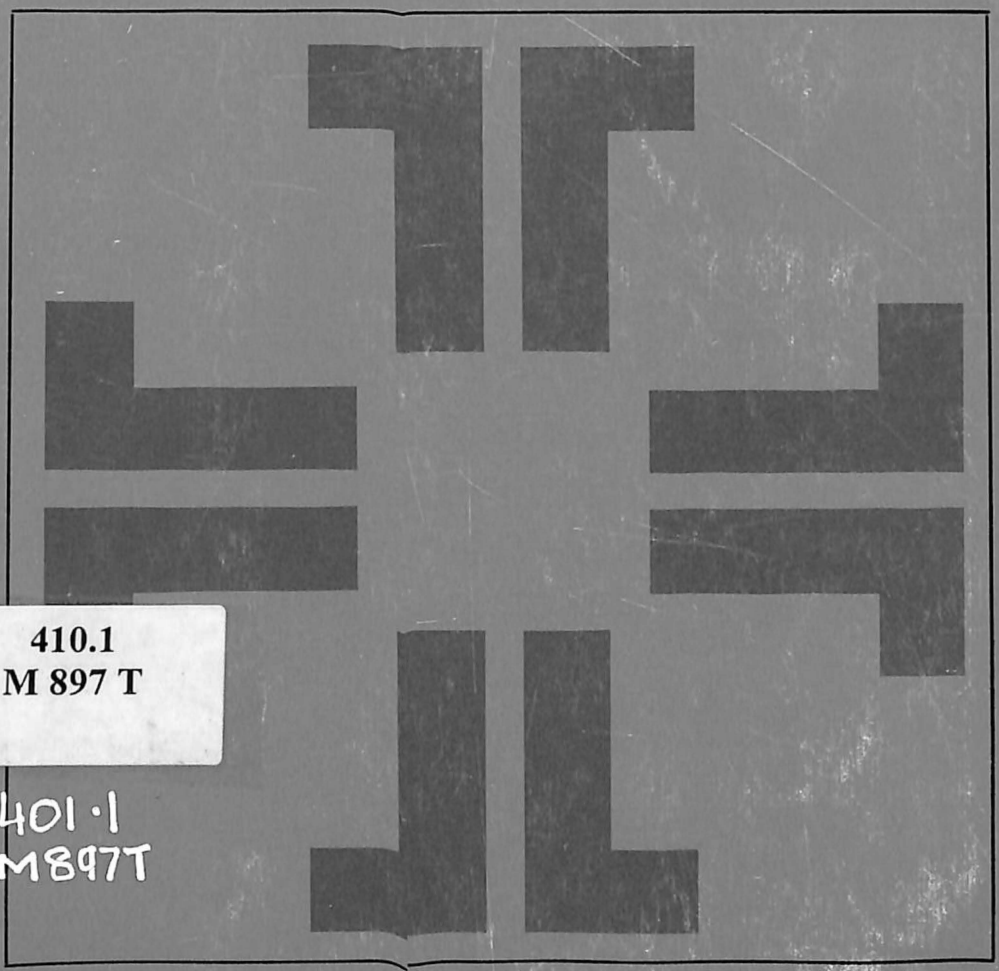
J.W.F. Mulder and S.G.J. Hervey

Theory of the Linguistic Sign



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THEORY OF THE LINGUISTIC SIGN

by

J.W.F. MULDER

and

S.G.J. HERVEY

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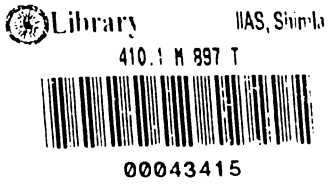

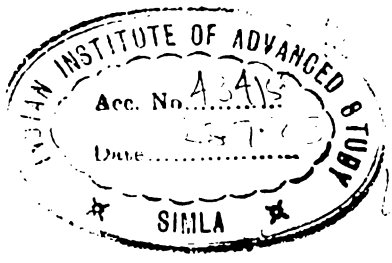

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In our opinion, the SIGN-CONCEPT should be considered to be the most important issue in linguistic theories. Bloomfieldian linguistics, as well as European (Saussurian and Prague) linguistics were based on it, and all the important theories that were in the main stream of these two directions, implicitly or explicitly have made use of it. Although it did not employ the term 'sign', Bloomfield's theory of the 'linguistic form' was basically a sign-theory, and Bloomfieldian linguistics differs from European linguistics in the first place insofar as the concept 'linguistic form' differed from that of the Saussurian *'signe linguistique'*.

A theory of the linguistic sign not only determines the form and content of 'grammar' and 'phonology', but that of 'semantics' as well. It pervades and determines every area of linguistics, including that of 'phonetics'. If it is a powerful theory, it may lead to a powerful linguistics. If it harbours inconsistencies, these inconsistencies will be perpetuated throughout the whole of the linguistic theory. Theories that lack some sort of a sign-theory (such as Traditional Grammar and some recent, mainly psycholinguistic, theories), are theories without a backbone, and the activities of the adherents of such a theory are confined to nibbling at the surface, while the linguists concerned are doomed to live with gratuitous and often far-fetched assumptions, or with circularities and inconsistencies.

It is some time ago now that de Saussure, Bloomfield, and Hjelmslev, the most important theoreticians of the linguistic sign in this century, stated their theories. These were very interesting and im-

portant theories at the time. Looked upon as stages in the history of linguistics, they are still very important, and Hjelmslev's theory is even nowadays intrinsically important. From our present level of sophistication — linguistics has gone a long way since de Saussure and Bloomfield — it is easy to condemn Bloomfield's theory as hopelessly inconsistent. The correctness of this judgement will be immediately seen by anybody with a feeling for logic, who carefully reads through Bloomfield's "A set of postulates for the science of language", *Language* 2 (1926), and who compares some statements made in that article and in his book *Language* (1933) e.g. "... a form is a recurrent vocal feature which has meaning, and a meaning is a recurrent stimulus-reaction feature which corresponds to a form" (1926), "... each linguistic form has a constant and specific meaning" (1933), "Every form is made up wholly of phonemes" (1926), "Different forms which are alike as to phonemes are homonyms" (1926). For a discussion of some of the inconsistencies in Bloomfield's views, see Mulder's "On the art of definition, the double articulation of language, and some of the consequences", *Forum for Modern Language Studies*, V, 2 (April 1969). The Saussurian sign-concept was not inconsistent in itself, but it could hardly be, as it remained primitive and exemplification was limited to easy and straightforward cases. It was mentalistic in an unacceptable way, just as his notion 'opposition' was, but the remnants of an outdated type of psychology, which also typified the early days of the Prague-school, can be easily stripped off without affecting the usefulness of the notions. For contemporary functionalists, '*signifiant*' and '*signifié*', in English linguistic literature usually called 'expression' and 'content', are no longer intrinsically psychologistic concepts, and nor is the notion 'opposition'. But functionalists have not done much to develop de Saussure's sign-concept any further. They have rather conveniently made use — or should we call it misuse — of its inherent vagueness. Reference to this vagueness is not meant as a criticism of de Saussure. At the moment of its introduction his sign-concept was a most brilliant and powerful concept, and, had de Saussure lived longer, he would almost certainly have developed and expanded it himself.

It was Hjelmslev who presented one of the various possible interpretations of de Saussure's sign, and who developed it into a precise and consistent notion within his theory. This is not the place for going into any of the details; it is enough to say that his interpretation, or rather the theory it led to — consistent and rigorous though it was — was not acceptable to linguists of other schools. For some this was because the problems glossematicians managed to solve with their system did not exactly coincide with theirs, or there were differences of emphasis upon, and importance attached to, different aspects of linguistic description. The non-acceptance, or, at least, the lack of full acceptance, by functionalists of Hjelmslev's sign-concept is mainly due to the fact that this concept does not leave room for "the double articulation" which, for functionalists, is THE defining property of language.

But there is at least one respect in which we believe that Hjelmslev should be followed, namely the notion 'sign' should be defined in terms of 'relations' rather than solely as a certain type of entity. For Hjelmslev, 'language' implicity, it seems to us, is a 'structure', an abstract and theoretical 'construct', not to be 'discovered' by the linguist, but to be 'established' by him. It is a means of 'accounting' for speech-phenomena, and not to be 'found' in the speech-phenomena themselves. Its only relation to the speech-phenomena is that it describes and explains them, unlike some other structures that may be set up, which do not. It cannot, however, be demonstrated that there could not be other, quite different, structures that can account for the same phenomena (though perhaps not for exactly the same aspects of those phenomena) equally well. THEREFORE, ONE MAY NOT CONCLUDE FROM THE APPLICABILITY OF A STRUCTURE TO THE PHENOMENA THAT THIS IS THE STRUCTURE OF THE PHENOMENA THEMSELVES. In some straightforward cases, for instance in the description of a motor-car, we may perhaps reasonably assume

(a) that the motor-car has a certain structure[1]; and
(b) that we can set up a theoretical structure that is in all relevant respects isomorphic with that structure.

[1] If only because motor-cars are intentionally CONSTRUCTED.

With respect to speech-phenomena, we would not even go so far as to make the former type of assumption (though we do not wish to assume the contrary either), let alone the latter.

It is in this spirit, and along the lines of AXIOMATIC FUNCTIONALISM — which is based upon the two premises that only functional features (i.e. features that are significantly opposed to their absence) are to be considered, and that 'language' (the hypothetical, or rather theoretical, entity) has a double articulation (Mulder 1968, p. 10) — that the present *Theory of the Linguistic Sign* has been evolved.

The earliest statements about some of the essentials of this theory are to be found in Mulder's Oxford D. Phil. thesis (1966), which was revised and published in 1968 as *Sets and Relations in Phonology; an axiomatic approach to the description of Speech.* The actual 'sign-concept' in this book was further elaborated in his "On the art of definition, the double articulation of language, and some of the consequences", *Forum for Modern Languages Studies* V, 2 (1969). Further refinements were introduced, and some of the consequences were drawn, in "Linguistic Sign, Word and Grammateme", *La Linguistique*, 1 (1971). In the meantime, Hervey was developing a Theory of Semantics based on the premises of Mulder's axiomatic linguistic theory, in that way adding a vital component to that theory. This work has now been completed, and in 1970 it was submitted as an Oxford D. Phil. thesis, entitled *Functional Semantics; a linguistic theory with application to Pekingese.* It is hoped that a revised version of that thesis under the title *Axiomatic Semantics* will soon be published. Most of Mulder's work on Linguistic Theory, and on Grammar, since 1968, has been influenced by the fact that he was Hervey's supervisor, which involved him deeply in semantic theory. During that period of close collaboration, extreme care was taken to avoid that statements made by the one should be inconsistent with statements made by the other. There has especially been some concern, when Hervey had to develop a different sign-concept, because Mulder's concept, though more suitable with respect to grammar, phonology, and even phonetics, was not sufficiently equipped to deal with semantic

facts. It has, however, turned out to be possible to develop the relevant notions in such a way that they are non-identical (in fact they are quite different) but still equivalent, because the one implies the other, and *vice versa*. As Mulder's linguistic theory is firmly embedded into SEMIOTICS, it goes without saying that also the sign-concept must be consistent with a general semiotic theory. Its link with semiotics is presented in a joint article by Mulder and Hervey entitled "Index and Signum", *Semiotica* (1971), an article that is itself an attempt to supplement and elaborate upon the discussion of various types of semiotic system to be found in Mulder's *Sets and Relations in Phonology*, whilst incorporating some ideas that derive from Hervey's semantic studies.

The first chapter of the present work, bearing the same title as the article just referred to, has partly the same content, but it is for the rest independent from that article. Chapter II deals with "Semiotic Systems" in a more elaborate fashion than this is done in *Sets and Relations in Phonology*. Chapter III introduces Mulder's version of the linguistic sign, and Chapter IV Hervey's. Chapter III pursues the consequences of this notion, via grammar and phonology, into phonetics. Chapter IV deals, among other things, with such notions as 'denotation', 'reference', 'synonymy', 'hyperonymy', 'hyponymy', and with the hypothetical nature of 'sign-identity' assumptions. Chapter V clarifies some controversies that may arise because of a difference in the use of the term 'denotation' by philosophers and linguists.

In our desire to apply the utmost rigour to our linguistic ventures, we had — in the absence of a theory that could fully meet our requirements — to develop such a theory ourselves as a *sine qua non*. The essentials of this theory are presented in this work in, as much as possible, an informal fashion. Optimistic as we are with regard to the possibility that our readers — even if they may not consider this theory useful for their own purposes — may find many points in it that are of interest to them, we have added a detailed index at the end.

St. Andrews
November 1970.

TABLE OF CONTENTS

I

INDEX AND SIGNUM

'Language' is said to be a communication-system, i.e. a system of entities that convey information. It is, however, not the only communication-system. There are innumerable others, natural, as well as artificial, non-conventional, as well as conventional ones. But the prerequisite for something to qualify as a communication system is that it should contain entities, at least two, by which information is conveyed. Those entities are not necessarily all of them formally positive entities. In systems that contain only two entities, one of the entities may formally be the mere absence of the other, e.g. a red dashboard light in a car, the entities in which system are the on- and off-state. There must be at least two entities, otherwise there can be no information. If the red dashboard light could only be on, the fact that it was on would not inform us about anything. If it were always on when the ignition was switched on, and off when the ignition was switched off, it could only inform us about THAT state of affairs. If, however, it can be off as well as on when the ignition is switched on — as is the case — but not on if the ignition is switched off, it can inform us about something that goes beyond mere information about the ignition, e.g. its off-state may indicate that the engine is running above a certain speed. If, moreover, the light may glow under certain conditions, even if the engine is running above a certain speed, we may be informed about some other conditions, provided that we know from other evidence that the engine is running above a certain speed. Just as in language, we may need, even in this very simple communication system, some outside knowledge for the correct interpretation of a given

item of information. This does not affect the actual information-value, only its interpretation. The actual information-value is in this case a purely physical one, i.e. that the amount of electrical energy generated and the resultant magnetic field are or are not sufficient to overcome a certain resistance in attracting a piece of metal through which an electric circuit that includes the red dashboard light becomes closed. Its interpretation is also dependent on further circumstances. But neither the precise information-value, nor the circumstances, have to be precisely known for the correct interpretation; only those features in them that are pertinent to the communication. One does not have to be a physicist to glean all relevant information from a red dashboard light.

There are many types of communication-system. Some of them are purely natural and for some of them even the fact that they are communication-systems is not their *raison d'être*, but is only incidental. Others are partly natural, or wholly conventional. We can infer from lightning that there will be thunder, from heavy clouds that it probably will rain, from the wagging of a dog's tail that it is happy, from the whistling of a kettle that the water is boiling, from a clock the time, from a telephone-bell ringing that there is someone on the line, from the purple bottoms of some male baboons that they are in love, from a girl's blushing that she is embarrassed, and from the sentence 'get out', when uttered, that someone emphatically wants someone to leave. We should not confuse the information-value with the actual information conveyed. The information conveyed depends on all the experienced circumstances and on known facts about the source. This may include knowledge about the information-value, but it need not. If we hear a Hottentot (we do not know Hottentot) say something, we receive all kinds of information, but most probably not enough of the purported information for the Hottentot to consider the communication to have been successful. This is mainly because we are not acquainted with the information-value of the sentence used in his utterance. The information-value of a given entity has to do with the PURPORTED information to be conveyed, but, again, it is not the same thing. We may infer from what the Hottentot says

that he is there, that he is a foreigner, that he has a cold, etc., but this is not the purport of the communication, unless the Hottentot happens to be SAYING just that. The success of the communication in accordance with its purport depends on knowing the information-value of the given entity and being able to give that entity a correct interpretation under given conditions. The 'sender' of the message makes use of the information-value and may make use of any number of circumstances as well, and the 'receiver' of the message employs all these to extract information from the message. A message may, of course, not be received, but there must be at least a potential 'receiver', or a supposedly potential 'receiver', for something to constitute a message. There may, however, not be a 'sender', in the usual sense, as in the case of natural systems. Still, the 'receiver' will interpret such a message on the basis of its information-value and, if relevant, the surrounding circumstances.

Let us call anything that has information-value an INDEX, and the completely abstract information-value of an INDEX its DENOTATION. An INDEX is the DOMAIN (left-hand element) in any relation 'INDEX R DENOTATION'. It does not exist, as an index, outside such a relation, neither does DENOTATION exist outside such a relation. An INDEX is a 'form that has denotation', and a DENOTATION is the 'information-value of a form'. Therefore we cannot say that an INDEX is a mere form. It is a form with certain properties that are themselves not form. Moreover, the term 'form' indicates here already a class of entities that are themselves 'forms', i.e. all the variants of that form are together the 'form' we are here talking about. We may, in fact, say that it is a 'class of forms' but not a mere 'class of forms'; rather a class of forms each member of which has the property of having a specific same denotation. Such member-forms are called 'morphs', or, if there are more than one, 'allomorphs'. The class of 'allomorphs with the same denotation' is the INDEX.

Within an index we may distinguish between EXPRESSION and CONTENT, which are merely different aspects of the same thing. Because INDEX, EXPRESSION and CONTENT mutually imply one another, they are equivalent. We shall say more about this later on (Chapter III).

A natural index, as opposed to a conventional one, only needs a knowledge of the natural phenomena, their laws or causal relations, for its correct interpretation. This is obvious for the PURELY natural indices such as *lightning* in *lightning R thunder*, but holds equally true for artificial devices based on the exploitation of laws of nature, such as the whistle on a kettle, the dashboard light and the telephone bell. There may be some element of choice as to what sort of device is used, but the RELATION between the device that serves as an index and its denotation is a natural one. Convention does not enter into it at all. There is an 'intrinsic' difference between the whistling of a kettle, in its function of indicating that the water is boiling, and a siren, in its function of indicating that an air-raid is expected. No matter how much knowledge we have about the workings of a siren, and the causes of its being set in motion, without knowing the convention we shall never be able to interpret it in the correct way. We may be able to learn the convention by experience, it does not have to be explicitly taught to us, but unless we know the convention, we can never arrive at interpreting the wailing of a siren as an index for *air-raid imminent*.

On the basis of whether the relation between INDEX and DENOTATION is natural or conventional, we can distinguish between NATURAL INDICES and SIGNA. It should be understood that for this distinction it is only relevant whether the RELATOR, i.e. the 'R' part of the relation, is natural or conventional, not whether the INDEX itself is a natural phenomenon or not. *Sunrise* can, for instance, be used as a signum with *time to attack* as its denotation. There is a convention necessary for *sunrise* to have this denotation, as there is no natural relation between *the rising sun* and *the time to attack*. We may further distinguish between relations based on FIXED conventions, and relations based on OCCASIONAL conventions. Based on fixed conventions — this has always to be considered within a certain system — are, for instance, indices in the system of number-writing. Their information-value is constant, and if we know the system, and we know the relevant circumstances at the moment of a particular use, we can give them the correct interpretation, without having to look up their momentary definition

first. Similarly in the Morse-code, the index '— .' always stands for the letter 'a', and '. — . .' always stands for 'l'. Quite different it is with, say, algebra, or the digital computer. In 'algebra' one has to know the occasional value of a 'letter', which is given *via* a definition for each operation, before one is able to give it an interpretation; and also in the digital computer, which is based on a system that is formally very similar to the Morse-code, one has, or at least the computor itself has, to be separately informed about the occasional information-value of the combinations of elements of the binary system before a proper calculation can be made.

We call *signa* that are dependant on a separate (occasional) definition for their correct interpretation: SYMBOLS; and those with a wholly fixed conventional denotation: SIGNS. Within systems of 'symbols' there are usually still some conventions operative. For instance in algebra, the symbols *a*, *b*, *c*, etc., have a different denotational usage from the symbols *x*, *y*, *z*. We shall call these 'proper symbols'. Also 'proper names' are PROPER SYMBOLS under this definition, as there is, for instance, a convention that *John*, *Peter*, *Paul*, *etc.*, may only denote males, whereas *Mary*, *Jane*, *Julia*, *etc.* may only denote females. The actual denotation, however, is not based on fixed convention, but on a separate definition for each, no matter how much prolonged, operation. As long as you are operating with the former of the co-authors of this publication (as an empirical entity), *Jan*, or *Jan Mulder*, always denotes that particular person; but if his parents had christened him otherwise, or if the patrilinear side of his family tree some time ago in history had been named otherwise, matters would have been different. What we want to say is merely that there is an intrinsic difference between the denotations of a sign such as *dog*, and a proper name such as *Jan*, but there is much less of a difference between that of the latter and a symbol, such as in algebra. Symbols whose denotation depends TOTALLY on occasional conventions we call NONCE-SYMBOLS. An example of a nonce-symbol is *whilk* which, if we wish to do so, we can define as 'a white elk with a missing eye'. But we could equally easily have defined it as anything else and used it in such constructions as *a whilk or so ago*, *I whilk you*,

mind my whilk, etc. This does not mean that one may not borrow a sign for use as a symbol, e.g. call one's wife 'little pigeon'; or a 'proper symbol' for use as a 'nonce-symbol', e.g. call an ashtray 'Johnny'; but in that case one has transferred a mere FORM from one system to another, and consequently changed its identity AS AN INDEX. The identity of an index, natural or conventional, sign or symbol, proper symbol or nonce-symbol, depends on its distinctive function in respect of the other elements in the system, and consequently on the system it belongs to itself.[1]

We call communication-systems that contain conventional indices, i.e. *signa*, SEMIOTIC SYSTEMS. A 'semiotic system' is 'any system of CONVENTIONS for communication' (Mulder, 1968, p. 10).

[1] For a more detailed treatment of "*Index* and *Signum*", see the authors' article bearing that title in *Semiotica* IV: 4 (1971), 324-338.

II

SEMIOTIC SYSTEMS

A semiotic system is any system of CONVENTIONS for communication, i.e. any system that contains *signa*. We can, on the basis of the previous discussion, sub-divide semiotic systems into systems that contain signs and systems that contain symbols. The latter we can sub-divide into systems with proper symbols, and systems with nonce-symbols.[1] A 'system' is a self-contained set of functional entities, i.e. entities that are separately relevant to the purport of the whole (Mulder, 1968, p. 10). The purport of a semiotic system is 'communication', i.e. the conveying of information.

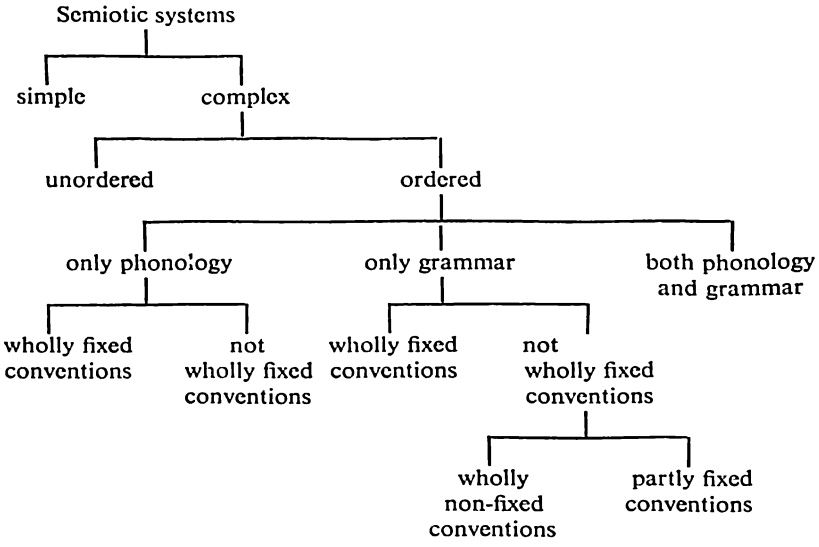
There is, however, also a more interesting way of sub-dividing semiotic systems, but before we discuss this, we should like to mention in passing yet another way of classification, i.e. one into systems in which the elements are of a discrete, or of a non-discrete nature. By the former a greater precision in communication can be achieved, but by the latter the actual communication can be made infinitely richer, because infinite gradations are possible. Systems such as 'language' contain both types of element. This distinction is important, but we cannot deal with it in the present work, except very briefly. An example in 'language' is 'intonation', fully interwoven with 'speech' in actual communication; so much interwoven, in fact, that it has to be considered in many cases as an integral part of the form of a construction. Yet, on the basis of a possible classification into discrete and non-discrete systems 'in-

[1] Such systems are not very interesting. We may reckon among those occasional colour, letter or number codes.

tonation' can conveniently be treated as a separate system, an auxiliary system to 'language'. Also sets of symbols (proper symbols or nonce-symbols), and any other systems that can be set up on the basis of this classification — if one wants to include them in one's description — are best regarded as different, perhaps coordinated or auxiliary systems. In the description of 'structure', as opposed to 'systems' proper, the distinction can become again irrelevant, and may then be ignored, e.g. *John hit Paul* can be treated on a certain level as constructionally equivalent to *the man hit the ball* (in spite of the fact that *John* and *Paul* are proper symbols, not signs, and hence belong to a different system), and even non-discrete features may be regarded as integral parts of the structure. As we said, however, we cannot go deeper into this matter here.

We can — and this is of great interest for the study of language — further sub-divide semiotic systems as to whether they contain complex elements, i.e. elements that are a combination of other elements, and as to the nature of this complexity. This gives us first a division into simple and complex systems, and the latter are further subdivided into unordered and ordered complex systems. As there are two types of ordering possible, a purely formal or phonological one (the term phonological in a very wide sense, just meaning 'having form', without reference to meaning) and a simultaneously formal AND meaningful or grammatical one, we can further sub-divide into 'phonological systems' and 'grammatical systems', and systems that have both 'phonology' and 'grammar'. What we call 'language' has both orderings, and this is referred to by Martinet's dictum of the 'double articulation' of language. We disagree slightly with Martinet on epistomological grounds, i.e. we regard the two articulations as independent, and not the second, or phonological, one as a continued operation performed on grammatical elements (i.e. on the *signifiants* of signs). The reasons for this will become clear in Chapter III.

The following tree-diagram exemplifies the above classification. A few of the points discussed in the previous chapter are also implemented in the diagram:



For easier reference we give here Table 1 (see overleaf) containing the same information, together with examples of each type, and some additional remarks.

By definition a semiotic system must contain *signa*. Let us call a 'sentence' any *signum* with such features that it is not an integral part of another *signum*. In a simple system then, every *signum* is a sentence. In an unordered, but complex, system, every *signum*, whether or not a simultaneous bundle of elements, that is not itself a simultaneous part of another *signum*, is a sentence. In an ordered system any *signum*, complex or not, ordered or not, that cannot be — by virtue of certain features, e.g. 'intonation' — itself a part of another internally ordered or unordered *signum* is a sentence.

Consequently we may say that any semiotic system contains SENTENCES. An animal cry (if belonging to a semiotic system) is a sentence. A traffic-sign is a sentence. The combination '. —' in the Morse-code, signifying the letter 'a', is a sentence. Certain combinations of 'states' in a digital computer are (potentially) sentences. So are 'syntagms' corresponding to 'statements' in algebra, mathematical logic and arithmetic, e.g.

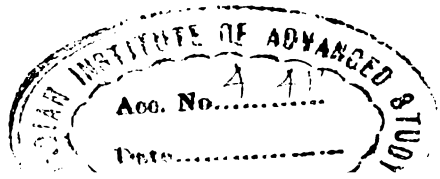


TABLE 1

Semiotic systems (systems containing *signa*)							
	complex (combination of elements into higher level elements)						
		ordered (combinations of elements between which there are ordering-relations into higher level elements)					
		only phonology (single articulation)		only grammar (single articulation)			both phonology and grammar (double articulation)
simple (no combination of elements into higher level elements)	unordered (simultaneous, i.e. unordered, bundles of elements constituting higher level elements)	wholly fixed conventions	not wholly fixed conventions	wholly fixed conventions	not wholly fixed conventions		
					wholly non-fixed conventions	partly fixed conventions	
non-discrete: 1. gestures 2. animal cries In language also: 1. interjections 2. intonation discrete: 1. siren for air-warning 2. police-whistle	non-discrete: bees' dance discrete: traffic signs In language also: 1. phonemes as complexes of dist. features 2. morphology	morse-code In language also: phoneme-complexes	digital computer	arithmetic In language also: syntactic complexes	nonce-symbols In language also: syntactic complexes containing nonce-words	1. algebra 2. mathematical logic In language also: Syntactic complexes containing proper names	language Language is the type of semiotic system with both articulations, and it incorporates or uses as auxiliary devices all the other types.
only paradigmatic relations		both paradigmatic and syntagmatic relations					

$a^2 - ab = (a - b)a$; $x \cup y = \sim(\sim x \cap \sim y)$; $12 \times 3 = 36$, and so is any syntagm when considered in a capacity of, systemically speaking, not being coordinated with, interordinated with, or super- or sub-ordinated to other syntagms. If we say 'systemically speaking', we mean within that semiotic system. There may be, in actual use, a system, semiotic or not, super-imposed over a semiotic system, e.g. with respect to 'language' a certain literary form, a certain narrative order, certain emotional overtones, etc. In the case of the Morse-code, there may be a system of ordering-relations superimposed, e.g. '— — · — — ·' means 'man' but the sentences, as far as the Morse-code is concerned, are the combinations of dots and dashes that signify letters of the alphabet, etc. I.e. there are here, as far as the Morse-code is concerned, THREE sentences.

The further ordering does not belong to the Morse-code but, in our example to the writing-conventions of English, another semiotic system altogether.

The SENTENCE is the MAXIMUM SIGNUM in any semiotic system. In SIMPLE systems it is the ONLY type of *signum*. The distinction made in the classification between purely phonological and purely grammatical systems is not based upon whether the system contains grammatical elements, as any system contains *signa*, at least sentences, and *signa* are grammatical elements. Grammatical, as opposed to phonological, elements are elements that have both form and meaning, as mere different aspects of the same thing, i.e. of the *signum*. In the case of 'symbols' this 'meaning' is of a 'potential' nature, but the sole justification for a 'symbol' is that it MAY be DEFINED. The case of 'nonce-symbol' is slightly different, as something is not a nonce-symbol, but just a form, until it actually HAS BEEN defined. If it might not be given a definite meaning (by supplying a definition), it would not be a 'symbol'.[2] The sole

[2] An interesting example of SYMBOLS, is a TECHNICAL VOCABULARY (e.g. in a linguistic theory). FORMS are directly or indirectly borrowed from another system (e.g. an 'ordinary language') or systems, and then defined for one's purposes. This connection with the original indices, i.e. with the system from where they are borrowed, is a DIACHRONIC matter. In fact, a TECHNICAL VOCABULARY is — with regard to its domain of deployment (e.g. a particular linguistic

justification for a phonological element is that it can be part (perhaps the only part) of an INSTANCE OF THE FORM OF A SIGNUM. By 'form' we mean purely systemic, i.e. functional, form. It does not have any reference to its substance, nor to its particular realization at a given moment. Yet, it is important to talk about an instance (not to be confused with realization) of a given form, as, especially in language, the form of a given sign may be rather a class of different phonological forms than a phonological form itself. Only the 'members' of such a class, i.e. instances, may be said to have phonological form proper. If we say that a 'sign' in language has phonological form, something we may say for convenience sake, we do not actually mean this literally. What is, for instance, THE phonological form of the 'plural' moneme in English?

If we say that this moneme has phonological form, we can only mean that not all the members of that class are 'zero', not that the form of the 'plural' moneme in English consists of a phoneme or a sequence of phonemes, or has any other single phonological feature. Some of the instances of the form of that moneme consist of a phoneme, phonemes, or other phonological features. In fact all instances, except 'zero' (as in the plural of 'sheep'), have phonological form in that sense.

As Martinet has pointed out[3] — and this is the beauty of his moneme-theory — it is immaterial whether phonological form can be described in terms of phonemes. It is sufficient that there are certain phonological features by which a form can be distinguished from all other forms. This holds also for classes of forms, i.e. the 'phonological forms' of signs. As long as they differ in respect to one element (e.g. the 'plural' and the 'genitive' in English have not exactly the same class of phonological forms corresponding to them), they are formally different classes. We come back to this below.

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theory) — a system of PROPER SYMBOLS. It is a system of proper symbols, not of nonce-symbols, as there are generally some conventions operative, and those conventions — it has to be admitted — have, at least partly, to do with the DIACHRONIC origin of the symbols (technical terms).

[3] A. Martinet, *A Functional View of Language* (Oxford, 1962).

In those systems where the form of a *signum* has only one member, as, for instance, in the Morse-code, we can ignore the distinction between the form of a sign, and an instance of that form. In systems where also the converse is true, i.e. where the same form always belongs to the same sign, i.e. where there are no HOMONYMS, such as, again, in the Morse-code, we can also ignore the distinction between 'phonological form' (in both senses) and 'expression', a vital distinction in language, as we shall see.

As we were saying, the distinction made in the classification between purely phonological, and purely grammatical systems, is not based on whether the system contains *signa*. It is based upon whether it contains complex ordered elements that are articulated into *signa* (in which case those complex ordered elements must be *signa* themselves) or into phonological entities. In the latter case, the complex ordered elements must, strictly speaking, be phonological entities themselves, but in such cases as in the Morse-code those phonological entities completely coincide with the *signum*, and therefore we may ignore the distinction.

It must also be understood that the classification is based on what is intuitively TYPICAL for the system in question, except that there is an inverse hierarchy from simple, *via* unordered, complex, ordered, to doubly ordered. That is, as soon as elements belonging to a higher step in the hierarchy are found in terms of complexity or ordering, the system is reckoned to be of the 'higher' type. But in systems of 'symbols', such as algebra and mathematical logic, one finds 'signs' as well, i.e. *signa* the meaning of which is determined by completely fixed conventions, e.g. in algebra '+', '−', '=', etc., and signs of that kind used in mathematical logic. Typical for algebra and mathematical logic, however, is their use of SYMBOLS.

If, in a semiotic system, we find sub-systems that are of the same kind as the full system of another semiotic system, we treat it, in analysis, just as we would treat that other semiotic system, e.g. we describe the morphology of a language in a similar way as we would describe the system of traffic-signs, *mutatis mutandis* of course.

III

THE NATURE OF THE LINGUISTIC SIGN

The two aspects under which we can view the linguistic sign, i.e. its 'formal' aspect and its 'meaning-bearing' aspect, called 'signifiant' and 'signifié' respectively by de Saussure, are in English usually referred to as EXPRESSION and CONTENT respectively. It is generally agreed that the two are inseparably united and that the one implies the other, and *vice versa*, i.e. they are in a one-to-one relation of mutual implication for each instance of a sign. It is not possible to set the notion 'sign' up in such a way that it is 'meaning' alone that determines the identity of the sign. If one did that, synonyms would be identical signs. A sign would then be a certain 'meaning' attached to no matter what form, i.e. there must be 'form', but what that form is, would be totally irrelevant. Also to let 'form' exclusively determine the identity of the sign would have undesirable consequences. In that case, there could be no homonyms, i.e. *hair* and *hare* in spoken English would be identical signs, and, moreover, there would be as many signs as there are phonological forms of signs, e.g. there would be several signs of the plural (plural-monemes) in English. The notion 'sign' would refer to a certain phonological form to which meaning is attached, but what kind of meaning was attached would be irrelevant for the identity of that sign.

So, either one must deny the possibility of synonyms, or that of homonyms, or one must agree that the identity of signs is as much determined by their form, as by their meaning. But this can only be done if we regard 'form' and 'meaning' with regard to signs merely as different aspects of the same thing. Otherwise the situation

would be even worse than in the case of solely depending on 'form', or solely depending on 'meaning'. Not only would all different 'forms' belong to different signs, but all similar 'forms' with different 'meanings' would be different signs as well, and in the end there would be as many signs as there are utterances, as we may assume that no two utterances ever mean exactly the same, nor are they formally (we would not be able to arrive at 'distinctive function', i.e. at 'phonology') ever exactly the same; we would, in other words, have no criteria to establish 'formal' or 'semantic' equivalence between utterances. In order to limit the number of signs in the inventory we must establish certain forms as being equivalent, and this can only be done on the basis of 'meaning' correlations, or we must establish certain 'meanings' as equivalent, and this can only be done on the basis of 'form' correlations.

Therefore we may say that the meaning of a sign implies its form, and the form of a sign implies its meaning. From this follows that (a) different signs have neither the same form nor the same meaning, and (b) form and meaning of signs are not just form and just meaning, but both are, in a sense, form as well as meaning.

Consequently the terms 'form' and 'meaning' used of signs do not, and cannot, have the same value as that which those terms normally and intuitively have. They are entirely different things. Therefore, they are given different names: in French '*signifiant*' and '*signifié*', in English 'expression' and 'content'.

We may, then, say that a sign is the CONJUNCTION of an EXPRESSION and a CONTENT, and that a particular 'expression' and a particular 'content' mutually imply each other. Each of them implies a specific sign, and *vice versa*. Therefore, in a mathematical sense, the notions 'sign', 'expression' and 'content' are equivalent. They represent three ways of looking at the same thing. Using the term 'sign' implies looking at the 'sign' in its totality, using 'expression' implies looking at the 'sign' from a formal angle, and using the term 'content' implies looking at the 'sign' from the side of meaning. Expression and content are each other's converse, nothing more, and moreover, because they mutually imply one another, they are equivalent. Except for that which is connected

with the difference in 'aspect', everything we say about one of the three can be equally said about any of the three. One would normally be inclined to say that an 'expression' is a class of allomorphs, or that the 'sign' is a class of allomorphs, because when we speak about allomorphs we are usually either primarily concerned with form or with the totality of 'form and meaning'. We could, however, equally well say that the 'content' is a class of allomorphs, as will become clear below. If we do that, the allomorph referred to is, as a relational structure, the converse of the allomorph as a member of the expression, but, as there is mutual implication between the relation and its converse in this case, the converse is equivalent to the relation it is the converse of. Similarly, if we say that a 'sign' is a class of allomorphs, we imply that an allomorph is a conjunction of the previous two relations, relations which are equivalent to each other, and each equivalent to the conjunction of the two. We can symbolize this as follows:

sign = *e* &*c*, i.e. a particular 'sign' is the conjunction of a particular 'expression' and a particular 'content'.

e ↔ *c*, i.e. a particular 'expression' and a particular 'content' mutually imply one another, and are therefore equivalent to one another.

e ↔ *sign and c* ↔ *sign*, i.e. both a particular 'expression', and a particular 'content' mutually imply a particular 'sign', hence *e*, *c* and *sign* are equivalent.

We may, then, say that:

sign ↔ (*e* ↔ *c*), i.e. a particular sign is equivalent to a particular expression and a particular content in an equivalence relation.

Let us now determine what *e*, *c* and *sign* are. If we determine what one of them is, e.g. *e*, we know what the others are, as, *c* is the CONVERSE of *e*, and *sign* is the conjunction of *e* and *c*.

If we assume, i.e. *a priori* accept, that, say, the different forms of the plural in English belong to one and the same sign, then we must accept that the so-called 'phonological' form of a sign is

actually a CLASS of phonological forms. I shall symbolize a phonological form by p, and a class of phonological forms by $\{p\}$. $\{p\} = p_1 \cup p_2 \ldots \cup p_n$, e.g. the class of phonological forms that constitutes the phonological form of the plural in English equals /iz/ ∪ /z/ ∪ /Z/ ∪ /rn/ ∪ /Ø/ ∪ /men ~ man/ ∪ /mais ~ maus/ ∪ /uaivZ/ ~ /uaif/ ∪ ... etc.[1] We cannot go into matters of phonology here, but the phonological representations (written between slant lines) refer to the forms of the plural-allomorphs in such words as *houses*, *days*, *huts* (or *heads*) (i.e. the archiphoneme /Z/, symbolizing a suspension of opposition between /s/ and /z/), *oxen*, *sheep*, *men*, *mice*, and *wives* respectively (see: Mulder, 1968; Mulder and Hurren, 1968). The symbol (in fact this is a 'sign') '∪' signifies the 'union' of terms. The whole is called a logical sum, which means that the terms stand in an 'either ..., or ..., or both' relation, i.e. $x \cup y$ means either x, or y, or both x and y. A class is here, for all practical purposes, the 'logical sum' of its members. It is clear that, if the members of a class stand in a '∪' relation, each member can REPRESENT the class. In the case under consideration, i.e. that of the form of a certain 'sign', the members (individual phonological forms) of the class are equivalent in respect to the sign, and each of them can therefore 'represent' the form of the sign in question.

A class $\{p\}$, if it is the phonological form of a sign, stands in a certain relation R with (i.e. it 'has') a certain distinctive function, distinctive that is within the domain to which that sign belongs, i.e. grammar. The distinctive function of an entity is determined by the class of entities with which it commutes (Mulder, 1968). The distinctive function of a 'sign' is determined by the set of signs with which it commutes, i.e. those 'signs' to which it is opposed in equivalent contexts. The allomorphs, i.e. variants with regard to their phonological forms, of signs are always COMBINATORY or CONTEXTUAL variants. Therefore allomorphs do not commute with one another, i.e. they are not opposed to one another. In the case of FREE variants, e.g. perhaps /aiðr/ and /iRðr/ 'either' for some

[1] For the phonemic notation of English used in this work, see Mulder and Hurren, 1968.

speakers in some dialects of English, or /felOu/ 'fellow' and /blOuk/ 'bloke', these are considered to be SYNONYMS, i.e. different signs. SYNONYMS are different signs, but with all their SEMANTIC FEATURES (Hervey, 1970) in common. As SIGN-IDENTITY depends in the first place on the distinctive function of a sign, and as distinctive function depends on the item being opposed to other signs (or to 'zero') in a certain position, COMBINATORY VARIANTS OF SIGNS, (e.g. *I* and *me*) if having the same semantic features, cannot be regarded as different signs, but free variants have to be regarded as different signs. They are FORMALLY DIFFERENT, and they are opposed to, i.e. they have a different distinctive function from, each other.

If two tentative signs are both FORMALLY DIFFERENT and OPPOSED to one another, they constitute different signs: SYNONYMS, if they are denotationally the SAME; JUST DIFFERENT SIGNS, if they are denotationally DIFFERENT.

If two tentative signs are FORMALLY DIFFERENT but NOT OPPOSED to one another, NOR DENOTATIONALLY DIFFERENT, they are one and the same sign, i.e. COMBINATORY VARIANTS.

If two tentative signs are FORMALLY THE SAME but DENOTATIONALLY DIFFERENT, e.g. *hair and hare*, they are DIFFERENT SIGNS, whether opposed to one another (in a strict paradigmatic sense; of course in the overall inventory different items are *a priori* distinctive, i.e. opposed to one another) or not. In that case we call them HOMONYMS.

If two tentative signs are both FORMALLY and DENOTATIONALLY THE SAME — which, incidentally, implies that they are NOT OPPOSED to one another — they belong to one and the same sign. So, the same phonological forms may either pertain to the same sign, or to different signs (i.e. HOMONYMS), and different phonological forms may either pertain to the same sign, in which case the formally different items are called combinatory variants (i.e. allomorphs), or they may pertain to different signs. In the latter case the signs are called SYNONYMS, if they are denotationally the same, i.e. if they have identical sets of semantic features (Hervey, 1970).

As just an example of what difficulties we would let ourselves in

for if we used formal SIMILARITY (e.g. /aiðr/ ~ /iRðr/) rather than formal IDENTITY as a criterion to distinguish between SYNONYMS and other types of free variants, we should like to say the following. If we cannot give a precise criterion for what is still similar and what is not, the whole procedure would remain an arbitrary one, and nothing would prevent us from regarding *fellow* and *bloke* as just free variants, but identical signs, as they have the phonological feature /lOu/ in common. Also, without Hervey's precise criteria for semantic equivalence, or, in fact, semantic identity, we would be unable to demonstrate that *hair* and *hare* are different signs, as both may refer to soft, hairy objects. We cannot deal with those criteria here *in extenso*, but it is, for the purpose of this discussion, enough to say that if two terms do not imply the same set of MORE GENERAL TERMS (called 'hyperonyms' by Hervey), they are semantically non-equivalent. *There is a hare*, implies, among other things, 'there is an animal', but *there is a hair* does not. Therefore, *hare* and *hair* are semantically non-equivalent, and this implies that if they are signs (which they are), they are different signs. The reverse (i.e. the condition of having two terms that do imply the same set of more general terms) implies semantic equivalence, but not necessarily sign-identity.

Mulder symbolizes distinctive function of a sign by '*s*', in order to distinguish it from distinctive function in phonology, which latter he symbolizes by '*d*' (Mulder 1968, 1969, 1971). In earlier publications (Mulder, 1968, 1969), he has equated the distinctive function of signs with their SEMANTIC FUNCTION. Since Hervey's refinement of the latter notion, we recognise that there is a difference between the two, but only with a view to cases of 'synonymy'. SYNONYMS are different signs, and therefore their distinctive function differs. Their semantic function is, however, by definition, the same, as they share the same semantic features.

We can now symbolize 'expression' by {*p*}R*s*, i.e. a certain class of phonological forms standing in a relation with a certain grammatically distinctive function, or, in plain language, a certain class of phonological forms with a certain distinctive function which allows it to carry a certain non-phonological information. The

content is the CONVERSE of this, i.e. $s\check{R}\{p\}$, where $\check{R}$ indicates the converse of R, and, together with the permutation of domain and counter-domain, it indicates the converse of the whole relation. The sign, being the conjunction of expression and content, i.e. *sign* = *e* & *c*, is therefore $\{p\}Rs$ & $s\check{R}\{p\}$. The intuitive interpretation of $\{p\}Rs$ is: $\{p\}$ in its capacity of having the specific function *s*. The intuitive interpretation of $s\check{R}\{p\}$ is: the function *s* of $\{p\}$.

Because $\{p\}$ may consist of more than one member (one of the members may even be 'zero', or less than 'zero', as in the case of the plural of French 'bœuf') one can say that $\{p\}Rs$ is a set, containing the members p_1Rs, p_2Rs, etc. That is to say $\{p\}Rs = p_1Rs \cup p_2Rs \cup \ldots \cup p_nRs$. The members p_1Rs, etc. are called MORPHS. If there are more than one i.e. if there are different morphs, they are called ALLOMORPHS. Similarly $s\check{R}\{p\} = s\check{R}p_1 \cup s\check{R}p_2 \cup \ldots \cup s\check{R}p_n$, and *sign* = p_1Rs & $s\check{R}p_1 \cup p_2Rs$ & $s\check{R}p_2 \cup \ldots \cup p_nRs$ & $s\check{R}p_n$. As these are equivalent (i.e. *sign*, *expression* and *content* are equivalent) we can call them all allomorphs, i.e. the sign is a class or set of allomorphs, so is the expression, so is the content. For convenience's sake, because we concentrate on form here, we shall use the EXPRESSION for our further discussion, but we could have used equally well the content, or the sign in its totality, though the latter would be clumsy, because of the longer formula. So $\{p\} = p_1 \cup p_2 \cup \ldots \cup p_n$, i.e. a set of phonological forms, and $\{p\}Rs = p_1Rs \cup p_2Rs \cup \ldots \cup p_nRs$, i.e. a set of allomorphs. One sees that not only is there a distinction between 'expression' (*signifiant*) and 'morph' (or 'allomorph'), but also between 'morph' (or 'allomorph') and 'phonological form'. Only the latter can be directly described in terms of phonological features, e.g. phonemes. This should be absolutely clear, for how could an allomorph, let alone a class of allomorphs, be analyzed into phonemes? Unless one is prepared to say that, for instance, "/iz/ R 'plural' " can be analyzed into "/i/ R 'plural' & /z/ R 'plural' ", i.e. unless one assigns to phonemes a grammatically distinctive function as well as a phonological one, saying that an allomorph CONSISTS of phonemes is logically contradictory. Yet, most linguists

say this not only of allomorphs, but even of the 'expression', i.e. a CLASS of allomorphs.

We have said that a *p*, member of a class {*p*}, is a phonological form, i.e. a phonological feature which often, in its turn, is a complex of phonological features. This is, of course, not entirely correct, as also 'zero' may be a member of such a class, and this is, of course, not a phonological feature. One should actually say that *p* is a phonological form or feature, or — in the case that *p* is a member of {*p*}, and one of the members of {*p*} is 'zero' — *p* may be 'zero'. This is how it should be understood, but it would be clumsy to say this every time we want to say what {*p*}stands for. In fact, perhaps, even the term 'phonological form' may be misleading, i.e. 'phonological feature' may be better. In the case of French *la grande montagne blanche* we have a discontinuous phonological feature /a ... d ... mõtañ ... š/, in the case of *men* we have /e/ ~ /a/ (i.e. /men/ as phonologically distinct from /man/) and in the case of French *bœufs* we have /bö/ ~ /böf/ or even Ø ~ /f/ (i.e., as it were, 'subtraction' of /f/)). All these we can call 'phonological features', no matter whether we can describe them exclusively in terms of phonemes or sequences of phonemes. One of Martinet's examples (Martinet, 1968) is the Latin case-endings, e.g. *orum* in *dominorum*, where there is amalgamation of case, number, and a, grammatically speaking, non-functional gender-feature. Still we can abstract the phonological form of each allomorph of the monemes present, e.g. the allomorph of the 'plural', by, keeping everything else the same, opposing it to its commutant, here a particular allomorph of the 'singular'. The phonological form of this particular allomorph of the plural-moneme is, then, *orum* ~ *i*. Other allomorphs of the plural have the forms *arum* ~ *ae*, *ae* ~ *a*, etc. Unlike under the Bloomfieldian 'morpheme-theories', under Martinet's 'moneme-theory', there is no difficulty at all in recognizing and dealing with any type of functionally differential feature, and we should exhaust all the possibilities that are inherent in this approach. Therefore, if we are talking about features, we mean any type of differential feature. Something is a phonological feature (or form), if it is functionally (though not grammatically)

differential. Something is a grammatical feature, if it is grammatically differential. Something is a phonetic feature, if it is phonetically (i.e. acoustically or articulatorily) differential.

Members *p* of a set $\{p\}$ which constitutes the domain of $\{p\}$R*s* stand in a relation to *s*, which simply means that they are GRAMMATICALLY differential. As such, i.e. as a *p*, however, they are just phonological forms or features, i.e. they are only PHONOLOGICALLY differential. Any phonologically permissible (i.e. allowed by the rules of the phonological system in question) feature or combination of features constitutes a *p* of the language, and any set of *p* constitutes a $\{p\}$ (Mulder, 1969). If, and only if, such a $\{p\}$ is, and is being considered as, the domain of a particular $\{p\}$R*s*, then such a *p* is the phonological form of a MORPH (or allomorph), and such a $\{p\}$ is the phonological form (but 'phonological form' has here a quite different meaning, i.e. it means 'a CLASS of phonological forms') of an EXPRESSION.

Let us now see what a *p* in itself actually is. As we have said already, it is a phonologically distinctive (i.e. differential) form or feature. It can be regarded as a class, i.e. a class of ALLOPHONES. But an allophone too is not just a phonetic form or feature. A phonetic form or feature is an ALLOPHONE if, and only if, when, and only when, it has *phonologically* differential function, just as a phonological form or feature is an ALLOMORPH, if, and only if, when, and only when, it has *grammatically* differential function. That is, also allophones ARE not phonetic features or forms, but they HAVE phonetic features or forms. Now, the phonetic features or forms of allophones do not, in actual fact, belong to a finite and discrete set, as no two productions of sounds are ever exactly identical, and an infinite number of 'in-between' realizations are possible. However, for convenience's sake, we may bring in here, a bit of distortion of the DATA, and act as if they were a set of discrete entities. This is, for instance, done if we use, no matter how narrow, a transcription by the aid of the symbols (in fact within their system, i.e. the 'alphabet', they are 'signs') of the International Phonetic Alphabet.

If we symbolize such a rather imaginary phonetic feature or

form by *f*, and a phonologically distinctive function (assessed by commutation, as in the case of grammatically distinctive function) by *d*, we may represent a PHONOLOGICAL form or feature by $\{f\}Rd$. Analogous to '$\{p\}Rs = p_1Rs \cup p_2Rs \cup \ldots \cup p_nRs$' we may say $\{f\}Rd = f_1Rd \cup f_2Rd \cup \ldots \cup f_nRd$. That is, a phonological feature or form is a class or set of allophones, just as a sign or an expression is a class or set of allomorphs. Analogously to the fact of $\{p\}$ in $\{p\}$ R*s*, if we say that a phoneme HAS PHONETIC FORM, we use the term 'phonetic form' in a quite different sense from if we say that an allophone has phonetic form, i.e. the phonetic form of a phoneme is a logical sum of phonetic forms, i.e. it is a CLASS of phonetic forms. As long as we are aware of this, we may use the same term for the two different things.

We may, however, never say that an allophone, let alone a phoneme, IS phonetic form, and consequently we cannot analyze an allophone, let alone a phoneme, into phonetic features or forms, any more than we can analyze a morph (or allomorph), let alone an 'expression', into phonological features.

In a way analogous to the definition of a particular EXPRESSION as 'a specific CLASS of phonological forms $\{p\}$ *in its capacity of* having a specific function *s* in the grammatical system in question',[2] and a corresponding ALLOMORPH as 'a specific phonological form *in its capacity of* having that specific function *s*', we may say that a particular PHONEME is 'a specific CLASS of phonetic forms $\{f\}$ *in its capacity of* having a specific function *d* in the phonological system in question', and a corresponding ALLOPHONE is 'a specific phonetic form *in its capacity of* having such a specific function *d*'. The symbol *s* stands, as we have said, for grammatically (i.e. *qua* sign) distinctive function, and the symbol *d* stands for phonologically (i.e. *qua* form) distinctive function.

[2] CONTENT is defined as 'the function *s* of $\{p\}$' (see the forgoing, and Mulder 1971).

IV

THE SIGN AS A CLASS OF UTTERANCES

The notion *sign* defined as $\begin{array}{|c|}\hline \text{Expression } \{p\}\text{R}s \\ \text{Content } s\check{\text{R}}\{p\} \\ \hline \end{array}$ is a sufficiently refined concept to satisfy the purposes of grammar. As it has been shown in the previous chapter, with the notion as it stands, 'sign' can be linked up with phonological form, or, more appropriately, with phonological features, and ultimately, through the phonological features, with phonetic form or features.

When one comes to semantics, however, the need becomes felt for providing a link between the sign and its 'meaning'. This 'meaning', roughly speaking, concerns the capacity to provide information (which can be inferred from realizations of the sign) about some entity or entities other than the sign itself or its realizations. This can be symbolized as follows:

realization of sign '*a*' provides information *b* (where $b \neq$ '*a*')

sign '*a*' has information value *b* (where $b \neq$ '*a*')

Consequently, we may say that, whereas the sign appears as a member of a semiotic set, for instance the set of signs in a 'language', the information value is *a priori*, an entity outside of the semiotic system in question.[1] What we mean by 'linking the sign to its

[1] The elements of semiotic systems can of course be projected, when we consider them as denotables, into the extra-linguistic world. Both the sign *man* in *Man is an animal*, and the sign *man* in *man is a noun*, have extra-linguistic reference, except that the denotable corresponding to an utterance of

meaning', is the bridging of the gap, by using certain relations, between signs, which are within semiotic systems, and their information value, which lies outside the semiotic systems. For the very reason that these entities belong to the complement of the given semiotic domain, e.g. language, and this complement can be considered to be the whole of the universe excluding the given semiotic domain, we consider the relation of linguistic sign to information value as a relation between a linguistic element and an extra-linguistic entity.

We propose to brave the disapprobation of philosophers, (see also the subsequent chapter), and use the term DENOTABLE for any entity (entity in the widest possible sense) when considered outside of a realization of an INDEX R INFORMATION relation. A DENOTABLE considered as the right hand term of such a relation we shall then call a DENOTATUM, for, once we make the assumption that an entity is the information inferred from the realization of an index, that entity is not potentially DENOTABLE, but is actually BEING DENOTED. We do not think that it is counter-intuitive to use the term DENOTATUM in our sense, for denotata are usually conceived of as extra-linguistic entities to which signs refer.

Here we must mention the fact that an entity which may elsewhere constitute the left hand term of a 'realization of sign R information' relation, may in turn be considered as a DENOTABLE itself, and may therefore itself become, in turn, a DENOTATUM within such a relation. We shall, however, want to distinguish, for instance, between an utterance of the sign *horse* and the DENOTATUM 'the sign *horse*', for the two are clearly kept apart according to their occurrence as left hand and right hand terms, respectively, in relations of 'realization of sign R information'.

Apparent difficulties arise — and the need for dealing with them will be shown to lead to a definition of 'sign' as an equivalence-class — when we consider the relation of SIGN to DENOTATUM. There is an apparent paradox which can be exemplified by taking

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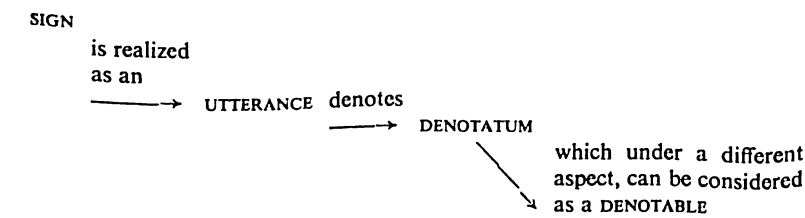
the latter is, in turn, a model in a linguistic description of English, whereas the denotable corresponding to an utterance of the former is the species *homo sapiens*.

the sign 'table' and its information value, or DENOTATION. If we were to say that the sign 'table' denotes a single DENOTATUM (i.e. one empirical entity) we should doubtless be wrong, for the whole purpose of having a sign *table* in a language, it seems to us, is to be able to talk about any given TABLE in the universe. From which it would appear that the sign *table* denotes, not a single TABLE, but a CLASS OF TABLES. On the other hand this alternative is also wrong, for that would make the sign *table* synonymous with the sign *the class of tables*. This is manifestly not so, but rather it is the case that, every time the sign *table* is USED (i.e. realized), it denotes a SINGLE DENOTATUM.

The above paradox can be resolved by the simple device of distinguishing between the sign *table* and realizations of the sign *table*, for which distinction the alternative paradox itself serves as a justification. Once we make this distinction, then we can say that, when the sign is realized, each of its realizations denotes a single DENOTATUM, and that this single DENOTATUM, when considered out of context of its relation to the realization by which it is denoted, can be said to be a DENOTABLE.

The link between the linguistic sign and the extra-linguistic complement of language within the Universe (i.e. the class of all DENOTABLES) will be visualized as follows:



An important fact is that denotables may belong to the field of study of various non-linguistic sciences, from which criteria, empirical in the case of denotables studied by empirical sciences, can be brought to bear upon DENOTATA. The fact that a denotational theory of (linguistic) semantics does not shed light on the nature of DENOTABLES as empirical entities, cannot be considered

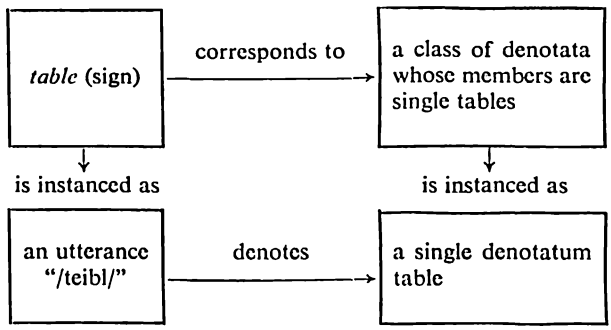
to be a shortcoming of that theory, for here, there is a case of one-way traffic. We have suggested that criteria from the various sciences studying what we call DENOTABLES, *might* usefully be brought to bear upon DENOTATA, and therefore play a part in semantic description. We are NOT suggesting that criteria from semantics can necessarily be usefully applied in non-linguistic sciences.

In order to build the link between SIGN and DENOTATUM (and ultimately DENOTABLE) into the theory itself, some changes have to be made in the notion of the sign as outlined in the previous chapter.

If an utterance is a single realization of a sign (in fact it is a MODEL for a single realization, as we shall see), then by adding together all the realizations of the sign into a potentially infinite class

$$\{u_1 \cup u_2 \cup u_3 \cup \ldots u_n\}$$

we should arrive at the definition of a given sign as an equivalence-class, 'equivalent' used in the sense that each utterance 'represents', as it were, the same sign. Now, if each utterance of the sign denotes a single DENOTATUM, then the equivalence-class of utterances that is the sign, will correspond to a whole class of the individual denotata of its member utterances. Thus, to return briefly to the example of *table*:



In defining the sign as an equivalence-class of utterances, we must be careful to avoid a contradiction which we shall outline below.

The avoidance of this contradiction together with the necessity of incorporating the notion DENOTATUM in the semantic theory, has led us to include UTTERANCE (or utterance-model) as a model in the theory itself.

Usually when Mulder speaks of the distinction between sign and its realizations, he equates it with a clearcut distinction drawn between ABSTRACT MODEL and CONCRETE DATA. Sign is a notion in the model; its realizations are in the realm of the data. The relation between the model and the data described is a certain isomorphism, whereby the model, say the sign, is said to ACCOUNT FOR a certain number of realizations. Thus, to say that the sign both ACCOUNTS FOR a set of realizations, and IS a class of those realizations, would be to imply an absurdity. Firstly, this statement would imply the false conclusion that the relation of isomorphism, that is of 'descriptive application' (e.g. sign *x* applies to a certain number of concrete acoustic realizations) is EQUIVALENT to the relation of CLASS TO MEMBER. Secondly, an abstract model cannot directly CONSIST of members which are concrete entities. The alternatives are then EITHER that SIGN ceases to be an abstract model OR that the UTTERANCES belonging as members to the sign as a class are no longer to be considered as concrete realizations, i.e. as speech-events. The first alternative would be tantamount to a rejection of SIGN as a theoretical concept in linguistics, and will therefore be ignored. The second alternative, the one which we have adopted, leads to the setting up of UTTERANCE as a model in the theory, as distinct from concrete REALIZATIONS of a sign in the data. An UTTERANCE can be said to be the following things: It is a MODEL FOR A SINGLE CONCRETE REALIZATION OF A SIGN. It is a MEMBER OF A CLASS OF EQUIVALENT UTTERANCES, i.e. of a sign. It has a formal component called a FORM, to account for the phonetic features occurring in the concrete realization for which it is a model. It has a referential component called REFERENT, in order to account for the information conveyed by the concrete realization for which it is a model. It is a ONE-TO-ONE RELATION BETWEEN A FORM AND A REFERENT, accounting for the fact that no two concrete realizations that ARE empirically different may ever be assumed to have (and

probably never do have) exactly the same phonetic features and to convey exactly the same information.[2]

Just as no two concrete realizations of a sign are ever identical in substance or in information, so no two utterances, which are models each for separate concrete realizations, may ever be identical, by definition, in FORM or REFERENT. An utterance can therefore be said to be the conjunction at a given, or presumed, point in time and space of a given FORM and a given REFERENT.

While no two utterances may ever be IDENTICAL to one another, there are, however, certain other relations which may hold between utterances.

Utterances may be SIMILAR as to FORM, when they have the same phonological properties (for determining this, criteria from phonology must be applied). These are so called FORMALLY SIMILAR UTTERANCES. Utterances may be SIMILAR as to REFERENT, when their DENOTATA are identical on the level of DENOTABLES (the condition for this is demonstrated or assumed empirical identity). These are so called REFERENTIALLY SIMILAR UTTERANCES. Utterances may also be BOTH FORMALLY and REFERENTIALLY SIMILAR.

The only other relations that we need consider as holding between a number of utterances are that of 'belonging to one and the same sign' and, of course, that of 'not belonging to the same sign', which is simply the negation of the former relation. For the sake of convenience we use the term EQUIVALENCE tautologously with 'the relation of belonging to one and the same sign'. This is a special restricted use of 'equivalence', for, strictly speaking, utterances may be equivalent with respect to various other classes to which they belong. In our sense here EQUIVALENCE (when applied to utterances) is to be understood as EQUIVALENCE WITH RESPECT TO A SIGN. As we have said, the only purpose of introducing the term EQUIVALENCE is one of convenience, in order to enable us to refer to the sign, when it is considered as a class of a certain number of utterances, tautologously, as a CLASS OF EQUIVALENT UTTERANCES. Furthermore, by tautology, instead of having to say each time that

[2] If for no other reason than the fact that physically distinct events occupy different positons from one another in time and space.

a number of utterances are all members of one and the same sign, we can say that these utterances are EQUIVALENT.

Ultimately we can only arrive at the statement that two or more utterances are equivalent, or that a certain set of utterances is co-extensive with a class of equivalent utterances (i.e. a sign) *via* statements of sign-identity in the description of a language. This procedure is not circular, for criteria are set up in the semantic theory (Hervey, 1970) whereby statements of sign-identity, made as hypotheses, can be tested (i.e. refuted or corroborated, i.e. if refutation has been attempted, but without succes).

It is our contention, that sign-identity, i.e. equivalence of utterances, cannot, in any description of a language, be proved in a positive sense. It can only be set up as a hypothesis in the description, and at best, demonstrated *via* the refutation of all possible alternative hypotheses, or refuted by confrontation with the data to which it is meant to apply.

The argument for this is that sign-identity, or equivalence of utterances could only be subject to positive (empirical) proof, if a both sufficient and necessary condition for the notion EQUIVALENCE could be devised from external, empirical criteria applicable to utterances. To our knowledge there are only two external, empirical approaches to utterances

a) *via* their phonological features
b) *via* their denotata

Consequently, any conditions for positive proof of equivalence between utterances would have to be based

either on identity of phonological features, that is to say FORMAL SIMILARITY between utterances.

or on identity of denotata on the level of denotables, that is to say REFERENTIAL SIMILARITY between utterances

or on identity both of phonological features and of denotata on the level of denotables, that is to say FORMAL-REFERENTIAL SIMILARITY between utterances.

That neither of these three alternatives will do as a sufficient and necessary condition for equivalence between utterances, i.e. for sign-identity, can be demonstrated if we consider the conclusions to which accepting them respectively as sufficient and necessary conditions, would lead.

If all formally similar utterances must also be equivalent, then all utterances having the phonological form /her/ must belong to one and the same sign. Therefore, homonyms do not exist, and there is only one sign "hair/hare", which is unacceptable, since this would lead to an INADEQUATE model for linguistic descriptions, e.g. certain types of 'ambiguity' would remain unaccounted for, such as the 'ambiguity' of an utterance "/ðer iz r her in mai sup/" ("there is a hair/hare in my soup"). Therefore FORMAL similarity is not a sufficient — and thus not a both sufficient and necessary — condition. As a matter of fact, it is not a necessary condition either, but we need not demonstrate this here.

If all referentially similar utterances must be equivalent, we obtain the following absurdity. Let us take a denotable whose empirical identity is premised, say the entity *Elizabeth II, Queen of England.* Any two utterances denoting this denotable must by definition be referentially similar, and consequently, by our first premise, also equivalent. Therefore an utterance "/šRi/" ("she") denoting *Elizabeth II* must be equivalent to an utterance "/ðr prezrnt kuRin of iŋlrnd/" ("The present Queen of England"). Which is absurd, since the utterance "/šRi/" is an utterance of a simple sign, whereas the utterance "/ðr prezrnt kuRin of iŋlrnd/" is that of a complex sign, and since one and the same sign cannot be both simple and complex in grammatical structure, there must be two separate signs *she* and *the present Queen of England* to which the above two utterances belong respectively. These two utterances are therefore not equivalent. Consequently, REFERENTIAL similarity is not a sufficient (and so not a both sufficient and necessary) condition for equivalence. It is, as a matter of fact, not a necessary one either.

If only FORMAL-REFERENTIALLY similar utterances may be equivalent then no utterance "/haus/$_1$" denoting a house in, say, London,

may ever belong to the same sign as any other utterance "/haus/$_2$", denoting a house in, say, San Francisco. Furthermore this would imply that the denotation class of EVERY sign consisted of a single member when considered on the level of denotables. This would be tantamount to denying the ability of realizations of one and the same sign to communicate more than one (empirically the same) information, and therefore in direct contradiction to one of the tenets of this theory of the sign. Consequently FORMAL-REFERENTIAL similarity is not a necessary condition (and so not a both sufficient and necessary condition) for equivalence. It is a sufficient condition (for two or more utterances to be equivalent), but this is trivial for the problem of sign-identity.

As the above approaches do not lead to a criterion which is both sufficient and necessary for equivalence, we must conclude that equivalence cannot be determined through positive empirical criteria, or indeed, be solved on the utterance-level at all. It must therefore, in each description of a language, be decided on the level of the sign, and this is done by making and testing hypothetical assumptions.

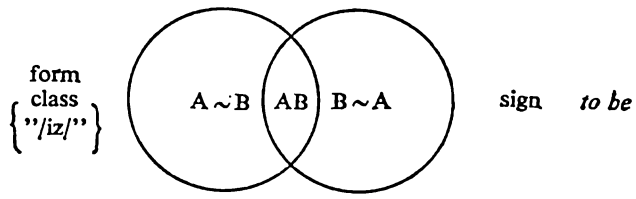
In the previous chapter a brief mention has already been made of the criteria that operate on "tentative signs" (i.e. on hypothetical assumptions of sign-identity). We cannot here go into these procedures, and the theorems that underlie these procedures, as these do not directly concern our theory of the sign so much as have to do with the setting up of signs in linguistic descriptions.

A consequence of treating the sign as a class of utterances, and of making UTTERANCE a model in the theory, is that we can make use of the relations of set-theory in various operations with classes of utterances.[3]

For instance, by specifying a certain phonological feature or set of phonological features, we can class together all the utterances which have that feature or those features, into what Hervey (1970) calls a FORM-CLASS (not to be confused with a class of phonological

[3] There are all kinds of secondary advantages as well, e.g. 'puns' can be accounted for as ONE REALIZATION to which correspond TWO OR MORE UTTERANCES (models, members of different signs).

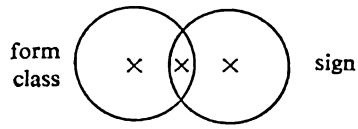
forms). Thus for instance, we can talk of the FORM-CLASS {"/iz/"}, namely the class of all utterances which have the phonological feature /iz/. Since the members of such a class are all of the same order as those of a sign (i.e. in both cases the members are utterances), we may use a set-theoretical approach in relating form-classes to signs. We may take for instance the form-class {"/iz/"} and the sign *to be* (assuming here that its identity has been established previously). Their relation will be a relation of PARTIAL INTERSECTION, as shown below:



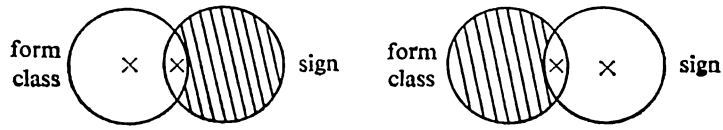
A ~ B = members of {"/iz/"} which do not belong to *to be*
e.g. members of "plural" (/hors*iz*/ 'horses')
B ~ A = members of *to be* which do not belong to {"/iz/"},
e.g. utterances of *am* as in *I* AM *here*.
AB = members of both *to be* and {"/iz/"},
e.g. utterances of *is* as in *he* IS *there*.

The possible relations between any given form-class and any given sign are as laid down by set-theory:

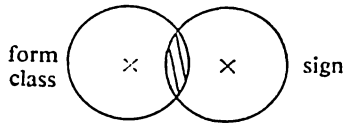
I. Partial Intersection



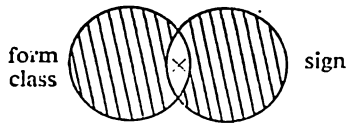
II. Proper Inclusion



III. Disjunction



IV. Total Overlap



We can now come to a different definition of morph and allomorph, which is nevertheless equivalent to that given in the previous chapter. A morph is the intersection of a form-class with a sign (and is therefore, itself, a class of utterances). A sign has allomorphs if and only if it intersects with more than one form class, that is to say, if it has more than one morph. When we say that this notion allomorph is equivalent to the notion allomorph discussed in the previous chapter, we can substantiate this claim. Just as in the earlier approach a sign can be regarded as a class of allomorphs, so it can under the latter definition, with the only difference, that in the former the allomorphs of which a sign is a class are themselves regarded as single entities, whereas in the latter approach they themselves are, in turn, classes. However, there is no contradiction implied in saying that a sign is a class of classes (allomorphs) whose members are utterances. The two notions ALLOMORPH are equivalent, by virtue of having the same relation (of member to class) to SIGN. They differ only in internal structure, in a way analogous with the distinction between the treatment of SIGN in the previous chapter, and that in the present. Namely, in the foregoing we did not treat either of them as a class of utterances, simply because we can dispense with the notion UTTERANCE in grammar. As stated earlier, the treatment of sign as a class of utterances comes into semantics in order to give access to denotation.

In what follows we propose to show that

(a) the notion 'class of equivalent forms' is equivalent to the notion Expression;
(b) the notion 'class of equivalent referents' is equivalent to the notion Content;
(c) the notion 'sign' as a class of equivalent utterances, is equivalent to the notion 'sign' as given in the previous chapter.

Each utterance in a class of equivalent utterances, i.e. in a sign, is a one-one relation between a form and a referent. When viewed from a formal aspect, all the forms of the utterances within one sign, constitute a class of forms, which are equivalent with respect to that sign. This class of forms we can call a CLASS OF EQUIVALENT FORMS.

Similarly, when viewed from a referential aspect, all the referents of the utterances within one sign constitute a class of referents, which are equivalent with respect to the sign. This class of referents we can call a CLASS OF EQUIVALENT REFERENTS.

A class of equivalent forms, as a class, implies, and is implied by a sign. Furthermore, it is a class whose members, individually imply (due to the one-one relation of form and referent in utterances), and are implied by, single referents belonging to the class of equivalent referents, proper to the same sign.

Conversely, a class of equivalent referents, which, as a class, also implies a sign, and *vice versa*, is a class whose individual members imply, and are implied by, single forms belonging to the class of equivalent forms proper to the same sign. From this it can be seen that a class of equivalent forms is a certain CLASS OF FORMS in a relation with a certain CLASS OF REFERENTS, and a CLASS OF EQUIVALENT REFERENTS is a certain class of referents standing in a relation (which is the converse of the former relation) with a certain CLASS OF EQUIVALENT FORMS. Therefore it would appear:

(a) that the class of equivalent forms and the class of equivalent referents proper to one and the same sign, are the converse of one another;
(b) that they both imply, and are implied by, the sign in question;

(c) that they are mutually equivalent aspects of the sign viewed from the point of view of 'form' and of 'meaning' respectively;
(d) that the sign is the conjunction of its class of equivalent forms and its class of equivalent referents.

If we now compare this with the terms EXPRESSION and CONTENT, we can conclude that these are equivalent to CLASS OF EQUIVALENT FORMS and CLASS OF EQUIVALENT REFERENTS respectively, since we find that:

(a) expression and content are the converse of one another ($\{p\}Rs$ and $s\check{R}\{p\}$, respectively);
(b) they both imply the sign in question, and *vice versa;*
(c) they are mutually equivalent aspects of the sign viewed from the point of view of 'form' and of 'meaning' respectively;
(d) the sign is the conjunction of its expression and its content.

On all these points CLASS OF EQUIVALENT FORMS is equivalent to EXPRESSION and CLASS OF EQUIVALENT REFERENTS is equivalent to CONTENT. By demonstrating this, we have already demonstrated also, that the two notions SIGN are equivalent, but we shall outline below the extent of this equivalence:

(a) the sign is a class of allomorphs (in both views);
(b) the sign is the conjunction of EXPRESSION ($\leftrightarrow$ class of equivalent forms) and CONTENT ($\leftrightarrow$ class of equivalent referents);
(c) the sign implies its expression ($\leftrightarrow$ class of equivalent forms), and *vice versa;*
(d) the sign implies its content ($\leftrightarrow$ class of equivalent referents), and *vice versa.*

The isomorphism stops only at 'the sign implies a class of equivalent utterances, and *vice versa*', but this is a trivial consequence of the fact that the former view (presented in the previous chapter) does not include the notion UTTERANCE in the model.

For a discussion of the descriptive potential of a model in which the sign can be regarded as a class of utterances, we must turn to

semantics proper. As it has already been intimated, a sign, whose identity has been established, will have as its members a potentially infinite, but nevertheless determined set of utterances. To each of these utterances corresponds the denotatum which it denotes, and therefore to the whole class of utterances corresponds the class of denotata whose members are denoted by the single utterances. Any set of utterances (e.g. a set of {"/teibl/", "/kat/", etc.}) can be said to have a class of denotata corresponding to it; but when, and only when, the set of utterances in question is co-extensive with a sign, the corresponding class of denotata shall be called DENOTATION CLASS.

Once the identity of the sign has been determined, that sign can be said to govern a specific denotation class; we may say that governing this denotation class is a property, the semantic property, of the sign in question. The members of denotation classes are denotata, and denotata can be considered on another level as DENOTABLES, to which outside criteria may be applied. Therefore, we can compare the semantic properties of signs; that is to say, we can set up semantic relations between signs by asking ourselves whether one and the same denotable may ever be a denotatum belonging to the denotation classes of all those signs, or, alternatively, whether one and the same denotable may ever be a denotatum belonging to the denotation class of one of those signs, but not to the denotation class of the other sign, or signs.

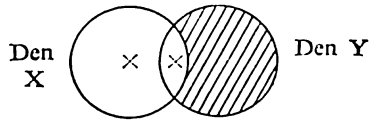
Here again, any of the relations possible in set theory may hold between the respective denotation classes of two signs. See diagrams overleaf.

When the denotation class of the sign x properly includes the denotation class of the sign y, we say that the sign x is a HYPERONYM of the sign y, and that the sign y, in turn, is a HYPONYM of the sign x.[4] An instance of such a relation from English would be that of *horse* and *stallion*, where the sign *horse* is a hyperonym of the sign *stallion*, and the sign *stallion* a hyponym of the sign *horse*.

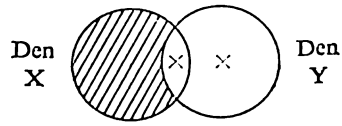
When the denotation class of the sign x totally overlaps with

[4] Lyons uses the terms "superordinate term" and "hyponym" in a rather similar, though less formal, way (Lyons, 1968).

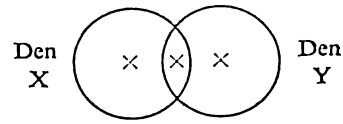
Den X[5] properly includes Den Y[6]



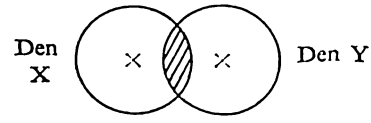
Den Y properly includes Den X



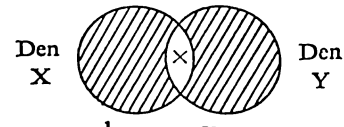
Den X partially intersects with Den Y, and vice versa



Den X is disjunct with Den Y



Den X totally overlaps with Den Y

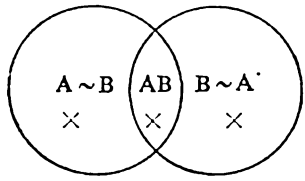


that of the sign *y*, we say that signs *x* and *y* are SYNONYMS. An instance of such a relation in English would be that of the sign *stallion* and the sign *adult male horse*. The validity of the statement that *stallion* and *adult male horse* are synonyms in the sense that synonymy is used here, depends on whether or not we can refute the proposition that 'any denotable which may be a denotatum belonging to the denotation class of *stallion*, may also be a denotatum belonging to the denotation class of *adult male horse*, and *vice versa*'. A single contradictory instance is sufficient to refute the statement that *stallion* and *adult male horse* are synonyms, but in the absence of such refutation, they will be described as synonymous signs.

No special semantic relations are set up between signs whose denotation classes intersect partially, or are disjunct. Partial intersection becomes interesting for semantics in cases where the intersection of two or more denotation classes is co-extensive with the denotation class of yet another sign. For instance the denotation

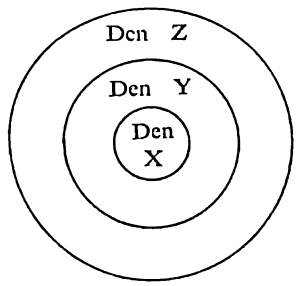
[5] Den X refers to the denotation class of the sign *x*.
[6] Den Y refers to the denotation class of the sign *y*.

classes of the signs *to refer to* (class A in the diagram below) and *to allude to* (class B in the diagram below) intersect in such a way that their intersection is co-extensive with the denotation class of *to mention*.



A ~ B: denotation class of *to refer to something at length (not briefly)*;
B ~ A: denotation class of *to allude to something without being explicit*;
AB : *to mention* (i.e. to refer to something briefly and explicitly).

We cannot, without exceeding the scope of the present work, do more than to mention the use of relations between denotation classes in the setting up of SEMANTIC FEATURES for signs. Here we need a notion 'direct hyperonym', which, without going into details, can be defined as 'a hyperonym z of the sign x, such that, in the language in question, there is no sign y which is both a hyponym of the sign z and a hyperonym of the sign x'. In brief exemplification of this complex statement we note here that, in a case where the denotation classes of signs x, y and z (Den X, Den Y and Den Z respectively) are in a relation as shown in the diagram below, the sign z is a hyperonym, but not a DIRECT hyperonym of the sign x, whereas the sign y is a DIRECT hyperonym of sign x.



A further use of the HYPERONYM-HYPONYM relation and of the relation of SYNONYMY, is that signs can be ordered into a HIER-

ARCHICAL NETWORK[7] on the basis of these relations. A sketchy representation of such ordering, in which a connecting line represents a hyperonym-hyponym relation, is given in figure 1.

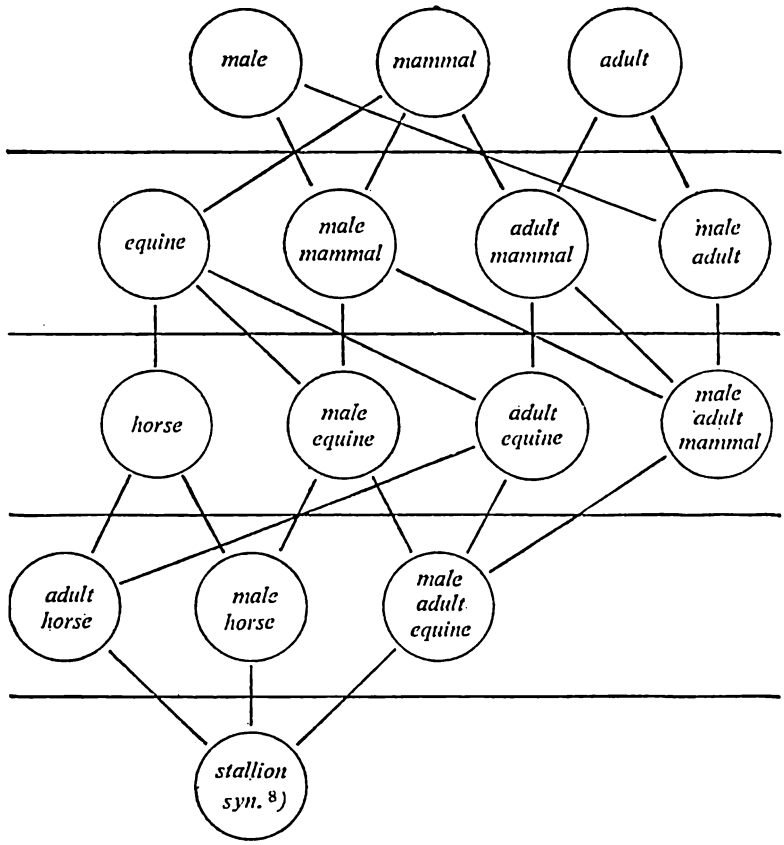


Fig. 1.

[7] It may be interesting to note that the 'semantic structure' of languages is most faithfully represented as a hierarchical network, and not as either just a hierarchy, or just a network.

[8] Synonyms of *stallion* are, for instance, *adult male horse*, *adult male mammal of the species 'horse'*, etc. These synonyms have *qua* signs (by requirement) exactly the same semantic features. In order not to complicate the discussion, we have left out of consideration the sign *gelding* (castrated adult male horse), which may refute the hypothesis that *adult male horse*, etc., and *stallion* are synonyms.

V

IN DEFENCE OF A DENOTATIONAL THEORY OF SEMANTICS

Most of the arguments against denotational theories known to us come not from linguists, but from philosophers. This places us in a paradoxical situation, where, although we are neither competent, nor, indeed, particularly inclined to take our stand in the domain of philosophical theory, we feel nevertheless obliged to present a philosophically slanted defence for our semantic approach. It is our purpose here to try to indicate the particular use of 'denotatum' in our theory, and to show that, some of the absurdities normally incurred by denotational theories, are avoided by our use of that term. We shall also allude to the scope of denotational semantics as compared to 'theories (general) of meaning', and the advantage of restricting this scope, as compared to other possible semantic theories.

We shall start by re-iterating a part of our discussion from the previous chapter. In that chapter we have discussed the possibility of resolving a paradox concerning denotation, by distinguishing between SIGN and UTTERANCE, as well as, in a parallel way, between DENOTATION CLASS (class of denotata corresponding to a SIGN) and DENOTATUM (corresponding to, or denoted by, an UTTERANCE).

It has also been stated in the previous chapter that denotata, when considered outside of their relation to utterances, are being viewed, on another level, as DENOTABLES. That empirical criteria, from the sciences studying entities in the empirical world, CAN be brought to bear on DENOTABLES, need not imply that positive characterization of all denotables (and therefore of all denotata) is always possible. What is more, this statement is not to be inter-

preted in a logical positivist sense as implying that all denotables are empirically existing entities (directly experienceable through the senses or through an extension of the senses).

At least some philosophers will agree that there are entities other than physical objects 'existing' in some sense of the word. It is our contention that at least one of the functions of human communication (e.g. speech) is to DENOTE entities, whether physical objects or not.

It follows from Mulder's axioms and definitions,[1] that this is the sole *raison d'être* of grammatical entities in some communication systems (e.g. the sentences ['letters'] of the Morse-code, which cannot, as such, be used to 'connote', only to denote) and specifically of linguistic signs (*qua* signs) as defined in our theory (this will be discussed further on).

The term 'denotable', and even the term 'entity', is not entirely devoid of 'substantive' implications. In our theory they are, however, to be understood in a sense entirely deprived of these 'substantive' overtones. By this is meant not only that entity and denotable are not to be interpreted as: 'empirical (physical) object', but that they are not to be interpreted as: 'object', in any sense at all. Some denotata, of course, may be 'objects' (e.g. table, unicorn), some may even be 'concretely existing objects' (e.g. table), but apart from these, there are denotables which are neither. Attributes, actions, processes, relations and all sorts of complex facts and circumstances are also denotables, and may in turn become the denotata of utterances.

Consequently, when considering denotables, it is immaterial for our purposes, whether they are entities whose existence has been instanced in a concrete sense, entities whose existence has not been instanced, but may yet be instanced, entities whose existence can never in fact be instanced, or entities whose existence can never in principle be concretely instanced. Of the first kind, entities such as *table*, *red*, *hit*, *underneath* (object, quality, action and relation respectively) would serve as examples. The case of the

[1] See Mulder, *Sets and Relations in Phonology* (Oxford, 1968), 10-12.

Abominable Snowman can furnish an example of a entity which, although it has not been instanced to date, may at some future time be empirically observed. An interesting instance of an entity (a complex circumstance) belonging at some time to the latter type, but becoming relegated to the type of entities whose existence can never IN FACT be instanced, is *The moon is made of green cheese.* Before any actual empirical observation of the substance of which the moon consists was possible, the fact (entity) that *The moon is made of green cheese*, was potentially instanceable. Since empirical observation of the surface of the moon, this complex entity has changed its status to 'entity that can never IN FACT be observed'. This change in the status of the denotable entity may perhaps effect the truth value of the proposition "The moon is made of green cheese", but we see no reason to suppose that it has in any way affected the information value of the sentence (sign) *The moon is made of green cheese.*

Our use of the term 'denotatum' is free of restrictions of scope on the basis of any possible non-linguistic classification of denotables. It is probably in this regard that our use of 'denotatum' is most unlike the use philosophers make of that term. Philosophers start by specifying what conditions a denotatum as an ENTITY (denotable) must fulfil before one can say that it is 'denoted' by a linguistic expression. At the most restricted, only concrete objects can be said to be 'denoted', but even at best, there will still be a specification as to what type of entities may be said to be denoted. Where this line is drawn may vary considerably, but drawn it usually is, rather arbitrarily, it seems to us, but whether it is drawn arbitrarily or not is irrelevant to the present discussion. On the other hand, in our approach to denotation, which is *via* the sign TOWARDS denotables (and not *vice versa*, as seems to be the case with philosophers), we merely note the fact that denotables may be classified in various ways, but insist on disregarding such classification as a possible criterion in a definition of 'denotatum'. Since we are using 'denotable' in the widest sense, and 'denotatum' in the sense of 'denotable being denoted', it would be absurd for us to say that 'SOME denotables, such that they are denoted, and such

that they fulfil certain empirical conditions as well, are DENOTATA'.[2] By this we would imply both that 'all entities are denotables' and that 'entities are denotables if an only if they fulfil certain empirical conditions'. Either one or the other of these contradictory statements must be rejected. Which one is rejected, that is to say how the term 'denotable' is to be understood, depends, of course, on the purpose to which the notion is to be put. In semantics it is not our purpose to construct a model for denotables, but rather a model for speech phenomena. This in itself is a good reason for choosing 'all entities are denotables' irrespective of subclassification of entities, as a definition in semantics (entity is left as a primitive term, but its use has been explained to be the widest possible). Furthermore, philosophers who have opted for the restricted use of 'denotatum' (note that they do not usually distinguish between the level of denotata and the level of denotables) are fond themselves of demonstrating that their notion 'denotation' (under their own definition) is a useless one. Therefore it seems to us justified on at least two counts to adopt the wider definition of 'denotatum'. The following chain of definitions will clarify our view:

> 'denotatum' for 'denotable being denoted';
> 'denotable' for 'any entity' (i.e. anything that can be, directly or indirectly, referred to);
> 'being denoted' for 'occurring as the right hand term in a relation a R b, where a is the realization of an index and b is the information conveyed by a, provided that $b \neq a$'.

From the above chain of definitions it might seem that we are indulging in a trivial tautology to the effect that 'everything that is the information conveyed by the realization of an index is a denotatum' and 'everything that conveys information is the realization

[2] We are thinking here specifically of the view according to which, say, *table* (in *red table*) DENOTES (because it 'refers to' something classified as an OBJECT), whereas *red* CONNOTES (because it 'refers to' something classified as a QUALITY of the object denoted).

of an index'. This, however is not the case, for it is always independently decidable, that is without recourse to circularity, whether a given element conveys information or not. If from the given element some entity other than its own identity is being inferred, then, in that instance, the given element is a realization of an index, and the entity inferred from it is its DENOTATUM. Whether or not we can say any more about that denotatum, say on the level of DENOTABLES, is not necessarily material to semantics. We might of course be interested in comparing two or more denotata on the level of denotables, where proof of their identity or non-identity may be used for setting up relations (e.g. of referential similarity) between the realizations (of indices) to which they correspond respectively. But for proof of such identity or non-identity positive characterization of denotables is not necessary. Unicorns do not have to exist, nor do we have to know their 'defining qualities' (this has to do, in any case, with devising paraphrases which are ultimately trivial), before we can say with a high degree of certainty that an entity *unicorn* is not identical to other entities such as *table* or *atom* or *force* or *fairy*. In the case of two realizations of the sign *unicorn* it may be undecidable whether their denotata are identical or not on the level of denotables, but for all our purposes in semantics, it is sufficient that they MAY be identical.

In the same way, whatever realizations of *and* denote (and we do not wish to be drawn into giving a paraphrase, since paraphrasability is a comparatively trivial, and certainly entirely language-bound property), we can say with certainty that they denote some denotatum, for they indubitably convey information (other than their own, presumably acoustic, identity). That they do so, follows inevitably from the fact that they differ in information value from realizations for instance of *or* (*a book and a pen* as opposed to the constructionally (i.e. syntactically) equivalent *a book or a pen*). Furthermore, one needs no concrete specification of the denotata of realizations of *and* in order to be able to determine that these denotata are, on the level of denotables, non-identical to the denotata of realizations of signs such as *table*, *unicorn* and *or*. Whether two realizations of *and* have or have not denotata identical on

the level of denotables may not be decidable. But we may assume for instance that this relation (denotable) is the same, provided it holds between the same empirical objects in identical conditions of time and space. This 'same' relation can be denoted by more than one realization of *and*, and therefore two realizations of *and* MAY have denotata which are identical on the level of denotables. The same DENOTABLE (relation) may be denoted by a realization of *together with*, implying that the denotation class of *and* intersects with that of *together with*. As long as intersections between denotation classes, and the type of intersection, are decidable in our view of denotation, we feel that our use of the terms 'denotable', 'denotatum' and 'denotes' are justified by their usefulness in leading to a consistent semantic description of speech.

Another line of attack must be covered. The example has been used by philosophers of *the evening star* and *the morning star* as being both denotationally equivalent to *the planet Venus* and to one another. Clearly, before the identification of the planet Venus, the two were not synonymous in even the narrowest sense, in fact they would have had to be described as having non-intersecting denotation classes. If they have become synonymous, this would seem to be purely a result of the change in the status of their respective denotata from being regarded as non-identical on the level of denotables to being regarded as identical on that level. Here non-linguistic facts would, then, appear to affect linguistic descriptions. This is true, but only in a sense, as will be seen in what follows. The conventional information values of the two expressions, that is to say their denotation classes, were originally demonstrably disjunct only on the assumption that these classes were limited (because of the way these expressions were USED by speakers) to 'particular star visible in the evening but not in the morning' and 'particular star visible in the morning but not in the evening' (two non-intersecting classes), respectively. Now it could be argued that this limitation is still extant and that therefore we have two different approaches to the denotation of the expressions in question, leading to two diametrically opposed conclusions, namely that

a) realizations of *the morning star* and *the evening star* denote one and the same denotatum (the planet Venus) and therefore there is total overlap between their denotation classes

b) the denotation classes of the same two expressions are disjunct.

Such a paradox can, however, only be obtained by falsifying the LINGUISTIC data. The denotata of realizations of these signs must of course be entities AS SPEAKERS KNOW THEM, and not as they are *qua* entities, but individual speakers do not have to be aware of the synonymy of expressions when they realize them. If we were accounting for 'the native speaker's intuitive knowledge of his language' we should have to say that some speakers are aware of the fact that *the morning star* and *the evening star* are both denotationally identical to *the planet Venus*, while other speakers are not. But what we are describing is SPEECH DATA, in other words, roughly, what people SAY. Now we shall clarify what we meant at the beginning of this paragraph by "falsifying the LINGUISTIC data". If on the one hand we accept the data equating (denotationally) the two expressions above, with *the planet Venus*, then we must ask the same informants from whom this data was gathered, as to whether it is true that 'the morning star is visible both in the morning and in the evening'. The informant, KNOWING about *the planet Venus* (and this fact was GIVEN) cannot negate this outright, but will say "Yes, but in the evening we call it the evening star" (or some such). In other words, it will no longer be the case, as it will become clear from the data, that the DENOTATION (as opposed to 'connotation') of *the morning star* will be limited (according to the speaker's usage) to 'star visible in the morning but not in the evening'.

Consequently, we can say that the discovery of the planet Venus and the knowledge of the fact that the *same* entity is denoted by utterances of all three expressions *the morning star*, *the evening star* and *the planet Venus*, will be seen to have affected the SPEECH-DATA. By this we mean simply that, whereas previously, speakers would have said categorically that "the morning star can be seen in the morning, but not in the evening", now at least some speakers

will say that "the morning star can be seen in the morning AND in the evening". This alteration in the speech-data, provided by informants, will lead to setting up a new sign *the morning star* in such a way that it is semantically (and therefore also *qua* sign) non-identical to the sign *the morning star* as it was set up previous to the discovery of the planet Venus. The empirical fact of this discovery affects sign identity only because it affects the speech-data; if it did not do so, it would have no linguistic repercussions. Therefore, it is not true to say that empirical discoveries, as such, affect linguistic descriptions, only that changes in the speech-data may cause changes in the linguistic description (which is as it should be), and empirical discoveries, of course, may occasion changes in the speech-phenomena.

Yet another point which can be demonstrated from the example of *the morning star* and *the evening star* is one that cannot be sufficiently stressed. When we say that, denotationally speaking, these two expressions are SYNONYMOUS both with *the planet Venus* (sign) and with one another, we most emphatically DO NOT imply that there is no significant difference of 'meaning' (in the wide sense) between these expressions. Indeed we firmly believe that there are other (by tautology NON-DENOTATIONAL) meaning-differences between them, or at least between respective utterances of them. Most denotata of utterances of *the evening star* TEND TO belong to the class of 'star seen in the evening', and most denotata of utterances of *the morning star* TEND to belong to the class of 'star seen in the morning'. This however, is only a TENDENCY in the utterances, and since it is not a general rule, it may not be made into a characteristic (semantic) feature of the SIGNS in question. Rather than making this tendency a feature of the sign on a denotational level, where it would lead to contradictions, we could specify on another (perhaps stylistic, but certainly non-denotational) level that the expression (sign) *the morning star* is CORRECTLY USED when it correctly implies (not in the logical sense) that its denotatum actually belongs to the class of 'star seen in the morning'. In a similar manner, one could specify the CORRECT USE of *the evening star*. But this would be definitely on a level other than

that of the DENOTATION of SIGNS, for the latter is concerned only with WHAT utterances (any and all) of a sign may denote, and does not extend to exploring under which circumstances it is a more or less 'correct usage' for those utterances to denote what they denote. In other words, all the information conveyed by utterances, if it is of a WHOLLY FIXED CONVENTIONAL nature (and may not vary between members of a class of utterances) is accounted for as the DENOTATION of the sign of which the utterances are members. Denotation classes are set up, semantic features determined, on the basis of WHOLLY FIXED CONVENTIONAL information values. This is neither more nor less than what is demanded by the definition of SIGN.[3] Consequently, if a realization conveys information other than a member of the denotation class of the sign of which it is a realization, we must conclude that this information is NOT the denotatum or part of the denotatum of the UTTERANCE which is a model for the realization, as well as being a member of the sign in question. We may then either say that that information is 'connoted' by the utterance (and TENDS to be 'connoted' by the sign) or that it is DENOTED not by the UTTERANCE, but by some other model (e.g. stylistic, but not a strictly linguistic one), set up on a different level, for the given realization. We believe, in other words, that the strictly LINGUISTIC 'meaning' of realizations [ðə prɛzɪdənt kɪkt ðə bʌkɪt] ("the President kicked the bucket") is no more and no less than that of realizations [ðe prɛzɪdənt dajd] ("the President died"), and the additional overtones of 'disrespect or dislike' in the former, are NOT strictly a matter of LINGUISTIC 'meaning'.

We have already indicated, both in the first chapter of the present work and in our article on indices[4], that elements are often present in the speech phenomena (such as tone of voice and the 'meanings' conveyed by this, or the conveying of other than the 'purported' information, e.g. the fact that the speaker is present, etc.) which, although they are functions of 'meaning' in the realizations, are

[3] See also especially the authors' article, "*Index* and *signum*", *Semiotica*, IV, 1971, 4.

[4] Ibid.

not accounted for on the level of signs. Such elements do not form a part of denotational sign-semantics. Strictly speaking therefore, we should not say that 'a linguistic UTTERANCE (member of a linguistic sign) connotes a certain information value', for by definition, whatever information value the actual UTTERANCE as a model conveys is its DENOTATUM or PART OF THAT DENOTATUM, a member, or part of a member, of the denotation class of the sign to which the given utterance belongs. It must be clearly understood that, wherever the realization of a sign is regarded as conveying information other than what is determined by the FIXED CONVENTIONS governing the information value of the sign whose realization it is, we are really dealing with a model for that realization on some level other than sign-semantics (such as psychology, or stylistics, etc.). If this is understood, then there is no harm in defining 'connotes' in such a way as to make it a function of the UTTERANCE (albeit an indirect one).

'utterance connotes x' for 'the realization corresponding to the utterance conveys information x, such that x is not the denotatum (or part of the denotatum) of the utterance'.

We may, furthermore, characterize signs (on a non-denotational, and therefore in our sense non-semantic level) by the tendency of their utterances to connote certain types of information.

'sign tends to connote x' for 'a conspicuously large number of (but by requirement NOT ALL) utterances of the sign connote x'.

In the case, therefore, of *gobble*, we can say that this sign TENDS to CONNOTE that 'the performer of the action is an animal' (N.B. it MAY be a human) and a given UTTERANCE of this sign may connote that 'the action of eating is performed by an animal'. This information cannot be said to be DENOTED by the UTTERANCE, for it is not WHOLLY FIXED CONVENTIONAL, but variable between members (utterances) of the sign *gobble*. Such information value may well be a part of the 'meaning' of a given realization, but not of the denotatum of an utterance "/gobl/". Therefore we say that denotation is only an 'aspect of meaning'.

We do not believe that our view of 'denotation' implies internal inconsistencies within the theory of the sign as presented in this work. Consequently, any arguments against this view have to be external ones. The objection that we allow utterances (e.g. of *and*) to DENOTE, which others might maintain have no denotation, has been answered, simply by pointing out that we use the term 'denote' in such a way that all utterances of signs do denote.

Other serious objections would arise if

(a) we were to claim that all questions of 'meaning' in speech can be resolved in denotational sign-semantics;

(b) it could be demonstrated that denotational sign-semantics blocked the way to the study of other aspects of 'linguistic meaning'.

The former point has been discussed above, where we made clear our belief that 'meaning', in the wide sense, has to be studied on AT LEAST one level other than that of denotational sign-semantics.

The latter point deserves to be mentioned in conclusion of our discussion. Not only is it not the case that denotational sign semantics impedes access to the remainder of 'linguistic meaning', but it in fact could be of valuable assistance in defining the scope (by elimination) of other disciplines studying such 'meaning'. If a realization conveys information other than what is accountable for in terms of the denotation of the sign whose realization it is, then we can be sure of having isolated a feature of the 'meaning' of that realization on some other level. Contradictions which might arise on a single-level approach to 'linguistic meaning', can, as we saw in the case of *the morning star* and *the evening star*, be resolved if a separation is made between levels.

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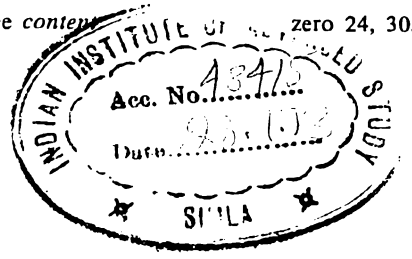

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