discussed at 1.3.3 adopt certain constraints on the attribution of meanings to speakers. Generalisations about the appropriate form of propositional attitude ascriptions to speakers constrain the attribution of meanings. This serves to guarantee that linguistic content cannot be reduced to any public act in which grasp of content is manifest. For such theorists will argue that there is always an alternative ascription of content and propositional attitudes which would as well explain behaviour as that which they adopt.  

What is mysterious in an account of this type is why we should expect that an adequate explanation of behaviour should invoke a theory of truth. We appear to be in a position in which the notion of truth which is used in explaining content has no particular explanatory role. For it is the abilities of speakers appropriately to interpret others' attitudes which provides the evidence for the

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6. Peacocke (1979, Ch. I) gives a formulation of the principles of holistic explanation.
theory of meaning, not their abilities to recognise when sentences are true.

There are evidently ways of filling this lacuna. Those who advocate propositional attitude constraints will argue that truth, conceived as a relation between words and the world, is not specifiable other than as the disquotational predicate of an adequate theory of meaning. It is worth noting, however, that a similar difficulty does not arise for the anti-realist. For, as I have presented the argument in Chapter II, truth in a theory of meaning is determined by the behaviour of speakers in justifying the sentences they use. Moreover, I have argued that truth, so conceived, must play the central role in a theory of meaning (II.3). The anti-realist, in explaining the notion of truth in this way, argues that truth cannot outrun our capacities for establishing sentences as true. The limitations on truth, and the explanation of why truth plays a role in explaining linguistic behaviour are joint consequences of the anti-realist theory of meaning. 'Empirical' theories of meaning which capture the irreducibility of the mental cannot use this route to an empirical theory of truth.

7. At least one means of deriving semantic notions — by appeal to causal relations between names and the world — seems to be inadequate. I do not think we can provide a general formulation of a causal relation between each name and its bearer, save in terms of the particular role such names play in sentences. Furthermore, I am sceptical of the thought (IV. fn 7) that an adequate account of sense must allow that every name has a bearer. Appeal to the ontogenesis and function of communication — for example, as an information processing capacity, enabling creatures better to move in the world (McDowell, 1980, §§5-7) — is less obviously objectionable. But I am uncertain about the sorts of evidence which could be used in support of such claims.
4. Conventionalism

There is a further option for those who wish to resist the revisionary consequences of an anti-realist theory of meaning. They might accept molecularity of the first and second types and reject molecularity of the third type. In that case, they would allow that sense is determinate, and is exhaustively manifest in use, while denying that the conditions under which logically complex sentences are true must be a function of conditions under which their components are. One way of sustaining such a view would be to reject the distributivity of truth over the logical constants. Another would be to adopt a form of conventionalism.

In discussing Quine, Dummett (1974, §II; 1973a) considers the possibility of interpreting the inferential connections between sentences in a language as fixed. The meanings of sentences would in part be determined by those inferential connections. We should have no reason, in this case, for denying that sentences have a determinate meaning, for the content of any particular sentence would consist in its inferential connections, and, ultimately, the dispositions to assent and dissent from it, in accordance with its relations to sentences on the "periphery" of the web. In this context, Quine's holism would consist in denying that there is any requirement that inference be faithful to the pre-established meanings of sentences. Inference serves, in part, to determine meaning. Nevertheless, what inferences are acceptable in a language would be determined by the inferential practices speakers (at a time) accept as valid. In a sense, we might say, the valid inferences of a language would be conventional.
A view of this type would make criticism of universally accepted inferential practices impossible, for those practices would themselves form an ineliminable part of the web of belief. Of course, it would be possible to criticise inferential practices internally. A speaker can be shown, say, illogically to have affirmed the consequent. But if an entire group refused to admit counter-examples to affirming the consequent, we should have to allow that that practice determined the meaning of expressions in their language, however deviant the practice appears to us.

The view that the actual inferential practices speakers indulge are in part determinative of the meaning of sentences of a language has been variously defended. Wittgenstein's view that the necessity of a valid argument, or proof, is a matter of decision is perhaps the most extreme version of such a defence.

4.1 Conventionalism and L.E.M.

Among the claims of the later Wittgenstein which Crispin Wright (1976a; 1980a) is concerned to defend is the view that logic and mathematics are antecedent to the notion of truth. The very fact that we unrestrictedly allow application of L.E.M. is regarded as a datum.

8. Priest (1979) adopts just such a quasi-Quinean view. He has elaborated an explicitly conventionalist account of Quine's views, purged of classical prejudices. He argues that we should regard the valid inferences of a language as akin to grammatical rules. An inference is correct just if it properly represents the practices of speakers in drawing inferences. There is no question of any further justification for a valid inference in terms of the truth values of premises and conclusion of the inference. Presumably, just as one can make grammatical errors, it is possible to make inferential mistakes. But on Priest's view, the valid inferences of a language are just those which speakers, at a time, generally indulge. They are, as it were, rules of behaviour.
It is a condition of adequacy on any account of the meaning of sentences that it preserves that feature of our practice. Yet Wittgenstein clearly subscribed to some version of the manifestation argument. He would be reluctant to allow verification transcendent notions in an explanation of the meaning of sentences of a language. The view of necessity appears to be of precisely the type which rejects the third type of molecularity, while accepting the two others.

Wright (1976a, pp.241-243) proposes that one way in which a theory of meaning which otherwise adheres to anti-realist scruples might reflect our acceptance of L.E.M. would be to treat L.E.M. as an axiom for the truth theory of the language in question. This is not satisfactory. If we allow that every instance of L.E.M. is derivable in a theory of meaning which adopts a generalised anti-realist account of disjunction and negation, we must explain the role of 'or' and 'not' in instances of L.E.M.. Either those connectives will be ambiguous in their general usage and their occurrences in instances of L.E.M., since we certainly could not appeal to their general anti-realist explanation without invoking recognition transcendent notions, or the 'v' of L.E.M. must be treated as an unstructured new connective, having no connections with the general use of 'or' and 'not'. Neither provides a satisfactory account.

In the context of an elaborated view of this type, Wright (1981, p.57) answers the charge of ambiguity. He suggests that we should allow as a definition of disjunction, the following:

There is a justification (verification) of 'AvB' in a TSI iff (a) there is justification of A in the TSI, or (b) there is a justification of B in the TSI, or (c) we have an effective means of obtaining a TSI of one of the previous two sorts or (d) B is the negation of A or
Wright argues that a definition of disjunction of this sort should not merely be seen as imputing an ambiguity in the use of 'v': for it is only a necessary condition and not a sufficient condition for ambiguity of a logical symbol that its assertion conditions are not uniform. The definition of disjunction above certainly appears to suggest non-uniform assertion conditions for disjunction, but Wright suggests that there might be pragmatic reasons for treating disjunction so defined as univocal. In particular the consequences of use of a disjunction — say, the elimination laws — are univocal.

The appeal to pragmatic reasons in this context is surely questionable. There is a uniformity in the sorts of inference one can justifiably draw from disjunctions and as specified by Wright's definition. But if meaning is specified by conditions under which sentences are justifiably assertible, then Wright's clauses will ensure that, in certain circumstances, a disjunction will be justified although neither disjunct is. Relative to justified assertibility, Wright's disjunction will be a non-conservative extension. For if we accept an intuitionist style negation, we might be in a position to assert that a certain state of affairs could not arise, justifying the assertion that '¬A', and hence to assert '¬¬A'. In the presence of disjunctive syllogism, we could then argue that

\[ [(A \lor \neg A) \& \neg \neg A] \rightarrow A. \]

Yet in such situations we might not, according to anti-realist scruples, be in a position to assert 'A'.

Wright (1981, fn. 7) notes this point, and argues that further pragmatic constraints might explain our reluctance actually to assert 'A' in such cases. Yet, it seems to me, we might as well argue that
we should abandon disjunctive syllogism, hence embracing non-intuitionist revisionary consequences. For to employ pragmatic constraints at this point is to draw a distinction between the types of inferences one may justifiably draw from complex sentences. Yet the uniformity of the inferential powers of complex sentences was supposed, on pragmatic grounds, to avoid the ambiguity of the grounds on which they are assertible.

However, Wright has a further argument, in which he specifically questions the use of the conservative extension principle, and molecularity of the third type, against this conception of disjunction. If it is possible to provide a theory of meaning which is molecular in the third way, then we should be able to specify how mastery of the language could be acquired by stages. Why, Wright asks (1981, p.62), should we not supplement this picture by adding that, at every stage, certain logical laws must also be acquired? Of course, the anti-realist reply is that we must explain the necessity of logical laws in terms of the conditions under which the components are justified, as antecedently mastered in each stage. But it is precisely this claim which the conventionalist denies. In doing so, the conventionalist might accept molecularity of the first and second types, and a modified form of the third. But he could not accept what is at the heart of molecularity of the third type: that the valid inferences of a language are those which, like the indirect procedures for determining truth value, are faithful to canonical means for the premisses and conclusion.
4.2 Necessity

Wright argues that the anti-realist conception of the necessity of valid inference is itself incoherent. The briefest statement of his views is to be found in 1981, §VIII. The anti-realist can, according to Wright, be convicted of adopting a recognition transcendent notion of the criteria whereby we judge inferential practices as correct. For, consider Dummett's (1959a) example of people who count as we do, but do not add. If they were to adopt a deviant addition rule - Wright suggests $17 + 29 = 45$ - then we should regard their practices as definitely incorrect. Their rule, after all, licenses inferences which are not faithful to the activities of counting. Yet it might well be that those who adopt the rule refuse ever to recognise that the inconsistency between their practices of counting and the adoption of the rule throws doubt on the rule. They explain the deviant results of their practices of counting as we explain counting errors which are inconsistent with our arithmetic - by allowing that, in such cases, we have made an error in counting. In effect, they treat the rule as determining the meaning of '17', '29' and '45'. They could not be forced to recognise that their practices were inconsistent.

From our perspective it is possible to judge the deviant arithmetic unsound. We can prove that $17 + 29 = 46$. But from their perspective, no such proof is available. For them, the unsoundness of their arithmetical practices is essentially recognition transcendent. Wright wonders how the revisionary anti-realist can both insist that the correctness of our practices is not recognition transcendent and

9. See also Wright (1980a, II.5; III-VI; esp. III.3, V.8, VI.5; XI.7; XII; XIV; XVI-XXIII).
yet claim that an account of those practices must be responsible to objective criteria. For example, to claim that our inferential practices must be faithful to the meanings laid down for the constants is to appeal to such objective criteria. Just as those whose arithmetic is deviant may be unable to recognise in what the incorrectness of their rule consists, so we might be unable to recognise the incorrectness (or correctness) of our own practices. How then can the anti-realist insist on revision of practice?

Wright contrasts the anti-realist conception of valid inference with the Wittgensteinian conception of necessity. According to Wittgenstein, necessary statements differ from ordinary, contingent, statements in so far as they do not purport to describe the way the world is. We cannot correlate necessary statements with an ability to recognise that they are, or must be, true or false. Rather, such statements stipulate how things must be. It is no easy matter to distinguish necessary statements from contingent ones by this criterion, as Wright (1980a, ch.XXIII) admits.10 And, as Wright shows, this attitude to necessity is far from intuitive. For we believe that we can recognise that certain sentences are necessary in virtue of the meanings of expressions contained in them.

10. One version of Wright's account of how we should describe necessity - of say, a mathematical proof - as stipulative I definitely reject. He suggests (1980a, pp.448-463) that we treat mathematical proofs as on a par with other quasi-assertions, such as promises; and hence differing from ordinary contingent sentences. I do not think that there is any general principle which we could use to distinguish quasi-assertions from genuine assertions (II.3, II.4).
It seems to me that this conception also leaves out of account the practices of assessment and revision of our own inferential practices. Our inferential practices are themselves submitted to scrutiny, and the criteria whereby we assess those inferences may be questioned. Indeed, the anti-realist might be reluctant to admit that, say, the rejection of the generalised application of L.E.M. is itself recognisably, and eternally, justified. But there is no reason why he cannot claim that, as things now stand, there is no adequate justification for its generalised application. That is not a recognition transcendent claim.

If the arguments of these sections are correct, Dummett is right to prefer molecular theories of meaning. Nevertheless, Dummett has qualms about whether the anti-realist can justify a molecular theory of meaning.

5. The Necessity and Informativeness of Deductive Argument

Any account of deductive practice must show how it is possible for a valid deductive argument to be both necessary and informative. A valid argument is necessary in the sense that it is necessary that, if the premises are true, the conclusion also is. A valid argument may also be informative: not merely relative to the beliefs of a particular speaker, but relative to the knowledge that fully competent use of the language involves. How can this be so? The question of how a theory of meaning can accommodate both features of deductive argument is broached by Dummett (1973a).

Quinean holistic theories and those I have called conventionalist can accommodate both the informativeness and necessity of deductive argument. For a new informative type of deductive argument could be
accepted by a community of speakers. In that case, the argument would be by definition valid: and, since what is true is in both cases partly dependent on the deductive practices of speakers, the conclusion would follow necessarily from the premisses. Realist molecular theories can do so too. In a realist theory, the grounds of truth may outrun the abilities of speakers to recognise truth. A valid deductive argument can show that a sentence is true which was not previously recognised to be true—hence it could be informative. Moreover, truth, in a valid argument, must be preserved: so in a valid argument, the conclusion follows necessarily from the premisses.

Anti-realist theories of meaning which are molecular in the three senses of 1 define truth in terms of the canonical procedures for determining truth value, where those procedures must be available to speakers. According to Dummett, in explaining either the necessity or the informativeness of deductive argument such theories thereby rule out any explanation of the other. If a deductive argument genuinely provides new grounds for a conclusion, then the means for determining truth value provided by that argument could not already be provably or recognisably equivalent to the canonical means for determining the truth value of the conclusion. But, if so, could the argument preserve recognisable truth? If the argument preserves recognisable truth, then the means for determining truth value provided by the deductive argument must be faithful to the canonical grounds for determining truth value. Where 'faithfulness' is as defined in 1, a procedure is faithful to another just if it can be converted by valid deductive (or perhaps inductive) proof to the other. Now in this case the valid deductive argument could not be informative: for any valid deductive argument would depend on the prior equivalence of procedures faithful to one another.
Dummett is not concerned with instances of *petitio principii* of the sort that Aristotle, for example, wished to exclude from the class of valid syllogisms. The argument 'p, therefore p' is not informative, but there is no reason we should expect it to be. His example is of Euler's proof that if anyone crossed all the bridges in Königsberg he crossed at least one, more than once. "No mere vacant observation" could be the canonical means for establishing, of someone, that he crossed a bridge in Königsberg more than once. The canonical means for establishing that conclusion must invoke a series of observations and inferences. But Euler's proof provides a means for determining the conclusion which involves a series of observations and inferences none of which need be canonical for applying the predicate '...cross a Königsberg bridge more than once'. The two procedures are proved to yield equivalent verdicts by the deductive proof, but if the procedures are not equivalent in this sense antecedently to Euler's proof, how could the proof be valid? And if the proof is valid, how could it be informative?

Euler's proof provides a particularly clear case of the reasons for calling a deductive argument informative. For we are inclined to think that the proof provides a means of establishing the conclusion which is genuinely distinct from the procedure which is canonical for that conclusion. The anti-realist, by requiring that a deductive argument is valid just if it preserves recognisable truth, apparently rules out an explanation of the informativeness of new deductive methods. For the anti-realist cannot say that the proof shows equivalent two procedures previously not recognisably equivalent.
Dummett appeals to the analogy with natural deduction systems. In a natural deduction system there is no objection to the introduction of a new logical constant, and rules of inference for that constant, when the constant extends the class of deducible statements only conservatively—relative to a well-defined context of deducibility (III.4). Arguments which are necessary and informative could arise when a suitable new logical constant is defined, just when the new constant appears in the conclusion. It is apparent that the necessity of the argument itself depends on the deducibility relation preserving the preferred semantic notion. Despite this, there is a sense in which we might allow that new constant yielding conservative extensions produce arguments which are valid, and, relative to the original language, informative.

The analogy cannot be applied to Euler's proof. Euler did not introduce a new logical constant. Dummett (1973, pp.225-229) suggests a broader notion of conservative extension. In particular, a new form of deductive argument is valid just if conservative relative to the epistemic criterion of "all possible observations". So, for example, Euler's proof provides a new epistemic method establishing that someone crossed at least one of Königsberg's bridges more than once. The method is, nevertheless, faithful to the original canonical procedure. For observations that suffice to establish the conclusion by appeal to Euler's argument could be rearranged in such a fashion as to suffice for the exercise of the canonical procedure.

The difficulty with applying the analogy as Dummett suggests it should be is with the appeal to a rearrangement of evidence. Evidence of a certain sort will establish a sentence by such a rearrangement just when there is a justified inductive or deductive argument showing
that the rearrangement does establish the sentence. We have apparently turned full circle: the argument is necessary and informative when it provides a means of determining truth value which is faithful to the canonical means for determining the conclusion. But if a deductive argument is faithful in this sense it cannot be informative.

If Dummett is correct in thinking that any adequate explanation of deductive practice must give an account of the necessity and informativeness of deductive argument, then he is also correct in thinking that an anti-realist molecular theory fails to do so. The anti-realist cannot explain how a deductive argument could be informative, while insisting on an anti-realist account of truth. Or at least this is so if we accept Dummett's conception of the informativeness of deductive argument.

Dummett thinks that deductive arguments are informative relative to the knowledge that a competent speaker of the language possesses. But the informativeness of Euler's proof is best seen as information a particular speaker may acquire in virtue of following the proof through. The conception of a molecular theory of meaning of the third type has it that speakers acquire and manifest their semantic knowledge in a certain ordered fashion. Speakers can learn indirect procedures that are faithful to the canonical specifications of semantic knowledge. Why should that process not be informative? A molecular theory does not imply that understanding a sentence consists in a grasp of all its inferential connections. There should be no inclination to deny the informativeness of deductive argument.
Dummett's use of the conservative extension principle suggests, however, that he had different cases in mind: those for which genuinely new procedures are employed to establish a conclusion. Dummett's difficulty would then relate not so much to deductive equivalence between procedures, but to the account of new canonical procedures arising through new techniques or procedures of any sort. It is to these cases I shall now turn.

5.1 Meaning change

The canonical procedures associated with sentences of a language change over time. New procedures supersede those which were previously canonical. Such new procedures might be a product of theoretical or technological change. The replacement of one canonical procedure by another is typically justified by deductive or inductive argument.

We can reinstate Dummett's difficulty for anti-realist molecular theories which are supplemented by these new procedures. Either the new procedures are genuine discoveries, in which case there could be no valid deductive or inductive argument to justify the replacement before the new procedures were developed; or the new procedures are faithful to the original procedures, in which case they are not genuine discoveries.

The anti-realist can justify new procedures which are faithful to those previously canonical, and may explain the replacement of, say, a direct procedure by an indirect procedure in terms of the greater ease of application of the latter. The difficulty arises only when the new procedure is not faithful to the canonical procedure. Consider a decidable physiological test for pain (here, 'pain*') which is
proposed as a replacement for our predicate 'pain' which, by hypothesis, is not decidable. If 'pain*' were to replace 'pain' the anti-realist could not justify the replacement. He should have to regard the replacement as either illegitimate, or as involving a change of meaning. For certainly 'pain*' does not invoke procedures faithful to those for 'pain'.

It is apparent that the conservative extension principle, if applied to this case, offers no useful ruling. For if 'pain*' is supposed to be replacement for 'pain', then it produces a non-conservative extension to the language, relative to truth anti-realistically conceived. Evidently

He is in pain* or he is not.

would be generally assertible, whereas

He is in pain or he is not.

is not. If, on the other hand, 'pain*' is a new predicate in the language, then we cannot treat the case as one of replacement of 'pain' by 'pain*'.

In effect, the anti-realist gives a criterion of radical meaning change. A meaning change is radical if it is not faithful to the previously canonical procedures; while any alteration in canonical procedures for determining truth value in which the new procedures are not faithful to the old is conservative. On this criterion, the introduction of new terms, or the rejection of old, will generally not involve radical meaning change. Radical meaning change arises in cases, such as the replacement of 'pain' by 'pain*', where the new procedures are not faithful to the old.
Again, it is the manifestation argument which suggests this criterion. Speakers could not manifest their reasons for accepting a radical meaning change, since there is no feature of the use of sentences either before or after the change which explains the replacement. Speaking metaphorically, we might say that there is no vantage point from which one could assess that 'pain' and 'pain*' apply to the same sensation. Hence, there could be no vantage point from which we could explain the replacement of one by the other.

Conservative meaning changes are explicable as the replacement of one canonical procedure by another. In this category we include changes in meaning derived from deductive argument. Such changes may well be informative to particular speakers, and provide alternative means for determining truth value. Radical meaning changes cannot be explained as relating to previously recorded facts, but may be genuinely informative, in so far as changes in technology, for example, provide new ways of establishing truths about the world.

5.2 Harmony

Dummett thinks we can use the conservative extension principle in explaining a further aspect of meaning change. This is the analogy mentioned in III.4.1, which postulates two features of the use of sentences which must be in harmony. The analogy is to the introduction and elimination laws for a logical constant in a natural deduction system. We might hope that this analogy could be used to explain radical meaning change.

Dummett discusses the two features of use with respect to the predicate 'valid'. One feature, corresponding to the grounds of application of the predicate, would be adequately captured by a
syntactic criterion of validity, at least in a restricted context. Grounds of this sort do not capture the point of the distinction between valid and invalid arguments which "resides in the connection between validity and truth" (1973, p.454). This second feature is analogous to the elimination laws for a logical constant and is intended to represent the consequences attendant on grasp of the predicate. If one understands 'valid' one understands that one can treat a conclusion validly derived from true premises as true.

However, it is doubtful whether grasp of the consequences of the use of 'valid' is properly seen as independent of grasp of grounds. For we might expect that an adequate account of the meaning of 'valid' would incorporate the ability to draw such consequences in the account of understanding the predicate, and hence be part of the assertibility conditions of 'valid'. For otherwise, we could not explain the use of 'valid', at least as it is anti-realistically conceived. So this example of Dummett's is unconvincing.

Dummett extends the analogy to pejorative expressions such as 'Boche'. The grounds of application of the predicate to a person — that he is German — can be distinguished from the consequences of application — that, for example, he is barbarous. Both aspects are part of the meaning of 'Boche', and when speakers reject the predicate they reject, in effect, the transition from grounds to consequences. For, Dummett says,

such change is motivated by the desire to attain or preserve harmony between two features of an expression's meaning

and he goes on

the addition of the term 'Boche' to a language which did not previously contain it would produce a non-conservative extension. (1973, p.454)
Dummett is clearly correct to think that in rejecting certain expressions, speakers reject the overtones implicit in the use of those expressions. Words like 'nigger', 'imperial', 'sophisticated' and so on fall out of use for this reason. So, in a sense, do outdated scientific terms: 'phlogiston' and 'humour', for example. However the heterogeneity of these cases suggests that the distinction between grounds and consequences is not readily drawn on the model of introduction and elimination laws. Pejorative tone, for example, is not a feature of use which normally licenses inferences of the sort:

He is a German therefore he is barbarian.

whereas the scientific terms do. Pejorative expressions are better seen as licensing conventional implicatures — in Grice's (1975, p.66) sense — than as justifying inferences. So if Dummett's notion of harmony is to be applied to these cases, we should need to reformulate it for conventional implicatures.

Dummett's examples illustrate a difficulty with the claim that grounds and consequences must be in harmony. If the claim is correct, then it should apply quite generally. Yet, without adopting a reductionist account of meaning, in terms, say, of sense data, how are we to distinguish the grounds and the consequences of sentences containing a predicate like 'blue'? In so far as calling something blue has consequences, those consequences appear to be features shared by all colour predicates, and hence not specific to the particular predicate the meaning of which those consequences are thought in part to define. We appear to need a method of distinguishing grounds and consequences which the non-reductionist anti-realism I have advocated does not provide.
Moreover, when the conservative extension principle is applied in this fashion it goes no way to explaining the problematic cases of radical meaning change. For, although we might suggest that our usual endorsement of L.E.M. for ascriptions of pain to others is not in harmony with the grounds on which we apply '...in pain', this fact provides no explanation of why we should adopt 'pain*' in place of 'pain'. We might indeed say that 'pain*', if that was meant by 'pain', would be such that it grounds and consequences are in harmony. But in the context of an anti-realist theory of meaning, this is no reason for adopting 'pain*' in place of 'pain'. Indeed, if the principle of harmony has any application in this context, it reinforces the conclusion that we should revise our belief in L.E.M. for attributions of sensation to others.

Of course, Dummett's use of the notion of harmony is intended to illustrate a principle whose primary consequence is the revisionism discussed in this thesis. I doubt that the wider applications of the principle to which Dummett refers are properly seen as relating to the conservative extension principle, or deserve the semi-technical terminology in which he describes them. Certainly, the analogy does not help to explain radical meaning change.

5.3 Explanation - A Final Suggestion

I began this essay with an explanatory requirement on a theory of meaning. A theory of meaning should explain how speakers are able to communicate. That requirement provides the rationale of the revisionary consequences, and, in particular, the suspicion of Bivalence characteristic of Dummett's anti-realism. Yet it seems that the anti-realist cannot explain how we justify the adoption of new
techniques, or admit that there is a relationship between practices before and after radical meaning change. One final example illustrates this point.

Consider assertions about the mass of electrons made before there were, even in principle, procedures for determining their mass. If we accept anti-realist scruples about analogy and insist that canonical procedures for determining truth value specify meaning, it appears that assertions of this type have transcendent truth conditions and are therefore meaningless. Yet, surely, before discovering a procedure for determining the mass of electrons we understand what it is we seek to discover?

Again, the realist can allow that assertions about the mass of electrons have a determinate truth value, whether or not we can determine what it is. There is no difficulty in according a sense to the assertions, although the anti-realist contends that there is a difficulty in specifying what it is. The 2-place predicate '...has a mass of...' has a particular content, according to the holist and conventionalist, depending partly on the inferential connections of sentences containing it. So our use of theory-laden assertions about the mass of electrons can be explained even though it is not possible to ascertain what their mass is.

Evidently, the anti-realist can allow that techniques might be developed for measuring the mass of electrons. But in doing so, we should effect a radical meaning change: assertions about the mass of electrons which were meaningless would become meaningful. Hence the anti-realist cannot explain or justify such new techniques. The realist and the holist will object that this does not capture our intuitive attitude while developing procedures for determining mass,
as, say, Thomson did. Surely Thomson was seeking a measure of mass, when he employed his method of determining e/m? His methods, in part geometrical, in part depending on the notion of a magnetic field, assume that it was the mass of an electron he sought to discover.

The anti-realist need feel no obligation to meet this objection. He may argue that we do indeed have an impression of understanding assertions about the mass of electrons before we can determine their truth-value. But that impression is ill-founded until we have canonical procedures for doing so. We certainly could not understand assertions about the mass of electrons by analogy with assertions about the weight of middle sized physical objects for which we do possess procedures, if, as we supposed, there are no procedures for determining the mass of electrons.

It might be argued that mass is, after all, a rough-and-ready concept, and, even before possessing procedures for determining the precise mass of electrons, we are in a position to show that the mass of an electron was of a certain order of magnitude. But unless we were in a position to determine, in principle, what the mass of an electron was, 'mass' would simply be ambiguous - vague for electrons, and not for large objects.

I suggest that we allow that 'mass' could have been applied to electrons metaphorically before the development of measuring techniques. A metaphor may be apt and relevant in certain respects, while being strictly and literally meaningless. As long as we can define the respect in which it is relevant, this is no bar to its being comprehensible. Such scientific metaphors, unlike most poetic metaphors, may acquire a strict and literal content as techniques and theory develop. When we acquire a procedure for measuring the mass of
electrons, the meaning of the relevant assertions change radically from metaphorical to strict and literal sense. But radical change of this sort is perhaps closer to our intuitive attitude towards scientific development than that which proposes an alteration in the status of assertions from meaningless to meaningful. Equally, we might argue that although the anti-realist cannot discern common content in assertions about 'pain' and 'pain*', such assertions are metaphorically related.

The appeal to metaphor is the slightest of gestures in the direction of an anti-realist account of radical meaning change. It is, after all, by no means clear that the anti-realist could give any account of the meaning of metaphors. We should need to specify what the procedures are for assessing the aptness of metaphors. Moreover, the appeal to metaphor could not explain why we adopt one, rather than another, radical meaning change. The anti-realist denies that such an explanation is possible. Nevertheless, the use of some such notion as metaphor permits the anti-realist to describe those features of linguistic practice, like radical meaning change, grasp of which could not be exhaustively manifest in use.

I have argued that the anti-realist may allow that there are impressions of understanding which could not be manifest in behaviour. It is not unnatural to think that we should talk of such impressions in terms of metaphor. I think that an account of what is constant over radical meaning change must refer to such impressions, and can only be discussed in those terms. Certainly, others have proposed that scientific developments may involve a radical shift in the meanings of expressions. What I have suggested is that one who endorses the manifestation argument must adopt a similar attitude, in
a very wide range of cases.

6. Conclusion

In this chapter, I have been concerned to distinguish varieties of holism, according to which aspect of Dummett's notion of molecularity they reject. I have argued that holism of Quine's type rejects the determinateness of sense. My objection to such holism is that it cannot explain why speakers treat sense as though it is determinate, when they disagree about the meanings of sentences and attempt to refine those meanings.

Davidson's claim that the mental is not reducible to the behavioural can be seen as rejecting the claim that sense is publically assessable. His own appeal to the behaviour of speakers in holding sentences true as the evidence for a theory of meaning appears to involve just the reductionism he rejects. I have suggested that alternative theories which talk of the totality of propositional attitudes of speakers as the evidence for a theory of meaning avoid such reductionism, but fail to capture the point of the notion of truth in a theory of meaning.

Conventionalist accounts of meaning avoid the revisionary consequences of the manifestation argument by allowing that certain logical laws may be true by convention. Such theories reject the claim that logical laws must be true in virtue of the meanings, established in a certain canonical fashion, of the sentences of a language. I have argued that conventionalism of this sort treats logically complex sentences as ambiguous. Moreover, the Wittgensteinian account of validity which offers an alternative view of the conditions under which complex sentences are true is not
intuitively satisfactory.

However, I have suggested that the anti-realist account of validity gives rise to a problem for the anti-realist. The problem is an adaptation of one which Dummett thinks arises for anti-realist molecular theories in accounting for the necessity and informativeness of deductive argument. The anti-realist cannot explain or justify what I have called radical meaning changes, which occur when new methods for determining truth value that are not faithful to earlier methods become available. I think that the anti-realist should talk of radical meaning change in terms of metaphor. But an account like this cannot explain how we justify the replacement of one procedure for determining truth value by another.

The conception of reality which emerges from these considerations can be made vivid in terms of Dummett's two contrasting views of mathematics. The first is an image of mathematical enquiry:

If we think that mathematical results are in some sense imposed on us from without, we could...have the picture of mathematical reality not already in existence but as it were coming into being as we probe. (1959, p.162)

The image captures two features of anti-realism as I have presented it. Mathematical reality exists independently of speakers' stipulations and desires: for reality is probed, not created. And there is no determinate reality independent of speakers' abilities to establish truths about it. The image also implies that speakers conceive of aspects of reality about which they do not have conclusive, or inconclusive, evidence as aspects of the reality they presently investigate. For it is that reality which they probe and bring into being.
However, if I am correct that radical meaning change is a consequence of the discovery of new procedures, then, at least in this regard, the image is inappropriate. For radical meaning change effects an alteration of reality which cannot be seen as a development of the previously used forms. The appropriate image seems to be one which treats radical meaning change in terms of realities replacing one another: for in these cases, we cannot, save perhaps metaphorically, describe the relation between the world before and after the change.

Dummett appears to recognise that this is so in the mathematical case. When he discusses the question of how canonical proof conditions develop over time, he says:

As mathematics progresses, so the relevant notion of canonical proof will change, and hence the meanings of our mathematical statements are always to some degree subject to fluctuation. But, for all that, their meanings must, at any given stage in the development of mathematics, be specific; and the means whereby they may be exhibited as specific has to lie in an analysis of some notion of proof, adequate at that stage, such that a proof of a given statement never depends upon the understanding of a more complex statement. (1977, pp.402-3)

In this passage, Dummett's image of mathematical reality is of a reality determined by the types of proof available at that stage of mathematical enquiry. Dummett contends that we cannot limit the types of mathematical proof which might turn out to be acceptable: so we cannot give an eternal description of mathematical reality, but only one relative to the types of canonical proof we do have available. Nevertheless, Dummett insists that unless it is possible to give canonical accounts of the meanings of mathematical sentences within a particular specification of the types of acceptable proof, those meanings would not be specific. If we cannot do so we cannot, he thinks, explain the use of mathematical sentences.
If we transpose Dummett's remarks from their mathematical context, the conception of reality is of a world determined by the types of procedure which speakers are able to and do use to decide the truth value of sentences. Speakers' abilities are limited: they are unable, for example, to scan infinite totalities or move at will through time. Moreover, the techniques speakers use to determine truth value are themselves limited and may be developed. Those limitations place a restriction on reality. Reality is determinate in so far as our best possible efforts could serve to decide how it is. Of course, it is possible to understand sentences about aspects of reality which are not fully determined. For instance, new evidence may be discovered which decides a past tense sentence. In these cases, probing the world makes it determinate: the world does "come into being".

However, just as in mathematics we cannot rule out the possibility of entirely new methods of proof, it is not impossible that entirely new means of determining truth value could emerge. Perhaps evolution will provide us with the ability to scan infinite totalities, or techniques will be discovered which enable us to move at will in the past. If that were to happen, the meanings of quantifiers or of temporal indexicals would change radically. On a less speculative level, scientific progress might allow us to decide sentences which we cannot at present decide. Again this would involve radical changes of meaning. In all these cases, these developments would more closely approximate our pre-theoretic conceptions. But at present we lack these abilities, and are not able coherently and consistently imagine what it would be like if we possessed them. The world, as investigated by speakers with such hypothetical powers or scientific techniques, would be a different one from ours.
These remarks can do no more than convey an intuitive picture of the anti-realist conception of the world. Anti-realism stands or falls with the arguments used in its defence, not with the vividness and plausibility of its imagery. In the mathematical case, the substantive requirement on which the anti-realist rests his case is that there should be a canonical account of the meaning of each mathematical sentence. Similarly, in natural language, a molecular account of the meaning of each sentence is needed. I have tried to argue that this requirement is not excessive.
I have attempted to justify the manifestation argument, and to explore its consequences. The source of the manifestation argument is Wittgenstein's contention that meaning is use. Its legacies are the repudiation of realism and of specific laws of classical logic.

The association between use and meaning has been described in various ways. Whether knowledge of meaning is described as knowledge of the contents of sentences or of the intentions with which sentences are characteristically uttered, neither realism nor classical logic is justified by the use to which sentences are put. I have advocated an account in which knowledge of meaning is manifested in the conventional activity of assertion. The meaning of an utterance is determined by the conditions under which its indicative correlate is justified. Meaning is then entirely comprised by features of use. This account is not realist; nor does it validate classical logic.

When meaning is defined by the conditions under which an assertion is justified, the meanings of logically complex sentences may be stipulated in various ways. The intuitionist account of logically complex sentences is appropriate for mathematics. It is not suitable for natural language, since the intuitionist negation does not properly predict the conditions under which the negations of contingent and defeasible assertions of natural language are justified. It is necessary separately to stipulate the falsification conditions of such sentences.
Falsification conditions, like conditions under which a sentence is justified, can be exhaustively described in terms of the practices of speakers in using sentences. In an account of meaning which provides both verification and falsification conditions of sentences, there is no appeal to recognition transcendent notions, so the account is not realist. Moreover, there is still reason to doubt that Bivalence and L.E.M. hold, so the association between anti-realism and revision of classical logic is confirmed.

I cannot, however, claim that a theory of meaning which yields classical logic could not meet the manifestation argument. Nor have I established that anti-realism invariably implies revision of classical logic. I have considered two types of counter-example. When verification and falsification conditions determine the meaning of sentences of a language, knowledge of meaning can be manifested in the activities of verifying and falsifying sentences. Yet, if negation is defined so that a negated assertion is correct just when the assertion is not correct, and what I have called a 'weak' notion of correctness is adopted, classical logic may be validated. The account of negation is not plausible. Nevertheless, theories of this type both describe meaning in terms of features of use and yield classical logic.

Moreover, theories which employ a weak notion of correctness may not be realist. For, in some theories of this type, it is always possible to recognise that a sentence is correct, when it is; and hence to recognise when its negation is correct: for that is so, when the assertion is incorrect. Dummett's topical anti-realist about time, for instance, adopts what is, in effect, a weak notion of correctness for past tense sentences in order to ensure that their truth conditions are recognisable. Certainly, topical anti-realism is
a species of anti-realism, for it makes no play with transcendent notions. Yet, although a classical tense logic is inappropriate for topical anti-realism, the propositional logic is classical. There are, therefore, anti-realist theories which accept classical logic in situations in which I have argued that the anti-realist should not.

The second type of counter-example to the claim that the manifestation argument implies revision of classical logic derives from holism. Those who adopt holistic theories distinguish between the ability to verify or falsify a sentence, and the ability to manifest an understanding of it. Although we may not be able to display an understanding of, say, L.E.M. in the fashion the anti-realist prefers, the holist insists that further evidence warrants attributing such an understanding. I have argued that such further evidence is inadmissible, and that holistic theories fail to accommodate those features of a theory of meaning expressed by the molecularity requirements, all of which I have taken to be desirable. Nevertheless, varieties of holism purport to provide non-revisionary accounts of meaning in which understanding is manifest in use.

Those holists who, like Quine and the later Wittgenstein, think that the import of a theory could not outrun its empirical consequences are not realists. Holism of these types provides a further reason to doubt the association between anti-realism and revision of classical logic. I have accepted neither holism, nor a theory of meaning in terms of a weak notion of correctness. In my view, the manifestation argument is best suited by an account which is anti-realist, and which ensures that understanding can be manifested by denying that Bivalence and L.E.M. have universal application.
Perhaps the most striking application of the manifestation argument concerns tensed sentences. It is not necessary to treat all times other than the present as unreal in order to describe the meaning of tensed sentences in terms of features of their use. If the manifestation argument is interpreted as primarily an epistemological argument it would have that consequence. For, certainly, speakers recognise the meanings of sentences at a time. But I have argued that we should not interpret the manifestation argument in this way. Speakers do manifest their understanding over time, and a description of their linguistic abilities should incorporate the ability to recognise equivalence in truth or assertibility conditions over time. Moreover, unless we attribute such abilities to speakers, it is impossible to give an adequate account of the meaning of tensed sentences.

Nevertheless, although a generalised anti-realism about times other than the present cannot be justified, a realist account of certain tensed sentences contravenes the manifestation argument. When there is no evidence for or against a past tense sentence, we lack procedures for determining its truth value in a finite time. We are therefore not justified in holding that it is either true or false. The same applies to some sentences involving quantification over times. Defeasible assertions are also a special case: for their truth value must be assessed at a time, if we are to avoid inconsistency.

Temporal anti-realism of this sort displays a general feature of the anti-realist view of the world. The anti-realist can accept a realist account of decidable sentences and the realist metaphor of the objectivity of the conditions in the world which make them true. The
anti-realist scruples apply only to undecidable sentences. The intuitionist in mathematics, for instance, accepts a platonist account of decidable mathematical sentences, but gives a different account of sentences the truth value of which could not be decided in a finite time. I have argued that the anti-realist should likewise admit a realist interpretation of sentences about other minds and distant places, unless particular features of those sentences lead to undecidability.

The anti-realist must take a similar attitude to scientific progress. When it is possible to show that the evolution of scientific methods is faithful to the procedures earlier used for determining truth value, the anti-realist can take over the realist account of scientific progress. In such cases, the anti-realist can, with the realist, describe the scientific innovator as evolving new and better means of getting to the truth. However, when developments provide procedures which do not always yield the same verdict as those earlier used, the anti-realist must describe progress as radically changing the meaning of sentences of the language.

I do not claim that the consequences of the manifestation argument are not counter-intuitive; some might think absurd. Our normal habit is to be realist about infinite totalities, the past, other minds and scientific progress. It is tempting to contrapose, and argue that since the manifestation argument has absurd consequences, it must itself be misguided. I am convinced that the manifestation argument cannot be refuted, and that we must accept the consequences, however unpalatable they may be.
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