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Professional Culture of the Specialist of the Future

**PHILOSOPHICAL COMPREHENSION OF SCIENCE IN THEORY
OF RUSSIAN AVAN-GUARDE**

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Abstract

The period of 1900-1910 was marked by a notable impact of science on the most radical trends of art of modernism. In Russia new artistic trends were presented as “theories” with their own method and pedagogical systems. Collapse of the mechanical physics' world view was regarded as a dramatic sentence for scientific world view. Philosophy of Ostwald and Bogdanov reflected in theoretical works of the artists before the revolution 1917. Artists and critics thought about the common grounds for the scientific and artistic creation. Artistic creations include visual interpretations of the scientific ideas and notions (the fourth dimension, types of energy, cells structures, evolution). Malevich used the principles of energy and maximum economy in suprematism's theory. Scientific influence is traced in different trends of avant-garde: study of relations between art and nature, art and mind, art and construction contributed to development of art theory and visualized facets of the scientific worldview.

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1. Introduction

Artistic culture of the late XIX – early XX century was strongly influenced by various philosophical trends and scientific ideas and leaders of avant-garde in poetry, painting, music even tried to find their own place in the scientific process. Modernism in art put forward new tasks for the artists creative work, first of all, concerning the language or the means of artistic expression. Creation was linked with the utmost substantial understanding of things and being, which demanded qualities of researcher, investigator or experimentalist. Articles and manifestos that proclaimed appearance of new trends in art took shape of political booklets or scientific research work.

Stressing this historical and cultural parallelism of scientific discoveries and new artistic trends Roman Jacobson (1989) wrote, that the most striking feeling of the coincidence of the scientific and artistic break-through in understanding time and space could happen only within those ten years between 1906 and 1916, with the special relativity theory and Cezanne's retrospective happened to take place at the same time, as well as the general relativity theory came together with Kokto's "Parade" and art of Picasso (p. 12).

Great interest in philosophical and scientific problems of creativity, heuristics, human-natural relations, study of space and its perception reminds the age of Renaissance. New language of artistic expression drifted from the concrete visible forms of reality to abstraction. Streaming to grasp something essential that has not yet come into being art often dealt with concepts and projects related to the future.

2. Problem Statement

Period of great scientific discoveries coincided with modernistic experiments in visual arts. Both scientific and artistic ideas seemed to follow the same direction in their aspiration to the future. Though their professional goals differed, artists often used the same rhetoric and terminology. New artistic trends were presented as "theories" with their own methods of creative and pedagogical activities. Results varied from mere illustrating to visual philosophy and deep penetration in process of cognition. Ideas of relativity, evolution, energy penetrated artistic theories of suprematism, organic culture, analytic art.

3. Research Questions

Scientific thought as inspiration and example for the avan-garde artists. Ideas of new science permeate artistic culture.

Artistic pursuit to render new model of universe and transition to abstract art.

Ideas of philosophical monism and their contribution for art theory. Leaders of pre-revolutionary art (K. Malevich, P. Filonov, M. Matushin) and their systems and methods

4. Purpose of the Study

The study is aimed to define the most influential philosophical concepts of scientific development and the major discoveries of the 1900-1910s which interacted with fine arts creativity and to reveal

mechanism of this interaction. It is also important to trace chronology of the process and pay attention to changes that scientific enthusiasm underwent in the first post-revolutionary years.

5. Research Methods

The articles, essays, manifestos and theoretical notes by the artists of the Russian avant-garde art are used as the material for the study. In most of these writings we are not able to find the direct references or citations from philosopher's works, but it is possible to reconstruct the circle of sources of information, knowledge and inspiration for the artists. Study of the texts written by artists and critics and philosophical and popular science authors written and published within a period of ten years make it possible to find parallel or similar ideas and trace philosophical and natural sciences reflection in the origin of the artistic systems and trends.

6. Findings

There were plenty of books dedicated to the recent scientific investigations and discoveries printed in Russia in 1900-1910s, as well as books on philosophy of science. Topicality and high level of scientific popularization work in early XXth century Russia gave even greater opportunities for acquaintance with modern science than in Europe or USA (Henderson, 2013, p. 243). Lectures and articles by M. Planck, H. Poincaré, popular physics by O. Khvolson and N. Umov were published in 1908-1912. Jacobson (1989) in his essay on the origins of futurism in art referred to the book on relativity principle by Khvolson and to Umov's characteristics of the development of natural sciences (p. 416). Works by Russian natural philosopher Nicholas Umov contained optimistic and forward-looking vision on the possibilities of the natural science and its human potential and inspiring call for scientific work as an integral part of ethic ideal and belief that love to humanity has to be navigated by science.

The "Space and Time" report by G. Minkowski read in 1908 and published in Russia in 1910 (in the Journal of Physics and Mathematics in Kazan University, translated by A. Vasiliev) presented a model of the four dimensional pseudo Euclidian space where space and time were described as interrelated characteristics of the spacetime continuum. Artists had been captured by idea of visualization of many dimensional space even before the Einstein's publication of the special relativity theory became widely known.

One of the first Russian artists to get interested in the problem of the fourth dimension was M. Matushin, it was in 1911 that he wrote the first article on this problem. In 1913 he published translation of the French book by Glez and Metsenje "About the Cubism" commenting it with the help of the fragments of a book by Peter Uspenski "Tertium Organum" (this well-known book was rather typical example of combination of science, theosophy and occultism). According to Uspenski (1992) human abilities in perception of space and time are improving so it is possible in the nearest future to have a new generation of man with a higher level of cognitive and perception skills. Moreover it is the art that can be a mighty method of cognition and the artistic language will be the first to appropriate elements of the language of the future. People may approach the mysterious world of the fourth dimension with the help of art (Uspenski, 1992, p. 58). Applying Uspenski's ideas Matushin wrote about the cubists as about the

adherents of future mystical transformation of consciousness (Henderson 2013, p. 218). Theoretical conclusions of cubism were also known to the artists who studied in Paris (L.Popova and N.Udaltsova studied at the Metsenje atelier). It seemed exciting to witness how painting of several spatial positions of the object reveal temporal feature of its changing. The fourth dimension (and even multi-dimensional structures) became a very popular idea amongst the artists and poets. V.Khlebnikov, the former student of the Kazan university, mentioned “the Lobachevsky space” which in his poetry appeared as a metaphor of the highest possible state of freedom reached by overcoming of the absolutism of traditional concept of space.(One of his university teachers was an outstanding mathematician A.Vasiliev, who first translated Minkovsky report set a series of publications “New Ideas in Mathematics” in 1913).

The members of futuristic group “The Union of Youth” (D.Burliuk, O.Rozanova, N.Altman, P.Filonov, N.Udaltsova and others) were strongly influenced by artistic and theoretical activities of Nicholai Kulbin (Doctor of Medicine, army doctor and researcher, joined the avant-garde artistic society in 1908 and soon became its leader). His lecturing on the modern art theory and problems of philosophy and science reflected the most palpating interest of the public. In beginning of 1914 he was lecturing in the concert hall of Tenishev's school in Saint-Petersburg on the new outlook covering the wide range of the subjects including changes in physics and other natural sciences, relativity of time and space, the fourth dimension. The new outlook that he shared was monism, enabling to put in one line the laws of nature, of creativity and harmony. Monism as a philosophic orientation was widely spread at that time in the connection with difficulties that scientific vision faced in connection with “disappearance of substance”. Monism seemed to be a kind of intellectual fashion (Bobrinskaya, 2016) Members of artistic community had a chance to learn it from the publications by E. Mach, W. Ostwald and A. Bogdanov. Ostwald (1913), outstanding chemist and science philosopher, wrote both in Russian and in German, Khlebnikov mentioned in one of his letters, that it is natural to think about Ostwald as Russian. Collapse of the mechanical physics' world view was regarded as a dramatic sentence for scientific materialism. Ostwald (1912) suggested to avoid juxtaposition of matter and spirit by subordinating both of them to energy which he understood as natural, social and intellectual. In his system of sciences life should be studied by physiology, psychology and culturology (p.204). Douglas (2002) who investigated influence of philosophical ideas on K. Malevich art, wrote that energitism played a leading role in formation of suprematism theory, in prerevolutionary years. (p. 7).

One of the early prosaic fragments by Khlebnikov “Let them read on the tombstone..” written as an epitaph for some fictional scholar, to whom poet entrusted the most famous scientific ideas and innovation of the time. Ostwald's ideas are hidden in the lines: “...he found true classification of science” and “...he did not discern the human species and animals species” (as cited in Schetnikov, 2003, p. 285).

Origin of abstraction as a scientific method to ground an artistic system is possible to trace in the suprematism of K. Malevich for which Ostwald theory was one of the philosophical sources (Douglas 2002; Smolyanskaya, 2009). Kazimir Malevich not only created suprematic avant-garde trend but also described it as a philosophy, as a theory of cognition/ Suprematism was invented in 1913-1915 and promoted an idea of pure elements, self-sufficient pictorial forms not burdened neither by habitual logic and notional connections nor by certain spatial and temporal features. “The Black Square” was first exhibited in 1915 at the “0,10 exhibition”, which united ten artists who crossed the border of the “zero”

of forms. One of the explaining ideas of the black square, put forward by the artist describes it as an energy stream taken in its most “economic” state. Further development of suprematism lead to simulation of a new universe, built in a harmonized balanced rest, and this new Universe has got deliberately spiritual symbolic meaning. His own artistic theory is full of reflections of numerous scientific, philosophical, psychological and economical theories of the time, “as if absorbed from the atmosphere of the beginning of the century” (Shatskih, 2000, p. 8).

Malevich (1992) uses scientific terminology to describe principles of creation of abstract subjectless painting, for instance, principle of maximum economy, which he also called th fifth measure or the fifth dimension of art. “Each new form is a result of energetic movement...towards economy...the shortest possible way” (Malevich, 1992, p. 295). During the last years there were published many works on the theory of Proletcult connected with philosophy of Alexander Bogdanov and also of their influence on visual art (Chehonadskih, 2018). However, acquaintance with his ideas took place before the revolution, when the major works had been published. Giving examples for his organization theory, Bogdanov noted that «...artistic creativity, combined and often alloyed with cognition...organizes understanding, feelings and emotions by its own methods. In art the organization of ideas and the organization of things are inseparable” (Bogdanov 1980, p. 70). In Bogdanov's (1980) description of one of the analytic methods of “tektology”- the method of abstraction – we found parallels to artistic abstraction (process of removal of external complicated features and search for the pure shapes, unchanged tendencies, hidden under the visible complexity.

Refusal from rendering of concrete forms of life and from the imitative essence of art in favor of revealing basic elements of reality was needed for creating totally new, what had never been seen. This was reflected in a well known definition by Olga Rozanova: “The art of painting is the decomposition of nature's ready-made images into the distinctive properties of the common material found within them and the creation of different images by means of the interrelation of these properties; this interrelation is established by the Creator's individual attitude” (as cited in Gurianova, 2000, p. 187). She also describes the stages of creative process from an intuitive principle (that helps to penetrate into the natural world), through individual transformation to the abstract principle (Gurianova, 2000, p.191). Significance of the compositional principle led to constructivism thought to be the most efficient “economic” cand purposeful organization of elements. In the course of social revolution constructivism acquired the meaning of the major new trend in art and moreover an artistically expressed philosophy of life building. It also became a leading pedagogical principle in the new educational institutions in early Soviet period.

On the other hand the interest in natural sciences lead to evolving of the “organic development” concept, in accordance with it the world was seen as harmonious unity of interrelated systems and as evolutionary growing organism. Scientific research in biology, chemistry, physics impressed the artists and inspired them to depict the inner structures and energies of the substance. Development of biology as independent science with its own philosophy and methodology influenced artistic vision by ideas of holistic outlook, vitality and reductionism (Wunsche, 2011, p. 133) Consistent patterns of nature and their visualization was regarded to be artistic implementation of harmony. Organic concepts in Russian avant-garde also tried to avoid direct imitation of nature, they introduced artistic creation as a process of growth, similar to objective natural law, revealed and understood in human creativity. Michail Matushin and

artists of his circle (P. Mansurov, B. Ender, P. Miturich) are considered to represent organic trend in Russian avant-garde art.

They were united by perception of the world as great organic unity, with belief that the natural laws of its deep inner structures could be revealed with the help of artistic creativity and will be available to a new type of human in future. They do not share an idea of human intrusion, even with the purpose of analysis, but they believed in long meditative viewing and thorough observations of the world in state of rest and harmony (Tilberg, 2008, p. 218). In the post-revolutionary years Matushin's idea of perceptive abilities development in the need of new humanity got more formalized qualities as he started to work for the first research and educational institutions like a workshop of "Spatial realism" in the Academy of Science and the department of Organic Culture in GINHUK (State Institute of the Artistic Culture). Matushin and his colleagues and students started to study the problems of vision using the modern scientific research data. They experimented with influence of different environmental features like space, light, airy conditions on the quality and effects of vision. They also investigated the system of colors, their combinations and energy, their relationship with shape and even with sound. It was psychological and physiological study, also connected with optics and chemistry. Matushin studied the effects of peripheral vision and enlarging of the sight angle. It is known that I. Pavlov and V. Behterev interested in his results. Matushin system of visual perception was not limited by psycho-physiological aspects, it included large scale of empirical methods, upon which he built his practical system of teaching "Zorved" (from two words – to see and to realize). His holistic philosophical system of human-natural relationship was based on the principal idea of perfection of physical, intellectual and spiritual abilities of men.

In the post-revolutionary years leaders of the avant-garde movement got a chance to use their methods in pedagogical work. Museum of Artistic Culture, INHUK originated as institutions for teaching on the basis of the new principles of art (they were included in the system of Proletcult, planned by A. Bogdanov). Structures and programs of these institutions were very close to those of scientific research institutes, which Malevich and Matushin considered to be the only proper way for the avant-garde art.

Artistic theory of Pavel Filonov also presupposed search for the initial forms in painting and special talent of penetration into the evolution processes of nature and being with the help of "knowing eye" of the artist. Analytical method of Filonov represent an idea of equal role of rational cognition and intuition for getting an image of phenomenon in its wholeness, innumerable connections and evolution. Artist's eye he compared to that of scientist-researcher or inventor – their vision is much deeper as they see with a help of mind and analysis (Ershov, 2017). An important notion of his system is "formula" – an analytic conclusion, an integral idea based on investigation of elements in their interrelation. Understanding of art as active force and energy was echoing the ideas of overcoming of entropy in the human world. Filonov highly praised cognitive resources of art and called his system a cognitive theory and science. He was fascinated by idea of the universal evolution in life and inanimate nature.

7. Conclusion

Formally working out of the artistic systems of Russian avant-garde strongly reminded a process of the scientific research with putting forward some hypothesis and its empirical proof. Objectivity of the

scientific methods was an ideal which they strive to reach within their artistic creative work. Mightiness of science and its leading role in culture was a source of inspiration for them.

Artists and critics thought about the common grounds for the scientific and artistic creation. They formulated principles of creation as theories with system of artistic methods ready to use in their pedagogical activities. In proclaiming their ideas they often relied upon authority of scientific thought and used terminology related to its most topical spheres. However emotionally accepted breaks-through in science were not only reason for widening of the vocabulary but also stimulated elaboration of modern philosophy of art and to some extent lead to rationalization of one branch and spiritualization of another. Attempts of visual interpretations of the scientific ideas and notions (the fourth dimension, types of energy, cells structures, etc.) might also produce different artistic results. From the science to technology and utilitarian tasks (constructivism) or to mistification of scientific knowledge in romantic way leading backwards to mythology. Most of the ideas were taken from the writings of philosophers, especially representatives of monistic line, like W. Ostwald and A. Bogdanov. The peak of this interaction takes the decade before revolution 1917. Coming over to a real experiment in the building of new life and formation of new man dissociated avan-garde activists. Constructivism was considered to be the main theory and practice of the new world, but it was a short way out from art to engineering and design. Organic trend seemed to be deeply rooted in the Russian philosophical tradition, still both of these major trends underwent influence of philosophical monism. The role and meaning of artistic experiments and theories are seen in their examination of the interference of art and science, in testing the borders within the world picture.

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