TRANSLATION

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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 Ciceroian 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.

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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, it can be used to solve Moore's Paradox of Analysis. Secondly, following lines laid down by J. L. Austin, both in his seminars, and in his paper on *Excuses*, and following also, though less nearly, a line laid down by Wittgenstein in Part II of *Philosophical Investigations*, 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*.

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* 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 Anseombe for describing Wittgenstein’s Picture Theory of Meaning. It is used also, though less philosophically, by I. A. Richards and Molly Gibson in their language-teaching series of books Language Through Pictures. 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

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* 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 confound 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
stick pictured below, namely, that of someone showing grief, that 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 stick pictures which have human beings in, or all those stick pictures 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 stick picture, and each stick picture 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 renoticing 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, and, in philosophy, with Waismann,—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 describably 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, 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 dis-
coversies, 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, \( \equiv \), 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 sense, of sudden explosion, — which has been figuring prominently in a corner of the picture throughout, is the icon, — in the new extended sense, — 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 catastrophic. 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.\footnote{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.} 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
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
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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 ostensibly 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 stickpicted, 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 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:

English Through Pictures
French Through Pictures
German Through Pictures
Spanish Through Pictures
Hebrew Through Pictures
Italian Through Pictures

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 stockpicture, 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 wideish 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."*8

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 recondite for practical application . . . . 'The languages'
observes Horne Tooke, '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
confuted.) 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 Baget'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

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* 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"\textsuperscript{18}; and, what a come-down!

**SAMPLE SET OF TAGS, DEFINED BY KEY-ICONS**

<table>
<thead>
<tr>
<th>Icon</th>
<th>Tag</th>
<th>Description of icon in English</th>
</tr>
</thead>
<tbody>
<tr>
<td>.</td>
<td>BE</td>
<td>a dot</td>
</tr>
<tr>
<td>!</td>
<td>BANG</td>
<td>an exclamation-mark</td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>ARROW</td>
</tr>
<tr>
<td></td>
<td>DONE</td>
<td>(i.e. the same occurrence shown twice, once in continuous and once in discontinuous line)</td>
</tr>
<tr>
<td></td>
<td>ONE</td>
<td>one stick-like object in a free cloud</td>
</tr>
<tr>
<td></td>
<td>PAIR</td>
<td>two stick-like objects in a free cloud</td>
</tr>
<tr>
<td>Icon</td>
<td>Tag</td>
<td>Description of icon in English</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
<td>--------------------------------</td>
</tr>
<tr>
<td><img src="image1.png" alt="Change Icon" /></td>
<td>CHANGE</td>
<td>quartered circle,— actually the phases of the moon,—with an arrow inside it</td>
</tr>
<tr>
<td><img src="image2.png" alt="Cause Icon" /></td>
<td>CAUSE</td>
<td>two round objects— actually billiard balls—connected by an arrow</td>
</tr>
<tr>
<td><img src="image3.png" alt="Kind Icon" /></td>
<td>KIND</td>
<td>free cloud with objects from which abstraction must be made inside it</td>
</tr>
<tr>
<td><img src="image4.png" alt="How Icon" /></td>
<td>HOW</td>
<td>free cloud, as above, with label attached</td>
</tr>
<tr>
<td><img src="image5.png" alt="Same Icon" /></td>
<td>SAME</td>
<td>two crosses marking two similar objects, also in the picture, the whole in a free cloud</td>
</tr>
<tr>
<td><img src="image6.png" alt="Next Icon" /></td>
<td>NEXT</td>
<td>As for same, with dot-series and a third cross added; the third cross marking a third object, also in the picture</td>
</tr>
<tr>
<td>Icon</td>
<td>Tag</td>
<td>Description of icon in English</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>&lt;</td>
<td>MORE</td>
<td>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</td>
</tr>
<tr>
<td>&gt;</td>
<td>LESS</td>
<td>an entrance to a cave: a number of similar moving objects are going into the cave, i.e. are on the left, and one is in the cave, i.e. on the right; the whole in a free cloud</td>
</tr>
</tbody>
</table>

- **FOR**  an arrow, hitting the centre of a target
- **SPREAD**  an arrow, hitting only the rim of the target, and falling bent
<table>
<thead>
<tr>
<th>Icon</th>
<th>Tag</th>
<th>Description of icon in English</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image](133x257 to 422x770)</td>
<td>HAVE</td>
<td>a pleased man, with mouth, clutching an object</td>
</tr>
<tr>
<td>![Image](133x257 to 422x770)</td>
<td>LACK</td>
<td>two clutching hands having taken an object from a man with a woeful mouth</td>
</tr>
<tr>
<td>![Image](133x257 to 422x770)</td>
<td>MAN</td>
<td>figure of limp man with no eyes or mouth</td>
</tr>
<tr>
<td>![Image](133x257 to 422x770)</td>
<td>THING</td>
<td>circle, picture of a stone; cf.: also change and cause</td>
</tr>
<tr>
<td>![Image](133x257 to 422x770)</td>
<td>SELF</td>
<td>a man pointing to himself; and walking along</td>
</tr>
<tr>
<td>![Image](133x257 to 422x770)</td>
<td>FOLK</td>
<td>a number of men walking along</td>
</tr>
<tr>
<td>Icon</td>
<td>Tag</td>
<td>Description of icon in English</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
<td>--------------------------------</td>
</tr>
<tr>
<td><img src="image1" alt="Male Icon" /></td>
<td>HE</td>
<td>a trousered figure with penis sign</td>
</tr>
<tr>
<td><img src="image2" alt="Female Icon" /></td>
<td>SHE</td>
<td>a skirted figure with womb sign</td>
</tr>
<tr>
<td><img src="image3" alt="Man Pointing" /></td>
<td>I</td>
<td>a man pointing to himself, with mouth, and a tied cloud coming out of it</td>
</tr>
<tr>
<td><img src="image4" alt="Two Men Pointing" /></td>
<td>YOU</td>
<td>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</td>
</tr>
<tr>
<td><img src="image5" alt="Beast Icon" /></td>
<td>BEAST</td>
<td>an undetermined animal</td>
</tr>
<tr>
<td><img src="image6" alt="Plant Icon" /></td>
<td>PLANT</td>
<td>an undetermined plant</td>
</tr>
</tbody>
</table>
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

Tag          Word-uses

kind          lamentation, mourning;
lament, wail, 363 INTERMENT;
languishment, grief, moan, condolence, 915 CONDOLENCE;
sobbing, crying, tears, mourning, 837 DEJECTION;

one be         sob, sigh, groan, moan;
complaint, plaint, grumble, murmur, grief, 923 WRONG;
mutter, whine, whimper, 886 CIVILITY;

bang kind      flood of tears, burst of tears, fit of tears;
crying, howling, screaming, yelling, 411 CRY;

one bang be    spasm of sobbing, outburst of grief;
cry, scream, howl, 411 CRY;
waning and gnashing of teeth, 900 RESENTMENT;
Tag &emsp;&emsp;&emsp;&emsp; Word-uses

thing &emsp;&emsp; weeds, crepe, crape, deep mourning, sackcloth and ashes, 225 INVESTMENT;
&emsp;&emsp; passing-bell, knell, keen, death-song, dirge, 402 SOUND;
&emsp;&emsp; requiem, wake, funeral, 998 RITE;

she thing &emsp; widow’s weeds, widow’s veil, 225 INVESTMENT;
man do &emsp; mourner, weeper, keener;
pall-bearer, chief mourner, professional mourner, 363 INTERMENT;
do &emsp; lament, mourn, grieve for, weep over;
&emsp; condole with, moan with, mourn for, 915 CONDOLENCE;
&emsp; fret, groan, 828 PAIN;
keen, attend the funeral, follow the bier, 363 INTERMENT;
mew, bleat, bellow and roar, whine, 412 UTULATION;

more do &emsp; burst into tears, cry one’s eyes out, cry one’s self blind;
&emsp; scream, wail, yell, rend the air, 411 CRY;
&emsp; beat one’s breast, wring one’s hands, gnash one’s teeth, 3 SUBSTANTIALITY;

less do &emsp; sigh, shed a tear, fetch a sigh for;
how &emsp; lamenting, mourning;
&emsp; in mourning, in sackcloth-and-ashes, 225 INVESTMENT;
mournful, tearful, sorrowful, in tears, 837 DEJECTION;
&emsp; with tears in one’s eyes, bathed in tears, 824 EXCITATION;

now be &emsp; with tears standing in the eyes;
now hang be &emsp; with tears starting from the eyes;
more now be &emsp; with eyes suffused,—swimming,—brimming,—
&emsp; overflowing with tears;

hang &emsp; Alas! Alack! Woe is me! miserabile dictu! 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 \textit{fan}. If the set of uses is unstructured we shall call it a \textit{simple fan}; if any method of sub-classification of the uses is employed, we shall call the resulting system a \textit{jointed fan}. Let us call the point of origin of the fan its \textit{hinge}, and the set of word-uses represented in it its \textit{spokes}. Let the word-token $W$ for any fan be called the \textit{sign} of the fan.

Consider now the interpretation of the fan. We shall say that the word-token printed in heavy-leaded 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-leaded word-sign for any word $W$ represents an alternation of the form of the form $U_1 \lor U_2 \lor U_3 \ldots U_n$, 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-leaded 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 $U_1, \ldots, U_n$ 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 \textit{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 $U_1 \ldots U_n$ as given in the O.E.D., but that it does something to separate them.
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))

*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 drown'd 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? Priftee 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 physical 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")
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-fam. 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 \( a \lor b \lor c \lor \ldots \lor n \), the set \( a, b, c, \ldots, n \) being the set of word-uses listed in the head. Call this alternation \( I \). Let the overlap of meaning of the set \( a, b, c, \ldots, n \) be a single conjunction-formula of the form \( a \land b \land c \land \ldots \land n \). Call this conjunction \( O \). \( I \) and \( O \), together with the set \( a, b, c, \ldots, n \) 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 \( \lor \) can be identified with the Boolean join \( \cup \), interpreted as "and/or," and the connective \( \land \) 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:

\[ \text{MATHEMATICAL REPRESENTATION OF A HEAD} \]

\[ I \]

- total set of word-uses forming a head
- word-uses of constituents of the head
- overlap of meaning: concept
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*

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* 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 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 \( U_1 \lor U_2 \ldots U_n \); it can therefore be interpreted as the join of \( U_1, U_2 \ldots U_n \). Let the set \( U_1, U_2 \ldots U_n \) 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:

<table>
<thead>
<tr>
<th>NAME OF ENGLISH WORD</th>
<th>description of word-use</th>
<th>HEAD-reference</th>
<th>tag-reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>list of relevant synonyms, slightly enlarged from Rogel's Thesaurus</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

"A"

(i) a member of a class

- a, one, a single one, a typical member, a specimen . . . ."

"FATHER"

(i) male parent

- parent, father, sire, daddy . . . ."

(ii) progenitor, fore-father

- family, patriarch, matriarch, ancestor, parent, father, mother"

(iii) male title

- Mr, Mister, monsieur, sahib, Herr, Signor, Señor, Father . . . ."

(iv) to beget, to father

- propagate, father, sire, engender, bring into being"
(v) originator, designer
   "producer, creator, designer, fons et origo, parent, father of . . .".
(vi) leader, patriarch, person in authority
   "master, padrone, patriarch, head, stern parent . . ."
(vii) priest
   "father, father-in-Christ, padre, abbé, curé, patriarch . . ."
(viii) Deity
   "God, God the Father, our Heavenly Father, God the Creator, the Maker, the
   Preserver . . ."
(ix) Church Father
   "prophet, evangelist, apostle, disciple, saint, the Apostolic Fathers, the Church
   Fathers . . ."
(x) venerable person
   "veteran, old man, seer, patriarch, grey-beard, father . . ."
(xi) stock character
    in play
   "play the Dame, play the heavy father . . ."

---

(i) exists (as)
   1 EXISTENCE
   "exist, be, have being . . ."
(ii) occur
    3 SUBSTANTIALITY
    "be, actually be, occur, be a fact that . . ."
(iii) live
    359 LIFE
    "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 186 PRESENCE be
    space, literal or
    metaphorical
    "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, 494 TRUTH be
    absolute
    "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 45 VINICULUM how
    in screws)
    "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*


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

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

---

"STRICT"

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

"exact, accurate, correct, strict, definite, precise, just, right . . ."

(ii) *in conformity 82 CONFORMITY how with*

"typical, normal, formal; sound, strict, rigid, positive . . ."

(iii) *requiring 737 AUTHORITY how obedience*

"peremptory, over-ruling, severe, stringent, strict . . ."

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

"conscientious, right-minded, high-principled, religious, punctilious, strict . . ."

---

"PARENT"

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

"parent, father, sire, dad, daddy, mother, mama . . ."

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

"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,
        "Adam, First Parent, Adam and Eve, man
        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, quotation, 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);
one 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.\textsuperscript{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 \textit{and} sign be replaced by $a$
Let same \textit{or} be replaced by $b$
Let 27 \textit{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 \textit{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 $I$ \textit{you} \textit{he} \textit{she}$ be replaced by $f$
Let \textit{man} \textit{beast} \textit{plant} \textit{thing}$ be replaced by $g$
Let one \textit{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 \textit{TRUTH}$ be replaced by $M$

$S\,3$ now runs:

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

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

(b) $(f(X(j(g)))) (M(h)) (Y(k(X(g))))$
S 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) \( \text{f} \cap X \cap j \cap g \cap M \cap h \cap X \cap g \cap \text{l} \)

(b) \( (f(X)\gamma))) (Mh) (X(g)) \)

(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 \( \text{EQUALITY} \cap \text{pair} \cap \text{sign} \), 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:

- \( 11 \text{ FAMILY} \cap \text{man} \)
- \( 164 \text{ PRODUCER} \cap \text{man} \)
- \( 166 \text{ PATERNITY} \cap \text{he} \cap \text{man} \)

all of which occur both in the T-fan for "father", in X1, and in the T-fan for "parent", in X2.

and \( 373 \text{ MAN} \cap \text{he} \cap \text{man} \)

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:

```
father
  27 \text{EQUALITY} \cap \text{pair} \cap \text{sign} \\
  (11 \text{ FAMILY} \cap \text{man}) \cup (164 \text{ PRODUCER} \cap \text{man}) \cup (166 \text{ PATERNITY} \cap \text{he} \cap \text{man}) \\
  (373 \text{ MAN} \cap \text{he} \cap \text{man})
```

is
```
27 \text{EQUALITY} \cap \text{pair} \cap \text{sign}
```

male
```
373 \text{ MAN} \cap \text{he} \cap \text{man}
```

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 be-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 idio-
   maticness 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 inter-
   section 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 Sn.

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

   Result: S 3 is retained, Sn being now identified as a description.

3. Intersect the set of tags in Sn with the set of tags in S 3, with this exception: that any tag in S 3 which has no counterpart in Sn, 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 Sn the tag-specifications of which have been rejected under 3.

5. Intersect the set of spokes of each T-fan in Sn as retained after 4 with the sets of spokes of all the other T-fans in Sn, 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 Sn.

Result:

<table>
<thead>
<tr>
<th>My</th>
<th>I ( \cap ) have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father</td>
<td>166 PATERNITY ( \cap ) he ( \cap ) man</td>
</tr>
<tr>
<td></td>
<td>11 FAMILY ( \cap ) man</td>
</tr>
<tr>
<td></td>
<td>164 PRODUCER ( \cap ) man</td>
</tr>
<tr>
<td></td>
<td>737 AUTHORITY</td>
</tr>
<tr>
<td>is</td>
<td>494 TRUTH ( \cap ) be</td>
</tr>
<tr>
<td>a</td>
<td>one</td>
</tr>
<tr>
<td>strict</td>
<td>494 TRUTH ( \cap ) be</td>
</tr>
<tr>
<td>parent</td>
<td>737 AUTHORITY ( \cap ) how</td>
</tr>
<tr>
<td></td>
<td>166 PATERNITY ( \cap ) he ( \cap ) man</td>
</tr>
<tr>
<td></td>
<td>11 FAMILY ( \cap ) man</td>
</tr>
<tr>
<td></td>
<td>164 PRODUCER ( \cap ) man</td>
</tr>
</tbody>
</table>

* 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. This procedure will not be discussed here.
(b) The reformulation

1. Take the first T-fan which retains more than one head-specified in the analysis as given under b, a, 4. Scan the lists of Roget synonyms, in the dictionary, which are attached to the head-specifieds 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 Sn which have retained more than one head-specified. 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           | parent, father parent
|------------------|------------------------
| 166 PATERNITY \(\cap\) 11 FAMILY 166 PATERNITY \(\cap\) 164 PRODUCER 166 PATERNITY \(\cap\) 737 AUTHORITY | parent
| 11 FAMILY \(\cap\) 164 PRODUCER 11 FAMILY \(\cap\) 737 AUTHORITY 164 PRODUCER \(\cap\) 737 AUTHORITY | parent

| strict           | strict
|------------------|------------------------
| 494 TRUTH \(\cap\) 737 AUTHORITY | strict

| parent           | parent, father parent
|------------------|------------------------
| 166 PATERNITY \(\cap\) 11 FAMILY 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


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