5. Is Semantics Scientific?

The first four chapters of this book have been largely unscientific, or – as I would prefer to say – prescientific. In them I have reported and proposed various ideas and classifications, various structurings of semantic phenomena, but none of these has really added up to a scientific theory. An example of prescientific thinking is the classification of language functions (informational, expressive, etc.) given on pp. 40–42. This classification provides no criteria by which the proposed division of functions could be confirmed or shown to be false. How, for example, could I show, using objective evidence, which of the five functions are applicable to a given utterance? There is no experiment which will separate them out, like a chemical analysis separating the ingredients of a compound. The most I can claim for such an analysis is that as a method of reducing the phenomena in question to some sort of order, it seems to fit reasonably careful observation, and to give some sort of intuitive satisfaction. Or we might take, as another example, my explanation of metaphor as a 'conceptual fusion' on pp. 37–8. This explanation entirely begs the question of what is a concept, or of what experimental evidence we might bring to bear to show that the conceptual reordering postulated there actually takes place when one describes a ship as a 'sea-steed'. How on earth can one justify in scientific terms talking about a 'concept' – something which, if it exists, is locked up in the brain away from observation – as an element of a scientific description at all?

I do not intend to apologize for this prescientific thinking. It is useful to have rough-and-ready ways of charting an imperfectly explored terrain – which is what semantics is. We need tentative ways of looking at and rendering orderly a range of phenomena so vast and perplexing. But there is a difference between saying 'this is a useful way of looking at it', and saying 'this is *the* way of looking at it, because this is the way it is'. Can semantics be regarded as a science, seeking out the truth about meaning as astronomy, for example, seeks out the truth about the universe?

My answer to this question will be a qualified 'Yes', but before justifying it, I need to dispose of the fallacy that science progresses by

a process of discovery; that is, by deriving new knowledge from new observations, so that the quantity of human knowledge increases rather like a bucket filling up with water. In the present century, scientific developments (such as Einstein's theory of relativity) and philosophy of science have presented a very different picture of scientific method. one which was formulated by Karl Popper (*Objective Knowledge*, p. 297) as follows:

$$P_1 \rightarrow TT \rightarrow EE \rightarrow P_2 \ldots$$

(where P_1 = problem; TT = tentative theory; EE = error elimination; P_2 = new problems; the whole chain of procedures being cyclic). In this formula, there is no expectation that we shall ever arrive at 'the truth'. but rather, the method of science ensures better and better approximations to truth, by eliminating errors in theories – that is, by falsifying hypotheses. We can never prove a theory true, but we can (if it makes claims which can be tested) prove it false. Thus even the most well-founded theories are tentative or provisional; they are (to use another formulation of Popper's) 'bold conjectures'.

The difference between science and non-science, in this view, is that a scientific theory makes predictions which are FALSIFIABLE: that is, we can derive from it statements describing observable events ('BASIC STATEMENTS' or 'OBSERVATION STATEMENTS'), the truth of which can, at least in principle, be tested. An important prerequisite is, obviously, that a theory should be as EXPLICIT as possible in its claims about reality: otherwise we shall not know how to test it. But there is no requirement that *everything* claimed by a theory is directly susceptible to empirical test: few physicists today would agree with Ernst Mach in refusing to accept the existence of submicroscopic atoms and particles because they cannot be observed.

There are further desiderata for a scientific theory. It should be COMPLETE in the sense of accounting for *all* the data at one's disposal. It should be SIMPLER than other theories known to account for the same data. It should also be STRONGER than competing theories in the sense that it should limit its truth-claims, as far as possible, to accounting for known data: in this way it will be less easily falsifiable. Finally, it should be testable by OBJECTIVE (or rather INTERSUBJECTIVE) means, in the sense that the basic statements derived from it may be independently checked by different observers. All these requirements, and the trade-off relations between them, are problematic, and particularly so for what we may provisionally call the 'human sciences': psychology, sociology, anthropology and linguistics. Theories accounting for what human beings are like and what they can do have to be inordinately

complex, and the relation between such theories and the observations they are meant to account for may be extremely indirect. In any case (and this is particularly so with semantics) it is often unclear what is the domain of the theory, and hence what set of observations it should try to account for. Because of these and other problems, probably the most that we can say for semantics is that it is a 'would-be science'.

To have reached the stage of being a would-be science is no trivial achievement, as it means that semantics adopts the general method of inquiry common to natural sciences and to other types of empirical investigation: the so-called HYPOTHETICO-DEDUCTIVE method. But before pursuing this topic further, we shall find it instructive to consider the failure of earlier attempts to make semantics scientific.

The Contextual View of Meaning

It was during the 1920s and 1930s that linguistics first began to give serious consideration to its scientific credentials. We may say that during this period (and the following two decades) linguists tended to give credence to the 'bucket theory of knowledge', and this meant giving precedence to the OBSERVATIONAL aspect of scientific investigation; an approach which manifested itself in the attempt to base meaning on context.

CONTEXTUALISM, as I shall call this tendency, has a superficial attractiveness for anyone who aspires to the ideal of scientific objectivity. If meaning is discussed in terms of ideas, concepts, or internal mental states, it remains beyond the scope of scientific observation; so instead, goes the argument, we should study meaning in terms of situation, use, context – outward and observable correlates of language behaviour. As J. R. Firth, the leading British linguist of the period, put it in 1930:

> If we regard language as 'expressive' or 'communicative' we imply that it is an instrument of inner mental states. And as we know so little of inner mental states, even by the most careful introspection, the language problem becomes more mysterious the more we try to explain it by referring it to inner mental happenings which are not observable. By regarding words as acts, events, habits, we limit our inquiry to what is objective in the group life of our fellows.
>
> *Speech*, repr. in *The Tongues of Men and Speech*, 1964, p. 173.

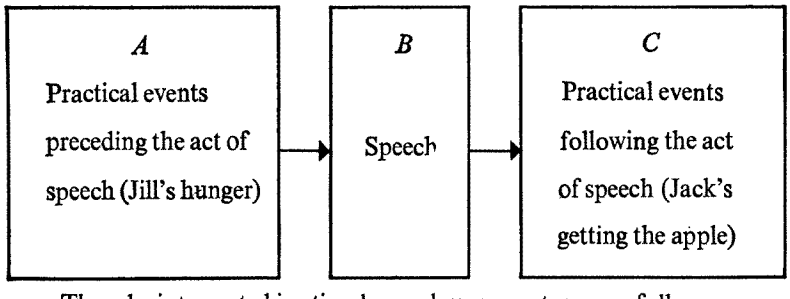
Firth had been influenced in this view by the great Polish-born anthropologist B. Malinowski, who, in his study of the part played by language in primitive societies (see Malinowski 1923, 1935), had found it appropriate to treat language as 'a mode of action, not an instrument of reflection'. 'Language in action' and 'Meaning as use' might be taken

as twin slogans for this school of thought. Certainly at one time, not too long ago, the statement of the philosopher Wittgenstein, that 'For a large class of cases ... the meaning of a word is its use in the language' was the most quoted, though perhaps not the most studied, of pronouncements on meaning. Similarly the simple 'language games' invented by Wittgenstein, to illustrate how in a limited context the meaning of a word can be understood simply from observing what is going on, seemed to linguists an object-lesson in how meaning should be studied.

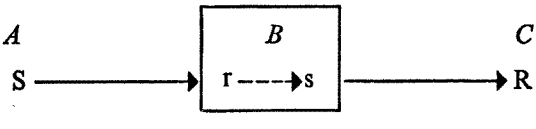
Not only anthropology and philosophy, but a third discipline relating to semantics – psychology – appeared to support the contextualist viewpoint. Bloomfield drew on behaviourist psychology when he defined the meaning of a linguistic form as 'the situation in which the speaker utters it, and the response which it calls forth in the hearer'. By way of illustration (in Chapter 2 of *Language*) he described a simple situation in which that immortal couple, Jack and Jill, are walking down a lane:

> Jill is hungry. She sees an apple in a tree. She makes a noise with her larynx, tongue, and lips. Jack vaults the fence, climbs the tree, takes the apple, brings it to Jill, and places it in her hand. Jill eats the apple.
>
> *Language*, p. 22.

Of this situation Bloomfield distinguished three components:



These he interpreted in stimulus-and-response terms as follows:



(where s and r stand for verbal stimulus/response, and S and R for external stimulus/response).

Thus, in Bloomfield's eyes, language came to be regarded as basically a remote control system, by which a stimulus to one organism of the human species can result in a response in another organism.

Another behaviourist approach to meaning was that of the American philosopher Charles Morris, whose ideas gained some currency among linguists in the forties and fifties. Morris recognized five basic components in any communicative situation:

a *sign*	
an *interpreter*:	an organism for which something is a sign
an *interpretant*:	the interpreter's reaction to the sign
a *denotatum*:	the something else to which the interpretant is a partial response (or in other words, the *referent*)
a *significatum*:	those properties which identify a denotatum as being a denotatum of the sign (or in other words the *meaning*).

These are my own simplified explanations of Morris's terminology: something of the forbiddingly technical flavour of his own explanations can be sampled from this definition of the *sign*:

> Roughly: something that directs behavior with respect to something that is not at the moment a stimulus. More accurately: If A is a preparatory-stimulus that, in the absence of stimulus-objects initiating response-sequences of a certain behavior-family, causes in some organism a disposition to respond by response-sequences of this behavior-family, then A is a sign.

A simple sign situation of the kind that Morris deals with is the following. A dog is kept in a pen for the purpose of experiments. When food is placed for him in a certain place A, a buzzer sounds. After a while, the dog learns to associate the buzzer (which we may call S_1) with the food, so that when he hears it, he responds to some extent as if he had actually seen or smelt the food: that is, he moves over to A, where the food is placed. The buzzer sound S_1 is now a *sign*; the dog is the *interpreter*; movement towards A is the *interpretant*; the food placed at A (say, a bone) is the *denotatum*; the set of conditions (e.g. the qualities of being edible, tasty, nourishing) which make the bone a denotatum of S_1 constitute the *significatum* of the sign. We can see that the buzzer, in this situation, is analogous to a simple linguistic message, such as 'Grub up!' or 'Dinner time!'.

It is noticeable that the situations to which Malinowski, Bloomfield, and Morris naturally turn when they want to illustrate the contextualist thesis are all 'primitive' in one sense or another. In fact, contextualism in its crudest form (which we may summarize in the formula 'MEANING = OBSERVABLE CONTEXT') is incapable of dealing with any but the simplest and most unsophisticated cases of language use. In most circumstances in which linguistic communication occurs (say, telling a

story, giving a lecture, gossiping about the neighbours, reading a news bulletin) observing the situation in which speaker and listener find themselves will tell us little, if anything, about the meaning of the message. Manifest inadequacies of this simple-minded contextualism are that speech may take place in the absence of the objects being talked about (what Bloomfield calls 'displaced speech'), that anyway many linguistic forms, such as words referring to states of mind, have no observable correlate, and that some linguistic forms have no correlate in the contemporary real world at all (e.g. *dragon, gladiator* A.D. *1990*).

In practice, therefore, linguists like Bloomfield espoused a weaker form of contextualism, in which the relation between context and meaning was more indirect, and which may be expressed in a formula like 'MEANING IS ULTIMATELY DERIVABLE FROM OBSERVABLE CONTEXT' or 'MEANING IS ULTIMATELY REDUCIBLE TO OBSERVABLE CONTEXT'. One way of modifying crude contextualism in this direction is to say that whereas meanings are *learned* by reference to context, their use may be free of context from then on. In effect, this means accepting the internal mental record of previous contexts as equivalent to those contexts themselves. More generally, the requirement that context should be observable may be relaxed, so that the attitudes of speaker and hearer, their previous mental histories, and so on, may be taken into account. Even broad abstractions such as 'British culture' have been accepted as part of the contextual description of an utterance. An additional extension of the contextualist thesis is to bring in *linguistic* context as well as (or instead of) non-linguistic context. Thus the probability of one word's co-occurrence or collocation with another (see p. 17) comes to be regarded as part of its 'meaning'.

Although this weaker form of contextualism has the advantage of approximating 'context' more nearly to what we usually understand by 'meaning', it has the corresponding disadvantage of rendering 'context' a much more abstract notion, so that it is more and more difficult to relate it to observation. Thus the goal of scientific objectivity, which provided the reason for adopting a contextualist position in the first place, recedes into oblivion. Worse, one may arrive at a kind of mongrel 'mentalist contextualism', by which the investigator claims to be correlating language with situation, but is in effect relating it to those 'inner mental states' reprehended by Firth.

An additional, purely logical, objection to contextualism is that it falls prey to the 'linguistic boot-straps fallacy' we met earlier in Chapter 1 (p. 4). By this I mean that the semanticist 'tries to lift himself by his own boot-straps' in the sense that he describes meaning in terms of language, thereby begging the question of how the meaning of the

language he has used to describe meaning is itself to be described. An illustration of this fallacy may be taken from Morris's book *Signs, Language and Behavior* at a point (p. 156) where he is elaborating his dog-and-buzzer situation in order to account behaviourally for the meaning of formators, or logical elements of meaning such as 'and' and 'or':

> Suppose that S_1, S_2, and S_3 are signals to the dog of food in three different places, so that the dog, when hungry, seeks food in the place signified by the stimulus presented to it. Now if a new stimulus, S_6, be combined always with two of these other stimuli (as in, say, S_1, S_6, S_2), and if the dog then, without preference, seeks food at one of the two places signified and at the other place if and only if food is not secured at the place first approached, then S_6 would be a stimulus which has much in common with the exclusive 'or' of English ('at least one but not both').

What stares us in the face is that Morris, in giving a behavioural explanation, provides a far more complicated communicative object for us to study and explain than the original sign-sequence. His description of what 'exclusive *or*' means presupposes that we already know the meaning of such logical elements as *if*, *if and only if*, and *not*. The whole exercise amounts to the same thing as equating two logical formulae:

> X exclusive-*or* Y = (X if and only if *not*-Y) and (Y if and only if *not*-X).

The best that can be said for such contextualist explanations therefore is that they correlate two sets of linguistic expressions (in itself not a futile procedure – but a different procedure from that which is apparently aimed at). The only way out of this circularity would be to resort to non-verbal characterizations of context (e.g. pointing to objects instead of describing them in language); in which case semantics would attain the absurd status of the science of the ineffable.

In view of these defects, it is not surprising that in practice contextual semantics made little progress. Although there were many programmatic formulations and anecdotal illustrations of how the job might be done, virtually no systematic accounts of particular meanings in particular languages were produced. One achievement was to direct attention to the previously neglected areas of social and collocative meaning (pp. 14, 16). But in general contextualism had the opposite effect to that intended: it took the mind of the investigator away from, rather than towards, the exact study of data.

How do we deal with Context?

Recent work in semantics has returned to the 'mentalism' against which Firth, Bloomfield, and their contemporaries reacted. One might claim that this is simply a recognition of common-sense reality: meaning actually *is* a mental phenomenon, and it is useless to try to pretend otherwise. Later in the chapter we shall pursue this further, and consider in what sense there can be a 'science' of mental phenomena. But first, let us at least acknowledge that there is some degree of common sense on the side of the contextualists – that context is an undeniably important factor in communication; and let us consider how this semantic role of context can be allowed for within a theory based on conceptual meaning.

Ordinary observation supports the importance of context in a number of ways. We have all experienced the bewilderment which results from lack of contextual information: for example, when we tune in to the twelfth instalment of a twelve-part serial.

In addition, we may recall familiar examples where the contextual predictability of meaning enables us to understand such skeleton messages as:

(1) SPLASH! UPSIDE DOWN
(2) IT'S OFF!
(3) STICK IT ON FOULNESS
(4) JANET! DONKEYS!

Without the clues of the original context, the present reader will find it difficult to make any sense of any of these. They are (1) a news headline announcing the splash-down of Apollo 13 in October 1970; (2) another newspaper headline announcing the termination of the British Dock strike in July 1970; (3) a car sticker seen at the time of the controversy over the placing of London's third airport (1971) (Foulness, of course, is a place and not a state of filth); (4) a celebrated recurrent remark by the hero's aunt Betsey Trotwood in Dickens's *David Copperfield* (the remark was an order to her maid to carry out a routine task of driving donkeys off the grass). In each of the four cases, the originator of the message has assumed an unusual amount about what background knowledge is in the mind of the reader.

More widely, we may say that specification of context (whether linguistic or non-linguistic) has the effect of narrowing down the communicative possibilities of the message as it exists in abstraction from context. This particularization of meaning can take place in at least the following ways:

(A) Context eliminates certain ambiguities or multiple meanings in the message (e.g. lets us know that *page* in a given instance means a boy attendant rather than a piece of paper).

(B) Context indicates the referents of certain types of word we call DEICTIC (*this, that, here, there, now, then,* etc.), and of other expressions of definite meaning such as *John, I, you, he, it, the man.*

(C) Context supplies information which the speaker/writer has omitted through ellipsis (e.g. we are able to appreciate that *Janet! Donkeys!* means something like 'Janet! Drive those donkeys away!' rather than 'Janet! Bring those donkeys here!', or any other of the indefinitely many theoretical possibilities).

The first of these roles, the so-called DISAMBIGUATING role of context, may be illustrated by the simple sentence *Shall I put this on?* It makes a great difference to the understanding of this sentence to know whether the speaker is holding up (1) a portable radio; (2) a sweater; or (3) a lump of wood. The difference does not simply lie in the changing referent of *this*, but in the sense one attaches to *put ... on*:

(1) = 'switch X on'
(2) = 'don X', i.e. 'put X on oneself'
(3) = 'place X on top of (something else, such as a fire)'.

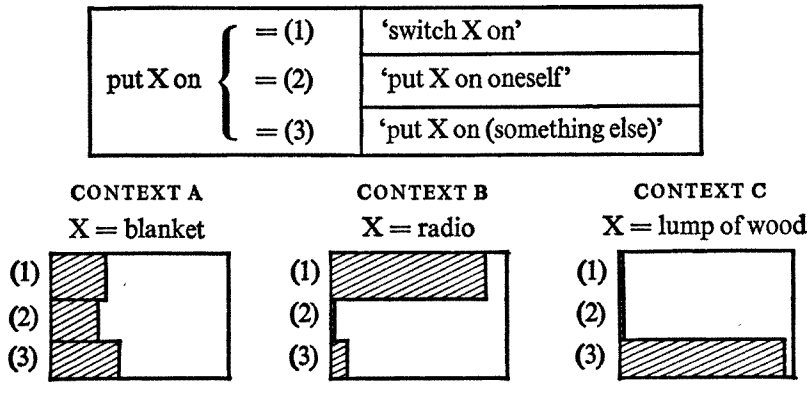
The same point could be made if we replaced *this* in the sentence by the noun phrases (1) *the portable radio*, (2) *the sweater*, or (3) *the lump of wood*, except that it would be made in a slightly different way: we would not be talking about the *non-linguistic* environment of the whole sentence, but about the *linguistic* environment of the phrase *put ... on*:

(1a) Shall I put the portable radio on?
(2a) Shall I put the sweater on?
(3a) Shall I put the lump of wood on?

But the way in which context operates on meaning is not so straightforward as so far suggested. In fact, 'disambiguation' is not only an ungainly, but a misleading term, as the effect of context is to attach a certain *probability* to each sense (the complete ruling-out of a sense being the limiting case of *nil* probability). Sentence (2a), for example, allows not only the 'wearing' sense of *put ... on* (sense 2), but the sense of 'placing on top of something else', such as a pile of clothing (sense 3). The former alternative tends to occur to us because it is far more probable than the latter; but the latter is far from impossible. Once we attune ourselves to these things, we realize that there are far more potential ambiguities than appear at first glance. Thus sense (2) of *put ... on* could apply in sentence (1a) in the unlikely case of a radio being treated as

something to wear (if, for instance, a person were to balance it on his head as a hat). What is more, sentence (2a) could have all three meanings: meaning (1) could be read into it if someone invented an electric sweater (on the analogy of an electric blanket). Contextualists are inclined to play down ambiguities of this kind, arguing that they would not arise if we were able to supply a more detailed specification of the context. But on the other hand, it is everybody's experience that ambiguities do occur and can cause mistakes of communication. A plausible example would be an instruction shouted to someone upstairs to *put the electric blanket on*; the intended meaning might be that he should place it on the bed; the actual interpretation could be that he should switch the current on.

Within a semantic approach based on conceptual meaning, all these observations suggest that meaning-in-context should be regarded as a narrowing down, or probabilistic weighting, of the list of potential meanings available to the user of the language. For example, if we suppose that the dictionary entry for *put ... on* provides us with just the three meanings already listed, then the dictionary senses, as represented in the top box of the following diagram, will be modified in context roughly as indicated in the three lower boxes:



The shaded parts of each rectangle represent my rough estimate of the relative probabilities of the three meanings.

The contextualist position is thus reversed. Instead of seeing total meaning as an aggregate derived from contexts, we see the contextual meanings as dependent on a previously established set of potential meanings. This does not conflict with what we know about how context contributes to the learning of meaning. It means, rather, that learning meaning through context is seen as a process of inductive approximation to the semantic categories that the linguistic community operates with,

as described on pp. 27–30. Moreover, learning through context is seen as only part of the process of learning meaning: verbal explanation (definition, etc.), which in the later stages of language learning plays a role at least as important as context, can be given its full weight.

This view of context fits the distinction between linguistic COMPETENCE and linguistic PERFORMANCE alluded to on p. 5. In terms of this distinction (which has been drawn for language in general), it is part of our semantic COMPETENCE (what we know about meaning as speakers of English) to be able to interpret *put ... on* in the three dictionary senses discussed above. But it is by virtue of linguistic performance (the practical use we make of that knowledge) that we infer which meaning is most likely, given our background knowledge of the context. 'Background knowledge' can include here anything we happen to know about the state of the universe at the time that the linguistic expression under consideration was uttered. For example, it is relevant to interpretation (1) of sentence (2a) *Shall I put the sweater on?* to know whether anyone has yet invented a sweater warmed by an electric current. In this light, it is evident that the study of interpretation in context can involve that vast encyclopedic knowledge of the universe which it has already been suggested (pp. 7, 13) cannot be practically included in the study of semantics. The study of meaning-in-context is logically subsequent to the study of semantic competence, rather than the other way around. In a sense, 'real world' knowledge is a kind of competence – part of a general 'communicative competence' – but insofar as they are kept apart in theory, linguistic knowledge and 'real world' knowledge mingle together only on the level of performance.

Even so, we cannot dismiss context so lightly, for there are respects in which the abstraction of 'semantic competence' from 'contextual performance' is difficult to maintain. Factors of situation can cause conceptual meanings to converge and diverge in a way which calls for systematic treatment. For example, although 'willingness' and 'ability' are in general distinct concepts, they converge *pragmatically* in the conventional reply to an invitation, as the following prepaid reply form shows:

> *I am willing
> ——————— to accept the invitation
> *I am unable
> *Delete as appropriate
> Date..... Signed.....

Normally *unwilling* would be treated as the antonym of *willing*, but in

this context, a pragmatic opposition, cutting across conceptual boundaries, is set up for reasons of politeness (actually, in order to anticipate politeness on the part of the person replying). Such facts cannot be explained by a semantic theory which ignores the relation between addresser and addressee in the situations in which language is used. But the use of the term 'pragmatic' above introduces a distinction which is widely recognized between semantics – the study of meaning *per se* – and PRAGMATICS – the study of how meanings get interpreted in communicative situations, in relation to the roles of the speaker and the hearer. The question of distinguishing semantics from pragmatics will be considered in Chapter 16. If we assume that such a distinction can be maintained (as many linguists do), then we can accept, as a working basis for inquiry, that semantics can disregard factors of contextual variability.

Mentalism and 'Intuition'

This brings us to the question: 'What respectable alternatives are there to contextualism?' The reaction to this of most modern linguists, led by Chomsky, has been an unashamed return to the 'mentalism' from which the contextualists tried to escape. The notion that the primary function of language is 'the communication of ideas' has become acceptable again. What is more, it has been assumed, as a working basis for linguistic inquiry, that the data we need about language can be supplied by direct resort to intuition. How have modern linguists dared to take up this stance, which seems not only at variance with contextualist thinking, but in defiance of the whole empirical tradition of science? Chomsky's answer is a rhetorical shrug of the shoulders: in reply to the question 'How do we know that such-and-such a sentence is grammatical, that such-and-such an expression is synonymous with such-and-such another expression, etc.', he says: 'There is no very satisfying answer to this question; data of this sort are simply what constitute the subject matter of linguistic theory. We neglect such data at the cost of destroying the subject.' (*Current Issues in Linguistic Theory*, p. 79.) He even argues that the relation between competence and operationally derived data (e.g. results of tests in which speakers have to judge the acceptability of sentences) is so indirect that 'operational tests ... must meet the condition of correspondence to introspective judgement' (p. 80). He justifies this apparently cavalier attitude by claiming (p. 81) that ...

... at the present stage of the study of language, it seems rather obvious that the attempt to gain some insight into the range of data we now have is likely

to be far more fruitful than the attempt to make this data more firm, e.g., by tests of synonymy, grammaticality, and the like. Operational criteria for these notions, were they available and correct, might soothe the scientific conscience; but how, in fact, would they advance our understanding of the nature of language...?

In other words, the linguist has already plenty to do in explaining what is common knowledge about language.

To a surprising extent, argument in semantics does indeed seem to go forward on a generally agreed basis of common data: investigators frequently agree as to which sentences are synonymous, which sentences are ambiguous, which sentences are ill-formed or absurd, and so on. Intuitions are consistent enough, then, to form the basis of satisfactory argumentation. Differences of intuition amongst speakers of a language are often treated as relatively unimportant: they may indicate a certain difference of 'dialect' between one speaker and another, but are not likely to affect crucially the argument for or against a particular theory or descriptive account.

In the words of the philosopher W. V. Quine, the ultimate contextualist objection to mentalism was that it ...

... engenders an illusion of having explained something. And the illusion is increased by the fact that things wind up in a vague enough state to insure a certain stability, or freedom from further progress. ('The Problem of Meaning in Linguistics', *From a Logical Point of View*, p. 47)

But by an extraordinary irony the opposite seems to be the case: mentalism has brought progress, while contextualism led precisely to the illusion described by Quine.

Semantic Data

Meanings are mental phenomena, and a mentalist theory of meaning merely acknowledges this obvious fact. But how does such a theory fit into the paradigm of scientific investigation? On the face of it, evidence of intuition (introspective access to one's linguistic knowledge) is subjective and therefore fallible: I can, for example, lie about my introspections, and no one can check my veracity. But remembering that *inter*subjectivity is the requirement placed on scientific observations, we may look at intuitions in a more favourable light. Linguistic knowledge, it may be claimed, is public knowledge, because speakers of a language, by virtue of sharing that language, also share the same implicit linguistic knowledge. In this sense, although my introspections are private, the data which I obtain through introspection are public: they may be confirmed by the introspections of other people.

This does not mean that intuitions are unproblematic. Firstly, a speaker's report of his intuition may be vague or unclear. Secondly, it may fail to agree with the reports of other speakers for at least two different reasons: it may be that his version of the language (his dialect) is different from that of others; or he may simply be misrepresenting the facts of his language – it is a well-known temptation to make the 'facts' suit one's theory. It is difficult to see how these cases can be distinguished. Moreover, if a linguist is investigating a language which is not his own, the problem arises of how to elicit intuitions from native speakers. How can judgements be elicited which faithfully represent the speaker's intuitions, and which are verbalized in a form which is appropriate to one's theory?

Since intuitive evidence is fallible or unclear, it is important to ask what other types of evidence could be found regarding the mental phenomena we call meanings. Two alternatives are (i) behavioural evidence and (ii) physiological evidence; but both unfortunately are of limited value.

Sources of behavioural evidence are (a) corpuses of the spoken and written language that people actually produce; (b) informant tests designed to elicit from speakers their explicit judgements about pieces of language; and (c) psychological tests in which subjects perform other tasks on a linguistic input. Such evidence is, of course, by its very nature evidence about performance rather than competence, and can only be used to test semantic hypotheses on the assumption that all irrelevant factors influencing performance can be discounted. For example, it might be predicted that contradictory and other nonsensical utterances would just not occur in corpuses of everyday language. But it is well known that tautologies and contradictions do occur, usually with some special interpretation involving factors such as metaphor, irony, and hyperbole: *If you must go, you must go*; *He's his father's son*; *All reactionaries are paper tigers*; *I need something to quench my hunger*; etc. In practice, all behavioural evidence is indirect and probabilistic. It can show a semantic theory to be more or less plausible, but it cannot categorically disconfirm it. This point can be illustrated with reference to psychological tests. Over many years, word-association tests carried out by psychologists have yielded much detailed information (see Postman and Keppel, 1970) which tends to confirm relations of synonymy, antonymy, hyponymy, etc. between words (see pp. 94–5). Other experimenters have used statistical techniques to plot relationships of meaning on the basis of people's judgements of semantic similarity between words (Fillenbaum and Rapoport, 1971). Such experiments are advantageous in that they tend to complement the evidence of intuition, and provide a wealth of data

for which semantics must provide some explanation. But it is difficult to see how they can absolutely falsify the predictions of a semantic theory. Similar considerations apply to semantic informant tests, to which I shall turn later in the chapter.

As for physiological evidence: this is also indirect. Systematic studies of aphasia (various types of language disorder resulting from brain damage) are a source of information about the cerebral organization of language, including the organization of semantic competence (see Luria, 1976). But the data from this source pose in themselves a complex problem of interpretation. Such support as these studies can give to semantics is at present fragmentary and uncertain.

Thus, although semantics is answerable indirectly to other kinds of data, in practice intuition is the first resort and often the last resort of the semantic investigator looking for evidence to back up his theories.

Basic Statements: the Control of Intuition

What is needed, if semantics is to be as securely based as possible, is firstly a control of the way in which intuition is resorted to, and secondly, an exploration of the means by which intuitive data can be more securely backed up by other kinds of evidence.

Many semanticists today assume that the main purpose of semantics is to explain that primary, conceptual aspect of meaning called 'conceptual' or 'logical' meaning, and that in particular we have to account for certain semantic categories and relationships which apply to sentences: synonymy, entailment, contradiction, semantic anomaly, etc. These may be incorporated into a set of statements which may be taken to be intuitively 'given'. They can be called BASIC STATEMENTS (in the sense referred to on p. 60) because semantics has to explain them, by constructing theories from which they can be deduced. A theory will be falsified, in these terms, if it can be shown that, according to the data of intuition, what it claims to be a basic statement is untrue. In this way, (a) intuition is explicitly controlled by limiting its use to judgements about basic statements, and (b) semantics is given a clear goal: that of accounting for basic statements by the hypothetico-deductive method of science.

At this stage, I shall simply give illustrations of basic statements, leaving their definition till later (*X* and *Y* in the formulae are propositions rather than sentences – on this distinction, see p. 75).

Types of Basic Statement

1. *X* is synonymous with *Y* (e.g. 'I am an orphan' is synonymous with 'I am a child and have no father or mother')*
2. *X* entails *Y* (e.g. 'I am an orphan' entails 'I have no father')
3. *X* is inconsistent with *Y* (e.g. 'I am an orphan' is inconsistent with 'I have a father')
4. *X* is a tautology (e.g. 'This orphan has no father')
5. *X* is a contradiction (e.g. 'This orphan has a father')
6. *X* presupposes *Y* (e.g. 'My father is at home' presupposes 'I have a father')
7. *X* is semantically anomalous (e.g. 'The orphan's mother lives in New York')

This is not a complete list of types that might be considered as basic statements, but includes the most commonly discussed types. The contrasting relationships between those types bracketed together will be clear from the examples.

Why choose these as basic statements? Firstly, because they are statements at a level where investigators seem to find themselves intuitively in agreement. A second reason, no doubt connected with the first, is that they are statements easily translatable into terms of truth and falsehood, notions which all normal users of language understand. This in turn means that they lend themselves to supporting tests of validity (of which more later). The point about truth and falsehood can be demonstrated by the following partial definitions:

1. *X is synonymous with Y*
   X has the same truth value as *Y*: i.e. if *X* is true, *Y* is true: also if *X* is false, *Y* is false; and vice versa.
2. *X entails Y*
   If *X* is true, *Y* is true; also, if *Y* is false, *X* is false.
3. *X is inconsistent with Y*
   If *X* is true, *Y* is false; also, if *Y* is true, *X* is false.
4. *X is a tautology*
   X is invariably true.
5. *X is a contradiction*
   X is invariably false.
6. *X presupposes Y*
   If *X* is true, *Y* is true; also, if the negation of *X* is true, *Y* is true.

*'Orphan' is sometimes taken to mean a child lacking just one parent (see O.E.D.), but as this usage is unusual, the more common sense has been adopted.

7. *X is semantically anomalous*
   X is absurd in the sense that it presupposes a contradiction (therefore it makes no sense to ask whether *X* is true or false).

(On the status of 6 (presupposition) there is much disagreement: see Chapter 14.)

Why are these no more than partial definitions? Because if notions like synonymy were defined purely in terms of truth and falsehood, they would be wide enough to include cases which we recognize as belonging to that category on the basis of factual knowledge of the 'real world', rather than on the basis of linguistic knowledge. For each 'semantic' category there is a corresponding 'factual' category; for example:

1. *X* 'Charlotte lives in Paris' has the same truth value as *Y* 'Charlotte lives in the capital of France'.
2. If *X* 'It has just been raining hard' is true, then *Y* 'The ground is wet' is true; also, if *Y* is false, *X* is false.
3. If *X* 'John has just eaten a seven-course meal' is true, then *Y* 'John is hungry' is false; also, if *Y* is true, *X* is false.
4. 'Houses are made of solid materials' is invariably true.
5. 'Mr Smith bit his own ear off' is invariably false.

It would be unreasonable and impractical (for reasons mentioned in Chapter 1) to expect a semantic theory to account for all the 'real-world' knowledge which enters into our judgement of truth conditions. We therefore have to exclude examples like these from the domain of semantics, and to add to the above definitions of basic statements the proviso that these statements about truth and falsehood hold *by virtue of conceptual meaning alone*. This brings a problem which will be discussed on pp. 82–4.

But first, let us consider the list of basic statements itself. There are arguments for saying (a) that this list is too short, and (b) that it is too long. It is too short in that, by restricting basic statements to truth-value properties, we restrict semantics to dealing with PROPOSITIONS; that is, to the meanings expressed by declarative sentences, at the expense of other sentence types, such as questions and commands There is no doubt that questions and commands have their own conditions of 'validity' even though they do not have a truth value. *Yes–no* questions, for example, have the logical characteristic of eliciting a positive proposition ('Yes') or a negative proposition ('No') as their reply, and so it is possible to set up, for each of the basic statements already given, a corresponding basic statement to do with questions. We might call the corresponding properties of *yes–no* questions '*Q-synonymy*',

'*Q-entailment*', '*Q-contradiction*', etc. Thus 'Is your father a man?' is a pointless question because the only sensible answer to it is 'Yes'. It is a Q-tautology, because its positive answer is a tautology. Similarly, the question 'Is your father a woman?' is a Q-contradiction; and the relation between 'Did you buy any apples?' and 'Did you buy any fruit?' is one of Q-entailment. There is also a systematic relation between propositions and commands, in that a command has a 'satisfaction condition' which may be indicated by a proposition; for example. 'Shut the window, Jane' has a satisfaction condition reported in the proposition 'Jane will shut the window'. Thus the command 'Play this duet for three instruments' is semantically anomalous in a way which is parallel to the semantic anomaly of 'You will play this duet for three instruments'. In effect, it is an impossible command.

No doubt we intuitively recognize the synonymy, absurdity, etc., of questions and commands just as we recognize the equivalent properties of propositions. But there would be little point in setting up special basic statements for questions and commands since, on the whole, by a few simple rules these could be reduced to the types of basic statement already listed. In any case, it seems that propositions are more 'basic' in the sense that when we judge the validity of non-propositions we do so against the standard of corresponding propositions. (For example, a natural reaction to the question *Do any of the orphans have fathers?* would be *What a silly question! of course they don't – orphans don't have fathers* – where the final tautological proposition provides the reason for regarding the question as absurd.)

Truth-based Semantics

This argument could be taken further, to the effect that the types of basic statement should be reduced to a smaller number of types, or even to just one type. Synonymy, for example, can be expressed as bi-directional entailment: '*X is synonymous with Y*' means the same as '*X entails Y* and *Y entails X*'. Similarly, the inconsistency of *X* and *Y* can be expressed as an entailment relation between *X* and the negation of *Y*, and between *Y* and the negation of *X*. We can even define tautology and contradiction in terms of entailment: a contradiction is a proposition whose negation is a tautology, and a tautology is a proposition which is entailed by all other propositions. In this way all basic statements can be translated into statements about entailment.

There is nothing to prevent us, then, simplifying the goals of semantic theory by limiting it to the explanation of one kind of basic statement: *X* entails *Y*. A theory whose goal is formulated in this way may be called

an INFERENTIAL theory, since by explaining entailments (including entailments where *X* and *Y* are conjunctions of simple propositions) one would in effect account for a native speaker's ability to infer the truth of some propositions in his language from the truth of other propositions; or to put it more informally and generally, the object would be to explain one's ability to use one's language logically. Geoffrey Sampson adopts this view of semantics in *The Form of Language* (1975, p. 140).

Another way to formulate the goal of semantics is potentially equivalent to this. In a TRUTH-CONDITIONAL approach to semantics, it is proposed that knowing the meaning of a sentence is equivalent to knowing the conditions under which that sentence would be true. Hence all statements about meaning are formulated as statements about truth conditions:

(1) *S* is true if and only if p

(where *S* is a sentence and p is a set of propositions describing the truth conditions of *S*). This formula is taken from the work of the logician Tarski, who was interested in formalizing the concept of truth for mathematical languages; but it has since been proposed that the same type of formalization can be used to specify meaning in natural languages such as English. However, here truth-conditional semantics encounters the by-now-familiar problem of 'contingent truth' – truth by virtue of fact, rather than by virtue of linguistic necessity. For instance, one of the truth conditions of 'It has just been raining hard' is that the ground is wet, but few people would want to include this fact in the semantic specification of that sentence. To make truth conditions match what we ordinarily understand by meaning, therefore, Ruth Kempson (1977) strengthens Tarski's formula as follows, requiring that the conditions obtain as a matter of necessity:

(2) *S* means that p ≡ necessarily *S* is true if and only if p

This makes truth-conditional semantics perform the same task as inferential semantics. For by 'necessary truth' we mean, in effect, 'truth by the very nature of language' (ANALYTIC TRUTH) rather than 'truth by virtue of some state of affairs in the real world' (SYNTHETIC TRUTH). Suppose, now, that in the formula (2), p stands for a set of conditions p_1, p_2, p_3, etc. And suppose that each of these conditions is denoted, in the language in question, by a proposition X_1, X_2, X_3, etc. Then saying that *S* means that p is equivalent to saying that *S* ENTAILS each of the propositions X_1, X_2, X_3, etc. (We ignore for the present the discrepancy between sentences and propositions.) On this interpretation, then, both inferential and truth-conditional semantics amount to theories

whose goal is to explain meaning by accounting for all the entailment relations in a language.

Although this has the advantage of stating the goal of semantics in a maximally simple way, I also see some advantage in maintaining the distinctions between different kinds of basic statement. One of them is that inferential semantics and truth-conditional semantics are restricted, by definition, to propositional meaning: to meaning in relation to truth and falsehood. It is not clear, therefore, how they can be extended (without a redefinition of meaning) to deal with questions and other sentence types. A second reason is to do with accessibility to intuition: if we want to check our basic statements against the intuitions of other speakers (particularly those who are not logicians), to reduce statements about synonymy, contradiction, etc., to more complicated statements about entailment is to replace something which the ordinary language user can understand and react to by something which is more obscure. However, these arguments do not seem to me important, since whichever formulation of the goal of semantics one prefers, the requirements placed on a theory are more or less the same. The point I wish to stress is that there is broad agreement that semantic theory deals primarily with the properties of language which have to do with truth and falsehood: a point of view that may be summarized in the term TRUTH-BASED SEMANTICS.

Ambiguity

Another question which arises here is whether AMBIGUITY should be considered a basic datum of semantics; i.e. whether '*X* is ambiguous' should be classed as a basic statement. It is true that linguists often assume the ambiguity of a sentence is self-evident to native speakers; but *the nature and extent* of ambiguity is often far from clear, and has to be explicated by resort to context clues, paraphrase, etc. It is arguable that ambiguity can always be reduced to a set of basic statements of the kinds that we have already recognized. For example, to show why *Hugo is drawing a cart* is ambiguous, I can say that in one sense it is synonymous with (a) *Hugo is drawing a picture of a cart* and that in another sense it is synonymous with (b) *Hugo is pulling a cart*. The ambiguity is then evident from the fact that (a) and (b) are not synonymous with each other. Since ambiguity in this way can be explained in terms of more basic, truth-based notions, it is probably best excluded from the categories of basic statements. This is not to deny that, informally, linguists often rely on the recognition of ambiguities in the formulation of analyses.

This brings me to an important point which affects the formulation of basic statements. Earlier I said that the *X* and *Y* used in the basic statement formulae are PROPOSITIONS, not SENTENCES. Ambiguity, on the other hand, is a property of sentences; in fact, an ambiguous (declarative) sentence may be defined as a (declarative) sentence which expresses more than one proposition. This reflects a difference between levels of linguistic statement: sentences are syntactic units, whereas propositions are semantic units; ambiguity is a one–many relation between syntax and sense. Thus we may say that *Hugo is drawing a cart* is ambiguous in that it expresses at least two distinct propositions: 'Hugo is drawing (a picture of) a cart' and 'Hugo is drawing (=pulling) a cart'. Since it is important to know which level of linguistic statement we are discussing, I shall now make explicit a graphic convention which I have used above, and shall continue to use: *italics indicate a syntactic entity, whereas single quotation marks indicate a semantic entity.* (This convention can save a lot of confused thinking, but should be interpreted warily: it is a rough-and-ready device to avoid confusion of levels, but it does not (when single quotes are used) avoid confusion of meanings. For instance, the single quotes of 'Hugo is drawing a cart' make it clear that we are discussing a meaning, but they do not say which meaning we are discussing!)

If ambiguity is a one–many relation between sentence and sense, it might be argued that synonymy is the opposite phenomenon, viz. a one–many relation between sense and sentence. On this basis, it would be appropriate to say that two SENTENCES are synonymous (say *Hugo is drawing a cart* and *Hugo is pulling a cart*) in that they express the same proposition. But if propositions are meanings of sentences, then it would seem illogical to say that two propositions are synonymous, i.e. that two meanings have the same meaning. Notice, however, that we cannot simply define synonymy as sense-equivalence between sentences, since we shall often have to say (as in the example of *Hugo is drawing a cart*) that two sentences are synonymous only with respect to *a certain sense*. Also, I shall later (in Chapter 13) want to argue that two propositions can be equivalent, in that they entail one another, without being identical in sense. For these reasons, I shall be content, for the present, to interpret 'synonymy' loosely, as a property of either sentences or propositions.

Translation Equivalence

Before we leave basic statements, there is one further datum of semantics to be briefly considered: that of TRANSLATION EQUIVALENCE. Should

'*X* is a translation of *Y*' (e.g. '*Sie singt sehr schön* is a German translation of English *She sings very beautifully*') be included in the list of basic statements? Since nothing was said earlier about *X* and *Y* belonging to the same language, I have already included it by default, to the extent that translating can be defined as finding a synonymous expression in another language. To obtain this data, of course, we have to have access to the intuition of a bilingual speaker, or else consult documentary evidence such as translations, grammars, and dictionaries. But, in principle, it seems that explaining translation should be among the goals of semantics. We should distinguish here between two kinds of semantic theory: a specific theory, which aims to predict all the basic statements of a particular language (say English); and a general theory, which aims to specify the semantic properties of human language in general. The theory of a particular language, which we may call a SEMANTIC DESCRIPTION, is included in the general theory, which has as its 'basic statements' statements about the general form of semantic descriptions. In this sense, a general semantic theory predicts semantic 'universals' (see pp. 26–30 and Chapter 12) which may only be falsified at one remove, as it were, by a demonstration that there is some language which cannot be described in the terms that it specifies. Needless to say, a general semantic theory, so considered, is so highly abstract that it may be extremely difficult to falsify. But it is within the domain of such a theory that semantic comparisons of languages, and the evidence of translation equivalence, should be considered. In this sense, translation equivalence implies an extension of the goals of semantics beyond those which have so far been assumed.

Translation, in the everyday sense, involves both much more and much less than the truth-based notion of translation equivalence. An 'ideal' translation would be one translating the whole communicative value (see p. 23) of a text into another language. But since this is generally impossible (conspicuously so with literary texts), the translation of sense is often sacrificed in order to preserve other types of meaning-equivalence. The difference between 'free' and 'literal' translation is a question of how far sense-equivalence is maintained in preference to other factors.

Semantic Testing

The notion of 'basic statement' not only codifies and controls the use of intuition; it also shows the way towards testing procedures which help the investigator to go beyond his own intuitions and to discover how far his own findings have general validity among the linguistic community at large. This is all the more necessary where the linguist is studying a

language of which he is not a native speaker, so that his intuitions are likely to be unclear or second-hand.

If the results are to be truly representative of a linguistic community, such tests have to be presented in a way that can be understood by people with no technical knowledge of the language. For example, it would be little use facing a random collection of adult English speakers with the question 'Does sentence *X* entail sentence *Y*?', but it might well be worth while to ask them 'If sentence *X* is true, does sentence *Y* have to be true?' Hence the value of reducing questions of conceptual meaning to questions about truth and falsehood: notions that are familiar to everyone. Here are two examples of such tests, the first designed to test entailment and inconsistency, the second to test tautology and contradiction:

Entailment and Inconsistency Test

X: *George is my half-brother*
Y: *George is my brother*

Instructions:
Assuming *X* is true, judge whether *Y* is true or not.
If you think *Y* must be true, write 'YES'.
If you think *Y* cannot be true, write 'NO'.
If you think *Y* may or may not be true, write 'YES/NO'.
If you don't know which answer to give, write '?'.

The responses 'YES' and 'NO' in this test are taken to be diagnostic of entailment and inconsistency respectively.

Tautology and Contradiction Test

My half-brother is my brother
Instructions:
If the statement would be true whatever the situation, write 'YES'.
If the statement would be false whatever the situation, write 'NO'.
If the statement could be true or false, write 'YES/NO'.
If you don't know which answer to give, write '?'.

Here again it is the first two responses ('YES' and 'NO') which are diagnostic: they indicate tautology and contradiction respectively.

From my earlier remarks on behavioural experiments (pp. 72–3), one would not expect a 100 per cent confirmation from such tests; *ad hoc* metaphorical interpretations and other 'nuisance factors' inevitably interfere. However, a predominance of 80 per cent or more in one direction or another can be taken to be a fairly strong confirmation of a basic statement. Here are examples of such results:

Entailment and Inconsistency Test

(Examples from Leech and Pepicello, 1972)

Test Sentences	Percentages			
	Yes	*No*	*Yes/No*	*?*
1. *X*: Someone killed the Madrid chief of police last night. *Y*: The Madrid chief of police died last night.	96	0	3	1
2. *X*: Every radio made by Stumpel carries a 12-month guarantee. *Y*: Some radios made by Stumpel do not carry a guarantee.	4	88	7	1

Notice that, in accordance with scientific method (p. 60), we should regard such results as *confirming or falsifying a hypothesis*, rather than as means of *discovering* facts about meaning. Treated as discovery procedures, they fail if they cannot distinguish 'semantic' from 'factual' truth-statements. But viewed as tests of hypotheses (basic statements), they require neither the linguist nor the informant to make such discriminations; since basic statements are those statements which a theory predicts to be true, the 'factual' category is defined simply as that set of observations which the linguist omits from the domain of his theory – and which he is therefore not interested in testing.

However, because the results of semantic tests are quantitative, they cannot be said to confirm or falsify basic statements absolutely; the most one can say is that they *tend* to confirm or falsify basic statements – which in practice means that they tend to confirm or disconfirm what the investigator already has intuitive evidence for. There are many other problems in semantic testing: for example the problem of how to test ambiguous sentences. But the fact that by using informant tests we can in principle find wider, more systematic evidence than individual intuition is important – particularly for cases where individual intuition is unclear.

Analytic and Synthetic

We return now to the problem which has already claimed our attention a number of times, and which threatens the very basis of any theory of meaning: the problem of how to draw the line between 'semantic knowledge' and 'factual knowledge', or, in terms which have long been familiar in philosophy, between ANALYTIC TRUTH (truth by virtue of meaning, truth in all possible worlds) and SYNTHETIC TRUTH (truth by virtue of fact). We have seen that semantic theory assumes such a distinction; but there is, on the other hand, an influential sceptical school

of thought in philosophy (see especially Quine, 1960) which has argued against it. Experimental evidence (see Steinberg 1970; Leech and Pepicello 1972) such as it is backs up both sides of the argument, suggesting on the one hand a large area of agreement about what cases are analytic or synthetic, and on the other hand an area of borderline uncertainty. (Consider, for example, the uncertain analyticity of propositions like 'Murder is a crime' or 'Everyone is born before he dies'.)

I suggested above that thinking of basic statements as those statements which the theory predicts to be true, we do not have to solve this problem, because the distinction is drawn by the theory itself. But the problem does not go away entirely; rather, it shifts to a different place. In the introduction to this chapter, I noted a number of requirements for a semantic theory: requirements of explicitness, completeness, simplicity, strength, and empirical testability. The analytic/synthetic problem does not, I have argued, threaten testability; but it does threaten completeness. That is, unless we can decide which truth-statements are analytic and which are synthetic, we shall have no way (apart from arbitrary fiat) of deciding what is the domain of observations that the theory is meant to account for, and hence of knowing when *all* those observations have been predicted by the theory. This may seem an unimportant priority – especially since all semantic descriptions one can at present envisage are likely to be glaringly incomplete. But without criteria for defining the domain of a theory, one cannot conclusively apply any criterion of simplicity (for simplicity implies that we can compare alternative theories applying to the same domain). So the whole basis for evaluating one's theory remains shaky.

Nevertheless, the analytic/synthetic distinction becomes, on this interpretation, somewhat less problematic; what we now require is a *principled way* of deciding which facts our semantic theory has to account for. Let us take, as a particular case, the definition of the word *dog*. There are indefinitely many properties of dogs (positive and negative) about which it is possible to construct invariably false propositions:

The dog had eighty legs.
Dogs have horns.
Some dogs talk sensibly.
etc.

If we wanted our semantic theory to explain the absurdity of these propositions, we should have to include such features as 'four-legged', 'hornless', 'incapable of speech', in our definition of *dog*. But if we included *all* such features, we should end up not with a dictionary entry, but with an encyclopedia entry of indefinite length. The two possible

solutions are therefore either (a) to include some features of this kind, but not others; or (b) to exclude all such features. The first solution is in fact no solution, because it still leaves us with a task of arbitrary demarcation: we arrive at an indefinite number of possible definitions, between which the choice is a matter of tossing a coin. In other words, we find ourselves claiming that *dog* has indefinitely many meanings, but none is more 'correct' than any other. The second solution, which does not have this drawback, amounts to a refusal to anatomize the meaning of *dog* any further than 'an animal of the canine species'. The conclusion is, then, that the oddity of propositions like 'The dog had eighty legs' is something that zoology has to explain rather than conceptual semantics. If we can employ a strategy of this kind (in effect, a strategy for deciding on practical grounds what it would be reasonable for a semantic theory to account for), we may go a long way towards solving the demarcation problem.

Prototypic Categories

It is helpful here to bring in a psychological viewpoint to rescue us from a philosophical dilemma. From the viewpoint of cognitive psychology, the analytic/synthetic problem is the problem of how man's mental dictionary (part of his language-using capability) interrelates with his mental encyclopedia (his general capacity for assimilating, storing and implementing experience of the world). Although much work in this field remains speculative, it has become clear that our ability to interpret and organize experience depends heavily on mental 'blueprints' called CATEGORIES. Moreover, research by Eleanor Rosch and others (see, for example, Rosch *et al.*, 1976) has indicated that we recognize members of a category by matching them with a PROTOTYPE or 'typical example' of that category. For example, not all fish are equally fishlike: herrings and trout will be more 'prototypic' than (say) eels or octopuses. We may be uncertain about the periphery of the category (for example, are barnacles or killer-whales fish?) but there will be little disagreement on what is a typical fish. The same scheme of category recognition (that categories have a clear centre but unclear and variable boundaries) applies also to perceptual processes (e.g. pattern recognition and colour perception) and to discriminations made by non-human species, so it is not particularly to be associated with language.

Now natural species, such as dogs, fish, trees, etc., are good examples of prototypic categories (I am talking not of the biologist's but the lay-person's recognition of species), so it is reasonable to see a support in this for the preceding decision to treat propositions about properties of

dogs as synthetic: they reflect our cognitive ability to recognize bundles of properties distinguishing the category 'dog'. In this context, all we may say about the meaning of the word *dog* is that it names a particular category. Or, in psychological terms, whenever we interpret the word *dog*, we simply associate it with the category of canines. There is no reason to suppose that our mental dictionary separately connects up the word *dog* with individual properties characterizing dogs – such as barking and tail-wagging.

This accords with the simplest possible view of conceptual meaning: the so-called NOMINAL VIEW OF MEANING (see Putnam 1975; Clark and Clark 1977, pp. 413–14), which says that the relation of a word to its meaning is simply a naming relation; that just as *Berlin* names a particular place, or *Good Queen Bess* names a particular person, so *dog*, *table*, *bird*, or *cup* each names a particular category. This would reduce the role of conceptual semantics, in explaining word meaning, to the minimum of matching a word to a category. But the nominal view appears to be too restricted: firstly, it can only be easily applied to common nouns (rather than to adjectives, verbs, etc.); and secondly, it does not allow us to treat as analytic propositions which spell out relations between categories (whether of inclusion or exclusion), such phrases as 'Oaks are trees', 'Milk is not a metal', 'Skyscrapers are tall buildings', 'Carpenters make things out of wood', etc. It is entirely natural to say that we know that these are true because we know the meanings of words like *oak*, *milk*, *carpenter*, rather than because we know something about the real world. They resemble, indeed, the definition statements that we find in dictionaries.

Thus in addition to the category-recognizing ability, human beings also have a different order of cognitive ability – something which is much more closely tied to language – which is the ability to recognize structural relations between categories. This ability is not, so far as one can tell, shared by non-human species, and it is reasonable to postulate that it is an aspect of our semantic competence – part of the specifically human language-learning and language-using competence – rather than something that belongs to more general cognitive processes.

So there is a psychologically plausible way of interpreting the boundary between linguistic and real-world knowledge. However, the psychological viewpoint also discourages us from assuming too absolute a boundary between analytic and synthetic; it would not be surprising if the remarkable coordination which the human mind achieves between experience, thought, and language were the result of a more complex integration than current models suggest. I shall have more to say about this on pp. 119–22. Meanwhile, I hope to have shown that the problems

surrounding the distinction between analytic and synthetic truth do not prevent one from assuming, as a reasonable postulate, that such a distinction is a real one.

Elements of a Semantic Description

We are now in a position to look at the overall shape of an ideal semantic description which deals with conceptual meaning for a particular language.

1. The theory predicts basic statements of synonymy, entailment, tautology, contradiction, etc., for some language. The number of such statements that can be made about a language is vast – in principle, infinite – but the theory must predict them by means of a finite number of rules and constructs (the fewer and the simpler these are, the better).

2. The theory also relates meaning to syntax within an overall theory of how the language works. A theory of meaning in isolation from syntax is inconceivable, for we cannot identify basic statements in natural languages without identifying the sentences whose meanings are referred to in basic statements. In practice, this means that we must give (a) an account of word-meanings, (b) an account of sentence meanings, and (c) an account of the way in which word-meanings and sentence meanings are related.

3. The theory must also relate meaning to pragmatics – the way in which sentences are actually used and interpreted in speaker–hearer communication. This is also a necessity, because (as indicated on pp. 69–70) meaning 'in the abstract', that which belongs to semantic competence, cannot be entirely separated from the circumstances of language use.

4. The theory must be part of a more general theory which defines the nature of semantic descriptions, and therefore constitutes a specification of language universals – the common properties of meaning which are manifest in all language.

I call this 'an ideal semantic description' advisedly, because it lays down a programme of research so immense as to be beyond realistic contemplation. And yet, unless all four elements above are included, the description will be incomplete – which means, in fact, that we shall not ultimately be able to judge how simple, how good a theory it is. The major difficulties are these two:

(A) All existing descriptions of languages – both in semantics and in linguistics as a whole – are fragmentary. We are a long way from the goal of completeness.

(B) The very delimitation of the domain of semantics – of what semantics is trying to explain – is uncertain. This is evident if we consider that each of the four elements listed above involves a problem of demarcation: how to delimit the semantics of a language from (1) real world knowledge; (2) syntax; (3) situational knowledge; and (4) the semantics of human language in general.

It is understandable that much of current thinking in semantics is taken up with controversy about basic issues – particularly 'territorial disputes' about the factors mentioned in (B) above – rather than in the detailed working out of theories. And moreover, even when theories are worked out in some detail, there are as yet no clear criteria for choosing between competing theories.

Conclusion

Since there is such a wide gap between goal and achievement in semantics, there appears to be plenty of justification for a pessimistic answer 'No' to the question posed in the title to this chapter. But I still maintain that the progress made in the subject over the past twenty years – both in the clarification of goals and in the formulation of theories and descriptions – vindicates the application of scientific method in semantics. Quine (1960, p. 3) has quoted Neurath's comparison of science to a boat 'which, if we are to rebuild it, we must rebuild plank by plank while staying afloat in it'. The leaky ship of semantics is still making headway, even though there are some planks missing in important places. In the remainder of this book I shall focus on the major areas in which progress has been made.

Scientific method is a term for a broad set of procedures and principles which we apply to the best of our ability in order to find out the truth; and in studying such a philosophically troubled subject as semantics, we have to adapt them with as much ingenuity as we can to its peculiar problems. One symptom of this adaptation – which reflects a general tendency in linguistics and indeed in the human sciences as a whole – is a preference for talking about MODELS rather than about THEORIES. The significance of this terminological shift is rarely discussed, but can best be explained as follows. Whereas theories claim to tell us what reality is like, models claim to tell us what reality can and could be like – given certain speculative assumptions. We can, for example, construct a model of the mind as a computer, or of society as a market, knowing that this is not true, or only partially true, but seeking in this way to provide a detailed but perhaps idealized understanding of some domain which must await incorporation within a more comprehensive theory.

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In this way, almost by act of faith, we define a domain for semantics and study it, knowing that our models cannot be fully explanatory unless and until they are incorporated into a more general theory of human language and, more broadly, of human thought and communication. But then, acts of intellectual faith – what Popper calls 'bold conjectures' – are the springboards of science.

My aim in the remaining chapters will be to explore a model of conceptual meaning, and thereby to take the reader into the heartland of semantics – the investigation of topics which have been the foci of recent research and debate, such as word-meaning (Chapters 6–7) and sentence meaning (Chapters 8–9), the nature of the lexicon (Chapter 11), semantic universals (Chapter 12), and the relations between semantics and syntax (Chapters 10 and 17), and semantics and pragmatics (Chapters 14–16). I shall, on the whole, follow the method of developing one model, rather than of comparing different models (making clear in the notes how far my model contrasts with, or is paralleled by, others). Similarly, I shall concentrate on one language – English – rather than compare different languages. By limiting the field in this way, even though I must strike a balance between depth and breadth of treatment, I shall aim to give a coherent picture of what semantics is about.