e-ISSN 2385-2720

Venezia Arti

Nuova serie 2 – Vol. 29 – Dicembre 2020

Mikhail Larionov's Rayonism and the Scientific Mythologies of the Late Nineteenth and Early Twentieth Century

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Abstract The article investigates the theory of non-figurative painting developed by Mikhail Larionov (Rayonism) and its connection to parascientific theories of the early twentieth century. One of the central scientific and parascientific mythologies of the time regarded the shift in the understanding of the idea of matter. The notion of 'radiant matter' had a prominent place in these mythologies. The article analyses a range of frameworks, within which the idea of 'radiant matter' was interpreted (from a scientific research of different phenomena provoked by invisible waves to spiritualist and occultist experiments). The iconography of these waves and the theories of the dissociation of matter represent an essential input to understand how abstract art emerged in early-twentieth-century Russian painting.

Keywords Rayonism. Mikhail Larionov. Abstraction. Russian Avant-garde.

Summary 1 Introduction. – 2 Radiant Matter. – 3 Rayonism: Dissociation of Matter.

1 Introduction

Scholars widely acknowledged both direct and indirect influence of scientific theories in physics, chemistry, physiology, and psychology on the avant-garde artists active in the first half of the twentieth century. Nevertheless, some questions remain mostly undiscussed by art historians. The programme of pictorial Rayonism launched by Mikhail Larionov in 1912, despite its explicit reference to scientific discoveries of the epoch, is yet underexplored. I will present a series of observations that show how a broad context of contemporary scientific discoveries, intellectual pursuits, and parascientific visions affected Larionov's theory of Rayonism.

In his writings, Larionov defines the discoveries of "invisible" rays, such as ultraviolet, x-rays, and radioactivity, as the theoretical foundation of his vision of abstract painting. Whether Larionov had studied these scientific and parascientific theories with any academic scrutiny is less of importance, than the fact that they acted as a cultural background for his ideas, crystallising those years. These scientific achievements were widely discussed in the circles of his peers, in professional journals and in the press addressed to a broad readership. This facet of distribution of scientific knowledge, unique for the early twentieth-century culture, should be highlighted. At the beginning of the last century, an avant-garde artist or poet did not resemble a Renaissance man who was an artist and a scientist at the same time, neither was he any

Edizioni Ca'Foscari

Peer review

Submitted	2020-07-03
Accepted	2020-08-31
Published	2020-12-11

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Citation Brobinskaya, E. (2020). "Mikhail Larionov's Rayonism and the Scientific Mythologies of the Late Nineteenth and Early Twentieth Century". *Venezia Arti*, n.s., 29, 127-136.

DOI 10.30687/VA/2385-2720/2020/01/007

close to the universal intellectuals, such as Goethe or Lomonosov, who could equally excel in scientific and artistic domains. By the second half of the nineteenth century, and even more univocally by the beginning of the twentieth century, science becomes a highly professionalised activity that is reserved only for "initiates". The press appears to be the mediator between art and science. New scientific theories and discoveries are now regularly covered not only by professional editions but also by the popular press. I, therefore, wish to stress how crucial this source was in familiarising the avant-garde artists with scientific research. It was the press and the popular literature, alongside other printed mass media (book and magazine illustrations, posters, leaflets, postcards) that were shaping the avant-garde art. Artists usually dealt with these materials rather than with scientific treatises.

Russian culture of the early twentieth century was flooded with scientific, religious, and artistic intuitions about how to go beyond the nineteenth century positivist tradition. Many of these intuitions came from the positivist milieu, as they were often articulated by the scientists who flavoured their research in physics or chemistry with mystical religious speculations. The gloss of similar theories, striking balance between materialism and tentative deviations from its straightforwardness, was a highly compelling element of Russian culture at the turn of the century. A wide range of artistic concepts of the avant-garde, including Mikhail Larionov's Rayonism, were rooted in this intellectual environment.

One of the central scientific and parascientific mythologies of the early twentieth century was associated with the changes occurring to the notion of matter. "Radiant matter" was a major one among these mythologies. Following the findings of the late nineteenth century, such as Röntgen X-rays, radioactivity discovered by Becquerel, polonium and radium discovered by Marie and Pierre Curie, the number of new ideas related to the study of radiations given off both by the human body and objects increased. Gustave Le Bon, a famous French psychologist and sociologist, then stated: "Un corps quelconque est une source constante de radiations visibles ou invisibles, mais qui sont toujours de la lumière".[1] Some of the popular theories have been merely older mainstream theories, such as Mesmer's universal principle of fluid matter or Reichenbach's Odic force.[2] However, new insights based on positivist principles and modern technologies were coming along. Prosper-René Blondlot's N-rays, Louis Darget's V-rays, Y-rays of Sergei Iur'evich (Serge Youriévitch) that were allegedly emitted by the human body, Naum Kotik's "brain rays" that were linked to the thinking process, Julian Ochorowicz's "rigid rays" which he considered a form of magnetic field transmitted by living organisms, or "physiological polar energy" discussed by St Petersburg doctor Messira Pogorel'skii are only a few examples of hypotheses and mythologies that sought to conceptualise the phenomenon of radiation, often crossing the edge between scientific and occult knowledge.

The junction of positivist science and occultism was definitely one of the greatest paradoxes in the turn-of-the-century culture. Mikhail Matiushin asserted in his memoirs:

> The question of dimensions was an issue that was on everybody's mind, especially in the artists's. There was a bunch of literature being written about the fourth dimension. Everything new in the arts and science was seen as something coming from the depth of this dimension. It was, to a large extent, tingled with the occultism.[3]

This rich cultural ground was crucial for many avant-garde experiments to bloom. Mikhail Larionov's Rayonism was no exception. Similarly to many European avant-garde artists, his theory drew upon a broad spectrum of contemporary scientific and parascientific approaches alike.

2 Radiant Matter

In a 1936 letter to Alfred H. Barr Jr, the director of the Museum of Modern Art in New York, Larionov, in a slight annoyance, pointed out: "I am usually quite indifferent to what people think about various issues and me personally. I am not that interested in keeping track of when I started speaking about Rayonism. No one yet talks about it anyway. Even if someone does, I am sure you are aware it is not exactly Rayonism that they are talking about, since abstract painting is by no means Rayonism yet. This

1 Le Bon 1908, 30. A translation to Russian was published in 1909. See Lebon 1909, 15.

2 Carl Reichenbach (1788-1869) was a German naturalist. His studies of phenomena he called the "Odic force" were close to Mesmer's animal magnetism.

3 Matiushin 1976, 160.

e-ISSN 2385-2720

is the reason why I am writing to you, as I believe that the issues of the materialisation of the spirit might be of interest to you".[4] The expression "materialisation of the spirit", which Larionov uses, refers to a specific term that was widespread among spiritualists. Materialisation, rather than dematerialisation, that appears in the rhetoric of artists, such as Vasilii Kandinskii, was at the forefront of various spiritualist practices and scientific research at the turn of the century. It should be noticed that Larionov has been primarily working within the scientific paradigm, seeking to envision phenomena that were invisible but known to science. However, Larionov's Rayonism certainly absorbed some elements coming from the parascientific imagery that prevailed at the dawn of the century. His theoretical constructions regarding Rayonism contain occasional references to spiritualist or occult context. He included the following points in the draft for his speech *On the Newest Russian Painting* (January 1913): "A form that results from the intersection of different objects and the artist's will. The fourth dimension. Spiritualism, transversality".[5]

Spiritism, a consolidated subculture with its language, mythologies, and iconography, underwent a radical change by the beginning of the twentieth century, incorporating a number of positivist methods and theoretical schemes. This blend of rigorous scientific elements and experimental occult mythologemes and fantasies set the ground for multiple cultural processes at the time. It is essential to acknowledge that the boundaries between science and different forms of parascientific discourse were less strict than they are today. Confluences of occult and scientific fields were not seen as a retreat before the irrationality, but as an ultimate triumph of science that has finally reached the grounds of the most mysterious sides of the matter, thought and the human psyche. The occultists and spiritualists, in turn, sought to exploit scientific discoveries to rationalise their accounts about mysterious phenomena. The craze for positivist methods in the quest for "materialisation of spirit" during the séances was remarkably wide. Many of the most prominent scientists were involved in these explorations, while the venues for the séances often bore more resemblance to science labs full of instruments. They often included photographic equipment, which was used to capture radiation and materialisation processes during the sé-ances. If only particularly receptive individuals under a trance or hypnosis could see the ray of radiant matter in the 1870s and 1880s, the new century brought a host of new machines that allowed those wishing to penetrate the hidden world of invisible rays. Henceforth, Röntgen x-rays became an attraction, and the studies of radium entered collective imagery just as the miracles of household comforts and the upcoming medical marvels.

The everyday world turned out to be filled with invisible life – motion or vibrations of the radiant matter and currents of radiant energy. "All living things are immersed in a sea of radiant matter"[6] or "All bodies give off rays, and the universe if therefore filled with a myriad of overlapping rays"[7] were just a few of the statements one could read those days. This idea of surrounding space being filled with overlapping rays giving shape to new radiant forms is one of the main points of the Rayonist theory. This was how Larionov imagined the radiant space in his paintings:

> Considering the sums of rays that speed out of objects, instead of objects as such, we can structure the painting the following way: the sum of rays from the object A is crossed by the sum of rays from the object B, while a form emerges in the space between them driven by the artist's will.[8]

In the letter to Alfred H. Barr Jr mentioned earlier, Larionov emphasises the link between Rayonism and various kinds of radiation. "Rayonism is not concerned with the issues of space or motion at all. It understands the Light and any rays, be it radio, infrared, ultraviolet, etc., as a physical basis as such". He continues, "Rays of any kinds are the subject of Rayonist research, including radioactivity and the radiation of human thought".[9] It should be noticed that the latter idea refers to the beliefs

4 Larionov 2003a, 98.

5 Larionov 2005, 351. Russian sources rarely make any distinction between "spiritualism" and "spiritism". The issue is evident in the following passage: "Modern spiritualism, including spiritism, represents a broader and more detailed unbundling and development of one of the ancient fundamentals of thought in its history". *Tainoznanie. Magiia i spiritizm* 1980, 21. A. Aksakov also used the words "spiritualism" and "spiritism" interchangeably: Aksakov 1872.

6 Pavlov 1910, 31.

7 *Novaia forma luchistoi energii* 1907, 12.

8 Larionov 1913a, 19.

9 Larionov 2003a, 97-8. Such ideas were widespread among artists and poet of Larionov's circle. For example, I. Zdanevich used the expression "rays of thought" in the manifesto *Multi-poetry*: "Our poetry resembles the din of stations and markets, a deep

that were then circulating in popular science literature. A characteristic statement from a popular book of the time reads: "Higher nervous activity and intellectual work provokes N-rays emission".[10]

The early twentieth century witnessed the emergence of a unique iconography for radiation from the human body and various objects. It was rooted in popular science magazines, scientific illustrations and photographs taken during the séances and experiments that sought to capture the radiation emitted by the human body. Larionov's early Rayonism bore evident traces of this widespread iconography. The main patterns are, for instance, beams of light from a person's eyes, nose, or mouth. It was a highly recurrent motif in illustrations that accompanied scientific-occult studies. These motifs are persistent in Larionov's "realistic Rayonism", as the artist called it (*Bull's Head*, 1912, State Tretyakov Gallery; *Male Portrait (Rayonist Construction)* in the book *Pomade* 1913; *Rayonist Portrait* in the book *Half-Dead* 1913).

At the turn of the century, electricity and radiant matter or radiant energy were often linked in collective imagery. One of the leading Russian researchers in the domain, Iakov Nardkevich-Iodko developed a "method to capture the energy emitted by a living being exposed to the electric field". He called this method electrography. The photographs by Nardkevich-Iodko were well known both in Russia and Europe. They were featured in photography exhibitions, shown during his public talks, and published in technical journals and popular magazines alike. Nardkevich-Iodko considered these pictures made without using a camera to be the images of electric discharges from the human body. "Here electricity acts as an illustrator, making the particles (or the tiniest atoms of the matter) spread in a certain order".[11] In 1899, doctor Pogorel'skii developed his system for capturing electric radiation of the human body, described in his work *Electrophotosphenes and Energography*,[12] based on the energograms. His energographic alphabet featured the images made by Pogorel'skii himself and those by Nardkevich-Iodko. Tree-like forms, "light clusters", straight and zigzag rays create some bizarre abstract forms and landscapes of the invisible. Certain motifs and compositional principles of these images can be compared to the Rayonist landscapes by Larionov and Goncharova, where the light beams or "light clusters" and branching tree-like forms recall electric currents' iconography (Nataliia Goncharova, *Electric Chandelier* 1913, State Tretyakov Gallery; *Sea. Rayonist Composition* 1912-1913, Stedelijk Museum; Mikhail Larionov, *Rayonist Landscape* 1912-1913, State Russian Museum; *Rayonist Composition* 1912-1913, Private collection, Milan). Rayonist pictures, like energograms, captured the energy framework of the world hidden from view.

Larionov's Rayonism is not a bare compilation of different iconographic sources but a rich synthesis that was cast into a solid creative scheme, where mythologies of rays, scientific and parascientific experiments are just a starting point. Yet, these elements allow for a better understanding of the context in which Larionov's painterly system arose.

Larionov described his vision of rayonist forms in one of his texts:

> There is a blank portion of air between the house, the wall and the garden, that we call the sky. With no clouds, nothing. The artist imagines a form in this space and drafts it on a piece of paper or a canvas. A form that has nothing to do with the garden, the house or the wall. The artist assumes that this space contains an endless amount of rays from different objects, which he is either aware of or not, some of them being emitted (reflected) from out of space.[13]

The presence of radiant forms invisible to the eye in the space surrounding us is a reference to another recurrent idea of the beginning of the century. Aether was considered to be a light-bearing, universal substance which allowed the circulation of radiant matter and radiant energy. The physical world was thought to be made of clumps of aether of different density. It is worth emphasising that aether theory was then widely accepted in science and was mentioned in physics textbooks as an actual one. In 1875, two physicists, Balfour Stewart and Peter Tait published the study *The Unseen Universe*, where they interpreted aether as a depository for images, senses, forms, and feelings.[14] They understood it as a unique memory space where the events, feelings, thoughts, and images are impressed in the light waves. Aether turns out to be an environment

and rich rumble that rays of all the thoughts rush in" (Zdanevich 1914).

10 Popov 1904, 317. Cf. N. Kotik: "Brain gives off radiant psychophysical energy, i.e. […] it can be considered radioactive substance". Kotik 1907, 75.

11 Nardkevich-Iodko 2007, 303.

12 Pogorel'skii 1899.

13 Larionov 2003b, 102.

14 They characterised aether as "a way in which the universe conserves a memory of the past's", Stewart, Tait 1875, 156.

that can host invisible radiant forms. Charles Hinton, whose works were familiar to Russian artists thanks to the publications by Petr Uspenskii, described aether as a sort of phonograph or a cosmic depository for all kinds of images.[15] I would like to briefly draw attention to the fact that Hinton's theories focus on practices of visualisation, intense work of imagination that allows for penetrating invisible fourth dimension. Larionov's approach also reserves a vital place to the work of imagination, proclaiming that the artist's will open the gateway to invisible forms. Larionov emphasises the imaginary nature of forms in Rayonism:

> Not reflected objects (like in a mirror) but imagined, non-existent forms that can be created by the artist's will form an intersection of an endless [amount of] rays from all kinds of objects, and are unlike any other object.[16]

Finally, another important aspect of Rayonist theory is a reinterpretation of the very idea of the artist. Rayonist painting draws inspiration not only from invisible reminiscences of aether forms. It emerges at the intersection of external rays and the rays that come from the thoughts of the artist. When the radiant matter of thought and the invisible radiant forms of aether intersect, a Rayonist picture is born. Larionov observed, "If light, radio, and other rays are material and if our thoughts are a form of radiation too, then we just need to find the crossing point between them and then what I am talking about will occur".[17] When speaking about a superior potential of Rayonism versus other kinds of abstract painting, Larionov means this latter aspect of Rayonism that makes the artist assume the role of a paradoxical machine binding invisible and visible world, thought and matter. According to him, Rayonism allowed for "transferring purely philosophical field to purely physical one".[18] The same element of Rayonism was emphasised by Il'ia Zdanevich in his book on Larionov and Goncharova's art: "Rayonism is enriched by its ability to consider not only external radiation but also the internal, spiritualistic one".[19]

At the turn of the century, the attempts to catch the thought on photographic plates[20] and the development of studies in telepathy was boosted once again by the invention of wireless telegraphy. In the 1910s, Russian physicist Nikolai Pavlov presented a series of public lectures entitled "The radiant and wireless transfer of thoughts", where he claimed: "Humans are electromagnetic machines"; "our brain, like a telegraph station, can play the role of both dispatcher and receiver of electromagnetic waves".[21] The concept of a human being exposed to radiation and existing in a permeable world recalls some widespread ideas about a medium's body that gives off and absorbs radiant matter. A scientific-occult interpretation of the phenomenon of mediums becomes a new model for the artist. The idea of the artist as a medium able to capture aether's vibrations, reading invisible prints left by the images within it, and transmitting them through the painting would become crucial in the development of modernist art. These beliefs are reflected in Rayonism by Larionov who tried to depict "the radiant and wireless transfer of thoughts".

3 Rayonism: Dissociation of Matter

Variability and potential dynamics of matter or its "colloidal" state, which was associated with the primary matter or "protoplasm" context of neovitalist beliefs at the turn of the century, became one of the main scientific metaphors for a brand new sense of matter and material among Russian avant-garde artists. "Colloidal" state of matter, its "vivid", dissonant properties were seen as a new device that broadened the horizons of creativity, allowing to create "vivid" things, that is to say the works of art, from the "protoplasm" matter-material. In his keynote lecture "We and the West" (1914), B. Livshits interpreted a unique feeling of matter-material as a distinctive feature of national, "Eastern"-Russian understanding of art:

> We do not draw inspiration from some external evidence of our Eastern identity. […] Our inner-

15 Hinton 1906 (a Russian edition appeared in 1915: Khinton 1915). Hinton's ideas were examined in: Uspenskii 1911.
16 Larionov 2003b, 102.
17 Larionov 2003a, 98.
18 Larionov 2003a, 98.
19 Zdanevich 2014, 115.
20 See *The Perfect Medium* 2005, 114-25.
21 Pavlov 1910, 6, 25.

> most proximity to material, our unique feeling and our natural ability to transform it, which eliminates all intermediary elements between creator and material, go incomparably deeper.[22]

Livshits describes this sensitivity towards matter-material, its ability to transform it and delve into its essence, as an exclusive ideology close to some sort of protocosmism that has been penetrating new Russian art already in the 1900-1910s: "We feel the material even when it is still thought to be a universal substance, and therefore we are the only ones who can and will ground our art on cosmic basis".[23] The urge to work with the primary "substance", with the matter as such, was accurately articulated by Ol'ga Rozanova:

> The art of painting is a deconstruction of readily available images of nature into specific properties of the universal substance that rests within them, a creation of brand-new images by establishing the order of these properties which is to be defined by the Creator's attitude.[24]

Rayonist paintings by Larionov basically expressed the "colloidal" state of the matter (radiant matter, as he used to call it)[25] which fascinated many avant-garde artists in Russia. Driven by the attempt to depict the invisible light rays, Larionov's Rayonism was a contradictory combination of materialism-sensualism ("Rayonist painting should be able to express all properties of the matter, such as softness, crepitation, lightness, expensiveness, cheapness")[26] and speculative reason ("The world, both real and spiritual, can be, in all its fullness, recreated in painterly forms")[27]. According to Larionov, Rayonism takes "into account imaginary forms that do not exist, rather than reflect (mirrored) objects".[28] However, it is worth noting that Larionov here intends the ability of the artists to envision scientific facts. The weakness of the human eye and the possibility for genuine vision through a priori knowledge obtained by science are two primary assumptions of Rayonist painting. Larionov sought to create an invisible scientific reality, an invisible "radiant" shape of the world using artistic-scientific imagination: "If we happen to know that certain things have to be in a way that science has revealed to us, then, even if we cannot directly sense them, we'll still firmly believe in that and no other way".[29]

In the early twentieth century, new perspectives on the matter reserved special attention to discoveries in the field of radiation. Larionov acknowledged these discoveries and new fields of study of the "life of the matter" as being the "official" grounds for his Rayonist theory: "Strictly speaking, Rayonism was 'officially' based on the following premises: theory of radiation, radioactive rays, ultraviolet rays".[30] The discoveries of new properties of matter were well known in Russia through publications in both professional and popular science editions. "Radiant matter" was analysed from a wide variety of standpoints. Wilhelm Ostwald[31] saw it as "a unique combination of electric and magnetic energy".[32] "Radiant energy appears to be even freer from the matter," he observed.[33] "Energetic theory" developed by Ostwald included "the replacement of the notion of matter by the notion of the 'complex of energy factor'".[34] He wrote, "Energy is the concept which, as a matter of fact, describes everything in this so-called 'external world'".[35] Energy revealing itself in various effects of electricity fascinated Nataliia Goncharova, who addressed this subject in a series of works (*Electric Chandelier*, 1913, State Tretyakov Gallery; *Electric Lamp*, 1913, Centre Pompidou; *Dynamo Machine*, 1913,

22 Livshits 1996, 256-7.

23 Livshits 1996, 257.

24 Rozanova 1999, 228.

25 Larionov emphasised his interpretation of light as a material basis: "Starting with the rays in Leonardo's camera obscure we discover light dust, a material light, which is somewhat close to pigment paint. Leonardo did not think the light was material, neither did Newton, though he was wrong. Materiality could be indeed very difficult to catch" (Larionov 2018, 13).

26 Kovalev 2005, 349.

27 Larionov 1913b, 95.

28 Larionov 2003b, 102.

29 Larionov 1913b, 96.

30 Larionov 1913b, 96. In his later texts, Larionov insisted on this "official" pedigree of Rayonism: "Rayonism … understands the Light and any rays, be it radio, infrared, ultraviolet, etc., as a physical basis as such" (Larionov 2003a, 97).

31 Wilhelm Ostwald (1853-1932) was a chemist who received a Nobel Prize in 1909.

32 Ostval'd 1910, 75.

33 Ostval'd 1903, 171.

34 Ostval'd 1903, 176.

35 Ostval'd 1903, 174.

Private collection). Goncharova's works do not depict the rays, but rather the mechanisms which in many ways recalled new properties of matter. Rayonist painting proposed a different path.

Rayonism advocated a radical version of the "life of the matter", that would resonate with a human sensibility as closely as possible. A different matter that the artist sees or imagines in an empty space and envisions with colours and lines is one of the key ideas of Rayonism. Scientific grounds that Larionov consistently emphasised in his Rayonist texts suggest that his theory suits the context of radical ideas about the matter that circulated at that moment. I will address in further detail the ideas of Gustave Le Bon, who has elaborated one of the most vivid intellectual fantasies on the subject of the "life of the matter".[36] His ideas were well known in Russia and familiar to many avant-garde artists and poets, such as Nikolai Kul'bin and Mikhail Matiushin, as it is evident in their works.

Matter and energy were inseparable for Le Bon:

> La force et la matière sont deux formes diverses d'une même chose. La matière représente une forme stable de l'énergie intra-atomique. La chaleur, la lumière, l'électricité, etc., représentent des formes instables de la même énergie.[37]

According to Le Bon, the matter is a

> source constante de radiations visible ou invisible, mais qui sont toujours de la lumière;
>
> si la sensibilité de la plaque photographique n'était pas aussi limitée, elle pourrait, pendant la plus profonde nuit, reproduire l'image des corps au moyen de leurs propres radiations réfractées par les lentilles d'une chambre noire. Ces auréoles rayonnantes qui entourent tous les corps ne sont pas perceptibles parce que notre œil est insensible pour la plus grande partie des ondes lumineuses.[38]

One of the most impressive assumptions at the core of Le Bon's proposal was the idea of the decay of matter: "La matière, supposée jadis indestructible, s'évanouit lentement par la dissociation continuelle des atomes qui la composent".[39] Radioactive rays are the process of the decay, of the dissociation of matter. All kinds of matter are radioactive to some extent, Le Bon believed, and therefore all the matter is disappearing, undergoing the process of dissociation. Le Bon states: "C'est de l'énergie intra-atomique libérée pendant la dissociation de la matière qui résulte la plupart des forces de l'univers, l'électricité et la chaleur solaire notamment".[40] Le Bon's theory understands the light as the result of the dissociation of matter which is at the same time the driver of the dispersion, of dissolution:

> La matière émet sans cesse des radiations lumineuses ou calorifiques et peut en absorber.[41] […] Les agitation de la matière se propagent à l'éther et celles de l'éther à la matière, il n'y aurait même ni lumière ni chaleur sans cette propagation. Éther et matière sont une même chose sous des formes différentes et on ne peut les séparer. Si on n'était pas parti de cette vue étroite que la lumière et la chaleur sont des agents impondérables parce qu'ils ne paraissent rien ajouter au poids des corps, la distinction entre la matière et l'éther à laquelle les savants attachent une si grande importance, se serait évanouie depuis longtemps.[42]

Larionov's Rayonist painting does not seek to play with the glowing light illusions that emerge between the painterly matter and the eye, as Neo-Impressionists did. Nor was he interested in using the light rays as a means for painting (painting experiments on a screen using film projectors).[43] At last, he did not follow scientific ventures that attempted to achieve some forms of images with invisible rays.[44] Larionov aimed at envisioning the very process of light emission, the rays them-

36 G. Le Bon's writings in part compiled existing studies on common places that dominated the scientific discourse. They might be, to some extent, seen as a digest of scientific ideas of those years.

37 Le Bon 1908, 10.

38 Le Bon 1908, 28-30.

39 Le Bon 1908, 9.

40 Le Bon 1907, 14.

41 Cf. the 1910 manifesto signed by Futurist artists: "Movement and light destroy the materiality of bodies" (Marinetti 1914, 129).

42 Le Bon 1907, 14.

43 Larionov mentions analogous Neofuturist experiments in his essay *Rayonist painting*, while Mikhail Ledantiu makes a similar remark in a 1913 manuscript. Both probably meant the experience of Corradini brothers (Arnaldo Ginna and Bruno Corra).

44 These experiments are discussed in detail in a number of studies, for example in: Lebon 1910, 210-23. Many scholars recognised the attempts to reproduce such experiments in the work of František Kupka, who tried to bring out the effects of x-rays images (*Woman Picking Flowers*, 1909; *Planes by Colours*, 1910-1911, Centre Pompidou).

selves, a different (invisible) matter in its pure form. Or, more accurately, the process of decay, the dissociation of matter. In November 1912, Larionov stated in an interview: "I display the canvases that are executed in accordance with a new method. It will be the 'radiant' painting. […] Everything we see gives off rays. These rays will be captured in my paintings".[45]

Le Bon's theories were discussed and recounted in numerous publications in professional and mass media and sparked a fervent debate. Kul'bin, who was familiar with the theory, claimed for the "eternity of energy, instead of the moribund laws of the eternity of matter"[46] in one of his public presentations. The debate on Le Bon's theory extended to the sphere of scientific research and religious circles.[47] It was one of the strongest and most disturbing ideas regarding the new state of the world. Larionov, who pushed a series of new phenomena, such as radioactive and ultraviolet rays, at the centre of Rayonism, was unlikely to ignore a theory that then was on everybody's mind.

Following Le Bon's reflection on the new properties of the radiant matter, one of the critics wondered: "What if the process of radioactivity is identical for all kinds of bodies? Doesn't every substance exist in a continuous state of decay?" By then answering directly, "the answer to the question mentioned above is definitely affirmative".[48] Dissociation of the matter that manifests itself in radioactive emissions, and which is a feature to all physical bodies to varying degrees, was considered an evident proof of the finiteness of matter. Apocalyptic imagery constructed by human thought and provided with a scientific framework heralding the inevitable dissolution and vanishing of the matter, fitted the context of tension and anxiety. Le Bon's texts constantly repeat some "apocalyptic" motifs:

> Des corps tels que l'uranium et le radium représentent sans doute un état de vieillesse auquel tous les corps arriveront un jour et qu'ils commencent déjà à manifester dans notre univers, puisque toute matière est légèrement radio-active. Il suffirait que la dissociation fût assez générale et assez rapide pour produire l'explosion du monde où elle se manifesterait.[49]

In this regard, the Rayonist painting that recreates the invisible rays "in the space between the objects", i.e. fulfilling the process of the dissociation of matter, represents the very process of matter's dissolution. This disintegrative power of Rayonism was immediately perceived by the contemporary critique. Iakov Tugendkhol'd reviewed Larionov's Rayonist works he saw at the "Target" exhibition in 1913 in the following terms:

> We are no longer witnessing a myth-making [mifotvorchestvo], but physics instead […]. French Pointillists decomposed the colours of nature into the primary colours; Moscow pathfinders need more than that, they want to reduce all the nature to the 'crisscrossing of rays', the 'colour dust'. Neo-Impressionism is a dematerialisation of the universe, but yet it bears little comparison with the radical and ultimate disintegration of the world, to which Larionov aspires.[50]

These attempts can be traced both in Larionov's Rayonist paintings and in his penetrating and unravelling portraits that coincide with the Rayonist non-objective works from the same period. In *Portrait of Vladimir Tatlin* (1913), the human body is composed of a myriad of splitting glowing planes, conjugated at different angles, which are disintegrating the body and transforming its matter into a light-splitting crystal prism. Meanwhile, in his Futurist books illustrations, light beams (*Lady at the Table*, 1912) or light scribblings (*Woman with a Hat*, 1913) almost entirely replace human bodies, disintegrating and nearly vanishing in the stream of radiant matter.

Indeed, the miraculous texture of Rayonist painterly surface reproduces matter's dissolution, its death and ultimate disappearance. It is literally in non-objective painting that we see only the effects of the dissociation power, the radiant matter. The materialistic "apocalypse" that unfolds in the scenes of dissolution and disappearance, alongside those of transformation and regeneration of matter which is recognisable in Larionov's Rayonist works, can hardly be considered a theoretical construct intentionally elaborated by the artist. Apocalyptic tone is more likely a side feature of his paintings that appears to

45 Krusanov 2010, 441.

46 Kul'bin 2018, 175.

47 For instance, Sergei Glagolev, a theology professor, published the work *Matter and Spirit*, defining it as an "attempt to embrace all existing knowledge about the matter and the spirit in order to provide a scientific basis for the Christian mindset regarding the universe and the man" (Glagolev 1906).

48 Geinrikhs 1905, 49.

49 Le Bon 1908, 54-5.

50 Tugendkhol'd 1913, 59.

resonate when analysed within the scientific context that surrounded Larionov's theories and works.

The context of new scientific knowledge that changed the existing world views was a disturbing and yet inspiring source for the new artistic languages. The movement towards the abstraction was partly rooted in a shock in front of the material world's transformations. Kandinskii described his feeling upon the discovery of the radioactive decay: "In my soul, it was the same as the decay of the whole world. Suddenly the sturdiest walls collapsed. Everything became uncertain, unsteady, and soft. It would not have amazed me, if a stone had melted into air before me and become invisible".[51] Kandinskii's quest for abstraction alludes to the apocalyptic imagery. His world of the new matter bears the signs of the end of time, while Larionov's one – just occasional references to the history of matter's dissociation. In his 1936 article entitled *Rayonism*, he points out: "Rayonism takes into consideration the radiation of any kind, such as radioactivity and radiation of human thought, since the efforts of our brain, its dissociation (rotting) constitutes its radiant emissions, its radioactivity".[52]

Surprisingly, a faint echo of similar apocalyptic tone comes from an opposite pole of the cultural field. It appears in a conversation with Aleksandr Blok recorded by Maksim Gor'kii. Gor'kii, who saw the "world as an endless process of matter's dissociation",[53] drew out the following picture to his interviewer:

> While dissolving, the matter continuously emits a wide range of energies, such as light, electromagnetic waves, Hertz waves, etc., including radioactivity. Our thought is a result of brain atoms dissociation, while the brain is made up of the elements of 'death', inorganic matter. In human brain matter, this inorganic matter is continually evolving into psychic energy. I let myself think that someday all this matter, absorbed by a human, will be transformed by his brain into a single flow of psychic energy. It will find harmony within itself and will freeze in contemplation of its hidden, endlessly powerful, creative force.[54]

The Russian avant-garde artists were fascinated with the universal matter, its life and transformations. Their pursuit of the "deconstruction of readily available images of nature into specific properties of the universal substance that rests in them" often unintentionally left traces of scientific apocalyptic motifs of death and the birth of a new matter in their artistic projects. Larionov's Rayonism closely aligned with the cultural context of the time. Painterly matter of Rayonism does not have any form and challenges stereotypical thinking about the space. It is something that escapes both emotional and intelligible comprehension, being an impossible place where painting is born of universal matter. It is the edge between chaos and cosmos, being and nothingness. Rayonism tries to capture either the very dawn of painting, or its death, a speculative moment when the painterly matter "will find harmony within itself and will freeze in contemplation of its hidden, endlessly powerful, creative force", and will become the "painting per se".

51 Kandinskii 2001, 274.
52 Larionov 2003a, 97-8.
53 Gor'kii 1951, 331.
54 Gor'kii 1951, 331-2.

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