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# Radiant Painting, Radiant Matter and Radiant Energy: Science and Parascience

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**Ключевые слова:** Михаил Ларионов, лучизм, лучистая материя,  
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**Abstract.** The article examines Mikhail Larionov's Rayonism in the context of a wide range of scientific and pseudoscientific ideas about radiant matter, radiation and invisible fluids. Rayonism is one of the first pictorial movements within the framework of which the task was set to visualize scientific knowledge about the invisible: radiation, X-rays, radioactive, ultraviolet, and infrared rays, and the rays of thought. Numerous interactions or direct intersections of Larionov's texts with the ideas of radiant matter that were widespread in the culture of his time give reason to consider the invention of Rayonism not as an extravagant gesture provoking and shocking the public but as a conscious attempt to synthesize ideas scattered in the atmosphere of those years, as an attempt to clothe the current problems of his time in a new 'stylistic' unity. At the beginning of the 20<sup>th</sup> century, the spread of scientific, occult, theosophical, and simply fantastic ideas related to invisible radiation, radiant matter and the rays of thought was indeed so widespread that it could lead to thoughts about the creation of a 'ray style', about the emergence of a new formative 'artistic will'.

**Аннотация.** В статье рассматривается лучизм Михаила Ларионова в контексте широкого круга научных и околонучных представлений о лучистой материи, излучениях и невидимых флюидах. Лучизм — одно из первых живописных течений, в рамках которого была поставлена задача визуализировать научное знание о невидимом: об излучениях, рентгеновских лучах, лучах радиоактивных, ультрафиолетовых, инфракрасных, а также о лучах мысли. Многочисленные взаимодействия или прямые пересечения текстов Ларионова с распространенными в культуре его времени представлениями о лучистой материи дают основание рассматривать изобретение лучизма не как экстравагантный жест, провоцирующий и эпатазирующий публику, но как сознательную попытку синтеза рассеянных в атмосфере тех лет идей, как попытку облечь в новое «стилевое» единство актуальную проблематику своего времени. В начале XX века распространение научных, оккультных, теософских и просто фантастических представлений, связанных с невидимыми излучениями, лучистой материей и лучами мысли, действительно, было столь повсеместным, что могло наводить на размышления о создании «стиля лучей», о появлении новой формообразующей «художественной воли».

## Introduction

In his article *The Eye Is a Part of the Mind* (1952) Leo Steinberg, reflecting on abstract art, posed the following question: “Whence come the plastic symbols of the artist’s unconditioned subjectivity?”. Stressing the impossibility of giving an absolute answer, he nevertheless suggested paying attention to the “testimony of those artists and critics who have pointed to the impact of science on contemporary art. The impact operates on several levels and takes various forms. There is, first, the original stream of suggestion issuing from the laboratories. *Wittingly, or through unconscious exposure, the non-objective artist may draw permissions for his imagery from the visual data of the scientist* [emphasis added henceforward. — E.B.] — from magnifications of infinitesimal textures, from telescopic vistas, submarine scenery, X-ray photography. Not that he renders a particular bacterial culture or cloud chamber event. The shapes of his choice are recruited in good faith *for their suggestiveness as shapes, and for their obscure correspondence to his inner state*” [Steinberg, 2018, p. 446].

For an art historian it is critical to understand what kind of suggestiveness attracts the artist’s attention in various types of scientific iconography and what ‘visual data of science’ he selects suggestive forms from. What appeared to be close to the ‘inner state’ of Mikhail Larionov (1881–1964) was the suggestion of radiation, rays or radiant matter. It should be immediately noted that at the beginning of the 20<sup>th</sup> century, that was the field of the most urgent and radical scientific theories and advanced knowledge at the intersection of different cultural and intellectual frameworks. Radiant matter attracted physicists and spiritualists<sup>(1)</sup>, chemists and theosophists, biologists and occultists. Moreover, various types of radiation and rays became a much-debated topic and a popular subject in mass culture at the beginning of the century. It was in that borderline area that Larionov sought ‘*correspondence to his internal state*’.

(1) In using the terms ‘spiritism’ and ‘spiritualism’, we rely on the study of the history of Russian spiritualism by V. Razdyakonov, who emphasizes their interchangeability in the cultural practice of the early 20th century: “Despite attempts to distinguish between ‘spiritualism’ and ‘spiritism’, these terms were used in Russian spiritualist periodicals as synonyms” [Razdyakonov, 2022, p. 42].

The revolution in thinking and perception of the world associated with scientific discoveries was much written about by numerous artists at the beginning of the 20<sup>th</sup> century. Among them was W. Kandinsky, whose statements on this topic are well-known, for example, the following one: “One of the key obstacles on my way was removed itself thanks to a purely scientific event. It was nuclear fission. It echoed in me like the sudden destruction of the entire world. Suddenly, thick vaults collapsed. Everything became uncertain, wobbly and soft” [Kandinsky, 2001, p. 274]. Art historians treat this statement with due respect and attention, rightfully referring to it in studies on the genesis of non-objectivity in the artist’s work. Larionov, however, was unlucky in this regard. In his texts on Rayonism, even more straightforwardly than Kandinsky, he emphasized the relevance of the latest scientific discoveries for his concept: “Officially, Rayonism stems from the following provisions: Radiation due to reflected light (in the inter-object space this forms a kind of coloured dust). The doctrine of radiation. Radioactive rays. Ultraviolet rays. Reflectivity” [Larionov, 1913, p. 17]. Larionov also referred to specific scientific ‘optics’ — the knowledge-visibility capable of convincing us of the existence of the invisible: “If we know about some things that they must be such because science reveals it, despite the fact that this cannot be directly perceived with our senses, we still remain certain that this is so and not otherwise” [Larionov, 1913, p. 17]. However, devoid of the literary effect of Kandinsky’s text, Larionov’s references to scientific discoveries, lapidary and direct, either caused irony<sup>(2)</sup> or were ignored in studies about the artist. From our perspective, underestimation of scientific or, more precisely, pseudoscientific contexts in the study of Larionov’s work considerably impoverishes the understanding of pictorial Rayonism and, in broader terms, the genesis of abstract painting in Russian art.

“By the beginning of the 20<sup>th</sup> century, many scientific research had expanded beyond laboratories and publications in domain specific journals. Non only did the mass media and the genre of public lectures, which captivated the audience at the beginning of the last century, contribute to

(2) For instance, J. Tugenhold: “The broad nature of M. Larionov is obsessed with some deeply Russian trait — going to extremes in everything. When it comes to folk — it is painting on walls; if it is science — it is the fourth dimension, ultraviolet rays and communication with Mars at the very least” [Tugenhold, 1913, p. 58].

the dissemination of scientific knowledge, but they also created a special environment and forms of its existence. Catchy newspaper and magazine headlines and fascinating retellings for a wide audience (which at times turned into science fiction novels) simplified and often radicalized scientific ideas, transforming assumptions into established facts, and cautious hypotheses — into absolute truths. Such was the territory where artists and writers most often came into contact with advanced scientific research” [Bobrinskaya, 2022, pp. 13–14]. Therefore, it is not that important whether or not Larionov studied scientific or parascientific theories of radiation with academic focus, read theosophical works or took part in séances (like many of his contemporary artists and poets did); what is important is that it all formed the cultural background, influenced the intellectual atmosphere of the time, was in the focus of his colleagues’ attention, was discussed in the press (not only in scientific but also in the mass media), and ultimately, was the topic of conversation and debate in artistic circles and salons. The mentioned layers of mass consciousness and the information industry, which at times notably transformed scientific ideas, should be taken into account when studying the origins of numerous artistic concepts of the early 20<sup>th</sup> century.

“Numerous interactions or direct intersections of Larionov’s texts with the ideas of radiant matter that were widespread in the culture of his time give grounds for considering the invention of Rayonism not as an extravagant gesture provoking and shocking the audience, but as a conscious attempt to synthesize ideas scattered in the atmosphere of those years, as an attempt to clothe the current problems of his time in a new ‘stylistic’ unity” [Bobrinskaya, 2022, p. 31]. In one of his later texts, Larionov suggested considering line-rays, as a style-forming element. He proposed a special ‘style of rays’ in which a ray would determine the image of an integral culture: “using rays in much the same way as, for example, the Gothic style applies the elongated upgrowing forms, or Rococo employs the winding forms of shells and plants” [The History of the Russian Ballet, 2009, p. 122]. “At the beginning of the 20<sup>th</sup> century, the spread of scientific, occult, theosophical and simply fantastic ideas related to invisible radiation, radiant matter, and rays of thought was indeed so widespread that it could lead to thoughts about the creation of a ‘ray style’, about the emergence of a new formative ‘artistic will’” [Bobrinskaya, 2022, p. 31].

“A ray is conventionally depicted in the plane as a coloured line” [Larionov, 1913, p. 19], wrote Larionov. On the one hand, a straight line is the simplest and most trivial way of depicting a ray of light. This is how, for instance, light and sun rays are depicted in children’s drawings. On the other hand, a ray-line is a peculiar archetype with a centuries-old history and truly inexhaustible iconography: rays-strokes in gold hatching on icons, rays in sacred images of different time and different peoples, in illustrations to esoteric and natural science works, as well as in popular science or occult visual products of the early 20<sup>th</sup> century. In terms of iconography, Rayonism *invented* by Larionov is connected to a multitude of semantic contexts and pictorial traditions. The archaic and mythologized form of a ray of light could exist in different cultural and historical perspectives. An elementary sign possessing the immediacy of the primitive and a complex system of metaphysical constructions appeared to be equally connected with a straight line — a ray of light. A ray-line could express both scientific and metaphysical reality: it could represent the divine light, be part of scientific schemes, show rays coming from the hands of a hypnotist in a picture from a popular magazine, and express a ‘ray of contemplation’ connecting man and God in the reflections of Christian mystics<sup>(3)</sup>.

The avant-garde language of Rayonism with all its radicalism and innovation appears to be inscribed in a steady and widespread pictorial tradition. Rayonism seems to be suspended between the poles of the archaic, traditional, and popular on the one hand, and the relevant, modern and scientific on the other. This property of Rayonism, despite remaining background and unformulated into a coherent theory, is fundamentally important for Larionov’s version of non-objectivity. The ‘suspendedness’ of Rayonism — between scientific knowledge and speculation at the frontier of the scientific, between radical innovation and traditional visual signs — is not an accidental effect but a key property of Larionov’s invention. Such a dual nature of Rayonism, from our perspective, was predetermined by the entire atmosphere of culture at the beginning of the 20<sup>th</sup> century rather than it emerged in the theoretical constructs of the artist himself.

(3) On the expression ‘ray of contemplation’ see: [Hugh of Saint Victor, 2008, p. 345].

## Radiant Matter: Science and Parascience

“The turn of the 20<sup>th</sup> century in European and Russian culture was marked by groundbreaking discoveries that changed the usual optical modes and allowed entering the invisible and reconsidering many of the established notions. Roentgen’s X-rays, radioactivity, wireless telegraphy, chronophotography and microphotography blurred the boundaries between the internal and the external, the visible and the invisible, and created new communication models. It should be acknowledged that the boundaries between science and various forms of occult and parascientific knowledge at the turn of the century were less strict and persistent than they are today” [Bobrinskaya, 2018, p. 281]. Scientific methods and laboratory experiments actively interfered in the ‘dark’ areas of metaphysics, religion and, to put it more broadly, everything inexplicable and paradoxical. Scientific knowledge itself often appeared to be in the same ‘suspended’ state as Mikhail Larionov’s pictorial Rayonism. What formed the territory of such ‘suspended’ knowledge at the beginning of the century was a wide range of theories and experimental studies carried out in scientific laboratories and spiritualistic or theosophical circles<sup>(4)</sup>.

At the beginning of the 20<sup>th</sup> century, many authors reflected on the new, borderline status of natural sciences. It would not be an exaggeration to say that it was one of the most acute and debated issue. The famous English scientist William Crookes wrote about the new state of reality that was discovered in radiant matter, “We have actually touched here the borderland where Matter and Force seem to merge into one another, the shadowy realm between Known and Unknown” [Crookes, 1889, p. 25]. Similar opinions were expressed by theosophists and spiritualists: “Our usual ideas about matter, about energy and its indestructibility are beginning to waver <...> we have approached the boundary of the ponderability of matter and in the new doctrine of electrons we find different bewilderment: matter escapes from our observation and strangely transforms into a flow of moving energy. <...> we find ourselves on the threshold of a completely new understanding of the nature around us; we have begun to regard all phenomena of the

material world as a ghostly diversity of manifestations of immaterial forces” [Chistyakov, 1906, p. 3]. This feature of the scientific context of the early 20<sup>th</sup> century found expression in Larionov’s version of non-objective art. It is no coincidence that Ilya Zdanevich, Larionov’s associate, emphasized the dual, borderline nature of his (Larionov’s) invention: “Rayonism is further enriched by the fact that it takes into account not only external radiance but also internal spirituality” [Zdanevich, 2014, p. 115].

By the beginning of the 20<sup>th</sup> century, there had developed a certain mythology of radiations observed both in scientific laboratories and during séances. Undoubtedly, the ideas about radiations and invisible rays had existed long before the major discoveries of the turn of the century, which left a certain mark on the perception of scientific facts. A distinct or obscure trail of the mysterious, mystical, and sublime accompanied scientific research into radiation and light. In the 1840s, the German naturalist Carl Reichenbach was engaged in research into radiations perceptible to particularly sensitive people — sensitives. Reichenbach associated those radiations with a specific force, close to F. Mesmer’s ‘animal magnetism’, which he (Reichenbach) called ‘the odic force’. Another area where the interest in radiations preceded the discovery of X-rays and radioactivity was practical and theoretical research into hypnosis. The phenomenon of hypnosis attracted scientists and medical professionals. It was a subject of discussion both in academic circles and in the mass media, sometimes featuring in the advanced scientific discoveries section, and sometimes — in the crime news. The influence of a hypnotist on a subject by means of rays coming from the hands or eyes became a recurrent topic not only in the theory of hypnosis but also in its iconography — in illustrations for scientific, medical works and in popular visual products of the 19<sup>th</sup> — early 20<sup>th</sup> centuries. A popular explanation for the phenomenon of hypnosis was through a special ‘radiant force’ emanating from the hypnotist. In 1885 in St. Petersburg, Doctor of Medicine, professor of the Kharkov University Alexander Shiltov delivered a report *On the Radiant Force of Man*, in which he mentioned the ability of the ‘radiant force’ to influence thoughts and behaviour: “The radiant force of one person affects the nerve centres of another one in such a way that it makes the subject under test move against their will, feel certain desires of the experimenter, write the required numbers or letters, and say certain words” [The Speech of Doctor of Medicine, 1885, p. 32].

(4) The interaction with this ‘territory’ in Larionov’s work was sometimes direct and immediate, and sometimes just implied typological parallels and art history metaphors that allowed understanding the nature of the artist’s pictorial experiments more clearly.

The penetration of the occult into science at the beginning of the 20<sup>th</sup> century had its own peculiarities. “It was perceived not as a retreat of the rational before the irrational but as the ultimate triumph of positivist science which had finally reached the grounds of the most mysterious spheres of matter, thought and the human psyche. Occultists and spiritualists, in their turn, sought to apply scientific discoveries in order to rationalize their explanations of mysterious phenomena<sup>(5)</sup>.”

At the turn of the century, the fascination with scientific, positivist methods in studying ‘materialization of spirit’ at séances was remarkably wide. The venues where séances took place often resembled scientific laboratories equipped with radiometers, electroscopes, dynamometers, etc., as well as with photographic equipment used to capture the processes of radiation and materialization during séances” [Bobrinskaya, 2018, p. 281]. General availability of scientific and occult experiments was also facilitated by mass advertising in publications on theosophy and spiritualism. The pages of the popular magazine *The Spiritualist* advertised various devices for conducting experimental research on mediums and organizing séances.

Prominent scientists of various fields (e.g. physicists, chemists, doctors, biologists, and psychologists) were involved in the study of radiation and radiant matter. They often delved deeply into studies on mediumship and spiritualism. William Crookes, one of the first researchers of radiant matter<sup>(6)</sup> and a convinced follower of spiritualism, described the gradual decrease of material properties in the transition from solid to liquid, gaseous and, finally, to the radiant state of matter. Cathode rays discovered by Crookes often became an argument not only in scientific evidence, but also in numerous studies of mysterious radiations during séances. As one of the articles in *The Rebus* magazine stated, “mediumistic radiations are

essentially homogeneous with the radiations of radium and the cathode rays of the Crookes tube” [The Nature of Radiations, 1908, p. 5]<sup>(7)</sup>.

After the discoveries of the late 19<sup>th</sup> century — X-rays by W. Roentgen, the phenomenon of radioactivity by H. Becquerel, the radiation of radium and polonium by Marie and Pierre Curie — there appeared many concepts related to the radiation of the human body and various objects. The famous sociologist Gustave Le Bon claimed, “Any body is a constant source of radiation, visible or invisible, but always luminous radiation” [Le Bon, 1909, p. 15]. “Some of the theories popular in those years simply updated the old concepts of F. Mesmer’s universal fluid or Reichenbach’s odic force. At the same time, many versions emerged based on positivist scientific principles and new technologies. There existed various hypotheses and mythologies associated with the phenomenon of radiation and radiant matter: Prosper-René Blondlot’s N-rays and Louis Darget’s V-rays, Gustave Le Bon’s ‘dark light’ or ‘dark rays’, Sergei Yuryevich’s Y-rays emitted by the human body, Naum Kotik’s ‘brain rays’ associated with the thinking process, Julian Ochorowicz’s ‘rigid rays’ which he interpreted as a magnetic field generated by living organisms, or Messola Pogorelsky’s ‘physiological polar energy’, just to mention a few, — hypotheses crossing the borderline between scientific and parascientific knowledge” [Bobrinskaya, 2018, pp. 281–282].

At the beginning of the 20<sup>th</sup> century, a mass mythology about rays and radiant matter was formed, which possessed characteristics of both scientific knowledge and ‘secret sciences’. According to many authors, radiant matter, invisible to the human eye but recordable by equipment, envelops all organisms and all objects. The famous Moscow spiritualist Pavel Chistyakov stated that “invisible rays are found anywhere. They always surround us and are a constant element of all visible rays of light” [Chistyakov, 1907, p. 169]. ‘Radiant matter’ and ‘radiant energy’ became popular concepts and were used to interpret many phenomena that defied conventional rational explanation.

(5) “Speaking of the ‘scientific nature’ of their judgments, spiritualists usually meant the empirical origins of the knowledge they acquired. Many turned to spiritualism through ‘experimenting’ with various practices, such as table-turning, fortune-telling on a saucer, the use of automatic writing, and hypnosis. The practice itself was often defined in everyday conversations through discourse, for example, ‘engagement in spiritualism’ meant ‘engagement in experiments’. In the ‘age of science’, such an appeal to the researcher’s personal experience and scientific practice created a scientific aura around spiritualism, which could be exploited by the members of the movement” [Razdyakonov, 2022, pp. 51–52].

(6) It is believed that back in 1816, Faraday for the first time described the fourth state of matter — the radiant one.

(7) The article described the experiments with Dr. Imoda’s electroscope conducted by C. Lombroso with the medium Eusapia Palladino: “During a mediumistic séance with Palladino on the evening of April 10, 1908 in the apartment of engineer F. (Turin), I managed to obtain experimental proof that the medium generates radiation similar to radium and cathodic radiation. The argument consisted in a rapid discharge of the electroscope without any contact” [The Nature of Radiation, 1908, p. 4].

The blurred boundaries between academic science and experimental research of spiritualists, theosophists, and occultists were a characteristic feature of the intellectual atmosphere at the turn of the century and in the 1910s. Thus, in the program of the First All-Russian Congress of Spiritualists held in Moscow in 1906 there was a separate thematic unit “The radiant energy of the human organism — its out-of-body detection and action at a distance”, clearly oriented towards the application of the scientific approach. A number of issues related to the experimental study of radiation were proposed for discussion at the congress, including “the photography of thought, photography of the invisible radiation of the human body and various methods and techniques for its generation; various devices for demonstrating and detecting invisible radiation; the latest experiments and scientific theories on the radioactivity of the human body” [The First Congress, 1906, p. 6]. The visual environment at the beginning of the 20<sup>th</sup> century appeared to be full of life invisible to the eye — the movement or vibrations of radiant matter and currents of radiant energy: “All living things, everything that exists appears to be immersed in a sea of radiant energy” [Pavlov, 1910, p. 19]; “All bodies generate rays, and therefore, the entire Universe is pierced by waves of rays” [A New Form, 1907, p. 12].

In the context of such views, Larionov’s pictorial Rayonism is no longer perceived as an accidental whim of the artist. In his invention of Rayonist painting, he relied on the numerous and diverse theories of radiant matter, well-known in those years, as well as on practical experiments in the visualization of invisible radiation. Scientists studying the invisible (from atoms to various rays) both in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries had to use not only rational constructs, not only experimental data obvious to the eye, but also imagination and the experience of visualization (contemplative or by technical means). J. Tyndall, who wrote much about “the role of imagination in resolving the issues of natural science” [Tyndall, 1873, p. 9], was one of the first to point out the importance of visualization in scientific research, “the life of the experimental philosopher is twofold. He lives, in his vocation, a life of the senses, using his hands, eyes, and ears in his experiments: but such a question as that now before us carries him beyond the margin of the senses. He cannot consider, much less answer, the question, ‘What is light?’ without transporting himself to a world which underlies the sensible one, and out of which all optical phenomena spring. To realise this subsensible world the mind must possess a certain pictorial

power” [Tyndall]. The imagination or ‘pictorial power’, necessary in the new studies of the invisible to which scientists turned, predetermined the interaction of scientific and artistic imagination.

Larionov was one of the first in the Russian art of the early 20<sup>th</sup> century to demonstrate sensitivity to such overlaps of scientific and artistic imagination. It was the visualization of invisible radiation that he considered to be the main task of a Rayonist artists. In the autumn of 1912, in one of his earliest interviews on Rayonism, he said, “I am displaying the works painted in accordance with a new method. This will be ‘radiant’ painting. Here is what it is based on: we gain an impression of the external world through rays that come from each object to our eye. Everything we see gives off rays. And *it is these rays that will be depicted in my works*” [Mezzo, 1912, p. 3]. The idea of the surrounding space being filled with overlapping rays shaping new forms becomes a key point in the theory of Rayonism. “Considering the sums of rays coming from the objects rather than the objects themselves, we can construct a painting the following way: the sum of rays from object A is crossed by the sum of rays from object B, and between them there emerges a certain form driven by the artist’s will” [Larionov, 1913, p. 19].

Throughout his entire life, Larionov insisted on the scientific origins of Rayonism and its connection with various types of radiation. In a 1936 letter to Alfred H. Barr Jr, the director of the Museum of Modern Art in New York, Larionov highlighted the connection between Rayonism and different kinds of radiation. “Rayonism is not engaged with the issues of space or motion at all. It considers the Light and any rays, be it radio, infrared, ultraviolet, etc., as a physical element as such”. <...> “Rays of any kinds, including radioactivity and the radiation of human thought, are the subject of Rayonism” [Larionov, Rayonism, 2003, pp. 97–98].

Larionov was one of the first in the Russian art of the 1910s to establish a new creative method in the theory and painting practice based on the scientific (or rather pseudoscientific) knowledge of his time. It should be emphasized that in the artist’s theoretical speculations both scientism and spiritualism had a ‘blurred’, not fully articulated form. Nevertheless, scientific and parascientific discoveries and hypotheses allowed Larionov to come to a new understanding of painting and to lift off the objective world. The concepts of radiant matter, invisible rays, extreme zones of the light spectrum inaccessible to the human eye, radioactivity, and the material and ponderable nature of light became the pivot point for a new

painting concept, for the invention of non-objectivity. Having entered the subfield of scientific knowledge and linked art with a wide range of popular ideas of the time, Larionov anticipated the creative search and discoveries of many artists who would turn to those themes only in the late 1910s and 1920s.

### Iconography of Rays

By the beginning of the 20<sup>th</sup> century there had developed a new scientific and pseudoscientific iconography of light radiation from the human body and various objects. Its sources varied: popular magazines, illustrations in scientific literature, an extensive archive of photographs taken during séances, photographs of human radiation by Hippolyte Baraduc, Louis Darget, J. Narkevich-Iodko, and others. This layer of images had an important property: it was connected with scientific knowledge and therefore was perceived as documentary evidence of the invisible.

“Larionov’s early Rayonism often directly followed the widespread iconography of rays. Beams of light from a person’s eyes, nose, ears or mouth are a persistent motif in the illustrations that accompanied various studies” [Bobrinskaya, 2018, p. 285]. Such motifs are recurrent in ‘realistic Rayonism’, as Larionov himself called it: *The Head of a Bull* (1912, State Tretyakov Gallery, Moscow), *Male Portrait (Rayonist Construction)* in A. Kruchenykh’s book *The Lipstick* (1913), *Rayonist Portrait* in A. Kruchenykh’s book *Half-Dead* (1913), *Portrait of Goncharova* in the collection *Donkey’s Tail and Target* (1913). Rayonism created a new concept of the ‘extended’, permeable human body, and the Rayonist man in Larionov’s works reflects the shifts in positivist anthropology that were formed in scientific laboratories and at spiritualistic or hypnotic séances.

We should mention another motif of Larionov’s Rayonism that contains a reference to the popular iconography of rays. In the book *Luminous Radiations of Man and the Exteriorization of Sensitivity* Albert de Rochas based on the experiments of various researchers stated the following: “Different body parts have different colours... the right hand generates the bluish light, the left one — the dark red”; “the right side of the human body is generally blue in colour. The eyes, ears, nostrils, teeth emit rays of the same colour... The left side emits red rays through the sense organs” [de Rochas, 1915, pp. 4, 6–7]. Similar views were widespread in spiritualist

circles, and the references to the theories of red and blue rays are found in the works of many authors<sup>(8)</sup>. For instance, the author of the article *Human Radiations and Their Application in the Treatment of Diseases*, which was published in the Proceedings of the Congress of Spiritualists and discussed the creation of ‘fluidic photography’, claimed: “We should stress another detail that disappears in the prints: it has been found that the photographic negatives that were taken out by the right hand were coloured red, while those taken out by the left one had a blue shade. This appears to support to a certain degree Reichenbach’s theory of the polarity of the human body” [Kudryavtsev, 1907, p. 211].

The polar red and blue division of the pictorial space is seen in several Rayonist works by Larionov. The most illustrative example of such a polar colour scheme is *Rayonist Lines* (1912, M. Nesterov Bashkir State Art Museum, Ufa). The red and blue Rayonist painting possibly reminds of the extreme areas of the spectrum inaccessible to the human eye. In other words, it reflects the invisible reality of infrared and ultraviolet rays which Larionov referred to in his theories.

Let us point out another interpretation opportunity in connection with *Rayonist Lines*. Kandinsky repeatedly addressed the combination of red and blue in his texts, calling it a ‘spiritual accord’ that best suits modern times. In his treatise *On the Spiritual in Art* (undoubtedly familiar to Larionov), he discussed this combination of colours: “red and blue side by side, which as colours have no physical relationship, yet achieve the strongest effect through their great spiritual contrast, which is our day’s choice of harmony, relying on the principle of contrast, a most important principle in art at all time” [Kandinsky, 2019, p. 127]<sup>(9)</sup>.

(8) The position of blue and red may vary with different authors.

(9) The researcher of the artist’s work N. Podzemskaya writes in connection with this text: “Kandinsky’s interest in this combination of colours, which played an ever-increasing role in his painting in the years before the World War I, dates back to an earlier time. Cf. the commentary on the lost painting *The Heavenly and Earthly Sorrow* (abt. 1904) known only from the drawing for it: “<...> red and blue = earth and sky = heaviness and distance” [Kandinsky, 2019, p. 128]. In the text *On the Spiritual in Art*, Kandinsky also points out the significance of the comparison of these colours in primitive art: “the combination of red and blue, equally beloved by the primitives” [Kandinsky, 2019, p. 129]. In the book *Thought-forms*, A. Besant and C. Leadbeater offered their interpretation of the polar properties of red and blue: “Red, of all shades from lurid brick-red to brilliant scarlet, indicates anger <...> The different shades of blue all indicate religious feeling” [Besant, Leadbeater, Thought-forms].



In his red and blue Rayonism, Larionov seems to make an attempt to create a comprehensive structure based on different motifs — from the mythology of radiation (the red and blue polarity in the human body), from scientific theories of ultra-red and ultraviolet invisible light, and from traditional symbolism and its modern interpretations. *Rayonist Lines* is a project of a holistic, synthetic image, built on the ‘principle of contrast’ (poles of light rays invisible to the human eye, symbolic polarity of the heavenly and the earthly, the material and the spiritual). The artist combines these poles in one work in a dissonant ‘spiritual accord’.

“And finally, yet another aspect of the iconography of rays. At the beginning of the 20<sup>th</sup> century, electricity and radiant matter or radiant energy were often directly linked. A prominent researcher in this field in Russia was Iakov Narkevich-Iodko, who developed a ‘method of recording the energy emitted by a living object being exposed to the electric field’ and called it electrography.

The photographs by Nardkevich-Iodko were well known both in Russia and in Europe. They were often displayed at photo exhibitions, during his public talks, and were published in specialized journals as well as in popular magazines. The images of electrical discharges made without a camera were considered by Nardkevich-Iodko as ‘micrographic traces of electrical currents’ generated by the human body” [Bobrinskaya, 2018, pp. 287–288]. “What acts as an illustrator here is electricity itself which makes particles (or the smallest atoms of matter) spread in a certain order” [Kiselev, 2007, p. 303].

“In 1899, in his work *Electrophotosphenes and Energography* [Pogorelsky, 1899] St. Petersburg doctor Messola Pogorelsky developed a system of energograms for recording electric radiation of the human body and a special energographic alphabet based on his own images and photographs by Nardkevich-Iodko. Tree-like forms, ‘light clusters’, straight or zigzag rays create bizarre abstract forms and unique landscapes of the invisible in energograms” [Bobrinskaya, 2018, p. 288]. Some motifs and compositional principles of these images are comparable to the Rayonist landscapes by Larionov and Goncharova, in which light beams, or ‘light clusters’ and branching tree-like forms make a reference to the iconography of electric currents (N. Goncharova: *Electric Lamp*, 1913, State Tretyakov Gallery; *The Sea. Rayonist Composition*, 1912–1913, Stedelijk Museum, Amsterdam; M. Larionov: *Rayonist Landscape*, 1912–1913, State Russian

Museum, St. Petersburg; *The Sea. Rayonist Composition*, 1912–1913, private collection, Milan).

By the 1910s, the mythology of rays and radiation had become a remarkable element of popular culture, a trending topic addressed not only in scientific publications, but also in newspaper articles and popular magazines<sup>(10)</sup>. Many scientific discoveries related to radiation and radiant matter became part of popular culture and a kind of scientific attractions. For instance, Roentgen’s discovery of X-rays inspired fascination with ‘post-mortem’ photographs of the body — X-ray images that allowed getting a glimpse of the future and seeing one’s own skeleton. In April and May 1912, just a few months before the first mention of Rayonism, a large International Photo Exhibition was held in St. Petersburg, which featured the latest X-ray machine and a special attraction of X-raying anyone who wanted. Another popular issue was the discovery of radioactivity. Radiation in the fantasies of people of those years was part of life and was associated with everyday comfort and the coming medical marvels. Advertisements of various radioactive goods (from cosmetics and toothpaste to radioactive medicinal water and special devices for its home-based production) became an everyday reality.

In modernist painting of the 1910s, the iconography of the modern was often immediately linked to various types of rays and radiations. An illustrative example is the paintings of the Italian Futurists: *Modern Idol* (1911, Estorick Collection of Modern Italian Art, London) and *Laughter* (1911, Museum of Modern Art, New York) by U. Boccioni; *The Revolt* by L. Russolo (1911, Gemeentemuseum, The Hague) where light rays of different nature (electric or spiritual) appear as an important symbol of the new reality. Similar motifs can be found with Max Ernst (*Paris Street*, 1912, the collection of Brühl) or Sonia Delaunay (*Boulevard Saint-Michel*, 1913, private collection). Different types of radiation and light rays often were the motif employed in advertising, popular illustrations and photographs.

(10) See, for example, newspaper publications: Man as the source of N-rays // Petersburg Newspaper. 1911, No. 355, December 27, P. 3; Nemo. Man emits N-rays. // Early Morning. 1912, No. 4, January 5, p. 4. On L. Darget’s photography of thought: Gradenwitz A. Vital rays // Herald of Knowledge. 1910, Supplement to No. 5, p. 549–551. Article about H. Baraduc with photographs: Fluid Diseases and Their Treatment // Niva. 1908, No. 5, p. 89–91.

The early Rayonism, or ‘realistic Rayonism’, is indicative of Larionov’s appeal to the trending topic of radiation and of the connection between his artistic invention and the popular culture of his time. Playful, ironic, naive and straightforwardly illustrative, some of his works, of course, are devoid of the pathos of Italian artists. Such works as *Rayonist Sausage and Mackerel* (1912, Ludwig Museum, Cologne), *The Head of a Bull* (1912), *Rooster (Rayonist Sketch)* (1912, State Tretyakov Gallery, Moscow), and even *Rayonist Landscape* (1912, State Russian Museum, St. Petersburg), which is close to non-objectivity, somewhat follow the strategies of the primitivist period, even though they add the motifs coming from the scientific and pseudoscientific iconography of rays to the previous sources of inspiration (signboard and lubok).

Additionally, to promote the ‘ray style’, Larionov consciously made use of the strategies of popular culture of the time (more specifically, of advertising). In 1912 and especially in 1913, he gave numerous interviews in which he explained the principles of Rayonist painting and described the projects of Rayonist theatre, fashion, and even cuisine<sup>(11)</sup>. For example, speaking of theatrical costumes for the Rayonist theatre, Larionov referred to trending scientific topics (Roentgen’s X-rays) and new technologies of popular culture (cinema): “The costume will be transparent. The X-ray dresses that excited anger abroad pursue the idea of nudity and transparency, which is advanced by futurism. Our costumes will resemble these dresses. Lightning effects and cinematography will play a key role. Either a light source will be placed behind the transparent fabric, or a dress of light will be put on a naked figure by means of cinematography” [Futurists and the Upcoming Season, 1913, p. 5].

It is no doubt that Larionov’s Rayonism does not simply repeat various iconographic sources — it synthesizes and transforms them into a new artistic structure, where mythologies of rays, scientific and parascientific experiments are just a starting point. Rayonist painting bears traces of the popular iconography of rays but never follows any

(11) Larionov’s project of the Rayonist cuisine was significantly ahead of the Italian Manifesto of Futurist Cuisine (1930). Apart from describing culinary paradoxes on the Rayonist menu, the press reported on the coming release of ‘a collection of recipes from Larionov’s ‘present for Rayonist housewives’” [Painted Muscovites, 1913, p. 5]. Unfortunately, the collection was never published.

sources blindly. Yet, these traces allow better understanding the context in which Larionov’s painterly system was formed [See: Bobrinskaya, 2018, pp. 288–289], reconstructing and clarifying the origins of his version of abstract painting.

## Rayonist Anthropology

The next important aspect of Rayonism is connected with the new Rayonist anthropology, as well as a new interpretation of the creative process and the figure of the artist. Research into the radiation of the human body and its radioactivity were the focus of many scientists’ attention, and works on the topic were published both in reputable scientific journals and in popular newspapers. The human body was considered to be a paradoxical machine, simultaneously generating and receiving rays. According to physicist N. Pavlov, man should be recognized as “a complex and perfect dynamo-electric machine producing psychic emanation and radiant vibrations, similar to the radiation of radium” [Pavlov, 1910, pp. 31–32]. Man in Larionov’s works not only emanates rays. His entire body loses solidity and materiality; what is left instead of the usual anatomical forms is often clusters of rays or individual ray-lines (*Woman at a Table* in the book *Mirskontsa* 1912; *Woman in a Hat* in the book *The Lipstick* by A. Kruchenykh, 1913).

The spiritualistic and theosophical man — radiating himself and immersed in space with invisible rays — was comprehended through evolutionism. Spiritual progress and development were associated with the transition to an increasingly subtle substantivity — a radiant state<sup>(12)</sup>. The reduced bodily component is an essential characteristic feature of Larionov’s radiant man. In the works *Rayonist Composition No. 8*, *Rayonist Composition: Heads* (1913, Museum of Modern Art, New York), and *Balance of Dance* (sheet from the pochoir album Gontcharova, Larionow, L’Art Décoratif Théâtral

(12) A researcher of the theosophists’ anthropological concepts highlights an important characteristic feature — the relation of ideas about a ‘subtle body’ in man with the discovery of radiant matter by W. Crookes: “The main ‘scientific argument’ in favour of the existence of subtle bodies for many theosophists was the research of William Crookes” [Shevchuk, 2020, p. 78]. Rayonist anthropology developed in the 1920s and 1930s, for example, in K. Tsiolkovsky’s concept of the ‘radiant humanity’ or in V. Khelebnikov’s concept of ‘people-rays’.

Moderne, Paris, 1919) corporeality is reduced to a few linear strokes and ray clusters that go beyond the barely perceptible body contours.

The concept of man, radiating and permeable to radiation, also contains a reference to the common interpretations of a medium's body — generating and receiving radiant matter. It is the phenomenon of the medium in its scientific and occult interpretation that often created a new prototype for the artist himself. The idea of an artist as a medium, capable of capturing the vibrations of the ether, perceiving the invisible to the eye imprints of images in the ether, and depicting them in their paintings, becomes essential in the formation of modernism.

Rayonism also implies changing the traditional view of the creative process itself. The creation of a Rayonist painting is similar both to the 'materialization of spirit' at séances and to the materialization of invisible radiation in scientific laboratories. The surrounding space is filled with invisible forms and pierced with rays. By an effort of will and imagination, a Rayonist artist can 'see' them, visualize them, and bring them on canvas. Here is how Larionov described it in one of his texts: "These forms are infinite in number... Say, between the house, the wall, and the garden there is an empty portion of air called the sky. Without clouds, or anything. The artist imagines a certain form within this space, which has nothing in common with the garden, the house or the wall, and depicts it on paper or canvas. The artist assumes that this space contains an infinite number of rays from various objects he is or is not aware of, reflected from out of space. He assumes that the so-called space is filled with forms we are not aware of. What it takes the artist is simply to want it, and he will be able to extract the form out of infinite space. These are Rayonist forms" [Larionov, *On Modern Trends*, 2003, p. 102].

In such an interpretation, a Rayonist artist resembles a medium who helps materialization of the invisible, or in Larionov's words — 'the materialization of spirit'<sup>(13)</sup>. However, a Rayonist painting draws images

(13) Larionov wrote about the 'materialization of spirit' as a key element of Rayonism to A. Barr: "I am usually quite indifferent to what people think about various things and about my own self. Thus, it does not matter whether I started talking about Rayonism long ago or recently. No one else yet talks about it anyway, and even if they do, I believe, you see it is not Rayonism that they are talking about, since abstract painting is by no means Rayonism yet. That is why I am writing to you, because I believe that the issues of the materialization of spirit may interest you" [Larionov, *Rayonism*, 2003, p. 98].

not only from the invisible ethereal archives of forms. It is also formed in the interaction of external rays and the rays of the artist's thought<sup>(14)</sup>. The idea of radiant matter being emitted in the process of thinking or mental activity circulated in popular science literature at the beginning of the century. Here is a typical statement from a book of those years: "The work of the higher nerve centres, mental work, implies the emission of N-rays" [Elpe, 1904, p. 317]<sup>(15)</sup>. The intersections of the radiant matter of thought and the invisible radiant forms that fill space, give rise to Rayonist paintings. Larionov claimed: "If light, radio, and other rays are material, and if our thoughts are a certain form of radiation too, then we just need to find the intersection between them and then what I am talking about will come to life" [Larionov, *Rayonism*, 2003, p. 98]. It was this aspect of Rayonism, turning the artist into a medium who connects the invisible and the visible worlds, thought and matter, that Larionov most likely had in mind when writing to Alfred H. Barr Jr about the presence in Rayonism of something beyond ordinary abstract painting ("abstract painting is by no means Rayonism yet"). Rayonism, according to him, allowed for the 'materialization of spirit', 'materialization of inspiration', and "the transfer of the purely philosophical realm to the purely physical one" [Larionov, *Rayonism*, 2003, p. 98].

"In much the same way that other radiations can be recorded on photographic plates, thought (related to radiation) can leave its trace on light-sensitive surfaces. Experiments on ways to capture and visualize thoughts and feelings with the use of modern equipment were conducted at the turn of the century by numerous researchers. Louis Darget and Hippolyte Baraduc created a compendium of photographs of the invisible" [Bobrinskaya, 2018, p. 292]. To capture invisible fluids, they even designed a special device ('portable radiograph') that allowed photographing thoughts, or more precisely, directly capturing invisible radiation and vibrations on a photographic plate located on a person's head without using a camera. Louis Darget described the process of thought imprinting

(14) What proves the fact that such ideas were widespread in Larionov's circle is, for example, the expression 'rays of thought' from I. Zdanevich's manifesto *Multiple Poetry*: "Our poetry resembles the din of train stations and markets, a complex rumble that rays of all thoughts rush in" [Zdanevich, 1914].

(15) Cf. N. Kotik: "the brain generates radiant psychophysical energy, i.e. it falls into the category of radioactive substances" [Kotik, 1907, p. 75].

on a photographic plate as follows: “In the process of thinking, the soul makes the atoms vibrate and the phosphor located in the brain — glow. This glowing radiation is projected outward. If one concentrates their thought on an object with simple contours, such as a bottle, the fluidic mental image comes out through the eyes and, by means of its radiations, is imprinted on the photographic plate” [Darget, 1911, p. 121]. This description is quite compatible with Larionov’s theories about invisible forms or rays, which a Rayonist artist can extract from the ‘infinite space’ and materialize by an effort of will and imagination.

## Conclusion

The appeal to scientific or pseudoscientific theories and mythologies of radiant matter and to its ‘plastic symbols’ widespread in the early 20<sup>th</sup>-century culture, undoubtedly included pictorial Rayonism in the range of problems of the modern and current. Rayonism is considered one of the first pictorial trends within which a task was set to visualize scientific knowledge about the invisible — radiation, X-rays, radioactive rays, ultraviolet, infrared, and the rays of thought. Meanwhile, the domain of knowledge about radiant matter itself had an obviously dual nature. On the one hand, it appealed to the ‘secret sciences’ and the motionless timelessness which incorporated ray-lines in an endless series of archaic symbols and signs, mythologies and metaphysical speculations. In the culture contemporary to Larionov, this duality found form in spiritualism, in experiments and experiences on the borderline between the ‘ancient’ and the ultra-modern. Thus, it is no coincidence that spiritualism was mentioned in connection with Rayonism both by Larionov and by his associate Ilya Zdanevich. On the other hand, Rayonism addressed the newest theories and technologies. Most likely, Larionov’s choice of ‘suggestive forms’ from this dual sphere was unconscious and followed the principle of ‘obscure correspondence to his inner state’. This choice, however, can be considered significant for Russian culture, which in those years was directed towards both the archaic and the modern — just like Rayonism itself.

Larionov’s strong urge to change along with the changes of life made him particularly sensitive to the transformations of the familiar and stable, both in culture and in life. Larionov stated: “My task is not to establish new art, since once established it ceases to be new, but to try to do as life

itself does: every second it brings new people and creates a new way of life, thus endlessly providing new opportunities” [Cherry, 1911, p. 5]. That sensitivity to relevance, changeability, and instability (which, to a certain extent, was connected with or coming after the impressionistic sensitivity to the movement of light) empowered Larionov to be among those to create the hymn of modernity: “We exclaim: the whole brilliant style of modern times — our trousers, jackets, shoes, trolleys, cars, airplanes, railways, grandiose steamships — is fascinating, is a great epoch, one that has known no equal in the entire history of the world” [Rayonists and Budushchniki, 1999, p. 240]. Meanwhile, the borderline status of Rayonist painting did not let Larionov continue the story of his artistic invention in the cultural context when art made a certain choice and began not to anticipate, welcome or reflect, but to actively shape modernity. Suprematism and especially Constructivism, freed from their borderline status, engaged in active reorganization of the cultural space, keeping pace with political, scientific, and social innovations. In such a cultural landscape, Rayonism with its openness and the dualism of the scientific and spiritual could hardly seize the ‘new opportunities’ that life offered.

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