NOTES ON THE NEW SYLLOGISTIC

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One of the most exciting events in the logical studies of recent years has been F. Sommers' development of an extended and strengthened syllogistic logic of terms [1]. This work deserves to be examined by every philosopher interested in the field of logic regardless of his own «philosophy of logic.» In this essay we will look at two traditional problem areas for syllogistic — the doctrine of term distribution and the notion of existential import. A preliminary brief look at the law of identity will help us in getting clear in both these areas.

The Law of Identity

Aristotle nowhere formulated, as far as we know, the «law of identity.» If he had, however, it is likely that he would have offered several versions (as he did for the «laws of non-contradiction and excluded middle»). It could be: everything is what it is. Or: everything is identical with itself; or: every proposition is logically equivalent to itself. The most helpful versions of the so-called laws of thought are those which take them as metalogical statements. They state special truth conditions for simple propositions or simple propositional pairs *solely on the basis of their logical forms.* We will say something about the form of a proposition in Sommer's logic and then offer an appropriate formulation of the law.

[1] See: «On a Fregean Dogma,» *Problems in the Philosophy of Mathematics,* ed. I. Lakatos (Amsterdam, 1967); «Do We need Identity ?» *Journal of Philosophy* 66 (1969); «The Calculus of Terms,» *Mind* 79 (1970); «Existence and Predication,» *Logic and Ontology,* ed. M. K. Munitz (N. Y., 1973); «Distribution Matters,» *Mind* 84 (1975); «The Logical and the Extra-Logical,» *Boston Studies in the Philosophy of Science,* 14 (1973); «Logical Syntax in Natural Language,» *Issues in the Philosophy of Language,* ed. A. MacKay and D. Merrill (Oberlin, 1976).

With Aristotle, Sommers holds that all propositions are either categorical or translatable into categoricals. Such propositions have exactly one subject and one predicate. A subject is a term (simple or complex) modified by quantity. A predicate is a term (simple or complex) modified by one of two modes of predication. The two modes of quantification are universal and particular. The two modes of predication are affirmation and denial. Any term may be negated or unregated. Any term may be found in either the subject or the predicate. Terms outside of subjects and predicates are logically homogenous. Individual terms are terms. An individual (singular) proposition is one whose subject term is an individual term. Such terms may be quantified either universally or particularly, since in such cases the two quantifications are logically indiscernible. A proposition whose subject and predicate terms are both individual is one of identity or nonidentity.

Here are some examples:

1. *All men are animals.*

Here the subject is 'all men'; the predicate is 'are animals'; the subject term is 'men'; the predicate term is 'animals'; the quantifier is the universal 'all'; and the mark of predication is the affirmative 'are'. The entire proposition is a universal affirmation.

2. *Some boys are unclean.*

Here the subject is 'some boys'; the predicate is 'are unclean'; the subject term is 'boys'; the predicate term is 'unclean' (the negation of 'clean'); the quantifier is the particular 'some'; and the mark of predication is 'are'. It is a particular affirmation.

3. *Whales aren't fish.*

The quantifier here is understood as 'all'; the subject then, is 'all whales'; the predicate is 'aren't fish'; the subject term is 'whales'; the predicate term is 'fish'; and the mark of predication is 'aren't'. It is a universal denial.

4. *Dogs do not fly.*

Again the quantifier is understood as 'all'. Here the mark of predication is 'do not'. It is a universal denial.

5. *Babies are crying.*

In this particular affirmation the quantifier, 'some', is understood.

6. *Socrates is wise.*

Since the subject term here is the singular 'Socrates', the hidden quantifier is arbitrary ('all or some'). It is a singular affirmation.

7. *Jones runs.*

In this singular affirmation the mark of predication is the hidden 'does'.

8. *Shakespeare is Bacon.*

Here the predicate is 'is Bacon'. Since both subject and predicate terms are individual it is a proposition of identity. (Identities are affirmations; nonidentities are denials).

Sommers has developed an ingeniously simple symbolization for categoricals. Terms are symbolized by letters. Negative terms are preceded by '—'. The subject term of an affirmation is followed by '+'. The subject term of a denial is followed by '—'. Universal quantification is indicated by '—'. Particular quantification is indicated by '+'. We can formulate the general form of any categorical, then as

$$\pm\ (—)S \pm (—)P$$

Where '±' means '+ or —' and parenthetical marks may be omitted. The formula reads: 'All or some (non)S are or aren't (non)P'.

Of course, what we have offered is only a rough and ready, incomplete sketch of Sommers' theory of propositional form. But, it will suffice to allow us now to formulate the law of

In *Formal Logic* Keynes [5] had tried to argue that we could have both the validity of such inferences and distribution as well by taking those inferences to have a tacit premise: 'Not everything is P'. I think Keynes was correct insofar as we can have both the validity of such inferences and distribution by taking those inferences to have a certain hidden premise. But I think he got that premise wrong.

From a formal point of view, no proposition should be admitted as a hidden, assumed premise unless it is formally true. Indeed, in ordinary discourse we leave out certain premises only when we take them to be so obviously true that they need not be explicitly stated. Keynes' tacit premise is not a formal truth. In fact, if in our argument we let P be 'self-identical', then Keynes' premise says 'Not everything is self-identical'. If this is not false its formal truth at least, is questionable.

I believe the hidden premise needed here is one which has a form governed by the law of identity. Sommers has said that an inference can be valid only if (a) all premises and the conclusion are universal or the conclusion and exactly one of the premises are particular, and (b) the sum of the premises is algebraically equal to the conclusion. For example, in

$$\begin{array}{l} -S+M \\ -M+P \\ \hline \therefore -S+P \end{array} \qquad \begin{array}{l} +S+M \\ -M+P \\ \hline \therefore +S+P \end{array} \qquad \text{and} \qquad \begin{array}{l} +S+M \\ -P-M \\ \hline \therefore +S-P \end{array}$$

conditions (a) and (b) are both fulfilled so that the three arguments are formally valid. In

$$\begin{array}{l} +M+P \\ +S-M \\ \hline \therefore +S+P \end{array}$$

condition (b), but not (a), is fulfilled. So it is not formally valid. And

[5] (London, 1906).

$$\begin{array}{l} -S+M \\ -P+M \\ \hline \therefore -S+P \end{array}$$

is formally invalid since (a) but not (b) is fulfilled.

We can formulate the counter-argument given earlier as follows:

$$\begin{array}{l} -S+P \\ \hline \therefore +(-S)-P \end{array}$$

By introducing the tacit premise 'Some nonP is nonP' we get

$$\begin{array}{l} -S+P \\ +(-P)+(-P) \\ \hline \therefore +(-S)-P \end{array}$$

This is a formally valid argument which satisfies both conditions (a) and (b) and our doctrine of distribution. The new premise is innocent (formally true) since it has one of the forms (viz. $+A+A$) governed by the law of identity. In the new argument the term distributed in the conclusion, P, is distributed in the new premise also. To show this we must add to our theory of distribution the simple, innocuous, and obvious rule that the negation of a distributed/undistributed term is itself undistributed/distributed. In '$+(-P+(-P)$', since $(-P)$ is undistributed, its negation, P, is distributed. So, while P is undistributed in the first premise, it can be distributed in the conclusion since there is a second (hidden) premise in which it is distributed.

Existential Import

The problem of existential import can be handled in a way

Our premises are algebraically equal to the conclusion. The conclusion and exactly one premise are particular. And the assumption is formally true by the law of identity.

Russell claimed that in modern times most scientific advances have been «made in the teeth of opposition from Aristotle's disciples.» I believe that further study of Sommers' new syllogistic will provide at least one example of progress because of one of Aristotle's disciples.

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