

**ONCE AGAIN ABOUT THE TERNARY DESCRIPTION LANGUAGE
AS A NON-CLASSICAL LOGIC**

When it comes to the criteria for distinguishing classical logic from non-classical logic, the following criteria are usually mentioned (see: [2, p. 30]) 1) weakening or rejection of the laws (principles) of traditional and classical logic (for example, the rejection of the law of the excluded third led to the foundation of intuitionistic logic); 2) extension of the scope of classical logic (for example, John P. Burgess argues that the fact that mathematical logic goes beyond its scope gives rise to various philosophical logics); 3) the struggle with inference (implication, consequence, etc.) (for example, the rejection of some structural rules within the Gentzen calculus led to the creation of substructuralist logics).

I suppose that the Ternary Description Language (see: [1]), the formal logic created by Avenir Uyemov, is a non-classical logic, and there are several reasons for this.

The first reason is that the Ternary Description Language was created to meet the needs of parametric general systems theory (the version of general systems theory created by A. Uyemov). Over time, however, the Ternary Description Language began to be used outside of systems theory, primarily in modelling theory and the theory of inference by analogy. That is, the scope of the Ternary Description Language has expanded, which may indicate the non-classical nature of this language.

The second reason is that two principles (laws) of identity are observed in ternary description language. Both have their origins in Aristotle's philosophy (they are implicit in Aristotle's *Metaphysics*). The first principle of identity is the law of identity from traditional and classical formal logic, which in traditional logic usually takes the form of either $A \in A$, or $A = A$, and in symbolic logic: $a \rightarrow a$ (a entails a), or $a \equiv a$ (a equals a), or $\forall x (p(x) \rightarrow p(x))$ (if it is the logic of predicates). This principle of identity is, in my opinion, the most important in the Ternary Description Language in terms of tools, because it allows us to use the closed identity operator: ι (iota-operator).

The second principle, the so-called 'counter-Leibnizian principle of identity,' unlike the first, allows us to identify one thing with another. This principle makes it possible to use the second identity operator, the open one: j (the j -operator). Depending on the context, the situation and the needs of the *ternary descriptive language*, two types of identity are used and thus two principles of identity are observed. This indicates at least a weakening of the law of identity. So, this is evidence that the Ternary Description Language is a non-classical logic.

The third reason is that the Ternary Description Language uses non-standard types of implication: attributive, relational, mereological, neutral and two-sided. Classical formal logic recognizes only material implication, which has the following forms $A \rightarrow B$, or $\neg A \vee B$, or $x \in A \Rightarrow x \in B$, $A \in B$. Non-classical logics often offer their own versions of implication. This is due to the so-called 'paradoxes of (material) implication.' In order to avoid the paradoxes of implication, non-classical logic introduces other types of implication that are based on material implication as a model (i.e., they are actually modifications of material implication adapted to these logics), e.g., strict implication

of C. I. Lewis, strong (relevant) implication of W. Ackerman, A. Anderson and N. Belknap, intuitionist implication, connectionist implication.

A. Uyemov proposed his own five types of implication:

- 1) attributive (implication of properties): \Rightarrow ;
- 2) relational (implication of relations): $>$;
- 3) mereological (implication of inclusion): \supset ;
- 4) neutral: \rightarrow ;
- 5) bilateral: \leftrightarrow .

All these types of implication combine with each other and with other types of implication from other logics to perform the same function: to justify certain statements by reference to other statements. The Uyemov's implications are not modelled on material implication, as opposed to, say, relevant or strict implication. The Uyemov's implications are not bound by the concepts of truth and falsity. This is a consequence of the specific understanding of 'truth' and 'falsity' in the Ternary Description Language. This point is also very important in the sense that the implications of A. Uyemov are not bound to the consequence. Material implication and other implications, except the Uyemov's ones, can be the 'basis' (generalizations) of a consequence (in fact, a consequence appears here as a law or as a pure abstraction or form of implication without reference to a specific content), and vice versa, implications themselves can be concretizations of formulas (consequences). In the Ternary Description Language, the consequence as such is not presented or developed. But in any case, every kind of consequence in contemporary logic imitates as its own model the classical consequence of A. Tarski, in which truth plays an important role (and presumably truth here is taken from A. Tarski's semantic conception of truth).

It should be noted, however, that Uyemov assumed that implications from other logics, especially material logic, could be used in the Ternary Description Language. These implications will simply take the form of a neutral implication, as the other four Uyemov implications do in certain cases.

The presence of non-standard implication types may indicate the non-classical nature of the Ternary Description Language.

As a result, we can say that the Ternary Description Language is a non-classical logic according to all three of these criteria.

References

1. Райхерт К. В. Базові знання з мови тернарного опису. Одеса : Одеський національний університет імені І. І. Мечникова, 2019. 40 с.
2. Peregrin J. Co je nového v logice. Praha : Nová beseda 2018. 80 s.