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later Wittgenstein's notion of art, criterion.

20. See T&OE pp.248-9; pp.123-128 of my Wittgenstein on the Foundations of Mathematics, (Duckworth, 1980); and my "Strict Finitism", Synthese 51 (1982) pp.203-82.

2. HOLISM, MOLECULARITY AND TRUTH*

NEIL TENNANT

What is holism? Ironically, one has to confront almost the whole corpus of Michael Dummett's writings[1] to extract an answer; and considerations that prompt professions of holism are almost inextricable from those that support the thesis of inextricability. Dummett more than anyone has been both explicit about what he understands by holism, and forceful in his reasons for rejecting it. Still, there are vacillations in that understanding, usually tailored to the reasons for rejection. Can his formulations and criticisms of holism be improved upon? Can his doctrine of molecularity be refined? And can one find a middle position which recognises, with the holist, certain brute facts about complexity, but which descries, with the molecularist, enough manageable structure to get a satisfactory semantical theory going? I shall devote three sections to answering these questions affirmatively.

I Dummett's Holism(s)

The view of holism that emerges from 'Frege's Distinction Between Sense and Reference' is of a piece with the inextricability thesis that Dummett discusses in 'The Significance of Quine's Indeterminacy Thesis'. There the emphasis is on how it is impossible to separate belief from meaning, to separate grounds for assent or dissent from shift in content of the statement at issue.

We cannot predict the pattern in which truth values will be redistributed in the light of specific exposure to external stimuli. For to predict this pattern we need to know how meanings will change, and how theory will be revised. Conversely, from the pattern once observed we cannot uniquely resolve to components of meaning and theory-change. The emphasis is thus primarily epistemological - though, to be sure, it becomes a semantic one as soon as one acknowledges the necessary interplay between evidence and

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content, however fuzzy the distinction between the two. Dummett indeed cites as a "characteristic expression of holism" a passage from Davidson which does not even use the word 'holism':

> To give up the analytic-synthetic distinction as basic to the understanding of language is to give up the idea that we can clearly distinguish between theory and language. Meaning, as we might loosely use the word, is contaminated by theory, by what is held true. (p.134)

In 'The Philosophical Basis of Intuitionistic Logic' the emphasis becomes more specifically semantic. On a holistic view of language

> ... it is illegitimate to ask after the content of any single statement, or even after that of any one theory, say a mathematical or a physical theory; the significance of each statement or of each deductively systematised body of statements is modified by the multiple connections which it has, direct or remote, with other statements in other areas of our language taken as a whole, and so there is no adequate way of understanding the statement short of knowing the entire language. Or, rather, even this image is false to the facts: it is not that a statement or even a theory has, as it were, a primal meaning which then gets modified by the interconnections that are established with other statements and other theories; rather, its meaning simply consists in the place which it occupies in the complicated network which constitutes the totality of our linguistic practices. (p.218)

The same account of holism is presupposed in the essay 'The Justification of Deduction' - and for very good reason. For in both these essays Dummett is occupied with the problem (generated by a molecularist view of language) that our inferential practice appears to stand in need of justification, and with the question whether it is possible to provide such justification. The justification he has in mind employs the notions of

(i) canonical (direct) means of verifying statements

and

(ii) rules of deduction conservatively extending theories modulo canonically verified basic statements.[2]

(The same conception of holism also, understandably, underlies the philosophical discussion in Elements of Intuitionism.)

Talk of holism in Dummett, then, appears to have two sources, and thus two senses:

(a) the sense by reference to inextricability (of theory and meaning)

and

(b) the sense by reference to place in the network.

For brevity, I shall call these

(a) holism from inextricability

and

(b) constitutive holism

respectively.[3]

Note, in connection with constitutive holism, that Dummett speaks of the place a sentence occupies within the 'complicated network that constitutes the totality of our linguistic practices' (my emphasis). This invites an understanding of a species of constitutive holism as not deriving from, and indeed invariant across, the vicissitudes of theory change. To use the same Quinean metaphor of which Dummett is one of the most sympathetic and vivid expositors, one could regard it as of the very nature of certain of our linguistic practices that, as the pattern of truth values swirls on the periphery, the possible interior currents of consequential truth value redistribution are constrained in certain ways - certainly, by the meanings of the logical operators and very possibly, also, by the stability in meaning of other lexical primitives, such as everyday natural kind terms, colour and shape predicates etc. The possibility I am canvassing here is that the constitutive holist might be able to give detailed content to his conception of holism without having to appeal to inextricability; and I shall try to supply such detail below. Bearing in mind the lack of any prima facie connection between the two senses of holism that I have so far distinguished, let us now review Dummett's apparently undifferentiated notion by listing the most important claims he makes involving it. I shall give his primary characterisations as well as consequences (mistaken or otherwise) of the holist position, and its alleged shortcomings. (I shall use his own formulations verbatim wherever possible.)

Here, then, are the ingredients, according to Dummett, of the holist's view:

1. The two theses

   (i) No experience compels the rejection of any sentence

   and

   (ii) No sentence is immune from revision

   transform Quine's original network model into a theory "quite rightly characterised as holism" (Frege, p.597).

[But (i) destroys the periphery/interior distinction, and (ii) dissolves the internal structure of the theory. Thus the question might be raised: what then constitutes the totality of our linguistic practices in the face of arbitrary lurches in various intellectual biographies?]

2. 'Meaning is contaminated by theory'
   [Davidson's supposed "characteristic expression of holism".]
3. There is no way to discriminate between any two sentences held true, especially with regard to the kinds of reason speakers have for accepting them (T&OE, p.136).
4. There is no way to distinguish between a move in the language game and an alteration in the rules. Every move changes the rules (T&OE, p.135).
5. The theory of meaning for the language does not by itself determine our disposition to assent to or dissent from any one particular sentence under different conditions (T&OE, pp.136-7).
6. Individual words and sentences still do have senses (mistakenly denied by some holists) (T&OE, pp.136-8); but no model for such individual contents can be given (T&OE, p.309).
7. Use is beyond criticism:
   (i) We can have no conception of rules of inference remaining faithful to the individual contents of the sentences they involve (T&OE, p.303).
   (ii) Deduction is justified, simply because it is part of our overall linguistic practice (T&OE, p.303).
8. A theory of meaning is impossible (T&OE, p.309):
   (i) There is no determinate capacity which constitutes knowledge of the meaning of an individual sentence (T&OE, p.382).
   (ii) We cannot derive a theory's significance from its parts, since it has none (Frege, p.600).

Against this eclectically axiomatised position Dummett raises the following objections:

1. Holism cannot account for how we do, in fact, understand new statements (T&OE, p.177).
2. Holism subverts the (presumably useful and licit) 'periphery-interior' metaphor (cf.1 above).

3. Holism delivers a wan account of why deduction is useful: it can only say it is so because by means of it we can arrive at conclusions, even conclusions of the simplest logical form, which we could not arrive at otherwise. And of course on a holistic view the question of justification cannot arise (cf.7(ii) above).
4. Holism cannot give an account of how we use language as an instrument of communication: "I cannot know anything that a man believes until I know (or guess) everything that he believes" (Frege, p.599).
5. Holism cannot account for "how we acquire a mastery of a language" (Frege, p.597-8) or for "the progressive acquisition of language" (WTMI, p.137), because "learning language involves learning what justifications are required for sentences of various kinds" (Frege, p.622).
6. Holism cannot say how communication could even begin (Frege, p.599).
7. A theory of meaning(!) based on a holistic view can give no determinate content to the notion of a mistake (WTMI, p.119).

Is the holist position no more than a bundle of broad metaphors about games, networks, patterns of truth value redistribution, and all-or-nothing grasp of language? And if it is at all plausible that holism (notwithstanding claim (6) above)

> demands that we regard our words as having senses of a much more complex kind than we have imagined, of a kind, indeed, of which we have as yet no clear picture (T&OE p.138, my emphasis)

then where is the holist who will even begin to unravel the constitutive semantic matrix implicitly postulated in such a claim, in the way that, say, truth theorists in the Davidson or Montague schools, or game theorists of the Hintikka school, have undertaken to characterise expression forming operators of various language fragments?

At times Dummett himself seems to come close to taking on board certain central ideas of holism, even and especially when trying to contrast with it the molecularist doctrine he advocates. Take, for example, his claim

> ... any acceptable theory of meaning must give recognition to the interconnectedness of language. Since words cannot be used on their own, but only in sentences, there cannot be such a thing as a grasp of any one word which does not involve at least a partial grasp of the sentences of some other words. (WTMII p.78, my emphasis)

Can we take solace from the fact that we have this occurrence of "some other" rather than one of "all other" which, presumably, he would have in mind for the holist? And how can we be sure that if we do our ancestral "somes" we might not yet arrive at the grand total of all?

II On Conceptual Schemes

Let us take R_N and R_S to be the following relations:

$\{C_1, \ldots, C_m\}\ R_N C$: $C_1,\ldots,C_m$ are the concepts grasp of which is necessary for a grasp of concept C

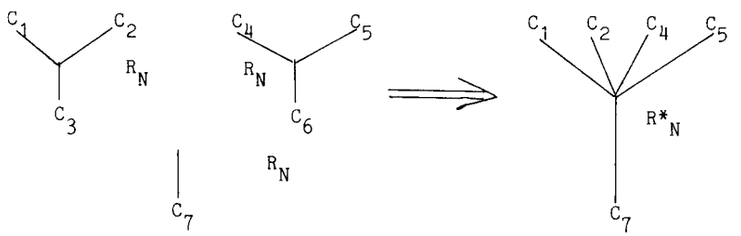
$\{C_1, \ldots, C_m\}\ R_S C$: grasp of concepts $C_1,\ldots,C_m$ is minimally sufficient for a grasp of concept C

(A minimally sufficient set is one which is sufficient, but which has no sufficient proper subsets.)

Let R^*_N and R^*_S be the ancestral relations of R_N and R_S respectively. Thus, for example,

$$\text{if } \left\{\begin{array}{l}\{C_1, C_2\}\ R_N\ C_3\\ \{C_4, C_5\}\ R_N\ C_6\\ \{C_3, C_6\}\ R_N\ C_7\end{array}\right\} \text{ then } \{C_1, C_2, C_4, C_5\}\ R^*_N\ C_7$$

Or, diagramatically:



Concepts thus depend on one another[4] in very much the same sort of tree pattern in which the conclusion of a proof depends on the assumptions at the tops of its branches. Now just as one can chase back along lines of

logical dependence to uncover first principles, or axioms, for one's theory about a given subject matter, so too now does the possibility present itself of seeking out primitive concepts within our scheme. What now becomes crucial for the conceptual foundationalist is whether the process of tracing alone these lines of dependence comes to an end after finitely many steps - that is, whether the relation in question is well-founded. This notion has been developed at some length by Alan Weir.[5] It occurs also in Dummett's concluding philosophical remarks in Elements of Intuitionism (p.368), where he says that

> What would render the functioning of language unintelligible would be to suppose that the relation of (immediate or remote) dependence of the meaning of one word on that of others might not be asymmetrical, that, in tracing over what is required for an understanding of a given sentence, and, therefore, of the words in it, we should be led in a circle.

I am concerned now to supplement the notion of well-foundedness with another one, one which provides the key to an understanding of the contrast between molecularism and holism.

I want to suggest that what is crucial for the molecularist is whether, as we trace along, the "covering umbrella" of ancestral concepts reached from any given concept does not mushroom out, well-foundedly or not, in such a way as eventually to take in as basis the basis of the whole conceptual system - that is, whether the relation in question is what I shall call separable. (For the holist, of course, the relation is not separable.)[6] I shall define in an Appendix below precisely what it is for R to be separable with respect to a given point within the system.

When addressing either the question of well-foundedness or the question of separability, one must bear in mind two other distinctions:

(i) Are we talking about concepts in a broadly behavioural or mentalistic way, shorn of any necessary connection with their linguistic expression by creatures whom we credit with a grasp of them - thereby opening up the possibility that the progressive conceptual hierarchy that we may uncover might not correspond to the hierarchy of logico-grammatical complexity of the linguistic expressions of those concepts?

(ii) Are we thinking about R_N or R_S?

Each combination of answers to (i) and (ii) exerts its own effect on the

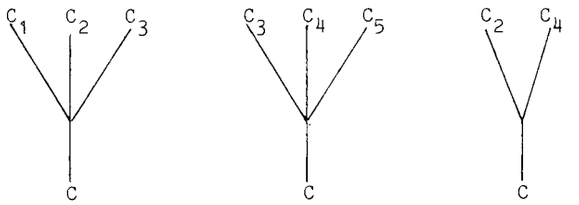
questions of well-foundedness and of separability. Let us look more closely in turn at each of (i) and (ii).

Suppose we answer (i) positively. Suppose we envisage broadly behavioural criteria (not necessarily linguistic) for attributing to creatures grasp of various concepts. With a choice of R_N in mind in answer to (ii), we might construct the R_N hierarchy of concepts by means of some notion of the logical complexity of experimental tests and controls by means of which grasp of the concept is to be ascertained. We might thus appeal to some cybernetic analysis of behavioural sub-programmes in crediting the creatures with increasingly complex and componential skills. (It is because behavioural routines can be thus hierarchically nested, and in so being also respond in their arrangement to genetic mutation that, according to an ethologist such as K.Lorenz, the evolution of complex behaviour is possible.[7]) The finished R_N-hierarchy might very well be well-founded: premissed, perhaps, on some basic abilities such as colour- and shape-discrimination. But it <u>might</u>, also, be non-separable, in that any one concept in the scheme might presuppose, via R^*_N, grasp of <u>all</u> the basic, or R_N-terminal concepts. On the other hand, it might be separable - across, say, basic concepts attached to the different sense modalities. (Molyneux's problem can thus be seen as one about the separability of the concept "cube" within such a conceptual scheme.)

In having answered (i) positively, we then have to address the question of the extent to which mastery of linguistic expressions of these concepts coincides with, reflects or parallels grasp of the concepts themselves. Is it not possible, and even evolutionarily plausible, that certain lexical <u>primitives</u> might attach to concepts high up in the hierarchy of conceptual complexity? And that the primitive (i.e. R-terminal) concepts of that hierarchy might be isolable only via complex locutions of the language? On this account, the linguistic naif might be a conceptual sophisticate. He might choose (or have chosen for him) linguistically simple entry points (as he learns the language) fettered to quite highly 'compiled' concepts.[8,9] And later, as he embarked on conceptual analysis in pursuit of the most basic concepts in his repertoire, he might find himself given over to lengthy explicit or implicit linguistic definition of the same.

What I am saying amounts, crucially, to this: There may be partial inversions of the linguistic with respect to the conceptual order. Now such

inversion might generate an <u>illusion</u> of non-wellfoundedness in the R_N conceptual scheme. For one could tread endlessly the path from complex concept, via R^*_N to simple concepts, then mistakenly exit to the linguistic scheme, to complex expressions for the latter, decompose them to lexical primitives, and effect re-entry to the conceptual scheme once more to corresponding complex concepts; and find oneself embarking on the process again. Since the process might not terminate, R_N might appear not to be well-founded. Let us now turn our attention to R_S. A given concept C may have several minimally sufficient sets of other concepts via R_S:



Now in the case of R_S, the question whether C is well-founded is that of whether <u>some</u> tree can be generated from C by gathering up all R_S-ancestors at each node in such a way that every one of the branches thus created terminates after finitely many steps. Likewise, the question whether C is separable is that of whether some such R_S-tree that can be generated from C does not take in every R_S-terminal concept.

The finished R_S-hierarchy might very well <u>not</u> be well-founded, but <u>might</u>, also, be separable. And here again one might generate an <u>illusion</u> of non-separability in the R_S conceptual scheme. For one could eventually pass through every point by starting from a complex concept, passing via an R_S-tree of the sort described to simpler ones, then mistakenly exiting to the linguistic scheme, to complex expressions for the latter, decomposing them to lexical primitives, and effecting re-entry to the conceptual scheme once more to the complex concepts that these lexical primitives express, ready now to generate a <u>different</u> R_S-tree than before.

One way to forestall both the illusion of non-wellfoundedness and the illusion of non-separability is, of course, to marry up or fuse together the conceptual and linguistic schemes; or to maintain the possibility, in principle, of a language in which each concept could be directly matched by

a linguistic expression of the same complexity. Whether such a language could be devised by adult speakers, I know not. Whether such a language could be acquired by children, I doubt.[10]

Mindful, then, of the possible cleavage between the conceptual and linguistic schemes, and the illusions that can be generated by their reverberative interplay, let us remind ourselves of the grounds for distinguishing R_N from R_S. These are familiar. Wittgenstein has taught us the likely futility of seeking necessary and sufficient conditions for the application of a linguistic term, or for the probative display of one's mastery of a given concept. (Indeed Wittgenstein's point might be taken as even stronger: we cannot, on behalf of a speaker or master of certain concepts, specify for him necessary and sufficient conditions for his exercise of a word or concept, regardless of whether we require him to have mastered the concepts we invoke in our definiens.) What I am doing is generalising Wittgenstein's point about conditions for application to the concepts that might be involved in the formulation of various such conditions. But it is worth noting too that R_N could coincide with R_S while yet Wittgenstein be right about the general lack of necessary and sufficient conditions for the application of a concept.

Before distinguishing thus between conditions and the concepts they involve, one might have asked whether there is not a tension between this view, supporting the distinction between R_N and R_S, and a generalised form of Dummett's own principle of harmony? Does not harmony enjoin that, when for sets C_1, ... C_n we have $C_1 R_S C$, ..., $C_n R_S C$ then we should somehow have, disjunctively, $(C_1 v \ldots v C_n) R_N C$?

But we can now see why not. For by means of R_N and R_S we are talking about concepts grasp of which is necessary or sufficient for grasp of some given concept. But Dummett's principle concerns conditions canonical verification of which is sufficient for the assertion of a statement of a given form; which, by harmony, the hearer is entitled to descry in his own inferences to statements whose own canonical verification would presuppose that of the conditions mentioned. In short, the harmony principle can regulate our assertions while not yet saying anything about the availability of sets of concepts whose mastery is necessary and sufficient for mastery of the concepts involved in those assertions. At best, harmony governs the workings of logical operators, which form a very special case

among lexical primitives.

This now brings me to an important positive conjecture about the semantics of our language, in the light of the foregoing discussion of well-foundedness and separability. Just as we have relations R_N and R_S in the conceptual scheme, so we can have relations R_N and R_S in the linguistic one. Linguistically

$$\{e_1, \ldots, e_m\} R_N e$$

holds just in case mastery of the use of the expression e requires mastery of the use of the expressions e_1, ..., e_m. And likewise $\{e_1, \ldots, e_m\} R_S e$ holds just in case mastery of the use of the expressions e_1, ..., e_m is minimally sufficient for mastery of the use of the expression e.

Now a possible position is as follows. The mastery of any one colour word requires mastery of all (or at least some of) the others in the language. (It may also require mastery of shape predicates, but I shall set that issue aside.) But by contrast it is difficult to point to expressions whose mastery is required for, or is sufficient for, mastery of the logical operator 'and'. For mastery of 'and', it would appear, rather, that one needed mastery (albeit implicitly) of the general concept of assertion, and of warrants for assertions.

To grasp the concept of conjunction is to use a compound form of assertion in a certain way. There are no particular other concepts, or words, which have to be mastered, and which could feature on the left in the predication

------ R_N 'and';

rather, the manifestation conditions are highly schematic, requiring only that for any sentences A,B, the speaker will assert A and B only when in a position both to assert A and to assert B. Because of this, it seems to me that if it is at all appropriate to enquire, with regard to either the conceptual or linguistic schemes, whether conjunction is well-founded and whether it is separable, the answer must be 'both'. It shares these features with all the logical operators: they offer outstandingly secure points of entry to the molecularist.

But, compatibly with all that, it is quite plausible that non-logical concepts or expressions may be non-separable: and our theory of meaning for such expressions would accordingly be a holistic one. The existence of 'semantic fields', only within the whole of which member concepts can be

properly located, might turn a significant field of semantics into a preserve of the holist.

And is this not the picture that emerges in Davidson's theory, and against which Dummett pitted his wits in his Appendix to WTM I? The Davidsonian is a molecularist to the core when it comes to recursive clauses in the core theory. But he implicitly recognises the possible non-wellfoundedness and non-separability of the native's grasp of predicates and referring terms by preferring, as Dummett describes, (WTM I circa p.127) the assignment of denotations to non-logical expressions that maximises the number of native assertions that we would regard as true according to the resulting interpretation delivered by the core theory. The theory quite rightly, on such a view, refrains from any attempt to state "full-bloodedly" what grasp of these non-logical expressions severally consists in: because, on this view, there <u>is</u> nothing, constitutively, to put into such a statement. To put colour into the theory's cheeks we rely on charity alone. Dummett is quite right to remark that the evidence ceases simply to <u>support</u> the truth theory in a holistic fashion, but becomes <u>internal</u> to the theory, rendering it constitutively holist. That, the Davidsonian might say, is just as it should be.

And Dummett is quite right to deny

> that one can derive, from the knowledge that a certain set of sentences - necessarily ones without indexical features - comprises all those accepted as true by all speakers of a language, without any further information about their conditions leading to their acceptance, the linguistic dispositions of the speakers, or anything that could possibly be taken as an interpretation of the language. (T&OE, p.139)

This observation does not undermine the explanatory and interpretative force of a Davidsonian theory arrived at by the proper route. For the Davidsonian does far more than merely <u>identify</u> the set of sentences accepted as true by all speakers of the language under study. He seeks an <u>interpretation</u> which maximises the set of <u>true</u> beliefs expressed by those sentences identified as held true. Those belief contents are bestowed by the core theory via canonically proved disquotational biconditionals once the preferred assignment of denotations has been settled upon.

None of this, it should be noted, is at all affected by anti-realist misgivings about verification-transcendent truth-conditions. The Davidsonian position that I have outlined, which is molecularist on logical operators but which might be holist on non-logical ones, might recommend itself to the anti-realist who wishes to speak about recognisable assertability conditions instead of transcendent truth conditions. It is worth raising at this point the question of <u>how much</u> holism has to be rejected before clearing a route to intuitionistic logic as the 'correct' logic from the demands of the publicity principle, and the manifestation and acquisition arguments. My own view is that molecularity with regard to the logical operators is all that one requires in order to travel with Dummett along that route. The 'determinate individual contents' with which he seeks to invest sentences of the language need be <u>individual</u> only modulo schematic logical representation. What obstacle is there to our generally being able to specify a warrant for the assertion of an atomic statement <u>even if</u> grasp of its atomic predicate presupposes a grasp of other predicates not occurring in the statement? And once equipped with the notion of warrantedly assertable atomic statements, along with the usual account of logical structure of first order statements, it seems the way is clear for Dummett to proceed as he does to intuitionistic logic as the correct logic. Nothing in Davidson's method of radical interpretation appears contrariwise to commend the principle of bivalence (or law of excluded middle).

III Dummett's Molecularism

Does Dummett's characterisation of the molecularist position place it way out of line with the position just sketched? The following are some of his litmus statements about molecularism:

> (1) Individual sentences carry a content which belongs to them in accordance with the way they are compounded out of their own constituents, independently of other sentences of the language not involving those constituents. (T&OE, p.222)

> (2) (Each) sentence possesses an individual content which may be grasped without a knowledge of <u>the entire language</u>... (Each) sentence... retain(s) its content, (is) used in exactly the same way as we now use it, even when belonging to some extremely fragmentary language, containing only the expressions which occur in it and others, of the same or lower levels, whose understanding is necessary to the understanding of these expressions: in such a fragmentary language, sentences of greater logical complexity than the given one would not occur. (T&OE pp.302-3, my emphasis)[11]

> (3) (Each) sentence may be represented as having a content of its own depending only upon its internal structure, and independent of the language in which it is embedded. (T&OE p.304, my emphasis)
>
> (4) ... a grasp of the meaning of any sentence must, even on a molecular view of language, depend upon a mastery of some fragment of the language, a fragment which may, in some cases, be quite extensive. (T&OE p.304, my emphasis)
>
> (5) ... on a molecular account, one knows the language by knowing the meaning of each sentence of the language taken separately. (T&OE, p.378)

I find it difficult to make sense of the underlined part of (3); and anyway, it seems to be cancelled or overridden by the underlined part of (4), taken from the very same page. Reading 'the entire language' in (2) literally - as involving all the logical operators, for example - we are left with a set of representative assertions of the molecularist position that appear entirely compatible with the Davidsonian position sketched above. Nor is this position, combining logical molecularity with possible holism on extra-logical primitives, vulnerable to the criticisms (1)-(7) that Dummett levelled against the more thoroughgoing brand of holism, from which it significantly differs. It is important to note that a language fragment is still a (possible) language in its own right, even if, historically, it may never have existed as such. In principle, however, it could be used as such by some community. A language fragment, like a language, is closed under its stock of expression-forming operators. Assertion (4) above, in this light, is clearly the Achilles heel in Dummett's characterisation of molecularism. Taking the fragment as a full blown language, (4) concedes the possibility that constituent concepts or expressions might not be separable therein, in the technical sense that I defined earlier. Putting the fragment back with the others that go to make up the full language, we then see Dummett's molecularism diluted to a possible blend of globally separable local holisms. If understanding demands fragments, our understanding of the demands of molecularism fragments.

IV Truth Theory and the Logical Operators

I said earlier that charity was all one could rely on in making one's theory of truth as full-blooded as possible. Now Dummett has attacked even the view that a Davidsonian theory gives the meanings of the logical constants - the view that

> in order to understand the meanings of the logical constants, we need to look to nothing but the axioms governing them within the theory of truth. (WTMII, p.107)

Does an axiom of the theory of truth itself display "that in which an understanding of the expression which it governs consists"? Not so, according to Dummett, if the axiom is

> one which, when rendered in a metalanguage which is an extension of the object language, will yield, in combination with suitable axioms for the other expressions, a trivial T-sentence for each sentence of the object language containing the expressions which it governs. (WTMII, p.107)

Now for the homophonic truth theorist trivial T-sentences are positively to be desired. What Dummett thus appears to be saying is that the axiom will not display the required understanding of the relevant expression if it features in a truth theory in precisely the way the Davidsonian wishes - which is no more than a flat denial of the Davidsonian's claim, rather than an argument against it.

I think there is a way to redeem the value that the Davidsonian places on his axioms as somehow giving the meanings of the expressions they concern. It is all a question of how the axioms yield (trivial) T-sentences. For we can non-trivially generate trivial T-sentences. One might go so far as to agree with Dummett that a trivial axiom 'does not, in itself, display in what an understanding of the expression consists' but deny that it 'throws the whole task of explaining this upon the theory of sense' (WTMII, p.108). For in truth theory what displays that in which the understanding of logical operators consist is, not necessarily the axiom, but rather the right kind of proofs of trivial T-sentences using it (or using an equivalent inference rule).

The extent to which truth theory captures one's understanding of the logical operators depends on the inferential structure of the theory itself - which in turn depends on the kind of logic employed in the metalanguage.

Now how much logic is needed for truth theory? If very little, then truth conditional semantics may, canonical derivations of disquotational biconditionals notwithstanding, shed little light on the understanding Dummett seeks to characterise. But if more - say, some logic of the operators translated up from the object language - then this negative impression might be dispelled. I want now to explore two possibilities, at each of these extremes.

By truth theory I shall for the time being understand the axiomatic and inferential apparatus employed in the derivation of the disquotational biconditionals (Dummett's trivial T-sentences). Call this the basic theory. (The basic theory can be extended. One extension includes the principle of bivalence. This is the metalinguistic claim that every sentence of the object language is either true or false. One needs classical logic in the metalanguage in order to prove bivalence for the object language.) For the moment let us investigate basic logics - that is, logics delivering the basic theory.

Assume we are dealing with a first order language. For definiteness and ease of exposition, take one based on ~, & and ∀. The familiar rules for the introduction and elimination of these operators are

$$\begin{array}{c} \underline{\quad(i)} \\ A \\ \vdots \\ \underline{\Lambda}(i) \\ \sim A \end{array}$$

$$\frac{A \quad \sim A}{\Lambda} \qquad \frac{A \quad B}{A\&B} \qquad \frac{A\&B}{A} \qquad \frac{A\&B}{B}$$

$$\begin{array}{c} \vdots \\ A(a) \\ \forall x A x \end{array} \qquad \frac{\forall x A x}{A t}$$

Let us use only these rules in the metalanguage. We adopt the notational convention of bold type for expressions used metalinguistically, and ordinary type for referring to the corresponding expressions in the object language.

Let f be an assignment of individuals to variables. f/A will mean that f satisfies A. It will always be assumed that in such a context f deals with all the free variables in A. ϕ is the null assignment. For a sentence A (with no free variables), ϕ/A will of course mean that A is true. $f(x/\alpha)$

will be the result of extending or modifying f so as to assign the individual α to the variable x.

Let f be the assignment

$$\begin{array}{ccccc} x_1 & & & & x_n \\ \downarrow & & \cdots\cdots & & \downarrow \\ \alpha_1 & & & & \alpha_n \end{array}$$

and let $A(x_1,\ldots,x_n)$ be abbreviated to $A(\vec{x})$. A generalised disquotational biconditional, dealing with satisfaction by any f (not just by ϕ) will be of the form

$$f/A(\vec{x}) \text{ iff } \mathbf{A}(f\vec{x}), \text{ ie iff } \mathbf{A}(\vec{\alpha})$$

where **A** is the natural translation of A into the metalanguage. I shall state matters inferentially whenever possible. Thus the familiar adequacy condition on the basic theory of truth (and satisfaction in general) is that the inferences

$$(I) \qquad \frac{f/A(\vec{x})}{\mathbf{A}(f\vec{x})} \qquad \frac{\mathbf{A}(f\vec{x})}{f/A(\vec{x})}$$

be derivable, for any formula A of the object language.

For our basic logic we take just the introduction and elimination rules above, in bold type. For our basic theory we doctor the same rules with 'f/...' as follows:

$$\begin{array}{c} \text{——(i)} \\ f/A \\ \vdots \\ \Lambda \\ \text{——(i)} \\ f/\sim A \end{array}$$

$$\frac{f/A \quad f/\sim A}{\Lambda} \qquad \frac{f/A \quad f/B}{f/(A\&B)} \qquad \frac{f/(A\&B)}{f/A} \qquad \frac{f/(A\&B)}{f/B}$$

$$\frac{\begin{array}{c}\vdots\\ f(x/\alpha)/A\end{array}}{f/\forall xA} \qquad \frac{f/\forall xA}{f(x/t)/A}$$

For each primitive predicate F we have the basic clause

$$\frac{f/F(\vec{x})}{\mathbf{F}(f\vec{x})} \qquad \frac{\mathbf{F}(f\vec{x})}{f/F(\vec{x})}$$

Now assume (I) is derivable for A and B (induction hypothesis).
We show that (I) is derivable for ~A, A&B, ∀xA:

$$\frac{\begin{array}{c}-(i)\\ \mathbf{A}\\ f/A \qquad f/{\sim}A\end{array}}{\begin{array}{c}\Lambda\\ \sim\mathbf{A}\end{array}(i)} \qquad \frac{\begin{array}{c}(i)\\ f/A\\ \mathbf{A} \qquad\qquad \sim\mathbf{A}\end{array}}{\begin{array}{c}\Lambda\\ f/{-}A\end{array}(i)}$$

$$\frac{\begin{array}{c}\mathbf{A\&B} \qquad \mathbf{A\&B}\\ \mathbf{A} \qquad\quad \mathbf{B}\\ f/A \qquad f/B\end{array}}{f/(A\&B)} \qquad \frac{\begin{array}{c}f/(A\&B) \qquad f/(A\&B)\\ f/A \qquad\qquad f/B\\ \mathbf{A} \qquad\qquad\quad \mathbf{B}\end{array}}{\mathbf{A\&B}}$$

$$\frac{\begin{array}{c}f/\forall xAx\\ f(x/\alpha)/Ax\\ \mathbf{A}(\alpha)\end{array}}{\forall\mathbf{x}\mathbf{A}\mathbf{x}} \qquad \frac{\begin{array}{c}\forall\mathbf{x}\mathbf{A}\mathbf{x}\\ \mathbf{A}\alpha\\ f(x/\alpha)Ax\end{array}}{f/\forall xAx}$$

That shows that basic logic (for basic truth theory) can be minimal logic.[12] The inductive proof of adequacy just given delivers canonical proofs of (I), explicitly decoding ~ as **~**, & as **&** and ∀ as **∀**. Moreover, ¬,

& and **∀** are manipulated according to rules of introduction and elimination in canonical proofs of (instances of) (I). To that extent they are endowed with a meaning, presumed to be understood by the metalinguistic reasoner. To that extent also ¬, & and ∀ receive interpretations as **~**, **&** and **∀** respectively. So it would appear that basic truth theory lays minimal meanings bare.

Not so another version, despite its provable adequacy. Take now as our basic logic the following very impoverished system.[13] It has only a rule of substitution of interdeducibles - indeed, the weak version in which substitution is uniform. That is to say, the following rule schema is allowed:

$$\frac{\begin{array}{ccc}-(i) & & -(i)\\ B & & C\\ \vdots & & \vdots\\ A & C & B\end{array}}{A^B_C}(i)$$

where A^B_C is the result of uniformly replacing B by C in A. By simple iteration we derive the rule schema

$$\frac{\begin{array}{ccccccc}-(i) & -(i) & & -(i) & -(i)\\ \left[\begin{array}{c}B_1\\ \vdots\\ C_1\end{array}\right. & \left.\begin{array}{c}C_1\\ \vdots\\ B_1\end{array}\right] & \cdots\cdots & \left[\begin{array}{c}B_n\\ \vdots\\ C_n\end{array}\right. & \left.\begin{array}{c}C_n\\ \vdots\\ B_n\end{array}\right]\\ A & & & & \end{array}}{A^{B_1\ldots B_n}_{C_1\ldots C_n}}(i)$$

This logic tells one nothing about the logical operators. To preserve their anonymity, take Υ as an arbitrary n-place connective, and take Q as an arbitrary first order quantifier. It turns out that we can obtain an adequate truth theory simply by postulating the functionality of 'f/' -

that is, by laying down that it distributes over Υ and Q.
Details:

$$\frac{f/\Upsilon(\vec{A})}{\Upsilon(\overrightarrow{f/A})} \qquad \frac{\Upsilon(\overrightarrow{f/A})}{f/\Upsilon(\vec{A})}$$

$$\frac{f/QxA}{Q\alpha f(x/\alpha)/A} \qquad \frac{Q\alpha f(x/\alpha)/A}{f/QxA}$$

With the same basis clause as before, the inductive proof of adequacy goes through effortlessly. Helping oneself to the appropriate inductive hypothesis, we have

$$\dfrac{\dfrac{f/\Upsilon(\vec{A})}{\Upsilon(\overrightarrow{f/A})} \quad \left[\begin{array}{cc} \overset{(i)}{\mathbf{A}} & \overset{(i)}{f/A} \\ f/A & \mathbf{A} \end{array}\right]}{\Upsilon(\vec{\mathbf{A}})}\,(i)$$

$$\dfrac{\Upsilon(\vec{\mathbf{A}}) \quad \left[\begin{array}{cc} \overset{(i)}{\mathbf{A}} & \overset{(i)}{f/A} \\ f/A & \mathbf{A} \end{array}\right]}{\dfrac{\Upsilon(\overrightarrow{f/A})}{f/\Upsilon(\vec{A})}}\,(i)$$

and

$$\dfrac{f/QxA(x,\vec{y}) \qquad \dfrac{\overset{(i)}{\mathbf{A}(\alpha,\ f\vec{y})}}{f(x/\alpha)/A(x,\ \vec{y})} \qquad \dfrac{\overset{(i)}{f(x/\alpha)/A(x,\ \vec{y})}}{\mathbf{A}(\alpha,\ f\vec{y})}\,(i)}{Q\alpha f(x/\alpha)/A \qquad\qquad Q\alpha\mathbf{A}(\alpha,\ f\vec{y})}$$

$$\dfrac{\dfrac{\overset{(i)}{\mathbf{A}(\alpha,\ f\vec{y})} \qquad \dfrac{\overset{(i)}{f(x/\alpha)/A(x,\ \vec{y})}}{\mathbf{A}(\alpha,\ f\vec{y})}\,(i)}{Q\alpha f(x/\alpha)/A(x,\ \vec{y})}}{Q\alpha\mathbf{A}(\alpha,\ f\vec{y}) \qquad\qquad f/QxA(x,\ \vec{y})}$$

We thus have an adequate truth theory from the single assumption of functionality. No logical operators have been assumed as understood. Indeed, the operators pass by like ships in the night, their meanings untouched, unexploited, undivulged. Only their functional character is known, but not the idiosyncratic logical behaviour of each. Truth theory has degenerated into a trivial exercise of shunting 'f/' back and forth over Υ's and Q's. We can hardly claim, in proving biconditionals this way, to be unravelling the meanings of sentences of the object language. At best we are tracing over semantically inert syntactic structure.

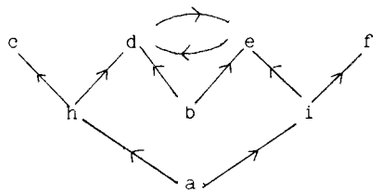
I conclude that adequacy is not enough for truth theory as a theory of meaning. We need more than that the disquotational biconditionals can be derived. We need to specify further that they be so by means of the more intimate sort of logical tinkering that we saw earlier. The intensionality we require of a theory of truth, insofar as it is to serve as a theory of meaning, is to be located in the structure of the proofs of the 'meaning-giving' T-sentences.

APPENDIX

R is a two place relation on a domain S. Take any member a of S. Everything that now follows will be relativised to S. The pedigree of a will be the set of all R-ancestors of a. The subset thereof consisting of R-terminal points will be called the foundation of a. The ground of a will be the intersection of all the pedigrees of points in the pedigree of a. Intuitively, it comprises all those non-terminal points on which a, via R, 'ultimately' depends. The basis of a will be the union of the foundation of a with the ground of a. The basis of S will be the union of all bases of points in S. Finally, R is separable with respect to a in S just in case the basis of S properly includes the basis of a.

An example will make these definitions vivid. Consider the relation R

as given by the arrows in the following diagram:



The pedigree of a consists of h,i,c,d,e, and f.

The foundation of a consists of c and f.

The ground of a consists of d and e.

The basis of a consists of c,d,e and f.

This is also the basis of the whole system.

So R is not separable with respect to a.

By contrast, the foundation of b is empty, since there are no R-terminal points ancestral to b.

The ground of b consists of d and e.

Thus d and e form the basis of b.

This is properly included in the basis of the whole system.

So R is separable with respect to b.

Our definitions and the diagram capture a clear sense in which an R-separable point within a system does not presuppose, via R, a basis which turns out to be the basis of the whole system.

* * * * * * * * * *

NOTES

* This paper was delivered to the Conference in honour of Donald Davidson at Rutgers, New Jersey in April/May 1984. I am grateful to Alan Millar, Christopher Peacocke, Alan Weir and Crispin Wright for their comments on an earlier draft; and to Louise Antony for prompting me to be clearer about what I meant by separability.

1. Frege: Philosophy of Language. (Duckworth, 1973), especially Chapter 17, 'Original Sinn';
Truth and Other Enigmas. (Duckworth, 1978) (henceforth T&OE), especially the essays 'Frege's Distinction Between Sense and Reference', 'The Philosophical Basis of Intuitionistic Logic', 'The Justification of Deduction' and 'On the Significance of Quine's Indeterminacy Thesis';
'What is a Theory of Meaning? II' in G.Evans and J.McDowell (eds.), Truth and Meaning. (OUP, 1976).

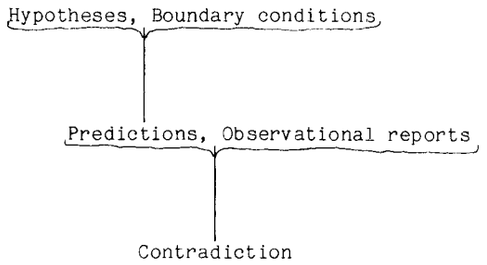
2. Christopher Peacocke (in correspondence) has asked whether 'modulo canonically verified basic statements' is not stronger than Dummett's requirement. He refers to the first whole paragraph of T&OE p.316 in support of the view that what really seems to matter is conservative extension with respect to truth. But I do not think that that paragraph, or the passage in which it occurs, can sustain such an interpretation. For Dummett says (pp.315-16):

> These considerations place a restriction on the extent to which it is legitimate to demand that the language as a whole must be a conservative extension of a fragment of it formed by omitting certain expressions - together with the rules of inference governing them. ...it would be illegitimate to demand that the language as a whole be a conservative extension of each significant fragment... even relative to conclusive knowledge... The most that can be demanded is that the extension be conservative relative to the possibility of establishing a statement as true given a sufficiently detailed set of observations. (My emphasis.)

He then goes on (p.316) to say something that seems to me to fly in the face of Peacocke's suggested construal:

> If we have a satisfactory semantic notion of truth, then whether or not the introduction of new vocabulary, subject to rules of inference, is a conservative extension of the language is something to which we can be indifferent: ... The semantic notion becomes the standard, but our means of establishing truth something to be judged by that standard, not a standard in itself.
>
> Or, rather, this is a misleading way of putting the matter... Given (the realist model of meaning in terms of truth-conditions), there is no justice whatever in the idea that the language as a whole need be a conservative extension, relative to our recognition of truth, of any fragment of it.

It is worth noting that, on the very reasonable assumption that observation reports are atomic (or at least decidable), the procedure emphasized above can be construed without loss as that of canonical proof relative to an atomic basis (for which notion, see D.Prawitz, 'On the Idea of a General Proof Theory', Synthese 27 (1974), pp.63-77, as well as the use made of it in my paper 'Language Games and Intuitionism', ibid.42 (1979), pp.297-314). And in this connection, where Dummett is discussing the theory of meaning for non-mathematical statements, it is worth placing on record that minimal logic is provably adequate for the falsificationist method in science. On the Popperian model, logic is required only in order to negotiate the downward transitions in the following schema:



And minimal logic is adequate for these transitions. See my paper 'Minimal Logic is Adequate for Popperian Science', British Journal for the Philosophy of Science 36 (1985) pp.325-29.

3. The reader may wonder here just how successful is the attempt to distinguish these two senses of holism. As Alan Millar has observed (in correspondence):

> There is, surely, a connection between inextricability and constitutive holism... On any plausible view of the matter, understanding a sentence involves knowing how its truth-value contrains and is constrained by the truth-value assigned to others. On the traditional view, the constraints which count are those reckoned to the learning of the language. If the inextricability thesis is true, no such set can be distinguished. In that case, it is plausible to hold that one's understanding of a sentence is reflected in the entire network of sentences in which it is truth-valued related. Ex hypothesi there is no basis for separating out a part of that network which is in some special way relevant to understanding the sentence in question. But this is just constitutive holism; pending further argument not yet, admittedly, the global constitutive holism according to which understanding a sentence means understanding an entire language. Further argument would be needed to show that the network which reflects a person's understanding of a sentence cannot fall short of the entire language.

But commenting independently on the same questions, Peacocke agrees that

> the constitutive holist need not appeal to inextricability: indeed, I'd adopt precisely that position for many families of concepts. But he has to work to establish his position: it will be hard for him to deny that sentences which specify the constitutive relations of a concept in the total network have some kind of analytic status: and the inextricability theorist thinks he has an argument against the analytic-synthetic distinction anywhere.

Bearing in mind the slide from inextricability to at least some form of constitutive holism, I nevertheless think it useful to maintain my distinction, which, as I said, is a prima facie one. An anti-Quinean

might wish to deny inextricability and yet concede some form of constitutive holism.

4. It is worth making some ancillary points about the relations of conceptual dependence to be discussed below. I intend to characterize a structure general enough to accommodate a variety of views as to the logical relations involved in this dependence. On a traditional view, a concept may depend on others in that the latter might be used to specify necessary and sufficient conditions for the application of the former - whether conjunctively, disjunctively, or by means of some other Boolean combination. Or again, a concept may apply to an object just in case a suitable weighted majority of others from some criterial set do. An extreme 'family resemblance' view might hold that the criterial set should contain any salient shared feature of any two instances of the concept in question, without undertaking to explicate what it is for any of the criterial features to be relevant, salient or central.

I hope thus to accommodate both essentialists and criterialists. It is important to note that my conceptual 'hierarchies' structured by the dependence relations are not taxonomies based on an inclusion relation, and the associated notions of superordination and subordination. For I may have c depending on c' without it having to be the case that all instances of c are instances of c' or vice versa. The concept c', for example, may enter into a specification of the application conditions of c within the scope of a negation. So, emphatically, the dependencies I am interested in will not, in general, be inclusions. In some cases, though, they may be - as with examples of pairs of concepts such as 'dog' and 'animal'.

I do not (yet) distinguish different types of concept. On my account sortal concepts, mass concepts and qualitative concepts (such as colour, shape and texture) may all be relata of the dependency relations. Nor do I say anything (yet) about how the order of acquisition by a child of concepts in the scheme (or of linguistic expression for them) relates to the dependency relations; see footnote 6 below.

5. See his paper 'Realism and Behaviourism' (Dialectica, forthcoming). In this paper Weir is concerned to provide, from a behaviourist point of view, a wellfounded notion of 'explanatory soundness'. But I have supplied the other notion of separability below, and distinguished R_N from R_S. Christopher Peacocke, in his book Holistic Explanation: Action, Space, Interpretation (Clarendon Press, Oxford, 1979) has provided an analysis of the holism of certain schemes of explanation. One example is the scheme for explaining action by appeal to beliefs and desires. The notions of belief and desire are intertwined by an a priori principle which, pending various refinements, he states as follows:

> it is a priori that for all (actions) ϕ, (contents) p and (agents) x there are conditions C such that if x desires that p and believes that if he ϕ's then p, and condition C obtains, then x ϕ's;

and the notions are governed further by the ideal of rationality of a pattern of beliefs and desires. The point I wish to make here is that Peacocke's a priori principle makes the notions of beliefs and desire depend on each other: in my terminology, they form an R_N-loop, making the relation R_N non-wellfounded. Peacocke, of course, has a great deal more to say about the subtlety of this interdependence. Nevertheless, I

do not regard holism in this sense of mine (non-wellfoundedness) obstructive for any account of concept- or language- acquisition. Dummett's misgivings about holism on that score seem to me to be more justified when it is holism in the sense of non-separability (q.v.) that is at issue.

6. Christopher Peacocke (in correspondence) has suggested
(i) that there are forms of what he calls moderate (as opposed to radical) holism which will endorse non-separability of R_N in the sense of R_N* mushrooming out to cover the whole foundational basis;
(ii) that we ought to allow the radical holist that someone can be red/green colour blind but still have the concept blue;
(iii) that R_N could usefully be re-construed, in order to enable one to distinguish moderate from radical holism, as a relation between sets of types of concept and a concept, rather than (as I am here suggesting) between sets of concepts and a concept.

Developing or rejecting these suggestions would take me too far afield here. It is, however, gratifying that the suggested framework seems to afford a useful analytical perspective admitting of further refinements.

7. Cf. K.Lorenz, Behind the Mirror (London, 1977).

8. Cf. J.Fodor, The Language of Thought (Crowell, New York, 1975) p.85: "... single items in the vocabulary of a natural language may encode concepts of extreme sophistication and complexity."

9. With regard to

> the thought that the ordering, with respect to semantic simplicity, of expressions need not correspond to the ordering with respect to basicality of the concepts which they express

Crispin Wright (in correspondence) has questioned whether the apparent semantic complexity of 'looks parallel' and 'looks straight' will not prove, on examination, to be suspect. He suggests that 'looks parallel' could be a predicate

> which could be fully understood by someone who did not know a geometrical definition of parallelism at all.

But this raises the question whether one might not be master of the spatial predicate 'parallel' (as opposed to its phenomenologue 'looks parallel') without knowing (explicitly, at least) either an explicit or an implicit definition of it. My own qualm about Wright's suggestion arises from the more general possibility that, in a language for which Beth's theorem on implicit definability fails one might implicitly master a concept Q after having mastered concepts $P_1,\ldots,P_n$, by espousing a suitable theory that involves them all and succeeds in defining the former implicitly in terms of the latter. But, given the failure of Beth, there might not be any explicit definition of Q in terms of $P_1,\ldots,P_n$, and therefore none such of which it could be said that the language master knew it either implicitly or explicitly!

10. Present consensus among language acquisition theorists reinforces this doubt. Roger Brown concludes his now classic paper 'How Shall a Thing be Called?' (Psychological Review 65 (1958) 14-21) as follows:

> With some hierarchies of vocabulary the more concrete terms are learned before the abstract; probably the most abstract terms are never learned first, but it often happens that a hierarchy develops in both directions from a middle level of abstraction. Psychologists who

> believe that mental development is from the abstract to the concrete, from a lack of differentiation to increased differentiation, have been embarrassed by the fact that vocabulary often builds in the opposite direction.

That the child's point of entry to the linguistic scheme is at the middle level of abstraction - at 'dog' rather than 'collie' or 'quadruped', at 'tree' rather than 'oak' or 'organism' etc. - is something which several psychologists, notably E.Rosch and C.Mervis, seek to explain by what they call the 'best example' theory of categories. A best example, or prototype, is an instance (concrete, or taking the form of some sort of mental representation) to which instances of a category bear varying degrees of resemblance. This is strongly reminiscent of Wittgenstein, and also to a certain extent echoes Putnam's theory of natural kind terms. But it is crucially mute on the metaphysical implications that Putnam claims for his theory. In particular, their interest in mental representations would tend to put meanings back in the head, where, according to Putnam, they ain't! (Cf. Mind, Language and Reality (Philosophical Papers, Vol.2 - CUP, 1975), essay entitled 'The Meaning of "Meaning"').

The Rosch-Mervis theory no doubt faces formidable logical difficulties, not least in respect of the notion of salient attribute or feature, and also given their too-easy assumptions about individuating and counting attributes. But despite its crudeness, it is a promising start. On this theory categories such as 'dog' and 'tree' (at Brown's 'middle level of abstraction') are basic in that it is at that level of categorization that

> the division of objects into categories best corresponds to the perceived correlated attribute structure of the objects in the world. This basic level has been shown to be the most general level for which people are able to list large numbers of attributes that (most) category members share, for which people are able to form a concrete image (sic), and for which people use the same motor programs to interact with (most) category members.

(C.Mervis, 'Category Structure and the Development of Categorization', in R.J.Spiro, B.C.Bruce and W.F.Brewer (eds.) Theoretical Issues in Reading Comprehension: Persepctives from cognitive psychology, linguistics, artificial intelligence and education (Erlbaum, Hillsdale, NJ, 1980) 279-307; at p.285.)

For a review of the present state of the theory, see C.Mervis and E.Rosch, 'Categorization of Natural Objects', Annual Review of Psychology 32 (1981) 89-115. Whether their basic concepts (categories) would be R_N-terminal on my account is in general doubtful. For presumably the numerous criterial attributes, some of which people are able to list, and which are shared by most instances of a basic concept, would R_N-precede or R_S-precede that concept in the scheme I propose. Thus Mervis and Rosch's basic concepts would appear to be not only taxonomically middling, but also R-middling. One must concede, however, that some of these R-predecessors might only be "grasped" unconsciously by the learner effecting linguistic entry at the basic level. They might even never receive linguistic expression. And if certain criterial features are like this - being at best subliminally registered, and exerting always an unconscious influence over the act of categorization - can one say that the feature itself has been

grasped or mastered in the same sense in which we would wish to say that the concept for which it is criterial, and for which there is explicit linguistic expression, has been grasped or mastered? These, unfortunately, are important questions which would take me too far beyond the scope of this present paper.

11. This last thought appears to be a minor confusion on Dummett's part. There seems to be no reason why in such a fragmentary language sentences of arbitrary logical complexity might not occur, provided only that their primitive vocabulary is restricted to the expressions to which Dummett refers.
12. In his Critical Notice of G.Evans and J.McDowell (eds.) Truth and Meaning (OUP, 1976) in Synthese 52 (1982), Martin Bell says at p.141:

> Whether or not a truth theory for a language implies that its sentences obey bivalence, (McDowell) says, depends upon the proof theory of the metalanguage, and he comments that an intuitionist proof theory could be employed in a truth theory which was still "fundamentally Tarskian".
> (Both McDowell and Evans say this in their papers without, unfortunately, referring to a published example.)

In my paper 'From Logic to Philosophies' (British Journal for the Philosophy of Science 33 (1982) 287-301) I observed at p.297 that indeed minimal logic sufficed for the derivation of T-sentences. I have taken this opportunity to give the details that justify this claim and supply what Bell is missing.

13. Deriving T-sentences by means of a rule of substitution alone was suggested to me by Kit Fine.

3. IN DEFENCE OF MODESTY*

JOHN McDOWELL

I

A modest theory of meaning for a language - in the technical sense introduced by Michael Dummett - is one that gives no account of the concepts expressed by primitive terms of the language.[1] We should note that the use of 'concepts' here is not Fregean, in two ways. First, Fregean concepts are associated only with predicative expressions, whereas Dummett's considerations are meant to apply to meaningful expressions in general. Second, Fregean concepts belong to the realm of reference, whereas the concepts Dummett is concerned with would belong to the realm of sense; they are determinants of content - determinants of the thoughts expressible by sentences containing the associated words.

Dummett's official exposition of the notion of modesty suggests that a theory gives an account of a concept just in case it is capable of conferring the concept on someone - just in case someone could acquire the concept by learning the facts which the theory states.[2] However, any theory (of anything) would need to employ some concepts, so that a formulation of it would presuppose prior possession of them on the part of any audience to whom it could sensibly be addressed; and it seems undeniable that any theory of meaning for a language would need to help itself to at least some of the concepts expressible in that language - and hence to resign itself to at least partial modesty in the sense determined by the official exposition. But Dummett nowhere suggests that the requirement of immodesty (in his terms, full-bloodedness) that he wishes to impose on theories of meaning is less than total, and indeed in places he suggests quite the opposite. I think this indicates that his official exposition is not quite right.[3]

It will help me to say what I think Dummett's real point is if I first

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