

The Unfinished Avant-Garde Modernity and the Idea of Tékhne: The One Hundred Years' Revolution, 1850–1950

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In what follows below I reconceptualize the relationship between the European avant-garde(s) and technology across the longer century from 1850 to 1950 through the classical notion of *tékhne*, understood as the inseparability of making and knowing. Rather than treating machines as external influences or iconographic motifs, it argues that avant-garde practices transformed technological procedures into operative esthetic forms: montage, projection, seriality, acceleration, noise, typographic disruption, bodily training, diagrammatic abstraction, and speculative construction. Using examples out of modernist architecture, cinema, theater, painting, poetry, sound, science, and theories of perception, discussion evokes various iconic figures including Tatlin, Leonidov, Vertov, Russolo, Marinetti, Meyerhold, Malevich, and Khlebnikov as illustrative examples. Particular attention is focused on the new forms of mechanized body, revolutionary visualities, fourth-dimensional geometry, and the conversion of historical time into new poetic calculations. My essay situates the individual contributions to the Arts Special Issue within a transnational constellation extending across Russian, Soviet, Italian, German, French, and Central European modernisms. It concludes that the avant-garde's technically unrealized or functionally "unsuccessful" projects possess distinctive epistemic force: they reveal the virtual gap between technological imagination and artistic possibility. This unresolved interval defines avant-garde modernity as ever *unfinished*, exposing every apparatus as simultaneously esthetic, political, corporeal, metaphysical, and temporal. Such experiments demonstrate that newly conceived marvels of previously unseen technology often reorganized not only artistic media but grounded modernity's very conditions of permanently changing existential experience (Ioffe 2011).

1. Tékhne, Operative Modernity, and the Technical Nerve of the Avant-Garde

The European avant-garde(s) was not merely accompanied by technological innovation, rather it partially *became* one of the unique venues where technological modernity learned to see, hear, pace, diagram, accelerate, parody, and eventually even disassemble itself. The meaningful "modern" century between 1850 and 1950 was plainly filled with various apparatuses - telegraphy, photography, phonography, cinema, radiography, electric illumination, radio, aviation, reinforced concrete, scientific development, and industrial standardization. Yet the deeper mutation did not just reside in the multiplication of formal instruments alone. It lies in the fact that cultural *making* became more theoretical, abstract or even epistemological than physical. To fabricate, to project, to mount, to serialize, to calculate, to train a body, to construct or design a page, or to place sound under

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mechanical pressure - these operations became new modes of reflection. The ancient term *tékhnē* is therefore not just a decorative Hellenism but a possible name for, so to say, a historical principal schism: the separation between *knowing* and *making* (Heidegger 1954; Simondon 1958; Latour 1991; Latour 2005).

The avant-garde art proceeded to occupy the most volatile edge of that fundamental divisive schism. It did not simply replace the traditional still life or landscape with the factory, the heroic subject with the worker, or the lyrical line with the blueprint. It reconceived the artwork as an operation: a certain ad hoc device for reorganizing perception, a laboratory of social time, a graphic machine, or at times a sonic trap, a choreographic semiotic code (Akimova 2026), an architectural proposition, or a calculated scandal (Ioffe 2025b). The old artwork asked to be contemplated; the avant-garde object frequently demanded to be performed, activated, misread, assembled, or even be fought against. This is why the technological history relevant to our volume must be written not as a catalog of machines but as a genealogy of operative forms (Mumford 1934; Giedion 1948; Benjamin 1936; Kittler 1999).

In this context symbolically stands Ivan Leonidov's imaginary *Lenin Institute* (Figure 1), where the utopian (political) model is not a neutral architectural illustration but a condensed syntax of Soviet ephemeral Constructivist thought: tower, bridge, sphere, cable, suspended volume, and abstracted ground-plane are arranged not as a picturesque ensemble but as a potent proposition about knowledge made spatial. The library becomes a virtual machine of what we can term as collective cognition where architecture is intended to behave like a diagram of perpetual knowledge-production circulation. This image foreshows my argument and is subject of one of our volume's important fundamental papers, (notably Protopappas 2026) as it showcases technology already converted into avant-garde form: not a background to artistic modernity, but the very grammar through which technical modernity (re)imagines itself as construction, transmission, and disciplined projection (Protopappas 2026; Cooke 1995; Lodder 1983; Lissitzky 1925).

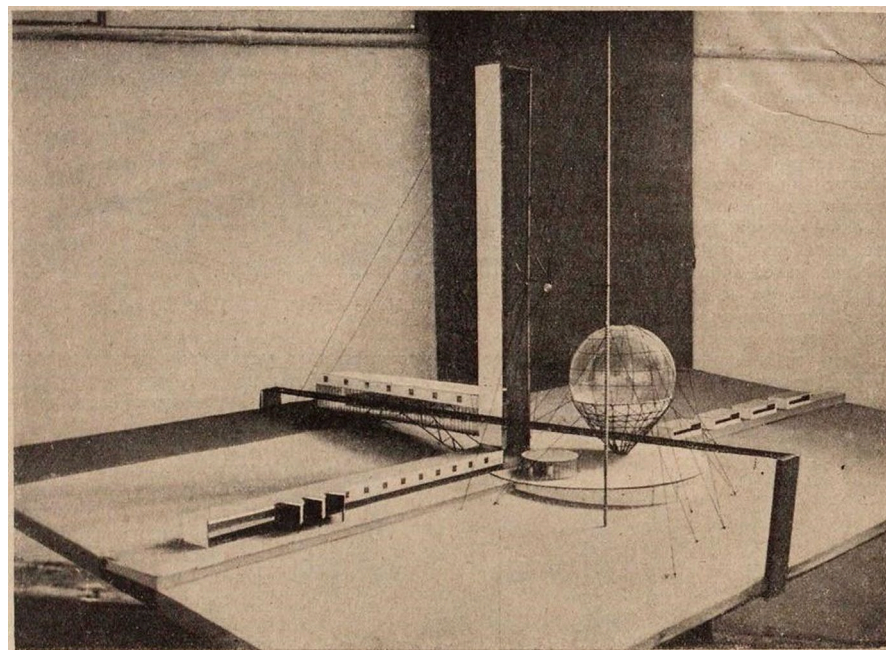


Figure 1. Ivan Leonidov, Central Lenin Institute, 1927; Wikimedia Commons.

The cover of *Sovremennaya arkhitektura* for 1928 (Figure 2), extends the point from theoretical model to a concrete publication. Its typographic gray severity is not just the laconicity or even minimalism of what later be known as “modern design”; it is the graphic metaphor of an institution of argument: a printed machine through which Constructivist

architecture addressed itself as a collectively practiced discipline. The enormous letters, the lateral vertical title, and the brutally reduced surface turn the magazine into a kind of portable architectural facade. Here print does not report avant-garde architecture from outside; it participates in the futuristic grammar of compression, standardization, and visual command. The figure therefore marks the point at which the avant-garde periodical becomes both archive and even apparatus (Buchloh 1984; Tupitsyn 1992; Cooke 1995; Ioffe and White 2012).

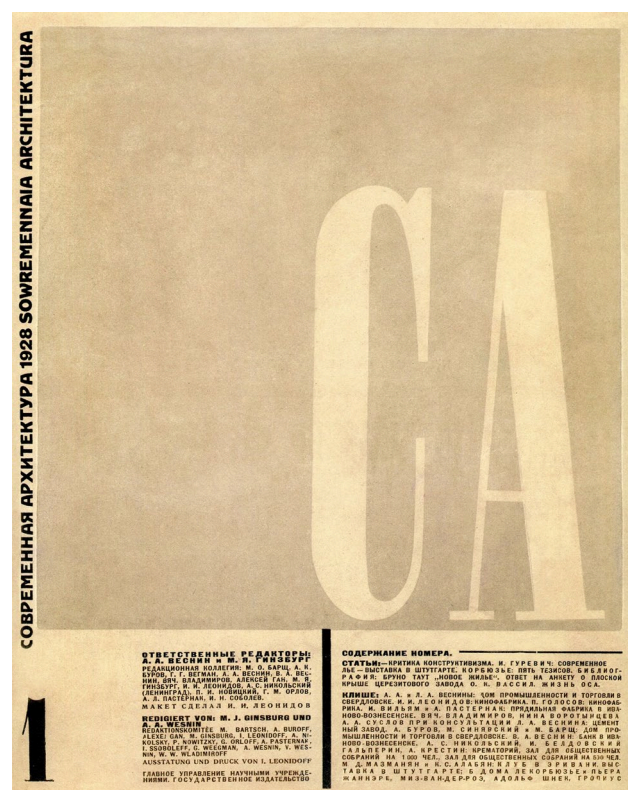


Figure 2. Ivan Leonidov, cover design for Contemporary Architecture (Sovremennaya arkhitektura), no. 1, 1928, Wikimedia Commons.

For our discussion Figure 3 introduces a different, sharper diagram of avant-garde political technics: El Lissitzky's canonical work known as *Beat the Whites with the Red Wedge*. It could be useful not to try to domesticate this image into a familiar emblem of a typical proto-Constructivist linear design. Its implicit combative violence remains purely spatial (or even cosmic) rather than being more illustrative. The red triangle represents an operation performed on the white circle, a violent geometrical assault in which politics is rendered into vector, impact, and penetration. The poster in a metaphoric way condenses a whole theory of avant-garde communication: the process of creating meaning arrives as a brutal collision, and the page looks like a battlefield of various forces (Malevich 1916; Lissitzky 1925; Lodder 1983; Buck-Morss 2000).

This is the contextual and conceptual atmosphere in which our *Arts* volume should be perceived. The avant-garde did not “use” technology in the direct sense in which a painter uses pigment. It translated technological procedures into esthetic and intellectual forms creating such innovative cultural idioms as montage, faktura, projection, acceleration, seriality, shock, portability, diagrammatic abstraction, laboratory training, and speculative construction. Its indeed *unfinished modernity* - as Jürgen Habermas once termed it - constitutes precisely in this refusal to let the technical object remain silent. The avant-garde forces every apparatus to profess its existential metaphysics (Poggioli 1962; Bürger 1974; Habermas 1980; Adorno 1970).



Figure 3. El Lissitzky, Beat the Whites with the Red Wedge, 1919. Wikimedia Commons.

2. Apparatus, Montage, Noise, Typography, and the Mechanized Stage

The idea of apparatus is introduced in the avant-garde not as normal equipment but as a certain re-education of the senses. *Chronophotography*, cinema, innovative sound recording, telecommunication, and mechanical reproduction altered the confidence with which a body could claim to perceive the world. However, the avant-garde did not merely accept this fracture, it turned fracture into a new experimental method. Figure 4, the celebrated eye-and-lens still from Vertov's epoch-making *Man with a Movie Camera*, supplies perhaps the most laconic formulation of this virtual method. The human eye is not replaced by the camera, it is rather invaded, doubled, and even disciplined by it evoking the spirit of Vertov's French surrealist contemporary Georges Bataille (*Histoire de l'œil* which appeared just before *Man with a Movie Camera*). Vision becomes a compound sensible organ mixing human flesh, glass, aperture, and montage. The figure condenses the Kinokis' (кино-оки) strong wager that the camera could disclose a world unavailable to unassisted perception, while also exposing the dynamic by which that disclosure is in fact finalized and manufactured (Vertov 1929; Benjamin 1936; Kittler 1999; Moholy-Nagy 1925).

If Vertov provides the physical optical organ of the avant-garde, Luigi Russolo and Ugo Piatti (Figure 5) offer one of its roughest acoustic machines. Russolo's *Intonarumori* were not quaint boxes for producing colorful noises, they were peculiar instruments designed to abolish the traditional hierarchy between music and urban-industrial sound. The crank, the horn, and the box make the modern city audible as constructed force. Noise here is not a random accident of modernity but an esthetic medium, while the act of listening is forcibly detached from the cultivated interiority of the normal concert hall. The image matters because it shows the avant-garde sound-object in its stubborn primary material minimalist poverty: wood, metal, mechanism, and above all semiotic provocation (Russolo 1913; Marinetti 1909; Moholy-Nagy 1947; Rutsky 1999).

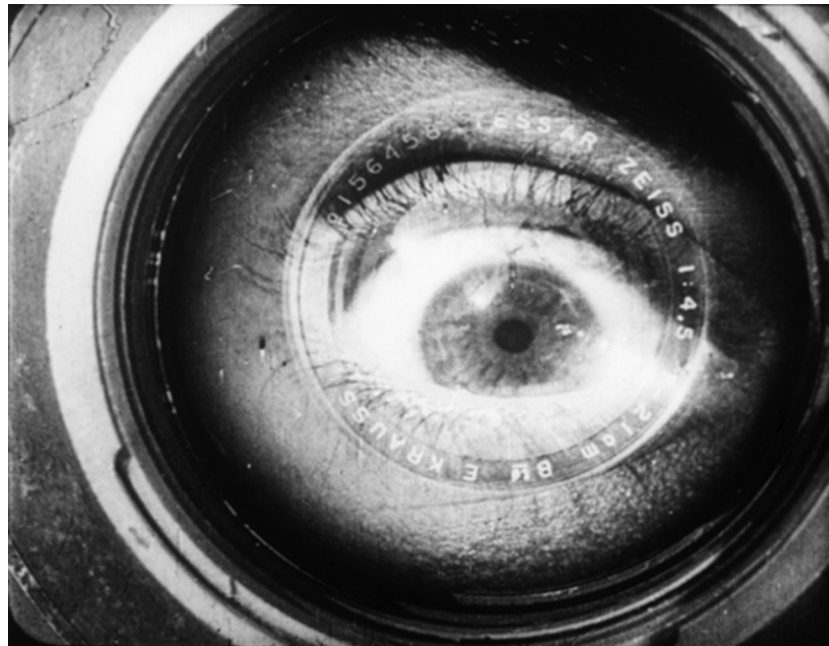


Figure 4. Vertov (1929), still from *Man with a Movie Camera*. Wikimedia Commons.



Figure 5. Luigi Russolo and Ugo Piatti in the Milan studio with the *Intonarumori*, 1913. Wikimedia Commons.

Figure 6 offers a certain suggestive typographic *analog* to Russolo's noise machines. Marinetti's famous *Zang Tumb Tumb* does not just symbolically represent newly augmented artillery, it allows the page to be reorganized by detonation. Letters are scattered, inflated, and forced into spatial relations that behave like trajectories rather than sentences. The book becomes a potential acoustic battlefield in which syntax is broken open by velocity, onomatopoeia, and visual pressure. The fact that this violence remains ludic as well as aggressive is crucial: Futurist typography is not an illustration of war but a technical method for producing a readerly body subjected to impact (Marinetti 1914; Apollinaire 1913; Huyssen 1986; Foster 1996).

Figure 7 proceeds from the page to the performing body *full of organs*. Hugo Ball's Cabaret Voltaire costume has often been treated as a suggestive comic relic, but its importance extends beyond this initial interpretation. The body is de facto immobilized or even encased, made somehow hieratic by a costume that is at the very same time priestly, solemnly mechanical, and above all absurd. The Dada performer appears as some kind of malfunctioning ritual device: neither actor nor machine, neither religious prophet nor theatrical puppet. The image renders visible form to a specifically avant-garde variation of a certain *anti-technology*: not a real escapist retreat from mechanism, but a quite grotesque mimicry of mechanized authority by a body that de facto refuses smooth functionality (Ball 1916; Bürger 1974; Poggioli 1962; Foster 1996).



Figure 6. F.T. Marinetti Zang, Tumb Tumb, 1912. (Marinetti 1914). Wikimedia Commons.



Figure 7. Hugo Ball in costume for a Cabaret Voltaire performance, Zurich, 1916. Wikimedia Commons.

The visuality of the Petro Martyniuk (Figure 8) represents an avant-gardist industrial fantasy: this is the artist's less known work titled 'The Overthrow of the Autocracy', a Ukrainian Soviet avant-garde specimen of the late 1920s–early 1930s. Its political drama is not reduced to any singular revolutionary incident, it is quite carefully engineered through constant visual pressure of color-collage optics. Red planes cut the pictorial field like revolutionary machines, searchlights convert darkness into an optical instrument of power, block letters behave as material objects rather than inscriptions, and the disciplined sailors at the lower right are caught inside a larger machinic choreography of beams, diagonals, engines, and silhouettes. Autocracy is not simply "overthrown" as an *ancien régime*, it is optically dismantled, divided into fragments, exposed to further projection, and reassembled as the negative matter of a new revolutionary form of visibility. The painting's importance for our ongoing discussion lies in this ontological conversion of politics into a technical scene of perception. Martyniuk does not add machines to revolution as automatic emblems of some abstract social progress. He makes the idea of revolution itself appear as a montage-apparatus: a nocturnal laboratory in which light, typography, industrial architecture, military discipline, and urban energy become mutually translatable forms of hidden force. The result is neither naive propaganda nor detached formalism, but a volatile technopolitical poetics in which Ukrainian and Soviet avant-garde formations meet the problem of how history can be made visible as a technical operation (Zlydneva 2026; Buck-Morss 2000; Tupitsyn 1992; Ioffe 2011).



Figure 8. Petro Martyniuk, *The Overthrow of the Autocracy*, 1929–1930. Wikimedia Commons.

Figure 9 represents Boris Grigoriev's canonical Portrait of the Russian world-famous avant-garde director Vsevolod Meyerhold, which could be in some sense regarded as one of the most incisive visual documents of the pre-revolutionary theatrical avant-garde where radical experimentation was usually proudly performed. Grigoriev does not offer a realistic likeness in the conventional portraitist's sense. He stages Meyerhold as some sort of a vertical mechanism of theatrical self-invention: the immaculate white shirt, the black tailcoat, the raised arm with the white glove, the elongated feet, and the almost marionette-like attenuation of the body transform the director into a figure suspended between dandy, magician,

puppet-master, and instrument. Behind him stands the strange, costumed double—a hunter, but also a Harlequin, or displaced stage-mask—whose bow and chromatic violence turn the portrait into a miniature mise-en-scène as if it were part of a performance. The image appears already *biomechanical* before Meyerhold’s biomechanics formally receives its later systematic vocabulary and institutional recognition. Gesture is not the expression of an inward soul, it is possibly the external architecture of theatrical meaning. The body is gradually drawn into costume, pose, rhythm, and counter-pose, while the portrait itself becomes a weird machine for producing new theatrical regime. In this sense, Grigoriev’s Meyerhold belongs in the context not merely because it depicts a major experimental director, but because it visualizes the avant-garde stage as a perpetual technology of corporeal estrangement in a Formalist sense (Ioffe 2025b): the performer does not “represent” life but in a way manufactures a new legibility of movement under the implicit pressure of form (Meyerhold 1922; Arefyeva 2026; Buckley 2000; Bürger 1974).



Figure 9. Boris Grigoriev, Portrait of Vsevolod Meyerhold, 1916. Wikimedia Commons.

Expanding our discussion, Tatlin’s Monument to the Third International (Figure 10) further develops a comparable logic towards the non-realized architectural reality of the avant-garde. This image never functions as merely a documentary, since the tower’s historical power depends on its existence as a tentative model, reproduction, and constant theoretical provocation. Its spiraling structure transforms revolutionary politics into some sort of kinetic oscillation and inclination, its tilted axis makes the building behave like a cosmological instrument rather than an administrative headquarters. Yet the Tower also exposes the avant-garde’s grand issue: its most technologically remarkable object may be the one

that remains unrealized, surviving as a technical demand placed upon history rather than as a completed utilitarian fact (Bowlit 2026; Lodder 2026; Bowlit 2022; Lodder 1983).

These images may potentially clarify why the Russian Formalist concept of the *device* remains ever so indispensable (Ioffe 2025b). The *device* is certainly not an ornament, writing trick, or surface procedure; it is an operation by which art interrupts automatized perception and compels *form* to become newly perceptible (Ioffe 2023, 2025b). Technology in the avant-garde is therefore never reducible to the machine as subject matter. It is a method of cultural interruption, segmentation, and, as a result, estrangement and reassembly. Shklovsky's own artistic prose often behaves like the very devices it describes: angular, delaying, structurally perverse, and resistant to the smooth consumption of meaning (Ioffe 2025b; Shklovsky 1917, 1990; Jakobson 1956; Janecek 1996).

The body is the most delicate site of this technical reassembly. Alexei Gastev's Central Institute of Labor imagined work as rhythm, blow, posture, and standardizable gesture. Before that Frederick Taylor supplied the theory that a meaningful labor-action could be disassembled into measurable units. Meyerhold's avant-gardist biomechanics later conceptually absorbed this approach and artistically further challenged it. Its actor is not a factory part but a performer of technical form, it is a body that plays mechanization rather than merely automatically obeying it. In this divergence, early Soviet modernism reveals one of its strongest inner tensions: labor as emancipation versus labor as discipline; the body as collective instrument versus the body as theatrical intelligence (Gastev 1923; Taylor 1911; Meyerhold 1922; Simmons 2026).



Figure 10. Vladimir Tatlin, Monument to the Third International, 1919–1920. Wikimedia Commons.

3. (Inter)National Constellations and the Avant-Garde Stasis

The European avant-garde was never a real monolith. It operated through local catastrophes, multilingual borrowings, polemical mistranslations, small magazines, exhibitions, theaters, workshops, factories, and unrealized plans. France offered the resources of Cubism, typographic modernity, and ironic *anti-machinism*; Italy gave the machine a

militarized eroticism of speed and noise; Germany and Central Europe developed the dialectic of Bauhaus minimalist rationality and Dadaist sabotage; Britain, more suspicious and elegiac, often grasped technology through the melancholy aftermath of its tragic but grandiose Industrial Revolution, while Russia and the Soviet Union transformed nearly every technical metaphor into a question of revolutionary social anthropology (Ioffe 2011; Apollinaire 1913; Marinetti 1909; Moholy-Nagy 1925; Huyssen 1986).

The papers included in the *Arts* Special Issue enter this field not as automatic illustrations of some artificially crafted single thesis but as a deliberately uneven constellation of technocultural problems and questions. Collectively, we sought to establish the *status quaestionis* concerning the complex relationship between technē and modernism in its most radical forms. John Bowlt's reading of Tatlin and the absurd is especially enlightening because it rescues the technological avant-garde from solemnity: Tatlin's machines are not only utopian instruments but also objects in which functionality, theatricality, and comic excess become impossible to separate. Christina Lodder's subsequent original study of Tatlin's transition from the technological to the organic sharpens the same problem from another angle, showing how "technology" itself becomes unstable once energy, movement, body, and material are treated as mutually translatable. Alexandros Dimosthenis Protopappas's long-read Leonidov article, in its turn, provides the architectural vision with a certain instability: geometry floats, icons return in secularized form, and Constructivist space becomes a metaphysical spectacle rather than a merely functional scheme (Bowl 2026; Lodder 2026; Protopappas 2026; Icin 2026).

Other contributions in our volume powerfully shift attention from historical monumental form to body, labor, gender, and temporal discipline. For example, Anastasia Arefyeva's detailed analysis of Meyerhold's biomechanics situates and contextualizes actor training as an *anthropotechnical method* for manufacturing new subjectivity, while Natalia Zlydneva's study of body-machine antinomies tracks the moment when the mythopoetic machine-human yields to the more ominous organism-machine of the late 1920s; Simmons's work on women workers and the factory workbench shows how gendered emancipation was imagined through tools, benches, and mechanized labor. Serguei Oushakine's monographically ground-breaking essay on *thingful time* meticulously reconstructs early Soviet *chronization* as a material and administrative reworking of futurity itself (Arefyeva 2026; Zlydneva 2026; Simmons 2026; Oushakine 2026).

The literary and philosophical essays of our collection widen the same map of experimentation. The late Willem Weststeijn's learned Khlebnikoved article returns the fourth dimension to its poetic versus mathematical context while Michaela Böhmig's current as well as earlier work remains crucial for understanding the philosophy of hyperspace around the cubo-futurist centrality of Khlebnikov; Skrodzki, Lipschütz, Reitebuch, and Polthier provide the mathematical reconstruction of the Laws of Time; and Alexandrova's work on Ouspensky and Matiushin supplies the missing esoteric-artistic hinge (Weststeijn 2026; Böhmig 1996; Skrodzki et al. 2020; Alexandrova 2025). Mikhail Odesskiy and Monica Spivak's detailed study of Andrei Bely brings science and technology into a darker anthroposophical genealogy. Henrietta Mondry's science-fiction essay turns surgical bodily transformation and Fedorovian futurity into a technic of speculative flesh while Sascha Bru analytically treats avant-garde oeuvres as unique time machines. Along with that Valetina Parisi makes Ivo Pannaggi legible between mechanical art and Constructivism (Odesskiy and Spivak 2026; Mondry 2026; Bru 2026; Parisi 2026).

Our volume also proposes that technique is not always synonymous with machinery in a narrow sense. Astvatsaturov & Dviniatin's bridge-construction erudite essay places Mayakovsky and Henry Miller within a cross-cultural engineering of literary passage, while Lyubov'Khachaturian's study of Kruchenykh's "lit-recycling" treats handwritten time and recycled textual matter as technical modes of avant-garde survival. Kazartsev

and Kirichenko powerfully demonstrate that traditional versification, far from being simply abolished, could be instrumentalized as a hidden technology of poetic renewal. The result is a collective work in which technology appears as body-training, graphic force, temporal arithmetic, recycled paper, acoustic disturbance, poetic meter, ideological infrastructure, and metaphysical architecture (Astvatsaturov 2026; Khachaturian 2026; Kartzartsev and Kirichenko 2026; Ioffe 2025a).

What actually binds these essays together is not just a shared context and period label but perhaps a programmatic refusal of any definitive finalizing interpretative flattening. The avant-garde is not a style placed on top of the modern world. Rather, it is a procedural way in which the modern world becomes operable and therefore vulnerable to the idea of experiment (Ioffe 2011). Its machines are often useless; its plans are often unbuilt; its poems are often semantically unruly; and its bodies are often theatrical rather than efficient. Yet precisely in these “failures” the avant-garde discloses the cultural truth of technology: the technical object is never merely technical, since every apparatus carries a theory of perception, a model of the body, a social rhythm, and a politics of futurity (Ioffe 2011; Ioffe and White 2012; Buck-Morss 2000; Rutsky 1999).

4. Hyperspace, Projection, and Fourth-Dimensional Perception

The fourth dimension entered avant-garde milieu not as a single clear-cut doctrine but rather as a permanently traveling heuristic disturbance crossing mathematics, occultism, philosophy, popular science, literature, and pictorial experiment. Before it became a recognizable modernist *topos*, several habits had already prepared its reception: perspective had ceased to appear as an automatic transcription of nature, seriality had begun to serve as a way of giving duration a visible structure, and geometry had become increasingly detachable from ordinary spatial intuition. Nineteenth century newly developed mathematics supplied decisive conceptual openings, but the avant-garde transformed them into perceptual scandal and poetic method (Monge 1799; Grassmann 1844; Riemann 1867; Schläfli 1901). Its wider philosophical horizon also included the late nineteenth-century rethinking of geometrical foundations and the popularization of non-Euclidean possibility as a problem for ordinary cognition (Russell 1897; Klein 1928; Manning 1910; Robbin 2006).

With Figure 11, we observe Jouffret’s famous diagram from the *Traité élémentaire de géométrie à quatre dimensions*, is valuable precisely because it is not a conventional artwork. Its lines potentially represent austere pedagogical tools, also containing a certain visual logic that would later become artistically explosive: the higher-dimensional object is never directly present; it appears through projection, section, diagram, and disciplined impoverishment. The avant-garde inherits this diagrammatic humility and turns it into audacity. What cannot be seen in ordinary space can nevertheless be made operative through formal convention (Jouffret 1903; Henderson 1983; Robbin 2006; Volkert 2018).

Hinton’s tesseract frontispiece (Figure 12), provides the same problem with a more explicit pedagogical form. Hinton does not merely force the reader to believe in the fourth dimension; he designs exercises for training an inner sight capable of moving among serial views. The image thus belongs to the prehistory of avant-garde abstraction not because it looks like painting, but because it teaches viewers to treat every given image as a partial and disciplined reduction of a richer structure. Vision becomes an exercise rather than a possession (Hinton 1886, 1904; Bragdon 1913; Manning 1910).

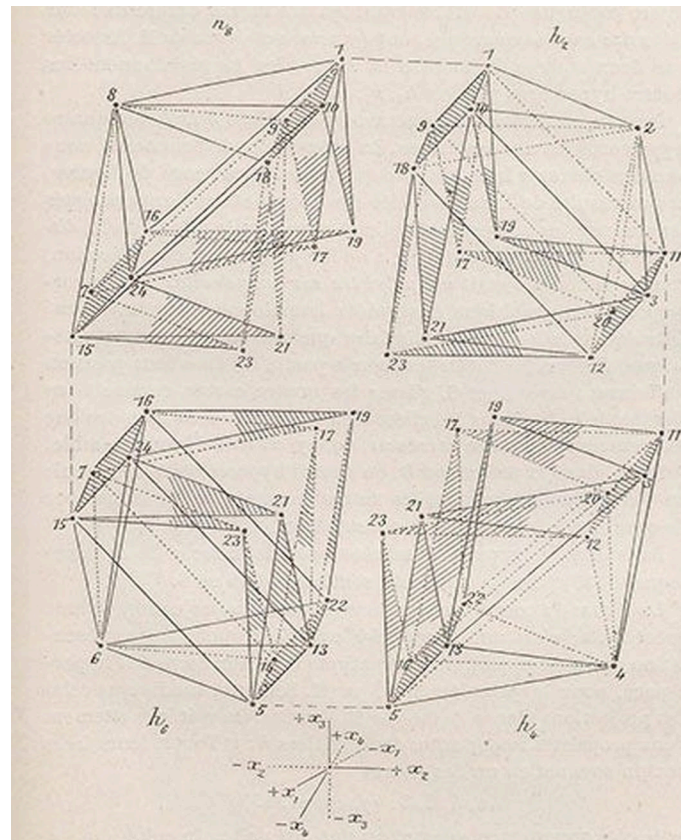


Figure 11. Jouffret (1903), diagram from *Traité élémentaire de géométrie à quatre dimensions et introduction à la géométrie à n dimensions*. Public domain.

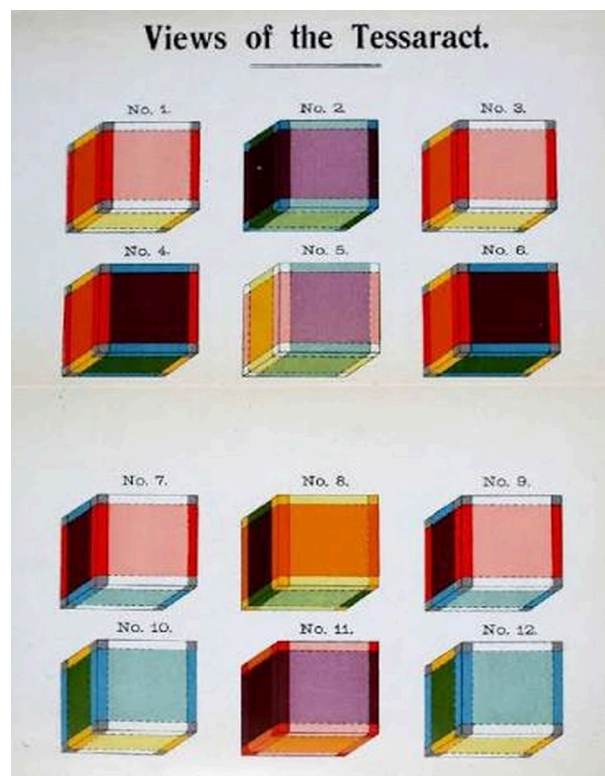
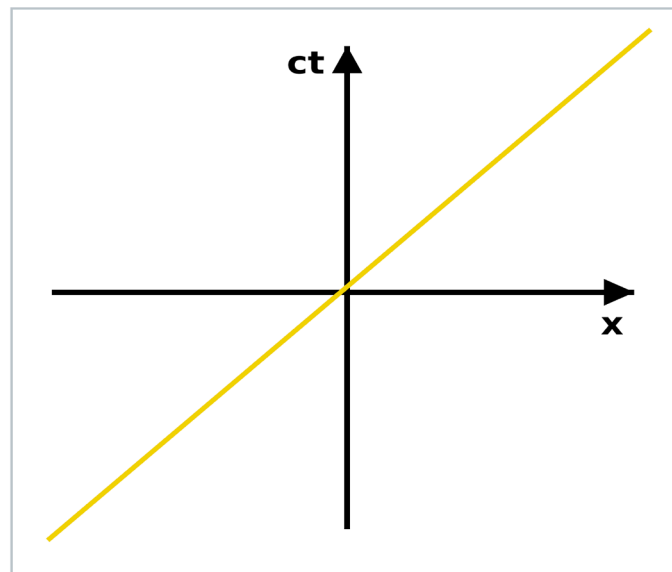


Figure 12. Frontispiece to Hinton (1904), *The Fourth Dimension*, London: Swan Sonnenschein; New York: John Lane, illustrating serial “views” of the tesseract. Wikimedia Commons.

Dealing Figure 13, we discuss the Minkowski-style spacetime diagram that symbolizes the moment when four-dimensional thinking gained a new scientific authority. Its austerity appears quite deceptive. A line on the page becomes a world line, an event becomes a coordinate, where duration is no longer merely the invisible condition of experience but a dimension to be plotted. This does not mean that avant-garde artists simply “illustrated relativity”, a crude formula that various scholarship has rightly complicated. It means rather that the cultural legitimacy of four-dimensional thinking intensified at the very moment when artists were already breaking the single viewpoint (Einstein 1905; Minkowski 1909; Weyl 1918; Eddington 1920).



The world line (yellow path) of a photon, which is at location $x = 0$ at time $ct = 0$.

Figure 13. Schematic Minkowski-style spacetime diagram: a two-dimensional graph representing one spatial coordinate and one temporal coordinate. Wikimedia Commons.

Figure 14 represents the title page of Abbott’s groundbreaking *Flatland*, which adds a literary dimension to what we may define as *pedagogy of the unseen*. Abbott’s novella is not simply some witty geometrical fable. It powerfully stages dimensionality as an ethical and social problem: a world may be imprisoned not by walls but by the form of intuition it playfully mistakes for some sort of empirical reality. This is why *Flatland* mattered deeply to modernist and avant-garde collective imaginaries. It aesthetically translated the problematics of fourth dimension from technical abstraction into narrative metaphysics, making cognition itself theatrical (Abbott 1884; Wells 1895; Pawlowski 1912; Gamow 1939).

Ouspensky’s groundbreaking *Tertium Organum* (Figure 15) brings this (multi)dimensional philosophy into explicitly esoteric territory. Ouspensky’s time is not simply a fourth coordinate, but the mark of ordinary consciousness trapped in multidimensional sequential perception. He defines duration as a lower-dimensional slicing of a larger order, thereby turning geometry into a metaphysics of new forms of human consciousness. The cover image appears rather laconic and modest, but the book’s cultural effect was quite immense: it made the fourth dimension readily available to artists not only as pure mathematics but as disciplined mental speculation about invisible, yet existing (other) reality, spiritual evolution, and the inadequacy of empirical direct sight (Uspenskii 1909; Ouspensky 1920; Zöllner 1880; Leadbeater 1903).

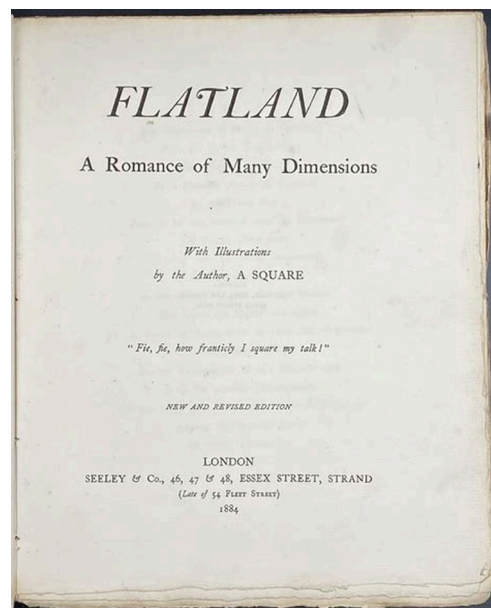


Figure 14. Abbott (1884), *Flatland: A Romance of Many Dimensions*. Wikimedia Commons.

The religious and occult inflection of four-dimensional discourse should not be dealt as some contradictory embarrassment, potentially external to modernism and its main innovative ideas. It belongs to the same historical formation as the experimental concepts of laboratory, the graph, and ultimately, the machine. Steiner's important lectures on the fourth dimension, Leadbeater's celebrated astral visuality, and the common theosophical traffic between mathematics and invisible worlds all in their turn helped to create a cultural environment in which abstraction could critically claim to disclose new essences rather than merely decorate something already existing in nature. Kant had famously defined time as *the a priori form* of inner intuition and then Ouspensky re-described it as just a formal or traditional limit of consciousness that might be further widened. Between these two different positions, the avant-garde discovered a vast speculative territory (Kant [1781] 1787; Steiner 1921; E'temadinia 2012; Alexandrova 2025).

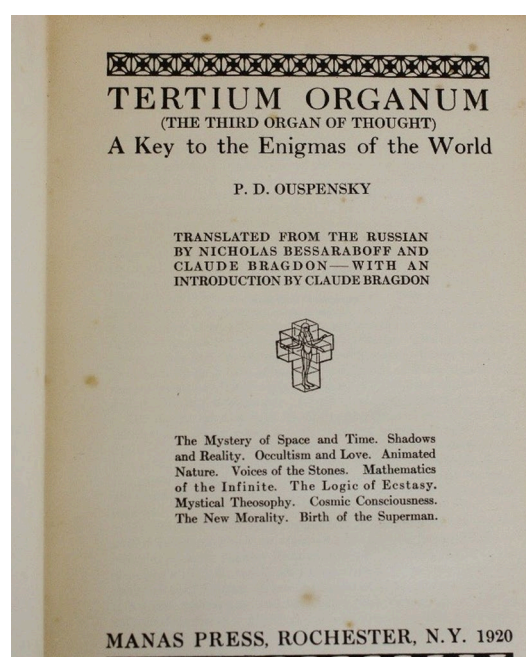


Figure 15. Ouspensky (1920), *Tertium Organum: The Third Canon of Thought*, Rochester, NY: Manas Press. Wikimedia Commons.

5. Picturing and Sculpting Time: Cubo-Futurism, Velimir Khlebnikov, and the the Invisible

“...Now faith is the substance of things hoped for, **the evidence of things not seen**. For by it the elders obtained a good report. Through faith we understand that the worlds were framed by the word of God, so that things which are seen were not made of things which do appear.”

—Hebrews 11:1–3

If hyperspace diagrams taught artists to meaningfully work with projection and section, chronophotography offered them to treat duration as independent material *sui generis*. Muybridge's *Nude Woman Throwing a Bucket of Water* (Figure 16), does not yet belong to the avant-garde art *per se*, but it supplies one of the operative preconditions of avant-garde temporality. A single action is dissected into phases, and the body is converted into a sequence that can be studied, recomposed, and esthetically violated. The image is therefore best read not as a documentary precursor but as creative technical grammar of temporal physical decomposition that Futurism, Cubism, and cinema would later radicalize in their own artistic idiomatic formulations (Muybridge 1887; Bergson 1922; Flusser 1983; Zielinski 2006).

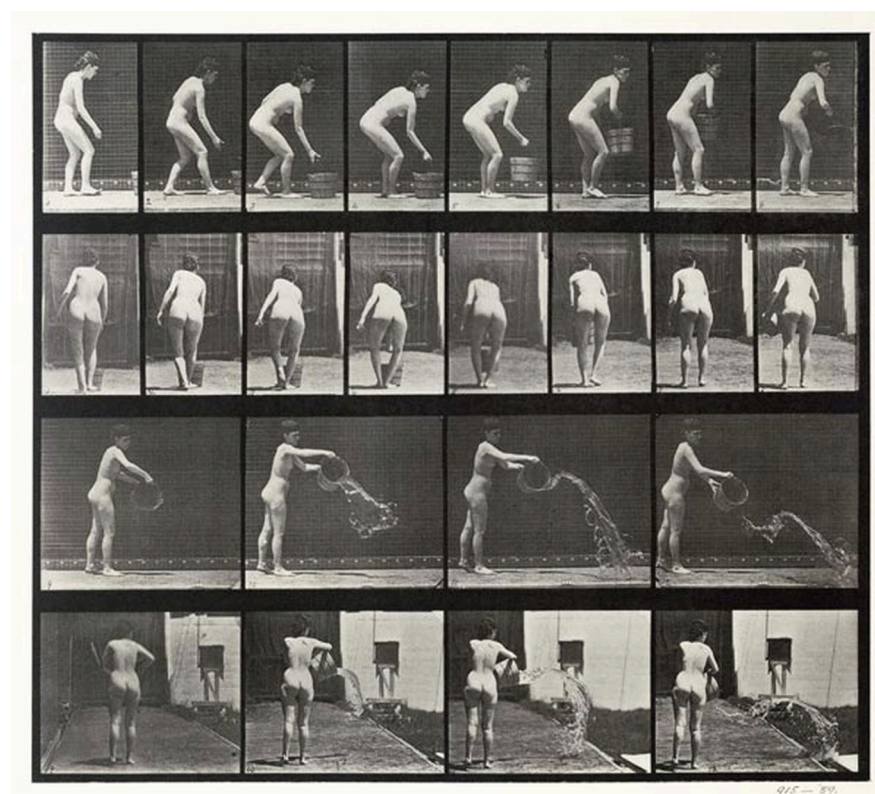


Figure 16. Eadweard Muybridge, *A Nude Woman Throwing a Bucket of Water*, plate 401 from *Animal Locomotion*, 1887. Wikimedia Commons.

Duchamp's epochal *Nude Descending a Staircase, No. 2* (Figure 17), is the painterly response to that peculiar creative grammar of new art. The figure is not a body represented in motion: rather it is motion which has gradually *consumed* the body and left behind a scaffolding of several phases. The known scandal of the painting is located in its refusal to respect either anatomical integrity or the stillness traditionally demanded by the easel picture. Duchamp playfully collapses sequential instants into a single visual consequential apparatus, in the end producing a symbolic body made of the mixture of delay,

repetition, and above all profound mechanical irony (Duchamp 1912; Boccioni 1914; Robbin 2006; Henderson 1983).



Figure 17. Duchamp (1912), *Nude Descending a Staircase, No. 2*, Philadelphia Museum of Art. Wikimedia Commons.

Boccioni's *Unique Forms of Continuity in Space* (Figure 18), assigns Futurist temporality new forms of sculptural density. The figure seems eroded and produced by speed at the same time; its surfaces behave like force-lines, and its anatomy is less a closed organism than a residue of passage. Here the fourth dimension need not be a literal hypercube. It is the ambition to make continuity visible, to turn movement into mass, and to let the body become aerodynamic rhetoric (Boccioni 1914; Marinetti 1909, 1914; Rutsky 1999).

Figures 19 and 20, Metzinger's *Nu à la cheminée* and Gleizes's *Portrait de l'éditeur Eugène Figuière*, explain why Mikhail Matiushin's 1913 Russian translation of parts of *Du "Cubisme"* mattered so profoundly. Cubism was not merely a popular style of faceted surfaces, it gradually became perhaps a holistic theory of distributed viewpoints and analytic reconstruction. In the Russian context, these French propositions entered a field already saturated by Ouspenskian experimental hyperspace, Symbolist multiple invisible worlds, and Futurist transrational forms of language. The image becomes a true arena in which visible form was tested against the possibility of dimensions that ordinary seeing cannot fully command (Gleizes and Metzinger 1912; Apollinaire 1913; Matiushin 1913; Böhmig 2015).

Mikhail Matiushin's *Geometrization of Space* (Figure 21) showcases not an ordinary decorative abstraction but something that we term as indigenous Russian aesthetic answer to the issue of trained hyperspatial seeing. The crystalline lattice, layered planes, and suspended blue geometries make space appear as something cut, folded, and internally refracted. If Hinton's tesseract instructs the mind to pass through serial views, Matiushin offers a painterly suggestive atmosphere in which space itself seems to be thinking through the viewer. The image belongs to the same horizon as *Victory over the Sun* and the broader Cubo-Futurist desire to overthrow linear ocular realism (Matiushin 1913; Alexandrova 2025; Böhmig 2015; Ioffe 2025a).



Figure 18. Umberto Boccioni, Unique Forms of Continuity in Space (Forme uniche della continuità nello spazio), 1913. Wikimedia Commons.



Figure 19. Jean Metzinger, Nu à la cheminée, 1910. Wikimedia Commons.

Self-Portrait Crystal (Figure 22) does not portray Matiushin's likeness so much as dismantle the mimetic accustomed tradition of likeness. The organic body has become a faceted sensorium: a kind of unstable polyhedron whose planes gather, refract, and redistribute color. One may decipher the radiating wedges not necessarily as more familiar Cubist anatomy but as new vectors of aesthetic reformation of attention, converging upon and departing from a perceptual nucleus. The pale ground makes this crystalline organism appear somehow postponed or suspended, less a person than an instrument being calibrated for another spatial order. Here the discussed *tékhnē* is neither craft nor real self-sufficient technology in the strict instrumental sense, it is possibly a remaking of the

perceiving subject. Matiushin's exploration of the Fourth Dimension begins more or less at this peculiar frontier threshold, where the inherited eye proves inadequate and must be experimentally reconstructed. The innovative self-portrait therefore stages avant-garde modernity as unfinished anthropogenesis: humanity has not yet acquired the organs required by the cosmos it has begun to intuit. Painting becomes both laboratory and metamorphic exercise, developing a future body through color exercise.



Figure 20. Albert Gleizes, *Portrait de l'éditeur Eugène Figuière*, 1913. Wikimedia Commons.



Figure 21. Mikhail Matiushin, *Geometrization of Space (Crystal)*, 1919. Wikimedia Commons.

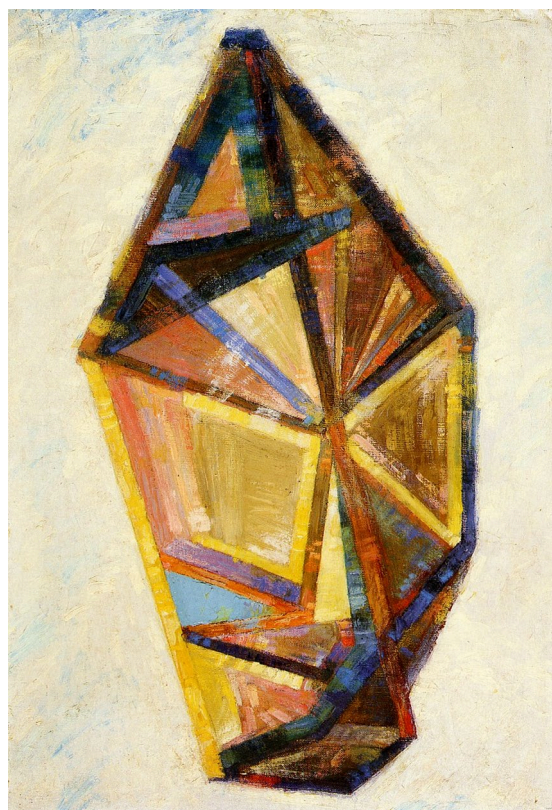


Figure 22. Mikhail Matiushin, Self-Portrait Crystal, ca. 1919. Wikimedia Commons.

In *Non-Objectivity: Crystallization in Space* (Figure 23), space is not a receptacle, but an active pictorial field as if caught in the act of generating new form. Curves, beams, wedges, apertures, and architectural fragments collide around a pointed axial structure, as though three-dimensional reality were being pierced by a “new perpendicular” arriving from elsewhere. The central cone appears projected, rotated, and unfolded, it behaves not as an object but more like the visible residue of an operation performed in some unknown hyperspace. This is why the painting’s disorder is exacting rather than chaotic: each fragment registers a different temporal-spatial cut through one continuous event. Matiushin’s continuing exploration of aesthetic *tékhne* here is projective and implicitly cosmological. It does not directly imitate the world around us but tests the conditions under which another unseen world might become perceptible. Crystallization names a temporary arrest within flux, a moment when invisible energies precipitate into coloured structure. The canvas offers no concrete or completed cosmos, only one of the possible potential realities undergoing experimental reassembly in front of the viewer.

Movement in Space (Figure 24) in fact almost totally abandons the discrete object altogether and submits painting to a radical experiment, posing a silent question: can color itself disclose the temporality of space? The diagonal bands do not lie beside one another. They advance, recede, accelerate, and thicken through reciprocal pressure; each hue is altered by its neighbor and by the environmental field. The image is therefore not a spectrum but a chromatic event, a condensed record of differential velocities. Matiushin’s distinction between *active* color, *environmental* color, and the *mediating interval* is already operative here, converting the canvas into an apparatus for testing relational perception. I would call this cosmic mechanics without presence of real machines. Its technology seems more physiological: the spectator’s eye must adapt to register peripheral motion, afterimage, vibration, and unstable adjacency. The Fourth Dimension emerges not as a pictured destination but as an acquired capacity for simultaneity. In this sense, avant-garde

modernity remains unfinished because its construction is dependent on what we are able to see and our abilities to deal with radical abstraction.



Figure 23. Mikhail Matiushin, Non-Objectivity Crystallization in Space ca. 1915–1917. Wikimedia Commons.



Figure 24. Mikhail Matyushin, Movement in Space, ca. 1919–1921. Wikimedia Commons.

Another example of the same approach is Matiyushin's well-known *Haystack in Lakhta* (Figure 25). Executed in gouache and watercolour on paper, the work embodies a certain culmination of artist's innovative theory of "expanded vision", effectively deconstructing the traditional landscape as if perceived through the virtual prism of a new mode of plastic spatial awareness.

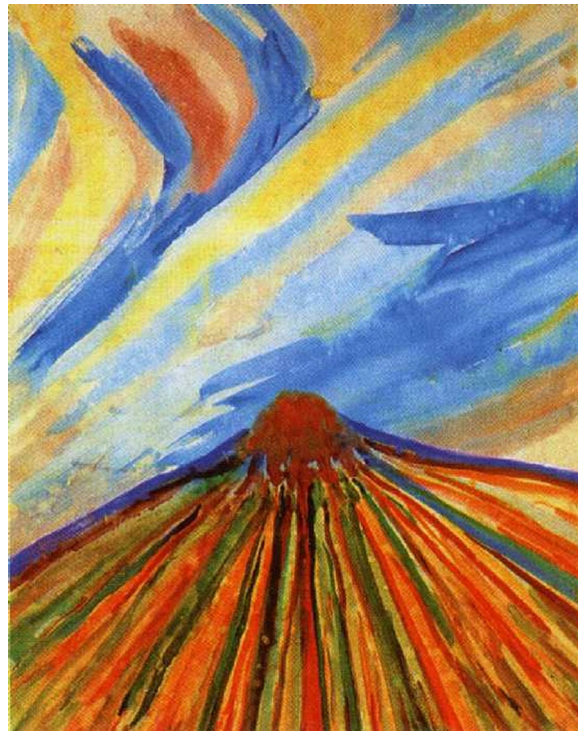


Figure 25. Mikhail Matyushin, Haystack in Lakhta, ca. 1921. Wikimedia Commons.

Continuing the same heuristic tradition, Figures 26–28 showcase how Max Weber’s renowned *fourth dimension* enters into an American–Russian Cubist experimental idiom of compression, urban intensity, and performative rhythm. Interior of the Fourth Dimension turns space into a pressure chamber of angular depth; Russian Ballet converts dance into chromatic and planar simultaneity; and Rush Hour treats the modern city as a pile-up of mechanical tempos and pedestrian velocity. Weber’s images are valuable here because they demonstrate how the fourth dimension could pass from mathematical speculation into a general pictorial permission to bend the visible world until it confessed its temporal congestion (Weber 1910; Henderson 1983; Robbin 2006; Volkert 2018).

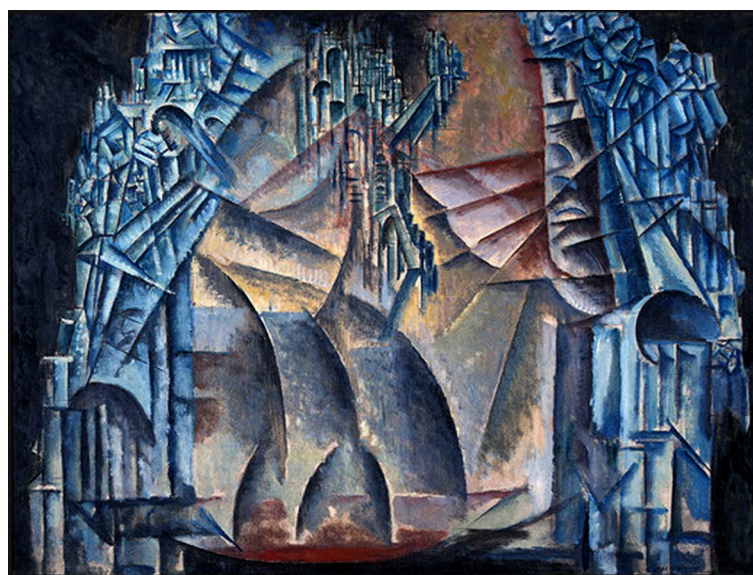


Figure 26. Max Weber, Interior of the Fourth Dimension, 1913. Wikimedia Commons.



Figure 27. Max Weber, Russian Ballet, 1916. Wikimedia Commons.

Figure 29 brings the very famous photograph of the 0.10 Russian Avant-Garde exhibition, introducing the institutional scene of Malevich's Suprematist condition. The epochal Black Square, as was often observed in its time, occupies the so-called “red corner”, the traditional place of the Orthodox holy icon in the Russian home, and thereby turns geometric abstraction into a more polemical domain of sacred technologies. The exhibition wall appears not as a neutral display surface, it turns into a new spatial argument about how an image commands belief or discourse in a more general sense. This figure clarifies why the question of technology in the avant-garde cannot be fully separated from the traditions of liturgy, icon, and ubiquitous metaphysics: the new image becomes *technical* precisely because it de facto reconstructs the conditions under which the act of seeing becomes *assent* (Malevich 1916; Protopappas 2026; Henderson 2018; Ioffe 2025b).



Figure 28. Max Weber, Rush Hour, 1915. Public-domain.



Figure 29. The Futurist Exhibition 0.10, Petrograd, 1915–1916, with Malevich's Suprematist works including Black Square in the upper corner. Wikimedia Commons.

In this context, Figure 30, Piet Mondrian's universally famous Composition of 1914, represents a different but related route toward *invisible order*. Its pale grid and muted planes do not dramatize the machine, they subdue it into some kind of proportional discipline. Mondrian's fourth-dimensional theoretical thinking does not represent a real Futurist velocity but rather the search for a pictorial order in which vibration, equivalence, and universal relation might become visible within a certain artistic pattern. The work implores the viewer to accept abstraction as a dominant cognitive instrument, not as mere reduction of other available devices (Baljeu 1968; Ubink 1918; Kruger 2007; Volkert 2018).



Figure 30. Piet Mondrian, Composition, 1914. Wikimedia Commons.

Malevich's decision to create a certain black window (Figure 31) into the *other world* represents, in its own turn, a possible paraphrase of the fourth dimension. In parallel, Wassily Kandinsky (Figure 32) and Ilya Chashnik (Figure 33) introduced their own cosmic dimensions into their suggestive representational mechanics.

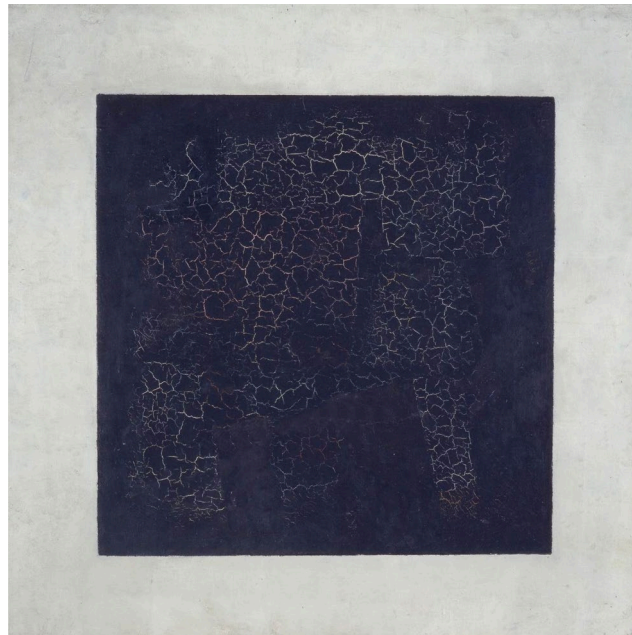


Figure 31. Kazimir Malevich, Black Square, 1915. Wikimedia Commons.



Figure 32. Wassily Kandinsky, Several Circles (Einige Kreise), 1926. Wikimedia Commons.

Wassily Kandinsky's *Composition VI* (Figure 34), returns the invisible to turbulence. Unlike Mondrian's measured relational field, Kandinsky chooses to visualize radical catastrophe, vibration, and apocalyptic movement as a new chromatic event. The painting is quite central in this respect because it denies the problematic choice between technical modernity and spiritual aspiration. Its formal violence is no less constructed for being ecstatic; its spiritual rhetoric is no less modern for being anti-naturalistic. In Kandinsky, as in much of the avant-garde, invisible worlds become thinkable through the disciplined deformation of visible form (Kandinsky 1912; Henderson 2018; Ioffe 2025a, 2025b; Adorno 1970).

Russian (Cubo)Futurist Velemir Khlebnikov radicalizes this entire virtual domain by relocating the fourth dimension from its familiar visual hyperspace into some temporal arithmetic. His celebrated "Laws of Time" and "Boards of Fate" (*Законы Времени и Доски Судьбы*) proceed from the conviction that history is not necessarily a linear procession but

a semiotic system of recurrent waves, integer relations, and fateful periodicities. Dates become symbolic movable (calculated) coordinates for wars, uprisings, catastrophes, and irruptions of genius; these events “rhyme” across intervals, and poetic intuition claims the right to become a form of computation. Whatever the scientific status of these calculations, their cultural importance is immense: they make the poet an engineer of temporality, not a decorator of experience (Weststeijn 1995, 2026; Dahlström 2001; Imposti 2018).

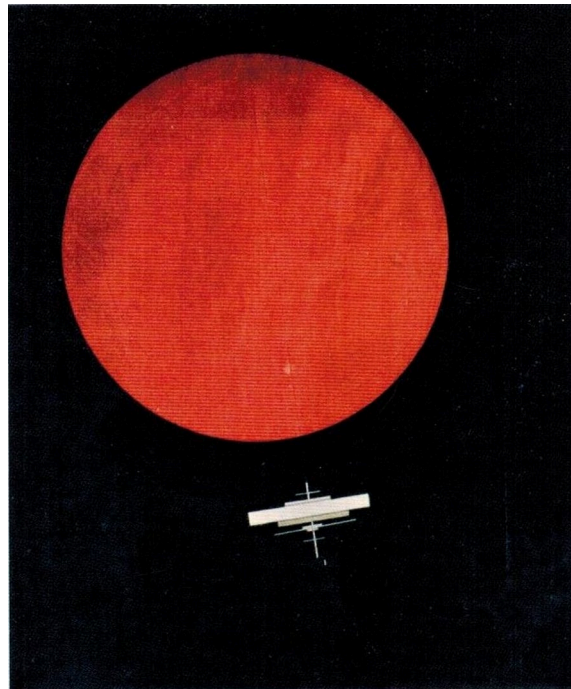


Figure 33. Ilya Chashnik, Red Circle on a Black Surface 1925. Wikimedia Commons.



Figure 34. Wassily Kandinsky, Composition VI, 1913. Wikimedia Commons.

Comparing Velimir Khlebnikov’s philosophical and artistic views with his fellow colleagues of the same cultural milieu, the point is not that Khlebnikov was “mathematically correct” in any narrow positivist sense. The issue is rather that his entire personal aesthetic project reveals a specifically avant-garde epistemology in which mathematics, myth, language, and cosmology enter a single field of exploratory labor. Khlebnikov does not simply imitate science, he re-poeticizes its initial intellectual authority. Nor does he

automatically return to Symbolist transcendence while he submits transcendence to calculation, number, and verbal experiment (Ioffe 2011). Khlebnikov's own fourth dimension is consequently not an elsewhere but an operator: a cosmic principle by which time becomes decipherable, history becomes rhythmic and partially verbal composition, and futurity crates a domain of speculative construction (Skrodzki et al. 2020; Oushakine 2026; Böhmig 1996; E'temadinia 2012).

6. Discussing the Unfinished Tékhne and the Virtual Afterlife of Avant-Garde Experiment

The central heuristic argument of this introductory essay may be gathered into a concluding remark about the Avant-garde's most consequential technological experiments which were seldom those that most efficiently served a real working technical end (Ioffe 2011). They were the imaginary projects, unit devices, performances, diagrams, poems, and unrealized constructions that forced the very idea of technical efficiency into crisis. Tatlin's tower was not built, his *Letatlin* did not massively conquer the air, Khlebnikov's universal laws of Time did not become a real predictive science while the Intonarumori did not found a stable musical industry. At the same time Dada grotesque performance or Meyerhold's innovative Biomechanics did not produce a durable *theater of machines* or bodily behaviour, while Suprematism did not eventually become a true universal language of communal aesthetic perception in any conceivable semiotic sense (Ioffe 2025b).

Yet to name these projects as *technical failures* would be to blindly mispresent the kind of artistic knowledge they de facto produced. Their perceived failure is in fact an embedded part of their very epistemic form. They disclose the interval between what a culture can technically imagine and what its institutions, materials, and political structures can possibly bear (Poggioli 1962; Habermas 1980; Bürger 1974; Adorno 1970).

This implicit interval is the true site of *unfinished modernity*. Habermas's theoretical formula remains useful only if it is somehow rescued from its hidden bureaucratic optimism. Modernity is not per se always unfinished because the avant-garde merely failed to complete a rational program, nor because postmodern culture abandoned an Enlightenment prophetic promise of permanent amelioration of our civilization. It is unfinished because every technical operation generates unexpected residues that cannot be fully administered: perceptual shock, bodily ambivalence, comic surplus, spiritual return, semantic opacity, political violence, esthetic uselessness, and archival fragility. The avant-garde(s) understood this before most theories of technology did. It grasped that the apparatus does not simply solve problems; it manufactures new forms of visibility, new bodily regimes, new desires for transcendence, and new comedies of malfunction (Heidegger 1954; Simondon 1958; Latour 1991; Winner 1986).

All this is aimed to illustrate why our volume refuses the possible strategy of dividing the avant-garde into *technophilia* and *technophobia*. The Italian Futurist mighty right-wing engine, the Russian Constructivist left-wing blueprint, the Bauhaus universal workshop, the Dada costume, the Suprematist square, the OBERIU-like comic systemic devices, the chronophotographic sequence, the fourth-dimensional diagram, and the biomechanical body do not line up along a single axis of praise or condemnation. They establish a powerful field of competing technical imaginaries. Some are ecstatic, some evidently satirical, some politically disciplinary, some emancipatory, some metaphysical, some violent, and some tenderly absurd. What they share is the ultimate conviction that art must no longer merely represent or reflect a modern world already made elsewhere. Art must enter the workshop of *world-making* itself (Marinetti 1909; Lodder 1983; Huyssen 1986; Foster 1996).

The papers assembled in this Special Issue of *Arts* deepen this argument because they do not reduce technology to just technical instruments or machines as motifs. They reveal ontological technology as a hidden syntax of bodies, a metaphorical geometry of faith, or,

if one prefers, a temporal administration, a bridge between literary cultures, a recycled textual materiality, a poetic meter, an architectural theology, a kinetic absurdity, and a speculative procedure for *reordering the future*. Such a volume necessarily de facto unsettles disciplinary boundaries. It requires art history as well as practice to combat with media theory; Slavic/East-European studies with pure architectural history, digital poetics, esotericism or mathematics; and theater studies with the suggestive urban anthropology. Its object is not “technology in art” but the more difficult question of what art becomes when technique ceases to be ancillary and becomes constitutive (Bowlit 2026; Protopappas 2026; Arefyeva 2026; Simmons 2026).

The problem of the image appears central to this redefinition. Leonidov’s model and magazine cover show architecture and print as diagrammatic machines of collective cognition. Lissitzky’s wedge makes political force geometric. Vertov’s eye turns perception into a technological hybrid. Russolo’s boxes and Marinetti’s page make industrial sound and typographic violence legible as art. Hugo Ball’s costume shows the body trapped inside a comic mechanism. Tatlin’s tower, Matiushin’s crystal, Weber’s compressed urbanity, Malevich’s exhibition wall, Mondrian’s grid, and Kandinsky’s turbulence all demonstrate that the avant-garde image is never only an image: it is a test-site where visibility, belief, construction, sound, time, and politics are forced into relations they cannot finally stabilize (Benjamin 1936; Flusser 1983; Kittler 1999; Zielinski 2006).

The fourth dimension provides the argument with its most precise philosophical allegory. A four-dimensional object can never be fully possessed by a lower-dimensional representation; it appears through projections, sections, traces, serial views, and speculative analogies. The avant-garde itself behaves in this way. It cannot be exhausted by manifestos, styles, movements, or national genealogies. It appears through fragments: an un-built tower, a noise box, a typographic explosion, a training exercise, a rotated square, a cinematic eye, a calculated date, a floating sphere in Leonidov, or a comic body in Dada. Each fragment is a projection of a larger cultural object that remains structurally unavailable in its totality. To study the avant-garde technologically is therefore to accept partiality not as a defect but as a condition of interpretation (Hinton 1904; Jouffret 1903; Minkowski 1909; Robbin 2006).

At the same time, this partiality has political consequences. The avant-garde’s technical imagination repeatedly oscillated between emancipation and coercion. Scientific management could promise liberation from waste and drudgery, but it could also standardize the worker into an instrument. Biomechanics could train a new expressive actor, but it could also echo fantasies of programmable subjectivity. Constructivist architecture could model collective life, but it could also become vulnerable to administrative abstraction. Suprematism could open a non-objective spiritual horizon, but it could also risk becoming a grammar of command. The machine therefore remains double: marvel and menace, liberation and discipline, and transparency and opacity (Gastev 1923; Taylor 1911; Zlydneva 2026; Buck-Morss 2000).

The same doubleness structures the relation between technology and esotericism. To a positivist history of modern art, the alliance between higher geometry, occult speculation, theosophy, anthroposophy, invisible worlds, and abstraction may seem like an embarrassing admixture. Yet this embarrassment is historically productive. The avant-garde did not inherit a cleanly secularized modernity. It inherited a world in which X-rays, radio waves, electricity, non-Euclidean geometry, relativity, spiritualism, new media, and mass politics all destabilized the border between the visible and the real. The invisible was no longer simply theological; it was also scientific, technical, optical, and electromagnetic. This is why Ouspensky, Kandinsky, Matiushin, Malevich, and Khlebnikov cannot be understood if one amputates their speculative, esoteric and occult surroundings (Ioffe 2023, 2025a; Henderson 1983, 2018; Uspenskii 1909).

One should not imagine, however, that the avant-garde simply abolished tradition all of a sudden. The technical radicalism of the various avant-garde movements often worked by refunctioning older forms. The icon becomes Suprematist placement, moreover, classical meter returns as a hidden poetic apparatus and the book becomes a recycled material object where ritual costume becomes Dada mechanism. Furthermore, religious ascension grows into architectural levitation and the bridge becomes a literary machine of passage. The avant-garde's hostility to tradition is therefore better perceived as a war over concrete use. What matters is not whether inherited forms survive, but how they are technically re-inscribed into a new regime of operation (Kazartsev and Kirichenko 2026; Khachaturian 2026; Protopappas 2026; Parisi 2026).

For this reason, “the one-hundred-year revolution” should not be taken as a neat period label. It names a long transformation in which artistic practice learned to compete with science, industry, design, and media by imitating none of them faithfully. The avant-garde borrowed from mathematics but produced poetic metaphysics; borrowed from the factory but produced theater; borrowed from the machine but produced laughter; borrowed from architecture but produced unbuildable cosmograms; and borrowed from cinema but produced not merely film but a new theory of perception. Its revolution lies in this obliqueness. It takes the technical form seriously enough to disobey it (Mumford 1934; Giedion 1948; Moholy-Nagy 1947; Rutsky 1999).

The unfinished complexity of avant-garde should be categorized therefore not a museum category currently awaiting historical closure. It possibly represents an *irritation* placed inside modernity's technical self-understanding. It prevents technology from appearing as neutral and non-reflexive equipment. It also prevents art from withdrawing into decoration of sorts. Equally, it prevents politics from imagining that social life can be too easily engineered without deep cultural consideration. It prevents academic scholarships from separating form, device, body, matter, and belief too quickly. Above all, it reminds us that every act of making is also (and perhaps above all!) an act of thinking, and that every technical form carries an anthropology, a temporality, and a metaphysics. Tékhne is therefore not the opposite of art → on the contrary, it is the old and still *unfinished* term for the space (in Russian *prostranstvo* = пространство) where *art becomes knowledge* and *where history becomes form* (Groys 2012; Bergson 1922; Latour 2005; Simondon 1958; Zielinski 2006).

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