



The Dial of the Circular Complementarity of the Designated and Antidesignated Pairs

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Abstract:

The priority is given to MACROLEVEL, and MICROLEVEL only in the absence of macrodominant. Variable elements A, u form a *logic wave*, and invariable elements V, n – *logic atom*.

Keywords:

multiple-valued logic, microlevel and macrolevel, logic atom and logic wave, circular complementarity.

He who possesses Geometry bears it away, and acquires a new vigor.

B. Pascal. *Of the Geometrical Spirit*

The epistemological lesson of atomic physics has naturally, just as have earlier advances in physical science, given rise to renewed consideration of the use of our means of communication for objective description.

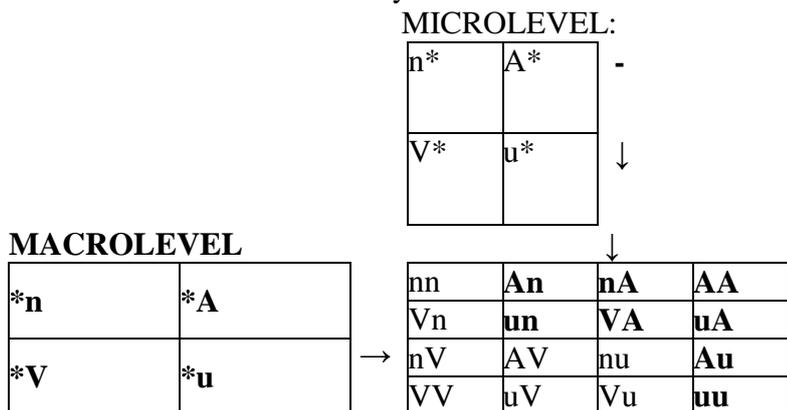
N. Bohr. *Atomic Physics And Human Knowledge*

“Let None But Geometers Enter Here” – that was a motto of Platonic Academy. The founder of the higher geometry chair in Sorbonne M. Chasles said that the geometry “is considered as a basis of mathematical sciences, and the best thinkers of all times considered it, as an excellent exercise in the logics, extremely suitable for development of great minds” [17, p. 515]. Lobachevsky's works have focused scientists' attention on the problem of the relationship between various geometrical constructions. “When analyzing formation of a principle of compliance in the history of geometry, usually the value of ideas of N.I. Lobachevsky for identification of relationship between Euclidean and not Euclidean geometry is appreciated” [12, p. 234]. The geometry is the most ancient mathematical discipline, and the higher geometry (which is usually called projective geometry) has shown how to unite both classical and non-classical theories [8, p. 242]. Empirical nature of geometry and logic was noted many times. S. Kleene emphasised similarity of geometry and logic in his *Mathematical Logic*. It is a good example of convergence of various scientific disciplines. Some logicians can tell: “I see no logic!” As in case of geometry the synthesis of classical and non-classical logics requires *the highest logic* which is generated by projective interpretation of a Boolean polysemy [4, pp. 14 – 34]. It should be noted that contemporaries did not quite understand G. Boole's logic which was considered in details by N.I.Styazhkin as non-classical, multi-valued logic [14, pp. 329, 335].

The principle of compliance establishes relation between classical and non-classical approaches. Asymptotic coincidence of classical and non-classical theories is the first manifestation of *the correspondance principle*. When arranging true-false pairs we consider them equivalent. According to *the correspondance principle* the designated and antidesignated pairs should be equivalent – *fifty-fifty*. At the same time the principle of compliance was one of sources of *the complementarity principle*.

First of all it deals with a complementarity of description levels carried out through essentially different experimental concepts. The concepts of microlevel and macrolevel as a methodological principle have been offered firstly in my article for magazine «Philosophy matters» in 1970 that was appreciated by corresponding member A.A. Lyapunov and was prepared for publication, but then its galley proof was withdrawn (because of quotations from A.A.Zinovyev’s work). The complementarity of levels generates a **fractality** (self-similarity) of the main table structure. **BLOCKS** of macrolevel *are subdivided* into microlevel cells. All two-letter words are formed by application of the “letters” to themselves, providing a quantum leap to the highest level [6].

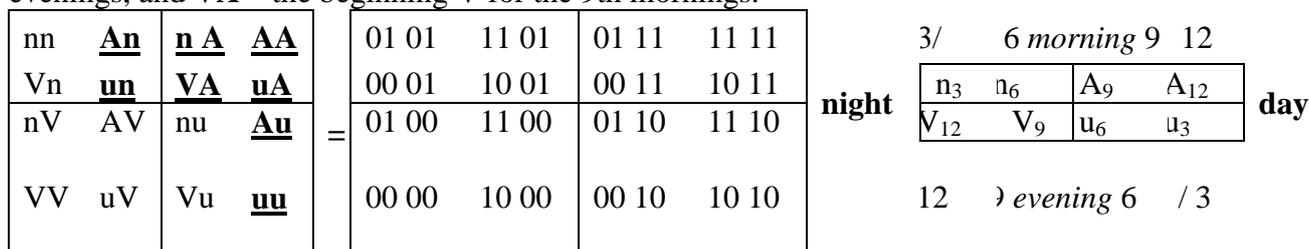
Using a traditional arithmetization of logic where 1 designates truth and 0 designates false, we have **DOMINANTS** which are *the absolute maximum* A = 11 which is designated value and the *absolute minimum* V = 00 which is antidesignated value. **NONDOMINANTS** are the designated u = 10 and the antidesignated n = 01. These four values form pairs (x, y) where the prefix x describes MICROLEVEL, the root y describes MACROLEVEL. When deciding on the designation of the pair (MICROLEVEL, MACROLEVEL) the priority is given to MACROLEVEL, and MICROLEVEL is chosen only in the absence of a macrodominant.



Let's accept the complementarity concept. A. Petersen considers its historical and philosophical roots in the problem of stability and changeability [20, p. 62]. Divisible, changeable elements form a logic wave, and indivisible ones form stable elements – logic atom which has the fourfold duplication that provides the higher safety when transferring genetic information.

Strong pair implies macrolevel priority and weak pair provides microlevel priority. Diagonal oppositions anti-commutate in designation that generates a complementarity.

The complementary pair of vowels A, u creates a *wave*, and the pair of consonants V, n forms **ATOM**. Adjacent pairs commute in the identity on designation: **Au = uA**. Diagonal oppositions of the designated and antidesignated true-false pairs (wave-particle and particle-wave) anti-commutate in identity on designation: **AV = – VA**. AV has the beginning A specifying the 9th evenings, and VA – the beginning V for the 9th mornings.



Diagonal oppositions – midday and midnight – are in antiphase as antipodes on the offered dial of the designated and antidesignated pairs. These are complementary a complementarity.

The anti-commutativity does not hide non-identity of the paradigm and anti-paradigm, but prepares qualitative transfer. Here *the complementarity principle* is fundamental, and N.Bohr considered nonclassical noncommunicativity as its most essential manifestation. “The noncommutativity formula turned from striking absurd into the unforeseen guarantee of the fruitfulness of the discovered way” [7, p. 259].

Von Weizsäcker was the first who paid attention that complementary descriptions are in the circular relation. He associates the complementarity concept with the general gnoseological model of “the circle of knowledge”. [1, pp. 159, 193]. It is necessary to join his opinion that this concept is in essence logical. The dial describes a circular order of the genetic code diagrams and sociotics quadras well [5, pp. 167-174]. Diagonal oppositions are complementary. “They teetered on scales: the morning raised one, the evening raised another” [9, p. 349]. There are good grounds for Russian saying: “The morning is wiser than the evening”. The complementary pairs appears on the macrolevel not together. Thus the overlaps from right to left and from left to right form a hysteresis loop. This so-called “inertia” was noticed long ago by experts in psychophysics.

The flying arrow achieves the target in multilevel logical model. Though it is motionless at every moment of time, but movement process as result of merging discrete frames is not a paradox (as Zeno stated) but a logical vector. It is particle-wave [2, p. 34]. The specified triad forms CINEMA = (freeze frames, movement, phase). Leibniz’s actual infinitesimalls were proved within non-standard mathematical analysis. That is the atomism of knowledge. A logical codon (MICROLEVEL, MACROLEVEL, *phase*) includes a fluxion z which describes a wave phase.

Let's count up the total number of distinguishable (by amino acids) logic codons. There are 8 indivisible codons + 8 x 2 doubled codons = 24 codons, distinguishable by amino acids, minus 3 repeated codons result in 21 = 20 amino acids + the STOP command.

The consideration of non-classical logic in terms of the classical logic allows to show clearly a role **of the designated values** for classification of the trigrams by means of the digram matrix of the genetic code. At first a logic matrix is constructed of large blocks, and then some cells are arranged and filled according to the principle of similarity [3, pp. 53-59]. It was possible to construct fractal cards due to the fact that positional recording requires just 4 letters at the highest levels.

The principle of a fractality must succeed within our Solar system! The Earth’s rotation around its own axis and its rotation around the Sun can serve as a bright example of a temporary fractality: *day periods* (morning, day, evening, night) are similar *to seasons* (spring, summer, autumn, winter). Plato prophetically stated: “The reason for God to invent and give us sight to the end that we might behold the courses of intelligence in the heaven, and apply them to the courses of our own intelligence which are akin to them...” [11, p. 450]. As a result Ptolemaeus’s epicycles emerged for heavenly bodies and al Arabi’s concentric circles for our thinking. Its sectors (*Speaking, Loving, Knowing and Dominating*) does not casually seen similar to the modern classification in the sotsionics [9, p. 69].

Aristotle's LOGICAL SQUARE quartered Natural Universal but “presented” to it a prison cell with a square outlook. Unlike the European astrological charts, of the rectangular shape, the Arabian charts *traditionally had the round shape*. Later the circular order prevailed in Europe as well. The striking examples are the round seal inherited from alchemists, and R. Lully's logical machine. Now the matrix of complementarity provided the circular arrangement (n “spring” – A “summer” – u “autumn” – V “winter”) in MATRIX OF COMPLEMENTARITY unlike the LOGIC SQUARE:

n spring **A SUMMER**
V WINTER u autumn

n spring **A SUMMER**
u autumn **V WINTER**

Aristotle applied the logic square in syllogistics where partial affirmative and partial negative judgments were nearby in one column, and general affirmative and general negative judgments are nearby in other column. Figuratively in that case summer and winter are nearby. A .Koyre believed that “the theoretical thought and human life are separated by a chasm” [19, p. 43]. He underlined this thesis, stating that the world of the science is leaving and separates from the living world. In the *living logic* the Matrix of Complementarity does not allow that gap. *The GENETIC APPROACH IN LOGIC* allows to define the features matching the *plan of the Nature*.

When creating the universal language the similarity of the trigrams and triplets of the genetic code can help. That was discovered firstly by the Nobel prize winner in molecular genetics F. Jacob. The genetic code is an information code. In philosophy of a science there is no other way to be loyal to the Nature, except to be loyal to genetics. Analytism is based on the positioning principle that should be applied for humanities because it offers there not less advantages than for arithmetics. It realizes Leibniz's dream – to make mathematics universal language in fact. “Universal” literally means “turning into one” (from Latin *Unus* = one and *Versus* – a participle from *Vertere* = to rotate). It is “the ability of one to turn different sides, ... a plenty in one subject” [18, p. 643]. In fact there is turning when turning!

“Since Plato the western thought and the theory of knowledge have concentrated on concepts True/False. However it is high time to shift to Stable/Unstable, and in a social Epistemology – to more serious problem of Dupe/Egghead...The most estimable task is to devote oneself to what has been neglected for very long time – to creation of the charts that could define limits of our current knowledge and our current methods” [15, pp. 206, 117-118]. N. Taleb emphasizes: “I used the concept ‘bulge’ – disproportionate nonlinear reaction to change of basic data when all tools to measure the accuracy level may be thrown out safely” [15, p. 102]. He applied the term “Black swan” for rare but shocking crises in the. This block of *the bulgy dissidents* allows to describe *variability of *A* as a cluster equivalent to a cluster of *stability *V* – *caved in to the authority* concordants.

The problem “how to shift from one style of thinking to another” was set by L. Fleck emphasizing the importance of the social and cultural aspect in philosophy of a science [16, p. 55]. He influenced greatly on the concept of T. Kuhn’s abrupt transitions to whose emphasis only on the ‘Normal’ science *without any irony* [13, p. 144] did not allow him to describe the structure of the scientific revolutions. However even L. Fleck repeatedly emphasized the impossibility of formal and logical interpretation of the cognitive process [16, pp. 37, 57, 61, 75]. The concept of a social clustering can help. However its author Academician V.L. Makarov specifies *the only cluster* – rigidity (“skeleton”), opposing it to softness (“muscles”) [10, p.11]. However only after consideration of *two dominant clusters* **V* and **A*, it is possible to plan solutions of the PROBLEM of CHANGES.

The logical *positioning* can help essentially to humanists in creation of universal language. Its letters can be small and big (dominants), concave and bulgy (“not caved in”) concordant and public (dissidents). That’s why A. Makarevich sang: “Don't cave in to the changing world, get the world to cave in to you”. This motto practically realizes sociocultural aspect in the philosophy of science.

The offered genetic method to solve the problem of transition from one style of thinking to another is the *message* which provides the clue to cognitive process that will help fill the gap between natural intelligence (NI) and artificial intelligence (AI).

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