

TRANSLATION

By MISS MARGARET MASTERMAN AND MR. W. HAAS

I—MARGARET MASTERMAN*

THE purpose of this paper is to present to this symposium a philosophical model of real translation.

“Translation” is here used in its ordinary sense; in the sense, that is, in which we say that passages of Burke can be translated into Ciceronian Latin prose, or that the sentence “He shot the wrong woman” is untranslatable into good French. The term “philosophical”, however, needs some explaining, since, so far as I know, no one has made a philosophical model of translation as yet. I shall call a model of translation “philosophical” if it has the following characteristics:

(a) It must not only throw some light on the problem of transformation within a language, but must deal also with the problem of reference to something. That is to say, it must relate the strings of language-units in the various languages with which it deals to public and recognisable situations in everyday life. It is characteristic of philosophers that, unlike most linguists, they do not regard a text in language as self-contained.

(b) It must deal in concepts, not only in words or terms. All philosophers believe in concepts, though they sometimes pretend not to.

(c) It must face, and not evade, the problem of constructing a universal grammar; while yet recognising fully how greatly languages differ, and how peripheral is the whole problem of determining the nature of grammar to the deeper problem of determining the nature of language.

(d) It must deal in word-uses, that is, with words as they occur in their contexts; that is, it must face and not evade the problem of the indefinite extensibility of word-meaning.

*The Aristotelian Society are grateful to The Cambridge Language Research Unit for financial and other assistance in printing this paper.

It is this last characteristic, philosophically speaking, which is the novelty, since it ties up my translation-model not to philosophy in general, but to a particular kind of contemporary philosophy, namely, linguistic philosophy, the "philosophy of ordinary language". The philosophical relevance of this translation-model, in my view, is twofold. Firstly, following lines laid down by C. H. Langford,¹ it can be used to solve Moore's Paradox of Analysis. Secondly, following lines laid down by J. L. Austin, both in his seminars², and in his paper on *Excuses*³, and following also, though less nearly, a line laid down by Wittgenstein in Part II of *Philosophical Investigations*⁴, it can be used to operate a Contrast Theory of Meaning. This Contrast Theory of Meaning may well be only analogous to, and not the same thing as, the theory of meaning searched for by Austin, and the theory of meaning glimpsed at by Wittgenstein. Nevertheless, if the analogy of each theory of meaning with the other or of either with the theory of meaning presented here is admitted at all, the fact that it is possible to construct this translation-model constitutes a far more fundamental answer than any given yet to the attack delivered on the "philosophy of ordinary language" in Gellner's *Words and Things*.⁵

Thus the philosophical roots of this model of translation lie not in the older logic, but in the study of "ordinary language". The system presented here is, however, a *model* in the sense that it can be operated, and yields results, either right or wrong; it is not just a piece of philosophical dictionary-making, undertaken either for its own sake or to discredit generality.

I. *Situations*. Such a book as Charles Duff's *How To Learn a Language*⁶ settles for me beyond doubt the fact that not very clever differing-language speakers with minimal sign-apparatus can understand one another,—that is, translate to one another,—if and only if they can both recognise and react to situations common to both of them in real life.

What I want to say here is that, even when we know one another's languages, we still do the same thing. It is important to side with the language-teachers, and not with the behaviourist psychologists or the linguists, on this; for either of these last two

groups, starting from their own assumptions, can talk one into thinking that translation, in the ordinary sense, is impossible. But language-teachers who teach translation know how it is that it can occur; the right hotel-room is engaged, the puncture in the left back tyre is mended, the telegram is sent, the friend's friend (unknown) is safely met at the station, all because, however little the people engaged know of each others' languages, they know a very great deal about the relevant situation. And in so far as this knowledge of a common stock of situations breaks down, as it well might break down as between us and the termites, or between us and sulphur-breathing beings from another planet, then it is evident that, whatever the languages involved, translation becomes impossible.

We now have to consider the place in the model of the situations occurring in real life; indeed we have to consider how to portray them at all, given that situations in real life are so many and have such vague boundaries. Fortunately, a philosophical technique for situation-portrayal has recently grown up which is used by Anscombe for describing Wittgenstein's Picture Theory of Meaning.⁷ It is used also, though less philosophically, by I. A. Richards and Molly Gibson in their language-teaching series of books *Language Through Pictures*.⁸ This technique consists in portraying a situation in real life by a stylised stickpicture, of the sort that is used in comic strips or in animated cartoons; moreover, it is a technique which can be logically examined and systematised; not completely, but to a greater extent than at first sight appears.*

Here is a brief description of the system:

We will assume that the stickpictures form a set, and that this set can be classified in the following way: (1) Two or more distinct stickpictures picturing the same basic situation will be

* It is probable, indeed, that far more can be done along this line than I have at present done. The rules and examples of the crude stickpicture situation-system given below are the result of the enterprise of interlingualising and generalising the first stages of the *Language Through Pictures* books, and were made for the purpose of interlingualising a crude procedure for mechanical translation.

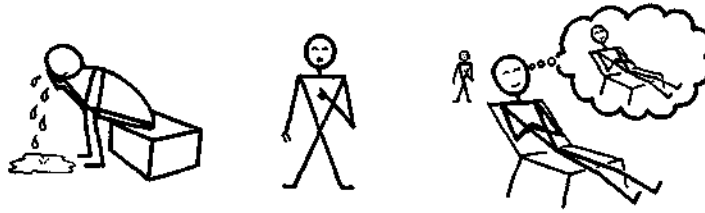
called *situationally similar*. The set may then be partitioned into mutually exclusive and collectively exhaustive subsets, which are such that all the stickpictures of any one subset are situationally similar; the whole subset will then correspond to one basic situation. The principles according to which the subsets corresponding to one basic situation are distinguished from one another we shall call principles of basic *situation-contrast*. (2) We then partition each subset of situationally similar stickpictures into subsubsets, the stickpictures in each of which picture the same basic situation from the same angle; or, as we shall say, from the same *aspect*. The principles according to which the subsubsets of *aspectually similar* stickpictures are distinguished from one another will be principles of *aspect-contrast*. (3) The principles of aspect-contrast according to which one subset of situationally similar stickpictures are partitioned will usually be partly the same and partly different from the principles according to which another subset of situationally similar stickpictures are partitioned. but we can conflate all the principles of aspect-contrast applicable to any of the basic situations, and take them all as applicable to every subset corresponding to a basic situation, if we allow for empty subsubsets in the subsets of situationally similar stickpictures.

It is characteristic of the system that it may be repartitioned any time according to different principles of classification. For example, new principles of situation-contrast and of aspect-contrast may be used, so that two stickpictures regarded from the old standpoint as situationally similar but aspectually dissimilar may be regarded from the new standpoint as similar or dissimilar, both situationally and aspectually, or as situationally dissimilar but aspectually similar. Moreover two stickpictures previously regarded as both situationally and aspectually similar may now be regarded as dissimilar in either or both of these respects. If such a repartitioning is made, the new arrangement of the system will, like the old, be a double classification system, but, of course, a different double classification system from the old one.

What does this come to in terms of real life?

We assume that, in life, we can recognise, and distinguish from one another, basic situations. Of these basic situations, three are

stickpictured below, namely, that of someone showing grief, that



*a human being
showing grief*

*a human being
pointing to himself*

*a human being
thinking about himself*

of someone pointing to himself, and that of someone thinking about himself:

We further assume that, in real life, basic situations are logically independent and all of equal weight, except that, logically, they go in contrasting pairs; e.g. "Laughter, Grief"; "Self, Other Man"; "Food, Drink"; "Birth, Death"; "War, Peace". Pairs of such basic situations can be re-sorted, but only into other contrasting pairs. Situation-series can also be built up (e.g. all those stickpictures which have human beings in, or all those stickpictures in which the sun is shining) but these series also will build up into contrasting pairs.


Thus, if we make ourselves a pack of cards on the specification of the system given above, each card having on it one stickpicture, and each stickpicture portraying one and only one aspect of a basic situation, we shall find at the end that we have a *double contrast-pack* of cards. Such a pack, as it stands, will be *objective*, in the sense that it will readily be sorted by differing players into the same sets, and these sets can be subsorted. If, however, it is desired to re-sort the pack, or any part of it, it will be found that all the re-sorted cards will have to be subtly redrawn, in order to bring up, or play down, new resemblances and contrasts between them. According to me, this re-sorting and noticing process is just what we do in real life, when we perceive a situation, as we say, "from a new angle". According to many people,—following lines associated, in linguistics with Lee Whorf,⁹ and, in philosophy, with Waismann,¹⁰—this is also what we do when we start to think in a new language; the new language, which will

have different sorting principles, will actually make its user notice different features of the world; he will see the world differently. My novelty in all this lies in introducing into the renoticing and re-sorting process a general principle of making contrasts in pairs.

We now turn to the mechanics of the ideography. It is evident that, if situation-contrasts and aspect-contrasts of a stickpicture-system are ever to be descriptably redrawn, their portrayal in the first place cannot be given by any feature alone; it must be given multiply. If, in an ideographic system for sorting and re-sorting cards by contrast, there are no units or elements of the system which can be inserted, transformed or removed, no change in the contrasts derivable from the system can ever be made. *The rules of the system, then, as they appear to the artist, will differ from the rules of the system as they appear to the sorter or re-sorter; the two men will deal in differing units.* The unit for the sorter or re-sorter is the card; for it is from the re-shuffling of the cards that he will have to build up new basic situations. The unit for the artist is any visual feature of a stickpicture which he finds by experience that he uses recurrently when making cards.

This recurrent visually-representational unit of the artist's I shall now call, extending Peirce's use of the term,¹¹ an *icon*. This definition enables me to say that the rules of the system, as they appear to the artist, consist in an icon-glossary together with a basic set of ideography-making principles; whereas the rules of the system, as they appear to the pack-user, consist of discoveries, made from his knowledge of the world and of languages, as to which combinations of stickpicture-cards are likely to occur together, and which are not and which extensions to the contrast-system can or can't be made. Since I want to pass quickly from the situation-system to the rest of the model, I will now leave the pack-user on one side, and concentrate on the artist.

There is neither need, nor space, to give a complete icon-glossary. Inspection of a small section of it, however, will make the nature of the whole system much clearer:

“... A free cloud, , must not be confused with a tied cloud,



. A free cloud stands for any abstraction from the objects which are within it, whereas a tied cloud, attached to a man's head, contains his thoughts given as images (see the right-hand stickpicture in the set of three, given earlier).

" A stickpicture with an arrow, , represents some sort of change,

or motion, or action. A stickpicture without an arrow, that is, with a blank background, represents a quiescent state. (See the left-hand stickpicture in the set of three, given earlier.)

" A stickpicture man with eyes only represents a participant in a situation or action, as opposed to an onlooker at it. A stickpicture man with eyes and mouth represents the doer of some action.

" A stickpicture man with features is a participant in some action; a stickpicture man without features merely exemplifies some situation.

" A stickpicture man whose hands and feet turn up is in a state of liveliness, whether of action or of movement. A stickpicture man with hands and feet turned down is limp; he is in an inert and quiescent state . . . "

And so on.

Consider now what happens, when you are teaching anything by pictures to someone with whom you have no common language. You go on building up your pictures or pictures, adding more and more realistic last-minute touches, and with your informant still looking blank, until suddenly communication is established. You will not yourself know, though you can sometimes guess, just what extra icon, what particularised spontaneous last-minute flick, adapted to his culture, caused your informant suddenly to fling up his hands in delight, burst into a flood of, to you, incomprehensible verbal expression, seize the chalk, and himself continue drawing the rest of the picture or pictures, correctly and without prompting. The point is, once he understands anything, he understands everything. Once he understands that the point of the picture which you are drawing for him is that it depicts, in every conceivable way, a sudden catastrophe, he will understand also that the exclamation-mark,—that icon, even in Peirce's *nonsense*, of sudden explosion,—which has been figuring prominently in a corner of the picture throughout, is the icon,—in the new *extended nonsense*,—which is to be used for all situations of sudden

catastrophe. He will understand this, and be able to act on it, even though there is no one word in his language for "sudden catastrophe" and therefore no counterpart of the exclamation-mark icon; for sudden catastrophes occur in his civilisation also. But it is the picture, or set of pictures, which makes him understand the icon; not the icon the picture. And so there has to be *something* in the picture which is instantly noticeable and recognisable to both draftsman and viewer as a concomitant of catastrophe. It might be that the stickpicture man's hair is standing right on end, (although "hair standing on end" has never yet been an icon) or that his face, beyond any doubt, expresses horror, or that the house is clearly on fire beyond putting out, or that the atom bomb has actually gone up,—any or all of these,—the point is that once something in the picture has been recognised as catastrophic, all the rest of the symbolism of the picture, by contagion, becomes catastrophic also. This is the principle upon which all comic strips, and all animated cartoons, in fact work; only in these, communication, both of mood and content, is so subtly achieved that the viewer can never consciously think back to what it was that first made him understand what was meant but never verbalised.

Now, it is a comedown from the brilliance of Walt Disney to the crude touched-up *Language-Through-Pictures* stickpicture system described here. Also, a language-teaching stickpicture system, unlike a cartoon, has not only got to tell a story; it must be charged with the message that aspect-indicators are the pegs upon varying combinations of which to hang various information-carrying devices used by languages. But it should now be clear that, however crude the system, quite complex multiple iconic contrasts have to be built up by the artist before a single aspect-contrast between two stickpictures becomes securely recognisable by readers from different cultures. Here, for instance, is the iconic lay-out of the aspect-contrast between a movement and a static posture; more generally, between an action and a state:

"Basic picture: a stickpicture man is lying (down) on a bed.
Active aspect: (i) there is an arrow somewhere in the picture, indicating the movement the stickpicture man is making.

- (ii) the stickpicture man's head, hands and feet all turn up; they show perkiness.
- (iii) the stickpicture man has eyes.
- (iv) the stickpicture man has a mouth.
- (v) if possible, the bed is being bounced on; but this is very difficult to draw.

- Quiescent aspect:*
- (i) there is no arrow in the picture.
 - (ii) the stickpicture man's head, hands and feet hang down; he looks limp; (but he is not sprawling, *i.e.* he is not dead).
 - (iii) the stickpicture man has no eyes and no mouth.

Nor is this an exceptionally complicated aspect-contrast to build up; many of the others are far worse.

Here, to conclude, are the basic principles of stickpicture-making in this system:

(i) Any aspect-contrast, in order to be understood by speakers from different cultures, must be overdetermined.

(ii) Any icon in the system can occur also as a complete picture, and any complete picture can occur also as an icon. (See, above, the two positions of the picture of the man pointing at himself).

(iii) There must always be something in common between any pair of icons, if this pair of icons is to convey an iconic contrast; and there must always be something in common between any pair of stickpictures, if this pair of stickpictures is to convey an aspect-contrast.

(iv) The icon-contrasts in the iconography cannot coincide with the aspect-contrasts in the aspect system, since the latter are built of the former.

(v) The icon-glossary, together with its rules of use, cannot completely specify the aspect-contrast system (this comes to saying that the whole ideography cannot be used to specify itself fully), since the way must always be left open for the stickpicture artist to add or alter any particularising last-minute touches, designed for some special culture, in order to make some basic situation or aspect recognisable to speakers of that culture.

II. Concepts. Let it be assumed that there can be constructed one set of situationally-similar stickpictures for each logically

independent *head* (or paragraph, or topic) in *Roget's Thesaurus*.^{(12)*} Let the *overlap of meaning* of the total set of word-uses in such a *head* be called a *concept*.

Let it be assumed also that the contrasts between the different *sub-paragraphs*, *rows* of word-uses and even smaller *strings* of word-uses which are separated by semi-colons as sub-divisions of rows, in any *head* in *Roget's Thesaurus*, can be defined in terms of the aspect-contrasts of the stickpicture system; either as single aspect-contrasts, or as alternations of aspect-contrasts, or as conjunctions of aspect-contrasts.

Let it be assumed further that any synonym-dictionary, in any language, could be similarly defined in terms of the stickpicture system, due allowance being made for the facts that both the stickpicture sets might have to be resorted, and the word-use distinctions within the heads might have to be specified by using different combinations of aspect-contrasts.

In so far as these three assumptions are true, it follows from them, and from what we have said earlier about situations, that we have now a general and interlingual way of constructing a meaning-contrast system which is interpretable as a synonym-dictionary in any language.

How this interpretation operates will become clearer in the course of describing how the whole model operates. There remains the need, however, to justify making the interpretation at all. That is to say, if this model of translation is to be philosophical, there is a need to show the sense in which *Roget's Thesaurus* is a philosophical document, as well as a synonym-dictionary written in English. And if this model is to be a model of real translation, there is a need to show the connection between

* As *Roget's Thesaurus* stands, the heads in it are by no means logically independent. Many of them, on the contrary, are logically connected; for instance, in the series 360 DEATH, 361 KILLING, 362 CORPSE and 363 INTERMENT, the last three are all *aspects* (in the sense of *aspect* which I wish to define in this paper) of the first. It is possible, however, by using a system of tags, to streamline *Roget's Thesaurus* in such a way as to leave only heads which can be taken as logically independent. This question will not be further discussed here.

aspect-contrasts occurring between stickpictures and basic **devices** for carrying information in various languages.

Let us take the philosophical matter first. Langford, in his article on *The Notion of Analysis in Moore's Philosophy*, explains philosophical analysis, both of language and of thought, in terms of a characteristic, both of language and of thought, which he calls "being idiomatic". Both verbal expressions and ideas, he says, can be idiomatic; an idea is idiomatic if it is ostensively defined,—that is, if you cannot give its meaning by applying the language's rules. The purpose of analysis is either to mitigate, or to remove an idiom, the *analysandum* being presumed to be always more idiomatic than the *analysans*. Thus, though in one sense of meaning, the *analysandum* and the *analysans* are synonymous, in another sense of meaning they are not, since the *analysandum* is always more idiomatic than the *analysans*. And so the Paradox of Analysis is solved; because a philosophical analysis, if correct, is not trivial; it does not only assert a bare identity; it asserts also a decrease in idiomaticness.

Now, ignoring various troubles which Langford gets into owing to his having two conceptions of analysis (the first applying to concepts, or ideas, the second to verbal expressions) in both of which analysis consists in decrease in idiomaticness, I want to examine, but examine critically, his central notion of "being idiomatic", which is common to both. My first contention is that this is by its nature an empirical notion, deriving not from any philosophical or logical root, but from the detailed, day-to-day study of languages. In what way, then, can an *idea*, or *concept*, be idiomatic? It is idiomatic, says Langford, if it has to be ostensively defined. This contention of his is wrong, though, in two ways. Firstly, idioms are just that part of a language which is never ostensively defined. If someone asks me, "What does 'It's raining cats and dogs' mean?" I say, "It means the same as 'It's raining very hard'"; and that whether I'm defining the idiomatic verbal expression or the idiomatic idea. I don't turn dumb, and drag him to the window. On the other hand, if he goes on to ask, "And what does 'It's raining very hard' mean?" and if he persists in doubt, I do, in the end, have to drag him to the window. So the second way in

independent *head* (or paragraph, or topic) in *Roget's Thesaurus*.^{(12)*} Let the *overlap of meaning* of the total set of word-uses in such a head be called a *concept*.

Let it be assumed also that the contrasts between the different *sub-paragraphs*, *rows* of word-uses and even smaller *strings* of word-uses which are separated by semi-colons as sub-divisions of rows, in any head in *Roget's Thesaurus*, can be defined in terms of the aspect-contrasts of the stickpicture system; either as single aspect-contrasts, or as alternations of aspect-contrasts, or as conjunctions of aspect-contrasts.

Let it be assumed further that any synonym-dictionary, in any language, could be similarly defined in terms of the stickpicture system, due allowance being made for the facts that both the stickpicture sets might have to be resorted, and the word-use distinctions within the heads might have to be specified by using different combinations of aspect-contrasts.

In so far as these three assumptions are true, it follows from them, and from what we have said earlier about situations, that we have now a general and interlingual way of constructing a meaning-contrast system which is interpretable as a synonym-dictionary in any language.

How this interpretation operates will become clearer in the course of describing how the whole model operates. There remains the need, however, to justify making the interpretation at all. That is to say, if this model of translation is to be philosophical, there is a need to show the sense in which *Roget's Thesaurus* is a philosophical document, as well as a synonym-dictionary written in English. And if this model is to be a model of real translation, there is a need to show the connection between

* As *Roget's Thesaurus* stands, the heads in it are by no means logically independent. Many of them, on the contrary, are logically connected; for instance, in the series 360 DEATH, 361 KILLING, 362 CORPSE and 363 INTERMENT, the last three are all *aspects* (in the sense of *aspect* which I wish to define in this paper) of the first. It is possible, however, by using a system of tags, to streamline *Roget's Thesaurus* in such a way as to leave only heads which can be taken as logically independent. This question will not be further discussed here.

aspect-contrasts occurring between stickpictures and basic devices for carrying information in various languages.

Let us take the philosophical matter first. Langford, in his article on *The Notion of Analysis in Moore's Philosophy*, explains philosophical analysis, both of language and of thought, in terms of a characteristic, both of language and of thought, which he calls "being idiomatic". Both verbal expressions and ideas, he says, can be idiomatic; an idea is idiomatic if it is ostensively defined,—that is, if you cannot give its meaning by applying the language's rules. The purpose of analysis is either to mitigate, or to remove an idiom, the *analysandum* being presumed to be always more idiomatic than the *analysans*. Thus, though in one sense of meaning, the *analysandum* and the *analysans* are synonymous, in another sense of meaning they are not, since the *analysandum* is always more idiomatic than the *analysans*. And so the Paradox of Analysis is solved; because a philosophical analysis, if correct, is not trivial; it does not only assert a bare identity; it asserts also a decrease in idiomaticness.

Now, ignoring various troubles which Langford gets into owing to his having two conceptions of analysis (the first applying to concepts, or ideas, the second to verbal expressions) in both of which analysis consists in decrease in idiomaticness, I want to examine, but examine critically, his central notion of "being idiomatic", which is common to both. My first contention is that this is by its nature an empirical notion, deriving not from any philosophical or logical root, but from the detailed, day-to-day study of languages. In what way, then, can an *idea*, or *concept*, be idiomatic? It is idiomatic, says Langford, if it has to be ostensively defined. This contention of his is wrong, though, in two ways. Firstly, idioms are just that part of a language which is never ostensively defined. If someone asks me, "What does 'It's raining cats and dogs' mean?" I say, "It means the same as 'It's raining very hard'"; and that whether I'm defining the idiomatic verbal expression or the idiomatic idea. I don't turn dumb, and drag him to the window. On the other hand, if he goes on to ask, "And what does 'It's raining very hard' mean?" and if he persists in doubt, I do, in the end, have to drag him to the window. So the second way in

which Langford's definition of an idiomatic idea or verbal expression is wrong is that it defines all the ideas and all the verbal expressions in language except the idioms. For both word-uses (Langford's verbal expressions) and concepts (Langford's ideas) have to be ostensively defined; idioms don't; on the contrary, they have to be mitigated or removed, as he says, by analytic definition.

I now want to ask: suppose now, in an attempt to save Langford's general position, we extend his notion of being idiomatic to all words, instead of only to idioms in the narrow sense, it being now only required of the words of any language that some words shall be ascertainably more idiomatic than others. Following Langford, we shall now have to extend it similarly to all concepts. Suppose further that we accept that the notion of "idiomatic" is indeed an empirical one, to be explained in terms of ostensive reference to situations outside language, and that whether it applies to verbal expressions or to concepts. We shall then be compelled to have empirical concepts; *i.e.*, we shall be compelled to have a new conception of the nature of a concept. If we can do this,—and only if we can do it,—can we solve, along Langford's lines, Moore's Paradox of Analysis.

Let me put this point another way. Langford's "idiomatic ideas" cannot, by the nature of the case, be the ordinary concepts. Consider: we see a male; we then talk about "the concept of maleness". But whoever talked about "the concept of raining-cats-and-dogs-ness"? Clearly, to talk sense about this last, we want a second, more fundamental type of concept; in my words, a concept corresponding to a basic situation (the situation of wet weather, portrayed in all versions and seen from all angles, including picturesque ones) rather than, like maleness, a concept corresponding sometimes to a basic situation but mainly to an aspect.

Let us now, with the need for generalised idiomatic concept-finding in our minds, re-examine the basic situation already stickpictured, *i.e.* the basic situation of grief: of someone being in grief, of someone shedding tears. It comes to this, that having dealt already with the question of situation, we now have to deal with that of reference; granted that we have now stylised what

we mean by a basic situation in real life, we now have to ask "How are we to refer to it?" Are we really going to assume that there is only one really correct way of referring to this grief situation, *i.e.* by the proposition "x is shedding tears"? Are we further going to assume,—as, according to Anscombe, the Wittgenstein of the *Tractatus* seems to have assumed,—that there is only one kind of contrast between sentences which is relevant to this basic situation, namely, the contrast between this proposition in its *T*-form, "x is shedding tears," and the same proposition in its *F*-form, "It is not the case that x is shedding tears." We can make this artificially restrictive assumption if we like; if we are concerned with facts, though, our presuppositions will be quite different. For whereas agreement between different people can fairly easily be reached as to what the basic situation referred to by any set of situationally-similar stickpictures is (or, if we remove the stylisation, as to what any frequently occurring situation in real life is), there is only the very vaguest tendency towards agreement as to how any such situation may legitimately be referred to. Thus, in a recent test, and taking now the basic stickpicture of a man pointing to himself (*i.e.* the middle one in the set of three) the *Language Through Pictures* series gave the following variety of utterances as references:

<i>English Through Pictures</i>	I
<i>French Through Pictures</i>	C'est moi
<i>German Through Pictures</i>	Ich bin ein Mann
<i>Spanish Through Pictures</i>	Yo soy un hombre
<i>Hebrew Through Pictures</i>	אני אדם
<i>Italian Through Pictures</i>	(picture not in book)

Nor could this variegation be blamed only upon differences between languages; for a set of young British philosophers, when shown the same picture, wrote the following even more variegated set of remarks under it in "ordinary language":

- "It is I"
- "Cogito, ergo sum"
- "My head is bloody but unbowed"
- "My name is John"

Suppose we now ask: "What is in common between all these remarks?" Certainly, no sentence; not even any word-use, in

any exact sense. The most we can say is that there is a certain conceptual overlap, that is, that there is a certain overlap of meaning between all these remarks seen in the context of this particular stickpicture, which could be expressed by saying that all of them contain or presuppose some sort of notion of "self", or of "I". *I propose to call this overlap of meaning, whatever it may be, "the concept of 'I-ness'".*

Let us now have another look at *Roget's Thesaurus*; this time, to get a good case, let us go back to the basic situation of grief, and therefore turn to head 839, *LAMENTATION*. Here we have just such an overlap of meaning. We cannot define it, but by reading through the list of synonyms, we can get a good idea of it; if we could not, there would be no synonym-dictionaries. Nor does it matter if the set of word-uses in English which might go into that paragraph is always liable to be subtracted from or added to; so long as there remains some overlap, this defines the concept.

Nor is this new concept of a concept unknown in philosophic literature. Consider, from this new angle, the following well-known passage:

"Suppose . . . that we set out to investigate excuses, what are the methods and resources initially available? *Our object is to imagine the varieties of situation in which we make excuses, and to imagine the expressions used in making them* (italics mine). If we have a lively imagination, together perhaps with an ample experience of dereliction, we shall go far, only we shall need system, . . . It is advisable to use systematic aids . . . First we may use a dictionary,—quite a concise one will do, but the use must be *thorough*. Two methods suggest themselves, both a little tedious, but repaying. One is to read the book through, listing all the words that seem relevant: this does not take as long as many suppose. The other is to start with a widish selection of obviously relevant terms, and to consult the dictionary under each: it will be found that, in the explanations of the various meanings of each, a surprising number of other terms occur, *which are germane, though of course not often synonymous* (italics mine). We then look up each of *these*, bringing in more for our bag from the definitions given in each case; and when we

have continued for a little, it will generally be found that *the family circle begins to close*, (italics mine) until ultimately it is complete and we come only upon repetitions. *This method has the advantage of grouping the terms into convenient clusters*,—(italics mine) but of course, a good deal will depend upon the comprehensiveness of our initial selection.”³

It cannot be doubted, I think, that in his second method, given above, Austin is describing not only a new method of thinking, but also the best possible method of compiling a synonym-dictionary; and it follows from that fact that, if it be granted that Austin’s method of investigating word-use did in fact bring up deep philosophic issues (and it should be clear by now that I think this must be granted) then the same, or cognate, philosophic issues will be raised by the whole enterprise of compiling a synonym-dictionary,—which must then be considered not only as a lexicographical, but also as a philosophical document.*

* “Metaphysicians engaged in the more profound investigation of the Philosophy of Language will be materially assisted by having the ground thus prepared for them, in a previous analysis and classification of our ideas; for such classification of ideas is the true basis on which words, which are their symbols, should be classified. (The well-known work of Bishop Wilkins entitled *An Essay towards a Real Character and a Philosophical Language*, published in 1688, had for its object the formation of a system of symbols which might serve as a universal language. It professed to be founded on a ‘scheme of analysis of the things or notions to which names were to be assigned’; but notwithstanding the immense labour and ingenuity expended in the construction of this system, it was soon found to be far too abstruse and recondit for practical application . . . ‘The languages’ observes Horne Took, ‘which are commonly used throughout the world, are much more simple and easy, convenient and philosophical, than Wilkins’ scheme for a *real character*; or than any other scheme that has been at any other time imagined or proposed for the purpose’. (Two notes are here conflated.) It is by such an analysis alone that we can arrive at a clear perception of the relation which these symbols bear to their corresponding ideas, or can obtain a correct knowledge of the elements which enter into the formation of compound ideas, and of the exclusions by which we arrive at the abstractions so perpetually resorted to in the process of reasoning, and in the communication of our thoughts (italics mine).” From the *Author’s Introduction to Roget’s Thesaurus* (1852).

III. *Grammar, Syntax and Phrases.* Now consider the partition of the stickpicture system with respect to aspects. Suppose that each aspect is represented, though not necessarily recognised, by exactly one icon (call these *key-icons*). Then every aspectually-similar stickpicture will contain the same key-icon in any one partition; for the distribution of the set of key-icons will change, in part at least, with each repartition; since the assignment of key-icons fixes the aspect-system. Let us assume* further that every key-icon in the total aspect-set can be represented, somehow or other, well or badly, in every language; either by a word, or by a grammatical or syntactic device, or by a phrase. (At a pinch, numbers or nonsense-syllables can be used for such names; but in practice, mnemonics are much better.) Let any such name for any key-icon, in any language, be called a *tag*.

We have now a set of names, in any language, for the members of our total set of contrasting aspects. It follows, moreover, from the whole argument which we have built up (it being always granted that the tags get their primary meanings not from the language in which they occur as words, or subwords or phrases, but from the key-icons, and that the key-icons in turn get their meanings, not from the tags in any language which name them, but from the sets of stickpictures in the stickpicture-system within which they are found) that I have now given a way of defining, generally and conceptually, a set of very general and widely recurrent perceptual distinctions which frequently recur in real life as aspects of basic situations.

It is my case that such very general and widely found aspect-distinctions cannot fail to have been noticed by the users of any

* For an actual example of a key-icon occurring in a stickpicture, see the miniature stickpicture of the man pointing to himself which is inserted in the corner of the full-size picture of a man thinking of himself, in the right-hand picture of the set of three. This key-icon is in a sense redundant; for it is already clear that the stickpicture man lounging in his chair is thinking (or dreaming) of himself. The presence of the key-icon of the man pointing to himself, however, clinches the matter. It says: "Note that the dominant note of this picture is 'self', seen against the basic situation of 'man brooding on'; not, for instance, the fact that the stickpicture contains a thought or a dream."

language; and that there will therefore be a tendency, in any language, to refer to these pairs of aspects,—that is, to the distinctions,—either by very frequently occurring pairs of contrasting words or contrasting phrases, or by contrasting grammatical devices (by devices, that is, which operate within a word) or by contrasting syntactic combinations of words (by devices, that is, logically analogous to the grammatical ones, which operate within a sentence or within a paragraph.) I see grammar and syntax also as a contrast-system; although I grant that, to see it in this way, complex sets of grammatical or syntactic alternatives, *e.g.* the Latin case system, have to be broken down into ordered pairs of contrasting alternatives.*

It is one thing, however, to see grammar-cum-syntax as in general a contrast-system, and quite another, in constructing an actual model, to determine how much of a complex grammatical contrast-system of some language to put into the model. Nor is the question of deciding what to put in and what to leave out made any easier by the very great confusion which currently prevails in philosophic circles as to what grammar and syntax in natural languages really are. And it is not surprising that this should be so, since philosophers, by their nature, have to think generally about language, whereas grammars and syntax-systems vary in all possible ways, as between languages. The result is that, in practice, being unable straightforwardly to generalise discussion of this phenomenon without doing violence to a multitude of known facts, philosophers usually brazenly identify the habits of their own language with those of the thinking world; and, by doing so, provide ground for well-grounded and sour comment by philosophically informed linguists. On the other hand, philosophers can and do reply that there reigns an almost equal confusion, of another kind, in linguistic circles, in spite of

* For instance, in the Latin case system, Nominative/Accusative is the primary contrasting pair. Nominative/Vocative can be taken as forming a secondary contrast; Accusative/Oblique cases another. Among the Oblique cases, Genitive/Dative-cum-Ablative can be taken as primary, Dative/Ablative as secondary; and, within each of these pairs, and also between them, further pairs of contrasting uses can fairly easily be built up by consulting such a work as Robey's two-volume Latin Grammar.

an initial appearance of sophistication and precision of attack. For, in order to discuss what they themselves are doing, linguists also, in the end, have to think generally, having explicitly deprived themselves in the beginning of any conceptual apparatus for doing so. They are therefore apt to get trapped into making such remarks as "I know you will not misunderstand me if I say that this is what we used to call in old-fashioned language a verbal phrase".⁴ By such *obiter dicta*, however, they betray themselves not as philologists, but as philosophers, and themselves become subject to all the comment which they dispense.

I propose summarily to break through this confusion by saying that I want to pick up the relevant basic-situation-referring habits of a language in preference to its grammar. I do not mind, that is, for purposes of the model, if I do not pick up any of the grammar or syntax of a language at all, except as grammatical or syntactic forms occur in particular phrases. To do this is not as stupid as it seems. To start with, nearly everything which can be said in any language by using a grammatical or a syntactic device can also be said without such devices, by using a common word or phrase; it is, after all, by using such words or phrases that we explain to learners of the language how to use the grammar. We can say as we choose, for instance, in English, "She killed him *with a hammer*," thus conveying the notion of instrument, or of means, with a syntactic device; or I can say, "She *hammered* him," conveying the same notion here grammatically, by using the past tense of the verb; or I can say, "She killed him: her *instrument*, a hammer," using the actual word "instrument" to convey the instrumental idea; or I can say, "She took a hammer, and bonk!—he was dead," thus referring back direct with "*bonk*" to a presumed known situation, without conveying the instrumental idea in language at all. For the purposes of any kind of formal analysis of language it matters very much, of course, which of these forms I use; for no formal equivalence between them can be established. For purposes of translation, however, it matters much less; for, speaking roughly, they all convey the same information, and their conceptual nearness to one another is more important, for the translator, than their divergence of form.

Suppose now, pursuing the *provenance* of this same example, we look up "instrument" in *Roget's Thesaurus*. We are directed immediately to a series of heads which, logically, are all aspects of the same basic idea; 631 *INSTRUMENTALITY*, 632 *MEANS*, 633 *INSTRUMENT*. Within these, together with the other heads cross-referred-to by them, we can find all the ways given above and more, of dealing with our hammer. "By means of, with; by any means, all means, some means;" . . . these come under the adverbial section of 632, *MEANS*. Then "hammer, etc.," in 633 *INSTRUMENT* refers us to 276, *IMPULSE*. Here we find not only "hammer, sledge-hammer, mall, maul, mallet, flail; battering-ram, . . . cudgel, etc., (*weapon*) 727; but also "strike, knock, hit, bash, . . . beat, bang, slam, dash; punch, thwack, whack, strike hard; swap, batter, dowse, baste; . . . buffet, belabour (insert here "hammer"); . . . fetch one a blow, swat (insert here "bonk"); strike at, etc. (*attack*) 716 . . ." all the accumulated richness of the English language for describing the classic blunt-instrument-using situation.

It comes to this, then: the procedure for classification, in a synonym dictionary, goes in the contrary direction from the procedure of classification of a grammar; though, ideally, grammatical classification should be reached in the end. Thus "with a" (a grammatical device in Latin, a syntactic device in English) is in *Roget's Thesaurus* all right, but classified merely as an adverb; "hammered" could be in under *IMPULSE*, among the verbs, if the *Thesaurus* was extended to allow of crude differences between past and future reference; but we should never be able to classify such a system sufficiently finely to get the whole English verbal tense system out of it. Grammar and syntax are potentially there; but they are there in a particularised form, and without being identified as such. From the classification point of view, they get in, as it were, by the back door.







It follows, then, that in a general meaning-contrast system interpretable in any language, as a synonym dictionary, the framer of the system will have to deal with grammar and syntax in the same sort of way as Roget does, only, if possible, more fully. This means that the primary system of classification which is required, in order to get at whatever grammar or syntax the


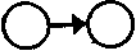




system can pick up, will have to be one aimed at subdividing Roget heads.





Below, two tables follow immediately after one another. The first attaches a set of tags to key-icons. The second, using these, subdivides a Roget head, with comments.


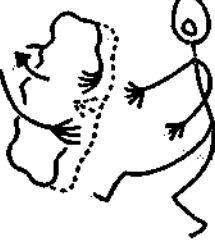



Here is the raw material of W. E. Johnson's "Universal Grammar"¹³; and, what a come-down!


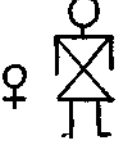

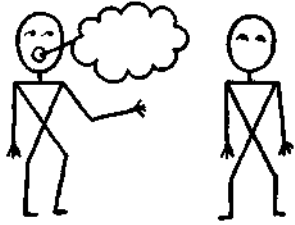
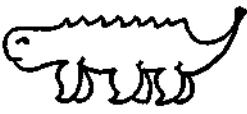

SAMPLE SET OF TAGS, DEFINED BY KEY-ICONS

<i>Icon</i>	<i>Tag</i>	<i>Description of icon in English</i>
	BE	a dot
	BANG	an exclamation-mark
	DO	ARROW
	DONE	(i.e. the same occurrence shown twice, once in continuous and once in discontinuous line)
	ONE	one stick-like object in a free cloud
	PAIR	two stick-like objects in a free cloud

Icon	Tag	Description of icon in English
	CHANGE	quartered circle,— actually the phases of the moon,—with an arrow inside it)
	CAUSE	two round objects— actually billiard balls—connected by an arrow
	KIND	free cloud with ob- jects from which ab- straction must be made inside it
	HOW	free cloud, as above, with label attached
	SAME	two crosses marking two similar objects, also in the picture, the whole in a free cloud
	NEXT	As for <i>same</i> , with dot-series and a third cross added; the third cross mark- ing a third object, also in the picture

<i>Icon</i>	<i>Tag</i>	<i>Description of icon in English</i>
	MORE	a mouth of a cave; a single moving object is on the left and a number of similar objects coming out, on the right; the whole in a free cloud
	LESS	an entrance to a cave: a number of similar moving objects are going into the cave, <i>i.e.</i> are on the left, and one is in the cave, <i>i.e.</i> on the right; the whole in a free cloud.
<hr/>		
	FOR	an arrow, hitting the centre of a target
	SPREAD	an arrow, hitting only the rim of the target, and falling bent

<p><i>Icon</i></p> 	<p><i>Tag</i> HAVE</p>	<p><i>Description of icon in English</i> a pleased man, with mouth, clutching an object</p>
	<p>LACK</p>	<p>two clutching hands having taken an ob- ject from a man with a woeful mouth</p>
	<p>MAN</p> <p>THING</p>	<p>figure of limp man with no eyes or mouth</p> <p>circle, picture of a stone: cf.: also <i>change</i> and <i>cause</i></p>
	<p>SELF</p>	<p>a man pointing to himself, and walking along</p>
	<p>FOLK</p>	<p>a number of men walking along</p>

<i>Icon</i>	<i>Tag</i>	<i>Description of icon in English</i>
	HE	a trousered figure with penis sign
	SHE	a skirted figure with womb sign
<hr/>		
	I	a man pointing to himself, with mouth, and a tied cloud coming out of it
	YOU	a man pointing to another man the first having eyes, mouth and a tied cloud coming out of it; the second man with eyes only
<hr/>		
	BEAST	an undetermined animal
	PLANT	an undetermined plant

*A HEAD IN ROGET'S THESAURUS
CLASSIFIED BY USING THE MODEL*

Below is shown a pared-down and re-organised Roget head with the word uses classified, in so far as they can be classified by the use of the set of tags given above, and of numerical cross-references. The set of tags given above is too sparse to give a natural-sounding classification; it is sufficient, however, to separate out the sub-paragraphs and rows of the head. The numerical cross-references are to be interpreted, in terms of the model, as the overlap of meaning between the cross-referring and cross-referred to head (see the note on p. 202) this overlap of meaning being indicated in the thesaurus,—whenever the cross-referring is adequately done,—by the presence of the cross-referred string of synonyms in the two heads. Synonyms within a string can also often be distinguished from each other by cross-references (see Section 5, Operation B, b, 1.), but I have not attempted here so to distinguish them.

839 LAMENTATION

<i>Tag</i>	<i>Word-uses</i>
<i>kind</i>	lamentation, mourning; lament, wail, 363 INTERMENT; languishment, grief, moan, condolence, 915 CON- DOLENCE; sobbing, crying, tears, mourning, 837 DEJEC- TION;
<i>one be</i>	sob, sigh, groan, moan; complaint, plaint, grumble, murmur, grief, 923 WRONG; mutter, whine, whimper, 886 CIVILITY;
<i>bang kind</i>	flood of tears, burst of tears, fit of tears; crying, howling, screaming, yelling, 411 CRY;
<i>one bang be</i>	spasm of sobbing, outburst of grief; cry, scream, howl, 411 CRY; wailing and gnashing of teeth, 900 RESENT- MENT;

<i>Tag</i>	<i>Word-uses</i>
<i>thing</i>	weeds, crepe, crape, deep mourning, sackcloth and ashes, 225 INVESTMENT; passing-bell, knell, keen, death-song, dirge, 402 SOUND; requiem, wake, funeral, 998 RITE;
<i>she thing</i>	widow's weeds, widow's veil, 225 INVESTMENT;
<i>man do</i>	mourner, weeper, keener; pall-bearer, chief mourner, professional mourner, 363 INTERMENT;
<i>do</i>	lament, mourn, grieve for, weep over; condole with, moan with, mourn for, 915 CONDOLENCE; fret, groan, 828 PAIN; keen, attend the funeral, follow the bier, 363 INTERMENT; mew, bleat, bellow and roar, whine, 412 UTULATION;
<i>more do</i>	burst into tears, cry one's eyes out, cry one's self blind; scream, wail, yell, rend the air, 411 CRY; beat one's breast, wring one's hands, gnash one's teeth, 3 SUBSTANTIALITY;
<i>less do</i>	sigh, shed a tear, fetch a sigh for;
<i>how</i>	lamenting, mourning; in mourning, in sackcloth-and-ashes, 225 INVESTMENT; mournful, tearful, sorrowful, in tears, 837 DEJECTION; with tears in one's eyes, bathed in tears, 824 EXCITATION;
<i>now be</i>	with tears standing in the eyes;
<i>now bang be</i>	with tears starting from the eyes;
<i>more now be</i>	with eyes suffused,—swimming,—brimming,—overflowing with tears;
<i>bang</i>	Alas! Alack! Woe is me! <i>miserabile dictu!</i> too true! Alas the day!

IV. *Words.* We have now defined a meaning-contrast-system containing situations, concepts, and some grammatical

and syntactic forms, particularised as phrases and defined by tags. We have yet, however, to insert into the system any words; that is, the statement that a set of word-uses in English are all uses of the English word *W* does not yet make sense within the system.

Let the set of uses of a word in any dictionary be called a *fan*. If the set of uses is unstructured we shall call it a *simple fan*; if any method of sub-classification of the uses is employed, we shall call the resulting system a *jointed fan*. Let us call the point of origin of the fan its *hinge*, and the set of word-uses represented in it its *spokes*. Let the word-token *W* for any fan be called the *sign* of the fan.

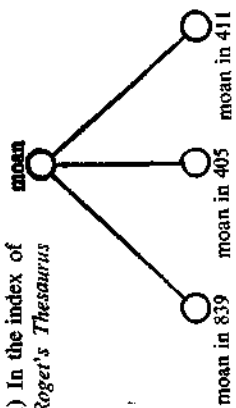
Consider now the interpretation of the fan. We shall say that the word-token printed in heavy-ledged type at the head of any dictionary represents the alternation of the actual uses of the word which are given underneath it. Thus, the heavy-ledged word-sign for any word *W* represents an alternation of the form of the form $U_1 \vee U_2 \vee U_3 \dots U_n$, each *U* being a particular use of the word given in the entry. If we now ask "What is there in common between all the uses of *W*?" the only safe answer is "The fact that they are referred to, in that dictionary, by the word-token *W*". Thus we arrive at a conception that in a dictionary, in the case of any word *W*, the word-token printed in heavy-ledged type at the top of any entry, the word-token of *W* as occurring in any particular entry, and the word-token of *W*, "*W*", as listed in the list of words of that language, all vitally differ in logical status. Only when we have fully seen this are we in a position to make a formal model for dictionary entries of words.

Such a model, however, will still be unilingual. To make it interlingual, the dictionary maker's set of defining classifiers for separating U_1, \dots, U_n for any *W* must be exchanged, in the case of any *U*, for a definition given in terms of tags. Below are given (a) an entry from Roget's *Index*, shown as a simple fan; (b) the same entry, with Roget's sub-classifications inserted into it, shown as a jointed fan; (c) the same word again, as defined by the O.E.D., shown as a jointed fan; and (d) the same entry classified by tags, and shown as a jointed fan. From this it can be seen that the system of tags used in this model does not

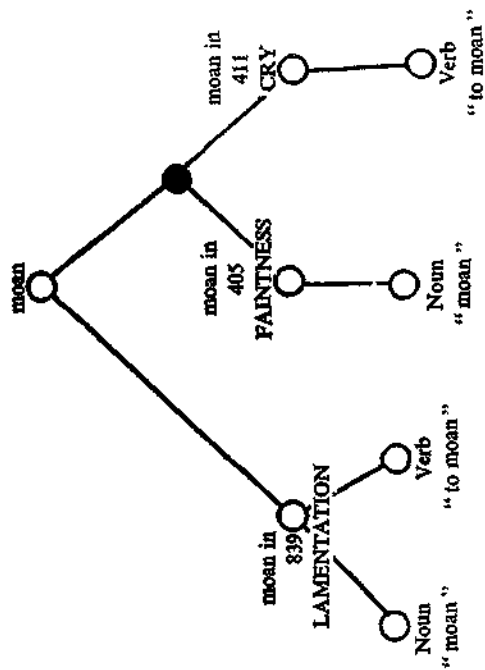
completely separate the members of $U_2 \dots U_n$ as given in the O.E.D., but that it does something to separate them.

THE ENGLISH WORD "MOAN"
CLASSIFIED IN FOUR DIFFERENT TYPES
OF DICTIONARY

a) In the index of *Roget's Thesaurus*



b) The same with Roget's classifiers:



the OXFORD ENGLISH DICTIONARY DEFINITION OF
MOAN

A: AS NOUN 1 (a) Complaint, lamentation (in general) (no examples)

Complaint 1 (b) A complaint, lament (an instance of 1 (a))
lamentation

(e.g. "In Henry's days the people made their moan that they were ground down")

1 (c) obsolete: a state of grief and lamentation =

(e.g. "T'would kill my soule to leave thee drownd in mone")

2 *A prolonged, low, inarticulate murmur* 2 (a) Differing from "groan" in that it suggests a sound less harsh and deep, and produced rather by continuous pain than by a particular access or paroxysm;

(e.g. "moan of an enemy massacred")

2 (b) *transference* of the low, plaintive sound produced by the wind, water, etc.

(e.g. "The moan of the adjacent pines chimed in noble harmony")

B: AS VERB (given as separate entry in O.E.D.)

1 (a) to complain of, lament (something)

(e.g. "She . . . bitterly moaned the fickleness of her Matilda")

1 (b) reflexive; "to make one's moan":

(e.g. "You should rouse up yourselves and moan yourselves to the Lord")

2 To pity (obsolete)

(e.g. "Does he take no pity on me? Prithee moane him Isabel")

3 (a) *intransitive*: with "for:"

(e.g. "Achilles moaning for his lost mistress.")

3 (b) (causatively) to cause to lament:
obsolete

(e.g. "And yet my wife (which infinitely moanes me)
Intends . . .")

4 (a) *intransitively* To make a low
mournful sound indicate of physic-
all or mental suffering.

(e.g. "The King . . . passionately moaned . . .")

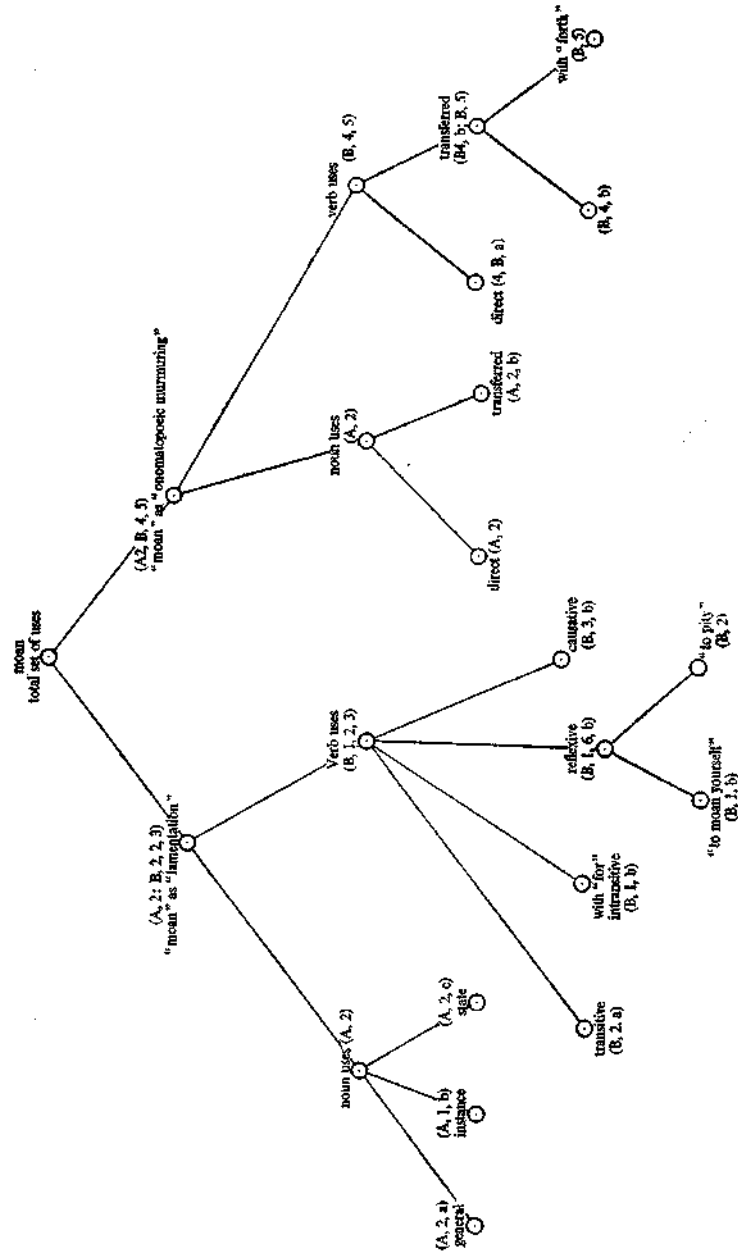
4 (b) *transferred*, of inanimate things

(e.g. "You hear . . . the forests moan")

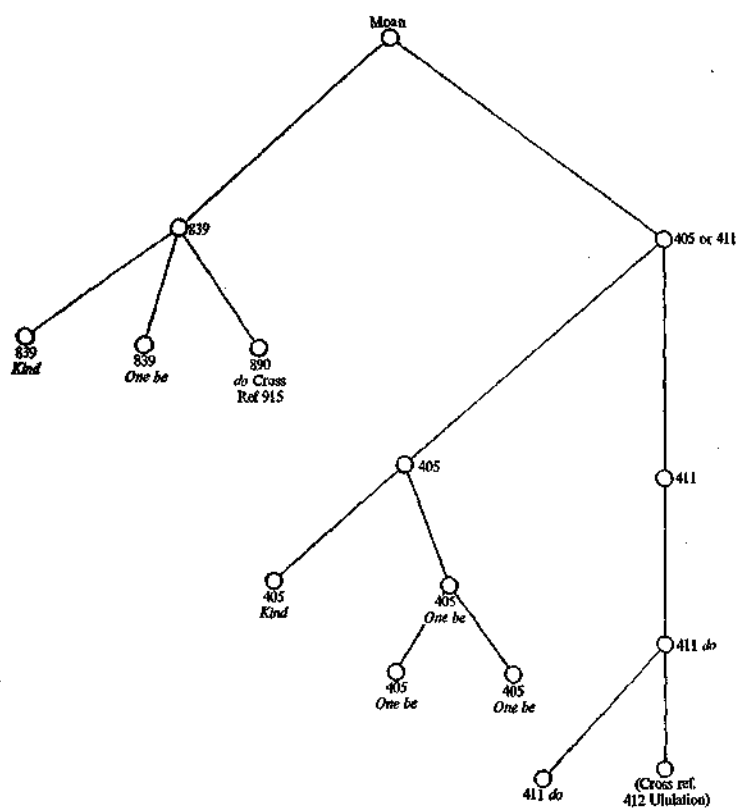
5 *transferred* To utter moaningly:

(e.g. Madeline began to weep And moan forth witless words")

THE O.E.D. SET OF USES OF THE WORD "MOAN"



AS CLASSIFIED WITH THE HEADS AND TAGS OF THE MODEL



Let the dictionary-entries of the words in a good dictionary in any language be redefined by using a set of heads and a set of tags. Call such a dictionary-entry a *T-fan*. Whatever the entry, the set of heads used in it will now be contained in the set of heads defined earlier as corresponding to basic situations; it is now required in addition, however, that this set of heads should be contained in the set which defines the heads of that particular language's synonym-dictionary. Similarly, the set of tags used for any dictionary-definition must be contained within the subset of the total set of tags which has been used in that language's synonym-dictionary.

If the dictionary-entries of that language can be so redefined,—and inspection of the dictionary-entries in the examples attached shows that they can,—then it follows that their constituent word-uses can be inserted into the system, which means that a dictionary-entry also can be seen as a subsystem of a system of contrasts.

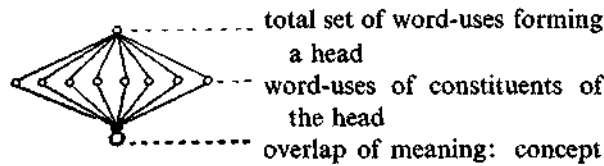
IV. *Specification of the Mathematical Model*

We shall first define a system of heads, taking no account of tags; then we shall insert the system of tags; then we shall map on to the combined system of heads and tags the word-system of fans, for any language.

Heads

Let a meaning-contrast system, or language, (or thesaurus) consist of a finite set of heads, and let the mathematical specification of a head be as follows: Let the total set of *word-uses* in the head be represented by a single alternation-formula of the form $a \vee b \vee c \dots \vee n$, the set $a, b, c \dots n$ being the set of word-uses listed in the head. Call this alternation I . Let the overlap of meaning of the set $a, b, c, \dots n$ be a single conjunction-formula of the form $a \cdot b \cdot c \dots n$. Call this conjunction O . I and O , together with the set $a, b, c, \dots n$ form a partially-ordered set. Let the inclusion-relation of this partially-ordered set be interpreted as *meaning-inclusion*. Then (if all semantic and grammatical distinctions between the word-uses in the set be provisionally ignored), the connective \vee can be identified with the Boolean join \cup , interpreted as “and/or,” and the connective \cdot be interpreted as the Boolean meet \cap , interpreted as “and”, in which case the head will be an interpreted lattice of the spindle form given below:

MATHEMATICAL
REPRESENTATION OF A
HEAD



Theorem of Language-theory. Suppose each head is treated as a point, and a method is given* for constructing a new set of finite lattices by adding I and O elements to sets of head-points on the same principle as for sets of word-points, (namely, by finding and defining overlaps of meaning between heads, in the way in which overlaps of meaning have been found and defined between word-uses); then (i) these superheads also can be treated as points, and so combined, up to N orders of superheads, N being finite, and (ii) by adding an I-element and an O-element to the total resultant structure, language itself can be defined as a finite lattice, H.

Tags

Let the set of tags given in the table form a spindle lattice, T. Form the direct product of T with H, in order to produce the language-lattice L. Thus $L = T \times H$. Philosophically speaking, the constituent subspindles of T can now be regarded as structures which give "new ways" of seeing the head-lattice H, and also structures which can be abstracted from L at will. We could now regard any head as a simplified analogue of Wittgenstein's concept which he compared in *Philosophical*

* Roget himself provides two methods for combining heads; (i) the Chapter of Contents given at the beginning of the book, and (ii) the numerical cross-reference system between heads. If (i) is used, the very general classifiers occurring in the left-hand column of the Chapter of Contents, which are numbered with Roman numerals and printed in large upper-case type, can be taken as the joins of the less general classifiers numbered with Arabic numerals and printed in small upper-case type, (on the ordinary principles of classification); and similarly, the less general classifiers can be taken as the joins of the bracketed and numbered sets of head-names printed in lower-case type and occurring in the left-hand column of the Chapter of Contents. Thus, on this method, *join* is interpreted, but *meet* is not; a set of heads classified together under, for example, LINEAR SPACE may be presumed to have some overlap of meaning; but this overlap of meaning is nowhere explicitly specified in the *Thesaurus*. If method (ii) is used both *join* and *meet* are interpretable and specifiable. The superhead set consisting of a head and/or all other heads cross-referred to in it will be interpretable as the join of its constituent heads, while the meet of any two of those heads will consist of (a) the actual set of word-uses which are common to both the heads, and (b) the common cross-reference number (if the Editors of the *Thesaurus* have remembered to put this in). Thus, in method (ii) both *join* and *meet* are specified.

Investigations to a gestalt figure: (the cube, the triangle, the steps, the duck rabbit) if we imagine the lattice as an elastic and simplified space.

Fans

As we have described it above, any fan is a partially ordered set, and any jointed fan is, in addition, a tree. T-fans are therefore trees.

We have now to map the set of T-fans on to L. We know already that the hinge of any T-fan, that is, the point of origin of any T-fan considered as a tree, is to be interpreted as an alternation of the form $U_1 \vee U_2 \dots U_n$; it can therefore be interpreted as the join of $U_1, U_2 \dots U_n$. Let the set $U_1, U_2 \dots U_n$ for any TF be called the U-set of TF. Now, if the U-set of any T-fan TF, can be assigned points on L, and the inclusion-relation of any TF be interpreted as *meaning-inclusion*, i.e. if it be given the same interpretation as the inclusion-relation in L, the TF can be meaningfully mapped on to L; for the join of the U-set already has an interpretation in L, and any meet of any pair of points in the U-set can be interpreted as "that which is in common between the two points of the U-set, i.e. the fact that they are both referred to by the sign W". Consider now any point T_p of the U-set of any TF. Any T_p will be defined by being assigned one or more tags and one and only one head; it represents, as in any classification which can be shown as a tree, what is in common between the meanings of the assigned tags and the assigned head. It is thus interpretable as a meet in L; since any combination of tags will have a unique meet in the tag-lattice T, and every head h will occur in the complete head-lattice H, and will therefore have a complete T-lattice assigned to it, since L is the direct product of T and H. Thus any T_p will occur in L. If it be now assumed that the inclusion-relation of any TF can be interpreted as meaning-inclusion, which can intuitively be seen to be the case, then it follows that any TF can be mapped on to L.

V. EXAMPLES OF THE OPERATION OF THE MODEL

(a) Analysis of: "Father" is "male parent".

(b) Translation of "My father is a strict parent" from English into English.

THE DICTIONARY

The dictionary-entries used in the examples are given immediately below. The form of each dictionary-entry is as follows:

NAME OF ENGLISH WORD		
description of word-use	HEAD-reference	tag-reference
list of relevant synonyms, slightly enlarged from <i>Roget's Thesaurus</i>		

The word-uses were pared-down from the smaller O.E.D.: the synonym-lists were slightly enlarged from the larger *Roget's Thesaurus* (English Edition). Inverted commas are straightforwardly treated as words:

"A"

- (i) *a member of a class* 76 INCLUSION *one*
 " a, one, a single one, a typical member, a specimen . . . "

" FATHER "

- (i) *male parent* 166 PATERNITY *he man*
 " parent, father, sire, daddy . . . "
- (ii) *progenitor, fore-father* 11 FAMILY *man*
 " family, patriarch, matriarch, ancestor, parent, father, mother "
- (iii) *male title* 373 MAN *he man*
 " Mr, Mister, monsieur, sahib, Herr, Signor, Señor, Father . . . "
- (iv) *to beget, to father* 161 PRODUCTION *cause be*
 " propagate, father, sire, engender, bring into being "

- (v) *originator, designer* 164 PRODUCER *man*
 “producer, creator, designer, fons et origo, parent, father of . . .”
- (vi) *leader, patriarch, person in authority* 737 AUTHORITY *man*
 “master, padrone, patriarch, head, stern parent . . .”
- (vii) *priest* 996 CLERGY *man*
 “father, father-in-Christ, padre, abbé, curé, patriarch . . .”
- (viii) *Deity* 976 DEITY *kind*
 “God, God the Father, our Heavenly Father, God the Creator, the Maker, the Preserver . . .”
- (ix) *Church Father* 985 REVELATION *man*
 “prophet, evangelist, apostle, disciple, saint, the Apostolic Fathers, the Church Fathers . . .”
- (x) *venerable person* 130 VETERAN *man*
 “veteran, old man, seer, patriarch, grey-beard, father . . .”
- (xi) *stock character in play* 599 DRAMA *man*
 “play the Dame, play the heavy father . . .”

“ IS ”

- (i) *exists (as)* 1 EXISTENCE *be*
 “exist, be, have being . . .”
- (ii) *occur* 3 SUBSTANTIALITY *be*
 “be, actually be, occur, be a fact that . . .”
- (iii) *live* 359 LIFE *have*
 “be, be alive, live, breathe, respire . . .”

- (iv) *remain, continue* 141 PERMANENCE *have*
 “be, remain, always be, . . . be born so . . .”
- (v) *same, identity* 27 EQUALITY *same be*
 “be, be equal to, lie on, be on a level
 with, be identical with . . .”
- (vi) *have a position in
 space, literal or
 metaphorical* 186 PRESENCE *be*
 “exist in space, be at, be present at . . .”
- (vii) *become* 144 CONVERSION *change be*
 “be made into, [and many passive
 “be”s] . . .”
- (viii) *real, positive,
 absolute* 494 TRUTH *be*
 “be, be true, be so, be the case that,
 really be . . .”

“MALE”

- (i) *sex* 373 MAN *he man*
 “man, male, he . . .”
- (ii) *full-grown man* 131 ADOLESCENCE *he man how*
 “in full bloom, manly, virile, adult,
 male . . .”
- (iii) *strength* 159 STRENGTH *more how*
 “manly, manlike, manful, masculine,
 male, virile, in the prime of manhood . . .”
- (iv) *penis-shaped, (as
 in screws)* 45 VINCULUM *how*
 “clamp, cleat, screw, male screw, female
 screw, worm screw, . . . coupling . . .”

“MY”

- (i) *possession* 780 PROPERTY *I have how*
 “one’s own, his own, her own, your own,
 my own, my, your, his, her, their, mine,
 yours, his, hers, theirs . . .”

(ii) *exclamation* 870 WONDER *bang*

“Lo and behold! O hey-day! O!
Halloo! What! Indeed! Really! Surely!
Humph! Hem! Good lack! Good
Heavens! Good Gracious! Good Lord!
By Jove! Gad so! Well-a-day! Dear me!
Only think! Lack-a-daisy! My stars! My
goodness! Oh my! . . .”

(iii) *self* 79 SPECIALITY *self have*

“I, you, he, him, she, her: my, your,
his, her; myself, himself, herself, itself . . .”

“ STRICT ”

(i) *limited, defined, accurate* 494 TRUTH *do*

“exact, accurate, correct, strict, definite,
precise, just, right . . .”

(ii) *in conformity with* 82 CONFORMITY *how*

“typical, normal, formal; sound, strict,
rigid, positive . . .”

(iii) *requiring obedience* 737 AUTHORITY *how*

“peremptory, over-ruling, severe, string-
ent, strict . . .”

(iv) *not lax, upright* 939 PROBITY *man how*

“conscientious, right-minded, high-
principled, religious, punctilious, strict . . .”

“ PARENT ”

(i) *father or mother human or otherwise* 166 PATERNITY *he or she, man or*

“parent, father, sire, dad, daddy, mother,
mama . . .” *beast or plant*

(ii) *member of a family* 77 FAMILY *he or she, man*

“ancestor, parent, . . . grandparent . . .”

- (iii) *originator* 164 PRODUCER *man*
 “producer, creator, designer, fons et
 origo, parent, father of . . .”
- (iv) *Adam and Eve* 945 VICE *he or she,*
man
 “Adam, First Parent, Adam and Eve,
 Old Adam, Sin of Eve . . .”

“ ”

- (i) *direct speech sign* 582 SPEECH *sign*
 “quoth he, saith he, “ ” . . .”
- (ii) *quotation sign* 19 IMITATION *sign*
 “imitation, copying, transcription, quo-
 tation, reproduction, quotes, “ ” . . .”
- (iii) *translation sign* 522 INTERPRETATION *pair sign*
 “interpretation, translation, . . . means, is
 to be translated as, “ ” means “ ”
 in X . . .”
- (iv) *definition sign* 27 EQUALITY *pair sign*
 “equivalence, identity, co-equality,
 equals, is, “ ”, is “ ”, makes, is
 the same as . . .”

THE S-LIST

The S-list is an inventory of permitted interlingual “sentence”-forms, a small example of which is given below; “sentence” here means “sequence which is derivable, by use of the model, from at least one sentence in at least one language”. Each formula in the S-list is given in two forms, (a) and (b); once as a lattice-formula, so that the operation “Find the nearest match” may be determinately performable, and once as a bracketed sequence of elements. In the lattice-form, the bracketings and the orderings are of course indifferent, since the lattice-operations are associative and commutative; in the sequence, they are not. A technique, using product lattices of different orders, has been worked out for incorporating the

bracketing and ordering features into an extended lattice model. This extension will not be discussed here.¹⁴

In the formulae the repeated symbols X and Y stand for repeated elements or sets of elements in the model which concurrently vary with each occurrence of the S-form.

S 1: S-form for a definition.

Let pair \cap sign be replaced by \cap a

Let same \cap be replaced by \cap b

Let 27 *EQUALITY* be replaced by C

S 1 now runs:

(a) $X \cap C \cap a \cap C \cap b \cap X \cap C \cap a = X \cap C \cap a \cap b$

(b) (X(Ca)) (Cb) (X(Ca))

S 2: S-form for a translation.

Substitute a and b as in S 1

Let 522 *INTERPRETATION* be replaced by D

S 2 now runs:

(a) $X \cap D \cap a \cap D \cap b \cap X \cap D \cap a = X \cap D \cap a \cap b$

(b) (X(Da)) (Db) (X(Da))

S 3: S-form for a description of a possessed person or object, with restricting qualification.

Let I \cup you \cup he \cup she

be replaced by f

Let man \cup beast \cup plant \cup thing

be replaced by g

Let one \cap be

be replaced by h

Let have

be replaced by j

Let how

be replaced by k

Let do

be replaced by l

Let 494 *TRUTH*

be replaced by M

S 3 now runs:

(a) $f \cap X \cap j \cap g \cap M \cap h \cap Y \cap k \cap g \cap l$
 $= f \cap X \cap j \cap M \cap h \cap Y \cap k \cap l$

(b) (f(Xj(g))) ((Mh) (Yk((Xgl))))

§ 4: S-form for a description of a possessed person or object, without restricting qualification.

Substitute as for S 3, omitting k.

S 4 now runs:

$$(a) f \cap X \cap j \cap g \cap M \cap h \cap X \cap g \cap l \\ = f \cap X \cap j \cap g \cap M \cap k \cap l$$

$$(b) (f(Xj(g))) ((Mh) (X(g)))$$

(a) Analysis of: "Father" means "male parent".

(a, 1) The pre-analysis

1. Substitute for the sentence: "Father" means "male parent" the sequence of T-fans for the constituent words, as given in the dictionary. Call this set of T-fans Sm.

2. Since every T-fan is mapped on to L, and L is a direct product of spindle lattices, (i) every constituent spindle in L will be a sub-lattice of L, (ii) Sm, together with its meet and join, will be a constituent spindle in L and will be a sub-lattice of L.

3. Match Sm with the S-list, retaining the S which is the nearest match to Sm. (N.B. The match will normally not be exact, since Sm is, in origin, unilingual, whereas the S-list is interlingual.)

Result: S 1 is retained, Sm being now identified as a definition.

4. Intersect the set of spokes of any quotes-enclosed T-fan with the sets of spokes of any T-fan or T-fans not enclosed in quotes.

Result: an intersection is obtained at the point 27 EQUALITY \cap pair \cap sign, since this point occurs both in the T-fan with sign " ", and in the T-fan with sign " IS ". This specifies the use of " is " employed in the analysis; redundantly, as it happens, as this use is uniquely specified by S1.

(a, 2) *The analysis*

1. Let the set of T-fans enclosed in the first pair of quotes be called X1, and let the set of T-fans enclosed in the second pair of quotes be called X2.

2. Intersect X1 with X2 in Sm.

Result: intersections are obtained at the following points:

<i>11 FAMILY</i> \cap <i>man</i>	}	all of which occur both in the T-fan for "father", in X1, and in the T-fan for "parent", in X2.
<i>164 PRODUCER</i> \cap <i>man</i>		
<i>166 PATERNITY</i> \cap <i>he</i> \cap <i>man</i>		
and <i>373 MAN</i> \cap <i>he</i> \cap <i>man</i>		which occurs both in the T-fan for "father", in X1, and in the T-fan for "male" in X2.

3. Reconstitute from Sm the original set of T-fans given by a, 1, retaining only those spokes which formed intersections either in a, 1, 3 or in a, 2, 3.

This sequence is:

“	<i>27 EQUALITY</i> \cap <i>pair</i> \cap <i>sign</i>
father	(<i>11 FAMILY</i> \cap <i>man</i>) \cup (<i>161 PRODUCER</i> \cap <i>man</i>) \cup (<i>166 PATERNITY</i> \cap <i>he</i> \cap <i>man</i>) \cup (<i>373 MAN</i> \cap <i>he</i> \cap <i>man</i>)
“	<i>27 EQUALITY</i> \cap <i>pair</i> \cap <i>sign</i>
is	<i>27 EQUALITY</i> \cap <i>pair</i> \cap <i>sign</i>
“	<i>27 EQUALITY</i> \cap <i>pair</i> \cap <i>sign</i>
male	<i>373 MAN</i> \cap <i>he</i> \cap <i>man</i>
parent	(<i>11 FAMILY</i> \cap <i>man</i>) \cup (<i>164 PRODUCER</i> \cap <i>man</i>) \cup (<i>166 PATERNITY</i> \cap <i>he</i> \cap <i>man</i>)

which is what the model gives as the analysis of "Father" is "male parent".

Interpretation of result: If we interpret the Rogetese sequence given above in pidgin English, the analysis states the following: "In this sentence, "father" can mean either 'family man', or 'producer man' or 'paternity he-man', or 'man he-man',— you don't know which; 'is' must mean 'equality pair-sign', and 'male' must mean 'man he-man'; but 'parent' can mean

either 'family man' or 'producer man', or 'paternity he-man', —you don't know which.

Thus the set of operations performed by the model reduces, but does not remove, the initial ambiguity of the constituent words of the sentence; there is still the need for a live philosopher to finish the analysis. On the other hand, this use of the model does solve the Paradox of Analysis, on Langford's lines, if the following definitions are admitted:

1. A T-fan F1 will be called *more idiomatic* than a T-fan F2 if F1 has more spokes than F2, *as idiomatic* as F2 if it has an equal number of spokes with F2, and *less idiomatic* if it has fewer spokes than F2.

2. The process of analysis, in a sentence already identified as a definition, shall consist in finding the intersection of the set of spokes of the T-fan in the *analysandum* with the combined set of spokes of the T-fans in the *analysans*.

3. If the set of intersections given under 2 is contributed to by all the T-fans in the *analysans*, each such T-fan having one and only one spoke which intersects with a spoke in the T-fan of the *analysandum*, then we shall say that the analysis *removes* the idiomaticness of the *analysans*. If the set of intersections is not contributed to by one or more of the T-fans in the *analysans*, or if any T-fan of the *analysans* intersects with the T-fan of the *analysandum* at more than one spoke (as in the example just given), then we shall say that the analysis *mitigates* the idiomaticness of the *analysandum*. If there is no intersection, we shall say that the analysis *fails*, or that it is *incorrect*.

4. Let the sense of "meaning" in which the *analysandum* means the same as the *analysans* be interpreted as: "An intersection is found by the process of analysis as given under 2". Let the sense of "meaning" in which the *analysandum* does not mean the same as the *analysans* be interpreted as: "The set of spokes in the T-fan of the *analysandum* is not the same set of spokes as the combined set of spokes of the T-fans in the *analysans*".

If these definitions are accepted, the process of analysis when successful is not trivial, and so the Paradox of Analysis is resolved.

(b) Translation of: "My father is a strict parent".

(a) *The analysis*

1. Substitute, for the constituent words of the sentence, the relevant set of T-fans as matched from the dictionary. Call this set S_n .

2. S_n being a sublattice of L , scan the S -list for the nearest match to S_n .

Result: S_3 is retained, S_n being now identified as a description.

3. Intersect the set of tags in S_n with the set of tags in S_3 , with this exception: that any tag in S_3 which has no counterpart in S_n , and is not part of a formula for a join, is to be retained.

Thus the final *do*, in S_3 , is retained.

4. Remove the spokes of all T-fans in S_m the tag-specifications of which have been rejected under 3.

5. Intersect the set of spokes of each T-fan in S_n as retained after 4 with the sets of spokes of all the other T-fans in S_n , retaining only the head-specifications of those spokes which give an intersection.* Retain, however, the tag-specification of all spokes which intersected with S_3 under 3.

The result is the analysis of S_n .

Result:

My	$I \cap have$
Father	$166 PATERNITY \cap he \cap man$ $11 FAMILY \cap man$ $164 PRODUCER \cap man$ $737 AUTHORITY$
is	$494 TRUTH \cap be$
a	one
strict	$494 TRUTH \cap be$ $737 AUTHORITY \cap how$
parent	$166 PATERNITY \cap he \cap man$ $11 FAMILY \cap man$ $164 PRODUCER \cap man$

* When no head-intersections are found, for any T-fan, under this operation, the model allows of a "scale-of-relevance" procedure being put into operation in which, for each head of a non-intersecting T-fan, is substituted the join of that head and its cross-references.²⁵ This procedure will not be discussed here.

(b) The reformulation

1. Take the first T-fan which retains more than one head-specification in the analysis as given under b, a, 4. Scan the lists of Roget synonyms, in the dictionary, which are attached to the head-specifications of this T-fan. Intersect these lists of synonyms, in pairs, retaining only words which are common to both lists.* Repeat this operation for all other T-fans in S_n which have retained more than one head-specification. The intersecting sets of words will be the *translations* of the original word which matched in the dictionary under b, a, 1 with the T-fan.

Result

father	166 PATERNITY \cap 11 FAMILY	parent, father
	166 PATERNITY \cap 164 PRODUCER	parent
	166 PATERNITY \cap 737 AUTHORITY	—
	11 FAMILY \cap 164 PRODUCER	parent
	11 FAMILY \cap 737 AUTHORITY	—
	164 PRODUCER \cap 737 AUTHORITY	—
strict	494 TRUTH \cap 737 AUTHORITY	strict
parent	166 PATERNITY \cap 11 FAMILY	parent, father
	166 PATERNITY \cap 164 PRODUCER	parent
	11 FAMILY \cap 164 PRODUCER	parent

2. Where more than one translation is given under b, b, 1, take the translation with the most specific set of tags, as give under b, a, 4.†

Result: "father" translates as "father"
 "parent" ,, also as "father",
 since $he \cap man$ is more specific than man .

* The synonym-match must be exact: phrases do not match with words.

† This step has to be taken intuitively, since the synonyms are not separately tag-specified in the dictionary.

3. In the case of any T-fan of which only one head-specification has been retained under b, a, 4, scan the corresponding list of synonyms in the dictionary, and take the first.

Result: "is" now translates "be".

4. In the case of any T-fan which retains no head-specification, transcribe as translation the tag-specification as given by b, a, 4. Transcribe also any extra tag-specification gained under b, a, 3:

Result: "my" translates as "*I have*"

"a" translates as "*one*"

and the final *do* is retained.

Correlating these results, we now get:

I have father be one strict father do

as the translation which the model gives of the English sentence

"My father is a strict parent."

REFERENCES

¹ Langford, C. H., *The Notion of Analysis in Moore's Philosophy in The Philosophy of G. E. Moore*, ed. P. A. Schilpp, New York, 1942.

² Gellner, E. A., *Words and Things*, London, 1959. See especially the discussion on pp. 40-43 of a seminar held by J. L. Austin.

³ Austin, J. L., *A Plea for Excuses*, Presidential Address to the Aristotelian Society, Proc. Arist. Soc., 1956-7.

⁴ Wittgenstein, L., *Philosophical Investigations*, transl. G. E. M. Anscombe, Oxford, 1953. See especially II xi, pp. 193e ff.

⁵ Gellner, E. A. *op. cit.*

⁶ Duff, C., *How to Learn a Language*, Oxford, 1947.

⁷ Anscombe, G. E. M., *An Introduction to Wittgenstein's Tractatus*, London, 1959. See especially Ch. 4.

⁸ Richards, I. A. and Gibson, C. M., *English Through Pictures*, Book I, Pocket Books, Cardinal Edn., New York, 1952.

Richards, I. A. and Gibson, C. M., *English Through Pictures*, Book 2, Pocket Books, Cardinal Edn., New York, 1958.

Richards, I. A., Gibson, C. M. and Hsley, M. H., *French Through Pictures*, Pocket Books, Cardinal Edn., New York, 1954.

Richards, I. A., Gibson, C. M. and Weinstein, D., *Hebrew Through Pictures*, Pocket Books, Cardinal Edn., New York, 1954.

Richards, I. A., Gibson, C. M. and Metcalf, R. C., *Spanish Through Pictures*, Pocket Books, Cardinal Edn., New York, 1953.

Richards, I. A., Gibson, C. M. and Evangelista, I., *Italian Through Pictures*, Book 1, Washington Square Press, New York, 1960.

Richards, I. A., Gibson, C. M., Mackey, F. W. and Schmidt Mackey, I., *German Through Pictures*, Book 1, Washington Square Press, New York, 1960.

⁹ Whorf, B. L., *Four Articles on Metalinguistics*, repr. from *The Technology Review and Language, Culture and Personality*, Foreign Service Institute, Dept. of State, Washington D.C., 1950.

¹⁰ Waismann, F., *Verifiability in Logic and Language*, 2nd Series, ed. A. G. N. Flew, Oxford, 1953.

¹¹ Peirce, C. S., *Collected Papers*, ed. C. Hartshorne and P. Weiss, Cambridge, Mass., 1931-58, Vol. II.

¹² Roget, P. M., *Thesaurus of English Words and Phrases*, Longmans, London, 1931.

¹³ Johnson, W. E., *Logic*, Pt. 1, Cambridge, 1921. See especially pp. xxi and xxii.

¹⁴ Parker-Rhodes, A. F., McKinnon Wood, R., Kay, M., Bratley, P., *The Cambridge Language Research Unit Computer Program for Syntactic Analysis*, C.L.R.U. Monograph, (M.L. 136).

Parker-Rhodes, A. F., *The Lattice Method for the Mechanical Processing of Syntax*, C.L.R.U. Workpaper, (M.L. 116).

¹⁵ Masterman, M., Needham, R. M. and Sparck-Jones, K., *The Analogy between Mechanical Translation and Library Retrieval*, International Conference on Scientific Information, Washington D.C., Nov. 1958.

The work of writing this paper, and of doing the research which lies behind it, was sponsored by the National Science Foundation and the Office of Naval Research, both of Washington, D.C., U.S.A.