On the Notation of Relations

The traditional arrow notation seems to represent duplex chains perfectly adequately. It is true that it is not logically exhaustive:

1.

$$\begin{array}{lll} a \leftarrow b = (a + ab) & = (a\underline{b} + ab + \underline{ab}) & (\underline{\text{note}}\text{: } \underline{a} = \text{'not-a'}) \\ a \rightarrow b = (ab + b) & = (ab + \underline{a}b + \underline{ab}) & \\ a \leftrightarrow b = (ab) & = (ab + \underline{ab}) & \\ a - b = (a + ab + b) & = (a\underline{b} + ab + \underline{a}b) & \\ \quad\quad\quad (a + b) & = (a\underline{b} + \underline{a}b) & \\ \quad\quad\quad (a) & = (a\underline{b} + \underline{ab}) & \\ \quad\quad\quad (b) & = (\underline{a}b + \underline{ab}) & \\ \quad\quad\quad (\ ) & \ \ (\underline{ab}) & \end{array}$$

but it can be maintained with some semblance of reason that in the last four cases there is no relation between a and b.

It has been supposed up till now that the same notation would work equally well for chains of higher complexity, since, by various arrangements of brackets, each relation could always be represented as having two and only two terminals. It does work in some cases, for instance in the analysis of the Spanish syllable [tʃe], where the class needed is (tʃe + te + e):

2. $(a \leftarrow b) \rightarrow c = (abc + ac + c)$

However, as indicated in U/20/6/47 1-2, there are 52 possible classes to which no arrangement of arrows and brackets corresponds, and it would now appear that some, if not all, of these unrepresented classes actually occur. Here is an example:

The nexis "when he came I went" can be analysed as follows: 1. (when he came)(I went); 2. ((when)(he came))(I went), i.e. (ab)c. The class needed is (abc + b + bc + c), since the possible nexias are "when he came I went", "he came", "he came, I went", and "I went", but no arrangement of arrows will produce this class. It can be done by the composite arrangement: x

3. $((a \leftrightarrow b) \rightarrow c) + (b - c) = (abc + c) + (b + bc + c) = (abc + b + bc + c)$

since 2c = c. But this is unsatisfactory because it does not indicate the true orientation of the relation between a and b nor the ambivalence of the relation between (ab + b) and c:

The relation between a and b is obviously

4. $a \rightarrow b = (ab + b)$

since the two possible nexus are "when he came" and "he came". The relation between (a → b) and c is ambivalent and selective since, when the relation has the orientation (a → b) → c the value of (a → b) must be ab, and when the orientation is (a → b) – c the value of (a → b) must be b. In other words, c enters into relation not with one orientation but with a class of orientations, viz (→ + –)c. This could be expressed as follows:

$$\begin{pmatrix} (a \leftrightarrow b) & \rightarrow \\ (b) & - \end{pmatrix} c$$

which still does not solve the problem of adequate representation of the relation (a → b).

x $(b \rightarrow c + b \leftarrow \rightarrow c) \rightarrow a = (abc + bc + b + c)$ 13/8/48

Leaving this problem aside for the time being, I should like to suggest that one must be prepared to find structures of the same general type as 5 but of much greater complexity, e.g. something like this:

6. $$\begin{pmatrix} \left(\begin{matrix}((a) \leftrightarrow (b))\\((m) \rightarrow (n))\end{matrix}\right) \leftarrow \\ \left(\begin{matrix}((b))\\((q) - (r))\end{matrix}\right) \rightarrow \\ \left(\begin{matrix}((x) \leftarrow (y))\\((p))\end{matrix}\right) \leftrightarrow \\ \left(\begin{matrix}((i) \leftrightarrow (j))\\((k) - (l))\end{matrix}\right) - \end{pmatrix} c$$

In 6 each letter is enclosed in brackets because the letters represent classes: a = (a' + a"" + ...) etc., just as in 5 a stands for the class ("when" + "as" + "since" + "because" + ...), b for the class ("he came" + "she sang" + ...), etc. The second brackets, counting outwards, enclose the class of substantials (my definition) and of chains which are internally related with one and the same orientation, which are related to c with one and the same orientation. The third brackets enclose the class of functives related to c with one and the same orientation, irrespective of their degree of complexity, which is incidentally of course their degree of derivation, and of the orientation of their internal relation, if any. The fourth brackets enclose the class of all functives in relation with c. It will be seen that 6 suffers from the same defect as 5. It would, of course, be easy to complicate 6 further by introducing units of greater complexity than two in the left-hand column.

There is, furthermore, a type of class which does not lend itself to even the unsatisfactory formularisation of 6;

7. $(a + abc + b)$

is an example. It is clear that this is based on the duplex chain whose class is $(a + ab + b)$, vis $a - b$, but the selection exercised by the relation between $(a - b)$ and c is such that in the relation with c the value of $(a - b)$ must be ab and that only in this relation can its value be ab. I.e.

8. $(a - b)c = (a + \underset{\substack{\updownarrow \\ c}}{ab} + b)$ (<u>note</u>: this is an ad-hoc formula which is not suggested for adoption)

I do not know whether classes of this type do actually occur, but there seems no justification for supposing a priori that they do not. It may be worth adding incidentally, if only to make confusion worse confounded, that 7 closely resembles the structure of certain syncretisms: if a be "nominative", b "accusative", and c "neuter", all in Latin, then, by adding d for "masculine" and e for "feminine", we obtain

9. $(a(d + e) + abc + b(d + e))$

which is precisely the structure of the Latin nom/acc syncretism. This may prove a fruitful line of research and should certainly be admitted to the problem-cupboard.

As the theory of orientations in its present form thus does not seem to work for triplex chains, I suggest that it be restricted to duplex chains. It might be possible, though it would probably be very difficult, to modify the theory and expand the notation so as to cover triplex chains, but as there would still be no security that such a new theory would be applicable to chains of higher complexity, it hardly seems worth the effort. On the other hand, the theory of orientation is so fundamental to glossematics as a whole, and its elimination would involve such far-reaching changes, e.g. in the definition of the morpheme, that it seems essential to retain it for binary relations.

We can use the same notation as before with the restriction that no symbolisation of a chain may contain more than one arrow. The example faultily symbolised by 3 would thus be written

10. (ab → c) + (b − c) = (abc + b + bc → c)

from which it can be deduced that the relation between a and b, considered in itself, is a → b and can be symbolised as before.

6/7/48

Engl. /sprai, spai, prai, sai, pai, rai/, but not /srai/:

11. (a + ab + abc + b + bc + c) =

12. (a + ab + abc + ac + b + bc + c) ÷ ac = (a − b − c) ÷ ac

3 and 10 =

13. (ab + abc + b + bc + c) ÷ ab = ((a → b) − c) ÷ ab