

## A System of Predicate Logic with Trans-Atomic Units

RICHARD BUTRICK

**Preliminary remarks** The original idea of introducing trans-atomic units into systems of formal logic was presented at the World Congress of Philosophy in 1983. Formal development of this concept at the truth-functional level was subsequently investigated in this journal [1]. This paper extends the concept of trans-atomic (*TA*) units to Predicate Logic (*PL*).

**Motivation for investigating *TA* units** The concept of *TA* units allows the introduction of special connectives over and above the 16 limitation of standard two-valued logic without leaving the confines of a two-valued system.

The one particular connective introduced in this paper has interesting possibilities as regards its use as a causal connective in the formulation of lawlike generalizations. Briefly, the difficulties with the Philonian (material) conditional in the formulation of lawlike generalizations concern its properties as regards confirmation and support:

$(x)(Fx \rightarrow Gx)$  is confirmed (totally) by

- (1)  $(x)Gx$  (and consequently by the pair  $\langle (x)Gx, (x)Fx \rangle$  as well as the pair  $\langle (x)Gx, (x)\sim Fx \rangle$ )
- (2)  $(x)\sim Fx$ .

is supported by

- (1)  $Ga$  (and consequently by the pair  $\langle \sim Fa, Ga \rangle$ )
- (2)  $\sim Fa$ .

There seems to be no escape from these difficulties. Even restricting evidence or support to instances of the corresponding conjunction, i.e.,  $Fa \ \& \ Ga$ ,  $Fb \ \& \ Gb$ , etc., is of no avail. Since  $(x)(Fx \rightarrow Gx)$  is logically equivalent to  $(x)(\sim Gx \rightarrow \sim Fx)$  the latter would be supported by  $\sim Fa \ \& \ \sim Ga$  and hence the former also. The partial connective, '—c', subsequently introduced avoids the

*Received April 8, 1985*