U 10/4/51

Glossematic Algebra.

The theory, derived from Ferdinand de Saussure, is, briefly, that the central part of a language is a system of abstract forms which serves to give form to and to connect two in themselves ~~abstract~~ substances: sound on the one hand and meaning on the other. With the specific nature of these substances, or their possible forming from other points of view, the linguist as such is not concerned.

The main reason for preferring this theory to the common-sense picture of a direct association between sound and meaning, is the observation that similar chunks of substance are often differently treated by different languages--like the same collection of shirts, socks, etc. being differently distributed in different chests of drawers.

The postulated linguistic forms are defined in terms of functions, "function" being the term adopted for any connexion or dependence. Our aim is, then, to describe each language and to account for the differences between languages entirely in terms of functions. The substances, and the functions between form and substance, which, of course, cannot be ignored, are to be dealt with by ancillary disciplines. Thus a consonant is linguistically defined and described in terms of its ability to combine with other linguistic forms, and when this is done, it is handed over to the phonetician for accoustic and physiological treatment.

The linguist therefore needs a theory of functions and a notation. In so far as the relevant functions are quantitative, he can draw on mathematics; in so far as they are not quantitative, he is largely left to construct his own, drawing on symbolic logic where he can. It is this theory and notation of non-quantitative functions which will be discussed in what follows.

These functions are divided into two main classes: (1) both-and functions (logical conjunction, or multiplication) which we call relation, and (2) either-or functions (alternation, logical disjunction, or addition) which we call equivalence. Of these it is proposed to leave relation as a primitive assumption, defining equivalence as follows:

> By a paradigm is understood a functive together with such other functive(s), if any, as may be capable of functioning as one and the same terminal of one or more relations.
>
> The members of a paradigm are said to be equivalent in respect of the relation(s) establishing the paradigm: $(a + b + \ldots + n).R$, derived from the observed occurrence of $a.R$, $b.R$, etc.
>
> Two or more functives which are equivalent in respect of all relevant relations are said to be identical.

Relations are found by analysis, which is a kind of division: if there are two syllables, [ta] and [ca], then one tries, as a hypothesis, to identify the [t]-elemt in both and divide [c] by [t]: $\frac{c}{t}$ assigning a symbol, e.g. ʃ, to the result; thus c = t.ʃ .

Once a functive has been observed to occur in a given relation, it becomes of interest to know, and to be able to indicate, whether it can also occur without the other terminal of that relation. This leads to the following definition:

> By the <u>negative</u> of a functive is understood its absence from a given chain; the negative of a functive, a, is symbolised by $\bar{a}$. The negative of a functive is a functive.

The reason for declaring the negative a functive is that it is then possible to regard the occurrence of a without b as a relation between a and $\bar{b}$. The total possible occurrences of a and b can then be given in the form of the paradigm

(1) $ab + a\bar{b} + \bar{a}b + \bar{a}\bar{b}$.

To this there must, of course, be a paradigmatic companion-piece:

> By the <u>negation</u> of a functive is understood its absence from a given paradigm; the negation of a functive, a, is symbolised by − a. Negation is a function.

I.e. if there is a paradigm (a + b + c), there may be another which is like it except that it does not include b; this is then written (a − b + c). For instance, the consonants which can be initial in English syllables form the paradigm (p + b + t + d + h + f + etc.); the paradigm of final consonants is (p + b + t + d − h + f + etc.). The total possible paradigmatic functions of a and b can then be given in the form of the paradigm

(2) $\{+ (+ a + b) + (+ a - b) + (- a + b) + (- a - b)\}$

This presupposes the following rule:

> Two or more relations or two or more equivalences are
> sa said to be equivalent if their terminals are identical.

which follows from the basic theory of a system of abstract forms: if the strings of the net (functions) serve to connect the knots (functives), the knots equally serve to connect the strings.

The paradigms marked (1) and (2) above are each the most general of a list of 16 given, with the same numbers, on p. 3.

Each of the paradigms in (2) can be seen as a special kind of equivalence between a and b, to which it is worth assigning special symbols; such special equivalences we shall call <u>correlations</u>.

Each of the paradigms in (1) must be the product of a relation, or a paradigm of relations, the terminals of which are a correlation between a and $\bar{a}$ and a correlation between b and $\bar{b}$. Such correlations we shall call <u>sets</u>. It follows from the definitions of <u>negative</u> and <u>negation</u> that only correlations 2,4,6,8,10,12, and 14 are possible in sets. Each of these relations between sets we can regard as a special kind of relation, to be called a <u>direction</u>, between the positive members of the two sets, and assign a special symbol to each direction.

All this is necessary to get the definitions of linguistic units sufficiently diversified. There is a good deal more, but I think this will do as a sample.

My recent difficulty was that I could not get a sufficient number of direct relations between sets to account for all the directions. The solution is to bring in paradigms of relations in numbers 2,3,5,7,9,10. As a matter of fact, all the directions except 14 and 15 can be made up, alternatively, by such paradigms; I haven't time to make out a complete list.

^8,12.