26

SEMANTIC STRUCTURE

John Lyons

1 Introductory

1.1 The priority of sense-relations

In this chapter we shall be concerned with the notion of *sense* (as distinct from both reference and application: cf. 9.4.1–9.4.8). We have already seen that the vocabulary of a language will contian a number of *lexical systems* the semantic structure of which can be described in terms of paradigmatic and syntagmatic *sense-relations*; and we have stressed that these relations are to be defined as holding between lexical items and not between independently-determined senses (cf. 9.4.2).

This last point is of considerable theoretical and methodological importance. It is one of the cardinal principles of 'structuralism', as developed by de Saussure and his followers, that every linguistic item has its 'place' in a system and its function, or value, derives from the relations which it contracts with other units in the system (cf. 2.2.2–2.2.9). Acceptance of the structural approach in semantics has the advantage that it enables the linguist to avoid commitment on the controversial question of the philosophical and psychological status of 'concepts' or 'ideas' (cf. 9.2.6). As far as the empirical investigation of the structure of language is concerned, the sense of a lexical item may be defined to be, not only dependent upon, but identical with, the set of relations which hold between the item in question and other items in the same lexical system. The nature of these sense-relations will be discussed in this chapter.

The methodological significance of the structural approach to the definition of sense may be illustrated by means of a comparison with the proposal made by Russell and other modern logicians for the definition of such notions as length, weight, shape, etc. In traditional logic the question 'Is *x* the same length as *y*?' was generally interpreted as if it were secondary to and dependent upon questions of a quite different logical structure: 'What is the length of *x*?' and 'What is the length of *y*?' (length being conceived as a property that objects might have more or less of). In practice, the length of an object is determined by comparing it with some conventional standard. When we say, for example, that *x* is exactly one metre long, we are asserting that if it were compared with the platinum–iridium bar kept at the International Bureau of Weights and Measures, *x* would be found to be equal in length to the distance between the two lines marked on the bar (the fact that since 1960 the metre is internationally defined by means of more complex, but more reliable, physical measurements does not affect the point being made). In other words, the question 'What is the length of *x*?' is answered by means of a procedure which yields an answer to a question of the form 'Is *x* the same length as *z*?' (*z* being the standard). Given two objects *x* and *y*, we can compare them directly with one another or indirectly by reference to some third object *z* (the platinum–iridium bar in Paris, a ruler that has been calibrated in accordance with some agreed standard of measurement, etc.). In either case, 'What is the length of *x*?' is dependent upon, and indeed reducible to, a set of questions of the form 'Is *x* the same length as *y*?' There is no other way, empirically, of determining the length of *x*; this being so, Russell proposed that length should in fact be defined in terms of the relation 'having the same length as'. (We need not go into the details of Russell's formulation of the definition here. The general principle is independent of this.)

Just as 'having the same length' is a relation which holds between two objects (and not between the 'lengths' inherent in them), so 'having the same sense'—or synonymy—is a relation which holds between two lexical items (and not between the 'senses' associated with them in the minds of the speakers: cf. 9.2.6). The definition of sense is far more complex than the definition of length (or weight, etc.) since there is more than the relation of sameness and difference involved. But there would seem to be no more reason to postulate a set of 'senses' associated with the lexical items in a system than there is to postulate a set of 'lengths' inherent in physical objects. The question 'What is the sense of *x*?' (and the answer to this question, it will be recalled, is only one part of the answer to the question 'What is the meaning of *x*?') is methodologically reducible to a set of questions each of which is relational: 'Does sense-relation R_i hold between *x* and *y*?'

1.2 'Analytic' and 'synthetic' implication

The notion of sense is frequently discussed by philosophers in connexion with the distinction between *synthetic* and *analytic* statements. This distinction may be put as follows: a synthetic statement is one which is true 'contingently'—as a matter of empirical fact which might have been otherwise; an analytic statement is one that is 'necessarily' true, and its truth is

guaranteed by (i) the sense of its constituent elements and (ii) the syntactical rules of the language. To take a standard example: the sentence *All bachelors are unmarried* might be regarded as analytic on the grounds that *bachelor* and *unmarried* are semantically-related in such a way that the truth of the sentence is guaranteed.

The validity of the notion of analyticity is open to dispute; and it is possible that it is philosophically indefensible in the form in which it is generally discussed. Fortunately, the semantic analysis of language as it is used in everyday discourse need not wait upon the solution of the philosophical problems attaching to the distinction between contingent and necessary truth. What the linguist requires is a *pragmatic* concept of analyticity—one which gives theoretical recognition to the tacit presuppositions and assumptions in the speech-community and takes no account of their validity within some other frame of reference assumed to be absolute or linguistically and culturally neutral. It was for this purpose that we introduced earlier the notion of the *restricted context*. Any statements that are made in this chapter about the semantic relations that hold between sentences by virtue of the sense of the lexical items in them are to be interpreted in the light of this notion.

Sense-relations are stateable within a framework which includes the notion of *implication*. This notion may be introduced here by way of the prior concepts of explicit assertion and denial. We will assume that in all languages it is possible to establish rules of correspondence between affirmative and negative sentences; and that the correspondence between a particular affirmative and a particular negative sentence is accounted for by the grammar of the language. Thus the negative sentence *John is not married* corresponds to the affirmative sentence *John is married*. We will now say that a negative sentence *explicitly denies* whatever is *explicitly asserted* by the corresponding affirmative sentence; and on the basis of this notion of explicit assertion and denial we can construct the semantically more interesting notion of *implicit* assertion and denial, or implication. One sentence, S_1, is said to imply another, S_2—symbolically, $S_1 \supset S_2$—if speakers of language agree that it is not possible to assert explicitly S_1 and to deny explicitly S_2. And S_1 implicitly denies S_2—S_1 implies *not* S_2:$S_1 \supset \sim S_2$—if it is agreed that the explicit assertion of S_1 makes impossible, without contradiction, the explicit assertion of S_2.

It should be stressed that implication, in the sense in which it has been defined here, is in principle objectively testable. This does not mean of course that all speakers will necessarily agree that one sentence implies another. As we have already seen, what is normally meant by 'understanding' utterances can be quite well accounted for without making the assumption that all speakers of a language will draw from a given utterance exactly the same set of implications (cf. 9.2.9). What may be assumed is that there is a sufficiently large overlap in the implications that hold for different speakers

to prevent misunderstanding in the majority of instances in which they communicate with one another. Semantic theory must allow for a certain degree of indeterminacy in the number and nature of the implications that hold between the sentences of a language.

2 Synonymy

2.1 A stricter and a looser sense of 'synonymy'

One may distinguish a stricter and a looser interpretation of the term 'synonymy'. According to the stricter interpretation (which is the one most commonly found in contemporary semantic theory) two items are synonymous if they have the same sense. It is this interpretation of synonymy that we shall be discussing in the present section.

The looser interpretation may be illustrated by means of a quotation from *Roget's Thesaurus*: 'Suppose we take the word "nice" . . . Under it [in the Index] we will see . . . various synonyms representing different shades of meaning of the word "nice".' The 'synonyms' given for *nice* in the Index are *savoury, discriminative, exact, good, pleasing, fastidious* and *honourable*. Each of these words itself appears in one of the lists of 'synonyms' in the main body of the text. For instance, turning to the section in which *pleasing* occurs we find 'an array of literally dozens of equivalents . . . expressing every possible shade of meaning'. So too for *good, exact*, etc. The thesaurus therefore provides us with 'an array of hundreds of words and expressions which are at our disposal to use instead of . . . "nice" with which we started'. All these words and expressions are 'synonymous' with *nice* under the looser interpretation of the notion of synonymy.

2.2 Proposals for the quantification of synonymy

It is sometimes suggested that synonymy is a matter of degree; that any set of lexical items can be arranged on a scale of similarity and difference of sense, so that, for example, *a* and *b* might be shown to be identical in sense (strictly synonymous), *a* and *c* relatively similar in sense (loosely synonymous), *a* and *d* less similar in sense, and so on. Various proposals have been made in recent years for the quantification of 'synonymy' along these lines. We shall not discuss any of these proposals here. Even if it were shown that one or other measure of similarity of sense were empirically reliable (applicable by different scholars at different times and consistent in its results) and succeeded in bringing together, as more or less 'synonymous', items which the native speaker felt 'belonged together', we should still be left with the problem of accounting for the differences between the 'synonyms'. (It may be worth pointing out that the practical utility of reference works such as *Roget's Thesaurus* depends upon a prior knowledge of the language

on the part of the person using them. Unless he can himself distinguish correctly between the hundreds of 'equivalents' that he is given for *nice* he can hardly be said to have them 'at his disposal'.) There is no reason to believe that, if *b* and *c* are shown to be 'equidistant' in sense from *a*, they are themselves synonymous and related semantically to *a* in the same way. Suppose, for example, that both *mother* and *son* were shown to be 'equidistant' from *father* according to one of the proposed measures of similarity of sense. How would we interpret this result? We should clearly not wish to say that *mother* and *son* were even 'loosely' synonymous. The sense-relationship between *father* and *mother* is patently, and describably, different from that which holds between *father* and *son*. In short, there is no obvious way of deriving the various sense-relations which are known to be of importance in the organization of the vocabulary from a measure of relative 'synonymy'.

2.3 'Total synonymy' and 'complete synonymy'

It is a widely-held view that there are few, if any, 'real' synonyms in natural languages. To quote Ullmann: 'it is almost a truism that total synonymy is an extremely rare occurrence, a luxury that language can ill afford.' As argued by Ullmann this view rests upon two quite distinct criteria: 'Only those words can be described as synonymous which can replace each other in any given context without the slightest change either in cognitive or emotive import.' The two conditions for 'total synonymy' are therefore (i) interchangeability in all contexts, and (ii) identity in both cognitive and emotive import. We will discuss the validity of the distinction between 'cognitive' and 'emotive' sense presently. For the moment we may take it for granted.

The condition of interchangeability in all contexts reflects the common assumption that words are never synonymous in any context unless they can occur (and have the same sense) in all contexts. We have already referred to and rejected this assumption (9.4.2). Like all sense-relations, synonymy is context-dependent: we will return to this point. The main objection to the definition of synonymy proposed by Ullmann (and others) is that it combines two radically different criteria and prejudges the question of their interdependence. It will be helpful to introduce a terminological distinction at this point. Granted the validity of a distinction between 'cognitive' and 'emotive' sense, we may use the term *complete* synonymy for equivalence of both cognitive and emotive sense; and we may restrict the term *total* synonymy to those synonyms (whether complete or not) which are interchangeable in all contexts. This scheme of classification allows for four possible kinds of synonymy (assuming that only two values are attributed to each of the variables): (1) complete and total synonymy; (2) complete, but not total; (3) incomplete, but total; (4) incomplete, and not total. It is complete and total synonymy that most semanticists have in mind when they talk of 'real' (or 'absolute') synonymy. It is undoubtedly true that there

are very few such synonyms in language. And little purpose is served by defining a notion of 'absolute' synonymy which is based on the assumption that complete equivalence and total interchangeability are necessarily connected. Once we accept that they are not, and at the same time abandon the traditional view that synonymy is a matter of the identity of two independently-determined 'senses', the whole question becomes much more straightforward.

2.4 'Cognitive' and 'emotive' meaning

Many semanticists invoke the distinction between 'cognitive' and 'emotive' (or 'affective') meaning in their discussions of synonymy. The terms themselves clearly reflect the view that the use of language involves two or more distinguishable psychological 'faculties'—the intellect, on the one hand, and the imagination and the emotions, on the other. One of the points that is frequently emphasized, both in technical treatments of semantics and also in the more popular works on the subject, is the importance of 'emotive' factors in linguistic behaviour. It is often said that, by contrast with the vocabulary of scientific and technical discourse, the words of 'everyday language' are charged with emotional 'associations', or 'connotations', over and above their primary, purely 'intellectual' meaning.

There is no need to discuss here the psychological validity of the distinction between the various mental 'faculties' upon which the semantic distinction of 'cognitive' and 'non-cognitive' meaning was originally based. The term 'cognitive' meaning is employed by many scholars who would not necessarily subscribe to the view that the 'intellectual' is sharply distinct from the 'affective'. As far as the actual use of language is concerned, it is undoubtedly true that one word may be preferred to another because of its different emotive or evocative associations. But the extent to which this is of importance varies considerably from one style or situation to another. For instance, Ullmann cites as examples of English words which are cognitively, but not emotively, synonymous *liberty: freedom, hide: conceal*. It is not difficult to think of occasions when a speaker or writer might deliberately use one rather than the other of these synonyms and make his choice on the basis of these 'connotations' which the words are likely to evoke. But there are also many contexts in which either one or the other might be used without any noticeable difference of effect. It would be wrong to assume that the emotive connotations of a word are always relevant to its employment.

A more important point is the following. The distinction between 'cognitive' and 'non-cognitive' synonymy is drawn in various ways by different authors. But in all cases it is 'cognitive' synonymy which is defined first. No one ever talks of words as being 'emotively', but not 'cognitively synonymous'. This fact of itself would be sufficient to suggest that 'emotive', or 'affective', is being used as a catch-all term to refer to a number of quite distinct factors

which may influence the selection of synonyms on particular occasions or in particular contexts. What is required is an account of these factors in terms appropriate to them. No useful purpose is served by employing the undoubtedly relevant category of 'emotive' (or 'affective') connotations for anything that does not come within the scope of 'cognitive' meaning.

Some of the factors which influence or determine our choice between 'cognitively' synonymous words and expressions have nothing to do with sense, reference or anything else that might reasonably be called 'meaning'. Many people deliberately refrain from using the same word more than once in the same utterance, if they can avoid it. Others consciously or unconsciously follow the practice of choosing a shorter word in preference to a longer word, a more 'everyday' word rather than a 'learned' word, an 'Anglo-Saxon' word instead of a Latin, Greek or Romance word, and so on. In writing verse, the particular phonological constraints imposed by the metre or rhyme introduce yet other non-semantic factors.

There are also factors which, though they might well be described as 'semantic', have to do with the situational or stylistic acceptability of particular forms rather than with their sense or reference. We have already seen that there are many 'dimensions' of acceptability that would need to be accounted for in a complete description of linguistic behaviour (cf. 4.2.3). We will say no more about these other determinants of full acceptability here, since we are concerned with the more general principles of semantic structure. It seems preferable to restrict the term 'synonymy' to what many semanticists have described as 'cognitive synonymy'. This is the convention that we will adopt for the remainder of this chapter. As a consequence we shall have no further use for the distinction between 'complete' and 'incomplete' synonymy.

2.5 Synonymy defined in terms of bilateral implication

Synonymy may be defined in terms of bilateral implication, or *equivalence*. If one sentence, S_1, implies another sentence, S_2, and if the converse also holds, S_1 and S_2 are equivalent: i.e. if $S_1 \supset S_2$ and if $S_2 \supset S_1$ then $S_1 \equiv S_2$ (where '$\equiv$' stands for 'is equivalent to'). If now the two equivalent sentences have the same syntactic structure and differ from one another only in that where one has a lexical item, x, the other has y, then x and y are synonymous. An alternative way of formulating the definition of equivalence would be as follows: if S_1 and S_2 each implies the same set of sentences, then they are equivalent to one another. The difficulty with a definition of this form, however, is that it falls foul of the principle that the set of sentences implied by any given sentence is indeterminate (cf. 9.2.10). If we define equivalence in terms of bilateral implication, we may assume that sentences which imply one another also imply the same set of other sentences, unless and until this assumption is proved false in particular instances.

2.6 Synonymy and 'normal' interchangeability

In traditional semantics, synonymy has generally been regarded as a relationship holding between lexical items; and the definition that has just been given takes this view. It is of course possible to extend the application of the term 'synonymy' so that it also covers groups of lexical items that are brought together in a particular syntagmatic construction, as well as single lexical items. One might well say, for example, that the phrases *female fox* and *male duck* are synonymous with the lexical items *vixen* and *drake*, respectively. But it is important to notice that, in making this statement, one is assuming that the phrases and the lexical items are indeed interchangeable in the normal use of the language. By contrast, **male cow* and *bull*, and **female bull* and *cow*, are not normally interchangeable (it may be assumed), even though one can easily imagine a situation in which the simplest way of explaining the meaning of *bull* (to someone who knew the meaning of *cow* and *male*) was by means of the normally unacceptable sentence *A bull is a male cow*. The reason why **female bull* and **male cow* are semantically unacceptable is that neither *bull* nor *cow*, unlike *fox* and *duck*, is 'unmarked' for the distinction of sex (cf. 2.3.7, on *dog* and *bitch*). So much would be undisputed by all semanticists. But the condition of 'normal' interchangeability is here intended to exclude many semantically-compatible (significant) groupings of lexical items, as well as such semantically-incompatible phrases as **male cow*. The phrase *mature female bovine animal* (which might be given as a dictionary definition of *cow*) is undoubtedly well-formed, both grammatically and semantically. But it is probably far less 'normal' a phrase than even the semantically ill-formed **male cow*. The native speaker of English would not 'normally' construct such a phrase as *mature female bovine animal* and use it interchangeably with *cow* in his everyday use of the language. The question of synonymy therefore does not arise in the case of the lexical item *cow* and the phrase *mature female bovine animal*. Alternatively, one might say that the most interesting question that arises in instances of this kind is not whether the relationship of synonymy holds, or how to account for it if it does, but why it is that a lexical item like *cow* and a phrase like *mature female bovine animal* are not in fact freely interchangeable. Many semanticists have failed to see the importance of this question. We will return to it later in connexion with 'componential analysis' (cf. 10.5.5).

2.7 Context-dependent synonymy

One final point may be made about synonymy: more than any other sense-relation, it is *context-dependent*, and in a theoretically interesting way. It is evident that it is not of itself a structural relationship. All instances of synonymy could be eliminated from the vocabulary without affecting the sense of the remainder of the lexical items. The 'impoverished' vocabulary

would offer fewer opportunities for stylistic variety, but everything that could be said with the larger vocabulary could also be said with the smaller synonymy-free vocabulary.

Although synonymy is not essential to the semantic structure of language, it arises in particular contexts, as a consequence of the more fundamental structural relations, hyponymy and incompatibility (to be discussed in the following section). It frequently happens that the distinction between two lexical items is contextually neutralized. For instance, the difference between the marked term *bitch* and the unmarked term *dog* is neutralized in a context, like *My—has just had pups*, which determines the animal referred to as female. All sense-relations are in principle context-dependent, but contextually-determined synonymy is of particular importance. It is clear that it can be brought within the scope of the general principle that the same information may be conveyed in language either syntagmatically or para-digmatically (cf. 2.3.8). One can say either *I'm flying to New York* or *I'm going to New York by air*, either *I'm driving to New York* or *I'm going to New York by car*. In the one case the distinction is made by the paradig-matic choice of the verbs *fly* and *drive*, in the other by the syntagmatic modification of the more general verb *go*. If a particular lexical item is very frequently modified syntagmatically in a particular way, this may have the effect, diachronically, of transferring the distinction from the syntagmatic to the paradigmatic and making the overt syntagmatic modification redund-ant. It is presumably this phenomenon which accounts for the development in the sense of the verb *starve*. At one time, it meant something like 'die' (cf. the genetically-related German *sterben*) and earlier 'to be stiff', but it was commonly modified syntagmatically with *of hunger* and thus acquired the sense it now possesses in modern standard English. (In certain areas of Northern England the typical syntagmatic modification was, and still is, *with cold*, so that *I'm starving* is roughly equivalent to the standard English *I'm freezing*.) The history of the vocabulary of English, and doubtless of all languages, is full of examples of semantic 'specialization' of this kind.

It is important to realize that the contextual determination of a lexical item may be probabilistic rather than absolute. For instance, the substitu-tion of *buy* for *get* in *I'll go to the shop and get some bread* would not generally be held to introduce any additional implications: *buy* and *get* would normally be taken as synonymous in this context. The standard conventions and presuppositions of the society are such that, unless there is some evidence to suggest the contrary, it will be assumed that what is obtained from a shop is obtained by purchase. At the same time, it must be admitted that *get* is not necessarily synonymous with *buy* (even with the syntagmatic support of *from the shop*). The example also illustrates the further point that there is no sharp distinction to be drawn between the probabilistic deter-mination of synonymy by other lexical items in the same utterance and the determination of synonymy by the features of the situation in which the

utterance occurs. If one says *I'm just going to get some bread* as one steps into a shop, the context-dependent synonymy of *get* and *buy* is no weaker than it would be if the words *from the shop* occurred in the utterance. Not only is it no weaker, it is no different in kind, since the same set of cultural presuppositions determine the implications in both cases.

3 Hyponymy and incompatibility

3.1 Hyponymy

Hyponymy and incompatibility are the most fundamental paradigmatic relations of sense in terms of which the vocabulary is structured. Although they are very largely interdependent, we shall for convenience discuss them separately.

The term 'hyponymy' is not part of the traditional stock-in-trade of the semanticist; it is of recent creation, by analogy with 'synonymy' and 'antonymy'. Although the term may be new, the notion of hyponymy is traditional enough; and it has long been recognized as one of the constitu-tive principles in the organization of the vocabulary of all languages. It is frequently referred to as 'inclusion'. For example, the 'meaning' of *scarlet* is said to be 'included' in the 'meaning' of *red*; the 'meaning' of *tulip* is said to be 'included' in the 'meaning' *of flower*; and so on.

This relationship, the 'inclusion' of a more specific term in a more general term, has been formalized by certain semanticists in terms of the logic of classes: the class of entities referred to by the word *flower* is wider than and includes the class of entities referred to by the word *tulip*; the class of entities that may be truly described as *scarlet* is included in the class of entities that may be truly described as *red*; and so on. It will be observed that this formulation of the relationship of 'inclusion' rests upon the notion of refer-ence (since it operates with classes of 'entities' which are named by lexical items). One reason for preferring to introduce the new technical term 'hyponymy' is simply that it leaves 'inclusion' free for the theory of refer-ence and its formalization in terms of class-logic. We have already seen that it is desirable to draw a theoretical distinction between sense and refer-ence. It is important to realize that hyponymy, as a relation of sense which holds between lexical items, applies to non-referring terms in precisely the same way as it applies to terms that have reference.

A more important reason for preferring to use an alternative to 'inclusion' is that 'inclusion' is somewhat ambiguous. From one point of view, a more general term is more 'inclusive' than a more specific term—*flower* is more inclusive than *tulip*—since it refers to a wider class of things. But from another point of view, the more specific term is more 'inclusive'—*tulip* is more inclusive than *flower*—since it carries more 'bits' of information, more 'components' of 'meaning' (cf. 2.4.3, 10.5.1). The difference in the point of

view from which one may consider 'inclusion' corresponds to the difference, in traditional logic and in certain theories of semantics, between the *extension* and the *intension* of a term. The extension of a term is the class of entities to which the term is applicable or refers; the intension of a term is the set of attributes which characterize any entity to which the term is correctly applied. Extension and intension vary inversely in relation to one another: the greater the extension of a term, the less its intension; and conversely. For example, the extension of *flower* is greater than that of *tulip*, since the former term refers to more things; on the other hand, the intension of *tulip* is greater than that of *flower*, since the characterization or definition of tulips must make reference to a wider set of attributes than those which suffice to characterize flowers. It may be mentioned in passing that certain semanticists, notably Carnap, have attempted to draw the distinction between sense and reference in terms of the logical distinction between intension and extension. We have taken the view that the difference between sense and reference is of a quite different order (cf. 9.2.2, 9.4.1, 9.4.2). Confusion is avoided by the employment of a neutral, non-metaphorical term like 'hyponymy'. We will say that *scarlet, crimson, vermilion*, etc., are co-hyponyms of *red*, and *tulip, violet, rose*, etc. co-hyponyms of *flower*. Conversely, we will say that *red* is *superordinate* with respect to its hyponyms (the more obvious Greek-based term 'hyperonym' is not sufficiently distinct acoustically from 'hyponym' in English).

Hyponymy may be defined in terms of unilateral implication. (For instance, *X is scarlet* will be taken to imply *X is red*; but the converse implication does not generally hold.) In the most typical instances, a sentence containing a superordinate term will imply either (i) the disjunction of sentences each containing a different member of a set of co-hyponyms, or (ii) a sentence in which the co-hyponyms are semantically 'co-ordinated', as it were. Both of these possibilities may be illustrated with *I bought some flowers*. This sentence might imply the disjunction of *I bought some tulips, I bought some roses, I bought some violets*, etc. (By 'disjunction' in this context is meant the choice of one from a set of alternatives: if *p* implies the disjunction of *q, r* and *s*, then *p* implies either *q* or *r* or s.) It might also imply a sentence like *I bought some roses and some tulips*, or *I bought some violets and some tulips*, etc. It is of course one of the most convenient features of the principle of hyponymy that it is enables us to be more general or more specific according to circumstances. It would be quite inappropriate to say that *some flowers* is either imprecise or ambiguous (as between 'some roses', 'some tulips', etc., on the one hand, and 'some roses and some tulips', 'a rose and some tulips', etc. on the other).

3.2 *Synonymy as symmetrical hyponymy*

Although a superordinate term does not generally imply its hyponym, it is frequently the case that the situational context or the syntagmatic modification

of the superordinate term will determine it in the sense of one of its hyponyms. This is the source of context-dependent synonymy (cf. 10.2.7). And it suggests the possibility of defining the relationship of synonymy as symmetrical hyponymy: if x is a hyponym of y and if y is also a hyponym of x (i.e. if the relationship is bilateral, or symmetrical), then x and y are synonyms. Drawing upon the terminological distinction made in set-theory and the logic of classes, we may refer to the relationship of unilateral, or asymmetrical, implication which holds between *tulip* and *flower* as *proper hyponymy*. All hyponymy is *transitive*, in the sense that if the relation holds between a and b and also between b and c, then it also holds between a and c. Synonymy, as a special case of hyponymy, has therefore the additional property that it is a *symmetrical* relation (it holds between a and b and between b and a). And for purely formal reasons it may be defined also as *reflexive*: every lexical item is substitutable for, and is synonymous with, itself in the same context. (Synonymy is therefore an equivalence-relation in the mathematical sense of this term.)

3.3 *Absence of superordinate terms*

The main point to be made about the relation of hyponymy as it is found in natural languages is that it does not operate as comprehensively or as systematically there as it does in the various systems of scientific taxonomy (in botany, zoology, etc.). The vocabularies of natural languages tend to have many gaps, asymmetries and indeterminacies in them. For instance, there is no superordinate term in English of which all the colour-words are co-hyponyms. (Logicians frequently cite as an example of analytic implication *If it is red, then it is coloured*. But this implication does not in fact generally hold for all colour-terms in normal English usage. The adjective *coloured* is in contrast with *white* in certain contexts—in sorting out the laundry, in the classification of people according to their race, etc.—and with *transparent* in others: e.g. *There was some coloured liquid in the bottle*—one might also wonder whether *coloured* is in contrast with *white*, as well as with *transparent*, in contexts of this kind.) Similarly, there is no more general adjective of which *square* and *round* are co-hyponyms. On the other hand, there are many words that are commonly regarded as lexical items whose application is so general that they might well be treated as grammatical 'dummies' in 'deep' syntactic analysis: e.g. *come/go, person, thing, event*, etc. At this point, there is a high degree of correspondence between syntax and semantics (cf. 9.5.2).

3.4 *Hierarchical structure of vocabulary*

Many semanticists have been attracted by the possibility of describing the vocabulary of the language in terms of a hierarchical, taxonomic classification

working from the most general to the more specific categories. We have already mentioned *Roget's Thesaurus*, the most famous attempt to analyse the vocabulary of English in this way; and we shall return to the question of the hierarchical structure of the vocabulary in the section devoted to the principles of 'componential analysis' (cf. 10.5.1; also 4.3.3).

The most important factor in the hierarchical organization of the vocabulary by means of the relation of hyponymy is the structure of the culture in which the language operates and in which it serves as the principal medium for communication. It is a truism that words referring to artefacts cannot be defined except in relation to the purpose or normal function of the objects they refer to: e.g. *school*, 'a building where children are taught', *house*, 'a building where people live'. But this is true of the vocabulary as a whole, which is not only 'anthropocentric' (organized according to general human interests and values), but 'culture-bound' (reflecting the more particular institutions and practices of different cultures). Part of what I have referred to as the semantic anisomorphism of different languages (cf. 2.2.1) is accounted for by the fact that individual languages vary considerably in the extension of 'roughly equivalent' terms. It is often possible to identify (in terms of their application: cf. 9.4.8) the hyponyms of a certain term in one language with lexical items in another language without being able to find an equivalent for the superordinate term. As an instance of this phenomenon, we may consider the word *dēmiourgós* in Greek.

Among the hyponyms of *dēmiourgós* (which is usually translated as 'craftsman', 'artisan') we find a large number of terms, including *téktōn, iatrós, aulētḗs, skutotómos, kubernḗtēs*. For each of these there is a satisfactory English equivalent for the purpose of translating the works of the classical authors: 'carpenter', 'doctor', 'flute-player', 'shoemaker', 'helmsman'. But there exists no word in English that is superordinate to all the translation-equivalents of *dēmiourgós* without being also superordinate to other words that are not translation-equivalents of *dēmiourgós*. The distinction between arts, crafts, trades, professions, and so on, is not relevant to the meaning of *dēmiourgós*. Anyone who had a culturally-recognized occupation which required specialized knowledge or training was a *dēmiourgós*. The meaning of this word can only be described in terms of its hyponyms and in terms of the sense-relations it bears to other words in Greek (in particular, to the verb *epístasthai*, 'to know (as a result of study or training)'). In fact, the translation of many of its hyponyms rests implicitly upon the decision to treat certain classes of people and their 'professional' activities as culturally-equivalent. We identify the application of the English word *doctor* and the Greek word *iatrós* by virtue of our decision to treat the cultural, or social, function of those denoted by these words as equivalent; and this decision involves the tacit recognition that many of the activities characteristic of the 'doctor' and the 'iatrós' are culture-bound and irrelevant to what we regard as their 'culture-invariant' function. All translation

from one language to another involves decisions of this kind. It is a sound methodological principle that sense is not held invariant in translation (so that there is no synonymy between words of different languages) but a greater or less degree of equivalence in the 'application' of words. And at the present time semantic theory can do little more than appeal to the bilingual speaker for intuitive judgements of equivalence in the area of 'cultural overlap' (cf. 9.4.7).

3.5 Incompatibility

Incompatibility can be defined on the basis of the relationship of *contradictoriness* between sentences. If one sentence, S_1, explicitly or implicitly denies another sentence, S_2, then S_1 and S_2 are contradictory (S_1 and S_2 are explicitly contradictory if S_1 negates S_2 syntactically, otherwise they are implicitly contradictory: cf. 10.1.2). If S_2 and S_1 are implicitly contradictory sentences of identical deep-syntactic structure, and if they differ only in that where one has the lexical item x the other has y, then x and y are incompatible.

To take a simple, and familiar, example from the colour-terms in English. If someone says *Mary was wearing a red hat*, this will be understood as implicitly denying *Mary was wearing a green (blue white, yellow*, etc.) *hat*. And the substitution of any one of the terms in the set *green, blue, white, yellow*, etc., for *red* would also be taken as implying the denial of *Mary was wearing a red hat*. The colour-terms therefore form a set of incompatible lexical items.

This is obvious enough. What has not always been quite so clear to semanticists is the fact that the incompatibility of *red, green*, etc., is not a secondary consequence of the sense which each of them has (independently as it were) but is necessarily involved in learning and knowing the sense of each of the terms in the set. As we have already seen, the colour-terms taken together exhaust a referential continuum; and learning where to draw the boundaries within the continuum for a particular term, say *blue*, is dependent upon the knowledge that on either side of the boundary is 'not blue' (cf. 9.4.5). In principle, it is perhaps conceivable that the reference of one of the colours could be learned without knowing the items referring to the areas of the continuum beyond the boundaries of 'blue' (i.e. by contrasting *blue* explicitly with *not . . . blue*). One could conceive of the language being learned in an environment which did not provide instances of colour at all 'points' in the continuum. But in practice, one may assume, the reference and sense of the most common colour-terms is learned more or less simultaneously, with continual adjustment of the boundaries until they approximate to the norm for the speech-community. Further lexical differentiation is then possible on the basis of hyponymy, *red* being 'subdivided' into *crimson, scarlet*, and so on. But the further differentiation will vary considerably as

between individual speakers. Those whose profession or interests require them to draw more numerous distinctions of colour will develop a very rich colour-terminology. But they will do so subsequently to the acquisition of the 'grosser' distinctions characteristic of the non-specialized vocabulary of the community as a whole.

3.6 Incompatibility and difference of sense

Incompatibility is to be distinguished from mere difference of sense. This is particularly clear in the case of incompatible co-hyponyms of a superordinate term, which are different within some 'dimension' of similarity of sense. For instance, *crimson* and *soft* are different in sense, but not incompatible: both adjectives may be applied to the same object without contradiction. On the other hand, *crimson* and *scarlet* are similar in sense (their similarity being stateable as co-hyponymy with respect to *red*), but incompatible. The 'higher-level' incompatible terms *red, green, blue*, are also similar in sense, although there is no superordinate term of which they are co-hyponyms.

The distinction between incompatibility and difference of sense is less clear in other instances; notably in the case of words which denote physical 'objects' (whether 'natural' or manufactured). The words *chair* and *table* are incompatible (we will neglect the theoretically-uninteresting complications introduced by the consideration of dual-purpose furniture), but we might be inclined to say, and no doubt correctly, that the meaning of the one could be learned independently of the other. Of course, we would not say that anyone knew the meaning of *table* if he used the word to refer to objects which other speakers of English described as 'chairs'. The question is whether there is any 'dimension' of sameness prior to the distinction of the two incompatible terms. The same question can be put in relation to the words *door* and *window*. In the case of *table* and *chair* there is the superordinate term *furniture*; there is no such term which brings together *door* and *window*. But the existence or non-existence of a superordinate seems to be of relatively small importance here. And when we consider such pairs of words as *chair* and *cow* (or a host of other lexical items—to use Lewis Carroll's example, *shoe, ship, sealing wax* or *cabbage* and *king*) which semantically have nothing in common other than the fact that they denote physical entities, there is little point in distinguishing between incompatibility and difference of sense. It is in the case of sets of lexical items which give structure to a continuum that the relation of incompatibility is of crucial importance in both the learning and the use of language. And it would be a mistake to think that the distinction between incompatibility and mere difference does not apply at all to the lexical classification of words which denote persons, animals and physical objects. One has only to think of such sets as *tree, shrub, bush*, etc., to see that the distinction is of importance here also.

One final point should be made in connexion with the notions of hyponymy and incompatibility. We have repeatedly stressed the principle that the same semantic distinctions can be made either paradigmatically or syntagmatically. To give yet another example, English draws a paradigmatic distinction between *brother* and *sister*. Turkish does not: the word *kardeş* is 'unmarked' with respect to the distinction of sex, but may be 'marked' by syntagmatic modification if one wishes to make clear the sex of the person referred to: *kizkardeş*, 'sister' ('girl-brother', as it were). Other languages make a paradigmatic distinction between 'eldest son', 'younger son', etc.

4 Antonymy, complementarity and converseness

4.1 'Oppositeness' of meaning

Antonymy, or 'oppositeness of meaning', has long been recognized as one of the most important semantic relations. However, it has been the subject of a good deal of confusion, partly because it has generally been regarded as complementary to synonymy and partly because most semanticists have failed to give sufficient attention to different kinds of 'oppositeness'. Synonymy and antonymy, as we shall see, are sense-relations of a very different kind. For simplicity, we will distinguish terminologically between three types of 'oppositeness'; and we will reserve the term 'antonymy' for just one of the three types. A fuller treatment of 'opposites' would draw more distinctions than we have space for here.

4.2 Complementarity

The first relation of 'oppositeness' to be discussed is that which holds between such pairs of words as *single:married, male:female*, etc. We will use the term *complementarity* for this, saying that *single* and *married*, or *male* and *female*, are complementaries. It is characteristic of such pairs of lexical items that the denial of the one implies the assertion of the other and the assertion of the one implies the denial of the other: $\sim x \supset y$ and $y \supset \sim x$. Thus, *John isn't married* implies *John is single*; and *John is married* implies *John is not single*. In the case of those pairs for which we are reserving the term 'antonymy' (*e.g. good:bad, high:low*), only the second of these implications holds: $y \supset \sim x$. *John is good* implies the denial *of John is bad*; but *John is not good* does not imply the assertion of *John is bad*.

Complementarity may be regarded as a special case of incompatibility holding over two-term sets. The assertion of one member of a set of incompatible terms implies the denial of each of the other members in the set taken separately (*red* implies $\sim blue$, $\sim green$, etc.); and the denial of one member of a set of incompatible terms implies the assertion of the

disjunction of all the other members (~*red* implies either *green* or *blue* or . . .). In a two-term set of incompatible terms, there is only one other member. Conjunction and disjunction therefore fall together: 'both *y* and *z*' and 'either *y* or *z*' amount to the same thing if *y* and *z* have the same value. And from this fact there follow the particular conditions of complementarity mentioned above. It would be erroneous, however, to suppose that complementarity is merely the limiting case of incompatibility with the set of incompatible terms reduced, accidentally as it were, to two. Dichotomization is a very important principle in the semantic structure of language. We will take up this point below.

Everything that has been said so far about complementarity and the implications between lexical items which determine this relation presupposes the applicability of the complementary terms. The use of the dichotomous terms *married* and *single* presupposes the applicability of whatever might be the culturally accepted criteria of 'marriageability'. *John isn't married* is hardly less anomalous semantically than *The stone isn't married*, if the person referred to as *John* is not in fact 'marriageable' (by virtue of age and other criteria).

A further point should be noticed in connexion with complementary terms. Although it is *normally* the case that the denial of the one implies the assertion of the other and the assertion of the one implies the the denial of the other, it is generally possible to 'cancel' either or both of these implications. But this fact should not be taken as sufficient to invalidate the normal usage of complementary terms. The point may be made more clearly perhaps by taking the complementaries *male* and *female* as illustrative of the general principle of 'normality' as it is intended to be understood here. Granted the applicability of the distinction of sex, there is a first-level, normal dichotomy into *male* and *female*; and this dichotomy reflects the assumption that a number of different biological and behavioural characteristics will 'normally' be associated in the same person or animal. There are, however, many cases where the dichotomous classification is unsatisfactory either biologically or behaviourally, and then the terms *hermaphrodite* or *homosexual* are available to take account of these 'abnormalities'. Most of the complementary terms in the everyday vocabulary of languages would seem to operate in the same way within the framework of the relevant presuppositions, beliefs and conventions subsumed under the notion of 'restricted context' (cf. 9.3.9). As Moravcsik has pointed out, in a paper devoted to the discussion of the philosophical distinction of the analytic and the synthetic, it is not difficult to think of circumstances in which one might wish to assert of the same person that he was both a *bachelor* and *married* (or neither *single* nor *married*). This situation might arise, if the person in question was not in fact married according to the law and customs of the society, but nevertheless lived and behaved in a way characteristic of people to whom the term *married* is applied 'normally' (living regularly with one woman, having

children by her and maintaining a home, etc.). The fact that it is possible to 'cancel' some of the implications of the first-level dichotomous classification means that in such cases the implications can only be regarded as 'normally', and not 'absolutely', analytic. But this principle holds for sense-relations in general.

Not only is it possible to conceive of situations in which the assertion of one term does not necessarily imply the denial of its complementary, but it is also possible to qualify a complementary term, 'abnormally', with *more* or *less*. One can say, for instance, that one person is *more married* than someone else (implying that his behaviour is more typical of what is 'normally' characteristic of married men). This is perhaps unusual, but it is a possibility which semantic theory should allow for. What is involved is the qualification of one or more of the presuppositions which determine the 'normal' interpretation of the term in question. However, in their 'normal' usage complementary terms are not qualifiable, or gradable, in this way.

4.3 Antonymy

The relation to which we are giving the name *antonymy* (to the exclusion of other kinds of 'oppositeness') may be exemplified by the terms *big* and *small* in English. It is characteristic of antonyms of this class, 'opposites' *par excellence*, that they are regularly gradable. *Grading* (in the sense in which the term is being employed here—it is borrowed from Sapir, to whom we shall refer presently) is bound up with the operation of comparison. The comparison may be explicit or implicit. Explicitly comparative sentences fall into two types. (1) Two things may be compared with respect to a particular 'property', and this 'property' predicated of the one in a greater degree than it is of the other: e.g. *Our house is bigger than yours.* (2) Two 'states' of the same thing may be compared with respect to the 'property' in question: e.g. *Our house is bigger than it used to be.* Actual utterances (taken out of context) may be ambiguous as between the two types of explicit comparison: e.g. *Our house is bigger*, which is presumably derived from a sentence of either one type or the other by the deletion of the phrase or clause introduced by *than*. But they are still explicitly comparative, and can only be interpreted if the other term of the comparison is recoverable from the context.

Both types of explicit comparison may be combined in the same sentence: e.g. *Our house is bigger than yours used to be, He is taller than his father was.* But the semantic interpretation of these more complex comparative sentences does not seem to introduce any additional problems. In fact, each of the two simpler types of explicit comparison may be subsumed under a more general formula which also covers the more complex sentences:

$$Comp \left\{ ([NP_1, x]T_i + M_k + A_m) ([NP_2, x]T_j + M_l + A_n) \right\}$$

In this formula, '*NP*' stands for 'noun-phrase' (denoting the thing or things being compared), '*x*' stands for the particular lexical item which is graded (in English, this is generally realized with the suffix *-er*, e.g. *bigger*, or with the word *more* preceding the uninflected adjective, e.g. *more beautiful*), 'T' stands for 'tense', 'M' for 'mood' and 'A' for 'aspect'. The subscripts distinguish the different values which may be assumed by the noun-phrase and by the markers of tense, mood and aspect. In terms of the formula, the sentence *Our house is bigger than yours used to be* might be analysed as:

$$Comp \{ ([Our\ house,\ big] T_{non-past} + M_0 + A_0)$$
$$([Your\ house,\ big] T_{past} + M_0 + A_{habitual}) \}$$

This analysis is not definitive, but merely illustrative of the variable factors involved. As we have already seen, the analysis of tense, mood and aspect in English is a complicated matter (cf. 7.5.8). For simplicity of exposition, we have shown tense, mood and aspect as independent variables in the formula: from the syntactic point of view this is quite unsatisfactory, but it does not affect the point being made here. The subscript 0 ('zero') indicates the 'unmarked' term in a category; the other subscripts are self-explanatory. The corresponding non-comparative sentences are *Our house is big* (modally and aspectually unmarked and non-past) and *Your house used to be big* (modally unmarked, habitual in aspect and past). The reason why the semantic analysis of the comparative sentence *Our house is bigger than yours used to be* does not proceed by way of a prior semantic analysis of the syntactically-embedded sentences *Our house is big* and *Your house is big* will occupy us presently.

In the case of our model sentence, *Our house is bigger than yours used to be*, the two noun-phrases are different (NP_1 does not equal NP_2) and so are the values of T and A ($T_i \neq T_j$ and $A_m \neq A_n$). The two simpler types of explicit comparison can be derived from the formula by imposing a condition of identity either between NP_1 and NP_2 or between i and j, k and l, and m and n. In *Our house is bigger than yours* the second, but not the first, identity holds ($i = j$, $k = l$ and $m = n$, but $NP_1 \neq NP_2$). In *Our house is bigger than it used to be* it is the other way round ($NP_1 = NP_2$; but, although $k = l$, $i \neq j$ and $m \neq n$). If both identities hold simultaneously the result is of course a contradictory sentence: *Our house is bigger than it is*.

Given this formal framework, we can state the most important defining characteristic of the relation of antonymy. If *x* and *y* are antonyms, then a comparative sentence containing *x* of the form

(i) $Comp\{ ([NP_1, x] T_i + M_k + A_m)([NP_2, x] T_j + M_l + A_n) \}$

both implies and is implied by a corresponding comparative sentence containing *y*:

(ii) $Comp\{ ([NP_2, y] T_j + M_l + A_n)([NP_1, y] T_i + M_k + A_m) \}$

To exemplify: *Our house is bigger than yours used to be* both implies and is implied by *Your house used to be smaller than ours is; Our house is bigger than yours* implies and is implied by *Your house is smaller than ours*; and *Our house is bigger than it used to be* implies and is implied by *Our house used to be smaller than it is* (*now*). The English words *big* and *small* are therefore antonyms in a range of contexts illustrated by these sentences.

4.4 'Implicitly graded' antonyms

We may now consider sentences in which antonyms are not explicitly graded. First of all, it may be observed that the denial of the one does not imply assertion of the other. *Our house is not big* does not imply *Our house is small* (although *Our house is big* does imply *Our house is not small*). This is a fact well-known to logicians; and it distinguishes antonyms from complementaries. More important, however, is the fact that sentences containing antonyms are always implicitly, if not explicitly, comparative. This was pointed out many years ago by Sapir, in a passage that deserves to be quoted in full:

'Such contrasts as *small* and *large, little* and *much, few* and *many*, give us a deceptive feeling of absolute values within the field of quantity comparable to such qualitative differences as *red* and *green* within the field of color perception. This feeling is an illusion, however, which is largely due to the linguistic fact that the grading which is implicit in these terms is not formally indicated, whereas it is made explicit in such judgements as "There were *fewer* people there *than* here" or "He has *more* milk *than* I". In other words, *many*, to take but one example, embodies no class of judgements clustering about a given quantity norm applicable to every type of experience, in the sense in which *red* or *green* is applicable to every experience in which color can have a place, but is, properly speaking, a purely relative term which loses all significance when deprived of its connotation of "more than" and "less than". *Many* merely means any number taken as a point of departure. This point of departure obviously varies enormously according to context.' Sapir goes on to observe, later in the same article: 'contrasting qualities are felt as of a relatively absolute nature, so to speak, and *good* and *bad*, for instance, even *far* and *near*, have as true a psychological specificity as *green* and *yellow*. Hence the logical norm between them is not felt as a true norm but as a blend area in which qualities graded in opposite directions meet. To the naive, every person is either good or bad; if he cannot be easily placed, he is rather part good and part bad than just humanly normal or neither good nor bad.'

The importance of this insight into the nature of antonyms should not be underestimated. Many pseudo-problems have arisen in logic and philosophy as a consequence of the failure to appreciate that such words as *big* and *small*, or *good* and *bad*, do not refer to independent, 'opposite' qualities, but are merely lexical devices for grading as 'more than' or 'less than' with respect to some implicit norm. Plato was troubled, for instance, by the fact that, if one asserted of X that he was 'taller than' Y but 'shorter than' Z, one appeared to be committed to the simultaneous predication of the two 'opposite' qualities 'tallness' and 'shortness' of the same person—that X was both tall and short. A similar pseudo-problem is exemplified by sentences such as *A small elephant is a large animal*. If *small* and *large* are regarded as merely incompatible, or complementary, terms, this sentence should be contradictory (cf. *A male elephant is a female animal*). But it is not; and, however we choose to formalize the rules or principles of semantic interpretation, what should be formalized by the rules is quite clear. The implicit 'size-norm' for elephants is not necessarily the same as the implicit 'size-norm' for animals taken as a whole class. The semantic analysis of *A small elephant is a large animal* should take something like the following form: 'An elephant which is small-rather-than-large by comparison with the norm relevant for elephants is (nevertheless) large-rather-than-small by comparison with the norm relevant for animals'.

It is because explicitly ungraded antonyms are understood as implicitly graded with reference to some relevant norm that a comparative sentence such as *Our house is bigger than yours* (or *Our house is bigger than yours used to be*) cannot be satisfactorily analysed, from the semantic point of view, on the basis of the analysis of the syntactically-embedded sentences *Our house is big* and *Your house is (or used to be) big*. A sentence like *Our house is big* is, semantically, a comparative: 'Our house is bigger than the normal house.'

The implicit grading of antonyms also accounts for the fact that there is no contrast between the two members of a particular pair in 'unmarked' questions (and in various other syntactic functions). For instance, the sentence *How big is it?* does not presuppose that the object of the inquiry will be classed as 'big' rather than 'small', but is completely open, or 'unmarked', as to the expectations of the inquirer. It may be regarded as equivalent to 'Is it big or small?'. The question brings into the discussion a scale recognized by the participants as relevant and asks that the object be measured, as it were, along this scale. The first-level measurement is in terms of the dichotomy 'big-rather-than-small' or 'small-rather-than-big' (by comparison with the norm). If the first-level description as *big* or *small* is not sufficiently precise for the purpose, it is always possible to put the further, 'marked' questions *Hów big is it?* or *Hów small is it?* (which differ in stress and intonation from the 'unmarked' *How big is it?*—this difference is summarized, for the present purpose, in the acute accent on the word *hów?* in the 'marked' questions). The 'marked' questions *Hów big is it?* and *Hów small is it?* carry with them

the presupposition that the object in question has already been placed towards one end of the scale rather than the other, and seek further specification of the place of the object on the scale relative to the relevant 'size-norm'.

The opposition between antonyms is 'neutralized', not only in 'unmarked' questions of the kind illustrated in the previous paragraph, but also in various nominalizations: *What is the width of the river? Everything depends upon the height*, etc. The nouns *narrowness* and *lowness* would not occur in such contexts. In general, only one of a pair of antonyms will occur in 'unmarked' contexts (*big, high, wide, good, tall*, etc.); and it is worth observing that many of the nominalizations of these 'unmarked' forms are irregular in English (cf. *big: size, high: height, wide: width*, etc.) by contrast with the less frequent 'marked' forms (*small: smallness, low: lowness, narrow: narrowness*, etc.). The fact that the distinction between antonyms is neutralized in certain syntactic positions contributes, no doubt, to our feeling that one antonym has a 'positive', and the other a 'negative', polarity. We tend to say that small things 'lack size', rather than large things 'lack smallness'. And, in general, the 'unmarked' antonym is used for what is felt as 'more than', rather than 'less than', the norm.

4.5 Converseness

The third sense-relation which is frequently described in terms of 'oppositeness' is that which holds between *buy* and *sell* or *husband* and *wife*. We will use the term *converseness* to refer to this relation. The word *buy* is the converse of *sell*, and *sell* is the converse of *buy*.

Although antonymy and converseness must be distinguished, there is a parallelism between the two relations. As NP_1 *bought* NP_3 *from* NP_2 implies, and is implied by, NP_2 *sold* NP_3 *to* NP_1 so NP_1 *is bigger than* NP_2 implies, and is implied by, NP_2 *is smaller than* NP_1. In both cases the lexical substitution of one term for the corresponding antonym or converse is associated with a syntactic transformation which permutes the noun-phrase, NP_1 and NP_2, and also carries out certain other 'automatic' changes in the selection of the appropriate preposition (or case-inflexion, in other languages). It may be observed that this 'permutational' feature is also characteristic of the relationship between corresponding active and passive sentences: NP_1 *killed* NP_2 implies, and is implied by, NP_2 *was killed by* NP_1. In English it is possible to form passive sentences in which the 'surface' subject is identical with the 'indirect object' of the corresponding active sentence. *John's father gave him a book* is related semantically to both (i) *John was given a book by his father*, and (ii) *John received a book from his father*. In many languages (including French, German, Russian, Latin, etc.) the 'indirect object' cannot be transformed into the 'surface' subject of a passive sentence in this way; and *John was given a book by his father* would be translated (to use French for exemplification) as either *Le père de Jean lui a donné un livre* ('John's

father gave him a book') or *Jean a reçu un livre de son père* ('John received a book from his father').

The consideration of the verbs for 'marry' in various Indo-European languages is illuminating from the point of view of the relation of converseness. (When we say that all these verbs are 'equivalent in meaning' we are, of course, invoking the notion of 'application' and 'cultural overlap': cf. 9.4.8. It is only 'rough' equivalence anyway, as we shall see.) The English verb *marry* is symmetrical, or reciprocal, in that NP_1 *married* NP_2 implies, and is implied by, NP_2 *married* NP_1. (We are not here talking of the transitive, or 'causative', verb exemplified in *The priest married them* and *They were married by the priest*, but of the verb that occurs in such sentences *as John married Jane* or *Jane married John*.) In a number of languages, including Latin and Russian, there are two lexically-distinct, converse, verbs or verb-phrases. In Latin, for instance, *nubere* is used if the subject of the (active) sentence is a woman and *in matrimonium ducere* ('to bring into wedlock') if the subject is a man. In Greek, the active of the verb *gameîn* is employed for the man and the middle (or occasionally the passive) of the same verb for the woman: it is as if one were to say in English *John married Jane* but *Jane got herself married to John* ('middle') or *Jane was married by John* (passive). These three possibilities illustrate the way in which 'the same relationship' between two persons or things may be expressed by means of a symmetrical 'predicator' (like *marry*), by lexically-distinct 'predicators' (like *nubere* and *in matrimonium ducere*) or by the 'grammaticalization' of the asymmetry according to the syntactic resources of the language (as with *gameîn*).

The vocabulary of kinship and social status provides many instances both of symmetry and of converseness. NP_1 *is* NP_2*'s cousin* implies, and is implied by, NP_2 *is* NP_1*'s cousin*, but NP_1 *is* NP_2*'s husband* implies, and is implied by, NP_2 *is* NP_1*'s wife*. Converseness also intersects with complementarity (of sex), so that NP_1 *is* NP_2*'s father* implies either NP_2 *is* NP_1*'s son* or NP_2 *is* NP_1*'s daughter*, NP_1 *is* NP_2*'s niece* implies either NP_2 *is* NP_1*'s uncle* or NP_2 *is* NP_1*'s aunt*, and so on.

Other lexical items are 'permutationally' related in the same way as converse terms, although they do not imply one another. For example, NP_1 *asked* (NP_2) . . . 'expects', rather than implies, NP_2 *answered* (NP_1) . . . ; and NP_2 *answered* (NP_1) . . . 'presuppose' NP_1 *asked* (NP_2) . . . Similarly, NP_1 *offered* NP_3 *to* NP_2 'expects' the disjunction of the complementary sentences NP_2 *accepted* NP_3 and NP_2 *refused* NP_3. 'Expectancy' and 'presupposition' of this kind are ordered with respect to temporal sequence: this is not so, it should be noted, in the case of such converse terms as *give* and *receive*.

4.6 A parallelism between antonymy and complementarity

We have noted the parallelism between converse terms and explicitly graded antonyms (and the purely grammatical transformation by which active and

passive sentences are related). It is no less important to stress the parallelism between antonymy and complementarity. They are alike in that the assertion of a sentence containing an antonymous or complementary term implies the denial of a corresponding sentence containing the other antonym or complementary. This being so, one might envisage the elimination from the vocabulary of all instances of both antonyms and complementarity. Instead of *John is single*, one could say, equivalently, 'John is not married'; and instead of *The house is small* and *The house is big*, 'The house is less big' and 'The house is more big' ('than the norm' being understood). The fact is that we do not; and this, as Sapir pointed out in the article referred to above, is one of the facts which 'so often renders a purely logical analysis of speech insufficient or even misleading'.

The existence of large numbers of antonyms and complementary terms in the vocabulary of natural languages would seem to be related to a general human tendency to 'polarize' experience and judgement—to 'think in opposites'. Although we have distinguished between complementaries, such as *single* and *married*, and antonyms, such as *good* and *bad* (and it is important to draw this distinction), it is noticeable that the difference between them is not always clear-cut in the 'logic' of everyday discourse. If the answer 'No' is given to the question 'Was it a good film?', this will probably be understood to imply, 'It was a bad film', unless the person answering the question goes on to qualify his denial and make clear, as it were, that he is not content to make his judgement in terms of the polarized contrast of *good* and *bad*. It may well be therefore that the gradability of antonyms (though not their implicit reference to some accepted norm of comparison) is 'psycholinguistically' secondary—that is, something which speakers are conscious of and utilize only when a first-level dichotomization into 'yes' and 'no' is insufficient.

5 Componential analysis and universal semantics

5.1 Preliminary discussion

What is meant by the term 'componential analysis' in semantics is best explained by means of a simple example—one that has often been used for this purpose by linguists. Consider the following sets of English words:

(1) *man*   *woman*   *child*
(2) *bull*   *cow*   *calf*
(3) *rooster* *hen*   *chicken*
(4) *drake*   *duck*   *duckling*
(5) *stallion* *mare*   *foal*
(6) *ram*   *ewe*   *lamb*

On the basis of our intuitive appreciation of the sense of these words we can set up such proportional equations as the following:

man:woman:child::bull:cow:calf

This equation expresses the fact (and for the moment we may assume that it is a fact) that, from the semantic point of view, the words *man, woman* and *child*, on the one hand, and *bull, cow* and *calf*, on the other, all have something in common; furthermore, that *bull* and *man* have something in common, which is not shared by either *cow* and *woman* or *calf* and *child*; that *cow* and *woman* have something in common, which is not shared by either *bull* and *man* or *calf* and *child*; that *calf* and *child* have something in common that is not shared by either *bull* and *man* or *cow* and *woman*. What these different groups of words have in common we will call a *semantic component*. (Other terms have also been used in the literature: 'plereme', 'sememe', 'semantic marker', 'semantic category', etc.; references will be found in the notes.)

Let us now introduce some elementary arithmetical considerations. Given a numerical proportion (what the Greek mathematicians and grammarians called an 'analogy': cf. 1.2.3) of the general form

a:b::c:d

where the first of the four expressions divided by the second is equal to the third divided by the fourth, we can factorize the proportion into what for the present purpose we may call its 'components'; and we can then refer to each of the four expressions as the *product* of a pair of components. (We have already made use of this parallel in our discussion of the distributional definition of the morpheme: cf. 5.3.3.) For example, from the proportion

2:6::10:30

we can extract the components 1, 2, 3 and 10. The proportion can then be restated as

$(2 \times 1):(2 \times 3)::(10 \times 1):(10 \times 3)$

where 2 is analysed as the product of 2 and 1; 6 as the product of 2 and 3; and so on. In this instance, three of the components are *prime numbers*, 1, 2 and 3; the fourth, 10, is not. However, in the case of numerical proportions we can always discover whether a given number is a prime or not; and, if it is not, we can determine its *ultimate components*—the set of prime numbers in terms of which it can be factorized. For the present purpose, we

may assume that the process of factorization rests upon the availability of all the relevant proportions. For instance, if we have available the further proportion 1:2:15:10, we could factorize 10 into the prime numbers 2 and 5; and we could then express our original proportion as

$(2 \times 1):(2 \times 3)::((2 \times 5) \times 1):((2 \times 5) \times 3)$

Each of the four expressions is now restated as the product of its ultimate components.

Let us now apply these considerations to the analysis of the English words given above. From the proportion *man:woman::bull:cow*, we can extract four components of sense: we will refer to these as (male), (female), (adult-human), (adult-bovine). At this stage of the analysis, if one were actually analysing the words on the basis of proportional equations, (adult-human) and (adult-bovine) would be regarded as single components. But as soon as we restate the proportion *man:woman:child::bull:cow:calf* as

(male) × (adult-human):(female) × (adult-human):(non-adult-human)
::(male) × (adult-bovine):(female) × (adult-bovine):(non-adult-bovine)

we can extract the further components (adult) and (non-adult). No one of these components, it should be observed, is assumed to be an ultimate component (a 'prime'): it is conceivable that, by bringing forward for comparison other words of English and setting up further proportions, we should be able to factorize (human) or (male) into 'smaller' semantic components, just as we factorized 10 into 5 and 2. Eventually we might hope to describe the sense of all the words in the vocabulary in terms of their ultimate semantic components. Assuming that the proposed analysis of the few English words given above is correct as far as it goes (and we will presently consider what 'correct' means here), we can say that the sense of *man* is the product of the components (male), (adult) and (human); that the sense of *mare* is the product of (female), (adult) and (equine); and so on.

The componential approach to semantics has a long history in linguistics, logic and philosophy. It is inherent in the traditional method of definition by dividing a genus into species and species into subspecies; and this method of definition is reflected in most of the dictionaries that have ever been compiled for particular languages, and in the organization of such works as *Roget's Thesaurus* (cf. 10.2.1). A number of attempts have been made in recent years to formalize these traditional principles of semantic analysis. We may begin by discussing some of the more important assumptions upon which current componential theories of semantics are based or with which they are frequently associated. The first is the assumption that the semantic components are language-independent, or universal.

5.2 The alleged universality of semantic components

It has frequently been suggested that the vocabularies of all human languages can be analysed, either totally or partially, in terms of a finite set of semantic components which are themselves independent of the particular semantic structure of any given language. According to this view (which has been a commonplace of philosophical and linguistic speculation since the seventeenth century) the semantic components might be combined in various ways in different languages (and thus yield 'senses' or 'concepts' unique to particular languages), but they would themselves be identifiable as the 'same' components in the analysis of the vocabularies of all languages. To quote Katz, who has put forward this view in a number of recent publications: 'Semantic markers [i.e. semantic components] must ... be thought of as theoretical constructs introduced into semantic theory to designate language invariant but language linked components of a conceptual system that is part of the cognitive structure of the human mind.'

Little need be said about the alleged universality of semantic components, except that it is an assumption which is commonly made by philosophers and linguists on the basis of their anecdotal discussion of a few well-chosen examples from a handful of the world's languages.

Chomsky has suggested: 'It is surely our ignorance of the relevant psychological and physiological facts that makes possible the widely held belief that there is little or no a priori structure to the system of "attainable concepts".' The first point that should be made about this remark is simply that the belief that there are few, if any 'universal, language-independent constraints upon semantic features [i.e. semantic components]' is probably most widely-held among those linguists who have had some experience of the problems of trying to compare the semantic structure of different languages in a systematic fashion: many have tried, and failed, to find a set of universal components. The second point is that, although Chomsky's own work contains a number of interesting, and probably correct, observations about certain classes of lexical items (e.g. 'proper names, in any language, must designate objects meeting a condition of spatio-temporal contiguity', 'the color words of any language must subdivide the color spectrum into continuous segments', 'artifacts are defined in terms of certain human goals, needs and functions instead of solely in terms of physical qualities'), such observations do not go very far towards substantiating the view that there is 'some sort of fixed, universal vocabulary [of semantic components] in terms of which [possible concepts] are characterized'.

It may well be that future developments in semantics, psychology, physiology, sociology, anthropology, and various other disciplines, will justify the view that there are certain 'language invariant but language linked components of a conceptual system that is part of the cognitive structure of

the human mind', as Katz has suggested. Such empirical evidence as there is available at the present time would tend to refute, rather than confirm, this hypothesis.

5.3 Componential analysis and conceptualism

It is obvious that the value of componential analysis in the description of particular languages is unaffected by the status of the semantic components in universal terms. It should also be realized that componential theories of semantics are not necessarily 'conceptualist', or 'mentalistic'. This point is worth stressing, since not only Katz and Chomsky, but also Hjelmslev, Jakobson, and many others who have advocated a componential approach to semantics, have done so within a philosophical and psychological framework which takes it for granted that the sense of a lexical item is the 'concept' associated with this item in the 'minds' of the speakers of the language in question. For example, Katz introduces the notion of semantic components (or 'semantic markers') as follows: 'Consider the idea each of us thinks of as part of the meaning of the words "chair", "stone", "man", "building", "planet", etc., but not part of the meaning of such words as "truth", "togetherness", "feeling", "shadow", "integer", "departure", etc.—the idea that we take to express what is common to the meaning of the words in the former group and that we use to conceptually distinguish them from those in the latter. Roughly, we might characterize what is common to our individual ideas as the notion of a spatially and contiguous material thing. The semantic marker (Physical Object) is introduced to designate that notion.'

We have already suggested that semantic theory should avoid commitment with respect to the philosophical and psychological status of 'concepts', 'ideas' and the 'mind' (cf. 9.2.6). Here it is sufficient to observe that what Katz has to say about the difference between the two groups of words can be stated without employing the term 'concept' or 'idea'. The first group of words denote things which are, or can be, described in English as 'physical objects' (the expression 'physical object' is of course itself made up of English words); the second group of words do not. Whether the correct application of the first group of words to their referents presupposes that the speaker has some 'idea' of 'physical object' in his 'mind' is a psychological question which we may leave on one side. The important question for the linguist is whether there are any facts pertaining to the acceptability or unacceptability of sentences, or to the relations of implication which hold between sentences, which can be described by assigning to all the words of the first group a distinctive semantic component, which we will agree to call '(physical object)'. The answer to this question carries no implications whatsoever for the dispute between various schools of philosophy and psychology about the status of 'mental concepts'.

5.4 *Apparent advantages of the componential approach*

At first sight, the componential approach to semantics would seem to have one striking advantage over other approaches: in terms of the same set of components one can answer two different questions. The first question has to do with the semantic acceptability of syntagmatic combinations of words and phrases: whether a given combination is to be generated as significant or excluded as meaningless. The second question is this: what is the meaning (i.e. the sense) of a particular combination of lexical items? We will take each of these questions in turn.

We have said that the significance of grammatically well-formed sentences (and parts of sentences) is traditionally accounted for in terms of certain general principles of 'compatibility' between the 'meanings' of their constituent lexical items (cf. 9.3.11). One way of stating this notion of semantic 'compatibility' is to say that the relevant semantic components of the lexical items in the syntagmatic combination generated by the syntax must not be *contradictory*. Let us assume, for example, that the word *pregnant* contains a component which restricts it to the modification of nouns which contain the component '(female)'. On the basis of this fact ('modification' being interpreted by the syntactic rules of the language) such phrases as *the pregnant woman* or *a pregnant mare* would be generated as significant and such phrases as *the pregnant man* or *a pregnant stallion* would be excluded as meaningless ('uninterpretable'). Whether such phrases as *the pregnant duck* are significant would presumably be decided with reference to further components of sense associated with the word *duck* and further restrictions imposed upon the combinability of *pregnant* with nouns.

There is no doubt that this is an elegant way of accounting for the combinatorial restrictions which hold between lexical items in particular grammatical constructions. It is to be noted, however, that any comprehensive treatment of the significance of sentences in such terms presupposes an adequate syntactic analysis of sentences and satisfactory rules for the semantic interpretation of the relevant grammatical relations. The example that has just been given, which involved the 'modification' of a noun by an 'adjective', is one which has never been regarded as particularly troublesome by semanticists. Its formalization within the framework of current syntactic theory is trivial by comparison with the problem of formalizing the vast majority of the relations of semantic 'compatibility' which hold in the sentences of any language. In the last few years there has been a remarkable concentration of interest upon the problems attaching to the formalization of different relations of semantic 'compatibility' (notably by Katz, Weinreich and Bierwisch). So far the results are not impressive, despite the sophistication of the formal apparatus that has been developed; and it would seem that progress in this area is dependent upon the construction of a more appropriate theory of syntax than is yet available.

The second question that componential analysis sets out to answer is 'What meaning does a given sentence or phrase have?' The general answer to this question is that the meaning of a sentence or phrase is the 'product' of the senses of its constituent lexical items; and the sense of each lexical item is the 'product' of its constituent semantic components. The meaning of a sentence or phrase is therefore determined by 'amalgamating' all the semantic components of the lexical items according to a set of 'projection rules' which are associated with deep-structure grammatical relations. It was suggested in the previous paragraph that current syntactic theory does not yet provide us with a satisfactory account of many of the relevant deep-structure grammatical relationships; and this was the main burden of our discussion of 'grammatical functions' in chapter 8. It follows that we are at present unable to interpret the term 'product' (or 'compositional function'—to employ the more technical term) in the proposed definition of the meaning of a sentence or phrase as 'the product of the senses of its constituent lexical items'.

At the same time, it is clear that many of the semantic relations discussed in the previous chapter might be reformulated within a componential theory of semantics. Synonymy, hyponymy, incompatibility and complementarity are obviously definable in terms of the semantic components of the lexical items in question. (For a componential approach to the definition of these relations the reader is referred to the works cited in the notes.) What must be stressed, however, is the fact that the componential analysis of lexical items rests upon the prior notion of 'implication' with respect to the assertion and denial of sentences. Componential analysis is a technique for the economical statement of certain semantic relations between lexical items and between sentences containing them: it cannot claim to circumvent any of the problems of indeterminacy that were discussed above in connexion with 'understanding' and 'analytic implication' (cf. 10.1.2).

5.5 *The 'cognitive reality' of semantic components*

The most interesting work so far published in the field of componential semantics has come, not from philosophers and linguists, but from anthropologists; and they have recently devoted considerable attention to what they have called the 'cognitive validity', or 'reality', of semantic components. It was this question that we had in mind, when we said earlier that we should have to examine what was meant by 'correct' in the context of componential analysis (cf. 10.5.1).

A good deal of the anthropological discussion makes reference to the analysis of the vocabulary of kinship in various languages. It has been shown, for example, that one can analyse the most common kinship terms of English in various ways. (In particular, *brother* and *sister* can be regarded as having the same component, 'direct line of descent', *as father* and *mother*

or *son* and *daughter*, as against *cousin*, which shares the component 'collateral' with *uncle* and *aunt*, and with *nephew* and *niece*; alternatively, *brother* and *sister* can be analysed as having the same component, 'co-lineal', as *uncle* and *aunt* of *nephew* and *niece*, as against *cousin*, which has the component 'ab-lineal'.) The question is which, if any, of the various possible analyses is 'correct'. Each of them is self-consistent; each of them distinguishes every member of the lexical system from every other member of the system; and each of them is 'predictive', in the sense that it provides the anthropologist with a means of deciding, with respect to any member of the family, what his relationship is to other members of the family in terms of the lexical system. But each of the alternative analyses rests upon a different set of proportional equations:
either

  father:mother::son:daughter::brother:sister

or

  uncle:aunt::nephew:niece::brother:sister

It is therefore the 'cognitive validity' of one set of proportions, rather than the other, which should decide the question of 'correctness' (if, indeed, this question is decidable). As far as the anthropological analysis of kinship is concerned, the 'cognitive validity' of a particular proportion is determined, presumably, by the social status and roles assigned to the different classes of family-relatives in the society; and this might well be reflected also in the linguistic 'intuitions' of the members of the community.

But we can also consider the question of 'correctness' from a more strictly linguistic point of view. Let us return, for this purpose, to the simple illustration of componential analysis with which we began this section. We assumed the validity of the following proportions

  man:woman:child::bull:cow:calf
  bull:cow:calf::rooster:hen:chicken
  etc.

On the basis of these proportions, we 'extracted' the semantic components (male) *v.* (female), (adult) *v.* (non-adult), (human) *v.* (bovine) *v.* (equine) *v. . . .* (sheep). We may now ask what is the linguistic status of these components.

At first sight, the opposition of the contradictory components (male) and (female) looks satisfactory enough. If we know that someone is an adult, male, human being, then we know that the word *man*, rather than *woman* or *child,* is appropriately applied to him; if we know that a particular domestic

fowl is an adult female of a given species, then we know that *hen*, rather than *rooster* or *chicken*, is the appropriate term of reference; and so on. But one might maintain that to differentiate *man* and *woman, rooster* and *hen*, etc., in terms of the sex of their referents is to give priority to but one of the many linguistically-relevant features which distinguish them. If one asks a young child (most of whose utterances are perfectly acceptable and manifest the same semantic relationships, as far as one can judge, as the utterances of his elders) what is the difference between men and women, he might answer by listing a whole set of typical characteristics—the kind of clothes they wear, how their hair is cut, whether they go out to work or stay at home and look after the children, etc. A totally unrelated set of criteria might be proposed for the differentiation of *rooster* and *hen*, of *bull* and *cow*, and so on. Why should one suppose that sex is the sole criterion even in adult speech? And how far is it true to say that *woman:child::cow:calf::hen:chicken*, etc.?

Obviously, there is a certain class of sentences, the semantic acceptability or unacceptability of which can be accounted for in terms of this proportional equation: *That woman is the mother of this child, That hen is the mother of this chicken*, etc. v. *That man is the mother of this child, That woman is the father of this child, That woman is the mother of this calf*, etc. And the grammatical phenomenon of gender in English is partly determined by the sex of the referent. But this does not mean that (male) and (female) are the sole semantic features which differentiate the complementary terms *man* v. *woman, bull* v. *cow*, etc. The status of such components as (adult) *v.* (non-adult) is even more dubious: once again, there are sets of semantically-acceptable or semantically-unacceptable combinations that can be accounted for in terms of this opposition, but there are others that cannot.

The problem is undoubtedly related to the anthropologist's problem of 'cognitive reality'. Consider, for example, a society in which the role of men and women is so different that there are very few activities in which both will engage. Assume now that there are two lexical items in the vocabulary of that language, which can be translated into English as 'man' and 'woman' on the basis of their reference to male, adult human beings and female, adult human beings, respectively. Knowing this fact about the reference of the two lexical items, the linguist could apply these terms appropriately to men and women. He would be fairly sure that the translation of English sentences such as 'The man gave birth to a child' (assuming that there is a term that can be satisfactorily translated as 'give birth to') would be semantically-unacceptable. But there might be an enormous range of other sentences, including 'The man cooked a meal', 'The woman lit a fire', etc., which are equally unacceptable. Our own cultural prejudices and our own taxonomic classification of the physical world should not be taken as valid for the analysis of either the culture or the language of other societies, still less of any alleged 'conceptual system that is part of the cognitive structure of the human mind'.

A further point should be made. It is one of the concomitant dangers of componential analysis that it tends to neglect the difference in the frequency of lexical items (and therefore their greater or less 'centrality' in the vocabulary) and the difference between lexical items and semantic components. For example, it is often suggested that *brother* and *sister* can be replaced with the 'synonyms' *male sibling* and *female sibling*. But this is true only in the context of anthropological or quasi-anthropological discussion. The words *brother* and *sister* are extremely common words, known presumably to all speakers of English, whereas *sibling* is a technical term, coined for the convenience of anthropologists; and most English speakers probably do not know it. The fact that there is no common superordinate term for the two complementaries *brother* and *sister* is *prima facie* evidence that the opposition between the two terms is semantically more important than what they have in common. Similarly, the fact that there is a term *horse*, which has as its hyponyms the complementaries *stallion* and *mare*, is relevant to the analysis of the structure of the English vocabulary. Any theory of semantics which encouraged us to believe that the phrase *adult male elephant* stood in exactly the same semantic relationship to *elephant* as *stallion* does to *horse* would be unsatisfactory.

Componential theories of semantics do not necessarily fall victim to inadequacies of this kind. But there has been surprisingly little attention devoted to a discussion of the relationship between lexical items like *male* or *adult* and semantic components like (male) or (adult). One cannot avoid the suspicion that the semantic components are interpreted on the basis of the linguist's intuitive understanding of the lexical items which he uses to label them.

5.6 Concluding remarks

Limitations of space prevent us from going further into the details of recent componential work in semantics. If our treatment of the subject has been somewhat negative, it should be realized that this has been by deliberate decision. I have tried to draw attention to some of the assumptions upon which componential theories of semantics are frequently based—in particular, the assumption that semantic components are universal. We have seen that the notion of componential analysis rests upon the establishment of proportional equations with respect to the sense of lexical items. The important question, which is not always considered, is the degree to which these proportions are 'cognitively valid'. It is too often assumed that these proportions can be set up simply on the basis of introspection.

Componential analysis has, however, made considerable contributions to the development of semantics. Apart from anything else, it has brought the formalization of syntax and the formalization of semantics (or some aspects of semantics) closer together than they have been in the past. That linguists are once again seriously concerned with the relations between syntax and semantics is due very largely to the impact made by the work of Katz and Fodor, taken up more systematically within the framework of 'an integrated theory of linguistic descriptions' by Katz and Postal, and further developed by Katz in a number of subsequent publications. Although Katz and Postal tended to minimize the value of previous work in componential analysis, they were right to insist upon the importance of specifying the form of the 'projection rules' and the manner of their operation 'within the context of explicit generative linguistic descriptions'. This had not been attempted before.

In a previous chapter, we raised the possibility of a *rapprochement* between 'formal' and 'notional' grammar (cf. 4.3.4); and much of our subsequent discussion of 'grammatical categories' and 'grammatical functions' (in chapters 7 and 8) would tend to suggest that further progress in the formalization of syntax depends upon this *rapprochement*. We may conclude the present work in the certain expectation that the next few years will see the publication of a number of books and articles directed towards this goal.

It is not unlikely also that a greater concentration of interest upon the theory of semantics will bring linguists back to the traditional view that the syntactic structure of languages is very highly determined by their semantic structure: more especially, by the 'modes of signifying' of semantically-based grammatical categories (cf. 7.6.10). If this development does take place, one must be careful not to assume that linguistic theory has merely retreated to the position held by traditional grammarians. All future grammatical and semantic theory, however traditional its aims might be, must meet the rigorous demands of twentieth-century, 'structural' linguistics. Revolutions may be followed by counter-revolutions; but there can be no simple restoration of the past.

Notes

1.1 Definition of 'length', etc.: cf. Reichenbach, *Elements*, 210.
1.2 'Analytic' and 'synthetic': cf. Cohen, *Diversity*, 153 ff.; Staal, 'Analyticity'.
2.1 Quotation from *Roget*: 'How to use this book', p. vi.
2.2 Quantification of synonymy: For a more interesting proposal than most, cf. Sparck Jones, *Synonymy*; cf. also Needham, 'Automatic classification'.
2.3 Quotation from Ullmann; *Principles*, 108–9.
2.4 'Cognitive' v. 'emotive': cf. Ullmann, *Principles*, 96 ff.; Salomon, *Semantics*, 27 ff. For a full and critical account, cf. Henle, *Language*, 121–72.
3.1 'Hyponymy': As far as I know, this term was first employed by Bazell, 'Logical syntax'—but in a somewhat different sense.
3.2 The definition of synonymy in terms of hyponymy is proposed in Staal, 'Analyticity', 78.
3.4 The Greek word *dēmiourgós* is one of many related words discussed in Lyons, *Structural Semantics*.

4.1 'Oppositeness': One of the best discussions is in Ogden, *Opposition*.
4.2 Reference to Moravcsik: 'Analytic'.
4.4 Quotation from Sapir: *Selected Writings*, 122. Discussion of such sentences as *A small elephant is a large animal*: cf. Weinreich, 'Explorations', 422 ff.; Katz, 'Recent issues', 184 ff.
  5 Componential analysis: cf. Bendix, *Componential Analysis*; Bierwisch, 'Hierarchie'; Bolinger, 'Atomization'; Burling, 'Cognition'; Conklin, 'Lexicographical treatment'; Ebeling, *Linguistic Units*; Goodenough, 'Componential analysis'; Hallig and Wartburg, 'Begriffssystem'; Hjelmslev, *Prolegomena*; Katz, *Philosophy*; 'Recent issues'; Kiefer, 'Semantic relations'; Lamb, 'Sememic approach'; Lounsbury, 'Semantic analysis'; 'Structural Analysis'; Weinreich, 'Explorations'.
5.2 Quotation from Katz: 'Recent issues', 129. Quotations from Chomsky: *Aspects*, 160; 29.
5.3 Quotation from Katz: 'Recent issues', 129.
5.5 'Cognitive reality'; cf. Burling, 'Cognition'; Romney and D'Andrade, 'Cognitive aspects'; Wallace and Atkins, 'Kinship terms'.

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Table of symbols and notational conventions

*   asterisk: (1) 'reconstructed form'
            (2) ungrammatical, or unacceptable, expression
( )   parentheses: semantic component ('marker')
{ }   brace brackets: (1) morpheme
            (2) extensional definition of a class
[ ]   square brackets: (1) phonetic transcription
            (2) grammatical feature
/ /   obliques: (1) expression-elements
            (2) phonemic transcription
italics: orthographic representation (or transcription)
CAPITALS: lexeme
+   plus-sign: (1) concatenation
            (2) positive value of binary variable
−   minus-sign: negative value of binary variable
<   'is less than'
>   'is greater than'
=   equals-sign: (1) 'is equal (equivalent) to'
            (2) identity of reference