

NON-EMPTY COMPLEX TERMS

A. J. BAKER

The logic of traditional *A, E, I* and *O* propositions containing conjunctive and disjunctive terms was outlined by de Morgan and developed by Keynes. But neither writer worked out the logical effects, either of requiring complex terms to have an application, or of alternatively admitting empty terms. De Morgan briefly skirted this question by introducing "existence" and "non-existence" as ingredients of complex terms, manipulable in the same way as their ordinary ingredients.¹ Keynes noted that there was a problem because unqualified manipulation of complex terms sometimes results in a contradiction in terms or in a term with a non-existent subject, and suggested, but did not elaborate the consequences of his suggestion, that particular propositions be interpreted as implying, and universals not as implying the existence of their subjects.² In this paper I want to deal with the logic of referential or non-empty terms. After introducing the requirement that empty terms are to be excluded from the system of complex propositions,³ I shall go on to discuss (a) the effect this requirement has on the validity of inferences involving complex terms, (b) the effect on relations of proposition, and (c) a special problem about relations between propositions that emerges in the system. The symbolism employed will be that of Łukasiewicz for symbolizing *A, E, I* and *O* forms of proposition, while "*k*" as in "*kab*", "*v*" as in "*vab*" and "*n*" as in "*na*", will be used to symbolize, respectively, conjunctive, disjunctive and negative terms (or negative ingredients of terms). For example, "*akabvncd*" is to be read as "All both *a* and *b* are either non-*c* or *d*". When connections between propositions need to be expressed, Russell's notation will be used, except that "*V*" will be substituted for his "*v*".

1. Augustus de Morgan, *Formal Logic*, 1847, p. 120.

2. J. N. Keynes, *Studies and Exercises in Formal Logic*, 4th ed., 1906, esp. p. 486 and p. 492.

3. I follow Keynes in using "complex proposition" to refer to *A, E, I* and *O* propositions one or both of whose terms are complex terms. While de Morgan used the phrase "complex term" in the sense followed by Keynes, he used "complex proposition" in a quite different way, viz., to refer to seven sets of *simple A, E, I* and *O* propositions that he distinguished (op. cit., pp. 65 ff.).