Technology and Language

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#mediaopera

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Editorial introduction

Premiering a Mediaopera. On-Site. Online.

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Abstract

Mediaopera is a relatively new genre, which invites questions as to its distinguishing features and contemporary relevance. How does mediaopera differ from related forms such as traditional opera, opera in video recording, film, and media art? On the occasion of the world premiere of *Pink Mouse* on March 21st, 2024, which took place at the Leuphana University Lüneburg in Lower Saxony, an international panel of philosophers, cultural theorists and artists approached *Pink Mouse* – musical-graphical translation (2021) by Tatar-Russian composer Iraida Yusupova of Victor Erofeev's prose poem (2017) of that name – as both singular live event and epistemic object, worthy of scholarly attention. The discussion revolved around the core contradiction of the ritualized gathering that had been convened: What could be learned from premiering a mediaopera, made to be accessible online, in a real-world setting, and with in-person attendance? The papers collected in this volume offer varying answers to this question. While reflecting on the performative contradiction in terms more or less oblique, they prove the exercise to have been intellectually stimulating. *Pink Mouse* has had subsequent public screenings at festivals in Florence, Hemnitz and Vienna. Could it be that mediaoperas are finally best consumed offline and in company?

Keywords: Mediaopera; *Pink Mouse*; Iraida Yusupova; Visual and musical systems of signs

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Редакторская заметка

Премьера медиаоперы. На месте. Онлайн.

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Аннотация
Медиаопера – относительно новый жанр, который ставит вопросы о его отличительных чертах и современной актуальности. Чем медиаопера отличается от родственных форм, таких как классическая опера, опера в видеозаписи, кино и медиаискусство? По случаю мировой премьеры “Розовой мыши” 21 марта 2024 года, которая состоялась в Университете Лейфана в Люнебурге в Нижней Саксонии, международная группа философов, теоретиков культуры и художников обратилась к “Розовой мыши” – музыкально-графическому переводу (2021) русского композитора Ираиды Юсуповой одноименной поэмы в прозе Виктора Ерофеева (2017) – как к уникальному живому событию и эпистемическому объекту, достойному научного внимания. Обсуждение вращалось вокруг основного противоречия ритуализированного собрания, которое было созвано: чему можно научиться из премьеры медиаоперы, доступной онлайн, в реальной обстановке и с личным присутствием? Статьи, собранные в этом томе, предлагают разные ответы на этот вопрос. Размышляя о перформативном противоречии в терминах более или менее косвенных, они доказывают, что упражнение было интеллектуально стимулирующим. “Розовая мышь” впоследствии была показана на публичных фестивалях во Флоренции, Хемнице и Вене. Может ли быть так, что медиаоперы, в конечном итоге, лучше всего воспринимать офлайн и в компании?

Ключевые слова: Медиаопера; “Розовая Мышь”; Ираида Юсупова; Визуальные и музыкальные системы знаков

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What is ›*mediaopera*‹ and why does one study it? Friedrich Schiller famously posed this question with respect to »*universal history*« in late 18th century Germany.[1] And the historiographical problem he names is as valid as ever: Why do new cultural phenomena arise when they do and what makes them worthy of scholarly attention? In lieu of taking the latest academic preoccupation for granted, it is worth considering where our research attention goes and why. Were Schiller alive today, he might have answered the question by writing such a piece himself – say ›The Digital Robbers,‹[2] a study of social injustice explored through the tale of two tech-bros with rivalrous views on personal ›freedoms,‹ state regulation, toxic masculinity, and anarchic disruption. For the social upheavals taking place in late 18th century Europe are not entirely dissimilar to the disruptions that attend the digital transformation currently underway. The relatively new genre mediaopera has emerged as an extension of the networked connectivity in which communication now takes place. In this volume we explore the mediaopera phenomenon on the example of *Pink Mouse,* Tatar-Russian composer Iraida Yusupova's 2021 musical-graphical translation of Victor Erofeev's prose poem of that name (see fig. 1). There is no reason to assume that the mediaopera's power of suasion should have less traction on future humanity than did the emergence of a German ›national‹ theater, as propagated by Schiller, and other 18th century ›*literati*,‹ on the stage and in theoretical tracts.

Figure 1. Still from the Pink Mouse mediaopera used with permission by the composer. © Iraida Yusupova (Yusupova, 2021).

The novel *Pink Mouse* presents a Russian-inflected wonderland situated at the bottom of the sea where all manner of institutions – national, familial, literary – shapeshift in the ebb and flow of utopian aspirations as conjured up in the mind of an orphaned

[1] Schiller, F. (1789). Was heißt und zu welchem Ende studiert man Universalgeschichte? (Inaugural lecture, Jena University, 26.5.1789). https://de.wikisource.org/wiki/Was_heißt_und_zu_welchem_Ende_studiert_man_Universalgeschichte%3F

[2] Schiller, F. (1782). *Die Räuber* (*The Robbers*), premiered in Mannheim in 1782. The play exists in several English translations and is referenced in Dostoevsky's *The Brothers Karamazov* as well as Turgenev's *First Love*.

young girl with a famous surname: Mendeleyeva. As if born of a symbolist table of period(ic)-social-world elements, she summons an unending stream of chemico-poetic reactions from a cast of allegorical characters, akin to what her namesake did for particulate matter (Gordin, 2019). The chimerical antics of these figures hold our attention in a lighted-hearted spirit while also evincing the political intrigue and complexity of today's ›preterhuman‹ moment of digital distortion. Preterhuman has fallen out of use – I propose to re-coin the term to signal a third position in the debate of transhumanism versus posthumanism, one that insists on the ineradicable historicity of human self-invention and takes dynamic conceptions of humanity to be rooted in constitutive social practice, always. Erofeev's novel, especially the elusive figure of Pink Mouse itself, arguably portrays the inner child of an unhinged *Weltgeist* facing adult dilemmas, beyond its maturity, with carefree abandon. Yusupova channels Erofeev's child-centric hallucinations in a surrealist score of image and sound that won the Zverev Art Prize of 2021.[3] Due to pandemic lockdowns, however, and other disruptive events, the piece had not yet been premiered when Erofeev came to the Leuphana University Lüneburg as guest professor in 2022.

The Leuphana University Lüneburg, with whose generous support the libretto was translated into English, took the opportunity to host the world premiere of *Pink Mouse*. For the occasion, we assembled an international panel of expert commentators from Russia, Germany, Austria, England and North America, including Victor Erofeev, to reflect on the piece.[4] Iraida Yusupova participated via Zoom. The workshop guests were invited to comment on: what characterizes the mediaopera in general; what distinguishes it from traditional opera delivered online; and how it differs from other types of musical theater (Tambling, 1997)? We also explored the distinctive imaginary of *Pink Mouse* and compared notes on the net effect of its narrative and aesthetic composition in picture and sound. Panel members were struck by the multitude and variety of national cultural icons that appear in the tale, including *Alice in Wonderland* (England), *The Divine Comedy* (Italy), US-cartoons and celebrities, and the German ›Hausmusik‹-tradition, and Russian Conceptualism, to name but the most prominent. After having attended the screening of the piece together, in person, the essays presented in this volume materialized in vastly differing cultural environs and circumstances. The resulting commentaries, assembled in this issue of *Technology and Language*, attest to the impression made by the piece in a group-dynamic reception running counter to the mediaopera's anticipated, small-screen airing. The responses by this informal ›focus group‹ have a philosophical bent. They appear alongside more personal statements by author Erofeev and composer Yusupova. A key insight to come out of the process of shared witnessing was precisely that an over abundance of construal secures the piece's lucidity. Hence, we did not seek to unify

[3] Her submission of *Pink Mouse* was one of 50 projects selected from 2000 submission and featured at the *Exhibition of Nominees for the Anatoly Zverev Prize* (19.10. – 28.11.2021). https://winzavod.ru/eng/calendar/special/vystavka-nominantov-premii-anatoliya-zvereva-/

[4] The panellists included: Victor Erofeev, Steve Fuller, Evgeniya Lianskaya-Lininger, Bill Mival, Alfred Nordmann, Anthony Sellors, Cheryce von Xylander, Iraida Yusupova. All of them left their mark on these papers, though not everyone chose to submit a paper. Tatiana Bernyukevich later joined the list of contributors; other authors are working on contributions to come.

interpretative perspectives or impose an editorial direction. Yusupova conjured up a realization of *Pink Mouse* quite distinct from the poet's – as computer-savvy spectators will make their own inferences of imagined operatic commonality based on their respective (dis)assembling of the piece.

Mediaopera represents a new and distinct genre; it is *both* opera and media art, not fully instantiating either of these established genres. Mediaopera relates to opera already in name. The word ›opus‹ refers to a technically or artfully produced work; the plural form ›opera‹ refers to an art-form that draws together many artists and technicians - musicians, singers, dancers, architects and builders of the space, costume and light designers, and then writer(s) and composer(s), conductor(s) and stage-director(s) to produce a piece collaboratively. Just as cinema and theater have been transformed by the arrival of video, now routinely incorporated in recorded and live productions, the use of video for staging virtual performances for an online audience has spawned a whole new genre of opera, namely the mediaopera here at issue. However, mediaopera differs from other media art, a well-established field of practices defined by its own norms and conventions, in its peculiar insistence on preserving a line of continuity to an antiquated performative idiom. Mediaopera's distinctive intervention consists in the re-appropriation of a ritualized past in fashioning its trailblazing modernism, or so the practitioners allege. In doing so, they employ not some arbitrary ritual but the very bastion of classical, traditionalist, hierarchical world-making, an instutionalized hub of illusionism very much beholden to the orthodoxies of old. These two registers – opera and media art – make for strange bedfellows.

The premiere of *Pink Mouse* on March 21st, 2024 revealed a host of self-negating premises, peculiar to the genre of mediaopera, of which one stands out most glaringly. Although popularity and reception history of the piece will be decided online, it felt compulsory to the parties concerned that its premiere take place in a real-world setting and in the presence of an audience gathered together in time and space. Attention is attention shared. Full stop (Richardson, 2024). The Leuphana University, which specializes in research dedicated to the digital transformation, seemed a suitable setting for the academic initiation of this piece. That the university would take an interest in mediaopera came as no surprise. Nor that a VW-Foundation funded research group rallied to usher the piece into public view.[5] But why did a premiere seem so vital to *Pink Mouse's* artistic validation? The keyword is *portability*. Like the »immutable mobiles« of Bruno Latour (2017), the mediaopera transports and perpetuates its own conditions of possibility. But instead of a model of germ theory that gerrymanders the boundary specifications of filth and hygiene in accordance with its own purposes clearing the path for industrializing modernity to take hold, the mediaopera reconfigures spectatorship. Ever since the German romantics declared the theater to be the school of the nation, authors have written plays that rouse collective sentiment and create »imagined communities« (Anderson, 1983/2006). To the extent that mediaopera partakes of the

[5] The premiere was kindly hosted by the research group »Commodified Agency – Social Space and the Digital Data Value Chain« with direct, generous assistance from Prof. Ulf Wuggenig, Institute of Philosophy and Art History & Institute of Sociology and Cultural Organisation (associated), Leuphana University Lüneburg.

theatrical, it, too, would seem to inspire collective reception along shared lines of concern. But its delivery is situated not in a municipal building but rather for download on social media platforms operating from California or China, across diverse cultures, at global scale. The ubiquitous delivery of connection by Big Tech goes hand in hand with discursive configurations that arise from extensive, transnational centralization: an integration of ›we, the tiktalkers,‹ if you will. Yet in terms of content and aesthetic articulation, mediaopera is also clearly delineated by national traditions and field formations. Indeed, one thought-provoking aspect of this genre is its ability to accommodate a dual geopolitical imaginary – on the one hand, local, historical, national and, on the other, displaced, presentist, global (Alford, 2018; Herman & Chomsky, 1988/2002; Lippmann, 1922; Zollmann, 2018). When opera adapts to the mobile, on-demand »non-lieux« (Augé, 1992/1995) of electronic devices, ticket price need no longer be prohibitive. But aesthetic experiments such as Yusupova's do raise vexing questions about art, technology, semiosis and witnessing in an age of dwindling resources for state-sponsored institutions that formerly supported big-budget cultural productions.

We framed the premiere of *Pink Mouse* not so much as spectacle as from a meta-theoretical perspective. Our conversation continues a long and venerable tradition of opera reception in philosophy, notably instantiated by Kierkegaard, Voltaire, Rousseau, Schopenhauer, Nietzsche, Adorno, Benjamin, Stockhausen, Bourdieu, Scruton, Weibel, Kluge, and others. As technology stands ever larger between us and the felt surround, , opera's phenomenal aura contestably acquires newly emblematic significance. The authors here collected read *Pink Mouse* as an exemplary and timely piece that can help to bring contemporary developments into sharper focus. One striking difference in the responses by Russian and non-Russian authors relates to the secondary literature available: Mediaopera is already the subject of extensive cultural theorizing in Russian scholarship, most of which has not been translated. There has been far less critical study of the phenomenon in French, German, and English – an omission we set out to address. The papers are arranged methodologically in this issue in that they proceed from a lesser to greater degree of abstraction and close-reading (or close-viewing).

I shall briefly introduce the authors, here listed in alphabetical order, by way of thematic focus. Tatiana Bernyukevich (2025) presents a comparative analysis of mediaopera and digital opera that identifies aesthetic similarities between these two forms but shows them to be genealogically distinct genres. She also emphasizes the information-technological dimensions of this art-form and its sociological ramifications. Victor Erofeev (2025) informs us of his own wonderous journey with respect to the operatic form, which he studiously shunned until the opera laid claim to him, not once but twice (a prior collaboration with Alfred Schnittke on *Life with an Idiot* has been staged multiple times, most recently at the Zurich Opera in 2024[6]). Evgeniya Lianskaya-Lininger (2025) takes a close look at the artistic context in which Yusupova's vision of mediaopera was first formulated and implemented looking at the art movements with which it is in dialog, individual artists whom she encountered, and important influences stemming from the

[6] Tholl, E. Völlige Zerrüttung. *Süddeutsche Zeitung* online, 5.11.2024; Thaler, L. Schwule Spezialoperation. *FAZ* online, 6.11.2025.

history of cinema, especially in the Russian tradition. Alfred Nordman (2025) approaches the problem of analogue sensibilities in digital contexts of delivery and mediation from a vantage point furthest removed from the premiere itself but informed by the philosophy of technoscience that he has originated and contextualized in a history of ideas, which qualifies exaggerated claims of novelty. Anthony Sellors (2025) brings to the piece the sensibility of a musician who has spent his career attending to nuances of expressive utterance. His reading deciphers the composer's phenomenology in the act of composing from the compositional configuration of the piece and, so, gives an account of its emotional tenor based on pattern recognition, not on partiality. Cheryce von Xylander (2025) treats the piece as a »heterotopia« (Foucault, 1967; 1971, p. xviii; 1984) of sorts, a world closed unto itself that stands like a ›paradigmatic exception‹ (Ginzberg, 1979) to the context of which it is part, mirroring a reality that cannot be seen but by learning to read the »affordance« (Gibson, 1979) of such cultural black boxes. Iraida Yusupova (2025) takes us into the process from which her mediaoperas in general and *Pink Mouse* in particular have arisen inviting us to look over her should while she is composing, thereby reinforcing the mysterious gulf between the activity and the outcome of her creative process. Texts she has written on »cryptophony« are appended to her article adding historical context to the development of the genre and detail in regards to her contribution. Finally, having dedicated this interpretative effort to *Pink Mouse*, we would like to direct interested readers towards other examples of Yusupova's pioneering work on Russian mediaopera (some in collaboration). Please find a list of pieces accessible online (with links) – and feel free to weigh in on this transnational, transdisciplinary conversation:

EINSTEIN & MARGARITA
https://www.youtube.com/watch?v=EHRaDWVHmnw
THEREMIN'S LAST SECRET
https://www.youtube.com/watch?v=X5XK_wk5OLA (in English)
https://www.youtube.com/watch?v=Hxvc1JhNQEc (in Russian)
THE PLANET PI
https://www.youtube.com/watch?v=WbmxaeBA9kU (with English subtitles)
https://www.youtube.com/watch?v=lEwEp3KKQI0 (with Russian subtitles)
THE DUEL
https://www.youtube.com/watch?v=Qmm5RPUR8PU
PINK MOUSE
https://www.youtube.com/watch?v=DwnTUqvkV_Q (with English subtitles)
THE ALPHABET
https://www.youtube.com/watch?v=JUiSkTi117A

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Short communication

Opera as an Act of Love

Victor Erofeev
writer

I have been deaf to operatic art for half my life, because I believed that opera was based on an artificial foundation of continuous singing, incompatible with living life. I have never fought against operas, I have never mocked them, like Mayakovsky, who believed that operas were made for non-smokers, in other words, for special lovers of this special dish, to which I, for my part, was simply indifferent.

But one day the opera came to my house, I had nowhere to retreat, the brilliant Schnittke created an opera based on my mini-novel “Life with an Idiot.” I not only admitted my mistake – I rushed to correct it, reworking my ideas about freedom in art. Now I think that opera is the freest direction of all the arts. What used to seem conventional to me has now become an amazing absoluteness. In opera, everything is allowed. It is an almost metaphysical dimension, close to enlightenment.

After Schnittke, the musicality of my prose became quite conscious, form-generating. In this respect, the novel “The Pink Mouse” became a rhythm novel, that is, a simultaneously thought-out and spontaneous musical phenomenon. Iraida Yusupova turned the musicality of the novel into music, verbal images into musical phrases. The novel went to the screen of her media opera, having lost nothing, on the contrary, having acquired stage authenticity.

The opera's heroes themselves received the right to musical existence thanks to the novel's proto-heroine, the Pink Mouse. She was in the novel and remained in Iraida's opera as a clot of vital energy in all its possible manifestations, from rational to divine, from aesthetic to erotic.

The Pink Mouse ignited existence.

Young Marusya Mendeleyeva, her colleague in the design of the plot of the narrative, is not far behind her. No less significant a figure in the opera is the Guitarist, the chief of evil will, who, however, is in love throughout the opera, and in this state does not fully understand who he is: an agent of love or world evil. In this internal battle with himself, the Guitarist is a new rich operatic figure who finds his theme in the song composition “The Last Lover” – an undoubted pinnacle of modern opera art.

None of the other heroes of the opera were created as accomplices of our favorites. Dad is a liberal, Mom is a lover of love, Klop, the first gentleman of Marusya Mendeleyeva, his dad, who is eaten as a cutlet many times in the opera – each sister has an earring.

It is astonishing how Iraida's music fuses with the artistic design of the media opera. It is difficult to tear yourself away from the screen. The opera is long, like the battle of love relationships itself, like a full-fledged love act, continuing for hours without stopping.

This is a love masterpiece, I have no doubt that this is exactly so.

Keywords: Mediaopera; Opera; Victor Erofeev; Iraida Yusupova; *Pink Mouse*

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Короткое сообщение

Опера как любовный акт

Виктор Ерофеев
Писатель

Я полжизни был глух к оперному искусству, потому что считал, что опера основана на искусственном фундаменте непрерывного пения, несовместимого с живой жизнью. Я никогда не воевал с операми, не насмехался над ними, как Маяковский, который считал, что оперы сделаны для некурящих, иными словами, для особенных любителей этого специального блюда, к которому я, со своей стороны, был просто равнодушен.

Но однажды опера пришла в мой дом, мне не было куда отступать, гениальный Шнитке создал оперу по моему мини-роману “Жизнь с идиотом”. Я не только признал свою ошибку – я бросился исправлять ее, переделывая свои представления о свободе в искусстве.

Теперь я считаю, что опера – это самое свободное направление из всех искусств. То, что мне раньше казалось условностью, теперь стало поразительной безусловностью. В опере все позволено. Это почти метафизическое измерение, близкое к озарению.

После Шнитке музыкальность моей прозы стала вполне сознательной, формообразующей. В этом отношении роман “Розовая Мышь” стал романом-ритмом, то есть одновременно продуманным и спонтанным музыкальным явлением.

Ираида Юсупова превратила музыкальность романа в музыку, словесные образы в музыкальные фразы. Роман ушел на экран ее медиа-оперы, ничего не потеряв, напротив, обретя сценическую достоверность.

Сами герои оперы получили право на музыкальное существование благодаря прото-героини романа – Розовой мыши. Она была в романе и осталась в опере Ираиды сгустком жизненной энергии во всех возможных ее проявлениях, от рациональных до божественных, от эстетических до эротических.

Розовая мышь зажгла бытие.

Не отстает от нее и юная Маруся Менделеева – ее коллега по оформлению сюжета повествования. Не менее значимой фигурой стал в опере и Гитарист, начальник злой воли, который, однако, всю оперу влюблен, и в этом состоянии до конца не понимает, кто он: агент любви или мирового зла. В этой внутренней схватке с самим собой Гитарист – новая богатая оперная фигура, которая находит свою тему в песенной композиции “Последний любовник” – несомненной вершине современного оперного искусства.

Никто из остальных героев оперы не создан подпевалой наших фаворитов. Папа – либерал, мама – любительница любви, Клоп, первый кавалер Маруси Менделеевой, его папа, которого в опере много раз кушают в качестве котлеты – всем сестрам по серьгам.

Поразительно подходит под музыку Ираиды и художественное оформление медиаоперы. От экрана трудно оторваться. Опера длинная, как сама схватка любовных отношений, как полновесный любовный акт, продолжающийся часами без остановки.

Это – любовный шедевр, у меня нет сомнений, что это именно так.

Ключевые слова: Медиаопера; Опера; Виктор Ерофеев; Ираида Юсупова; “Розовая Мышь”

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Research article

Everything You Wanted and Didn't Want to Know about Mediaopera: A Cryptophonic Memoir

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Abstract

If the compositional method for the so-called mediaopera reaches back to the conceptionalism of the 1990s and, with it, the invention of „cryptophonics," this memoir details the creation of Iraida Yusupova's five media operas. Starting with *Einstein & Margarita* in 2003 and ending with *The Alphabet* from 2024, they involve the development – in parallel, yet unified – of sounds and images as separate staves in a total score that is not fully written. As each line develops over time, their vertical connections are created in the performance which serves as a definitive staging and ulimate referent for the mediaopera as a work. This distinguishes Yusupova's mediaoperas from animated YouTube opera stagings or the use of video-projections on the opera stage. If, according to the poet Tutchev, „the pronounced thought is a lie," any meaning at all can be encrypted in different systems of signs. But even in the right musical key the encrypted meanings cannot be deciphered – allowing for a conversation between the living and the dead, especially the footage of Yusupova deceased husband and collaborator, filmmaker Alexander Dolgin, and herself.

Keywords: Mediaopera; Conceptualism; Cryptophonics; Principles of composition; Visual and musical systems of signs

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Научная статья

Все, что вы хотели и не хотели знать о медиаопере: Криптофонические мемуары

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Аннотация
Композиционный метод так называемой медиаоперы восходит к концептуализму 1990-х годов и, вместе с ним, к изобретению “криптофоники”. В этих мемуарах подробно описывается создание пяти медиаопер Ираиды Юсуповой. Начиная с “Эйнштейна и Маргариты” 2003 года и заканчивая “Алфавитом” 2024 года, они подразумевают развитие – параллельное, но единое – звуков и образов как отдельных нотных знаков в общей партитуре, которая не написана полностью. По мере того, как каждая музыкальная строка развивается с течением времени, их вертикальные связи создаются в исполнении, которое служит окончательной постановкой и окончательным референтом для медиаоперы как произведения. Это отличает медиаоперы Юсуповой от анимированных постановок опер на YouTube или использования видеопроекций на оперной сцене. Если, по словам поэта Тютчева, “мысль изреченная есть ложь”, то любой смысл может быть зашифрован в различных системах знаков. Но даже в правильном музыкальном ключе зашифрованные значения не поддаются расшифровке, что позволяет вести диалог между живыми и мертвыми, особенно в кадрах с покойным мужем и соавтором Юсуповой, режиссером Александром Долгиным, и ею самой.

Ключевые слова: Медиаопера; Концептуализм; Криптофоника; Принципы композиции; Визуальные и музыкальные системы знаков

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INTRODUCTION

The telling of how I invented something that I named „mediaopera“ demands a start at the very beginning. And this beginning was rather mystical. In the early 80s when I was a conservatory student in Moscow, composing a string quartet, I had a strange dream which I still remember in detail. I heard beautiful music and saw my score with four staves for 2 violins, viola and cello – the ordinary notation for string quartets. But there was something unusual in this picture: first, the notes were running on as if in a cartoon, and second, there was a 5th line under the four staves, and it was a long narrow screen showing a film of a beautiful brook with green grassed banks and birds and butterflies fluttering over running water, and evidently the camera which filmed that brook was moving along with the stream. I understood the meaning of the dream only many years later when I started to master professional digital programs – obviously it was the fancy interface of multichannel sound editors with video channel which I started using in my digital practice.

After graduating from the Moscow conservatory I started to compose music for the theatre. I felt rather confident as a theatre composer because during my time at the conservatory I also attended classes by distinguished Russian theater director Petr Fomenko of the Moscow Theatre Institute (GITIS), also collaborating with his students. In spite of the fact that I was an absolutely insane cinema-fanatic, I thought that the cinema's material recalcitrance was too tough for me to work as a composer in cinema. I didn't even dream of working for the cinema. But despite my doubts, my first experience as a cinema composer was rather successful as was my rather unusual way of creating music which I proposed on my first project ("The Date", director Arkady Yakhnis, 1989). Initially, the technicians of the project were shocked and complained about me to the Arseny Lapisov, the main musical editor of Mosfilm Studio. He asked me to tell him my ideas and then said to the team people "do what she asks for," and to the film-director he said about me that "this composer has a cinema mentality which is actually a rare case." On that project I was very lucky and very inspired as I dealt with footage by Alexander Knyazhinsky, one of the most outstanding Russian directors of photography who had previously filmed Tarkovsky's *Stalker*. It became quite clear that it is the work of the director of photography which would inspire me most when creating music for the cinema is. No wonder, then, that I fell in love with the brilliant work of Alexander Dolgin who was the director of photography for my next project as a composer in cinema ("Farewell" director Arkady Yakhnis, 1992), only after that falling in love – also with him. He and his talent were equally precious for me. And we never parted even since his death in 2019.

Initially, in the beginning of the 1990s, we continued working at different cinema projects separately and both became more and more disappointed. We brought to these projects a lot of authorship but not every film-director was ready to share this authorship with us, even when they saw that it was right, agreeing with it in their heart. For some time, we hoped in vain to meet "our" film-director. As the cinematic production process became more and more digital and mastering much of it ourselves, we became ever more confident in choosing the format or independent auteur, becoming film-directors ourselves. This was very hard work – blood, sweat, and tears – but it proved to be absolutely fruitful and gratifying for us both. We understood each other without words

and very often invented the same things simultaneously. Making everything with our own hands by using our basic professions we learned to master additional skills – I edited video and audio, made sound design, while Alexander recorded sound and worked on animation and compositing.

As for the content, for our various features I contributed the macro-dramaturgy, with Alexander providing micro-dramaturgy. Around 2002 I started referring to our experiments as "mediaoperas" and was thus the first to use this term at least in Russia. Initially these were multimedia compositions with music as the organizing element. But I can now define five works more properly and fittingly as mediaoperas because they are real operas realized through multimedia methods. I was often asked how our mediaoperas differ from other media art, from traditional opera, or contemporary opera stagings that include many media elements such as screens on the stage or electronics mixed in with acoustics, and also how they differ from Fluxus happenings and their documentations. These question made it rather more difficult for me to express what I always felt. I will try now: mediaopera is a conceptual artwork (Bernyukevich, 2025). It is hard to explain this more clearly. For me, the most evident example of this is Karlheinz Stockhausen's cycle of operas *Licht* (Stockhausen, Licht ("Light"), Nr. 47–80, 1977–2003). Having been in the early 1990s performance in Moscow, I can say that I witnessed there the strong verticals of a "creator/performer." These were provided in the conception of the performance and not by the composer's or writer's hand which is never so strong as the hand that creates the performance. This mystical vertical connection became for me the main guide in my subsequent development.

And now I will turn to my five main mediaoperas.

EINSTEIN & MARGARITA

In 2003, Alexander and I created *Theremin's last secret* (Yusupova and Dolgin, 2003). A year later we read about the romantic affair of Albert Einstein and Soviet spy Margarita Konyonkova who was the wife of Sergey Konyonkov, the famous Soviet sculptor. The Konyonkovs lived in the United States for almost 20 years. This story had many parallels with *Theremin's last secret* and was more intriguing than our invented plot. We clearly understood that we would never make a movie based on it, but to this story into an opera would be very possible. Besides, in opera I would remain absolutely free to invent elements of the plot. Later I found out that some of the details invented by me took place in reality. For example, Einstein really got acquainted with Leo Theremin and tried to play the theremin.

I never knew how to recruit people to participate in my projects but always infected them with my insane enthusiasm. I needed a libretto and I got the best one possible: My close friend, great poet Vera Pavlova and her husband, the brilliant translator Steven Seymour fell prey to my obsession. Vera wrote the poetical part of the libretto and Steve translated it into English. (Einstein's love story had much in common with their own, and that is why they were so enthusiastic about this work.) I wrote the dialogues in Russian and English – the main characters met in America, and since one spoke Russian the other German, they communicated in English as it was in reality). Besides English and Russian

there are four more languages in the libretto – German for Einstein and his second wife, Italian for his first wife, Latin for the final Lacrimosa, and Hebrew for the angels of death who are counting the last minutes of his life (tenors and basses call out the end of his life separately, with 15 minutes between them because there are two versions of his time of death, 15 minutes apart). Also, I used for singing the texts of some well-known arias' texts such as Isolde's *Liebestod,* for example) in the original language, set to my own music, of course. Vera did not translate these arias but rendered them in Russian poems of her own which Steven translated into English.

In 2004, it seemed to me that this was a first example ever for this way of staging an opera. Before that, when we started to work, I was absolutely sure that owing to the protagonists and its plot and the success, for example, of the operas by John Adams, this one would be welcomed by any opera house. And this even in spite of the musical difficulties of my score – the need for a full symphony orchestra that couldn't be reduced, the necessity to amplify partial voices, additional instruments such as a piano, jazz-band, five saxophones and a drum-set, the use of phonograms and rear voices like basso-profundo and counter-tenor, and the extremely difficult part for soprano. When finishing the score in 2004 I started to see more and more clearly that I could not show it adequately to anyone without recording its music. I managed to receive a theatre grant for a modest alternative staging, and used this grant to produce instead a multichannel recording of the best quality. After spending the funds on recording the music, I proceeded to create the visual part with zero budget. Alexander was my next victim. We made the movie with the recording of the full opera as its soundtrack – using old black&white movies, quoting from documentaries, along with Alexander Dolgin's animation (Yusupova & Dolgin 2006). In addition, there was a shoot with famous Moscow conceptual poet Dmitry Prigov as Margarita's husband, the sculptor Konyonkov. Prigov had become my next victim because he studied to be a sculptor in his youth and was able to create a sculptural portrait of Einstein for the camera. His zealous performance of first creating, then splitting Einstein's clay's head with an axe proved really quite funny. We also filmed well known musicologist Pavel Lootzker as Einstein because he looked very similar and knew how to play the violin.

The opera's multichannel recording was really excellent with one of the best Moscow orchestras directed by my favorite conductor Mark Kadin, including one of the best choirs, outstanding singer-soloists, and as sound-producer Petr Kondrashin, the legend of Soviet and Russian musical recording (this work became his swan song). The movie was exhibited with success at different events and cinema festivals. In order to justify the grant-money I received, I had to claim a theatrical performance, however. That's why, in 2005-2006, there were some events with me and Dmitry Prigov sitting underneath the movie-screen, playing as in chess with photographic dolls that were also created by Alexander. My purpose was to interest opera houses in my opera, but instead our modest theatrical performance met unexpected success in the form of several nominations and awards (nominated for the Golden Mask award in Moscow, receiving the Courtan's D'Hour – the main prize of the Rusk-Off festival in the city of Nice, invited to many festivals and cultural events). After that, nobody wanted to produce a second

staging of the opera, perhaps because we had already realized it in the best possible way. Indeed, I now consider it so definitive a reference that it cannot be remastered.

THE PLANET PI

Like *Einstein & Margarita*, my next opera score for 11 singers, an ensemble of 12 instruments and fixed audios was initially conceived for real staging as an opera. All the same, however, it was a mediaopera because from the very beginning of working on it I knew that in the staging there must be a translucent screen instead of theatre decorations, and singers must interact with it from both sides – real persons before the screen, making shadows persons behind it. The idea of the translucent screen was the main inspiration for me during the whole time of writing the score. The plot was based on Carlo Gozzi's last play Zobeida (Gozzi, 1884), the libretto written by brilliant Vera Pavlova (Steven Seymour later translated it into English for the subtitles). It is interesting that Gozzi did not write a final monologue for the heroine, letting each actress playing this role speak whatever she would want to. Vera wrote a rather unexpected and very touching text for the final aria. And, getting ahead of the story: even though the score was finished in 2007, as a mediaopera *The Planet Pi* was not finished until 2021 and still appears very contemporary (Yusupova, 2021).

For several years I tried in vain to find possibilities to stage my opera. At last Alexander and me decided to realize it as a movie all by ourselves. The selection of the visual style selection was very important for us. A very inspiring visit to Karel Zeman's museum in Prague finally provided the clue. We were true fans of Zeman's work before, and thought that it was sign of fate when we happened upon his museum on our way. Since we did not have any sponsors for the project, we made it on our own money, and therefore everything went slower. And this is where I come upon the saddest part of my story and of my life. By 2017, the music was recorded and edited, by 2018, all the footage was ready for editing, composing and animation. Alexander had created two episodes, the preface and the first half of the third act. In June 2019, he died. First, I thought that *The Planet Pi* had died with him, and I would never touch his footage. But as the time passed, I felt a strong connection with his immortal soul, trusting that it would provide guidance and ideas of how to deal with his material, use his animation footage, and finish the piece. Naturally, *The Planet Pi* turned out to be quite different from how it was planned, but I don't find this difference detrimental to the piece. Comparing the result to the planned project I would say that it is more multidimensional with theatre elements in the cinema, with aloofness and additional characters, without the presence of the author but an added dimension of the eternal. All these elements compensated for the lack of visual richness that Sasha would have provided, were he alive, but they also provided a felicitous natural background for his two original episodes.

After finishing *The Planet Pi* I thought that I would never make a mediaopera again. But never say never.

PINK MOUSE

Aside from creating mediaoperas, most of my work is for the concert hall. In 2014 and 2015 two of my compositions premiered at the yearly event for which they were written, namely the Gorky Prize that is awarded on Capri. Here I met the famous Russian writer Viktor Erofeev who was chair of the jury. He was very impressed by my music and recollected how he heard it while working on his novel *Pink Mouse* (Erofeev, 2017). He called me five years later and asked to write an opera after his new novel. I wasn't surprised because I knew *Life with an Idiot,* Alfred Schnittke's famous opera that was based on Viktor's novella. I had read *Pink Mouse* and saw right away that I wouldn't want "to write an opera" but would instead create a mediaopera as if Alexander were alive (Yusupova, 2021). This was not only because of the risk of writing an opera-score that would not go anywhere. More importantly, for Erofeev's novel to become embodied in opera (as I imagined it) demanded means that were impossible to realize in a traditional staging. By this I do not mean a multimedia approach which is already quite familiar in live stagings, but the need to preserve the main feature of the novel, namely the quick pace of scenes and high concentration of events.

I could not imagine creating this mediaopera without Alexander, but suddenly I had a very fruitful idea that would solve several problems: Alexander had been working with the Moscow Nonconformism Museum named after Anatoly Zverev (AZ Museum), creating the public image of the museum and authoring many animations that feature nonconformist pictures. This footage would become the ideal visual content for the *Pink Mouse* opera, at the same time getting a second life. This idea allowed me to considerably reduce the expensive animations that would have to be made especially for this project. I applied for the Zverev Art Prize with the promise to create a mediaopera that would actualize the AZ Museum's collection. The idea convinced not only the museum's director Natalia Opaleva, if only because of the success of *The Planet Pi* which in the final phase was also supported by the museum. And so I made *Pink Mouse* and received the Zverev Prize for it.

As soon as I had a firm idea and knew that I would make it all by myself there was no necessity to write out the total score. Instead, I produced isolated fragments for the musicians and recorded them in different settings, sometimes less than fragments but parts of a fragment. I then used digital sound editors to integrate them according to a virtual plan. Incidentally, my recording activity was further limited by the Corona pandemic. As to the libretto, based on the novel I wrote it myself, using original dialogue from the book. But for the fragments of the "bottom" substrate I used the dialogue only in the subtitles, inventing a "bottom" language for singing and sound performance.

As to visual part, I processed all I had – footage by Alexander and by specially invited artist-animators as well as photos of different pop-personalities. But I also had to create visuals by myself, learning to master composing and animation procedures, all of this within the short time-frame set by the Zverev Art Prize deadline – September 2021. Any necessary shooting was done by Sasha's close friend and colleague Dmitry Livshitz. I was happy that Vera Pavlova's eldest daughter Natalia would brilliantly sing the main part (along with her sister Lisa she had appeared already in *The Planet Pi*). My own daughter Anastasiya Braudo sang the part of Alice in Wonderland. She had also appeared

in *The Planet Pi* already as a conductor of recorded music, and she would have several parts in my next mediaopera *The Duel*. Also featured in *Pink Mouse* and a great help was Katya Erofeeva, Victor‘s wife. In reference to the piece *Endless Daughter* in my dedications after poems by Vera Pavlova (Yusupova, 2022a), I would refer to all of them as my endless daughters.

THE DUEL

I was by then very inspired by the idea to give new life in new mediaoperas to footage by Alexander Dolgin, and in the making of *Pink Mouse* I had acquired the necessary skills of editing, composing, and animation. This allowed me to take a chance again. Moreover, being a conceptualist, I do not resist the power of a strong idea but let it develop until a new work is finished. I am thus attracted to my ideas which seem like something that only I could invent – the translucent screen and penguins in the place of in *The Planet Pi*, the use of photographic cut-out images of pop-idols like Johnny Depp and Ashton Kushner in *Pink Mouse* or Elon Musk in *The Alphabet*, filming the poet Dmitry Prigov as he practices his former sculptor’s skill in *Einstein & Margarita*, etc. These ideas or elements make me forget risks and possible problems.

My next mediaopera appeared exactly like this (Yusupova, 2022b). It also included an inspiring element, namely the collaboration in this project with the singer Boris Komlev. In my mediaoperas I never limited myself to the academic vocals of traditional opera but included sound-performance and declamation as well. I almost always I invited outstanding singers to perform in different styles and thus brought very interesting sound performers into my projects; but Boris Komlev deserves separate mention. He performed all male singing parts with different timbres and in different manners in *The Duel*: rock vocals including growling, pop-songs, and poetic performance in the role of Zverev, romantic counter-tenor as Marinetti, classical counter-tenor as the bird-angel, academic baritone in the role Aseev, and an imitation of authentic British rock music in the British Embassy episode. Boris would also perform the main part in *The Alphabet*, my last mediaopera.

But despite all this, the most inspiring factor for me was still my video archive of Dolgin’s footages. Alexander and me engaged in many media projects for the Moscow AZ Museum, and I had a lot of footage of Zverev’s animated paintings, graphics, and private photos featured in different AZ Museum’s exhibitions. Being of high artistic value they could be integrated in new mediaopera-biopic-fantasy stories. Anatoly Zverev himself was more than suitable personage for even all opera roles – romantic, tragic and comical as well. He was one of the most extravagant personalities in Moscow‘s unofficial art scene of the 1960s to 80s (Museum AZ, n. d.). His love story was also very intriguing and “operatic”: he was deeply in love with a woman almost forty years older than he. She was a widow of Nikolay Aseev, the official soviet poet, former futurist, and close friend of Mayakovsky’s. She and her four sisters were muses of futurist poets in their youth. Mayakovsky, Burlyuk, Pasternak, Khlebnikov, Severyanin, and Aseev often visited their open home in Kharkov, young people recited poems, sang, danced, played piano, arranged masquerades and fancy parties. Zverev adored the Russian “silver” age, and

Oxana Aseeva personified this "silver" age in his eyes. He was jealous of her past and often proclaimed that if he had lived in those times, he would be no less great a poet and artist than all those gigantic figures. Starting from all this I created the fantastic story of Aseev going by Time Machine to his favorite "silver" age, meeting the futurists and competing with them. The well known playwright Yulia Tupikina wrote the libretto and made some further changes in the course of events: By time machine Zverev went first to Kharkov in the 1920s, saw young Oxana – still Sinyakova at the time– and fell in love with her. He then met her in reality but did not notice how old she was, seeing her only as the beautiful girl he met in Kharkov while travelling through time. Then he returned to those times and places again, fought the poetical duel with all futurists and even with Marinetti in Italy. Besides Yulia's texts there are many original poems in the libretto. Historical characters pronouncing their original poetic texts, including those of Zverev since he also wrote poetry, and so I used his poems including their translation into Italian for the duel with Marinetti. My working method was the same as in *Pink Mouse* – written music for the particular fragments and the total score in my head, not only a musical score one but one uniting audio and video. This time we creatively worked together with me, Yulia Tupikina, and artist-animator Victoria Malechkina simultaneously moving along and towards each other. Victoria taught me many things about composition and animation. This method of interaction accelerated the working process considerably.[7]

THE ALPHABET

My last mediaopera is based on Diana Vouba's (2022) eponymous visual project. In this project she created visual objects out of small elements – signs of an alphabet system that was invented by her, inspired by her own beautiful legend. These objects are not only non-anthropomorphical live beings, communicated by song-thoughts without visible human organs like eyes, ears, mouths, they are also space animals, buildings etc. The planet "An" where they all dwell, born from the bosom of Enoire the Queen who created all alphabetians from the signs of the alphabet. All this was Diana's part of the story, I then invented a love story between Enoire and an astronaut from the Earth in whose screen image I used photos of Elon Musk. Alexander Dolgin and I had collaborated with Diana a long time ago and I had Alexander's animated footage of Diana's pictures. The libretto I wrote myself, and it features laconic subtitles in Russian and English because the singing and sound-performance is for the most part in an artificial space language. Some texts of the songs are in English, they are translations of Vera Pavlova's and Marina Maximik's poems and of a very popular Soviet song by the famous writer-

[7] Of course, I am immensely grateful to every participant in all my projects. It is impossible to mention all of them here. After Petr Kondrashin's death, sound-producer Dmitry Misailov recorded my *The Planet Pi* and parts of *Pink Mouse* and *The Duel*. Owing to his talent and mastership, *The Planet Pi* won the Clean Sound. Other parts *Pink Mouse* and *The Duel* were recorded by the talented sound-producer Igor Sklyarov, and by Dmitry Cheglakov who also recorded *The Alphabet*. Cheglakow is also a great cellist and electric guitarist (he played both instruments in these three operas), a composer himself, and my friend and "partner in crime" for more than thirty years.

dissident Vladimir Voinovich (1960/2012) that was written especially for the first space-flight: „14 minutes before start.“

If I presented too many boring details about the creation of my mediaoperas, I shall conclude with some more about my compositional technique. In the early 1990s, when it was still possible to generate new m-usical ideas, I invented some composing techniques which made it possible for me to create complicated academic music without a total score. „Cryptophony“ was invented simultaneously but independently and with different motivations by me and my friends and colleagues Ivan Sokolov and Sergey Nevraev. The term was coined by Nevraev but the technique was aso referred to as spontaneous polyphony, samples' polyphony and, vertical polystylistics. Another reason for mentioning them here is that our cryptophonic collaborations produced my first two mediaoperas *avant la lettre*. Created in the 1990s and thus long before I used the term „mediaopera“ there was *Opera-Cyptophonica*, created and performed together with Ivan Sokolov and Sergey Nevraev, as well as *Opera-Marina*. Since they contained the seeds of my future mediaoperas, they might deserve more detailed consideration. For the time being, two rather more abstract statements of the cryptophonic program may suffice.

APPENDIX

Facsimile from the August 1999 issue of *20th Century Music*: Iraida Yusupova (1999) „Thoughts on Cryptophony," followed by Sergei Nevrayev (1999) „Cryptophony" from the same issue of *20th Century Music*

Thoughts on Cryptophony

IRAIDA YUSUPOVA

Feodor Tutchev (1803-1873)
Silentium!

Be silent, be secret, hide
Your feelings and your dreams.
Deep in the depths of your soul
Let them mutely rise and set,
As clear stars do in the night:
Admire them and be silent.

How does a heart speak out?
How to exlain yourself to another?
Will you grasp what you live by?
Pronounced thought is a lie.
Your burrowing troubles the waters:
Drink of them and be silent.

Know how to live within -
Your soul contains a world
Of mysterious, magical thoughts;
The outer tumult stifles,
The beams of daylight blind.
Hear their song and be silent.*

It is for a particular purpose that I begin my text about cryptophony with quoting this poem by Tutchev. As is well known, poets are, by their very nature, prophets, and the prophetic line of Feodor Ivanovich, "the expressed idea is a lie" has been confirmed by the discoveries of 20th-century science in the twentieth century: that human thought is in its very nature integral and continuous, and its symbolic expression (i.e., that which is expressed out loud or to oneself or written down) is, by its nature, discreet – which means that humans do not have the substantial ability to carry out their thoughts to one another. Apparently, this is why even when conversing in our own respective native languages, we frequently do not understand each other. Meanwhile, when transferring a symbolic expression of thought into another system of symbols, all the vacuum areas necessarily have to be filled up, since in a new means of expression of thought new vacuum phenomena appear, which have to do with the peculiarities of a different system of symbols.

The system containing the greatest amount of universalism is that of music. It is not accidental then that according to one version of the Biblical story of the tower of Babel, the first language for humans was particularly music. If we are to continue contemplating this theme, we can assume that the Babylonian confusion of languages is none other than the appearance of a symbolic expression of the thinking process and the further development of both (i.e. of the process and of its symbolic expression) in an indissoluble connection with each other.

In this manner, our cryptophonic method of composition is a means to bring out the hidden substance of the manifestations of the Spirit, which take place in the world of the Beyond, which are perceived by those that are chosen and expressed by them in a helplessly weak manner, so that all would hear them.

*F. I. Tutchev, *Poems and Political Letters of F. I. Tutchev*, translated and with an introduction by Jesse Zeldin (The University of Tennessee Press, Knoxville, 1973), 42-43.

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Cryptophony

SERGEI NEVRAYEV

What is cryptophony? The term could be translated from Greck as “mysterious sounding” – – certain hidden meanings implied which are true transmitted through real sounds. Cryptophony is best understood as one out of many possibilities of that artistic trend frequently known as conceptualism, and specifically Russian conceptualism.

Russian conceptualism differs somewhat from its Western equivalent, the former being closer to a type inherent in the art of 19th-century romanticists. Whereas Western art carries in itself, as a crucial feature, a process of analysis of the very elements of the language of art, Russian art to this day still focuses a great deal of attention on the programmatic content of the artistic text. In contemporary Russian art there exists a certain conflict – indeed a polarization – between two contrasting intellectual approaches (in the manner of the traditional argument between the “Westerners” and “Slavophiles” in 19th-century Russian thought): the structuralist versus the old-fashioned “romantic” conceptualism. The latter approach, though frequently manifesting itself in forms that might be avant-garde in appearance, in reality adheres particularly strongly to tradition.

It is in this second camp that the interest in cryptophony arose among three composers: Iraida Yusupova, Ivan Sokolov, and Sergei Nevrayev. Their interest did not appear accidentally, but as a singular reaction to this existing intellectual polarity. as a search for a middle road between an excessive structuralism and an equally excessive conceptualism

A structuralist artist –- for example the abstract artists in painting (Mondrian, Kandinsky) and the Second Viennese School in music (Schoenberg) – focuses attention exclusively om pure “musical” qualities and sees the entire meaning progress in the progressive development of the means of the language of art, which has its own inherent meaning, that cannot be reduced to any other extraneous sense. Priority is given to the language, inherent in any type of art. Development is reduced to the self-development of an language.

The path of conceptualism leads towards another destination: towards a quest of certain extraneous semantic content, towards subordinating the whole structure of the work of art to this content and, in the final outcome, towards a denial of the self-sufficiency of the artistic text, the case being that the text transcends itself into a “meta-text.”

Coming out of such an understanding of the processes going on at the present time in art, one can once again define the cryptophonic technique as being a compromise between the two extremes of the “ultra-text” and “meta-text,” as reconciling these two directions, as, speaking in a student-Hegelian language, a particular type of “alleviation” of this contradiction, an alleviation of the antinomical qualities – it is difficult to say between what – possibly the unity of these two opposites.

Here one must note once again that cryptophony appeared as a method of musical composition simultaneously among three composers, who were practically totally independent of one another in their respective creative development and who, only after sharing their discoveries with each other, determined that they are not solitary in this newly discovered artistic realm. It means that the appearance of cryptophony was not accidental.

If one is to speak of the substance of this technique, one can determine that, as always in such cases, just as it was in the case of the 12-tone technique, its roots can be traced quite far back in history. Most likely, precursors to its appearance have always existed; in any case the founder of contemporary notation, Guido D’Arezzo established the pre-requisites for it, when he tied together elements of notation with elements of a literary text (a Latin hymn). That is, here already we can see a certain ciphering involved, and one can say that all the music, written down in notes, is subordinated in one way or another to the deciphering and interpretation of this code.

Analogously, neumatic notation, existing prior to Guido, could be likewise viewed directly as a ciphering system, since each musical symbol in this system was connected to a certain element of literary speech.

Subsequently, the letter names of the notes of the musical scales appeared, which likewise infrequently inspired composers to use different kinds of ciphers. The musical signatures of Bach, Schumann, Shostakovich, and Denisov are all too well known, all of which could be looked at as an elementary type of cryptophonic technique. One can say that the new, more detailed cryptophony has been engendered by the historical course of events. In addition, this is the proper occasion to remember Newton, who matched the spectrum of colors in concordance with the seven-note scale; it is worthwhile to remember the Ancient Greek and Roman authors, who successfully combined concrete musical scales and modes with particular ethical modes and conditions. It is necessary to remember the medieval symbolism of the twelfth and thirteenth centuries with its ramified system of symbolic meanings, which frequently connected works of art with particular events in the Gospels, as well as with a particular type of numerology (the avidly reviving system of Neo-Platonism). Possibly one can also bring into account other artistic manifestations, about which we do not even have information at the present time.

Nevertheless, if one can, without any digressions, speak about cryptophony itself, the technique exists in two versions: as macro-cryptophony and as micro-cryptophony. Macro-cryptophony is close to that technique which utilizes concrete anagrams-notograms. The difference between these techniques, however, is that in macro-cryptophony the notogam, chosen for any particular text, determines the whole musical language of a given composition. The point of departure of macro-cryptophony lies in the letter names of the notes. It is possible to decode and read this direct ciphering system more or less rather easily.

Micro-cryptophony utilizes a more intricately detailed ciphering system, and this is the particular brand of cryptophony with which composers Yusupova and Sokolov work with, which can be determined as being cryptophony in the truest meaning of the word. In micro-cryptophony it is very difficult to decipher the connection between text and music, as well as between musical and verbal symbols and practically impossible to do so without knowing the ciphering

system. It seems proper to remember the opinion formed in political intelligences of Russian ciphers as the most complicated in the world – which is another argument in favor of the conclusion that it was no accident that cryptophony was invented particularly by Russian composers. Most likely, Russians possess a special talent for Aesop's type of communication.

The emergence of cryptophony can be established at around 1989. It was at that time that I began to write my macro-cryptophonic musical composition *Paraclete*. Two *Little Concerti* of mine, written with the aid of the macro-cryptophonic technique (namely *Paraclete* and *Strings caressing fingers – fingers caressing strings*) could be likened to the genres of the commentary or a sermon, which are built on playing around with as well as an "artistic" development of a certain respective thesis: in *Paraclete* it is a religious thesis, while m my second *Little Concerto* – a para-religious thesis following an Eastern Tantric tradition. These two compositions could be analyzed as commentaries about the content and purpose of asceticism, as well as the content and purpose of "counter-asceticism."

The term "cryptophony" itself appeared in 1991. At that time I wrote my *Sensitive odes* to which I supplied personal commentaries or program notes, where in a somewhat humorous manner I determined the substance of the cryptophonic technique. At any rate. it was particularly in this text that the term "cryptophony" appeared for the first time. Subsequently, this term has become. so to speak, authorized. The composers, Yusupova and Sokolov, upon hearing the term for the first time, accepted it unconditionally and it could be said that at that time this technique has finally received its proper name: the composers started to determine their technique as "cryptophonic."

For me, in addition to macro-cryptophony and micro-cryptophony. there exists yet another form of cryptophony, which I term as super-cryptophony. In 1993 I wrote a *Symphony* for string orchestra, in which the ciphering code was created in such a way that each note corresponds with any possible note of the Latin alphabet. This way, the cryptophonic substance of the composition lies in the fact that any possible text utilizing the Latin alphabet can be contained m the musical text. This can be, on one hand, a dead-end for cryptophony, while, on the other hand, it could be characterized as "super-cryptophony."

In this manner, cryptophony can now be subdivided into three brands: that of macro-cryptophony, micro-cryptophony, and super-cryptophony. In addition cryptophony appears as one of the means of attainment of and/or approach to that universal artistic model, which combines in itself a philosophical, religious and mathematical generalization, in other words, it turns out to be a transcendental means of overcoming an esthetical apprehension, a search for such a generalization, which is capable of giving a new life to already existing elements.

Cryptophony is one of the possibilities of the quest for the "glad tidings," bringing new life and revival to already developed existing forms, and presenting one means out of many of forming a new cosmos in the conditions of a historically conditioned chaos, in which, as according to Taneyev, "each sound can be followed by any other sound," in a situation where it is necessary to have a substantial foundation for creating such combinations of the elements of speech, which would have sense.

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Research article

From Eisenstein to Einstein: The Ultimate Guide to Mediaopera[1]

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Abstract

Mediaopera is a new syncretic genre that inherits opera's ability to constantly change or adapt and thus prove its relevance to the times. The article examines the evolution of opera in the modern technological era, its relationship with cinema, video art and the digital technologies of the 21st century. The analysis covers key examples: from the early experiments of Georges Méliès and Sergei Eisenstein to Fausto Romitelli's psychedelic opera *The Metal Index* (2003) and the documentary projects of Steve Reich. Particular attention is paid to the Russian context: the role of Soviet cinema for the musical avant-garde (Schnittke, Artemyev), as well as the innovations by Iraida Yusupova whose mediaoperas combine cryptophony, mockumentary, and eclecticism of styles. The genre balances between irony in relation to operatic clichés and fidelity to its main themes – life, death, social problems. Mediaopera rethinks the elitism of traditional opera, using technology to expand accessibility while remaining a *Gesamtkunstwerk* – a total work of art that engages the viewer in a multisensory experience. The work highlights the interdisciplinary nature of the genre, its role in maintaining the relevance of opera through a synthesis of academism, pop culture, and media art, demonstrating new ways of dialogue with the audience in the digital age.

Keywords: Opera; Mediaopera; Gesamtkunstwerk; Syncretism; Multimedia technologies; Iraida Yusupova

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Научная статья

От Эйзенштейна до Эйнштейна: Полное руководство по медиаопере[2]

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Аннотация
Медиаопера является новый синкретическим жанром, наследующим способность к изменениям и соответствию времени, которые на протяжении своей истории демонстрировала опера. Статья исследует эволюцию оперы в современную технологическую эпоху, ее взаимосвязь с кино, видеоартом и цифровыми технологиями XXI века. Анализ охватывает ключевые примеры: от ранних экспериментов Жоржа Мельеса и Сергея Эйзенштейна до психоделической оперы Фаусто Ромителли “The Metal Index” (2003) и документальных проектов Стива Райха. Особое внимание уделено российскому контексту: роль советского кино для музыкального авангарда (Шнитке, Артемьев), а также новаторству Ираиды Юсуповой, чьи медиаоперы сочетают кристофонию, мокументалистику и эклектику стилей. Жанр балансирует между иронией по отношению к оперным клише и верностью её главным темам – жизни, смерти, социальным проблемам. Медиаопера переосмысляет элитарность традиционной оперы, используя технологии для расширения доступности, оставаясь при этом Gesamtkunstwerk – тотальным искусством, вовлекающим зрителя в мультисенсорный опыт. Работа подчёркивает междисциплинарность жанра, его роль в сохранении актуальности оперы через синтез академизма, поп-культуры и медиаискусства, демонстрируя новые пути диалога с аудиторией в цифровую эпоху.

Ключевые слова: Опера; Медиаопера; Gesamtkunstwerk; Синкретизм; Мультимедийные технологии; Ираида Юсупова

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WHAT IS MEDIAOPERA?

Once a genre for the masses, by the 21st century, opera has become an elitist genre "not for everyone." Opera singers are no longer objects of worship for the general public, and fiddlers in restaurants hardly would play an aria from modern operas nowadays. However, throughout its four-century history, opera has always demonstrated amazing vitality, the ability to change and correspond to the spirit of the times, the development of new technologies and new aesthetic formats. Thus, as cinema and video art conquered the world, opera intertwined with it in various combinations, eventually giving rise to the new syncretic genre of "mediaopera."

Mediaopera is a modern modification of the opera genre, in which the visual-staging component has moved to a multimedia format. There are several important features of this genre: the combination of acoustic music and electronics, video and live performance, recorded soundtrack and real performance – which vary from work to work, from composer to composer. Unlike a film opera or film music, the video component and the musical dramaturgy do not illustrate each other, but are full-fledged and often parallel participants in the process.

In Russia, this genre has been known for about 30 years. And although some works written before the 1990s come close to this definition, the official naming belongs to the Moscow composer Iraida Yusupova.

FROM MONTEVERDI TO WAGNER

As is well known, opera is a syncretic genre. Music, theatre, words, fine arts and choreography at the turn of the 16th and 17th centuries united into the type of performance that we now call opera (officially, the first opera is considered to be Claudio Monteverdi's "Orfeo," which premiered in 1607, but before there was Jacopo Peri's mostly lost stage work "Dafne," produced in Florence in 1598).

Since its inception, opera has constantly undergone all kinds of changes: opera forms and genres have been formed, the role of the coauthors of the complex genre has changed – the ancient Greek theatrical and ritual mystery slowly turned into a drama with music, then primacy was accorded to the composer, subordinating everything that happens on stage to the musical development, and in the last 50 years, the director and production designer have burst onto the scene. This rapid evolution has always allowed opera to stay "on trend" with contemporary socio-cultural changes and to keep up with the times, whether it was Mozart's revolutionary decision to turn to a libretto in his native language after a long dominance of Italian operas or the use of the most innovative machinery in opera theater.

By the beginning of the twentieth century, outstanding artists were involved in the creation of opera productions, and composers were turning to the most serious literary sources. Richard Wagner, one of the leaders of the concept of the unity of the arts (the mysterious *Gesamtkunstwerk*), called for a great fusion of the various components of the opera genre at the turn of the century. Wagner lamented that in contemporary opera the different arts were too "selfishly" isolated, instead of working together towards one common goal – "the musical drama of the future."

IN SILENT-FILM HELL

Since the invention of cinema, its encounter with opera has only been a matter of time. The interaction between the opera genre and "the most important of the arts" in the twentieth century has been very active and diverse from the very beginning. The mutual attraction was due to the syncretic nature of both arts and the love of ecstatic experiences. The first timid steps towards bringing opera and silent cinema closer together were taken back in 1903: the owner of a Parisian variety show and president of the French Society of Illusionists, Georges Méliès (1903), presented to the public his film "Faust in Hell" – a sort of "screen adaptation" of Berlioz's opera "The Damnation of Faust."

Méliès was captivated by cinematography from the very first moment he saw a film screening by the Lumière brothers in 1895. He has bought a camera in England and began filming everything he could, using circus tricks and pyrotechnics in his films, becoming a pioneer of double exposure, editing, and even underwater filming. It is not surprising that opera did not remain on the sidelines of his experiments. A year after the "Faust in Hell," Méliès made the film "Faust and Marguerite," based on the opera of the same name by Gounod. The 15-minute silent film was accompanied by a musical score, composed by the director himself, in which individual fragments from the opera corresponded to specific scenes in the film (Méliès, 1903).

Similar experiments in combining video footage and live performances of certain fragments of operas became widespread – thus, in 1916, one of the pioneers of German cinema, Oskar Messter, made the film "Lohengrin," the demonstration of which was accompanied by a performance of Wagner's opera by soloists, a choir and an orchestra. Later, in 1926, one of the founders of cinematic expressionism, Robert Wiene, made a film adaptation of Richard Strauss's opera "Der Rosenkavalier" – at the premiere of the film in Dresden, an orchestra was conducted by the composer himself. The author of the opera's libretto, Hugo von Hofmannsthal, slightly changed the plot line for the film version, and Richard Strauss also included fragments of his other works in the score.

SERGEI EISENSTEIN

A new era in the romance of opera and cinema began with the advent of sound cinema. And here we cannot help but recall the great innovative director Sergei Eisenstein, who, although he did not create a single opera screen adaptation, nevertheless approached the problem of "internal synchrony and counterpoint of image and music" as closely as possible. The pinnacle of this experiments was Eisenstein's collaborative work with Sergei Prokofiev ("Alexander Nevsky" and "Ivan the Terrible") (Eisenstein, 1938).

The creation of the "Ivan the Terrible" (1945) proceeded in parallel with the Prokofiev's work on orchestrating his opera "War and Peace," and the co-authors, who understood each other perfectly, came up with the idea of working together on staging the opera at the Bolshoi Theatre in Moscow. Eisenstein even began making sketches, but due to illness he was unable to carry out the production (the opera eventually premiered in Leningrad in 1946, directed by the young theater director Boris Pokrovsky). The conductor of the production, Samuil Samosud was convinced that if Eisenstein was able to accomplish his planned production of "War and Peace" in the theater, this performance would be for

him a sketch for the future film-opera. The only experiment by Eisenstein of staging an opera was the production of Wagner's "Valkyries" at the Bolshoi Theatre in 1940, right before the war. Witnesses of the production were divided in their assessment of the staging. It is only known, that the director set the most daring plans: he intended to introduce an additional cinematographic plan in the scene of Siegmund's story and to broadcast the scene of the flight of the Valkyries (the sound of the orchestra was to be broadcast through a series of amplifiers, arranged in a stereophonic manner around the circumference of the hall). For various reasons (mostly technical ones), none of these ideas could be realized, but all of them were successfully implemented in the modern opera house several decades later.

FELLINI, HERZOG AND VISCONTI: OPERA IN A CLASSIC ART HOUSE

With the development of sound cinema, directors rushed to meet opera with all their enthusiasm. Opera's magical world, its recognizable characters, music quotations and stage allusions – all these themes have flourished in the sound cinema. Opera arias sound in the films of Fellini and Godard, Visconti and Rivette, enchanting viewers with the marvelous veil of operatic cliché. There are several famous films, even dedicated to passionate operamania. Sam Wood's (1935) "A Night at the Opera" tells the story of a young chorister's rise to operatic fame; Werner Herzog's "Fitzcarraldo" (1982) tells the story of a music lover's 2,000-mile journey just to hear Enrico Caruso; and Federico Fellini's (1983) film "And the Ship Sails On" follows the passengers of a cruise ship as they bid farewell to a famous opera diva. And, of course, the most important place in the series of cinematic hommage to opera is occupied by the film "Ludwig" by Luchino Visconti (1972), dedicated to the King of Bavaria, Ludwig II, who was obsessed with the operatic universe of Richard Wagner. A separate chapter in the love-story of opera and cinema is made up of famous film adaptations of operas: Shostakovich's "Katerina Izmailova," directed by Mikhail Shapiro (1966), Mozart's "The Magic Flute," directed by Ingmar Bergman (1975), Verdi's "La Traviata," directed by Franco Zeffirelli (1983) etc.

In the middle of the twentieth century, television quietly crept into the relationship between opera and cinema. The first work written specifically for television broadcast in America was Gian Carlo Menotti's opera "Amahl and the Night Visitors "(1951). For a long time, it was always staged "live" on television, and only in 1963 the performance was recorded on tape. Menotti's magical opera is still an absolute hit that has been on American television channels on the night before Christmas for many years: it is believed that more Americans have seen "Amahl" than any other opera in the world repertoire.

THE MEDIUM IS THE MEDIUM: OPERA AND VIDEO-ART

Within a few years the video camera would get into the hands of everyone, becoming an integral element of the American avant-garde. Composer Dick Higgins, a participant in the Fluxus movement (an international art movement founded by George Maciunas and including Yoko Ono and Joseph Beuys), begins to work in the field of "intermedia" – an artistic form at the intersection of different types of art (actionism, cinema, and music).

Video art pioneer Nam June Paik made the video camera an “accessory” to all of his musical performances. In 1963, Paik demonstrated his first “electronic opera.” The video was shown on Boston television in the program “The Medium is the Medium.” Distorted images of unnatural colors flashed on the screen, and a voice-over gave viewers commands: “Close your eyes,” “Turn off the TV.”

One of Paik's followers in combining video art with music (a sort of American *Gesamtkunstwerk*) was the avant-garde composer Robert Ashley. All of Ashley's operas take place in the American countryside, instead of arias he uses long monologue-recitatives (an original mix between Schoenberg's *Sprechgesang* and American hip-hop), and in the place of an orchestra, there is electroacoustic sound. His television operas, like silent movies, have subtitles, but here their function is less utilitarian – they set the rhythm and give visual accents. One of Ashley's best-known television operas is “Perfect Lives” (Sanborn, 1983) in seven acts, whose genre Ashley describes himself as “a comic opera on the theme of reincarnation.” (as cited in Gutkin, 2014, p. 23).

An important step towards the establishment of the genre was the work of the family tandem of composer Steve Reich and his wife, video artist Beryl Short. Their first project was the mediaopera “Cave” (1993), which combined instrumental score, non-operatic singing, speech and documentary video. Reich and Korot called their invention “documentary music video theatre.” A few years later, another joint multimedia project based on documentary materials appeared – “Three Stories” (2002). Each of the three acts of the opera corresponds to a certain “story” from the life of humankind at the beginning, middle and end of the 20th century. The first tells the story of the creation and crash of the largest airship in history, the Hindenburg. The second story is about the testing of atomic bombs by American troops on the Bikini Atoll in 1946-1954, which led to an ecological catastrophe. And finally, the third act (“Dolly”) is a “discussion” of influential American scientists on the topic of cloning, new biotechnologies, the creation of robots and artificial intelligence. The video sequence of “Three Stories” is realized on a single large screen, which is divided into parts from time to time, and the musicians are located live in front of it (Reich, 2002).

Almost simultaneously with Reich, the New York composer Michael Gordon also came to the genre of video-opera, collaborating with the video artist Elliot Caplan to create several works in this format. Their first project was the video-opera “Van Gogh” (Gordon, 1991) for three voices and a chamber ensemble, based on the letters of Vincent Van Gogh, and several years later the premiere of the video-opera “Weather” (Gordon, 1997) took place. This multimedia work is a visual and musical journey along a weather map – the score combines a wide variety of styles: the rhythmic pulse of classical minimalism, dissonances in the spirit of Ligeti, modality and quotations from pop music. The composer provided his score with a program note:

> I imagined history as being not so much like a timeline, but like an elevator where I could stop at whatever floor I wanted, and everything was going on simultaneously. The elevator went up to eight, where I found Vivaldi, who of course wrote a massive string piece based loosely on the same subject. Then I went down to the fourth floor, where I found Jimi Hendrix, back up to nine for some 1990’s London club music,

then to five for the noise of battleship sirens. (Gordon, as cited in “Manchester Collective’s video premiere: Weather,” 2022)

OPERA AS SOUNDTRACK

While new video technologies are gaining ground in the traditional opera house, contemporary composers, in turn, have not forgotten the good old cinema. One of the patriarchs of American minimalism, Philip Glass (the author of not only a huge number of operas, but also a large number of film scores – from Daldry's “The Hours” to Zvyagintsev's “Elena”), wrote a chamber opera (Glass, 1994) for orchestra and film “The Beauty and the Beast” (1995). It is a musical paraphrase of the famous film of the same name by Jean Cocteau (1946) with Jean Marais in the leading role. The film is shown on the screen without a soundtrack, and a small orchestra and singers performing their parts in sync with the actors' speech on the screen.

Another operatic homage to cinema is the video-opera “Lost Highway” (Neuwirth & Jelinek, 2003) by Austrian composer Olga Neuwirth, based on the film of the same name by David Lynch. The libretto for the opera was written by Elfriede Jelinek, Neuwirth’s long-term collaborator and Nobel Prize laureate in literature. Together they came up with a grand experiment on the edge of cinema, computer animation, and musical theatre. The production at the English National Opera combined the stage performance with several screens, showing fragments of the film, and live music performance was combined with a recorded soundtrack.

A HIDING PLACE FOR THE MUSICAL AVANT-GARDE

Speaking of the development of mediaopera in the Russian art scene, one should mention the very strong connection between the musical avantgarde and the cinema back in Soviet times. For reasons of censorship, film music was the only source of income for many nonconformist composers. The history of Soviet cinema knows remarkable director-composer tandems: Grigory Kozintsev and Dmitry Shostakovich (“Hamlet” and “King Lear”), Alexander Mitta and Alfred Schnittke (“The Crew” and “The Tale of Wanderings”), Andrei Tarkovsky and Eduard Artemyev (“Stalker” and “Solaris”), Georgy Danelia and Giya Kancheli (“Mimino” and “Kin-dza-dza!”). If in live action films music played a secondary role, animation provided the possibility of a much more subtle synthesis of music and video. A Soviet and Russian animator Andrei Khrzhanovsky not only cooperated for many years with Alfred Schnittke (“The Glass Harmonica,” “Butterfly,” “My Favorite Time”), but also released in 2020 the full-length film “The Nose or the Conspiracy of Mavericks” – a full-fledged animated film adaptation of the opera “The Nose” by Dmitry Shostakovich (Khrzhanovsky, 2020).

PSYCHEDELIC METALS BY FAUSTO ROMITELLI

Therefore, at the heart of any mediaopera is a music soundtrack that finds new life in a new genre. Authors of various stripes work on the work – a composer, librettist, director, cinematographer, media artist, performing musicians, singers and actors. As a rule, the video

sequence is created directly in the process of working on the opera, but in any case, the strings are pulled by musical dramaturgy (as it should be in a staged opera). This genre organically combines classical and avant-garde music, cinema and video art, performance and animation, and traditional operatic forms (aria, duet, choir), naturally coexisting with electronic music and elements of improvisation.

On European soil, one of the classic examples of the genre is Fausto Romitelli's mediaopera "The Metal Index" (2003) for instrumental ensemble (including bass and electric guitar), soprano, three screens and electronics – this is the last opus of the Italian composer, who passed away at the age of 41. The aim of the work, according to the author, was "to transform the secular genre of opera into an experience of total perception, immersing the viewer in hot matter, glowing and sounding, in the magma of floating sounds, shapes and colors, telling nothing, but hypnotizing, taking possession and putting into a trance" (Romitelli, 2003). The literary basis for the opera were the texts of the Croatian writer Kenka Lekovic, saturated with allusions and quotations (from Georges Bataille to Jim Morrison). The music is imbued with similar associations – there are greetings to Romitelli's older comrade, the spectralist Georges Grisey, and quotes from Brian Eno and even Pink Floyd.

The authors of the video series are artists Paolo Pachini and Leonardo Romoli who created psychedelic visions of different states of metal on the screen – from scorching melt to industrial debris and all sorts of damage to the metal surface. The opera consists of five scenes, conventionally divided into three hallucinations, representing a slow, viscous deadly immersion – not in water, however, but in metal. The source of inspiration for Romitelli was Roy Lichtenstein's painting "Drowning Girl," also known as "I Don't Care! I'd Rather Drown" (1963) in the pop art genre (a comic strip made on a huge canvas). The music and video sequence were created in parallel, but what was important was their connection in a common continuum and reliance on the same physical characteristics – "iridescence, corrosion, plastic deformation of the surface."

The traditional "operatic" quality of this very unusual composition is given by Romitelli's musical aesthetics itself, as a product of the synthesizing hearing of "high" and "low" – a genuine *Gesamtkunstwerk* of the early 21st century. Along with the electroacoustic spectral technique, the composer was always inspired by psychedelic rock, which, as it seemed to him, developed according to similar sound parameters: Aphex Twin, Sonic Youth and, of course, the electric guitar of Jimi Hendrix. Romitelli (2003) often speaks of his fatigue with "scientific," "pure" music and invents a new language. "The Metal Index" also naturally slips out of all classical genre categories – states of aggregation become the main mode of this composition on the visual, sound and conceptual levels.

Another impressive example of a multimedia opera is the large-scale project "Amazonas," (2010) shown at the Munich Biennale. The main character of this opera trilogy is the tropical Amazon forest, and the main theme is the problem of "catastrophe in paradise": climate change, endangered indigenous cultures, and the destruction of the habitat. In this multi-hour performance, composers Klaus Schedl, Tato Taborda, and Ludger Brummer, as well as media artists from Brazil and Germany conceptually rethink the very concept of multimedia musical theatre: opera and media art flow into each other, music becomes visible, and the visual series acquires sound.

MEDIAOPERA-EXPERIMENTS IN RUSSIA

On Russian soil, all new trends begin to modify without the time to become a tradition. In 2018 the premier of Olga Bochikhina's mediaopera "Face" took place – a "Mute opera" for ensemble, electroacoustics, and video projection that was commissioned by the VI International Festival of Contemporary Music "Another Space" (Bochikhina, 2018, the author of the video sequence is photo-artist Ivan Sakharov). Olga Bochikhina does not write tonal music as a matter of principle, the entire musical universe of her composition consists of vocal and instrumental "whispers and screams." In fact, the main "representers" of the opera-genre, the singers, do not appear on stage – their voices sound through loudspeakers. This very "inside out" of the opera-genre (in the opera about a person who never shows up), the concept of losing and finding a face, raises an important question about the border zones of art.

Another example of the genre mediaopera ins Russia are the works of Dmitry Kurlyandsky.first The opera-installation "NEKYIA" (Kurlyandsky, 2019) is based on the plot of Homer's epic poerm, combining a musical score and video-art by artist Elena Nemkova (a sequel appeared a year later – NEKYIA 2.0, created in collaboration with video artist Alexey Nadzharov). The subsequesnt mediaopera "Letters of Happiness" (2020). This work was created during the pandemic – forced isolation and prolonged sitting in front of a computer screen. The plot is based on letters that usually end up in spam. The composer himself made the videos for the five acts of the opera. The second act features the work of musician and media artist Alexander Serechenko, based on the principle of chance. The sixth act features the work of video artist Marina Chernikova, inspired by the ideas of psychogeography.

A fusion of academic music and media-technologies in the works of contemporary composers (regardless of their geographical and national affiliation) has been actively expanding and developing in recent decades, delighting us with the diversity of forms and genre subtypes. Video art has become another powerful tool on the path to achieving that absolute synthesis, desired by Scriabin in the "Prometheus" or Stockhausen with his 29-hour opera project "Licht" – in the score of both works, the visual part plays an important, full-fledged role. Among the contemporary Russian composers working today at the crossroads of academic and electronic music and video art, we should mention Elena Rykova's "Under Construction", accompanied by an animation, created in collaboration with the artist Maria Korol (Rykova & Korol, 2016-2017). A lot of the compositions by Alexander Khubeev are syncretic at their core – his scores often capture both light and video (in the multimedia project of Alexander Khubeev and Nikolay Popov "Biomechanics.NEXT" media technologies are combined with instrumental theater). Nikolay Popov – is the author of the multimedia-futuristic opera "Curiosity" (2018), based on the Twitter account of the NASA space agency's Mars rover (Mizonova, 2024).

IRAIDA YUSUPOVA

A true founder of the mediaopera-genre in Russia is Moscow composer and film-maker Iraida Yusupova. Iraida Yusupova was born in Ashgabat in 1962 and graduated from the Moscow State Conservatory, composition class of composer Nikolai Sidelnikov. During

these years, Yusupova's unique compositional technique was formed: cryptophony. This mode of composing combines different language codes and ciphers; it relies on the superimposition of different language systems and styles, based on a system of alphabetic-tone correspondences, arbitrarily set by the author. A guiding premise of this approach is that the language system participates in this symbiotic practice in which semiotic structures and generative composing are mutually enriching (Yusupova, 2025, p. 24-26, appendix). Together with her fellow composers Ivan Sokolov and Sergej Nevraeyev, Yusupova launched this method in the form of the stage opus "Opera-Cryptophonica," which was performed at the "Alternative-95"-Festival in Moscow in 1995. Besides cryptophony, Iraida Yusupova deploys a related musical method, namely "wholly spontaneous polyphony" – the composer herself came up with the term. This is not, as the phrase might imply, aleatoric with meaning reliant on random acoustic association, but consists in improvisation within a fixed time span or using harmonic segments; the resulting outcome becoming a mosaic of sampled sounds. These compositional techniques – cryptophony and wholly spontaneous polyphony – imply a mechanical approach to music-making that in no way corresponds to the euphonic and emotionally-charged quality of her work. Both performers and listeners cherish the music of Iraida Yusupova. She has always enjoyed writing for unusual instruments and for singers with a unique timbre, and the performers have often become not only long-life friends, but also faithful interpreters of her work, ready for all of the daring experiments she puts together. In her recordings (or rather soundtracks, speaking in the mediaopera idiom, all the voices and musical layers are carefully recorded and then compiled.

Yusupova has worked in a vast range of genres: operas, symphonies, compositions (chamber music, symphonic, electroacoustic, choral and vocal), music for films, and theatrical productions. Since 2003, Yusupova has also been known as a director of art-house cinema and an author of media projects, for which she coined the term "mediaopera." Her love for cinema and theater led her to attend courses at GITIS (The Russian Institute of Theatre Arts, Moscow), where she mastered the basics of directing. In 1991 she met cameraman and video-artist Alexander Dolgin (1958-2019), who later became her permanent collaborator and husband. In 1996 they began working on multimedia projects together. According to Yusupova, this artistic journey began when they discovered a shared, long-standing love for black-and-white movies.

This deliberate combination of not just different stylistic layers, but also of fictive and documentary elements is rooted in another one of Iraida Yusupova's passions, namely mockumentary (a fake parodistic documentary), where the real and the pseudo-real, the high and the low are united into a single lampooning pastiche. An impressive example of this technique is Yusupova's film "Theremin's Last Secret" (Yusupova & Dolgin, 2003) about Anna Theremin – a fictional sister of the brilliant Russian inventor Leon Theremin (the thereminvox is one of Yusupova's preferred, unusual instruments), a singer and artist who, according to the film, became the muse of the young Dmitry Shostakovich and Kasimir Malevich. The plot's pseudo-documentary style also finds expression in the soundtrack – the main song, imitating Soviet jazz of the 1920s, was written by Iraida Yusupova herself. Some elements of the mocumentary-style can be found in the mediaopera "Enstein and

Margarita" (Yusupova & Dolgin, 2006): images of Ingrid Bergman, Greta Garbo, the Kremlin towers, footage from pre-war films, etc.

THE PINK MOUSE

"Pink Mouse" is one of the latest mediaoperas of Iraida Yusupova (2021). Based on the fairytale-novel of the same name by Viktor Erofeev, it was written after a prior "pen-test": Yusupova setting to music Erofeev's mocking poem "The last lover." Both collaborators were highly satisfied with the result, so they ventured to tackle a bigger project.

"Pink Mouse" is not just a piece of experimental artwork, but also an excellent example of how one literary style can be faithfully recreated in another form of art. Viktor Erofeev is very fortunate to have such significant composers evoking his work in musical form. In the opera "Life with an Idiot" (Schnittke, 1992), based on Erofeev's (1980/2020) famous story of the same name, Alfred Schnittke deliberately goes beyond the limits of his own language, following the style and the concept of the text. Scraps of Soviet and folk songs and marches appear in the musical score, merged with the aesthetics of soz-art, a communal dump of musical associations; these are combined with Schnittke's unique music style (complex harmonic clusters in the orchestra score and his archetypal, though "cruel," tango-theme which appears here as a symbol of tempting banality). Something similar happens in "Pink Mouse," where Iraida Yusupova consciously experiments in a territory somewhat alien to her, combining different musical languages and layers: rap and electronic techno, punk, academic vocals and jazz. Both Schnittke and Yusupova diligently and fearlessly set to music the tart obscene vocabulary of Erofeev's novels.

The cheerful madness both of the text and music, its seething eclecticism is a kind of "postmodernism of a healthy person," which combines irrepressible children's fantasy, translucent reality, obscenities and a gentle haze of sentimentality (the cultural references of the story swing from the "Divine Comedy" to the "Snow Queen" – Marusya's daddy does not recognize her at the Bottom). Not only the musical score, but also the video-part ("Pink Mouse" is dedicated to Alexander Dolgin and includes many of his video and photographic works) is compulsively eclectic: it is replete with recognizable images of glamorous mainstream characters with basic children's mythology of all sorts (Mowgli, Alice, Winnie the Pooh, characters of famous Soviet cartoons) and references to specific artworks and personalities of Moscow conceptualism (images of the late artist: Dmitri Prigov in the role of a high priest and performance artist German Vinogradov as a clown). Both on the screen and in the musical score the visual image and sound of the piano (Yusupova considers this instrument her lyrical "alter ego") play an important role. In this connection, the shooting location takes on symbolic meaning – all the performative scenes are filmed in the memorial apartment of the outstanding pianist Sviatoslav Richter (The Pushkin State Museum of Fine Arts).

The childish, provocative and political ("Only clowns want democracy," "Let's not be cannibals! Let's sit in the hallway instead") suggestions in the book have been combined – and scrambled – in the ambivalence of the musical text. Omnivorous stylistic elements are fused: different types of singing (opera singing, recitative, children's voice, vocal jazz,

chanson, rap, pop, folk, sugary rock music), speech, electronic audio samples, a choir, and a symphony orchestra (State Capella of Moscow named after Vadim Sudakov), a folk choir (soloists of the Dmitry Pokrovsky Ensemble) and an eclectic combination of solo instruments (cello, guitar, electric guitar, keyboard gusli, harp, piano, organ). At the same time there's no doubt that this score belongs to the genre of musical theater – it includes a system of leitmotifs, and some deliberately "operatic" fragments, as the dramatic scene of the sinking yacht with a big dramatic choir (chromatic "Lacrimosa") and a mystical interlude to Act II (Bottom).

Like most of Iraida Yusupova's mediaoperas, "Pink Mouse" is a unique experiment at the crossroads of genres, styles, languages and contexts. The work remains "open," constantly acquiring its meaning in the process of contact with the viewer, who at the same time becomes a co-author. In 2021 the mediaopera "Pink Mouse" received the Special Jury Award of the "Anatoly Zverev Art Prize." The motto of the award is Zverev's statement: "*Life is shackled, art is free*" (Zverev Art Prize, 2021).

IN LIEU OF A CONCLUSION

Looking back at such different origins and variants of realization of the genre of mediaopera, one can conditionally divide the approach to this phenomenon into two main perspectives – as a syncretic expansion of contemporary music regardless of its genre affiliation (a tradition actively developed in the 20th century by performative practice, verbal music, instrumental theater, the merging of electronic and acoustic sound) and as a variety and transformation of the genre of opera itself.

While recognizing the significance of both perspectives, we would like to especially highlight the second one – the generic connection with opera. What are the core characteristics of the opera nowadays? A plot or a narrative? The "anti-operas" of Morton Feldman and Maurizio Kagel proved otherwise a long time ago. A text libretto? The only lyrics of the choral vocal lines in Philipp Glass's opera "Einstein on the beach" are "do re mi" and "one two three." The video-opera "Weather" by Michael Gordon does not have a vocal line at all. What remains as an important part of the genre is a balance between elitism and accessibility which manifests itself in the fusion of completely different musical styles and languages, and in the very idea of bringing the cumbersome stage genre of opera closer to the perception of modern audiences.

On the one hand, media opera often acts as an ironic commentary on its historical prototype – the very concept of "cheapening" the most expensive form of art thanks to modern technology and cleansing it of all traditional operatic "tricks." On the other hand, despite all the ironic detachment, this genre demonstrates a generic attachment to the "big" opera themes: life and death, love and loneliness (as in the works of Fausto Romitelli and Olga Bochikhina), social issues (documentary video operas by Steve Reich and Robert Ashley, the multimedia project "Amazonas") and playing with opera archetypes and mythologemes (mediaoperas by Iraida Yusupova, Nikolai Khrust and Nikolai Popov).

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Research article

Mediaopera and Digital Opera: Musical Conceptualism and Modern Technologies

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Abstract

The purpose of the study is to determine a number of features of mediaopera as a form of musical conceptualism and an innovative genre, the genesis of which is associated with information technologies – digital opera. The study is based on a comprehensive approach that allows to identify the ideological and artistic foundations of mediaopera in Russia, the influence of conceptualism on it, and compare it with the actively developing digital opera. The genesis of mediaopera is connected with the formation of musical conceptualism, the center of which is the idea. Such concepts as cryptophonics, synthetism, performance are associated with the phenomenon of "mediaopera" in the Russian art space. Information technologies can be used to solve technical problems of creating a stage space. However, digital opera is becoming an independent art form, where the place of the viewer changes. Digital opera includes a number of innovations: from the use of performative elements to a digital quest (games on a personal device, smartphone, in a special application, etc.). In Russian research literature, the genres of media and digital opera are not always distinguished. However, despite some similarity between these types of musical and stage art, they differ significantly. This is due to their genesis, understanding of the main goal of the work and the use of artistic means. In conclusion, this underscores that trends in the development of modern art forms can be determined not only by the growth of digitalization tools themselves, but also by the change in the role of the viewer with the help of these tools, with an emphasis on pressing social issues.

Keywords: Mediaopera; Digital opera; Conceptualism; Digitalization; Contemporary opera; Contemporary art

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Научная статья

Медиаопера и цифровая опера: Музыкальный концептуализм и современные технологии

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Аннотация
Цель исследования – определить ряд особенностей медиаоперы как направления музыкального концептуализма и инновационного жанра, генезис которого связан с информационными технологиями – digital оперы. В основе исследования комплексный подход, позволяющий выявить идейно-художественные основы медиа оперы в России, влияние на неё концептуализма, а также сравнить её с активно развивающей digital оперой. Генезис медиаоперы связан с формированием музыкального концептуализма, в центре которого – идея. С феноменом “ медиаопера” в российском арт-пространстве связываются такие понятия, как криптофоника, синтетизм, перфоманс. Информационные технологии могут использоваться для решения технических задач создания сценического пространства. Однако digital опера становится самостоятельным видом искусства, в рамках которого изменяется место зрителя. Digital опера включает ряд нововведений: от использования перформативных элементов до цифрового квеста (игры в персональном устройстве, смартфоне, в специальном приложении и т.д.). В российской исследовательской литературе не всегда различаются жанры медиа и digital оперы. Однако при некоторой близости этих видов музыкально-сценического искусства, они значительно отличаются. Это связано с их генезисом, пониманием основной цели произведения и использованием художественных средств. Тенденции развития современных форм искусства, могут быть определены не только нарастанием собственно средств диджитализации, но и с изменением роли зрителя с помощью этих средств, с акцентом на острых социальных проблемах.

Ключевые слова: Медиаопера; Digital опера; Концептуализм; Диджитализация; Современная опера; Современное искусство

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INTRODUCTION. OPERA AS A MEDIA GENRE AND SPACE FOR NEW TECHNOLOGIES

Contemporary art is undergoing significant changes associated with both the search for new artistic forms and the use of new technologies. At the same time, in a number of works, new technologies not only expand technical capabilities, but are also intended to facilitate the creation of artistic images and the transmission of ideas.

Despite the fact that opera is the most conservative form of performing arts, it is also subject to such changes. Among the innovative types of modern opera that use various media and new information technologies mediaopera and digital opera stand out. This phenomenon is currently being studied by musicologists, art historians, cultural scientists, philosophers, art historians, etc.

Irina Snitkova (1999), Galina Grigorieva (2005), Anna Panova (2020) and others are devoted to innovations and modern trends in the opera genre in Russia. Ideological and theoretical foundations of modern opera are studied in the works of Svetlana Lavrova (2016), Anna Amrakhova (2009; 2017). Non-academic and alternative directing in opera art is analyzed in the articles by Natalia Gulyanitskaya (2014), Konstantin Zhabinsky (2010), Galina Zadneprovskaya (2016; 2023a).

There are still only a few studies devoted to digital opera by Russian scholars, due to the novelty of the cultural phenomenon itself, but the development of this genre also influences research activity. Among the works on digital opera in Russia, there are the articles by Trofimova Galina, Tsagareishvili Severian (Trofimova & Tsagareishvili, 2024), Dmitry Otyakovsky and Rustam Sagdiev (Otyakovsky & Sagdiev, 2023). Issues of musical dramaturgy of digital opera are the subject of research by Alexandra Krylova (2024), Vadim Bezmenov (2022). The problems and prospects for the development of this genre are analyzed in the articles by Paul Michkov (2023), Marina Bunakova (2020). Digital opera as a special cultural form is analyzed by Ludmila Zubanova (Zubanova & Bunakova, 2022) and Catherine Shapinskaya (2019).

The goal of this study is to determine a number of features of mediaopera as the form of musical conceptualism and specific features of the innovative genre of digital opera, the genesis of which is associated with information technology.

To achieve this goal, the study draws on the analysis of some modern operas, on interviews and works of main representatives of conceptualism (Dmitry Prigov and Iraida Yusupova), also on scientific publications on the subject. The subject is approaches by way of philosophical and culturological analysis, adopting an interdisciplinary and integrated approach.

DISCUSSION. MEDIAOPERA, OR MUSICAL CONCEPTUALISM IN RUSSIA: ART AS AN IDEA

Galina Zadneprovskaya is the author of a comprehensive dissertation on Russian musical theatre at the turn of the 20th and 21st centuries (2023b). She considers the genre of mediaopera as an “alternative opera” where this alternative character is connected, in her opinion, with the fact that some modern operatic works contradict the traditional understanding of opera “as a synthetic genre, including academic singing, scenery,

costumes, acting, choreographic scenes, etc. (with the unconditional dominant role of music).” Zadneprovskaya notes that such innovative works that either partially contain features of the opera genre, or do not contain them at all, are called “operas” by the authors themselves.

The genesis of mediaopera in Russia is largely associated with the formation of the Russian version of musical conceptualism, and thus also with literary or artistic conceptualism. Conceptualism refers to the definition of the role of the idea in contemporary art, in that the idea is the core of conceptual art. The idea that arises in the discourse of the author and the viewer is iat the center of the space opened by conceptualism space. Art is understood as the power of the idea, and not in terms of artistic material (Kosuth, 1993).

At the same time, the artistic methods of forming the idea-concept and its expression can be formulated in different variations. Conceptualism is closely connected with the synthesis of various forms of art, which allows us to correlate its genesis with the avant-garde trends of the early 20th century. A number of representatives of Russian musical conceptualism, including Iraida Yusupova, who is called the founder of mediaopera in Russia, have repeatedly emphasized this continuity.

Yusupova calls “Opera-Marina” her first mediaopera, although she began to use the term later. The second opera was “Opera-Cryptofonica,” created in collaboration with Ivan Sokolov and Sergei Nevraev. As for the third mediaopera, “Einstein and Margarita, or Found in Translation,” she highlights her authorship of the idea, but emphasizes that “it was provoked by Sasha Dolgin, who showed me a newspaper article about the affair of the great scientist with supposedly a Soviet spy who was also the wife of an outstanding Soviet sculptor.” The idea of a media version of the opera also arose due to the complexity of the practical implementation of a live performance. The libretto was written by poet Vera Pavlova and translator Stephen Seymour. The media co-author and co-director was Alexander Dolgin. Yusupova also emphasizes the importance of the participation of Dmitry Prigov in this project, one of the founders of the original direction of conceptualism in Russia (it was the USSR then). Prigov’s role in the process of forming the genre of mediaopera in Russia is difficult to overestimate: it was with his participation that the f mediaopera was recognized as a formation of artistic conceptualism.

The concept and phenomenon of “mediaopera” in the Russian art space and its research are associated with such concepts as the above-mentioned conceptualism, cryptophonics, synthesis, and performance.

The performance space was part of Prigov’s artistic concept. The famous Russian musician and composer Sergei Letov believes that Prigov is a rare type of poet-performer, which he attributes to the fact that conceptualist writers “were considered meta-poets, creators of a new view of creativity.” According to Letov, much of what Prigov wrote “cannot be appropriately perceived outside of a performative presentation.” This, as well as his talent as a sculptor, contributed to Prigov’s creative interest in the genre of mediaopera (Chernikov, 2024).

Prigov presented his understanding of the essence of conceptualism in his works “What Should We Call You Now?” (late 1980s), “What You Need to Know” (1989), “One Cannot Help Falling into Heresy” (1990), “Do We Believe That We Believe, What

We Believe in?" (2006), "The Last Questions" (2007), "Where Are You, Where Are You, Mother Modernity!" (2007). Gurlenova and Gabb note that "Prigov tends to interpret the concepts of "conceptualism," "social art,", "postmodernism" as close and related, since, firstly, he often characterizes some artistic techniques and components as common, and secondly, he presents them in a number of articles as synonymous" (Gurlenova & Gabb, 2020). Prigov assigned an important role to the behavioral act, he writes about the gesture that determines the behavioral strategy, about the author's character, etc.

Russian, in particular Moscow, conceptualists in the 90s of the 20th century, tried to comprehend their place in the contemporary world art and Western conceptualism. One of the Russian writers and founders of conceptualism Vladimir Sorokin wrote that "paradoxically, after the collapse of the Soviet Union, it was possible to exhibit anywhere and travel anywhere, Moscow conceptualists did not fit into the Western context of contemporary art. […]. Simply put, 'Moscow conceptualism' did not become just conceptualism." Sorokin adds that "in the 70-80s, the circle of Moscow conceptualists was good only for its air: conversation, hanging out, the joy of free communication, breaking taboos (not only ideological) and exchanging ideas" (Sorokin, 2008).

Talking about the Russian version of conceptualism in musical creativity, we can turn to one of Iraida Yusupova's interviews, when she defines conceptualist composers as those "who generate such strong ideas that they attract everything necessary themselves, and just need to be able to capture this attracted thing and give it life" (Miroshnichenko, 2014). At the same time, the conceptualist himself, according to Yusupova, becomes a "slave of the idea." This is one of the reasons for mixing genres, styles and artistic means, going beyond the boundaries of opera not only as a musical, but also as a theatric art.

RESEARCH RESULTS. MEDIAOPERA: BETWEEN EARLY RUSSIAN AVANT GARDE, POSTMODERNISM AND MASS CULTURE

Culturologist Yuliana Bachmanova wrote about the work of Iraida Yusupova and Alexander Dolgin:

> Dolgin-Yusupova is a unique tandem, creating on the border of the Silver Age and Golden Hollywood, high archaism and ironic carnival. It is difficult to describe this style, when the deliberate – just hilarious – simplicity of the picture, its cartoonishness, mask-likeness, poster-likeness is elevated to an ancient tragedy by unearthly music, or rather, by touches of the voice to some deep-seated samples generated by the Universe. In the middle is a postmodernist text with a "Chekhov-style," double reading. (Mediaopera "Planet Pi," n.d.)

The mediaopera "Einstein and Margarita, or Found in Translation" is more in line with all of these features.

Galina Zadneprovskaya believes that Yusupova's mediaoperas ("Aelita, or the Tragic History of the Revolution on Mars," "Opera Marina, " "Cryptophonics," "Theremin's Last Secret," "Einstein and Margarita, or Found in Translation") demonstrate the basic principles of conceptualism, such as the dominance of the idea-

concept, a clear conception of the synthesis of arts, the use of favorite and typical forms of conceptualism (performance, video installation, interactive dolls, simultaneous translation captions, etc.) (Zadneprovskaya, 2023b).

Moreover, if we turn to the mediaopera "Einstein and Margarita, or Found in Translation," we will discover the amazing artistic integrity of this work, which includes a bright musical part (music and singing), an original video sequence, a demonstration of texts in Russian, English, and German, references to the dramatic historical realities of the time of action. This special multi-genre space is united by the idea of love of the main characters living in different social systems, unfree in their personal relationships, and bound by different obligations.

In fact, it was planned to stage this mediaopera in a theater. However, a number of difficulties, including organizational and financial ones, prevented the authors from the implementation of this idea. Then a wonderful union of two creative people, Yusupova and Dolgov, was able to do this in the experimental genre of video art. The mediaopera is based on an independent soundtrack, and the laws of constructing a musical composition are transferred to the visuals. In the mediaopera, music becomes relevant in the video space, emphasizing the idea of the work. Despite the bright musical part of the mediaopera, it moves away as much as possible from the classical "language for the sake of language" in favor of the idea. The score for a large symphony orchestra includes the sounds of a jazz band, electronic phonograms, and a theremin. Theremin is one of the first electronic musical instruments, created by the Russian inventor, physicist and musician Lev Termen in 1920. This instrument is the beginning of electronic music. Its use in this mediaopera is both a way of creating amazing music, and a reference to the artistic ideas of the Silver Age, and the creation of a special atmosphere of the characters' lives, since, according to various sources, Einstein tried to play the theremin.

Mediaopera is a process and a result of continuous experimentation, a kind of laboratory of new artistic forms. In the opera "Cryptofonica," created by Ivan Sokolov, Sergey Nevraev and Iraida Yusupova, a special method of composition is used, associated with the coding of information. The method of musical cryptophony consists in the transformation of verbal text into musical text based on an arbitrarily chosen system of alphabetic-tone correspondences. The creators of this method believe that if this "font" is found accurately, then completely new meanings of the poetic text arise when performing music (Nikolaeva, 2011).

As mentioned already, Yusupova often refers to literary texts and musical ideas of the early 20th century in her works. The idea of the synthesis of arts was a favorite idea of the Silver Age, it was embodied in the paintings of Mikalojus Konstantinas Čiurlionis, the poetry of Velimir Khlebnikov, and the musical works of Alexander Scriabin. It was Scriabin who sought the possibility of uniting sound and light in his desire to embody the idea of universal unity, which was reflected in the "The Poem of Ecstasy" (1907), "Prometheus: The Poem of Fire" (1910), and the ideas for "Mysterium." The modernist aspiration to search for new forms included the disclosure of the possibilities of interaction between different types of art in the embodiment of meaning, the task of creating a special space of artistic impact.

DISCUSSION OF THE RESULTS. MEDIAOPERA AND DIGITAL OPERA: CONTINUED DEVELOPMENT OR DIFFERENT FORMS OF THE GENRE

A new synthesis of arts and new forms of contemporary art cannot be imagined today without the use of information technology. These technologies can be used to solve technical problems of creating a stage space, for example, the use of holography in the theater, "digital doubles" of famous deceased actors in films, etc.

On the other hand, digital art in general and digital opera as a part of it are becoming independent types and genres of contemporary art, within which not only the tasks of the authors of the work can change, but also the place and role of the audience. With the help of information technology, the viewer himself can become a kind of creator of the work and part of the artistic process.

Vadim Bezmenov (2022) emphasizes that "new forms of digital opera finally break through with the idea of the author's musical work and turn the old genre into a modern quest for a smartphone user – a quest that unfolds according to the rules of a computer game on the screen and in most cases relies on the personal playlists of the participants" (p. 93).

Digital opera includes a number of innovations: from the use of performative elements related to the activity of the audience to a digital quest (a game on a personal device, smartphone, in a special application, etc.). The digital component can transform opera into something like a video game. Singing and music can be both real and simulated and reproduced using electronic means, which significantly expands the range of vocalization opportunities. The development of digital technologies facilitates the transfer of opera from theater halls to mobile devices and gadgets. The peculiarities of digital opera require the creative unions of programmers, web designers, composers, video art specialists and directors.

One example of mediaopera conceived and written for distribution as a mobile app is the project "The Omnivore opera." It involved musicians, singers, technicians, opera professionals, designers, video makers and food experts. The project was presented as a mobile app for iOS and Android, the opera unfolds as a "media manuscript" with short film episodes shown to users (Bezmenov, 2022). The action takes place once a day, with varying duration, depending on the course of the meal. "The Omnivore opera" made history as the first opera that was written for distribution as a mobile app.

This opera was created by a Finnish team. Director and author of the libretto is Jaakko Nousiainen, composer is Miika Hyytiäinen, the performers include mezzo-soprano Essi Luttinen and, Eva Alkula as well as Lauri Sallinen, playing kantele, koto, and clarinet. The title of the work can be translated as "Opera of an omnivorous creature." In response to the question about the difficulties of combining a "big" opera and the format of a mobile device, Jaakko Nousiainen talks about the special paradox of this task, that at the very beginning of the work it was necessary "to disassemble the opera into elementary parts and reassemble them so that they would meet the requirements of the mobile environment" (Mitts, 2012). The author attributes technical limitations to the choice of tools that will work in the range of sound quality of mobile phones, determining

the length of videos that people will want to watch, selecting visual elements that are effective for a small screen, etc. At the same time, Nousiainen notes the contradictory role of limitations that simultaneously determine the potential for creating something new.

Those works, in which information technologies are not a source of technical effects, but a way of expressing artistic meanings, including those related to the reflection of acute problems of society, could be called a digital opera. Thus, the media production-network opera (telematic opera) Auksalaq is devoted to the issues of climate change. In artistic terms, it gives the audience the opportunity to collectively control the musical development of the plot. The creators of the opera are Matthew Burtner (author of music and libretto) and Scott Deal (created media content). The main theme of the work is global warming and its impact on the climate of Alaska, this problem is reflected in the symbolic name of the opera, which is translated from the Eskimo language as “melting snow”. (Bezmenov, 2022)

In addition to music, choreography, and fine art, remote technologies are used to interact with the audience. This is an attempt to present a complex interactive world that includes society, science, and art, in which attention is focused on an acute socio-political problem. One of the interactive technologies of this project is the development of a special application for smartphones that provided the opportunity not only for audience comments, but also for limited sound manipulation.

Contemporary performing arts are not only a space for artistic and technical experiments and innovations, but also a place of empathy and compassion for a person who finds himself in a difficult situation. One of the examples is the project of Russian authors “What life did not prepare me for. Item 64. Parkinson”. It is a plastic performance by Alexander Chelidze inspired by the book “Parkinson’s Disease. The Formula for Survival” by videographer and director Igor Kazachkov. Using dance, this is an attempt to reflect the state of a person with an incurable disease, which gradually leads to immobilization of the body while maintaining the functioning of the brain and the person’s identity. Since digital technologies and artificial intelligence were used to create it, this performance is not just a project of modern choreography.. The project reads data on the body overload and psychological state of the performer, the visual score of the dance and the sounds of the performer’s body, after which a single media landscape is built on the basis of the data obtained.

There is no musical part in this work that is traditional for opera. At the same time, a musical space as such has been created. Media artist Kami Usu (Kamila Yusupova), composer Egor Savelyanov created video and audio accompaniment. The performance uses processed sounds of an MRI machine, a digital avatar of the character created on equipment used to diagnose the disease, etc. All these techniques allow us to classify this production as an “alternative opera.”

Thus, a dramatic picture of the fight against an incurable disease, the desire to live and create despite it, is presented. As well as any other, alternative opera reveals the strength of the human spirit.

CONCLUSIONS ABOUT THE GENRE'S PROSPECTS

As is known, the opera genre is one of the most traditional genres of performing arts. However, this genre is also subject to changes and transformations. Modern forms of opera include mediaoperas and digital operas, although these innovative forms are somewhat similar, they differ in their artistic meanings and focus. These differences are also present in Russian art.

In Russian musical and stage art, the introduction of the concept and genre of "mediaopera" is associated with the work of Iraida Yusupova and her followers in art. This trend implements the main ideas of conceptualism, with a certain specificity of the Russian version. Mediaopera in this sense is associated, among other things, with the transfer of an idea through the synthesis of different forms of musical and visual plans. At the same time, in the work of Yusupova, the synthetic combination of all artistic forms of expression is important, which makes it close to the creative concepts of the so-called Silver Age of Russian culture. If classical opera is the unity of music and literature in the stage space, then mediaopera is the deployment of a soundtrack no longer in the stage space, but in the video space, into which the laws and methods of constructing a musical composition are transferred. In mediaopera, music becomes relevant precisely in the video space, revealing the idea of the work. Despite the fact that a number of productions of this genre have a bright musical part, the emphasis in mediaopera is on the idea of the work. The revelation of this idea is served not only by the work itself, but also by its context and the mixture of artistic languages within it.

In Russian research literature, the genres of media and digital opera are not always distinguished. However, the analysis conducted allows us to conclude that, despite some similarity between these types of musical and stage art, they differ significantly. These differences are associated with their genesis, understanding of the main goal of the work and all artistic means that are used in media and digital opera.

Mediaopera is closely related in origin to the conceptualism of the second half of the 20th and early 21st century and the ideological quest of representatives of Russian (Moscow) conceptualism, which differed from Western conceptualism by its inclusion in the underground as an antithesis to official art. As for the form of mediaopera, the origins of the synthesis of artistic means largely go back to the modernist intentions of the Silver Age of Russian culture.

The origins of digital opera do not ascend to the philosophy and artistic ideas of conceptualism. The development of this innovative form of art is closely linked to the development of information technology. At the same time, understanding the place of the viewer as a participant in the creative process is of great importance, and the action itself can unfold as a quest or a computer game. The activity of the viewer in the production often correlates with the acute problems of digital opera, associated with complex social or anthropological issues. Today, the process of art digitalization, including musical and stage art, is accelerating and receiving support.

Will this only lead to the transformation of the opera genre into a form of mass art or, being a certain challenge, will it become an incentive for the development of traditional opera? It is difficult to give a definite answer. However, interest in digital opera is growing. To support digital opera projects, the Digital Opera festival has been held in

Russia since 2019, the purpose of which is to unite theater and multimedia: Opera as a "musical and theatrical genre based on the synthesis of music, stage action and words," and Digital as "everything modern and digital, including multimedia technologies and art." The development trends of these new art forms may be associated not only with the growth of digitalization tools themselves, but also with the emergence of certain artistic theories of the development of contemporary art, by generalizing the experience of creating such works.

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Research article

The Piano as Therapeutic Participant in the Drama of *Pink Mouse*

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Abstract

Out of the multitude of imagery in Pink Mouse, both visual and aural, one feature is picked out for close examination: the piano. This instrument is seen at the very opening and it reappears at significant moments as the piece progresses. In an opera notable for its colourful animations, most of the appearances of the piano are presented in black and white and are filmed from the life. In this essay, encounters with the instrument are traced in the order in which they occur, and the suggestion is made that the pianist seen in the opening shot is in fact Maroussia as a slightly older woman, composing the opera and reliving the events from childhood within it. Following a hint offered in the opening placard, where she vows "if a miracle occurs and I have a lucky escape," the suggestion is made that composition has something of the therapeutic quality of an ex-voto. Maroussia is seen putting together the musical imagery at her piano, attempting to make it her own, still suffering horribly from the memories of her traumatic ugliness, struggling also with Pink Mouse in the form of the dancer, who is her collaborator, fellow-rememberer and often awkward muse.

Keywords: *Pink Mouse*; Piano; Composer; Imagery; Memory

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Научная статья

Фортепиано как терапевтический участник драмы “Розовая мышь”

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Аннотация
Из множества образов в “Розовой мыши”, как зрительных, так и слуховых, для пристального изучения выбран один – фортепиано. Этот инструмент появляется в самом начале и виден вновь в значимые моменты по мере развития пьесы. В опере, известной своими красочной анимацией, большинство появлений фортепиано представлены в черно-белом цвете и сняты с натуры. В этом эссе встречи с инструментом прослеживаются в том порядке, в котором они происходят, и высказывается предположение, что пианистка, показанная в начальном кадре, на самом деле главная героиня Маруся, немного повзрослевшая, сочиняющая оперу и заново переживающая в ней события детства. Следуя намеку, данному во вступительной надписи, где она клянется “если произойдет чудо и мне повезет спастись”, высказывается предположение, что композиция имеет что-то вроде терапевтического качества ex-voto. Видно, как Маруся собирает воедино музыкальные образы за своим пианино, пытаясь сделать их своими, все еще ужасно страдая от воспоминаний о своем травматическом уродстве, борясь также с Розовой Мышкой в образе танцовщицы, которая является ее соратницей, единомышленницей по воспоминаниям и часто неловкой музой.

Ключевые слова: “Розовая мышь”; Фортепиано; Композитор; Образы; Память

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INTRODUCTION

One of the tasks of an opera composer is to come up with musical imagery capable of expressing the chosen subject matter. In the traditional form, music evokes scene, setting, character, emotion, balances of power, familiarity and strangeness – everything in the world, in fact (Conrad, 1977). At the conference about *Pink Mouse* in Lüneburg in 2024, I mentioned that when considering the nature of the different types of imagery in the opera, I had been particularly struck by the role of the piano. The opening scene, showing a female pianist, presents an image which recurs in varied form many times throughout the work (fig. 1). Sometimes the pianist is alone; sometimes she is accompanied by a dancer. In contrast to the rest of the opera, put together from a multitude of highly coloured animations, these moments are filmed from the life, in black and white. In subsequent discussion, it became clear that the instrument had a particular significance for the composer and so in what follows I offer some ideas on this topic. In essence, I interpret the woman encountered at the beginning of the work as the older Maroussia in the throes of composing the opera which we are about to hear, reliving her experiences in memory, in order to write them out and find some kind of repose. The autobiographical mode is found to involve re-encountering the traumatic and, as we discover, the process of composition is not easy. Frequently throughout the opera we return to the opening black-and white Maroussia at her piano, as if witnessing her struggles with the material she tries to rework.

Figure 1. The piano in *Pink mouse* (used with permission by the composer. © Iraida Yusupova)

TIMING: 0.00

From the middle distance, we see a young woman sitting at the piano. It is a fine, modern grand, glistening, coffin black; its lid is fully open. Behind her are the trappings of decoration familiar from Hollywood films such as Charles Vidor's (1945) Chopin biopic *A song to Remember*: a candelabra on a console, a bunch of flowers in a glass vase, cut across and half hidden by the straight edge of the piano lid. This straight edge forms a strong accent, mirrored both by the stick supporting the lid, and by the straight edges of the body of the instrument. All these are at an oblique angle to the picture plane; they contrast with the vertical division of the wall behind, with its contrast of light and dark. The piano provides curves, too: the grand curves of its box are mirrored above in the curve of the lid. This play of shapes also has its Hollywood precursors, in such films as Lothar Mendes' (1937) *Moonlight Sonata*, starring Paderewski (Huckvale, 2022).

The woman herself sits upright at the instrument; her shape, with its combination of straight lines and curves, almost mirrors in inversion that of the candelabra behind. Her posture is significant: she does not slouch over the keyboard as some very great pianists do, nor does she gesticulate wildly as You Tube amateurs are inclined to do. She is poised at the instrument like a well-brought-up young lady of early 19th century novels, those amateur salon pianists, so derided at the time by E.T.A. Hoffmann, keen to exhibit their figures and show off to their admirers (Hoffmann & Charlton, 1989). Such young ladies are a staple of costume dramas of the Jane Austen type, but our woman is dressed in modern garb and, rather than playing for us, the viewers, seems to be lost in her own world.

Significant is the fact that at no point do we see her hands. Whereas videos of, for example, Yuja Wang or Peter Bence focus closely on their extraordinary finger dexterity (for Yuja Wang, see for example https://www.youtube.com/watch?v=32OHSsk-BfE in which the fingers are observed from multiple angles during a live concert; for Peter Bence, see for example https://www.youtube.com/watch?v=FS3LVVkJMms in which the pianist plays for the camera, in an empty hall), here we are left to imagine the tactile relationship our pianist might be having with the keys, the ways in which she presses down on each note. This is presumably because – in Hollywood fashion – the actress herself is not playing the instrument. (I understand that the composer herself is the performer.) The room itself is rather resonant, with a "bathroom" acoustic, the sound captured most likely with a single microphone, in the way typical of amateur recordings.

The effect of this posture is to distance the woman from the actual music – there is a tentative quality to her playing, as if she was exploring the possibilities of the instrument and, perhaps, also testing her own powers of music-making.

But this is counteracted by her facial gestures, which register every inflection of the music, as if she was noting its expressive potential and personal significance. As she reaches the last chord, she registers her satisfaction with a smile and a frown. Has she been improvising, seemingly "plucking music from the air" (Kildea, 2018, p. 44)? Does she recognise *something of herself* in this theme (cf. Kramer, 2021, p. 124.

Then she turns away from the instrument. Why does she turn like this, away from both the instrument and the viewer? What does the music mean to her? Why should these phrases have special meaning, and what might that meaning be?

The music she plays has a melancholy, plangent quality. It has an improvisatory feel, dwelling on the same phrase before ending on a half-close. Her music at this point does not terminate, but leads into an orchestral version of the same material. The little scene has a prefatory quality, akin to a prelude. But the intimacy of the solo instrument contrasts with the fuller, richer sound of the orchestra; the contrast between the two takes us from the personal world of private memory and sensibility into a public, more fully worked-out world, even though the notes are the same.

As the film begins, we are carried into a world of nostalgia, but without being able to pinpoint exactly what the coordinates of that nostalgia are. Why should this kind of music appeal to the woman so much that she wishes to give herself up to it in the way she seems to?

TIMING: 0.22

With the arrival of the words, we are given hints. These come up on a placard; they are not sung or spoken. They suggest a very rich array of concepts: death, accident, escape, innocence, family, the possibility of redemption through creative activity. It is notable, though perhaps coincidental, that these are the themes of Britten's *The Turn of the Screw*, which also begins with a prologue featuring the piano. Britten's Prologue features an older man introducing and placing the "curious story" he has discovered in a faded manuscript, written by a young, unnamed governess "long ago." Whereas both operas share a theme – the corruption by adults of childish innocence – the use of the piano in their respective openings is quite different. In Britten's work, the piano's sonority separates it from the action which follows, as a frame separates a picture from the wall (Howard, 1969). The man does not play the instrument, which functions like a supporting harpsichord in a classical recitative, invisible in the pit. In *Pink Mouse*, by contrast, the woman expresses herself by playing the piano; we never see her away from it. (Indeed (to anticipate) the instrument itself will be found to be an active participant in the drama.) She, as the first character we see, is our story-teller, our narrator, the "I" of the placard. She is the mature Maroussia, looking back on events, hoping to salvage what she can from the experience of the child Maroussia.

The words on the placard set the origins of the opera in the past, and suggest the possibility of redemption from trauma through an act of creation.

> Once upon a time, a cat's whisker from death,
> I said to myself: If a miracle happens and I have a lucky escape
> Pink Mouse and I shall…write and opera!

If this suggests that the opera to follow will be a kind of votive offering, it also has echoes of the Proustian notion of a work of art as a "means of discovering Lost Time" the materials for which are "stored up" inside the author (Proust, 1981, p. 935-936). There are memories, painful memories which the girl attempts to assuage with her therapeutic

piano playing, as Orpheus attempted to assuage the misery of loss with his lyre. As a gesture of containment, the motifs of her music contain the motifs of the traumatic music accompanying the scenes with her family that follow.

TIMING: 0.40

The girl listens attentively to the orchestral version of her music. The quizzical expressions on her face indicate uncertainty as she attempts to join in. But she fails to recapture it: her attempts are cut short; she does not manage to take control again. Instead, the motifs of her music are purloined by the music belonging to her father, which follows.

TIMING: 0.50

Before the father begins his habitual ranting, however, there is a very brief moment featuring a cartoon of the piano wriggling its feet – a little dance of frustration, perhaps, as painful memories take over. This is an extraordinary moment, despite its extreme brevity. For the legs of the piano, fixed firmly into its body, cannot move very far. They cannot dance, they can only wriggle in away simultaneously comic and absurd, like a child's tantrum. This is an image of multiple frustrations: the child's frustration at the behaviour of her parents, the adult's frustration when attempts to take control of memories are thwarted. Frustration has coordinates in all the dimensions of time. So, this one image contains the past and the present; it implies also the future, unless some way is found to break through or achieve closure. There is perhaps a hint of hope: the piano legs are at least moving; they might one day break free and dance freely. But at this moment in the opera, they wriggle furiously, punctuating an opening episode that is fraught with memory.

TIMING: 1.57

The pianist-girl appears again, framing the father's rant. (His hands, as he thrashes at the computer keyboard, are like a grotesque version of the woman's at the piano. (*Pink Mouse* is full of such ironic references.) She is seen as before from the side, but this time she is not actually playing the instrument, and the music is different – a rapid, repetitive, quasi-minimalist figuration. It is as if some other force has taken over, pounding out the notes. Then we see her from behind, as she appears to be exploring the low notes of the piano, banging them out loudly, just as low notes had been used in the guitar-saturated music in the father's rant. Whereas her opening music was expressive and melodic, here, taking over her father's musical imagery, she uses repeated notes and clusters in the low register, which instantly become subsumed and overwhelmed by the colossal, oceanic sound of the organ. As choir and electronics are superimposed, a crashing sound, sounding like the piano clusters electronically manipulated, bangs repeatedly. This is the imagery of drowning and of the girl's underwater travel. Like the piano music, but in a totally different realm of expression, this imagery is hers in the sense that she has taken

it over as part of her narrative, her operatic enactment. It represents the world seen through her experience and memory.

TIMING: 2.50

The woman defends herself from it all be putting her face in her hands: the keyboard has failed her. But the piano plays on, repeating her threatening bass notes, accompanying her as she sings "in short, that girl was me".

TIMING: 3.01

In the scene immediately following, the repeated notes, taken up into a higher register, are taken up as the opening notes of the child's naming song. The young Maroussia sits at the grand piano, but in a cartoon form, tapping out the tune with one finger and looking for approval to her mother. Getting no immediate response, she repeats the melody. Her legs, which cannot reach the ground, do a wriggle dance like that of the piano legs, noted above. Her naming song is played on a vibraphone-like instrument, imitating a toy piano, even though she seems to sit at a full-size domestic instrument. The voice of the grand piano is heard again as her father explains the name. The arpeggiated chords recall the recitative of operatic tradition. The girl repeats her song in a high voice and with a high accompaniment, only to find that it is taken over by the father in a low register, with a deep, resonant accompaniment. The weaker figure's music is co-opted by the more powerful figure – a symbol of the intertwined forces characterising this relationship between the generations.

Naming is a gesture of assertion on the part of the child, of control on the part of the father. They duet on the name, their intertwining of the same motif being an image of the power struggle.

TIMING: 3.48

The mature Maroussia returns at her piano, though this time we do not see the instrument, as she recalls the bell-like nature of her name. The screen is divided into two: she is on the right, while on the left is imagery of doves ascending – imaginative liberation. But it quickly turns to falling or drowning as the doll-like child floats through the air, ever sinking. A hand tries to catch the child as she tumbles. It looks as if it could be our pianist stretching out, though we have not seen her hands thus far in the opera: their existence has been implied rather than glimpsed. In this interpretation, the mature Maroussia is hoping to catch – and save – the child Maroussia. Alternatively, the hands, which come from right and left, could be those of the parents.

This vignette ends with the child sitting on the father's hand, before it slides out of sight at the bottom of the screen, leaving the woman singing at her piano (*Timing: 4.32*). She does not immediately play it, however – her narration ("My parents did not want to see New Year in Moscow") is sung to a notably expressive line (notably expressive,

perhaps, as this is the cause of subsequent catastrophe), against the background of the repeated notes of the naming motif.

Then we have a return of the opening music – this time set to words. A lament, it becomes something akin to a song of protest: “My Dad was Mr Particular Opinion”. He is the embarrassing father who always has the last say – something excruciating for the child, hence the passion of this fragment of song. Hence also the richness of the piano accompaniment: gone are the bell-like sounds of infancy. Here instead is the full passionate utterance of the grand piano against the human voice.

TIMING: 5.15

It is interrupted by an all-seeing eye, haunting the woman, cutting across her song, threatening.

TV…radio…magazines… these splatter around the screen and the sound picture, to relentless, fragmentary, electronic music, before the piano returns, accompanying with rich, melodic figures, the father’s complaints about the loss of freedom.

This might imply that piano music is not the exclusive property, as it were, of the girl and of her search for liberation, and that it can be transferred to other characters when their emotional needs are similar. In general, however, this does not happen, so here it might be interpreted as part of Maroussia’s narrative technique. She projects the piano onto her father and his world. Meanwhile, the electronic onslaught continues, cascading around the words “out of Moscow – what a great idea”, negating the meaning of those words. A similar disjunction occurs at when the girl’s naming music, which earlier had suggested some kind of innocence, returns to the words “filled with resentment, we boarded the plane”. There is a surprising inappropriateness at such a moment, a jarring of music and text which demands interpretation, in the way of Brecht’s alienation technique.

A further juxtaposition occurs at 7.18, when the wriggling pianos – four of them this time – jive and shake, tormented by the electronic hubbub going on around them. These four multiply into eight at 7.25, as a background to the mental turmoil of the girl, as she covers her ears in an attempt to block out the uproar. This uproar, it immediately (7.35) becomes clear, is the sound of her parents’ party. For a moment, she wonders if it has stopped reverberating in her head, but she is disappointed. The sounds haunt her. Against them, the infant naming music returns (7.38), as a gesture of self-assertion through narration, of a child’s delight in Christmas: “instead of a Christmas tree, we decorated a young, slender cypress in our living room”.

If we can assume, from the beginning of the opera, that Marussia as a young woman is the overall narrator of the opera, in moments like these, she deputises, as it were, the role to her infant self. If this is the case, she sees herself in memory as a child, and allows the child to narrate in her own infantile voice, with the simple, unvarying melodic fragment against the rhythm of the chimes.

It is at this point that Pink Mouse appears in the opera, talking to the child. Immediately after, at 8.05, the mouse appears in a fully-grown, lithely balletic form, swirling around the Marussia at the piano. The talking mouse must be a projection of the child: it is a projection which haunts the adult in memory. So, there is at this moment a

polyphony of four characters, Maroussia as a child and as an adult, and Pink Mouse as a toy and as an adult. This quartet are our ostensible narrators, as they talk us through the events of the opera. But they do not form a unified group, they are projecting onto and questioning each other – setting up a dynamic in which the viewer is compelled to do the same to make sense of the multitude of events being presented.

There is a parallel here with another work treating the relationship between a child and the adults who surround her, Henry James' *What Maisie Knew*. Like Pink Mouse, this novella portrays a child grappling, armed with only infantile resources of understanding and language, the adult word into which she has been thrown. Readers seem to discover the world as the little girl does, through her consciousness, following the growth of her interpretation with all its byways and entanglements. But, as James himself notes in his 1909 preface to the work, "small children have many more perceptions than they have terms to translate them; their vision is at any moment much richer, their apprehension even constantly stronger, than their prompt, their at all producible, vocabulary." He therefore introduces a narratorial "commentary" to articulate what Maisie herself cannot. He continues:

Amusing therefore as it might at the first blush have seemed to restrict myself in this case to the terms as well as to the experience [of Maisie's], it became at once plain that such an attempt would fail. Maisie's terms accordingly play their part – since her simpler conclusions quite depend on them; but our own commentary constantly attends and amplifies. This it is that on occasion, doubtless, seems to represent us as going so "behind" the facts of her spectacle as to exaggerate the activity of her relation to them. The difference here is but of a shade: it is her relation, her activity of spirit, that determines all our own concern – we simply take advantage of these things better than she herself. Only, even though it is her interest that mainly makes matters interesting for us, we inevitably note this in figures that are not yet at her command and that are nevertheless required whenever those aspects about her and those parts of her experience that she understands darken off into others that she rather tormentedly misses (James, 1897/1966, p. 6).

This authorial voice hints at things, rather than explaining them; additionally, each of the adults is involved in a vortex of misunderstandings and misinformation. Nothing is stable. Nothing is straight-forwardly grasped.

The first question might be: is this dancer a friend or foe? She hems Marrisa in from both sides, almost trapping her. Her words "You are so beautiful, Maroussia Mendeleyeva" might be complimentary, but they are not necessarily those a young girl is comfortable with. If the dancer is a projection of Marissia's, as I suggest, then Marrisa herself might be experiencing the discomfort of a voice-hearer (Parker & Schnackenberg, 2021). Like a voice-hearer, she sits rigid, at first closing her eyes defensively, but subsequently following the dancer with a sideways glance – an eerie movement, reminiscent of the threatening eye seen earlier at 5.15.

The electronic sounds take over once again at this point, leading into the parents' party and the eventual appearance of the Guitarist, with his set-piece song. Maroussia leaves the safety of the piano; her rigid pose at the keyboard is abandoned for a flexible, undulating motion of the whole body in her *pas-de deux* with the dancer. Once again,

there is a degree of discomfort here. Pink Mouse's voice is not concordant with the guitar; there is a collage of disparate elements which hint at the various conflicting energies and emotions at work. This aural impression is reinforced by the visual aspect – black and white, half in shadow, the dancers' forms with their digital haloes disappear into and emerge from the indistinct background.

Colour returns at 9.29 as a memory of a family discussion about crabs cuts in, before (9.55) the dancers return once again. Even while dancing, the adult Marussia is haunted by the dooms of childhood. The subsequent section features the Guitarist's set piece song. The way for it is prepared, both musically, and emotionally. At 10.10 he is seen sitting by the grand piano – surely an invasion of the girl's territory. At 10.18, Pink Mouse, now sitting protectively in front of the child at the piano, articulates her own fear of the guitarist: "I don't like the hairy one". This is not accompanied by piano music, but by the generalised electronica of the threatening world.

The guitarist's song, salacious and predatory, is danced to in the opera by the adult Maroussia. She appears throughout, whereas the guitarist himself only appears occasionally in his cartoon form. Just before it started, the little girl was put to bed, so she cannot have danced to it as a child. But her mother did – and this is the essence of the threat. The adult Maroussia moves lasciviously to the music, pretending to sing it herself. She adopts the song and makes it hers, as it were, presumably as a gesture of containment, as a way of controlling the memory. Things that horrify one can easily become part of one. One takes possession as an act of control. But Maroussia is posturing as a rock-star: her gestures are out of character and do not carry conviction.

She dances against the background of a cubist picture featuring a guitar in fragments; later these fragments are let loose in a vortex of bits and pieces of the instrument swirling around like the sea in which the boats have sunk, or the coffee cup with the crab in it, both of which have featured already in the visual imagery of the opera.

At 13.51 there is a return to the adult Maroussia and the dancer at the piano. Maroussia is her previous semi-rigid self, watching anxiously the lascivious gestures of the dancer as she wafts her hands over shoulders, breasts and face, saying "Can't you see what the guitarist is doing? He wants to break up your family". This conjures up a memory of the guitarist visiting the little girl in her bed, music decorating the protective blanket, with Pink Mouse as sentinel. Momentarily, there is an image of the girl happy in bed, but this is straightway replaced – as if a slide were being changed – into a scene of horror, transgression, nightmare. This is an invasion of privacy which perhaps never happened in fact. Why should a musician enter a child's bedroom, even in this dysfunctional family? Is this perhaps an instance of the adult Maroussia reinterpreting or reinventing reality, of a mix-up of memory and truth? Or maybe he did visit her bedroom. Certainly, the guitarist's ugly twanging sends electric currents through Pink Mouse, who changes colour, and it also triggers the image of the wriggling pianos at 14.18. The guitarist's static is shown jarring against the noble shapes of three grand pianos, making them wriggle in dismay. As their forms are superimposed, it seems as if they are kicking one another.

There is a change of scene, to the parents' villa, the next morning. The sound of smashing plates sets the emotional temperature. At 18.08, we see the adult Maroussia at

the piano again, this time with her head cradled in her arms on the keyboard. She still looks out towards us, but is defending herself within her body and within the piano. She rouses herself, to plaintively narrate "I woke up early…" to the sound of cellos. But the sound of the smashing continues and the wriggling pianos return, turned upside down and on their sides.

At 19.20, the adult Maroussia witnesses the conversation between her infant self and the father. She sits there, in the middle, in black and white, her eyes twitching eerily, following the increasingly awkward interaction between her parents. At 20.06, we see her momentarily, as a now unattractive child, standing by her piano. The music increases in ugliness. At 20.32, her parents are fighting on the floor by the piano, as she looks on, half hidden behind the instrument. At 20.40, the adult Maroussia is seen clambering onto the music stand at the front of the instrument, as if hoping to enter into its protective space. She is no longer playing – the piano has become a defensive den or nest. Finally, after recognising that "this looks like the end of the family", she does manage to squeeze herself in. As she does so, we are vouchsafed a glimpse of the music stacked on the piano, which includes manuscript paper. She is a composer; what we are viewing is the opera she is writing. At 21.11, we are briefly back in the cartoon world of the child standing solidly by her piano, threatened by the heads of her parents. Then, at 21.19, the adult Maroussia sits in the piano with her feet over the keyboard, hearing the adults ask what has happened to her face. At 21.48, we see her looking into the mirror, reenacting the trauma of childhood. She confronts a mask. Her music is fast and electronic at this moment; she has turned away from the piano, as – overcome – she sings of her dismay. Only at 24.35 does the piano return, as the child tells her mother of the guitarist's visit to her bedroom, calling her to the seabed. Its role is now slightly different – it is in duet with the cello: other music is influencing it.

At 28.57, after the rap between the adult Maroussia and the dancer, which leads her away into more worldly ranges of expression, the timid Maroussia is seen once more at her piano, defensively clutching a rodent. The music is predominantly on the strings – an *obligato* melody that carries through this section of the opera. Maroussia herself is typing the narrative of her early life on a laptop keyboard, not on the keys of the piano itself, all the while fending off the dancer.

The interlude which follows points up the poignancy of the situation, featuring an expressive melody on the cello, with a distant piano accompaniment. The start of Act 1, on the yacht, does not feature the piano until 33.32, when full chords accompany in a recitative-like manner the Uncle introducing himself. As he comments on the attractiveness of the young girl, her earlier naming music is picked out on the piano in a varied form. He in some way takes hold of her music, and when the adult Maroussia is again seen with her head in her arms at the grand piano (34.38), it is with the oceanic gurgling sounds of the sea and the subsequent shipwreck overwhelming her. Increasingly also, the visual imagery is of the piano being overwhelmed by the waters (imagery reminiscent of that in the early part of Jane Campion's film The Piano (1993), explored in Campion & Pullinger (1994). Clusters in the bass register of the piano are heard – not played by her, but illustrative of the crashing of wreckage into the deep (35.11): "For many of us there would never be a tomorrow night".

At 38.30 the adult Maroussia is at her piano, her score laid out in front of her, apparently singing off it. She doesn't play the instrument – the music behind her is of a general, oceanic type, but she moves her arms from side to side in a flowing, wave-like motion, akin to that often used by singers when they engage physically with the lines they are singing. This image superimposes upon itself twice, and then three-times, forming abstract patterns, illustrative of the feeling of sailing in different directions all at once. (This use of multiple imagery and reflections also has precedents in Hollywood film, such as *Rhapsody in Blue* (Rapper, 1945)).

At 41.32, after the dialogue between the child and the boy on board the yacht, the adult Maroussia returns at the piano in black and white, alongside the cartoon image of her younger self on board the boat. This time she strokes the strings inside the piano, creating a metallic *glissando* effect which adds to the oceanic boom of the music. This is not the quasi art-music of the opening: this is the generalised sonic image of chaos. As before, images from various angles are superimposed upon each other, creating a vortex-like flux of straight lines and sharp accents illustrative of fear ("I'm scared when my parents quarrel!") and also of sex ("They sleep naked! I saw it myself.") These cluster sounds fade into the next section, aboard the yacht, which returns to the repetitive rap-like music. (This has a function akin to recitative in classical opera – large tracts of informative text are got through quickly, with the minimum of musical material.)

When the adult Maroussia at the piano returns at 42.46, it is to punctuate these memories with a cluster spread on the piano wires, as described above. This is clearly a comment on what has just been portrayed in the rap and the cartoon – and it is a comment of dismay. At 47.35, in the lull before the storm the adult Maroussia strokes the wires more gently, the sounds so produced combining with the sounds of underwater as the sea rises and the storm interlude begins. At 51.30, the low clusters in the piano are combined with vast chords in the organ, submerging all around them. We see the adult Maroussia again, clearly at her piano (though the instrument itself is not visible). Whereas before we saw her from the side, now we see her straight on, from a camera position within the piano, as it were, looking downwards in dismay at the keyboard, as she relives the experience of being on the sinking boat. Our narrator is vividly bound up with the action she remembers. Later the chorus adds a further sonority to the overwhelming oceanic soundscape, as the adult Maroussia, our narrator, sings in an ever more angular and emotional style. At 53.30, the top of her head is seemingly submerged by the tsunami, as if it is she, rather than the boat, that is floundering. Her voice changes (54.06), and the accompaniment is momentarily reduced to the crashing clusters on the piano, before the music and the visual imagery take over and portray the development of the storm.

At 52.50, the wriggling pianos return briefly, before giving way to Pink Mouse in both her cartoon and dancer incarnations. The music here is the Lacrymosa from the Requiem mass: the traditional musical imagery of death. There is no piano sound, nor piano playing, as the adult Maroussia relives her impressions of the agony of that day, and of her guilt at surviving ("How shall I go on living?"). As a suffering composer, she has delegated expression of that guilt to tradition:

Lacrimosa dies illa	Full of tears will be that day
Qua resurget ex favilla	When from the ashes shall arise
Judicandus homo reus.	The guilty man to be judged;
Huic ergo parce, Deus:	Therefore spare him, O God,
Pie Jesu Domine,	Merciful Lord Jesus,
Dona eis requiem. Amen.	Grant them eternal rest. Amen.

(Text from Latin Mass Funeral, n. d. https://www.latinmassfuneral.com/requiem-mass/).

At the opening of *Act 2, The Sea Bottom*, at 1.00.48, our narrator is revealed as the composer, studying her score, hearing the music and conducting the choir. At the sound of the organ, she cues the chorus, then joining in with her song while playing harp-like glissandi on the strings of the piano as if she were spinning. This is a significant moment in the opera. At the very beginning, she said "I shall write… What has come of this? An opera!" But this is the first time that we have seen her studying her score and conducting it. The implication – hinted at throughout – is that all the music in the opera is hers, not just the piano music.

It was suggested above that the piano was a refuge for the girl, having a therapeutic function (cf. Monaco, 2009, p.35). Composers often work out their ideas at the piano; their scores are notated on manuscript paper which comes in ring binders. But if she wishes to cure herself of the terrors of memory by writing them out, they need to be confronted and made apparent both to her and to the audience who she wishes to share and understand her experiences. This involves the invention of imagery suitable for each and every moment, each and every character, each and every action of the work. Much of this imagery is shared. Every work assumes an array of culture, and the sounds and sights of *Pink Mouse* are easily accessible to a contemporary audience, ranging from the lyrical piano music for inward thoughts, through the offensiveness of the guitarist's pop, to the overwhelming vastness of the choral music superimposed over the organ. But at this moment in the piece we understand that all this imagery comes out of the composer's mind – that means out of the mind of the adult Maroussia. She spins the eave and weft of the music. At 1.0.25 the piano, seen from above, looks like a harp; she strokes the strings accompanying the choir till it reaches a cadence, which she conducts. Then there is a superimposition in which she both stands up to sing, gesturing like an opera singer, whilst in another embodiment, her arms and hands are seen stroking the strings. The dancer meanwhile is present.

This is one of the most splendid moments in the opera. "We can understand the language of the bottom. We are at the Bottom. I can see nothing terrible in that." The girl gives full voice to the splendid melody she has found to express these words, and the harmony has a richness which supports the melody in an opulent fashion. This is not the music of reticence or of fear: she lets go, and the music soars.

Naturally, in this opera of juxtaposition and irony, this moment is brutally interrupted by the non- music of the Guardian of the Bottom, with its speeded-up discourse. Functionaries do not get fine music in most operas, and when at 1.05.15 the Director's aria is salon music with a honky-tonk piano, one is not surprised. The adult

Maroussia is absent from the scene with the Holy Goose, but returns at 1.09.35 along with the dancer. They interrupt the cartoon pageant, questioning the narrative "Why the young prince? Where is the senior one? He's in disgrace…"

Maroussia asks the questions; Pink Mouse, in the guise of the dancer, offers the explanations – they are, after all writing the opera together, as we were told at the very beginning. Why this dance at this moment? Perhaps just two collaborators letting off steam and having a bit of fun? Their dance lasts till 1.11.08: not much more than a minute and a half, but such is the speed of events in this opera, that it seems much longer. The following section evokes the musical world of Monteverdi (composer of *Orfeo*), folk song and religious song, until 1.16.23, when the adult Maroussia, her image superimposed four times, interrupts with low clusters and a spread glissando across her piano strings. These crash back and forth as the Queen announces that she has failed to give the girl back her beautiful face. At 1.17.04, we have to imagine the adult Maroussia at her piano, because although we hear her voice, we do not see her. She sings an operatic scena, accompanying herself on the piano with reassuring arpeggios: "Am I really going to remain ugly?...Not to worry…It will all be fine." This is another of the great lyrical moments of the opera, a moment of hope, as she rises to a top Ab over a climactic Db major chord, before continuing further though ever further keys. Such a moment cannot last long: a tam-tam stroke at 1.18.35 puts a stop to it.

The piano is largely silent until the love duet at 1.34.38, when it combines with the cello in a romantic-style set piece, with the boy admiring the girl who is more concerned about her parents than with him. At 1.35.45 we see the black and white adult Maroussia lying flat on the floor, fussed over by the dancer; the piano comes to the fore again as they sing the duet melody as a melisma. The dancer enacts the boy's desire, pulling up the girl's skirt, only to be roundly admonished: "hands off!!!".

Guitars and crude music characterise the next scene with the father and the prankster clown.

But at 1.39.25, we return to the adult Maroussia typing at her laptop on the piano, distracted by the dancer who repeatedly tries to interfere. Collaboration can be frustrating at times. Presumably she is creating the duet of high sopranos Reggy and Gina, which follows. At 1.46.57, she is back playing the piano, laden with jewels, reading the music off the score, singing "I had no idea how hard it is to be a real princess…I was [Dad's] toy princess: now I'm a real one". This is the first time in the opera that we find Maroussia actually using a score in this way, performing what she has written. Before long, her song becomes less lyrical – being a princess seems not to be effortless – and she switches to a new kind of music, in which she sings a jagged line, all the while picking out the tune, arms akimbo, with staccato notes in the piano. She does not refer to the sheet music as she spins the narrative of the creatures queuing up to make an appointment with her; it is as if this was a spontaneous improvisation. The music becomes more expressionist as the theme of denunciations is introduced; Maroussia's gestures become more anguished and her facial expressions decidedly ugly. What she narrates is bad stuff.

At one moment (1.50.12) she picks up the little doll of pink mouse which has been lying on the piano, and then throws it down. This section of her scena ends with a vicious glissando swiping the keyboard from top to bottom, a gesture of finality. But just a

moment later, the music has changed. At 1.50.31, she returns to her sheet music to sing a romantic song. This begins as music which could work for a love song – and yet it refers to the adult world which requires double standards and is generally disgusting. As she gets further into the performance, her need for release breaks open the line of the song: as she rips off her necklaces, the song takes a battering. Twice more she throws off the trapping of a princess; asking "why do anything at all?". This is a set-piece aria, and it leaves her at 1.53.22 apparently exhausted, contemplating what she has just been though and perhaps listening to the words following: "Eternity has a bad effect on people."

That's the last we see of the adult Maroussia for a while. The piano returns at 2.06.15 in the scene between the girl and her father as an *obbligato,* binding the scene together, and the melody is taken up by the guitar at 2.09.06, but we do not see the instrument being performed. Only at 2.20.07, after many other adventures, does the black and white image of Maroussia trying to control the dancer return. The piano reprises the repeated notes originally heard when the child was introduced at the opening of the opera, but quickly reprises the aria with cello *obligato* heard earlier during the interlude between the Prologue and Act 1.

But it is the guitar that from 2.21.30 onwards that carries this opera towards its end. "You know he is a guitarist?" "What do I care…I love him more than anyone else in the world." And it is a new sound altogether – organ plus marimba – which accompanies the disembodied childish voice in the work's lovely coda.

CONCLUSION

This essay has traced each and every one of Maroussia's black and white appearances, in order. Description of this kind seems necessary when a work is relatively unknown. Maroussia is seen as the composer of the opera, putting together the musical imagery at her piano, attempting to make it her own, still suffering horribly from the memories of her traumatic ugliness, struggling with the Pink Mouse in the form of the dancer, who is her collaborator, fellow-rememberer and often awkward muse.

We have one last sight of the adult Maroussia at 2.21.30, as the credits begin. She is contemplative, as if joining us, the audience, in taking stock of all that she has made to happen during the previous two-and-a-half hours.

If this is so, Maroussia will view herself sitting at the piano. She will consider her relationship with the instrument, noting the visual side of herself at the keyboard, her posture, her hand- and head- gestures and ask, along with us: Why do you want to play it? What's in it for you as the performer? Will she perhaps see the instrument as an extension of her body and her imagination, a repository of her longings, creative aspirations, her soul? As a performer, one does not always know how one looks while playing one's instrument. But, having completed the opera, she might be justified in feeling a sense of mastery and a sense of potential. As she said at the beginning: miracles might happen.

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Research article

And the Band Plays On – Remarks for an Aesthetics of Persistence

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Abstract

Iraida Yusupova's mediaoperas appear only at the end of this consideration of philosophical aesthetics from the mid-19th century onwards, that is in the industrial age where „everything solid melts into air." To the extent that aesthetics is concerned with how things appear to human perception and experience, it is not well suited to trace processes of evanescence or dissolution. And to the extent that this philosophical bias results from the spectatorial perspective of a human mind that views the world and makes sense of it, this bias can be corrected only by beginning in the midst of things as do the philosophy of chemistry and the philosophy of technology. When everything solid melts into air, these solids might disappear in the sense of ceasing to exist, perhaps giving rise to something different or new. However, these solids might also end up suspended in a solution, lingering on or persisting as modern subjects do in an anonymous crowd. – All this has implications for musical aesthetics as well. Hermann von Helmholtz set the tone by beginning in the midst of things with the interaction on a par of three simultaneously analytic and synthetic technical devices: musical and scientific instruments as well as the physiological ear. As music moves out of the sacred spaces of the opera house or the concert hall, composers like Charles Ives incorporate the lives of things into the flow of musical action. This holds also for the Theremin as a musical and technical instrument that knows no beginnings and ends, no appearance and disappearance, but fuses the roles of player, conductor, and creator in the endless modulation of a stream of electrons, setting the stage for Iraida Yusupova's cryptophonic mediaoperas.

Keywords: Hermann von Helmholtz; Charles Ives; Iraida Yusupova; Schopenhauer and Theremin; Aesthetics of disappearance; Aesthetics of persistence

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Научная статья

И оркестр продолжает играть – Замечания об эстетике постоянства

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Аннотация
Медиаоперы Ираиды Юсуповой появляются только в конце этого обзора философской эстетики середины XIX века, то есть эпохи индустриализации, когда „все твердое растворяется в воздухе“. В той мере, в какой эстетика связана с тем, как вещи предстают в человеческом восприятии и опыте, она не совсем подходит для отслеживания процессов исчезновения или растворения. И в той мере, в какой эта философская предвзятость является результатом зрительской перспективы человеческого разума, который видит мир и осмысливает его, эту предвзятость можно исправить, только начав с самого начала в гуще вещей, как это делают философия химии и философия техники. Когда все твердое растворяется в воздухе, это твердое может исчезнуть в том смысле, что перестанет существовать, возможно, давая начало чему-то иному или новому. Это твердое также может оказаться во взвешенном состоянии в растворе, задерживаясь на поверхности или сохраняясь, как это делают современные субъекты в анонимной толпе. – Все это имеет значение и для музыкальной эстетики. Герман фон Гельмгольц задал тон, начав с взаимодействия на равных трех одновременно аналитических и синтетических технических устройств: музыкальных и научных инструментов, а также физиологического слуха. Когда музыка выходит за пределы священных пространств оперного театра или концертного зала, такие композиторы, как Чарльз Айвз, включают жизнь вещей в поток музыкального действия. Это относится и к терменвоксу как музыкальному и техническому инструменту, который не знает начала и конца, появления и исчезновения, но объединяет роли исполнителя, дирижера и творца в бесконечной модуляции потока электронов, создавая основу для криптофонических медиаопер Ираиды Юсуповой.

Ключевые слова: Герман фон Гельмгольц; Чарльз Айвз; Ираида Юсупова; Шопенгауэр и Термен; Эстетика исчезновения; Эстетика сохранения

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A PARADOX OF PHILOSOPHICAL AESTHETICS

„All that is solid melts into air.“ This sentence rings familiar to readers of Marx and Engels‘s *Communist Manifesto* – and carries a lot further than the immediate context of their argument. It speaks from the heart of the 19th century and, in a sense, the heart of modernity.[1] Marx and Engels spoke of the effects of capitalism‘s revolutionary release of productive power:

> The bourgeoisie has stripped of its halo every occupation hitherto honoured and looked up to with reverent awe. It has converted the physician, the lawyer, the priest, the poet, the man of science, into its paid wage labourers.
> The bourgeoisie has torn away from the family its sentimental veil, and has reduced the family relation to a mere money relation.
> The bourgeoisie […] has been the first to show what man’s activity can bring about. It has accomplished wonders far surpassing Egyptian pyramids, Roman aqueducts, and Gothic cathedrals […]
> The bourgeoisie cannot exist without constantly revolutionising the instruments of production, and thereby the relations of production, and with them the whole relations of society. […] All fixed, fast-frozen relations, with their train of ancient and venerable prejudices and opinions, are swept away, all new-formed ones become antiquated before they can ossify. All that is solid melts into air, all that is holy is profaned, and man is at last compelled to face with sober senses his real conditions of life, and his relations with his kind. (Marx and Engels, 1848/2010, p. 30-31)

If along with the forests and fossil fuels, all social relations and human beliefs are swept up by the instruments of production and melt through the smoke-stacks of the industrial age, this is clearly an invitation to rethink, redefine, reinvent ourselves, and this is what moderns do (Berman, 1988). But before we ground ourselves anew, it is worth considering that everything solid melts into air also in the Empire of Chance which was erected alongside the industrial age (Gigerenzer et al., 1989). Especially prominent among the solid things that were dissolved, if not dispersed or diffused in the 19th century were biological species, including homo sapiens. What Ernst Mayr called „typological thinking“ that took species as individually created types, was subsumed by Darwinian „population thinking“ – that is, by a statistical conception of species as reproductive communities in which traits vary with shifting distributions (Mayr, 1994). At the same time thermodynamics describes the convertibility of solid work and dissipative warmth (Rabinbach, 1990). The rather simple gas laws or the so-called Galton Board served as paradigm for a probabilistic way of thinking according to which the individual is uninterestingly unpredictable, but a sufficiently large system as a whole moves in perfectly predictable ways. The crowd and crowd-behavior became an object of reflection, and under the heading of „public health“ statistical epidemiologists treated not individual people but a *Volkskörper*, that is, the collective body of the nation (Foucault,

[1] To be sure, this was compellingly argued in Russell Berman‘s book that spans the experience of modernity from Saint Petersburg to New York City (Berman, 1988). The following reflections are complementary to his.

1975/2003). Averages were formed, deviations recorded, „normality“ defined as a feature of a distribuition of behaviors of traits such that the value of normality began to be consisted as conformity to a shifting mean. So, even the solid pillars of public moraltity were swept up by the urban crowds which swept away the individual whose „free“ choices would be accumulated by the first kind of data science, namely population statistics. In the arts, this was manifested by the birth of the specifically urban art-form of cinema: If the opera-houses or art museums served to collect people, with viewers collecting themselves in front of the art-work that commands their attention, the cinema appealed to the distracted gaze of people who are always in motion, who consume plots and images, absorbing them into the routines of their daily lives (Benjamin, 1935/2008).

This list of symptoms can be extended, making the case for a profound transformation in the 19th century of human experience or rather, of the way of experiencing. Now, how we come to experience the world is first of all a question of sensory perception and thus of aesthetics: The original idea of aesthetics concerns the ways in which thing appear, take shape, become meaningful entities in time and space – most evident in Immanuel Kant‘s „transcendental aesthetics“ that precede his transcendental analytics. We want to know how sensory impressions are organized so as to render distinct and persistent objects of experience. Kant, like Alexander Baumgarten before him or Ernst Mach after him, is interested in discerning signals emerging against the background of noise, not interested in the signals melting back into the noise (Baumgarten, 1750/2007; Kant, 1781/1998; Mach, 1906/1959). Of course, one can have phenonomenological descriptions of loss, confusion, or a melancholy dissipation of sharply contoured items into a moonlit scene, but philosophical aesthetics provides a first and perhaps the longest chapter in accounts of world-making. Sensory perception along with the mind makes the world as we experience it. Post-Kantian philosophy of science, culminating in Thomas Kuhn‘s notion of scientific paradigms (Kuhn, 1962/1996), exposes the theoretical frameworks in which things appear as planets or as moons, as phlogiston or oxygen, as intelligible structures and permanent features of the world. The arts, and especially the operatic arts, compose works that allow us to experience them as worlds. In both cases, this is a drawing together of many sights and sounds into a totality, finally the Wagnerian *Gesamtkunstwerk* that concentrates a world of experience in the space of a few hours and a closed room.

The paradox of philosophical aesthetics is that it is set up to trace the making of worlds and the creation of meaning – with all its political implications – and that it does not trace its unmaking in an age where everything solid melts into air. The most telling example of this can be found in Theodor Adorno‘s *Ästhetische Theorie*. Adorno considers as the supreme aesthetic achievement of the arts that they reveal how things come to appear, and he finds a pure example of this in the art of pyrotechnics:

> There is a moment when artworks come to be and at least for traditional art this moment happens when the work suddenly coalesces as a totality of its particular elements […] They come to speak thanks to the initiating catalysis of thing and appearance. Artworks are things that have the capacity to appear. […] Prototypical for artworks is the phenomenon of fireworks. […] It is […] empirical appearance, relieved of duration as that which burdens all things empirical, simultaneously a

> sign of the heavens and humanly manufactured, writing on the wall, a script that flashes up and dies down that cannot be deciphered for its meaning. […] The artworks differ from mundanely flawed ordinary things not because they are more perfect but because – like pyrotechnics – they actualize in a consuming fire as an expressive appearance. (Adorno, 1970, p. 126-126, compare 131)[2]

While it is for Adorno an important feature of fireworks that its signs and symbols do not endure, the significance of the pyrotechnic work consists in the fiery spectacle of appearance. He does not pay any attention to fireworks as a spectacle of disappearance, as a grand gesture of deliberate wastefulness: so much cost and effort, for naught! Similarly, the sounds from a piano keyboard bring forth an ephemeral sound that will fade away soon, they are significant for what they produce. Hardly anyone seems interested in their decay. But if the individual subject melts away into the crowd, is it not strange that philosophical aesthetics and the arts focus almost exclusively on the subjectivity of the artist and the beholder, on the human mind that manages to hold things together in a meaningful totality?

CHEMISTRY, TECHNOLOGY, AND THE SENSATION OF TONE

If traditional philosophical aesthetics is biased against disappearance and dissolution, this is due to a spectatorial conception of the mind-world relation. Another vantage-point is required and it comes from fields that inhabit fringe districts of philosophy. The phenomenon of dissolution plays a big role in chemistry and might serve as a defining moment for a philosophy of chemistry. There is the cube of sugar that dissolves in a cup of tea, giving the drink a new quality. What is happening here? According to Bernadette Bensaude-Vincent (1998), this is an important question not just for chemistry. We find ourselves within the mixed, in a mixture of many ingredients and relations, that is, in the midst of things. From this middle-position, quite literally, we have to ask whether things have merely been dissolved, that is, whether they are diluted and distributed in a solution: The cube of sugar has disappeared but the sugar crystals can be distilled right back out again. But perhaps, we have entered new bonds and something irreversibly new has resulted: The sugar is gone but a new chemical compound has formed. For a superficial example, most societies have been confronting for centuries the issue of immigration that is now as pressing as ever. A certain naive thinking wants to believe that migrants mingle among the natives, that they can be extracted and expelled at any time to restore the original purity of the nation – when in fact, we have entered into countless inextricable bonds with one another, forming a national compound, a new way of life.

[2] „Der Augenblick, der die Kunstwerke sind, schoß zumindest in den traditionellen dort zusammen, wo sie zur Totalität wurden aus ihren partikularen Momenten. […] Beredt werden sie kraft der Zündung von Ding und Erscheinung. Sie sind Dinge, in denen es liegt zu erscheinen. […] Prototypisch für die Kunstwerke ist das Phänomen des Feuerwerks […] Es ist […] empirisch Erscheinendes, befreit von der Last der Empirie als einer der Dauer, Himmelzeichen und hergestellt in eins, Menetekel, aufblitzende und vergehende Schrift, die doch nicht ihrer Bedeutung nach sich lesen lässt. […] Nicht durch höhere Vollkommenheit scheiden sich die Kunstwerke vom fehlbaren Seienden, sondern gleich dem Feuerwerk dadurch, dass sie aufstrahlend zur ausdrückenden Erscheinung sich aktualisieren.“ English translation by A.N.

The vantage point from the midst of thing is that of entangling and disentangling ourselves, of composing and decomposing, of making and building, of becoming attuned to the multi-materiality of the world – it is the vantage point of artful technology and technological art:

> We have to imagine a perfectly similar spectacle proceeding in the interior of a ball-room, for instance. Hear we have a number of musical instruments in action, speaking men and women, rustling garments, gliding feet, clinking glasses, and so on. All these causes give rise to systems of waves, which dart through the mass of air in the room, are reflected from its walls, return, strike the opposite wall, are again reflected, and so on till they die out. We have to imagine that from the mouths of men and from the deeper musical instruments there proceed waves of from 8 to 12 feet in length [c to F], from the lips of the women waves of 2 to 4 feet in length [c" to c'], from the rustling of the dresses a fine small crumple of wave, and so on; in short, a tumbled entanglement of the most difterent kinds of motion, complicated beyond conception. (Helmholtz, 1895, p. 26)

And so we find ourselves in „a tumbled entanglement of the most difterent kinds of motion, complicated beyond conception.“ From this basic condition of hearing commences Hermann von Helmholtz‘s *Lehre von den Tonempfindungen als physiologische Grundlage für die Theorie der Musik* [On the sensations of tone as a physiological basis for the theory of music], originally published in 1865. It asks the question of classical aesthetics – how does a tone come to appear – and answers it in a way that goes beyond the question.

HERMANN VON HELMHOLTZ AND CHARLES IVES

The American composer Charles Ives was one of many readers of Hermann von Helmholtz – but in the hustle and bustle, the parades and Circus performances of Danbury, Massachusetts, he drew his own conclusions (Rathert, 2011).

Many readers of Helmholtz, to this day, see his physiological analysis of the hearing of tones as a modern way to ground very classical notions of harmony and dissonance: what is „naturally“ pleasing or painful to the ear? Along the way, Helmholtz would disclose how the ear works, how in seemingly pure and simple tones there is a comingling of tones and overtones, how the ear can distinguish not only the A of a violin from the A of the flute but how it also distinguishes human speaking voices and noises that do not appear to have tonality at all.

For a reader like Charles Ives, Helmholtz opened the door to a world of sound where the pure tone is no longer privileged, where musical sounds are intervowen with the sounds of the street. Helmholtz does this by distinguishing the physical ear from the mental ear, the latter with its culturally conditioned musical judgement, the former much more interestingly an instrument, quite literally on a par with a musical instrument and a scientific instrument – all of them devices for producing as well as for analyzing sound.[3]

[3] The piano features a great number of strings which are used for producing musical sounds. But the piano does not just play music, it can also hear tones: If one stands next to the piano producing a tone that matches perfectly the pitch of

As Julia Kursell worked out, the art of music became a laboratory for the physicist-philosopher-physiologist Helmholtz (Kursell, 2018). Inversely, for modern composers like Schönberg or Ives, the conditions of hearing became a premise for their musical practices – they do not just produce a work that offers itself up to listening, but they modulate how and what we hear, utilizing and intervening in a process of hearing which is so much more than listening.

It is a conceit of Western classical music, celebrated to this day, that the musical performance arises out of nothing, that it is surrounded by at least a moment of silence which sets the musical work apart from the random noise of the everyday. The listeners tend to the work, construing it as a totality that suffuses the entirety of their aural space. But when the musical work melts into air, it blends with all noise, and our hearing knows no silences but is at all times in a world of sound.[4]

Some of Ives's most famous pieces were inspired by his father who not only gave him the book by Helmholtz, but in Danbury, had two marching bands each play their own tune as they kept marching passed each other, back and forth, producing ever new sounds. On the sinking *Titanic*, famously, the band played on, maintaining its posture against inescapable adversity. Stoically, the Danbury bands played on in monological togetherness (compare Ives, 1935). In both cases, there is no longer a question of the appearance and disappearance of tones but of floating suspended in a solution of sounds which have no beginning or end but just go on as life goes on, following the unbroken course of things.

THEREMIN, SYNTHESIZER, AND MEDIAOPERA

If there were a patron saint for an aesthetics of disappearance, this would have to be Arthur Schopenhauer (1818/2014, 1818/2018). In *The World as Will and Representation,* when the world is represented in experience, language, science, or art, it appears to us in the form of discrete, individualized things. But the world as will is unbounded, has no beginning and end but, like music, persists as a kind of energy or generalized feeling, spreading continuously and lingering on. It does not appear or disappear but is the ground or substrate that conditions all appearance and disappearance. As it enters into and traverses the spatial and temporal framework of the world of representation, the will becomes formative and individuates things, but it is sure to leave this limiting and distorting framework behind. Among the arts, music is the furthest removed from representation and appears as pure expression or unfolding of the will. The disappearance of a representative and representational life is told most poignantly in

one of the piano's strings, that string will start to vibrate. At this moment the piano does just as the ear does.

[4] Inevitably, John Cage's (1952) eloquent composition *4'33"* needs to be cited here. Why four minutes and 33 seconds of silence and not, say, three minures and 54 seconds? Cage was working with the Chinese *I Ching* or *Book of Changes*, that is, he recruited chance as his compositional ally. Charles Ives was, by profession, in the insurance business and as such a successful entrepeneur in the Empire of Chance. An intermediary between the physiologist and semiotician Helmholtz and the insurance salesman Ives may have been the New Englander Charles Sanders Peirce whose „tychistic" philosophy sought to account for an unbroken continuity of feeling in a world of chance (Peirce, 1892). To be sure, the thought of Helmholtz and of Peirce, and their relation, as well as Peirce's cultural proximity to Ives need to be investigated and elaborated in a considerably more detailed manner.

Thomas Mann‘s Schopenhauerian novel *Buddenbrooks* which presents the „decline“ of a family as it fades away and completely dissolves into the world of music (Mann, 1993).

So much for the metaphysics of art. In the midst of things, looking for its technical analogue one encounters it in the Theremin. Its mysterious inventor Lew Sergejewitsch Termen, also known as Leon Theremin was the subject of one of Iraida‘s Yusupova first mediaoperas (Glinsky, 2005; Yusupova & Dolgin, 2003), and his instrument is a firm fixture in her compositional practice (for example, Yusupova, 2005). To be sure, Theremin was not the first physicist to invent musical instruments. In Helmholtz‘s lab one would see sirens that modulate a powerful stream of air, and Helmholtz himself developed a keyboard-controlled synthesizer which allowed him to combine tuning forks and Helmholtz-Resonators to generate from pure tones different sounds with different timbres. Instead of a stream of air, the Theremin modulates a stream of electrons, it is an electronic instrument and yet perfectly analogue. It is the persistent presence of an ethereal body, an unending standing sinus wave of a pure tone that serves as a physical equivalent of the basic energy, unformed ground or substrate, of Schopenhauer‘s all-pervasive will.

The invisible, intangible, yet physically present body of the instrument is manipulated by the performer’s hands, the left hand controlling the horizontal plane, the right hand structuring vertically. Horizontally, the hand can alter pitch and thus holds and maintains a melodic line. Vertically, the hand controls how we hear the melodic line in terms of volume or intensity. This separation of horizontal and vertical planes of action is deeply significant: The left hand cares and curates what flows from left to right also in each line of staff in a musical score, the right hand governs and judges, it is the hand of the creator, also the hand that keeps us in time, with crescendos and decrescendos rising and falling through the score, coming together or moving apart in this bar or that.

The Theremin is thus built around the fusion of player, conductor, and creator. The very posture of the player expresses this, and it is also the posture of the conjurer or magician who presents a levitating body (Figure 1). Here, what levitates is the ghost of a body that does not inhabit the spatio-temporal world as representation. The conjurer’s hands elicit a voice from the dead or not-yet-alive; the ethereal substrate is a persistent presence, standing by even when the hands withdraw – without beginning or end it is not produced but lingers always, latently.

Figure 1. Player, conductor, creator, eerily modulating the ethereal body of the immortal will: Clara Rockmore at her Theremin

The standing waves can be drawn out in the form of analogue continuous melodic lines, insinuating themselves into the individual movements of classically formatted chamber music pieces, also insinuating themselves into digital media.[5] One hears them echo everywhere in Iraida Yusupova‘s works. When she seeks to characterize the difference between mediaopera and other forms of media art, she points out that the melodic lines of mediaopera are aural as well as visual. Mediaopera does not project a musical plot into the format and genre-conventions of video-art, it does not seek the synergy from two distinct cultural spheres, but develops a visual score musically (Bernyukevich, 2025).

Equally important for Iraida Yusupova‘s aesthetics is the separation and juxtaposition of the horizontal and the vertical, the meandering melodic lines and their coordination in time. This, to be sure, is as in Charles Ives‘s marching bands: each line is well-defined, stoically following its own step and pace, but what one hears depends on the criss-crossing and coordination of the individual lines. Since none of them is bound by a specific temporal regime, the willful „vertical“ moments of coordination finally determine how the intermingling individual threads join together. While each line for

[5] Building on and expanding the Theremin, the Moog synthesizer and subsequent developments can modulate several such curves simultaneously, each tied back in with the keys of a classical keyboard.

itself is written by the composer, the vertical moments only occur during the performance of the piece, in the composer‘s head and during the production at the computer of the ultimately scoreless mediaopera – it is here where the creative act takes place, a powerfully intuitive decision which results in the weave, more significant than the writing of the lines. This first struck Yusupova in the early 1990s at a performance of Stockhausens‘s opera *Licht* [Light]:

> I witnessed there the strong verticals of a „creator/performer.“ These were provided in the conception of the performance and not by the composer‘s or writer’s hand which is never so strong as the hand that creates the performance. This mystical vertical connection became for me the main guide in my subsequent development. (Yusupova, 2025, p. 17)

It is not the appearance or the vanishing but the persistent presence of the modulated horizontal line which is the paradigm for Yusupova’s *Gesamtkunstwerk* [Total work of art] (Lianskaya-Lininger, 2025). It is not contained in the shoe-box of an opera-stage, it eludes the temporal logic of the house falling silent, the music commencing, and finally returning to the keynote, for the applause to set in. Instead, we find ourselves in the midst of a cryptophonic parallelism or interweaving of visual and aural lines, carried on by a laconic narrative that does not rise to the level of high drama, even in the case of the *Pink Mouse* and her troubled protagonist (Yusupova, 2021; von Xylander, 2025). The *Titanic* sinks, parents drown, but the band plays on, at the Bottom of the sea or on land, with the narrative arc drawing in bits and pieces of the world rather than presenting it as a totality (Nordmann, 1996). The meandering lines of Yusupova’s *Gesamtkunstwerk* take up, draw in, encrypt the whole world; and the encryption key is a musical key. And if it ends at all, this kind of mediaopera joins in with Gavin Bryars‘ *The Sinking of the Titanic* (Bryars, 1975). Or, as in Yusupova‘s mediaopera *The Alphabet* it opens up into a cosmic landscape of space explorers who, like the Buddenbrooks, lose their entrepeneurial will and footing in the world of representation (Yusupova, 2024). Lost souls everywhere, hapless space cadets, but carried forward in the flow, blessed and perhaps saved by the intermingling lines of beauty and grace.

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Research article

Recombinant Agency. *Divine Comedy* Meets Upcycled Comics Art in *Pink Mouse*, a Meta-Mediaopera

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Abstract

A prose poem adapted to the ›mediaopera‹ format as interpreted by participant spectating – this paper reflects on metric composition in generative fields of practice across varied technological modalities. It seeks to characterise workings of ›agency‹, conceived in both embodied-human and disembodied-machinic terms. *Pink Mouse* (2017) has been translated by composer Iraida Yusupova into a pictorializing aural-optical digital idiom. The resulting artwork can be read as meta-mediaopera in that it affords opportunity to explore form-theoretical features of the genre it instantiates. Besides being an object lesson in how to interpret virtual artwork, this interpretative exercise also addresses a more general challenge of pressing urgency in the post-pandemic era, namely how to extract sensual order from the virtual noise of online communications. The metrics in play in this case study encompass lyrical, graphical, and social articulation, i.e. cadences seemingly inflected by intentionality. Except metric inflection no longer vouches for subjective cogency. Now that reflexivity has taken an instrumental turn, we essentialize agency as an expression of purposiveness, be it immaterial or material, at our peril. This paper attempts to decipher agency by recourse to an objective ground of material practices rooted in constructive semiosis – here dubbed ›recombinant agency.‹ This concept takes agency to be emergent patterning made up of myriad vectors of functionality, merged in tool-use, bound by inculcated social context. Factored together, these parts yield a whole in the moving target of felt lucidity. Yusupova's mediaopera holds agency to be irreducibly *human*. She upholds an analogue sense of cultural reproduction within the extant, digital logics of cultural annexation. Yet, a participant spectator, viewing *Pink Mouse* online, might well reckon that the piece strikes a more speculative chord, perhaps inadvertently, that preferably can enlist users, facing inexorable automation, in the service of creative autonomy.

Keywords: Mediaopera; Recombinant Agency; Digital Imaginary; Participant Spectator; Semiotic Surround; Socio-Kinetics; Kayfabe

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Научная статья

Рекомбинантная агентность. “Божественная комедия” встречает переработанное искусство комиксов в “Розовой мыши”, мета-медиаопере

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Аннотация

Прозаическая поэма, адаптированная к формату медиаоперы, интерпретируемая участвующим наблюдателем, – статья представляет размышления о метрической композиции в генеративных областях практики в различных технологических модальностях. Она стремится охарактеризовать проявления агентности как в воплощенно-человеческих, так и в бестелесно-машинных терминах. Роман “Розовая мышь” (2017) был переведен композитором Ираидой Юсуповой в изобразительную аудиально-оптическую цифровую идиому. Полученное произведение искусства можно читать как мета-медиаоперу, поскольку оно дает возможность исследовать формо-теоретические особенности жанра, который оно представляет. Помимо того, что это наглядный урок интерпретации виртуального произведения искусства, это интерпретационное упражнение также решает более общую неотложную задачу в эпоху после пандемии, а именно, как извлечь чувственный порядок из виртуального шума онлайн-коммуникаций. Метрики, используемые в данном случае, охватывают лирическую, графическую и социальную артикуляцию, т. е. каденции, по-видимому, сознательно измененные. За исключением того, что метрическая интонация больше не гарантирует субъективную убедительность. Теперь, когда рефлексивность приобрела инструментальный характер, мы на свой страх и риск придаем значение агентности как выражению целеустремленности. В этой статье делается попытка расшифровать агентность, обращаясь к объективной основе материальных практик, укорененных в конструктивном семиозисе – здесь названном “рекомбинантным агентством”. Согласно этой концепции, свобода воли – это возникающий паттерн, состоящий из множества функциональных направлений, объединенных в использовании инструментов и связанных с внедренным социальным контекстом. Собранные вместе, эти части дают единое целое в движущейся цели осознанной ясности. Медиаопера Юсуповой считает агентность нередуцируемо человеческой. Она поддерживает аналоговое чувство культурного воспроизводства в рамках существующей цифровой логики культурной аннексии. Однако зритель, просматривающий “Розовую мышь” онлайн, вполне может подумать, что произведение затрагивает скорее спекулятивную струну, возможно, непреднамеренно, что, скорее всего, может побудить пользователей, сталкивающихся с неумолимой автоматизацией, служить творческой автономии.

Ключевые слова: Медиаопера; Рекомбинантная агентность; Цифровое воображение; Зритель-участник; Семиотическое окружение; Социокинетика; Кейфеб

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INTRODUCTION

Opera is *meta* by definition. Arguably the most integral artform, it insinuates world in all registers. If heads of state assume power over an opera-house, they do not just seek a stage for the razzle-dazzle of self-promotion that surrounds them in gold-plated opulence. The stage touts political clout. Its extravaganzas trade on high drama – and rouse powerful emotions by way of scripted human dilemmas and predictable destinies. The spectacle on view in an opera house flaunts the supremacy of artifice over authenticity. In the following discussion, not the personal but the aesthetic is political. When audiences protest the political affiliations of star sopranos, this illuminates with blunt clarity a long coming and now established socio-technical condition. Human/machine coordination pulls the strings of automatic operations that, under the outsize influence of digital systems of mass distraction (Galloway, 2022), are steadily colonizing ever greater shares of the legacy mindscape.

The mediaopera *Pink Mouse,* by Russian composer Iraida Yusupova based on Victor Erofeev's prose poem of the same name, is a tragicomedy in which a doomed party of Russian passengers, travelling on a luxury yacht, capsizes at high sea. It plays in post-soviet Russia and premiered in Germany in 2024 (fig. 1).[1] This liminal object – part and parcel of the digital world it instantiates – preserves a moment of inflection at which the culture of reference seems to be drowning in a semiotic deluge of its own creation. *Pink Mouse* reads like an exuberant meta-reflexion on this incumbent, alien subjectivity extracted from the online activity of the very users it is engulfing. A study in irony, right for the times. The virtual coliseum of online traffic – the mediaopera's habitat – prefers a mode of participant witnessing that is double-edged. It draws on rhetorical strategies from pro-wrestling and opera, mediated or otherwise, embracing fraudulent veracity. »No opera plot can be sensible, for in sensible situations people do not sing« (Auden, 1967/2020, p. 1037). In pro-wrestling a similar phenomenon has been dubbed »kayfabe« – the mentality of a crowd, which colludes in treating a match, whose outcome is fixed in advance, as a display of knuckle-biting suspense, not the swindle everyone knows it to be (von Xylander, 2021). These orgies of falsehood flaunt their showmanship and favour irrational affiliation. Socrates might have concluded that a life Second-Lifed[2] is not worth living.

[1] Spoiler alert: This essay may sway your impression of the mediaopera. Readers who would first like to form their own opinion – or wish to look up scenes discussed in the following pages – will find a link to the piece here (with English captions): https://www.youtube.com/watch?v=DwnTUqvkV_Q – The premiere of *Pink Mouse* took place in Lüneburg, Lower Saxony, not in a conventional opera setting but in a university lecture hall decked out with high-tech audio-visual equipment, which seemed more befitting a mediaopera. Attendance was open to the public and free of charge.

[2] ›Second Life‹ is a metaverse comprised of virtual worlds built by users/players who interact with each other via surrogate avatars. At the height of its popularity in 2007, it had 1,7 million users who had built *ad hoc* continents that replicated the existing world map, in part, but also appended fantasy lands that covered a territory many times the surface of the earth. This reality gameplay introduced its own currency system and sparked off a veritable political economy (Köver, 2007).

Figure 1. A tragicomic cast of character at 2 hours, 26 minutes, and 40 seconds of the *Pink Mouse* mediaopera, used with permission by the composer. © Iraida Yusupova

The medial multifarity and suasion of operatic art is ubiquitously acknowledged (Kotnik, 2013). »I have always believed that opera is a planet where the muses work together, join hands and celebrate all the arts,« to quote Franco Zeffirelli, famed Italian film and opera director, a cultural populist whom by the composer and fellow director Pierre Boulez already detested long before Zeffirelli finally became an active member of Berlusconi's centre right *Forza Italia* party (Boulez, 1967). This holds in spades for mediaopera, a made-for-the-internet entertainment format. When Roland Barthes declared authorship »dead« in 1967 (Barthes, 1968), the verdict applied to composers too (Wuggenig, 2004). An act of composing doesn't grant final interpretative authority to the originator or preclude subsequent interpretative appropriation. The authors contributing to the discussion of *Pink Mouse* in this and the subsequent issue of *Technology and Language* apply vastly differing frames of reference. But they approached the enigmatic, 188-minute long feature in the same manner, namely by replay. Their criss-crossing skips and jumps effectively reconstitute *Pink Mouse* as a meta-mediaopera instantiated in so many compositional co-creations. These human/machine interactions enact what I propose to call ›recombinant agency,‹ a concept spelled out in reading the digital artwork at hand. It remains to be seen to what extent, if at all, such interpretative activity may prove to be self-actualizing.

DIVINE COMEDY AND MEDIA REVENANTS

Erofeev's *Pink Mouse* (*Rozovaia Mysh'*) mixes high and low cultural icons interweaving a cosmos of Russian cultural allusions with *Alice in Wonderland* motifs, borrowings from mass culture, and references to Dante's *Divine Comedy*. The melange

of registers picks up on an aesthetic idiom advanced by the French/Russian filmmaker Roger Vadim (1928-2000) from the 1950s, in Erofeev's youth. Vadim forged a type of cinematic story-telling that grafted titillating visuals and suggestive plot-lines on scenarios from classical literature, painting and sculpture. His modern adaptations of Emile Zola's novel *La Curée* (1871), Arthur Schnitzler's play *Der Reigen* (1920), Choderlos de Laclos's *Liaisons Dangereuses* (1782) challenged established cultural boundaries between pornography and art and helped usher in a new era of permissive sexuality that came with the invention of the birth control pill. *Don Juan, or If Don Juan were a Woman?* (1973) runs through the role-reversal of wickedness. *La Vice et le Virtue* (1963), a film set in World War II, explores the polarity of annihilation and eros through *Justine* by the Marquis de Sade.

Vadim was the son of a French mother and Russian prince who escaped to France after the Russian revolution. His life and work encapsulates a cosmopolitan milieu that overlapped with Victor Erofeev's upbringing. The author of *Pink Mouse* spent some of his childhood in Paris; his father, a high-ranking Soviet diplomat, was the French interpreter of Stalin and Molotov. Men of Erofeev's generation grew up on the female heroines that Vadim canonized – Brigitte Bardot, Catherine Deneuve, Jane Fonda – a new edition of the femme fatale (Kennedy, 2012). Engaged to all three, Vadim married two of these film stars (Vadim, 1986). Vadim's iconic image of womanhood casts the female seductress as servile domina whose ability to anticipate, incite, and thwart male desire, seemingly at will, rests on a dirty little secret that complicates these power relations. Women are groomed to please the men whose strings they pull. In this libidinal protocol, seductive tactics employed to tame feral manhood are stipulated by the men themselves. Numerous versions of this mating game ruled for approximately three decades, from the early 1950s to the late 1970s, when second-wave feminism dismantled the libertine fantasy.[3]

Erofeev's *Pink Mouse* (fig. 2) appeared in 2017. It is one of few texts by this Russian dissident author not yet available in translation though plans for a German edition are underway. The delay may be related to the heightened metric and literary challenge of rendering poetic prose in a foreign tongue. In any event, a different kind of translation was effected, when the Tatar-Russian avantgarde composer Iraida Yusupova created a mediaopera adaptation of the prose poem in 2017.[4] Her visual score features a twofold protagonist that consists of the main character, a young Russian girl named Maroussia Mendeleyeva, and her *alter ego*, Pink Mouse, guardian friend or self-soothing illusion she projects on a hostile world. This literary device – a fictive character inhabiting the

[3] One of the leading voices of the movement was Simone de Beauvoir whose analysis had been trained on the films of Vadim and how they depicted male desire in the construct of the feminine as personified by Bardot (de Beauvoir, (1959/1961; 1949/1972; Evans, 2013).

[4] On the occasion of the work's premiere, March 21, 2023, Yusupova's *Pink Mouse* libretto was translated into English by Anna Rush with the generous assistance of the Leuphana University Lüneburg. The premiere was followed by an international, philosophical and theoretical workshop on the very conception of mediaopera with the following invited speakers from different institutional contexts: Alfred Nordmann (Technical University Darmstadt), Steve Fuller (Warwick University), Evgeniya Lianskaya-Lininger (Sirene Operntheater, Wien), Anthony Sellors (BBC Radio 3, London), Wiliam Mival (Royal College of Music, London), Victor Erofeev (Leuphana University Lüneburg), Ulf Wuggenig (Leuphana University Lüneburg), Cheryce von Xylander (Leuphana University Lüneburg), Iraida Yusupova (via Zoom).

poem's fictional cosmos – troubles such familiar psychological conceits as personal identity and self-continuity. In the tale's pictorial scoring, Maroussia and Pink Mouse will appear as two and as one, in league with other shape-shifting figurations in-between the poetic libretto and its pictorial translation. The who-is-who of this mediaopera dissolves into an indexical conundrum open to construal.

Figure 2. Book cover of Victor Erofeev's *Pink Mouse* (2017)

Pink Mouse was not Yusupova's first mediaopera, nor has it been her last. It is, however, the first mediaopera that she composed ›on her own‹, as it were. The notion of *solitary* credit is flexible, a socio-cultural construction that varies, considerably, from one artistic field to another, depending on the preponderance of »charismatic ideology« (Pierre Bourdieu) versus the belief that art production is a type of collective action (Becker, 1974). In film, supporting roles appear in long credit lines at the end of the work. In the traditional fine arts as well as in contemporary Western visual art, by contrast, all credit obtains to the conceiving artist while any craftspeople involved or persons in the cooperative network (frequently hired in executing an idea) remain forever unmentioned. One glance at an opera brochure will confirm that opera more closely tracks the rules of film than those of visual art: director and conductor are mentioned as well as singers, orchestra, stage design, costume design, dancers, and special effects. Yusupova credits numerous associates at the end of *Pink Mouse*. But artistically, *Pink Mouse* demanded a new artistic autonomy in that she worked out the visual and musical scoring of *Pink Mouse* by herself. Her husband and longtime project partner, cameraman Alexander

Dolgin, had died during their work on a prior mediaopera, *The Planet of Pi*, leaving her to go solo.

Pink Mouse can be taken as a work of mourning. In reinventing herself as a one-woman, musical-pictorial composer of this poetical phantasmagoria, she plotted out an experience of bereavement. The resulting piece can be understood as a quasi-collaborative artistic dialogue with the deceased. Her animation sequences use stock visual material from Dolgin's archive, which gives her former companion a preternatural, graphic life-after-death. Joint artistic agency, coalescing around the libretto in consonance with Erofeev's storyline, and perpetuated by way of technological mediation. Yusupova (2025) describes the exchange of husband and wife in mystical terms. Felt complicity, reified in works of art, speak to the workings of agency. Humanity can be understood as a mirage that arises from transactional practices involving exchange, tool-use, and negotiated purposiveness. The revenant quality of the making of this mediaopera might also be cast as an instance of a cultural epiphenomena rooted in today's computational infrastructure, an instance of digital sampling, cultural upcycling and archival reassembly – practices that have roused new notions of afterlife. While such spiritual experiences hearken back to ancestral religious beliefs, they also further a pictorial lifeworld predicated on materialist imperatives, i.e. microchip-driven infrastructures relying on the commodification of agency.

Alice in Wonderland, or the Male Gaze Revisited

Alice in Wonderland and its Russian derivative *Pink Mouse* are children's tales for adults, brim full of philosophical import. Both have been remade as operas, by female composers – and both lend themselves to critical gender analysis. The South Korean composer Unsuk Chin (2007), one of the favourite pupils of György Ligeti, premiered her *Alice in Wonderland* at the Munich Opera House in 2007. Chin portrays the *Alice* story (accessible, online, in full length) in a mesmerizing estrangement that approaches the subject as a thought experiment, an idea she borrows from that paean to computational creativity, Douglas Hofstadter's *Gödel, Escher, Bach*. Chin's libretto highlights philosophical nuances of the popular children's book, rather than its storyline or dialogical elements; her scoring, musical and visual, situates the tale in a dreamworld. The singers are outfitted to resemble puppets. Alice moves in the staccato cadence of marionettes. This enchanting girl-doll recalls the storied inner child in us all. On a darker note, her Alice-doll also conjures up the spectre of paedophilia: A gnarly old man who may or may not be a stand-in for the author haunts the theatrical production. His physiognomy spells perversion: He wears a mask showing a nose that looks like a semi-tumescent penis, erect enough to suggest a lack of impulse control, limp enough to give the impression of a man past his prime, age and ardour out of step (fig. 3). This artistic exploration neither condones nor condemns the intimation of an everyday paedophilia, which pervades our cultural order. Her *mise-en-scène* implies that the conditions of possibility within which the Alice tale endures may be archaic, archetypal and universal. The mirror her opera holds to the audience reflects covert, even anathema, cultural dynamics.

Figure 3. Masked figure in Unsuk Chin's (2007) *Alice in Wonderland*

Both composers, Chin and Yusupova, shift the sexual politics of their operas away from the original novels. Chin's piece is not a mediaopera in Yusupova's understanding of the genre. She did not compose her piece for a virtual online audience or re-invent the opera house as an institution without physical walls and fewer social barriers or challenge extant conventions governing the analogue/digital divide or use upcycled comics art and celebrity culture in a cyber-mix containing real world elements – all of which occurs in *Pink Mouse*. Whether or not Yusupova saw Chin's work before embarking on her own musical-graphical interpretation, their pieces bring a similar, gender-critical spin to stories about young girls told by men. When we meet Maroussia in *Pink Mouse*, she has just started puberty. She witnesses relational dynamics between her parents and adults in general. Older women are unfaithful (see her mother and the queen of the underworld). Older men seek to steal her virginity at a house party by a beach and later in the under-sea world (see the guitarist Thum-Strum as well as the older prince of the underworld Johnny Depp). She clings to Pink Mouse, her imaginary companion, as to a stuffed animal, her secret weapon against lecherous stratagems. The guitarist will have his way with her in the course of events, though we are not privy to any rape scenes or presented any details. There is no recorded trauma. Meanwhile, Maroussia joins forces with her cousin, Runt, who is her sidekick throughout the tale of sexual misadventures that have or have not occurred. As spectators, we are never quite sure. Events unfold in a twilight zone of impossible simultaneity: the girl seems dead but also very much alive; she dwells in the real world but also in a fantasy sphere; her home is Russia but she also inhabits an Americanized subcontinent situated on the bottom of the ocean, the »Bottom«.

Yusupova's mediaopera shuns ontological constancy. Her visual score oscillates between footage of real performers, landscape, film and photography, graphic illustrations, cartoon figures, collage-stills, and in-video image macros of the captioned libretto. In this semiotic universe, signifier and signified appear as doubles – the same lines of narration are elaborated in real and pictorial allusion, simultaneously, in counterpoint. In this fractal imaginary, experience fragments form a surrealist dreamscape. Central protagonists – like Pink Mouse, Crab, and Maroussia herself – are shape-shifting referents.

One certainty persists throughout the piece, however. Maroussia is an object of desire for those around her. The girl does not feel comfortable with her sexual persona. Having entered puberty early on in the story, she spends much of the piece looking like a dishevelled puzzle (fig. 4). Early on, we see her doll-face morph into a »scarecrow« (17:17-17:20). Her »ugliness« concerns the libretto, and the visual score. Maroussia is no Lolita. Yusupova's graphic casting of the girl's budding sexuality does not imply nubile curiosity. The shame incumbent on being deemed »ugly« is portrayed as a cultural mechanism, which entraps the fertile half of the population in strictures of gendered convention.

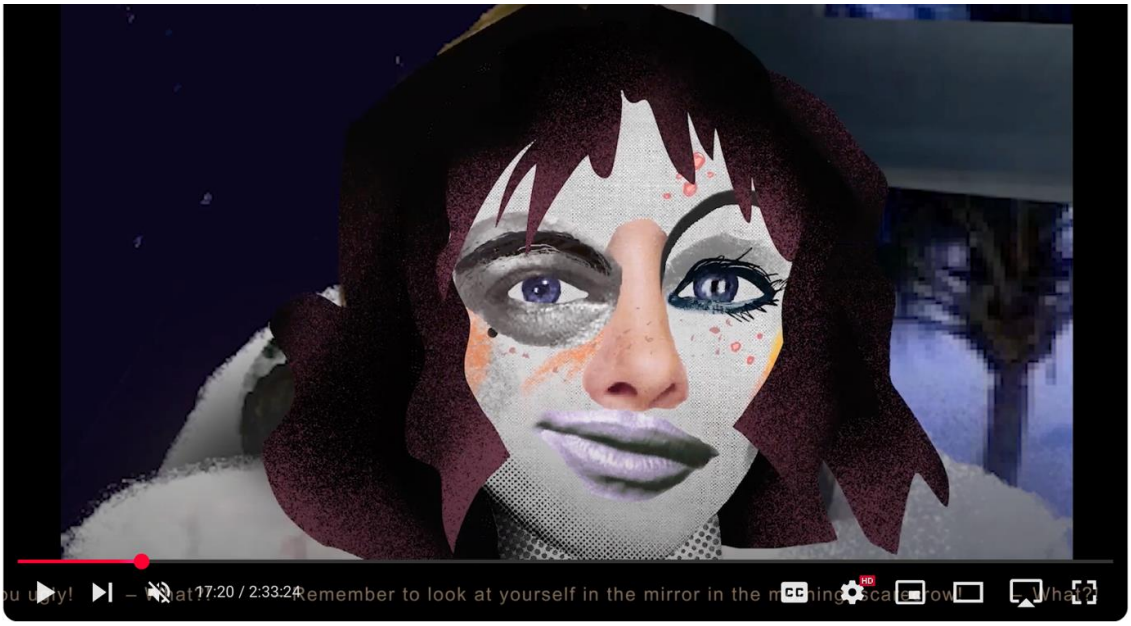

Figure. 4. A dishevelled puzzle, used with permission by the composer. © Iraida Yusupova

Yusupova does not expect her female characters to be virgins, madonnas, or asexual neuters. Girls like Maroussia deserve to reach adulthood in their own time and on their terms. But her heroine is being socialised in a milieu of ubiquitous grooming. A common female plight: Older males – family friends, authority figures, personages from public life – abuse their positions of power and authority for sexual access. Yusupova's Maroussia deplores this state of affairs and does what she can to avoid being the target of unwanted attention. In Yusupova's adaptation of *Pink Mouse*, young girls do not collude in their sexual exploitation. Indeed, the infidelities of older women come across as late acts of

defiance for the ways in which they too will have been taken advantage of in their younger years. An apposite side-effect of interpreting *Pink Mouse* as a mediaopera is that its premier was never destined to take place in a grand opera house. The audience on opening night – which occurred at 10 am in the morning – did not involve a long parade of suited men with bejewelled female companions wearing ball gowns and high-heeled shoes. Mediaopera, a genre less dominated by male composers, producers, and directors, breaks with institutionalized practices that leave space for women only in the capacity of singers and support staff.

Erofeev uses sex as a metaphor in his writing. He found literary notoriety for translating the *Marquis de Sade* into Russian, an author deemed inimical to the moral order of the Soviet Republic. As literary critic working for an underground magazine, Erofeev brought these forbidden writings to public attention by *samzidat*, meaning a small circulation of typewriter-produced copies that could easily be traced to their source. This kind of lettered pursuit was generally tolerated in the Soviet Block. But Erofeev's literary excursion resulted in a family calamity: he was accused of seditious activity; his father lost his diplomatic post; and the family, having fallen from grace, forfeited its privileged lifestyle. With no hope of a future as a scholar or public servant, this devastating development launched his career as an oppositional figure – he found his voice as a gadfly. Belonging to a generation of male authors whose gaze had been trained on the erotic sensibility of Roger Vadim,[5] later vulgarized by Hugh Hefner, Erofeev brought an anti-establishment outlook to the literary conventions of Socialist Realism. Schooled in the erotic-philosophy of the Marquis de Sade, he never minces words regarding demands of the flesh. His male protagonists might trifle with seeing rape as a crude kind of flattery and his victims come across as rather more complicit in their ruin than propriety might suggest.

Their respective critiques of entrenched sexual hypocrisies – Erofeev (male author) and Yusupova (female composer) – diverge. But they agree in the aesthetics of their compositional approach. Both narrative poem and its mediated translation show layered themes braided together in a fanciful plot with the result more resembling a palimpsest of words and images than a conclusive whole driving towards an inevitable conclusion. *Pink Mouse* riffs on national identity. Maroussia can be taken to be an emblem of the nation. Already her name sounds like ›Russia.‹ Her progression through adolescence parallels the country's changes and growing pains through Glasnost and Perestroika. We see post-soviet Russia corrupted by the market economy and venereal temptations of Western consumerism, which were unleashed on this innocent land in the late 90s and noughts. The reign of oligarchs with luxury yachts – central motifs in *Pink Mouse* – began at this time. A spectacle of »conspicuous consumption« (Veblen, 1899) brought vast wealth to

[5] The fame of Vadim's vamps (specifically, Bardot, Deneuve, Fonda) far outstripped that of their creative promoter. While they are considered great actresses, he is remembered as a second-rate director of B-movie soft erotica. Their careers advanced without him. Francois Truffaut, Jean-Luc Godard or Alain Resnais, recognized visionaries of the *Nouvelle Vague*, stand as the iconic film makers of that period. They have art acclaim while Vadim enjoys only marginal cinematic standing even though at least Truffaut drew inspiration from the latter's work. Little critical literature speaks to Vadim's legacy and it is not possible to purchase an edition of his collected work. Indeed, many of his films are difficult to obtain (Mancini, 1988).

the privileged few. The majority of the population was left to fend for itself in an impoverished economy that no longer insured their basic needs. Average citizens still had no easy access to those Western luxury items that, under Soviet rule, had long been maligned as corrupting tokens of capitalism. Maroussia's mother is always dressed in finest couture fashion; the family feasts on delicacies (fig. 5). Signifiers of a new class order: Russia-Maroussia, ravaged by powerful forces in the global capitalist world order, has lost her innocence.

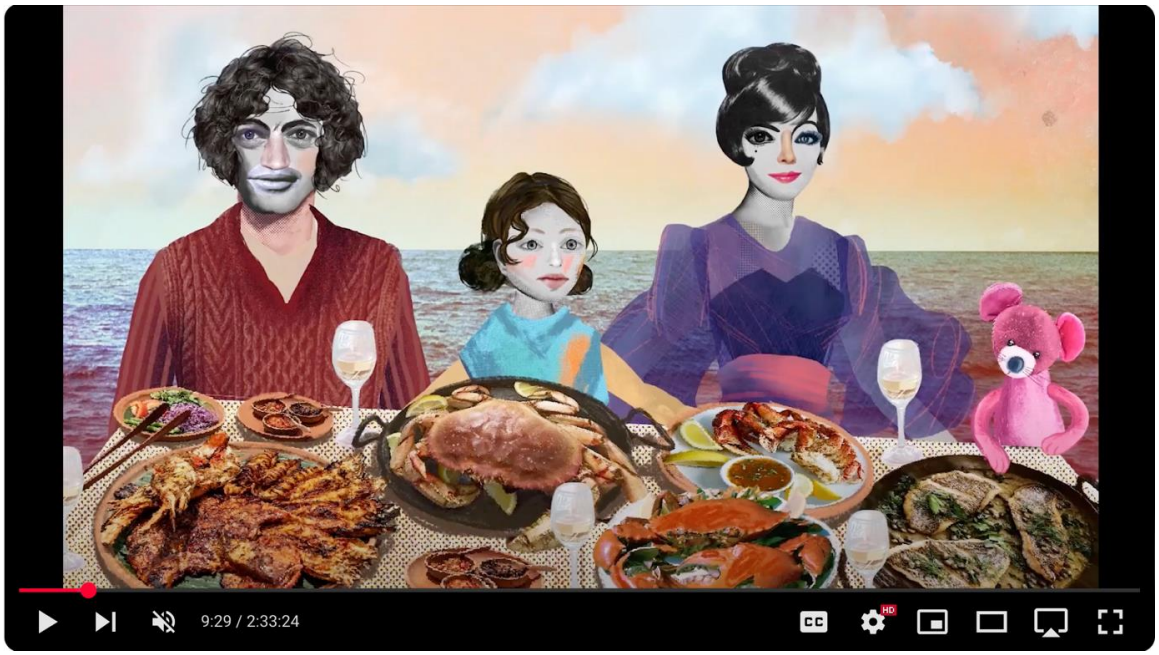

Figure 5. The family feasts on delicacies, used with permission by the composer. © Iraida Yusupova

A further emblem of the oft-cited ›Russian soul‹ in *Pink Mouse* is a spate of boiled crab collages, often bright red, signal colour of the Communist Party around the world. It appears time and again, here and there, throughout the piece. Sometimes the crab is assembled from props that appeared in other scenes, like an ashtray, excavator pinchers, or red hot lips (fig. 6). Crab meat is a national institution in Russia that carries culinary, historical, economic and political import. The invention of the crab stick was a major achievement of Soviet rule that helped quell public discontent when the political system was unable to supply fresh lobster and crab meat (Syutkin, & Syutkin, 2022). Crab meat is also one of the country's key export items, with the animal stock involved causing friction and prompting debate in respect of a host of ecological, economic, and political concerns (Dickie, 2020; Strauss, 2004).

Figure 6. The Thrum-Strum figure sports a crab head-covering, used with permission by the composer. © Iraida Yusupova

In its visual composition and pictorial commentary, *Pink Mouse* evokes Russia as a hybrid place, a ›Eurasia,‹ or – as Nicola di Cosmo would specify the matter – an »Inner Eurasia,« that »constitutes one of the basic units of Eurasian and of world history.« Yusupova's scoring assembles visual and acoustic tropes to evoke this charged idea – which is not national or ethnic but geographic in origin (Christian, 1994) – as both composite singular and mishmash of disjointed elements. The mediaopera presents an imaginary whose political and cultural self-understanding teeters between West and East, past and future, Europe and the Orient. Ancient Egyptian statues conjure the world of pharaohs early on in the score and cross-fades into a stray nomad leading a brightly clad camel (19:00-19:15) to an unknown destination to the left, off screen, possibly walking back in time (fig. 7).

A latent Orientalism recurs with the figure of the Prankster-Clown who dominates the scene for a minute and a half (1:37:31-:1:39:02), quite a duration in this fast-paced mediaopera. This Prankster-Clown, decked out in turban and Muslim robes, dances through cross-blending images suggesting that the tale's heroine may be being violated, though not by the oriental daemon who is merely a party to this act. A cartoon key appears alongside these images further highlighting the importance of this oriental influence within the compositional logic of the cultural tableau exhibiting a westernized party of Russians on a luxury yacht, now capsized, and dwelling on the Bottom where a Disney-regime rules. The troubled political implications of this Eurasian self-conception find abbreviated expression in the figure of Reginna, the Siamese twin-pig regent of the underworld, a two-headed monster whose political instincts pull in two opposite directions. A mythic creature, unreconcilable with itself (fig. 8).

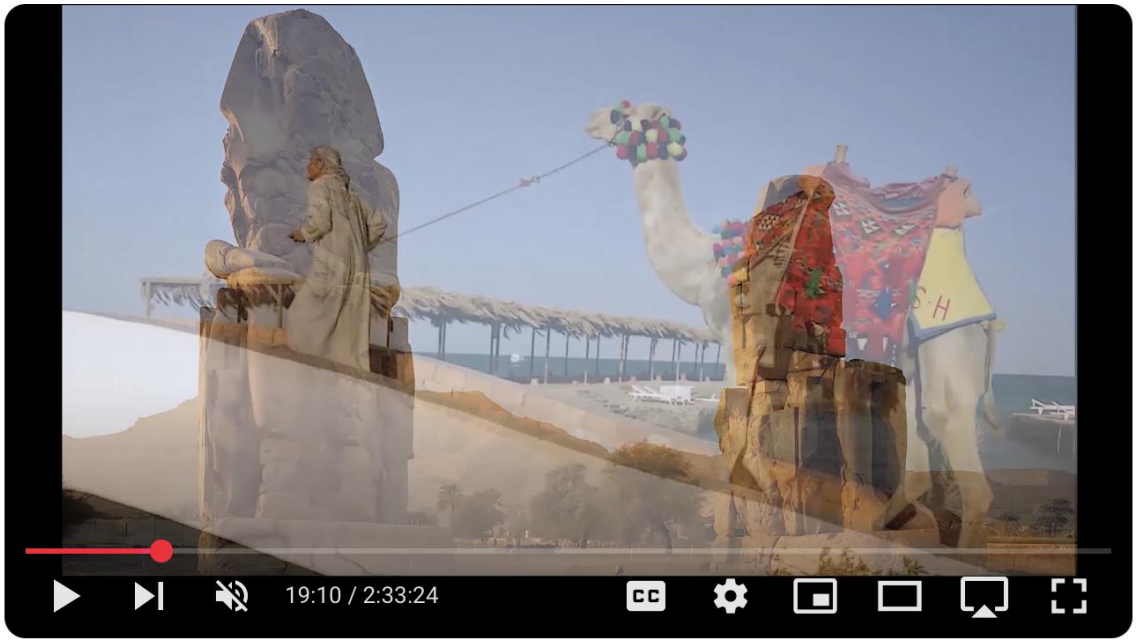

Figure 7. An Inner Eurasia and oriental scenes, used with permission by the composer. © Iraida Yusupova

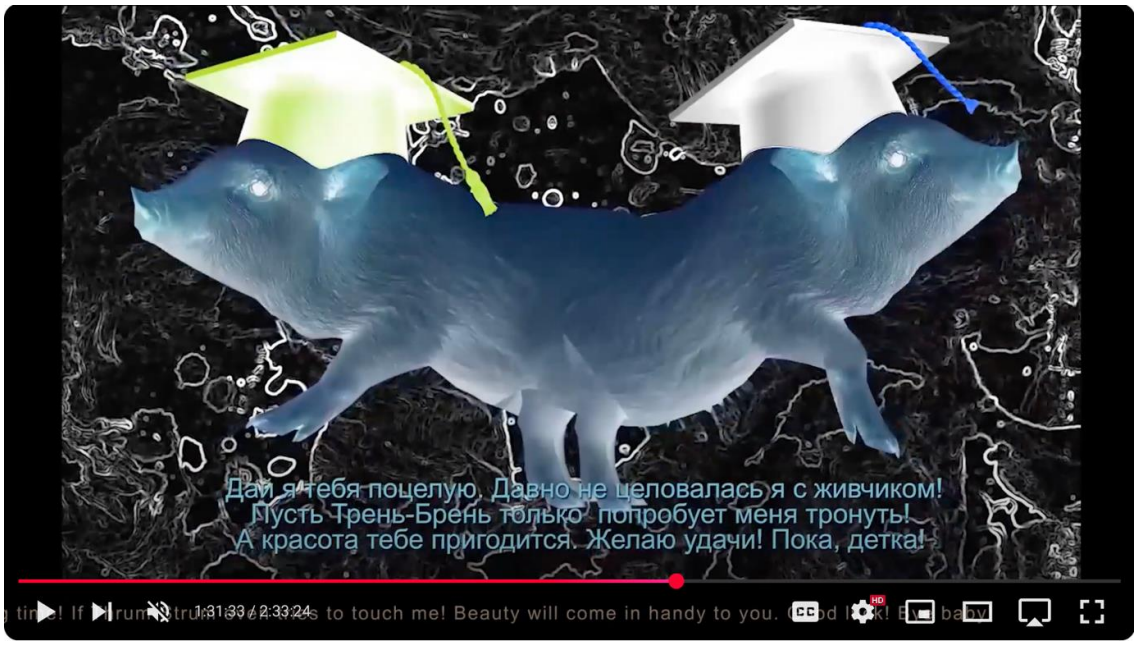

Figure 8. A mythic creature, unreconcilable with itself, used with permission by the composer. © Iraida Yusupova

Digital Afterlife

Dante is referenced by name in the libretto of *Pink Mouse* and so is the *Divine Comedy*, which serves as a structuring principle for the narrative poem's plot. Maroussia's journey to save her parents from eternal oblivion plays in a twilight zone of characters who may or may not be dead or dying. Like Dante's poem, *Pink Mouse* can be read as a reflection on the ›afterlife‹ – but this notion, once synonymous with metaphysical debates, has acquired a novel phenomenal heft in the world of virtual interactions. Facebook users die in the real world but their accounts remain ›active‹, simulating the living presence of a deceased person (presuming they ever truly existed and weren't always already a bot simulating a user). AI can imitate a loved one's figures of speech, expound on their topics of interests, and imitate their verbal mannerisms. Transhumanist reveries extend the mechanisms of selfhood to an ethereal realm of supreme invulnerability. Some versions of this vision are wedded to a person's physical incarnation; they focus on techniques of perpetual rejuvenation (to keep the body renewing itself), or cryogenic suspension of decay (to allow for a future resurrection), or storage of one's personal DNA (to re-generate full embodiment at later time). The machinic extension of the digital lifeworld gives the concept of afterlife qualitative materiality, time delayed and at a distance, in vivid communication uncoupled from responsive immediacy. Sometimes the remaining just want to bury their »dearly departed« in the readily accessible and literally *connected* forum of an online memorial site (Huberman, 2017). And with digital enhancement technologies, the biological reality of aging need no longer appear on screen (Holliday, 2021-2022).

Like the literary classic on which it is modelled, *Pink Mouse* courts different types of exegesis. Four main hermeneutic traditions have developed around the *Divine Comedy* – they can be grouped into *historical*, *moral*, *literary*, and *anagogical* exegesis. In this case, however, the interpretative modalities probe a phenomenon born of our computer-augmented lived reality. A new kind of afterlife interferes with the interrogating subject; it emanates from the sense of transcendence that has re-entered quotidian life through the backdoor of a technological sublime. The awesome predictive and imitative inveiglement of the technoscientific surround that we have put in place and that now comprises our lived habitat cannot be shrugged off. Every click feeds the fetich that we installed yet whose uncanny force we fear for the »omniscient and omnipotent« control it exercises over us. A proven way to subdue this almighty threat is not just to compel »benevolence« by way of a putative covenant[6] but rather to diminish its hold by means of old style demystification (Hornborg, 2001; 2013). Interpretative recasting of the inverted causality here on display, i.e. recollecting who installed the fetich, will serve the cause of self-defence and increase the capacity to act. With the spectator's participant re-composing of Yusupova's mediaopera adaptation of Erofeev's narrative poem, agency grows. The reception history of Dante's classic shows possible routes of elucidation. This modern re-telling of the *Divine Comedy* examines the conditions of the afterlife across disparate virtualities not from a medieval world view (hell, purgatory and paradise) but from the contemporary outlook of users linked to each other in networked disconnection on the

[6] See also: Bylieva, & Nordmann (2023)

basis of algorithmic discretion. Interpreted in *historical-digital* terms, for instance, Maroussia's plight resembles the Cold War and its aftermath from a Russian national perspective. Seen as a *moral-digital* tale, *Pink Mouse* examines the afterlife as a problem pertaining less to what may transpire after the finality of death but rather to the extension of life in digital doings that have unintended consequences in the present. On a *literary-digital* interpretation, this mediaopera follows a girl into adulthood to explore the sexual hypocrisy of modern Cosmopolitan societies. The female composer breaks with the author in her adaptation of the piece. A rupture recorded in the recurring lifelike dance scenes punctuating *Pink Mouse* and showing two female characters locked in uncertain gyrations. Are they friends or rivals? The choreography is ambiguous, simultaneously collaborative and adversarial. However, one of the dancers is the author's wife, his ›better half‹. Her movements can be viewed as an extension of the author's will while the other dancer plays the piano, sings, and more likely stands for the will of the composer. These scenes reflect on the act of composing across symbolic fields as one artist revisits, and adapts, the work of another.

An *anagogical-digital* reading of *Pink Mouse* requires the most analytic conversion in that allegorical/spiritual dimensions of the *Divine Comedy* have no obvious equivalent in today's technologically mediated way of life. Personhood does not hold up to scrutiny in this mediaopera. Unique individuation may be a mere quality of experience – an artifact of self-perception – not an accurate reflection of how mindful intentionality actually arises and perpetuates itself in social settings. Perhaps human spiritual capacities are not superterrestrial in origin, but rather phenomenal habits acquired and cultivated over time, passed on from generation to generation? The sense of selfhood may be a compelling conceit arising amidst interference patterns rooted in language, tradition, practice, semiotic systems, architecture and untold registers of meaning-making. Differing cultural practices have generated and continue to uphold homologous conceptions of selfhood across a worldwide patchwork of populations. Whereas computational machines can emulate intelligent expression and problem-solving, automated mind will not recombine in spontaneous self-assembly because it lacks bodily constraints. This is not to put the body forward as primal source of wisdom and insight. Rather, the claim pertains to the sociality of mind as it manifests in human agency: Carnal limitation necessitates affiliation. But digital platforms – the place where the mediaopera lives – are fuelled by a human-machine interface that parses agency along systemic principles shrinking the afterlife down in metaphysical size to a digital artifice. Yusupova's *Pink Mouse* shows this newfangled afterlife to be strangely entangled with the lived present of its viewers and, in so doing, agitates against the virtual milieu of which it is a part.

Humanity's Sublimated Voice

Opera extols voice – and *Pink Mouse* is no exception. Real-life actors, photo-collage effigies, and cartoon figures serve as so many vehicles to celebrate classically trained singing. She virtualizes the operatic stage, decouples delivery and reception of the opera experience, pictorializes the libretto by appending a graphical commentary to the musical score and more. But one liberty Yusupova doesn't take with the operatic form is to de-centre the human voice. The human/machine boundary holds firm – only human

beings sing in this production. No transhumanist or post-humanist dalliance with synthetic voice generation enters her musical score. Agency sounds intrinsically human in Yusupova's piece, which re-enshrines a distinctly humanist conception of said phenomenon in the mediated context of the digital surround with its online services optimized to hijack attention (fig. 9).

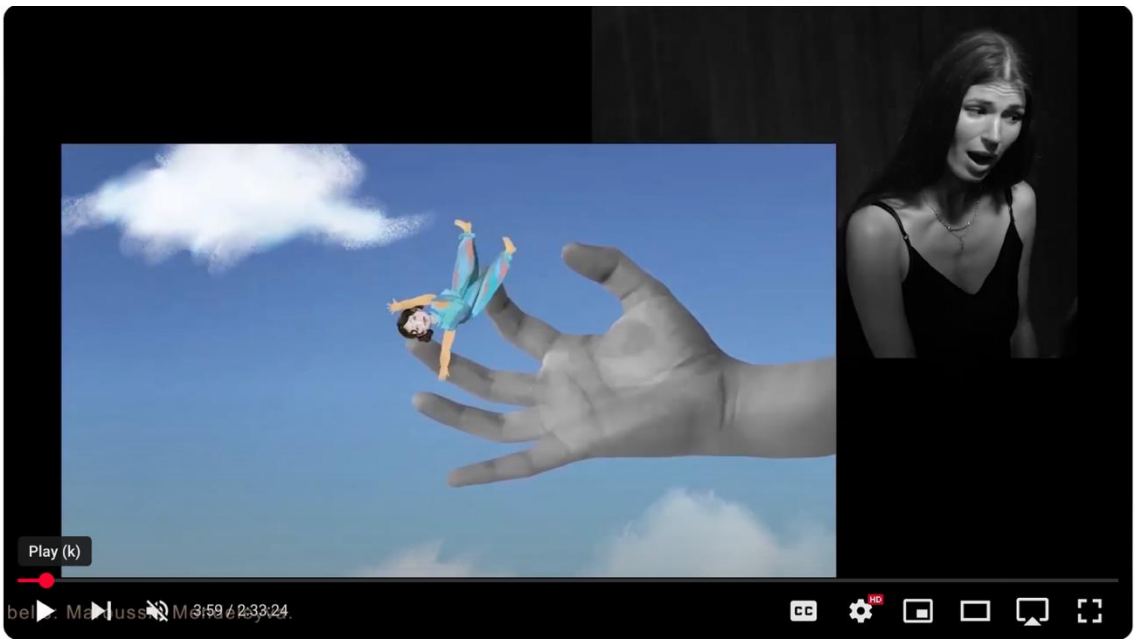

Figure 9. Digital framing of the human voice, used with permission by the composer. © Iraida Yusupova

To comprehend meaning intoned as song, it is not necessary to understand the words spoken. The international opera canon, according to a study is mainly based on four languages. Italian still has a leading position, English, French, and German come next, Russian, Czech and Spanish are following (Heaney, 2023). Melodically inflected voice complemented by orchestral accompaniment makes librettos all but impossible to follow even to the native ear. Audiences know the plot summary in advance or find it summarized in an accompanying booklet.[7] More recently, digital overtitles supply captions during a live performance. Operatic singing computes in its own vein, distinct from pure diction; it conveys dimensions of human experience that map onto language but are not phenomenally commensurate with the qualitative information coded in syntax, grammar, and vocabulary (Kluge, 2001, p. 36). A similar effect arises when watching foreign films where the original vocal enactment has an emotional heft that a dubbed film with lip-synched voices of doubles can never match.

Human exceptionalism turns on language. Large language models can replicate meaningful lexical utterance. But they cannot give expression to the negotiated emotional affiliation that staves off mortality and distinguishes human intentionality from intelligent automation. Embodied, vulnerable intelligence secures its survival by way of alliance.

[7] For a deconstructive reading of the opera brochure and the institution to which it belongs, see: Kluge (2001).

This most human of human urges – negotiated relationality – finds articulation in all manner of modulating conduct of which lexical utterance stands out both for the sheer physical dexterity of the mastery acquired over the voice box and for the intellectual quickness of using signs to encode meaning with the instantaneity of conversational speech. Opera singing elevates this one, outstanding human attribute, verbal expression – and makes the medium in which humans compose their humanity the message. In its most bombastic projection, the human voice can fill vast architectural spaces while pressing the emotional urgency of a dramatic moment and communing with an orchestral plurality. Said simultaneity of effect (amplification, accentuation, association) exposes the social adhesive function of language in a show of vocal agility that evidently also fosters voluptuous commingling, to judge from the enduring popularity of this art. What is more, the human capacity for vocalization, stretched beyond its innate limitation, becomes supercharged with symbolic potency. The sound intensity, the emotional timbre, the complex sonority seems preternatural – at times even sublime. This transfixing virtuosity conjures human agency in its pre-digital formation.

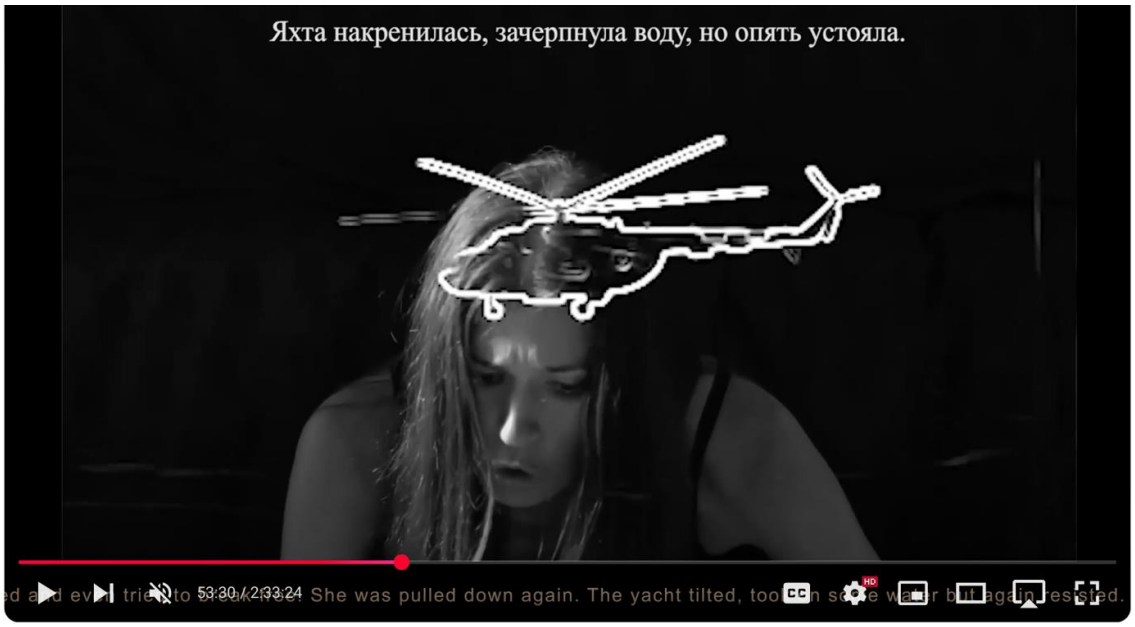

Figure 10. Technology rarely enters the scene, used with permission by the composer. © Iraida Yusupova

If opera exalts this driver of human self-invention – i.e. the anthropogenic effect of voice – then human singing might seem to jar with the preponderance of animal figures in the *Pink Mouse* storyline and with the machine-mediated delivery of its mediaoperatic adaptation. Animals lack the symbolic proficiency required for the use of lexical signs but they share with humans an experience of lived embodiment. Machines, conversely, lack the gestural gravity associated with embodied, reciprocal exchange but they have mastered, indeed surpassed, the human gift of gab. But the animal-machine framework adds conceptual embellishment bringing a complementarity to the spectacle on view that offsets human agency as such. Specifically, the triangulation of these elements –

animal/machine/human deliberation – showcases how reflexivity enters into the verbal exchange of one but not the others. As in *Alice in Wonderland*, to which *Pink Mouse* refers, anthropomorphic animals figure prominently in Yusupova's musical-pictorial translation. This bestiary has expository import deserving in-depth exploration elsewhere. For now suffice it to say, they congregate, scene-by-scene, forming a tacit social commentary. Machines are conspicuously absent from the mediaopera appearing only intermittently in the visual score as vehicles of transportation, i.e. airplane (fig. 10) and yacht with only the latter being relevant to the plot, or as musical instruments, i.e. piano and e-guitar, or as devices, i.e. computer and gun whereby the gun plays only a bit part. There is no sense of an urban jungle or metropolis pulsing through this mythic land, neither utopia nor dystopia, except by inuendo.

Can a chatbot do Callas? The answer, no doubt, is yes. And the mediaopera might seem a promising context in which to experiment with synthetic voice generation. To the extent that vocal embodiment nurtures community, however, the proliferation of digital assistants with synthetic voices, compounded by AI voice generators, would seem to pose a formidable challenge to human self-constitution (Böhlen, 2008). The digital art curator and mindscape artist Peter Weibel takes up this line of enquiry in his sound art studies. He produced mediaoperas and put forward his own conception of the genre in several manifestos, the first one published in connection with *Der künstliche Wille* presented at the *ars electronica* festival in Linz, Austria in 1984 (Weibel, 1984/2016a; 2014/2016b; 2020). His views on the aesthetic specifications of this genre are revisionist; he questions the anthropocentric bias and adopts a critical stance on vocal embodiment in general. Taking this position to its logical conclusion, Weibel maintains that a radically self-mediating mediaopera breaks with personified notions of agency even dispensing with human vocalization altogether (or incorporating indigenous voices not usually heard in opera productions). His mediaopera *Amazonas* is a case in point (although one could also group this piece to ›digital opera‹); it puts trees at the centre of action. They vociferate in synthetic sound. When the dying forest is the tragic hero, then let the forest be heard.

Yusupova's mediaopera, by contrast, urges the preservation of real human voice, with its unique modulation, in a world increasingly inundated by the noise of intelligent simulation, or humanoid illusionism. Voice figures programmatically in *Pink Mouse*: the maelstrom of moving images conveys graphic ›noise‹; ›sound‹ works as a corrective force imparting regulation, emotionally, on the mayhem.[8] There is a creative tension in her work between the graphical score in which shape-shifting figures morph into one another and the acoustic score which casts agency as a force that self-promulgates by way of vocal embodiment and so preserves a humanist world order. Online communication takes place within a sensory matrix that is upheld, synaesthetically, by two kinds of input for the most part: graphic and acoustic (tactile feedback hardly factors). Mediaopera instantiates this context. The placement of humans in such simulated environs leaves much room for interpretation. Weibel and Yusupova have pursued two contrasting intuitions on how the deployment of synthetic voice impacts the mediaopera as a genre: one rejects the anthropocentric premise of opera as an art form on formal and media-theoretical grounds

[8] This accords with Walter Benjamin's neglected reflections on music, which he deems the only form of communion that can pit hope against hopelessness. For further discussion, see: Matassi (2013).

(Weibel, 2020; von Xylander, 2020); the other perpetuates the premise of human exceptionalism in its sensory logic. Yusupova's sound score intimates that humanness can outlast its disembodied simulated surround. But where does this proposition leave a fictional device like Pink Mouse? Might such a thing of pure fabrication lend itself to the transmission of voice as artifice (fig. 11)?

Figure 11. Questioning the voice as artifice, used with permission by the composer. © Iraida Yusupova

UPCYCLED COMICS ART

Pink Mouse's Ontological Status

The category of being to which the figure Pink Mouse belongs remains a mystery throughout the narrative poem and its adaptation as mediaopera. Is Pink Mouse a thing, idea, fancy, or premonition? The baffling character seems to epitomise poetic licence as such. It is unclear if Pink Mouse exists in the story or the heroine's mind alone. Its ontological status resembles that of Hobbes, stuffed tiger, in the now discontinued daily comic strip *Calvin and Hobbes* and Harvey, rabbit friend, in the play of the same name, which won the Pulitzer Prize for Drama in 1945. When the first edition of *Harvey* (fig. 12) appeared in print, this invisible companion entered popular culture as a large pink rabbit drawn in the naïve sketch of a child's illustration. Although Pink Mouse is a mouse, not a rabbit, there is a family resemblance to Harvey.

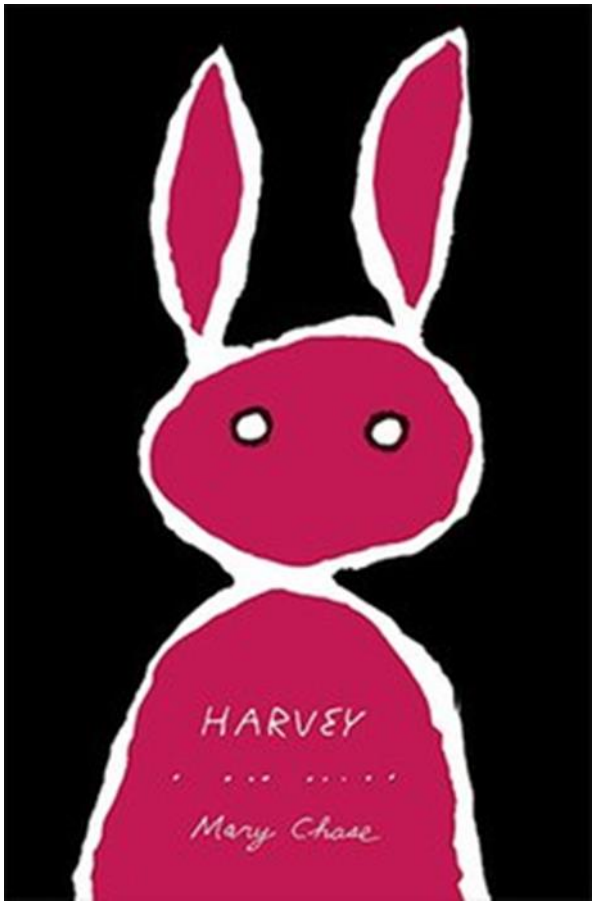

Figure 12. Book cover of Mary Chase's *Harvey* (1953), illustr. by Blechman, R. O. Acorn

Maroussia's animal sidekick takes on a life of its own. Mostly showing up as a playmate, it also turns out to be a significant trouble-maker in the tale. Pink Mouse betrays her bestie for a bribe, specifically ten kilograms of Parmesan cheese. Beset by regret for this act of treachery, Pink Mouse later apologises for having succumbed to its baser instincts. But the harm is done: Maroussia has lost her virginity. One can't really fault Pink Mouse for the breach of trust, however. A mouse is still a mouse, after all, even if only imagined. How is a mouse to resist its rodent nature? How can any living creature resist its most deep-seated instincts? Erofeev, the author, and Yusupova, the composer, seem to have diverging perspectives on the extent to which this excuse may exonerate the impulse-driven actions of others in the tale, say maybe the adult males preying on Maroussia.

In the context of our virtualized lifeworld, upheld by microchip-driven infrastructures, Pink Mouse signifies a novel reflexive condition whereby online activity manifests the reality of the make-believe commons in which we congregate. No need to conjure fictive buddies when they are surrounding us already: Apple's Siri, Amazon's Alexa, Google's Assistant, Samsung's Bixby, Microsoft's Cortana, varied AI-driven chatbots, and hordes of customer support services. Only that this coordinated social

activity, real and imagined, is now preformatted by automatic default settings that channel the traffic of attention while collecting hard data on the proclivities of users. Denizens of the internet spend many waking hours in the hallucinatory companionship of avatars, anonymous followers, and AI-driven consorts whose ontological status is akin to that of Pink Mouse. And this semi-delirious state of mind – progressing Pink-Mouse-ification – rests on same systems of technical delivery as Yusupova's mediopera.

The figure Pink Mouse reifies a techno-social phenomenon with deep anthropological ramifications. Users find themselves engaging with new configurations of agency arising within a field that is in large measure make-believe. Unlike Hobbes and Harvey, Pink Mouse has no given name; its designator is generic like the algorithmic attendants guiding and tracking user activity online. The moral ambivalence that surrounds this figure is humorous because it is familiar not just in its flawed character but, perhaps more importantly, in its instrumental capriciousness. A whole host of ethical dilemmas map onto the antics of Pink Mouse, a figure whose propinquity to Maroussia addresses problems of accountability newly incumbent on the massively multi-user agency formations that have emerged through social media. How to reconcile the power of coercion and determinist causation in cultural affairs with the imperative of free will on which modern claims for human autonomy rest? It remains uncertain how the perennial preoccupation of major world religions, juridical institutions, and philosophical inquiry with reason applies to systems of networked communications that provide a fertile breeding ground for intractable mouse nests of fleeting agency-figurations.

Mixed-Reality: Heroes/Villains

Visual allusions abound in Yusupova's *Pink Mouse*. While the soundtrack chooses its emotional registers carefully and arranges them in a varied progression, the visual score is superabundant. It cannot be processed in one sitting. As the locus of popular entertainment has shifted from stage to cinema to television to computer monitor, the fabric of celebrity culture has changed, accordingly. Public attention now materializes in disconnected, non-concurrent witnessing of entertainment spectacles: computer monitor has replaced opera stage, metal frame has replaced proscenium, a spinning white circle for a file being streamed has replaced front curtain. These material transformations bring new aesthetic conventions to the artifice of opera and the hucksterism of online storytelling. In the context of this poem reinvented as mediaopera, context itself turns out to be a critical factor in nudging users to get actively involved in generating coherence as participant observers of the piece.

The most striking and recurring real footage and photography that appears in Yusupova's *Pink Mouse* features recurring dance scenes, for one, and cutouts of iconic celebrities, for another. The dance scenes allude to a nostalgic past, pre-Soviet Russia. Two, beautiful, young women are seen singing and dancing and often wearing masks in a villa decked out in aristocratic regalia. A grand piano dominates these lyrical sequences, which enact a life of ease and luxury associated with elite class orders such as the landed gentry in classical Russian literature, bourgeois professionals before the revolution, or *nomenklatura* of the Communist Party.

Beyond this footage with human actors, *Pink Mouse* introduces photo-stills of celebrities, which blend ontological registers – figurative and naturalistic. These mixed-reality icons, immediately recognizable, do not figure in the original poem. They represent A-list actors Johnny Depp and Ashton Kutcher (fig. 13), and supermodel Naomi Campbell (or a lookalike) (fig. 14). These characters populate the Bottom alongside Disney-like cartoon figures in a world under the sea distinctly reminiscent of the glitzy Westcoast culture of Hollywood. Depp married a French actress and spent decades living in Europe; his Francophile leanings resonate with those of the author of *Pink Mouse* making his avatar-signifier perhaps a natural fit for the mediaopera. While other figures in Yusupova's visual score of *Pink Mouse* are merely generic symbols of various demographics or cultural abstractions – i.e. father, mother, Maroussia, Thrum-Strum (the guitarist), crab, Runt, nanny, uncle, uncle's female partner, king and queen of the underworld, Evil Goose aka Holy Goose, and so on – the three, cutout image-stills (Depp, Kutcher, Cambell-twin) are public personas with popular cultural reputations and personal baggage.

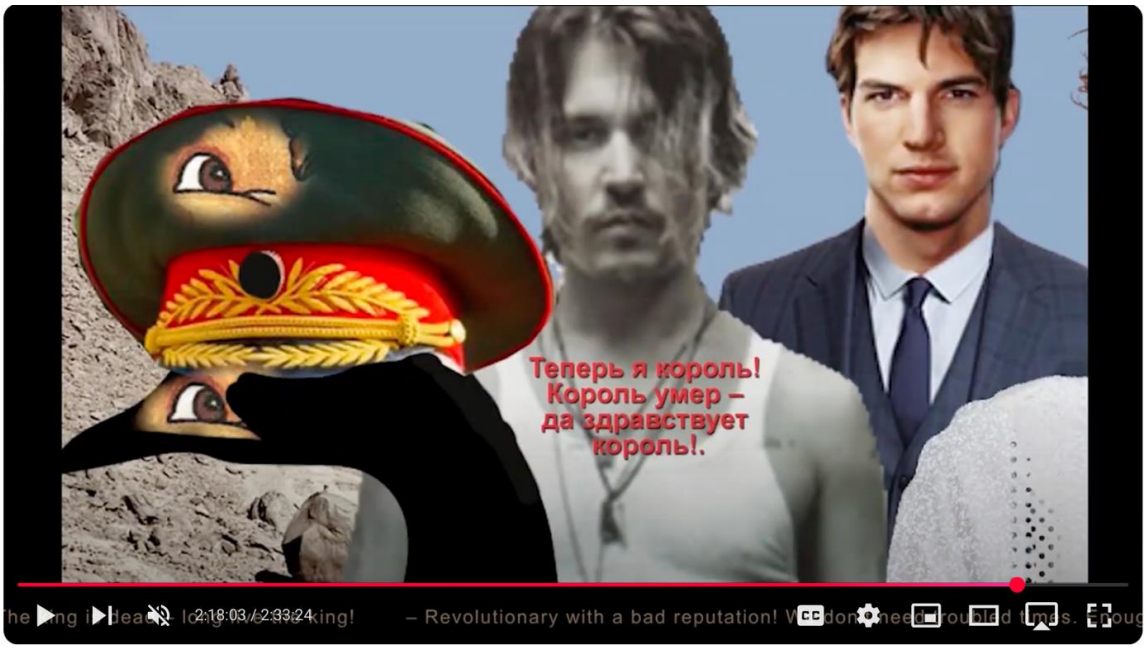

Figure 13. A-list actors in *Pink Mouse* mediaopera, used with permission by the composer. © Iraida Yusupova

The culture industry megastars that appear in *Pink Mouse* have carefully crafted images maintained by marketing teams. Depp and Kutcher, two pictures of masculinity, are household names; their acting careers were forged in an old-Hollywood movie star arena quite unlike the space of new media celebrity whose personalities are shamelessly self-promoting. Asking fans to hit a subscription button or to like their online channels would be anathema to their brand of celebrity. They need not solicit support, they have popularity and even charisma across broad swaths of social space, meaning paid professionals who shore up fandom on their behalf. The same holds for Campbell, an icon

of glamorous femininity. The sociological fabric of the two types of celebrity culture fused in Yusupova's mediaopera are orthogonal in style but not substance. Both realms of influence radiate from one geographical region that stretches from Los Angeles to Palo-Alto in California up to Seattle, Oregon. This industrial entertainment complex, which the sociologist Nick Turse abbreviates to ›The Complex,‹ comprises old and new mass media enterprises with global reach (Turse, 2008). Kutcher's brand of celebrity bridges the divide between old and new media offerings. His investment fund, A-Grade Investments finances start-up ventures. Besides fiscal capital, he invests his celebrity status in highly competitive markets, thus boosting the profiles of the enterprises in his portfolio. Like other modalities of capital, celebrity, too, partakes of that self-perpetuating market logic whereby an established industry drives related business opportunities arising in connection with new socio-technical infrastructures. Depp made his fortune playing the swashbuckling pirate Captain Jack Sparrow in the Hollywood franchise *Pirates of the Caribbean*. His public persona connotes an ocean imaginary. The rising appeal of maritime sagas (see also the *Aquaman* film series) surely reflects immersive fantasies associated with online access. Information inundation 24/7 conjures up the watery element. This idiom of the digital condition arises from an iterative logic whereby users find themselves ensnared in data streams generated from their online activity.

A large portion of Erofeev's prose poem plays in a world at the bottom of the sea. This choice of setting anticipates the poem's eventual translation to a mediaopera, where digital fluidity holds sway over users. One mythic being whose image has seen an extraordinary surge in popularity over the last three decades is the mermaid – and, not surprisingly, it makes an appearance in the libretto.[9] This fictional character, the quintessential expression of present circumstances, glides through the ocean like users surfing the internet (von Xylander, 2023). Meanwhile, Big Tech trawlers patrol the commercial waterways of digital traffic collecting traces of agency, which they trade like so many humanoid fish. The plot of *Pink Mouse* culminates in Maroussia realising that her parents have drowned: »What has happened to my parents? Can I save them?« This undertaking propels her towards the central challenge of the piece, namely to resist the lure of the »Bottoms«, where Depp and Kutcher dwell, a sphere governed by the corrupting influence of celebrity, mass-media and the digital-industrial entertainment complex. In this dangerous environment, where human relations are disembodied and truth has been replaced by the rule of opinion, people soon change beyond recognition. The whole story can be read as a quest to ward off the digital turn with its sociotechnical ramifications:

> Hurry before mum turns into a marriageable mermaid and
> dad into a sea water scholar with a special opinion. (Yusupova, 2022, p. 12)

Why insert old school celebrities into a mediaopera appealing to online audiences? The media consumption habits of social media users gravitate towards bloggers and

[9] The rising popularity of this fictional character is well documented in the time series curves given by Google's ngram viewer for the English-speaking world: https://books.google.com/ngrams/graph?content=mermaid&year_start=1800&year_end=2022&corpus=en&smoothing=3&case_insensitive=true

v(ideo)-loggers who come across as fallible, raffish and off-the-cuff. They like their influencers to be relatable and to come across like virtual buddies who stop for bathroom breaks and complain of bad hair days. Online story-telling must adapt to its conditions of delivery – and this shows in the rhetorical gambits that succeed in the public sphere. In a full-fledged economy of attention, rankings steer user traffic as measured in units of arrested attention (Goldhaber, 1997; Goldhaber & Warzel, 2021). Online messaging turns on eyeball-count. Public attention is a limited resource – curbed by waking hours and lifespans – and the capacity to absorb this vital variable is what makes or breaks companies. Attention is the most sought-after asset worldwide because it is terminally non-renewable: Every second of life ticks towards certain death. Scripted plots thrive in this arena for, to quote Coleridge again, they make »suspension of disbelief« effortless and turn »poetic faith« into a given. Enter the artifice of traditional opera – and similarly aforementioned kayfabe of pro-wrestling – where typecast agency plotted for a knowing audience easily gains traction. An epic battle between two chief characters has proven to be a predictable formula for snaring attention. In pro-wrestling jargon, the stock characters carrying this basic storyline are known as the ›dish‹ (hero) and ›heel‹ (villain). Yusupova casts Kutcher as the *dish*, good prince of the undersea world, and Depp as the *heel*, bad prince and older brother. In the cosmic scheme of *Pink Mouse*, Kutcher and Depp serve as torchbearers of a moral order where good battles bad and outcomes seem predictable due to coded archetypes being in play, which are known in advance. By inserting conspicuous celebrities into her visual script, Yusupova makes the mediaopera's interpretation a function, in part, of the spectator's information-consuming habits. Knowing the reputations of Depp, Kutcher, and Campbell, both as public and private figures, prods viewers to anticipate the moral tenor of their scripted exploits.

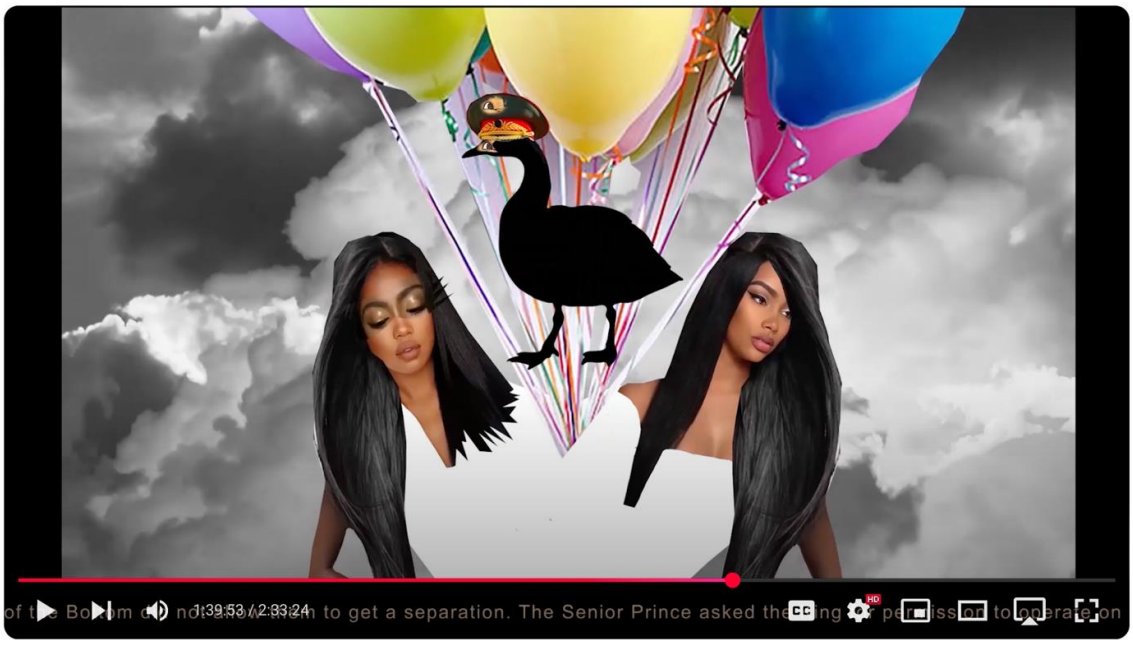

Figure 14. A media star in a mediaopera, used with permission by the composer. © Iraida Yusupova

Yusupova's celebrity-signifiers are not self-contained referents but indexicals pointing to relational dynamics on a storyboard designed for online delivery and broad public consumption. They inhabit a blended discursive arena of the fictional and the real, the analogue and the digital, and tap into cross-national imaginaries of mediated suasion. Yet the complexion of celebrity is as variable as the news of the day and, consequently, the interpretative filter-effect of the referential kayfabe in Yusupova's mediaopera, to some extent, arbitrary. The scripts of heel and face have been flipped since she completed her adaptation of *Pink Mouse*. Depp was exonerated of domestic abuse in court of law while Kutcher, philanthropic investor in an anti-child-sex-abuse-organization, stands accused of gross hypocrisy for condoning sexual violence against children.[10] This role reversal does not materially alter the structural logic of her gender-critical take on *Pink Mouse*, however. Her visual composition invites spectators to ruminate on the Hollywood-driven cult of celebrity in relation to online culture and the power vested in cultural icons of ambivalent moral standing. No later than when the Campbell look-alike cutout shows up as a Siamese twin with eyes blinking out of synch, a double of the Reginna pig, is the spectator made aware that this musical-graphical composition blurs the boundaries of reality and fiction.

IP and AI

Pink Mouse relies on overt cultural aggregation. In so doing, the mediaopera thematizes a set of vital concerns troubling the creative industries, specifically the problem of intellectual property rights. Today's ready availability of information and images is offset by ever more inscrutable claims to licensing rights that govern the reproduction of visual material. Whole new sectors of legal services have arisen around searching for copyright violations, pre-empting copyright conflicts, settling picture rights licenses and so on. Juridical precedent asserted in this domain is grounded as much in the commercial clout of those claiming copyright as in legal principle. Coercive litigation allows corporate interest to maintain proprietary control over large and growing portions of the semiotic surround.

Of course, the protagonist of this tale is not a tiger or a rabbit but precisely a mouse. The history of contractual practices governing intellectual property rights begins with a landmark case that ushered in a climate of corporate intimidation around copyright protection and trademark registration: Mickey Mouse. This figure first appeared in the cartoon *Steamboat Willy* in 1928. Copyright ran out in 2024, well after completion of the mediaopera adaptation of *Pink Mouse* (Jenkins, 2024). Disney's 98-yearlong iron grip on the exclusive usage rights to this figure produced unintended consequences for intellectual property rulings, including the codes and regulations that pertain to digitizing and preserving cultural heritage. It also raised thorny issues of why Disney was allowed to appropriate material from the public domain in its commercial productions over which it then held exclusive rights (see *The Snow Queen* by Hans Christian Andersen, *The Lion King* drawn from William Shakespeare's *Hamlet*, and *Fantasia* which features public domain classical music based on an *Alice in Wonderland* orchestration). Having

[10] See scandals involving Jerry Sandusky, Danny Masterson, and Sean Combes.

successfully lobbied the United States government to extend copyright protections, the Walt Disney Corporation then zealously guarded its exclusive claim to this lucrative character. This piece of legislation, known as the »Mickey Mouse Protection Act«, had far-reaching consequences for the culture of citation worldwide (Skladany, 2018, p. 32). Related claims were successfully defended before the EU and apply, variously, throughout Europe.

Figure 15. A cosmology of trademarked cartoon characters, used with permission by the composer. © Iraida Yusupova

Conflicting institutional interests, corporate and public, concerning transactions in the public domain are today litigated through an organisational network first established in connection with this case. Recent lobbying on the legal frameworks that govern proprietary data and its regulation on social media platforms in Europe, i.e. Digital Markets Act (European Commission, 2022) and Digital Data Act (European Commission, 2024), drew on legislative bodies (from expert consultants to advisory committees) first put in place in the context of shepherding the deliberative process around the Disney verdict. This bureaucratic apparatus consisting of think tanks and legal services, is substantially financed and backed by the very technology concerns whose services are supposed to be regulated in the public interest. Corporate lobbyists and representatives shaped the expert policy recommendations that went into drafting the EU mandates on digital data regulation (Schyns, 2023). A mouse trope enabled the legalized digital data accumulation and trade taking place on social media platforms today.

Pink Mouse hardly resembles the Disney figure that spawned not only cartoons, films, and merchandising but also theme parks, television shows, and video games over the 20th century. This cartoon mouse, appearing in the experimental context of a mediaopera, is not a mass cultural phenomenon and iconic branded character serialized

by syndicated-media conglomerates. Yet its eccentric, countercultural presentation draws attention to the conditions of possibility – sociocultural and techno-aesthetic – that have allowed a cosmology of trademarked cartoon creatures (fig. 15) to colonize our collective imaginary although the elements of which they are composed were extracted from our cultural commons. Born in a rhythmic poem that merges classical, modernist, and popular art and brought to life in a pictorial-musical composition that celebrates cultures of open access expressed in collage, cut-and-paste, sampling, the figure of Pink Mouse undercuts the rampant commercialism of all proprietary, datafied, ad-driven content by way of ironic subversion.

META-MEDIAOPERA

Technology mediates agency; for better or worse, it has punctuated and informed human self-conception forever (but certainly since the species took note of time, rhythm and cadence to synchronize experience). *Pink Mouse* advances an argument on the mediation of agency through tool usage – and puts spectators through corresponding paces that uphold the supporting claims, tacitly. The composition amounts to a form-theoretical study, or meta-mediaopera, of themes bearing directly on the artistic process in which Yusupova's graphical-musical productions arise. Beyond Maroussia's adventures in the world of adults or the literary machinations of Pink Mouse, the piece addresses perennial questions such as: What constitutes partnership – romantic, artistic or otherwise? How are the living changed by internalizing the dead? How does agency coalesce around compositional techniques and how, specifically, is mediated agency quickened by words, sounds, and images? How does the human interface with analogue musical instruments differ, in quality, from comparable interactive protocols with digital computational instruments? And to what extent does mediaopera, the artform, manifest creativity as a force in the world, of the world, neither, or both? This last question presumes a conversancy with the contexts in which the piece was produced, including Russian conceptualism, Western (post)conceptual art, and traditions of modernist, as well as postmodernist musical composition. In short, the historical roots of the rival strategies used to make one's mark as an artist or movement in the musical field. Over and above the musical-visual overtures in which this mediaopera has been plotted out, it participates in epistemic practices related to the constitution of self and others, revelation and concealment, and libidinal vagaries.

A manifest choreography of the human-machine relationship informs the very conception of mediaopera as artform at point of delivery, a synchronic plotting of the graphical-musical ensemble put forward as a compositional whole. It finds expression in patterns arranged both synchronically and diachronically in *Pink Mouse*. Synchronically, mediaopera presupposes a digital literacy, which also shapes the horizons of comprehension. *Pink Mouse* deconstructs, by way of semiotic encoding, the Wi-Fi-enabled data carriers on which the delivery of such cultural offerings is reliant. As a consequence, interpretation of the piece hinges, at once, on functionalities of the apparatus used for access and on affiliated dispositions of the spectators who make use of said apparatus. In the collusion of hardware, software and wetware, *Pink Mouse* can serve

as a demonstration piece for the workings of recombinant agency. Diachronically, the logic and progression of Yusupova's adaptation of Erofeev's metric composition lays out a developmental account of human agency here exemplified in formative instrumental interdependencies with computer (fig. 17), e-guitar, and grand piano (fig. 16).

Figure 16. Classical piano and electric guitar, used with permission by the composer. © Iraida Yusupova

Yusupova's juxtaposition of grand piano and e-guitar turns these instruments into signifiers for the civilizing process as such. They stand for different historical epochs but also, more importantly, for distinct world views with varying national and ethno-cultural implications.[11] It is worth noting that she showcases e-guitar, not classical guitar. The latter would sit comfortably alongside the grand piano in terms of gender connotations. Both the string guitar and piano gained popularity in 18th century Europe and were deemed appropriate activities for young ladies in privileged circumstances. As accomplished musicians, they were expected to entertain family and guests in observing the ritual of *Hausmusik* – variously adapted, by region, to family cultures across the continent – for leisure and diversion (Doubleday, 2008). The grand piano is heavier, more expensive to acquire and maintain, hard to move, and takes up expensive living space. Its stature emphatically asserted a timeless, landed, convention-bound domesticity, which was associated with stabilising the nuclear family nexus of an emergent bourgeoisie as recounted in literature and memoirs of the period (Walker, 2014). The guitar is portable, more affordable, and unassuming. Neither of these instruments causes performers to assume attitudes deemed »unbecoming« for females – to contort their faces, as when

[11] *Hausmusik* practices were adapted to Russian family life in ways still reflected in the institutional memory of the country's musical history (Bullock, 2012; Mannherz, 2017; Streatfeild, 2011).

blowing into a wind instrument, or to assume a suggestive posture (for instance, playing the cello[12]).

But *Pink Mouse* plays in the day of microphone voice amplification and karaoke singing with boom-box (10:54). The guitarist, Thrum-Strum, is a key figure in Erofeev's poetic scheme. In Yusupova's rendering, he fits the cliché of globe-trotting hippie who plays e-guitar. This instrument is not only associated with a distinct style of music, artistic persona, and musical happening, it gave expression to a youth movement whose emancipatory ideals ushered in a political rebellion that changed the fabric of civil society. The instrument came to be male dominated. Indeed, in its association with technology and social upheaval, e-guitar kinetics are so testosterone charged that strumming one's midriff in simulating air-guitar action amounts to a latter-day mating call. E-guitar is the very emblem of a countercultural revolution also associated with the computer. Not only is it portable and electronic, like the computer. But, according to Fred Turner, it defined that storied countercultural movement whose ideas of »freedom« and »autonomy« actually came to culminate in portable computing and ubiquitous access (Turner, 2006). Today these entrenched values, foundational to the ›Californian Ideology‹ (Barbrook & Cameron, 1996; Uluorta, & Quill, 2022), are prospering in our digital data-driven economies and continually fanned by the psychogenic illusionism of ›free services‹.

Yusupova casts the e-guitar as an instrument of seduction and aggression while the grand piano figures as source of emotional comfort, a coherence-generating machine (Sellors, 2025). Culturally-speaking, e-guitar and computer are close cousins. The *Grateful Dead* playing *Russian Lullaby* breaks seem closer in spirit to the lifeworld of 24/7 content streaming than a grand piano standing in the corner of an elegant, old-world boudoir. But instead of associating e-guitar and computer, her account of our tool-using, cultural evolution sets piano and computer against each other. Both instruments require ten digits for tapping; they are *digital* and *incremental* in that they are played key-by-key. And both instruments are intimately fused with how we externalize our interiority and show up as semiotic creatures. Yusupova leaves the spectator in no doubt as to which of the two is her preferred child. Whereas the grand piano is the single most visible prop in her graphic score and the computer makes but two cameo appearances. But the computer is written into the mediaopera's DNA. It is conditional to its production and its reception. No computer, no mediaopera. In the anthropological order of *Pink Mouse*, these two devices command similar semiotic authority. Although one is showcased in Yusupova's visual scoring and the other barely features, they lie on a continuum of world-making and agency-enabling contrivances.

With the insertion of the grand piano as musical protagonist in her visual score, she takes considerable liberties with the original text. There is not a single mention of grand piano (or computers or laptops, for that matter) in the libretto of *Pink Mouse* as compared with 9 references to guitar/guitarist. Yet, her pictorial commentary conjures up two rivalries on screen that stretch through the entire mediaopera: one involving e-guitar and grand piano finds articulation, explicitly, in images; the other involving grand piano and computer features tacitly and plays out mostly by implication. It would be easy to

[12] See period commentary by J. von Wasielewski, as cited in Hoffmann (2007/2010).

overlook the juxtaposition of grand piano and computer but for two crucial scenes in which the significance of these signifiers is asserted in no uncertain terms. Yusupova shows the cartoon-father typing on his cartoon-laptop in the first minute of the mediaopera (00:53-01:00) – it is one of the first objects fully on display. Later, we see Maroussia, personified as the singing dancer, suddenly no longer fingering the keyboard of the piano she has been playing until that point but typing on the keyboard of a laptop that is now placed on top of the piano (29:07-30:14). The elision of these two activities, piano-playing and computer-typing, in one show of dexterity – fingers on keyboards – can be read as a reflexive commentary not only on the piece itself but on the very genre of mediaopera. This superimposition of two pivotal instruments invites comparison of their semiotic functions in relation to each other and within the visual score of Yusupova's *Pink Mouse*. Grand piano will be foregrounded, thematically, for the duration of the virtual dramatics (in oscillation with e-guitar here serving as stand-in for the computational surround) while laptop and related accoutrements remain tacitly acknowledged, instrumentally, in the conditions of mediation.

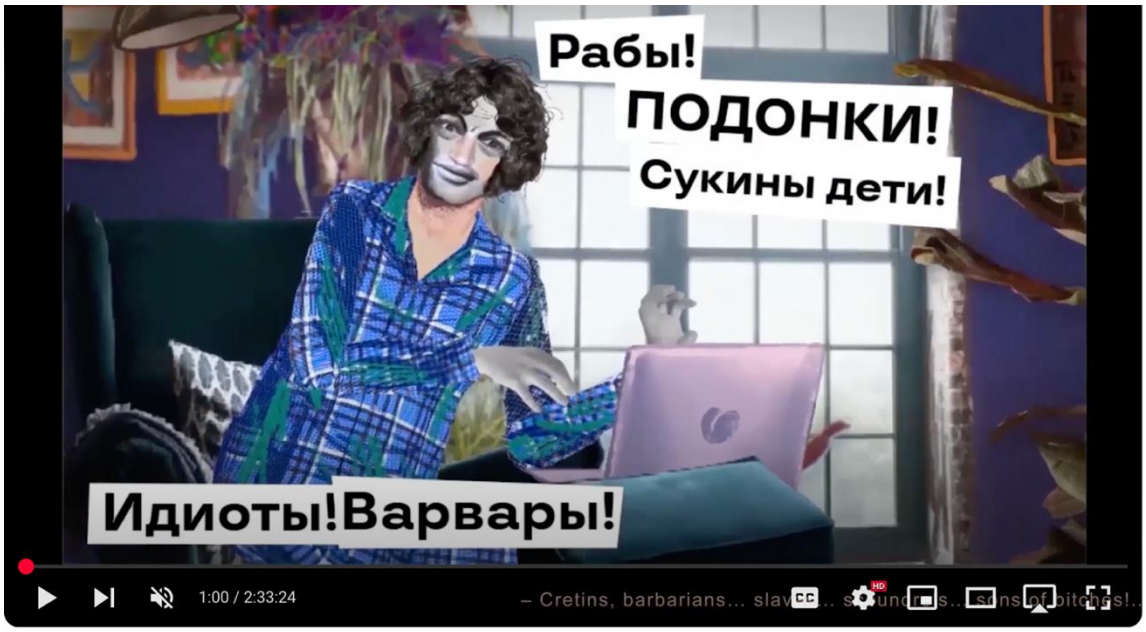

Figure 17. Another human instrument, used with permission by the composer. © Iraida Yusupova

These showcased instruments – grand piano, e-guitar, laptop – exemplify different world views and corresponding practices around the aesthetics of selfhood. What unfolds is a study in contrasts. As mood-setter, the e-guitar's elongated riffs and chord sequences brought a generation together that worshiped ›individuality‹ whereas the grand piano has for centuries amassed a pious repertoire of counterpoint compositions expounding polyphony in homage to a heavenly order held to defy human comprehension. But the action rises around the human/machine interface in particular: Not all keyboard-sporting instruments are created equal in Yusupova's visual score. Their differences go to the heart of her mediaopera practice. Whether depicted in acted scenes as a real instrument or in a

cartoon or in an illustrated abstraction, player-and-piano constitute a creative partnership fashioning the world in their own image. No comparable intimacy and ardency articulate the user-laptop collaboration. Also, the deep grammar of this composition seems to associate the acoustic score with the piano, an instrument of sound, whereas the instrument of image-generation, the computer, manifests in the graphical score. Two keyboard instruments operated in a similar fashion; yet one brings order and serenity to an analogue world, the other simulates worlding in a flurry of digital noise (Moseley, 2016). The difference consists in the feedback yielded by these instruments. Each tap on the keys of a grand piano is responsive to the pressure applied in qualitative terms, the mechanism reciprocates the player's actions. By contrast, taps on the keyboard of a laptop merely trigger functionalities that then transpire regardless of how fast or hard the user types. The exception being an e-piano, or other devices with sensate technology, in which case the non-responsive machine has been augmented with reactive-functionalities. As organs of self-expression, they differ on the score of reflexivity. Although both piano-metaphors (Anger, 2018) and computer-metaphors are used to symbolize capacities of mind in literature, painting, and science, the piano connotes an emotional sensorium, the computer neurobiological circuitry. Yusupova's comparative analysis of instruments and technological practices effectively advances an anthropological idea by way of an aesthetic programme – her adaptation of *Pink Mouse* amounts to an analogue mediaopera for a digital environment.

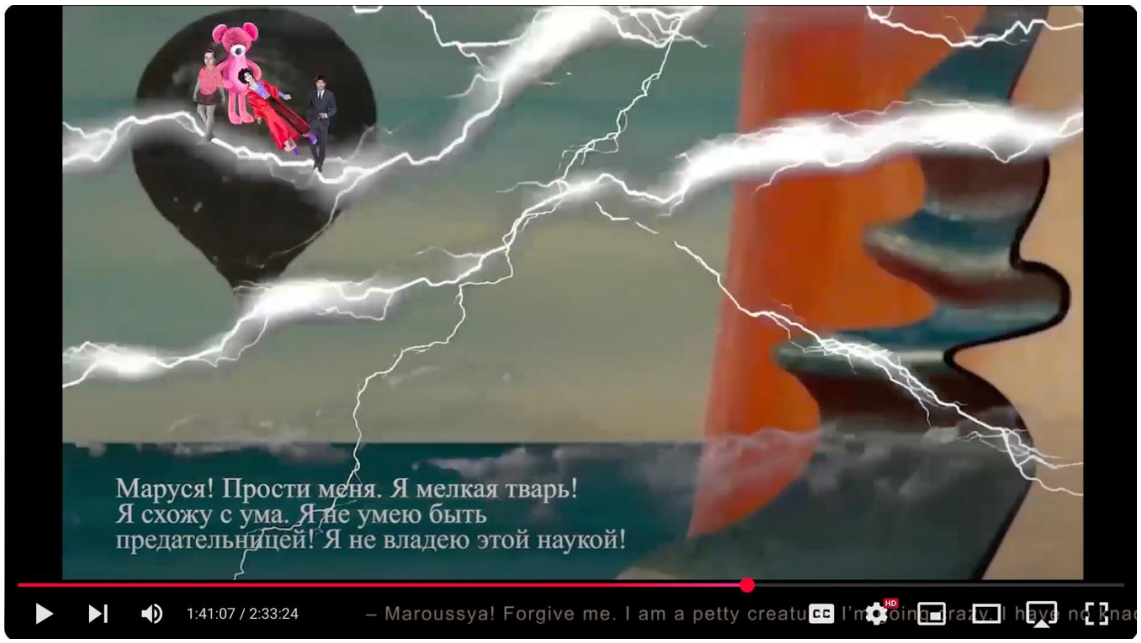

Figure 18. Symbolist allusions, used with permission by the composer. © Iraida Yusupova

This semiotic hybridity – superimposition of symbolic forms (analogue/digital) – recapitulates bygone media practices of collage and montage in conceptual abstraction. Yusupova's implicit cultural history recalls the print culture of high modernism in the 1920s, except that her cut-and-paste practices (te Heesen, 2002) operate across the vast

range of mass media inputs, now available; and they incorporate a solid legacy of upcycling semiosis across visual and acoustic fields of art that she melds with exceptional expansiveness. The techniques she uses for amassing parts into wholes pick up on configurational traditions and paradigms of assembly that have a developmental history in their own right. Her mediaopera productions adopt an unalloyed modernist posture in that they eschew conventional tropes of legibility.[13] Her work, in keeping with a certain notion of Russian conceptualism differing from the »Romantic« interpretation initially put forth by Boris Groys (1979), for instance, promotes the epistemic virtues of encryption and concealment. She quotes symbolist style experiments (fig. 18) to articulate and stir emotions, not to depict the natural or social world from an ›objectivist‹ standpoint (itself a moving target as Lorraine Daston and Peter Galison have shown (Daston & Galison, 2007). Regardless of the higher estimation in which she may hold her acoustic score over its visual elaboration, the spectator of *Pink Mouse* experiences a pageantry of graphical fanfares with an hallucinatory quality unto itself. Her style of metric composing amplifies the role of pictorialism by translating the poetic libretto in a simultaneous flow of both aural and optical tropes. The libretto is thus doubly exemplified. This distinctive feature of her work breaks with radical modernist theories of opera that insist on a minimalism that shuns conspicuity in the acoustics. According to radical modernist opera theory, graphical allusion and scenography distract from the true structure of musical utterance, which in its purest forms focuses on exploring proportionality through minimalist abstraction.[14] Yusupova's pictorial overabundance amounts to a stylistic mannerism that might lead an art theorist to classify *Pink Mouse* in the canon of postmodern composition. In this respect, too, her mediaoperas defy simple classification. She has forged a postmodern-modernist hybrid that pulls in countervailing aesthetic directions.

Recombinant Agency

Data pays the tariffs we owe as licensees of the technological systems that sustain the workings of agency as we know it (or, depending on one's theory of mind, as it owns us).[15] Erofeev's *Pink Mouse* runs counter to the isolationist current of attention-fuelled, technology-driven, rent-seeking commons. This prose poem – and Pink Mouse as its standout literary device – celebrates currents of »autopoiesis« (Varely, et al., 1974) that also require autonomous engagement on the part of readers. But the quality of attention needed to implement such engagement atrophies in disuse. Ironically, it is for lack of company that autonomy finds itself consigned to oblivion in the virtual world. Self-paced involvement in epistemic mind-games draws incentive from being in contact with others who are similarly caught up in parsing out a shared experience. By attending the world

[13] For the distance of the radical modernist musical avantgarde including its theoretical defenders like Theodor W. Adorno from the audience's expectations as well as reception capabilities, see Born (1995).
[14] This modernist thesis, which promotes a radically sublimated vision of sound-text-image triangulation unique to the operatic form and exalts pure structure (or structured materiality) over all manifestations of the pictorial, can be found in the writings of Theodor W. Adorno (1954/1999; 1968/1990), whereby he only exemplifies a music historical and music theoretical debate that began much earlier.
[15] Problems raised for social science research are discussed in: Koch & Kinder-Kurlanda (2020); Barrowman (2018); Halford & Savage (2017).

premiere of *Pink Mouse* in Lüneburg on March 21st, 2024, participants witnessed not just a seemingly antiquated thespian ritual. They were party to a sociological happening. This ›opening night‹ – it actually took place as an early matinée – offered a public screening of the mediaopera followed by a shared meal of Russian-themed crepe, topped off with two rounds of digestive philosophizing on *Pink Mouse* in a circle of knowledgeable guests. The interest there generated and carried over in solitary reflection and prose commentary arose from a congenial, experiential context. Curiously enough, premiering the mediaopera in real time and space with a seated crowd proved key to its coming into its own as a work of art making the circuit of festivals. Participant observers constitute themselves as vectors of embodied, social apprehension despite the fact that the mediaopera projects them as solitary spectators consuming video-content on screen real-estate crowded with other applications such as email inbox, search engine and virtual desktop trash can.

Erofeev's poetic curiosity flirts with this social dimension of interactive mind-making that presents as human agency. The heroine of his tale is Maroussia. Her full name, Maroussia Mendeleyeva, recalls Dimtri Mendeleyeev, Russian chemist known for devising the periodic table of elements, which classifies molecular elements according to their relative atomic weight. The physical qualities of matter can be accounted for by combining the elements in this table. Complex chemical reactions allow these elements to cohere in compound structures. These reaction-chains are described in terms of bond-making and bond-breaking principles that can hardly be articulated without invoking the realm of lived social relations (Neale, et al., 2019). The language of chemical science as codified by Mendeleev is inseparable from the language – and experience – of human affiliation. Erofeev mentions Mendeleyeva's »famous name« in passing, a mere insinuation. No circumstantial information in the libretto of *Pink Mouse* explains why Maroussia carries such a weighty moniker or why this historical personage in particular should be summoned. Be that as it may, the family name acquires signal surplus value in the mediaopera adaptation of *Pink Mouse*: ›Mendeleyeva‹ resonates with social imaginaries still rooted in a world of analogue social liaising (where human constellations make and break connections of variable size and resilience), which are steadily being replaced and hence eroded by automated routines. The table of elements alluded to only obliquely by Erofeev, but connoting a social semantics, stands out more tellingly in a mediaopera whose automated reading and writing procedures blur said principles of socio-chemical composition. It is increasingly difficult to parse agency in the user/laptop dyad. Who is in the driving seat of this epistemic exchange that appears putatively intentional, user or machine? AI-powered information engines contest the locus of agency.

In tendency, mediaopera obviates shared witnessing of a theatrical performance in time and space. Yet, Yusupova's *Pink Mouse* asserts that the triangulations of yore – namely, embodied exchange, tool-use, and negotiated purposiveness – have a future in the periodic table of our newly mediated cultural commons. A newly virulent factor has arrived on the scene of human communing, namely automation, and it stands to erode the adhesive power of felt connections. In supplanting the social dimensions of work with automated routines of task execution and decision-making, the new technologies also

suppress connective feedback loops of judgement. Much of the combinatory work that has traditionally grounded agency in sociality is being supplied by instrumental protocols of automation instead. These simulate social intelligence when in fact they are steered by private rationales operating off screen – unfelt, unseen, unheard. Yusupova's *Pink Mouse* amplifies the lived reality of humanity's existential entanglement with self-fashioning tools. Her mega-score of sound and image makes the complex tonalities of instrumental expression tangible in a synaesthesia of aesthetic elocutions, which are indivisibly visual and acoustic. The formatting of piano-generated imagery remains unstintingly mental and private, in playing and hearing alike; the images mobilized by invariant tapping on our digital devices correlate with preformatted commands that trigger automated routines and yield compartmentalized results, which are embedded in infrastructures that are public-facing, albeit proprietary.

While piano-playing arguably manifests combinate agency in formation (mental images brought into circulation by an audience listening to a piano concerto arise from direct corporeal gestures, mechanically translated, and spontaneously issuing in associative impressions), computer-using activates myriad, multifunctional, microchip-driven chain reactions that have been optimized to commodify agency in dispositional increments of *information* (image tropes coordinate the user-computer interface and are floated as thumbnails and adverts nudging the actions of users while the trace history of all past actions taken in that visual ›surround‹ (Turner, 2015) are logged, tallied, and applied in furthering operational advantage). The difference between *agency in formation* and *agency as information* is one of degree: Sociality matters. Whereas the player/piano dyad is ›unmediated‹ with respect to subjective expression, the user/computer dyad is mediated by transactional protocols that replace the agency of subjects with an artifice of subjectivity based on human-inflected natural language processing, stochastic language modelling, and algorithmic protocols, which are devoid of reciprocal intentionality. The ingress of automated procedures in the composing of thought leaves less room for the ›responsive exchange‹ and spontaneity of ›negotiated purposiveness‹ that couple expression and meaning to human affiliation. Heinrich Kleist's (1878) notable essay on composing thoughts while speaking describes the construction of an idea in a face-to-face interaction between brother and sister (paying heed to the choreography of minute gestures that are being noted, subliminally, between them as their sibling rumination spells itself out in words). Today, with *the gradual completion of thoughts while typing*, Kleist's observation no longer applies. The conversational modality of tele-transported messaging entails little exposure to the fractional intimate exchange observed by Kleist. Video-calls could be seen as a Kleistian technology in that they show the speakers while speaking but filter-effects, time-delays, and other glitches give the machine artefacts an intimate heft that is hardly able to overcome the palpable absence of holding space, together, in immediate presence.

Yusupova has long been interested in the dyadic movements of encryption and decryption that set subliminal-dialogical artmaking apart from more tuitional traditions (Kozel, 2017). Yusupova's (1999) »Thoughts on Cryptophony« appeared at a time when she was already testing aesthetic propositions put forward in her musical output. The crypto-cultural tactics deployed *in Pink Mouse* not only match but arguably even surpass

ideas she espoused at the time: »In this manner, our cryptophonic method is a means to bring out the hidden substance of the manifestation of the Spirit, which take place in the world of the Beyond«. Her ethereal purchase on symbolic systems, modular information design, and serial patterning engages a decidedly enigmatic source of inspiration. Kindred cryptographic techniques have long been of interest in cognitive engineering, computer science, and information technology where the ›agencies‹ under investigation comprise both artificial and human intelligence. The divide between subjective and objective modes of information processing is of critical importance in these fields. Subjective discernment pertains not only to the domain of felt experience but, critically, also plays a key role in the exercise of judgement needed when making category distinctions. Referential context may be tacitly given, but not explicitly stated or known in advance. Accordingly, coded messaging takes for granted an implied agent that has the requisite mapping capacities to resolve possible impasses of reference by making an informed subjective judgement as to the lines of situated embodiment that apply.

Yusupova uses bricolage, expressive appropriations and constructivist grammars in building dynamic propositions that she entrusts to the audience, isolated spectators for the most part, who are invited to deconstruct and recover the encoded import. A striking example of this technique in *Pink Mouse* occurs in a scene that quotes the film *Titanic* (1997): Maroussia and her cousin Runt can be seen standing on the helm of the vessel in the exact pose of open-armed, expectant intimacy that graced the film poster accompanying that box office hit (fig. 19).

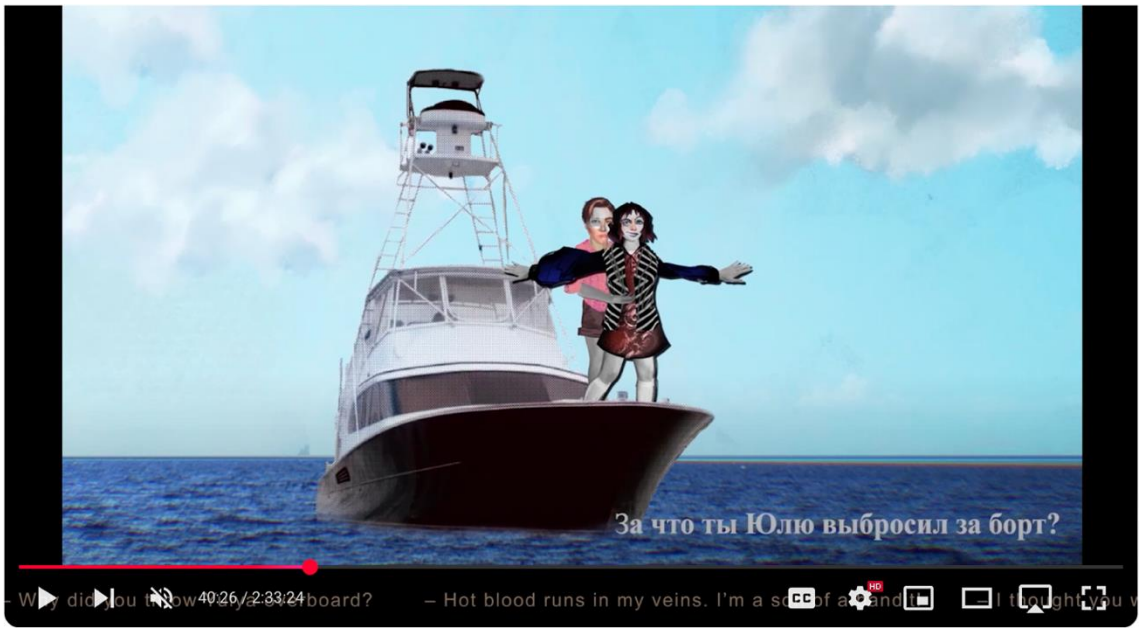

Figure 19. A familiar pose, used with permission by the composer. © Iraida Yusupova

Yusupova's reception aesthetics accord with received postmodernist art practices. Creative output that seeks critical acclaim in this discursive field aims to facilitate modes of co-composition on the part of spectators has variously been called »active audiences«, »negotiated meanings« or »emancipatory decoding«. Such terms reference semiotic

conventions that promise to empower the spectator, sometimes to the point of asserting the death of the author. Ultimately, such pronouncements attempted to elevate the consumer of a work of literature, film, or media production with respect to the semiotic production at hand. Similarly, Yusupova's *Pink Mouse* can be read as a sustained invitation extended to the generalized spectator of online ›content,‹ a spirited reminder to the person behind the screen to get personally involved in assessing the meanings of her piece. In this sense, *Pink Mouse* recalls the demands of Brecht's »epic theatre«, which renounced the traditional bourgeois separation of the stage and the audience in a relationship of reciprocal dependency. Like Brecht, Yusupova's treatment of *Pink Mouse* dispenses with the division of creative labour that would segregate the world of appearances from the world of being, embracing instead a theory of dynamic, meaningful co-production where acts of imagined congruity are coeval with scalable agency formations.

Mediaopera, as genre, brings diminished social communing to light, symptomatically – triggers a remedial response. The piece exacts an in-depth interpretative engagement; it re-invigorates a zest for developing perspectives, reciprocally contested, that foster resilient agency. Presumably, Yusupova plays the piano while composing. But spectators transact with *Pink Mouse,* and her other mediaoperas, on yonder side of the human/machine exchange with production context and reception context falling on opposite sides of analogue versus digital tool use. Her bifurcated conception of mediaopera as an analogue sanctuary in a digital danger zone has to be decoded by the spectator, which can only take place in socially structure fields of subjectivity. The practices of multi-sensory collage deployed by Yusupova are genealogically related to the navigational intuition behind the graphical user interface (von Xylander, 2007; Kramer (von Xylander), 2007). Functional control of the multifunctional, computational machines as widely in use as bicycles leans on socially inculcated and situationally encultured acts of transference that have to be effected by lay users on the basis of visual cues. Graphical tropes and situated desk-top related metaphors from the analogue world have been codified in pictures on screens. Users rely on these signposts in deciphering prompts and divining the likely sequence of action-instructions, which will allow them to operate machines that would otherwise be far too complex for casual use in the form of personal laptops and cell phones. In its visual functionalism, Yusupova's mediaopera reads like a microcosm of the extant cybersphere, meaning the totality of visual conventions governing the virtual world. Her postmodernist pastiche on the materiality of »spirit,« here also evinced in a deeply personal encounter with ›digital afterlife‹ and related artifacts of networked communication (Yusupova, 2025), challenges spectators to reflect on the divine comedy of social media relations. The artificial agency that is lampooned in her adaptation of *Pink Mouse* begs the question of whether at all, and if so by what means, spontaneous socially constituted agency might be re-designed for sustainable non-oblivion (Mayer-Schönberger, 2009).

Human Skeuomorphs

Constructivist accounts take humanity to be an acquired trait (Rockmore, 2020; Laland, & Brown, 2018). A vast body of literature in philosophy, psychology,

ethnography, anthropology and cultural theory has arisen around explaining how a »second nature« compensates for the lack of instincts with which human babies are equipped at birth (Testa, 2017). This second nature also makes human beings especially adaptable as a species: We learn to survive in environments for which we are not biologically outfitted. The bio-fictional hybridity of which we are all, though variously, comprised consigns us to a category of mixed being that lies outside the binomial system of Linnean classification. We are myth-cyborgs comprised of mammalian embodiment and socially constructed suppositions or, as Ernst Cassirer (1944) writes in *An Essay on Man*, »Not nature but society is the true model of myth« (p. 106). The mythic component of human self-invention arises out of the kinds of sociotechnical interactions that are canvassed in Yusupova's figuration of piano, e-guitar, and laptop in *Pink Mouse*. Her constructivist collages reflect this tradition of thought, which in its most vulgarized form easily falls prey to accusations of relativism, on one end, and technological determinism, on the other. It is either alleged that the human condition can be twisted into any shape that the powers that be may choose, or that the instruments utilized for our species survival have quasi-invincible character-forming potency. This is not the place to attempt to arbitrate this fundamental, philosophical controversy. Rather, the limitations of both positions come to the fore in light of the putative anthropomorphisms animating the figurations in *Pink Mouse*, and this includes the figure of Pink Mouse itself. In deeming these animated cartoon props simply or straight-forwardly ›anthropomorphic,‹ as the term is commonly understood, spectators of this mediaopera commit the fallacy of human essentialization (Scholte, 2017; Landgraf, 2017).

The only way for the grand piano or Pink Mouse to be anthropomorphic, i.e. to be invested with human traits, is to assume that there are identifiable human universals that can be mapped onto these surrogate carriers of agency, to essentialize the projection as an ahistorical expression of quintessential humanity. But smart computing – the mediaopera's natural habitat – challenges this conceit. It is unclear where the line between human and non-human agency can be drawn. With the influx of artificial intelligence and prosthetic ideation, the boundary is set to shift. New configurations of humanoid myth-making may already be incumbent on the virtual environment that increasingly separates us from our fellow earthlings imposing new degrees of separation (the mathematical measure of ›social distance‹ which is held to be logarithmic to the size of the population (Samoylenko et al., 2023)). If there are ›six degrees of separation‹ now, it may be a greater multiple in the future. The visual score of *Pink Mouse* reveals a fundamental attribution error pervading the discourse on anthropomorphism and related claims alleging our computational machinery to be anthropomorphic. The ›human traits‹ we see the piano and Pink Mouse acting out in this graphico-musical plunge into Erofeev's poetic reverie show themselves, on closer inspection, to be not so much *anthropomorphic* projections as *skeuomorphic* affordances. ›Skeuomorphism,‹ a term coined in the late 19th century by an English anthropologist, describes a phenomenon observed in tool evolution where material features of an artifact tend to outlast the actual material instantiation of that artifact because the original function morphs into a functional ornament conveying purposiveness with respect to a relevant domain of problem-solving practices (Blitz, 2015; Colley March, 1889). Skeuomorphism explains why primeval clay pots feature

woven wicker patterns as if they were woven from plant material, as they originally were, and why some digital cameras make a click sound even though they have no aperture that closes mechanically. The wicker patterning of clay pots and the acoustic design of a digital camera attest to the functional design of technological instruments operating on a timeline that is not congruent with the material reality of tools in use but that consolidates lived arrangements reflected in a sphere of aesthetic surrogacy that travels under the radar of consciousness (the skeuomorphic conception of selfhood goes mostly unmentioned in cultural studies and philosophical anthropology).

Conversely, skeuomorphism is a hot-button topic in the arena of digital interface design (Darius, 2023a; 2023b). The wholesale migration of real-world practices to virtual correlates upheld by visual metaphors on screens involves extensive skills and experience with respect to skeuomorphic transitioning (Taylor & Dell'Unto, 2021). Does the online calendar need to feature torn-page optics? And how much shadowing should be added to the buttons on a virtual synthesizer, so they resemble the original three-dimensional object? Sensibilities vary between engineers, designers, and lay people, and they also skew generationally (Pereira Urbano et al, 2020). Whole industry brands and product lines arise from different design intuitions around the degree of skeuomorphism that are appropriate to users being able to adopt new digital services with ease and comfort (Manjoo, 2012). Those discussions and investment decisions determine if specific tools and technologies are ready for market, which limits the conversation about skeuomorphic feature design to the plethora of computational devices developed for specific applications in science or the commercial sectors. Mediaopera as genre – and *Pink Mouse* as exemplary case in point – invites us to expand on this limited conception of tools and technologies in commodity form and to adopt a conception of »technics« that encompasses ourselves, too. In the self-constitutive entanglement we – players, users, problem-solvers – have with instruments in social arenas of shared experience lies a unique ability to survive (albeit at great cost to the planet and other species). Given the hybrid constitution of humanity, skeuomorphism is not only a technological phenomenon but significantly also a human-apparition effect. The analogue conception of humanity that Yusupova's *Pink Mouse* situates in the digital lifeworld may finally amount to what I propose to call a ›human skeuomorph.‹ This conceit of agency arguably informs the rendering of the mediaopera because, as functional default setting of a sensory formatting that is still widespread, it points to forms of sociality that continue to feel familiar and agreeable even after being discontinued in practice. The analogue sensitivities presumptively guiding the anthropomorphic characters in *Pink Mouse* have grown obsolete in exact measure to the material cultural practices, to which they were originally tethered, being replaced by social mediation.

Pink. Mouse.

The title lands a double punch: Pink. Mouse.

In the chart of colour symbolization, ›pink‹ has advanced from girlie connotations of ›sugar and spice and everything nice‹ to a bold statement of political convictions. It is the colour of non-binarity. When the Kant statue in Kaliningrad was vandalised for representing unwelcome Western influence in 2018, a bucket of pink paint was emptied

on the memorial. Images of the political statement circulated through the media worldwide (Chaly, 2020).

If ›pink‹ celebrates non-binarity (and is the target of its critique), ›mouse‹ bifurcates the world between digital practices and analogue givens: The term designates both a computer appliance and a kind of rodent whose newborn litter is so pink that the babies are called ›pinkies‹. Presumably, this is why we think of mice as being pink though they are predominately white, brown, and grey in the wild. The mouse occupies pride of place in the bestiary of modern childhood, being one of the first pets that an obliging parent will bring into the home. In fables, too, this animal has become supercharged with political associations. From ›The Town Mouse and the Country Mouse‹ in *Aesops Fables* to ›The Old Cat and the Young Mouse‹ (1668-1694) in Jean de la Fontaine's compilation of animal allegories to *Maus: A Survivor's Tale* by Art Spiegelman, graphic novel on the Holocaust memory serialized from 1980 to 1981.

The challenge of ›pink‹ and the dual nature of ›mouse‹ are taken up in *Pink Mouse*'s libretto when it alludes to one of the most influential essays of ecofeminism and technoscience: Donna Haraway's *Cyborg Manifesto* (1985). Art manifestos have punctuated the drumroll of modernity since the onset of industrial alienation. Futurists, Constructivists, Cubists, Vorticists, Dadaists, Surrealists - these aesthetic and anti-aesthetic movements were first asserted as programmatic provocations. Both iterations of *Pink Mouse*, Erofeev's and Yusupova's, mimic such saber-rattling postures in lexical, acoustic, and pictorial metrics. But the Haraway citation is not just postural, it is assertive. At a certain point, Pink Mouse reveals to Maroussia: »I am a mouse cyborg!« (Yusupova, 2022, p. 11). Before Haraway, the cyborg was a fever-dream of science fiction writers, mostly male, who projected fantasies of racist, patriarchal, and anthropocentric domination onto the image of a future incarnation of humanity augmented by machine parts. Haraway determined that the cyborg – this »condensed image of both imagination and material reality« – was being hijacked to further a reactionary ideology. Her manifesto re-inscribed this figure with an alternative, techno-utopian aspirationalism that would be inclusive, anti-authoritarian, and non-exploitative, thus ushering in a progressive »historical transformation« (Haraway, 1985).

And as it happens, an actual ›mouse cyborg,‹ i.e. the first patented animal, stands at the centre of another essay by Haraway, *Modest_Witness@Second_Millennium. FemaleMan©_Meets_OncoMouse*™ (1996). In this piece, she ponders the cultural significance of a technologically modified laboratory mouse commonly used in medical research. The species has a gene mutation resulting in an inhibited immune system, which allows for the testing of a wide range of tissue, tumour grafts, and genetic disorders, like cancer. The organism does not reject foreign cell matter. Some variants are hairless so the pink skin tone is visible. A memorable experiment involving this animal yielded a reality stranger than fiction, a Frankensteinian monster known as the Vacanti mouse (named after the scientist brothers who conducted the experiment) (Haraway & Goodeve, 1996/2018). The mouse seemed to have a human ear growing out of the side of its body. In reality, the ear had been grown by implanting cow cartilage cells under the skin of a nude laboratory

mouse and attaching an ear-shaped splint to the outside of its body into which the cartilage then moulded itself (Famous Pictures, 2013).[16]

The image of the naked mouse with a human ear protuberance made the rounds in 1997, when the Vacanti brothers published their findings. It prompted much outrage and public protest against genetic engineering run riot although no genetic manipulation was involved (Noah, 2015).[17] Grafting and growing – the skills of plastic surgery but also of gardening – were the only techniques utilized in making this arrestingly poignant monstrosity: do we see ugly Maroussia's plight, the grooming violence inflicted upon her and her struggle for transformative growth, in the laboratory animal which, according to Haraway, establishes a new kind of kinship between humans and mice, between cancer patients and animals for cancer research who are sisters in suffering? (Haraway, 1996)

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Grafting is of course also a principal manoeuvre used in art and culture. Grafting a Erofeev's book onto Yusupova's oeuvre and growing a mediaopera from it. Grafting an analogue operatic art onto a digital media platform, grafting a children's book onto an adult contemporary media culture.

Yusupova's transmutation of *Pink Mouse* entered the public sphere in a precarious geopolitical constellation: a Russian mediaopera furnished with English subtitles screened at a German university. The 2024 world premiere of a mediaopera that was finished and openly available since 2021 also raised pressing questions about art, technology, semiosis, witnessing, and the constitution of an audience in an age of dwindling budgets for state-sponsored institutions of legitimate culture. A very different approach to the challenge of composing for an audience that no longer constitutes itself as a collective gathered together in time and space has recently been put forward by filmmaker Gary Hustwit with *Eno* (2024), a documentary biography on Brian Eno, another renown composer in the mediaopera field. In reflection of Eno's artistic agenda, the film uses generative AI to recompose itself with every showing. The mediaopera is a genre still in formation. Whatever movements of mind the poet may have intended to stir with the fictive rodent nested in the head of a fictive girl, and the composer amplified with pictures and sounds, their combined artistic effort partakes of an epistemic whirl in which childhood sexuality, the human/animal continuum, the user/machine interface, and the compositional phantasmagoria of automated creativity converge in a generative hub of assemblage.

Now that machines have acquired problem-solving skills akin to, and even outstripping, the human capacities they plagiarize, old notions of anthropomorphism no longer hold up to scrutiny. Universalist, ahistorical conceptions of agency do not take the social dimension of combinatory personhood sufficiently into account. Yusupova

[16] See, *The Famous Pictures Collection. 1000 words behind the photos*. May 16, 2013. https://www.famouspictures.org/ear-mouse/

[17] Pink mouse cyborgs recently made the headlines again, not in the context of genetic engineering but another kind of culture wars. When laboratories were closed down because they allegedly promote the creation of »transgender mice,« howls of derision filled the blogosphere: The culture warriors had confused the intentions of the researchers who were working not on »transgender« but on »transgenic« mice (Smith, 2025).

positions the mediaopera as an analogue haven in a vaguely hostile digital environment and thereby draws attention to the workings of agency in relation to tool use. Compound humanity forms around principles of aggregation that have an instrumental dimension and recall the periodic table of elements devised by Mendeleev, family name of Maroussia, the heroine of *Pink Mouse*. In concert, Erofeev and Yusupova have authored a meta-mediaopera that reflects on the conceit of human self-understanding as a form of anthropomorphism. Pink Mouse is a literary device that exemplifies the attribution of human qualities to an unspecified carrier, an imaginary friend. In the original prose poem, a fiction within a fiction enacts the mechanism of transferral within the pages of a book. *Pink Mouse* rendered as mediaopera ascribes human traits to the genre itself and thus conveys the projective mechanism via a techno-functional logic more in line with *skeuomorphism*. Human agency as projected in and by Yusupova's semiotic specifications shows itself to be a metaphysical conceit whose nostalgic appeal is no longer in alignment with the lived conditions of sociality from which patterns of agency are finally generated. The sensorium of analogue experience is, arguably, a ›human skeuomorph,‹ that is to say a mythic remnant of a former way of being.

Like other functional attributes of superannuated contrivances, human agency comes to be sublimated in ideas of self-referential personhood (in effect, ›cognitive devices‹) that are prone to outlast the spontaneous, combinatory reality of the material relational networks to which they once obtained. What *Pink Mouse*, the mediaopera, finally exposes is the run-a-muck aggregating that pervades our digital commons. The broadband mash-up of parts and wholes incessantly pounding at attention spans, sustained in generational succession, and non-renewable in every instance, calls for new ways of parsing the social-technical-human continuum. A future touchstone for expressing individuated agency may lie in counter-composing the morph-imperative of that AI-shaped splint now attached to the social body.

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Guest Editors

Anna Kotomina and Colin Milburn

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Editorial introduction

Speculative Technologies: Further Dreams of Technical Reason

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Abstract
Speculative technologies emerge at the intersection of imagination and scientific knowledge. The second part of this special collection provides further testimony to this. If the dream of reason gives rise to monsters, the dream of technical reason gave birth to the perpetuum mobile along with the mechanical and artistic obsessions or compulsions that came with it. It stretches all the way to the right software app that will select a soulmate to cyberfeminist theories that seek to break through ways of thinking that foreclose technological horizons. As in the first part of this special issue (the September 2024 issue of *Technology and Language*), speculative technologies serve as provocations and inspirations, pointing to new possibilities, alternate horizons, and different worlds beyond our current reality. They are not just products of speculation; they are also generators, drivers, and focalizers of speculation, instruments of subjunctivity, heralding an aesthetic transformation of society. The thirteen papers (plus several essays about Kafka's killing machine) collected in this two-part special issue examine speculative technologies through historical reconstruction, philosophical reflection, cultural-technology assessment, museological engagement, and literary experiments.

Keywords: Speculative technologies; Imagined futures; Alternative worlds

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Редакторская заметка

Спекулятивные технологии: Дальнейшие мечты о техническом разуме

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Аннотация
Спекулятивные технологии возникают на стыке воображения и научных знаний. Вторая часть этой специальной подборки статей еще раз подтверждает это. Если сновидения разума порождают чудовищ, то видения о техническом разуме породили вечный двигатель вместе с сопутствующими механическими и художественными одержимостями или внушениями. Это простирается до правильного программного обеспечении, которое подберет родственную душу, до киберфеминистских теорий, стремящихся преодолеть стереотипы мышления, которые закрывают технологические горизонты. Как и в первой части этого тематического выпуска (“Technology and Language” от сентября 2024 года), спекулятивные технологии служат провокацией и источником вдохновения, указывая на новые возможности, альтернативные горизонты и другие миры, выходящие за рамки нашей нынешней реальности. Они не просто продукты спекуляций; они также являются генераторами, движущими силами и средоточиями спекуляций, инструментами сослагательного наклонения, предвещающими эстетическую трансформацию общества. В тринадцати статьях (плюс несколько эссе о машине для убийств Кафки), собранных в тематическом выпуске, состоящем из двух частей, рассматриваются спекулятивные технологии с помощью исторической реконструкции, философских размышлений, оценки культурных техник, музееведческого взаим одействия и литературных экспериментов.

Ключевые слова: Спекулятивные технологии; Воображаемое будущее; Альтернативные миры

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We offer our readers the second block on the topic of speculative technologies (Kotomina & Milburn, 2024). It consists of six articles that offer options for understanding the historical and modern experience of interaction between people and technical objects. The authors write about both the destruction and the preservation of stereotypes regarding technologies. They qualify expectations from technical innovations as justified and unjustified and express a whole range of positions – from skeptical, ironic, and detached to didactic and visionary.

Mikhail Kulagin and Mikhail Zimirev analyze the public response to the attempt of Soviet cyberneticists Viktor Pekelis and Aksey Berg to develop a computer algorithm for finding a romantic partner in the USSR in the late 1960s. The authors found that despite the enthusiasm associated with the use of the latest technical solutions to combat loneliness, the inertia of accepted family norms and gender orders turned out to be stronger. The technological design of the "cybersvaha" and its epistemic framework served to conserve traditional notions of the family (Kulagin & Zimirev, 2025). Anna Kotomina's analysis of the case of the perpetual motion machine project, as known from the diaries of Nikolai Chernyshevsky, also exhibits the persistence of expectations from technical progress in several generations of the Russian middle class "intelligentsia." In his student project, Chernyshevsky expressed hopes that are were typically expressed in his cultural environment. This included the belief that the social order could be improved through the use of free energy generated by a perpetual motion machine (Kotomina, 2025). In the article by Alla Mitrofanova (2025), we find a conceptual approach to indicate directions for going beyond narrowly conceived framings and discussions of gender, bringing to fruition a theoretical perspective that allows for a more comprehensive formulation of scientific tasks and the organization of practices. The author reflects on a revision of the concepts of early cyberfeminism in the 90s and their continuation in the works of contemporary researchers, writers, and data analysts. These three articles are united by a desire for a retrospective critique of stereotypes regarding technology in societies. These authors consider unrealized (or not yet realized) projects as a starting point for their reflections.

Joachim Kalka (2025) offers a panorama of attempts to build a perpetual motion machine from the 18th to the 20th centuries, as reflected in the works of Johann Ernst Elias Beßler, Paul Scheerbart, Leonid Leonov, or Georg Christoph Lichtenberg. Kalka offers a close reading of the peculiar obsession to gain something from nothing, an obsession that reappears in a different guise also in contemporary emerging technologies. In their analysis of one form of contemporary technology, Aramo Álvarez, Mercedes Villalba, and Joseph Dumit assess the capacities of large language models (LLMs) to contribute to practices of affirmative co-speculation. The authors criticize the established practices of treating LLMs as reliable if not oracular tools, insisting instead on the need for deeper appreciation of the technical dimensions of LLMs, which act as repositories of unactualized but potential patterns of thought and language. These patterns become manifest by addressing not only what has been excluded or made invisible, but also what

might yet become possible when seen from another direction. To this end, the authors present a variety of ways to approach LLMs as instruments of speculation, advocating for evolving our human relationships with LLMs in new ways (Álvarez, Villalba, & Dumit, 2025). Polina Kolozaridi (2025) also stresses that a human plot or a dream precedes any technical object. Like Álvarez, Villalba, and Dumit, her article addresses human interaction with digital objects. She analyzes the instructions and interfaces of digital humanities projects to understand their attitudes toward users. Her observations lead to the conclusion that these projects primarily mediate an institutional agenda rather than provoke affirmative co-speculations, making room for new user roles and possibilities. These three articles shift the focus from the study of speculative projects to observations on the design process, and come to conclusions that can be seen as an attempt to rationalize our not always conscious attitudes toward technical and digital objects. At the critical juncture of Enlightenment and technological modernization, the discussion of speculative technologies does not end but suggests a new beginning.

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Research article

„About Orffyreus' gift I have been keeping, / at the same time laughing and weeping.“ The Perpetuum Mobile – A Small Phantasmagoria from the Eighteenth Century

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Abstract

The perpetuum mobile reappears throughout history as a dream of technical reason. On the face of it, it relieves us for good of the drudgery of work but it signifies more generally the quest to get something for nothing, to achieve benefits without cost. This pervasive desire informs technical optimism, it is frustrated in the most mundane ways, but it never gives up. Inventors imagine that there is always just one small missing cog that would save the design, in the meantime they employ hapless laborers to secretly drive their machines. These are the ones that finally present the bill to the visionary dreamers. This becomes evident in a survey of mostly 18th century proposals, most famously that of Johann Ernst Elias Beßler or Orffyreus. Even before the age of thermodynamics and proof of the impossibility of the perpetuum mobile, Georg Christoph Lichtenberg was among the majority of 18th century scientists who would meet any such proposals with incredulity. Accordingly, he engaged with such claims with an in equal parts curious and satirical attitude. And even after the age of thermodynamics, the perpetuum mobile persisted in the artistic imagination, for example, of Paul Scheerbart or Leonid Leonov.

Keywords: Perpetuum Mobile; Johann Ernst Elias Beßler; Paul Scheerbart; Leonid Leonov; Georg Christoph Lichtenberg

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Научная статья

“О даре Орфиреуса, который я хранил, / одновременно смеясь и плача”. Вечный двигатель – Маленькая фантасмагория восемнадцатого века.

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Аннотация
Вечный двигатель появляется на протяжении всей истории как мечта технического разума. На первый взгляд, он навсегда избавляет нас от тяжелой работы, но в более широком смысле он означает стремление получить что-то бесплатно, добиться преимуществ без затрат. Это всепроникающее стремление порождает технический оптимизм, терпит крушение самыми обыденными способами, но никогда не сдается. Изобретатели воображают, что всегда есть одна маленькая недостающая шестеренка, которая спасла бы конструкцию, а тем временем они нанимают незадачливых рабочих, которые тайно управляют их машинами. Именно они в конце концов предъявляют счет мечтателям-визионерам. Это становится очевидным при рассмотрении предложений, в основном, XVIII века, наиболее известное из которых принадлежат Иоганну Эрнсту Элиасу Бесслеру или Орфиреусу. Еще до эпохи термодинамики и доказательства невозможности вечного двигателя Георг Кристоф Лихтенберг был одним из большинства ученых XVIII века, которые с недоверием относились к любым подобным предложениям. Соответственно, он занимался такими утверждениями с равной долей любопытства и сатирического отношения. И даже после наступления эры термодинамики вечный двигатель сохраняется в художественном воображении, например, Пауля Шеербарта или Леонида Леонова.

Ключевые слова: Вечный двигатель; Иоганн Эрнст Элиас Бесслер; Пауль Шеербарт; Леонид Леонов; Георг Кристоф Лихтенберг

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A TECHNICAL DREAM OF REASON

The irradicable drudgery of work – depending on your temperament, it is a source of sadness or enervation. We have to live with the thought that we have to always keep making a new effort so that the dust which we just wiped with great patience will not settle again tomorrow. With the thought that the work never ends, that fresh energy needs to be invested continually for a myriad of of various more or less unpleasant tasks. This drudgery of work has again and again given rise to daydreams of elves and servant golems, of robots and a reservoir of inexhaustible energy that turns everything into child's play. (Many things have become easier, but then the term “energy crisis” was coined in the twentieth century, which put in circulation its own hectic imaginaries of gigantic amounts of energy, be it from hydrogen or from biomass.) And so the following reflection shall be dedicated to the abandoned dream of the perpetuum mobile, of the machine which, once set in motion, runs continuously without any further energy input – which thereby mostly puts to rest our problems of work.

The great historian of technology Franz M. Feldhaus notes with angry fervor that the idea of the perpetuum mobile has surfaced again and again since the Middle Ages. After identifying the first instance of this idea around 1245 he encounters it “in numerous places and in the most outrageous variations, with magnetism, levers, moving balls, water wheels, water screws, lifters, etc.” (Feldhaus, 1914, columns 784-785). The de facto “impossibility” of such a machine had been proven along with the formulation of the first law of thermodynamics by Hermann von Helmholtz, Robert Mayer, and James Prescott Joule in the nineteenth century. The only “perpetua mobilia” that we still have today are, if you will, the barometer and the thermometer.

Of these, the barometer received this (long since abandoned) designation by Otto von Guericke. By this he meant nothing other than another Latin term that was commonly used for the barometer: semper vivum, always alive, in constant ups and downs. The same applies to the thermometer, for which the name perpetuum mobile can be found around 1604. A letter about a machine with the name in question belongs here. Georg Christoph Lichtenberg wrote it on December 20, 1774 to Abraham Gotthelf Kästner from England: “I have seen Mr. Cox's perpetual motion and examined it as far as is possible in such a matter. (For it is shown, as one shows exotic animals in Göttingen.)” (Lichtenberg. 1983, no. 267). It is a barometer, “perhaps,” as Lichtenberg writes, “the most expensive that has ever been made, for it contains two hundredweights of mercury.” In this device the changes of air pressure are used to do the work of winding a clock spring. However, “[t]hat this thing deserves the name of a perpetui mobilis is something that no one would claim who knows that watermills are not wound up either, nor set in any way.” Like the water cycle, air pressure belongs to the constant contingencies of the planet. Like the climate, barometers and thermometers are in “constant motion.” But the dream of a machine that always keeps „moving onwards“ is quite another story.

George Douglas's fabulous novel „The House with the Green Shutters“ (1901), presents in a casual vignette the image of a sad delusion (against the characteristic Scottish background of a society with a Calvinist work ethic that still haunts even the idle daydreamers):

> In every district almost you may find a poor creature who for thirty years has cherished a great scheme by which he means to revolutionise the world's commerce, and amass a fortune in monstrous degree. He is generally to be seen shivering at the Cross, and (if you are a nippy man) you shout carlessly in going by, “Good morning, Tamson; how's the scheme?” And he would be very willing to tell you, if only you would wait to listen. “Man”, he will cry eagerly behind you, “if I only had anither wee wheel in my invention – she would do, the besom! I'll sune have her ready noo.” Poor Tamson! (Douglas, 1901, p. 93)

Here one sees – the tell-tale sign is the wee wheel, the one small missing cog – the shrunken form of that old dream of technical reason that had its heyday at the time of Lichtenberg who lived in the second half of the 18th century.

We are used to considering this time the century of enlightenment, but it is also the century of Cagliostro – which has along the way produced something like a new form of superstition, one that feeds precisely on the urgent expectation of radical scientific renewal. And the classical age of the perpetuum mobile – after becoming, as mentioned, an object of physical speculation already in the High Middle Ages – is at the same time the age of absolutist mercantile politics, as such like the preceding age of gold-making. For any enterprising and in their appearance somewhat mysterious trader of secrets the ideal condition for the exploitation of this elusive dream consisted in the desire of absolutist courts to amass a huge state treasure as quickly as possible, bypassing laborious processes of production. The search for the perpetuum mobile remains attached to El Dorado fantasies: the dream of this machine is a gold rush that unfolds no longer in the colorful imagery of a seafaring imperialism, nor like alchemy in a magical vein and that of natural philosophy, but in the manner of physics and apparently within exact outlines. And yet, according to some contemporary writing, the machine still inhabits one of the “eight secret chambers of the edifice of nature” (Bülau, 1893, p. 71) , along with the philosopher's stone, the alkahest, the art of softening glass, eternal light, the hyperbolic line in a concave burning mirror, the *longitudo maris* and the squaring of the circle. Feasible solutions and wishful thinking here appear side by side and intermingle. Only a small step from the philosopher’s stone to the *longitudo maris*, that is, the calculation of longitude at sea which is decisive for precise navigation (Sobel, 2005). One or two rooms in the edifice of natural mysteries feature real and actually solvable problems. In others rooms reigns hopeful absurdity. There is hardly a clearer demonstration of science and superstition thus amalgamated than in the career of the most famous of all those who traveled with a perpetuum mobile in their bagful of projects – Beßler, oscillating between the Kabbalah and physics, between treasure hunting and mechanics, between anxiously eager tinkering and blatant fraudulence.

IMPRESARIO OF THE MACHINE

Johann Ernst Elias Beßler, who later assumed the extravagant name Orffyré, was born in 1680 in the area of Zittau where he attended the Gymnasium as the gifted son of a farmer, with an extraordinary degree of support from Christian Weise, the still remembered dramatist, poet, and author of enlightenment textbooks who had been the

school‘s rector since 1678.[1] However, Beßler lacked the means to continues his education at the university, and went on leading an unsettled, itinerant life here and there all over Central Europe, with forays into a monastery and the army, but above all constantly occupied with diverse arts and crafts (among many others the long list includes copper engraving and gunpowder manufacture, clockmaking and astrology,). He must have been an unusually skilled and gifted technical practitioner, also endowed with a theoretical curiosity that led him to dream of a revolutionary invention, but also with a penchant for the dubious activities of a treasure hunter and charlatan. With these versatile skills he managed to here and there move into aristocratic circles, and it is said that when serving as a travel-companion on a grand tour of Italy he came upon a seemingly self-moving roast grill and thus conceived the plan to construct a perpetuum mobile. His meandering journeys, which cannot be traced exactly, took him far and wide and involved him in a variety of – often precarious – living-conditions. His itinerant life as an artisanal mechanic and market crier finally found a firm footing when in 1712 in Annaberg, Thuringia, he managed to heal by way of a seemingly miraculous cure the sick daughter of the mayor (who was himself a doctor!). The cured patient marries her savior who thus achieves a certain steady prosperity, and in the following year he exhibits in Gera for the first time his perpetuum mobile, the mechanics of which he had probably been devising for many years. Over a period of several years, Beßler exhibits bigger and bigger machines in various locations, and in front of more and less sceptical experts – including the philosopher Christian Wolff (although the possibility, in principle, of such a machine is not yet in doubt, only sometimes its successful realization by Beßler), and in 1715 he gets lucky in that a prince devoted to the arts and sciences takes an interest in his invention. The landgrave Karl of Hesse-Kassel appoints him to his court on the recommendation, among others, of Leibniz. Born in 1654, Karl ruled from 1670 to 1730 and during this time built the Kassel Wilhelmshöhe park with its cascades. After the revocation of the Edict of Nantes he successfully recruited the Huguenots fleeing from France, making Kassel, next to Berlin, the city with the largest Huguenot population in the empire, pushing for the development of a significant textile industry, establishing factories for the arts and crafts such as faience production, glass finishing, amber cutting, tapestry weaving, thus attracting to his court a large number of travelling artists and architects. He is the typical embodiment of a prince who is at the same time a refined and enlightened mind, and a ruthless ruler. He promotes the fine and useful arts, and because such beneficial activities cost a lot of money, he sells entire regiments of his own subjects to Prussia and England – which was a sinister tradition of Hesse-Kassel as we remember how many Hessians fought on the British side in the American War of Independence, for example in the legendary battles of Trenton and Princeton immediately after Washington crossed the Delaware River in 1776.

In 1717, Landgrave Karl called for an experiment to be conducted at Weissenstein Castle which would become the probably most famous experiment in the history of perpetual motion: In a room with doors and windows sealed, Beßler's perpetual motion,

[1] My presentation of Beßler’s biography primarily follows the section "Beßler-Orffyré" in Bülau 1893, beginning on p. 69, as well as Michal (1976), p. 99 onwards.

a gigantic wheel, was to be tested, that is, kept in continuous motion for a long period of time, in the presence of the sovereign and his ministers as well as the Dutch physicist Willem Jacobus s'Gravesande and the architect Fischer von Erlach who was in Kassel to install a steam engine. And indeed, when the room was opened after the set period of "twice six weeks," Orffyré's wheel was still fully active. On May 27, 1718, the Landgrave issued a certificate to Beßler who, in turn, published in 1719 "Triumphans perpetuum mobile," perhaps the classic among his many other pamphlets such as the "Substantial Report of the ... felicitously invented Perpetuo ac per se Mobili, along with its accurate illustration [*Gründlicher Bericht von dem ... glücklich inventirten Perpetuo ac per se Mobili nebst dessen accurater Abbildung*]" (1715). It is fascinating and at the same time quite bemusing to read these programmatic and triumphant tracts since Beßler is also a master of endless, poetically pedestrian doggerel verse which he uses to confront his critics:

> Mister Gärtner asks: how long a time
> the work of my art should run on fine
> namely
> without the help of all such stuff
> of which millers and clock-makers make enough. (Orffyreus, 1716-1717, p. 52)[2]

This arbitrarily chosen example appears in a volume which features a most characteristic title to preface its second part, and for the purpose of characterizing Beßler this heading shall be rendered here in full:

> By Christian Wagner in Leipzig frivolously, dishonorably, dishonestly disparaged, libeled, yet in vain supposedly exposed, Now however saved, defended, justly and truthfully remaining Still unexposed: The Orfyrrean PERPETUUM MOBILE. Upon the urgent pleading by many great benefactors with utmost necessity and greatest speed composed in fine German verse by the inventor of the Perpetuum Mobile, ORFFYREUM himself. (Orffyreus, 1716-1717, titlepage part II)[3]

If this and other pamphlets afford a poetic polemic, there is, in contrast, the rather more gravely celebratory form of a Latin-German treatise like the one that reports about the experiment at Weissenstein castle, the title of which is rather more stilted:

> The triumphant PERPETUUM MOBILE ORFFYREANUM addressed to all potentates, heads of state, regents and personages of worldy importance etc. With all due submission Presented for eventual negotiation and designed as a proposal by its inventor, ORFFYREO, that is TRIUMPHANS PERPETUUM MOBILE

[2] "Herr Gärtner fragt: wie lange wol / Mein Kunst-Werck stetig laufen sol / Nemlich / ohn Zuthun solcher Sachen / Die Müller und Uhrmacher machen."
[3] „von Christian Wagnern in Leipzig Leichtfertiger-, Ehrvergessener- und Lügenhaffterweise herunter gemachte, verleumbdete, doch nur vergeblich entdeckte, Nunmehro aber auch gerettete, defendirte, gerechte und wahrhafftig-bleibende Noch unentdeckte ORFFYREIsche PERPETUUM MOBILE. Auf inständiges Ansuchen vieler großer Gönner höchst-nöthigen Falls eyligst in fein deutschen Verßen entworffen von dem Inventore des Perpetuum Mobile, ORFFYREUM selbst."

> ORFFYREANUM omnibus Summis Orbis universi Principibus Magistratibus et Statibus debita cum Submissione Venale propositum, una cum varis ejusdem effectibus per Authentica testimonia confirmatum ab ejusdem Inventore ORFFYREO. (Orffyreo, 1719)[4]

A survey of these works in their context provokes laughter and a sense of vertigo. But despite all their posturing and urgent sales propositions, and despite their being anchored firmly in the customary scholarly constructions of the time, they yet appear like a mirror which by way of distortion reveals surprisingly clearly certain features of a natural science on the occasions where it operates altogether rhetorically.

All these writings appeared under the name "Orffyreus" that had been adopted some time earlier to replace the rather plain "Beßler." The exotic-sounding new name resulted from encryption, namely a simple shifting of the alphabet by thirteen places so that A = N, B like Beßler becoming the O of Orffyré, and so on.[5] And so „Beßler" becomes a refined "Orffyré," and this then only needs to be latinized to „Orffyreus."

The literati who encountered the wheel of Orffyreus were rather skeptical because of the impossibility of examining the inside of the machine, yet were sometimes quite impressed. In a 1721 letter to Newton, for example, the physicist s'Gravesande still referred to the Kassel wheel as something admirable (see Michal, 1976). Six years later; in his work *Sur la possibilité du mouvement perpetuel* [Regarding the Possibility of Perpetual Motion] he did not rule out a perpetuum mobile, as long as there is no requirement that for its construction one should assume only mechanical elements, allowing for a magnetic conception of such a machine that had been under discussion for over a century (see Michal, 1976, p. 168). But s'Gravesande's was one of the last scientifically serious works that argued at the – albeit shaky – level of contemporary knowledge to concede the possibility of a perpetuum mobile.

So what about the "Kassel wheel"? Unfortunately, there is an infamous document that tears the veil of physical mystery as it seeks to create an impenetrable weave. It gradually became evident that several people, including Beßler's brother and his wife, took turns cranking the large wheel from an adjoining room. Although the wheel, with its considerable weight and clever arrangement, would have rotated for an astonishingly long time under its own weight, it finally would have come, of course, to it inevitable standstill. This explains why Beßler hesitated to accept the pressing invitations of Tsar Peter I who was very interested in a perpetual motion machine. He had offered a prize for such a machine in 1713, hearing of Beßler's invention on a trip to Western and Northern Europe in 1716/17. It also explains why the inventor always refused to have his construction examined by experts. Among the secret employees who had to turn the machinery for two pennies an hour – often for whole days – was the maid Anna Rosine Mauersberger, who

[4] „Das Triumphirende PERPETUUM MOBILE ORFFYREANUM an alle Potentaten, hohe Häupter, Regenten und Stände der Welt etc. In gebührender Submission Zu etwanniger Erhandlung vorgestellet und als ein Antrag entworfen von dessen Inventore, ORFFYREO bzw. TRIUMPHANS PERPETUUM MOBILE ORFFYREANUM omnibus Summis Orbis universi Principibus Magistratibus et Statibus debita cum Submissione Venale propositum, una cum varis ejusdem effectibus per Authentica testimonia confirmatum ab ejusdem Inventore ORFFYREO."

[5] I thank Ulrich Joost for pointing this out.

evidently began to talk. The document has been preserved in which she had to deliver an awful oath of secrecy to Beßler (see Michal, 1976, p. 106, and Bülau, 1893, p. 78-79). In it she swears

> by the triune God, dearly and with good deliberation that from this hour onward until my death, yes, for eternity, I will not speak, write or indicate anything evil about you, hitherto my master, who stands here before me; and I will not discover, reveal, speak or write anything to any creature, whether it be living or not, about your actions and omissions, arts and secrets, but everything and anything that I know and have seen or heard of your secrets I will keep silent and buried within myself, just as you desire or require of me [...][6]

And thus the formulation of the oath continues on for a long time. Indeed, for a while, everything went well. Around 1720, Beßler was at the height of his fame; an engraving portrays him as "High Princely Hessian Commercial Councillor, MP Mathem. and Inventor of the Perpet. Mobil." Despite the revelations that gradually leaked out and exposed him, he still enjoyed until the Landgrave's death in 1730 a somewhat favorable standing at the court in Kassel. The people there perhaps did not want to discredit themselves by throwing out the impostor. Also, in light of his undoubtedly versatile technical skill, the hope had perhaps not died that he was still good for something unsuspected.

And even after Karl's death he continued to live for a good while in Karlshafen on the Weser (another Huguenot settlement), where the Landgrave's generosity had granted him a property. He kept announcing adventurous machines – in 1739, for example, a submarine: "Neptune rendered powerless through an almighty wonderous power [Der durch allmächtigste Wundermacht ohnmächtig gemachte Neptunus]." He also tried himself as an ecumenical religious philosopher (one of his manifestos is called "The righteously believing Orygférean") planning to found a school of wisdom in Karlshafen. Shortly before his death, he moves on again, to northern Germany. Beßler's career belongs to a time when the British as the most advanced nation of capitalism referred to his social type – what today we would call „entrepreneur" – alternately as „undertaker," „projector," and „adventurer." The last years of his life were marked again by a confusing multitude of plans, which as in his early years show him to be one of those tireless project-makers for whom capitalist rationality and adventurous fortune-seeking come together. In 1743, for example, he wants to set up11 a factory in Braunschweig for marble slabs, Russian and Morocco leather. He died almost impoverished in 1745 in Fürstenberg, buried in the Karlshafen hereditary burial plot which he had acquired in happier times.

Even if we identify Beßler as an early capitalist entrepreneur, his emphasis is so strongly on the adventurous that we can use his case to reveal the extent to which

[6] She swears „teuer und mit gutem Vorbedacht bei dem dreieinigen Gott, daß ich von dieser Stunde an bis in meinen Tod, ja in Ewigkeit, von Euch, meinem bisherigen Herrn, der Ihr hier vor mir steht, nichts Böses reden, schreiben oder zeigen und zu einiger Kreatur, sie lebe oder lebe nicht, von Eurem Thun und Lassen, Künsten und Geheimnissen etwas entdecken, offenbaren, reden oder schreiben, sondern alles und jedes, was ich weiß, und bei Euch Geheimes gesehen und gehöret, ich in mir verschwiegen und verborgen halten will, so wie Ihr von mir begehret oder verlanget […]"

speculation on good luck and pure chutzpah are part of entrepreneurship. He reportedly announced to Anna Rosine Mauersberger that he would shoot her if she betrayed him, with her objecting that he would then be executed as a murderer, and him responding that this mattered not, since he has to die sometime – all this makes him a desperado for the science of miracles. He may well have believed now and then in his own lie, according to which the wheel was turned from the outside only to protect it, and that in principle his perpetuum mobile worked – perhaps only one small cog was missing. The stakes were high, after all, because in the end everything was at stake, a whole new world. In war and peace the most astounding things would become possible. As late as 1817 Christian August Vulpius in his "Curiosities" quotes the announcement of the perpetuum mobile by a certain Peter from Brussels who was born in Mainz:

> That perpetuum mobile consists of a wheel which is seven feet in diameter and two feet thick; it runs on its own original power and without the aid of springs, mercury, fire, electricity, galvanism, etc.; it yields the force of more or less a thousand horses; its speed is incredible […] Such a [machine] can serve emperors, kings, and princes in war, save human blood, facilitate and promote victory. It can be armed with sabers and thus form entire squadrons of cavalry without anyone directing the sabers [...] It is particularly useful for the commercial sector as it can obtain goods from distant countries less costly [...] If this machine had been invented already in the sad year that just passed, it would have relieved the great general hardship by much […] (Vulpius quoted in Buchner, 1927, vol 2, pp. 321-323)[7]

The stream of such promises, which always reflect the most urgent needs of their time, flows on and on. But these grandiose ideas, which are advanced again and again, are increasingly perceived as nothing but mere curiosities. The scepticism of science or even of so-called common sense becomes insurmountable by the middle of the eighteenth century, even though the Royal Academy of Sciences in Paris gravely holds out until 1775 with its final refusal to deal with the subject any further: "La construction d'un mouvement perpétuel est absolument impossible [The construction of a perpetuum mobile is absolutely impossible]." A good example of a sober summing-up from as early as the middle of the century can be found in a somewhat surprising place, namely Jacob von Eggers' "*Neuem Kriegs- Ingenieur- Artillerie- See- und Ritter-Lexicon* [New Dictionary for War, Engineering, Artillery, Marine-Matters, and Knighthood]." This dictionary of the military sciences, broadly speaking, includes in its second volume

[7] „Jenes perpetuum mobile besteht aus einem Rade, welches sieben Fuß im Durchmesser und 2 Fuß Dicke hat; es läuft durch seine eigne Urkraft und ohne Beihülfe von Federn, Quecksilber, Feuer, Elektricität, Galvanismus etc. fort; es kann eine Kraft von mehr oder weniger als tausend Pferden damit hervorgebracht werden; seine Schnelligkeit ist unglaublich [...] Für Kaiser, Könige und Fürsten kann solche [Maschine] im Kriege dienen, Menschenblut ersparen, und den Sieg erleichtern und befördern. Man kann sie mit Säbeln bewaffnen, und dadurch ganze Schwadronen Cavallerie bilden, ohne daß die Säbel von jemandem geleitet werden[…] Für den Handelsstand ist sie besonders nützlich, indem er die Waaren entfernter Länder wohlfeiler beziehen kann [...] Wenn diese Maschine schon in dem vorigen traurigen Jahre erfunden worden wäre, würde sie die allgemeine Noth um Vieles haben lindern können [...]"

"Perpetuum mobile" as an entry of its own.[8] This entry reads in full (in a peculiar staccato style, rich in commas):

> Perpetuum mobile, the perpetual movement, le mouvement perpétuel, refers in mechanics, in the precise and proper sense, to a machine which, merely by virtue of its own structure, once set into motion, continuously carries on this motion, in such manner that this movement would go on eternally if the matter of which the machine consists never diminished and nothing in its structure would get damaged. Such a machine has been sought like the Lapis Philosophorum [the Philosopher's Stone] from ancient times and a long while with much effort and expense, but in vain; and many of the newest and most learned mathematicians fairly consider it to be an absolutely impossible matter, the impossibility of which they have also sufficiently demonstrated. (as long as the rubbing or friction of machines, the resistance of the air, and other causes which constantly impede motion cannot be completely avoided). Each motion by itself would last forever if there were no external cause to weaken it little by little, to modulate its course, and finally to annihalate it. (Eggers, 1757, vol. 2, cols. 380-381)[9]

The last remnant of those dramatic hopes for saber-armed machines with which one could "form entire squadrons of cavalry" had already been "annihalated" in this military encyclopedia. What comes now until the end of the 19th century is a long succession of claims that are sham or fiction. The imagination of the scamming inventors must capitulate to the insoluble problem, but becomes focused instead on ever more subtle tricks (whereby the subtlety may occasionally reside in their unashamed audacity). The perpetuum mobile may inhabit one of the eight secret chambers of the edifice of nature, but it remains decisive for the floor plan of this chamber that there is an adjoining room. There, in some form, is always Beßler's maid, laboring. If need be, a cavity under the floor will do. Probably the last successful impresario of a perpetual motion machine, John E.W. Keeley, demonstrated a machine in his house in Philadelphia with which he was able to raise a million dollars in start-up capital for the Keeley Motor Company, which was to market a "generator" that extracted the power of water ("There is enough steam

[8] As an aside, here from the entry on „longitude" and the determination of the *longitudo maris*: "Seafarers would have a great benefit if they could determine this with certainty in all places. In this case they could properly register the location, where they are, in the maps of the sea. At this time it is still unknown how such matter is to be investigated" (Eggers, 1757, vol. 2, cols. 6-7).

[9] Perpetuum mobile, die immerwährende Bewegung, le mouvement perpétuel, heißt in der Mechanik, im genauen und eigentlichen Verstande, eine Maschine, welche bloß, vermöge ihrer eigenen Structur, die Bewegung beständig fortsetzet, darein sie einmal gebracht worden, dergestalt, daß solche Bewegung ewig währen würde, wenn die Materie, daraus die Maschine besteht, niemals eingienge, und nichts an ihrer Structur Schaden nähme. Dergleichen Maschine ist wie der Lapis Philosophorum von alten und langen Zeiten her, mit vieler Mühe und Kosten, aber vergebens, gesuchet worden; und viele von den neuesten und gelehrtesten Mathematicis halten es billig, (solange das Reiben oder die Friction der Maschinen, der Widerstand der Luft, und andere Ursachen, die der Bewegung beständig Abbruch thun, nicht gänzlich vermieden werden können), für eine schlechterdings unmögliche Sache, deren Unmöglichkeit sie auch zur Gnüge demonstriret haben. Eine jede Bewegung würde schon für sich ewig dauern, wenn keine äußerliche Ursache dazu käme, die sie nach und nach schwächte, ihren Lauf wandelbar machte, und endlich gar zernichtete.

power in a bucket of water to divert the globe out of its orbit"). After Keeley's death in 1898, one of the financiers bought the house and found a huge compressed air tank under the room with the generator. The *Encyclopaedia Britannica* reports this and ends with the wry remark: "In the course of his long career, Keeley may have broken a number of laws, but the first and second law of thermodynamics, which rule out a perpetual motion machine, he left untouched" (Encyclopaedia Britannica, 1979, p. 105).

CLIMAX AND ANTICLIMAX

At the beginning of the twentieth century, after the perpetuum mobile had disappeared for good even from the speculative gray area on the fringes of technological tinkering, it blossomed again by way of a small late flowering in literature: There was another visionary renaissance of the project in Berlin and a small explosion in Gogulev. In 1910, the publisher Ernst Rowohlt, who was fascinated by this brilliant poet, presented Paul Scheerbart's *The Perpetuum Mobile. History of an Invention* – including 26 construction drawings that had to be incorporated on a folded sheet (Scheerbart, 1910/2011). Scheerbart, the only German author besides Jean Paul whose complete works Gershom Scholem took with him to Palestine (Scholem, 1982, p. 146), made an appearance of excentricity and genius, he was singularly unique in German literature around 1900 and remained so with his thoroughly idiosyncratic mixture of cosmic wit and a radically earnest commitment to life – the earnestness of a man who died of hunger and a broken heart in 1915 in the face of the World War. For him, the perpetuum mobile is a symbol for the universal transformation of the world, but he also wants it to be a reality.

Going through the poet's letters, a selection of which Mechthild Rausch has published in a beautiful edition (Scheerbart, 1990), one can study his proclamations about the "Perpeh," as he likes to write, from May 1908 onwards. I will only give a few extracts here. On "May 15th ... afternoon 4 o'clock 3 min 6 sec" to Richard Dehmel:

> Oh! Hurrah! Finally! At this very moment, oh Riccardo, the patent office in Luisenstrasse has received my wheel '*Gear* wheel moved by weights' – for the time being it exists only in the drawing – but it works – you can be sure of that. Now the new age is coming. What is from now on possible – goes beyond description. All mountains will be 'architecturally' transformed – and the rivers will be channeled into canals. The wheel looks completely different, of course, than it did 4 months ago – and I look different *as well*. Perpetual gear wheel greetings from castle to castle [...] (Scheerbart, 1990, May 15, 1908)[10]

[10] „Oh! Hurrah! Endlich! In diesem Augenblick, o Riccardo, hat das Patentamt in der Luisenstrasse mein Rad erhalten 'Durch Gewichte bewegtes *Zahn*rad' - es ist vorläufig nur in der Zeichnung da - aber es geht - davon kannst Du überzeugt sein. Jetzt kommt das neue Zeitalter. Was jetzt alles möglich ist - das ist nicht mehr zu beschreiben. Alle Gebirge werden 'architektonisch' verwandelt - und die Flüsse werden in Kanäle geleitet. Das Rad sieht natürlich ganz anders aus als vor 4 Monaten - ich seh *auch* anders aus. Perpetuirliche Zahnradgrüsse von Burg zu Burg [...]"

On June 1st again to Dehmel:

> Just submitted a second improved application for the patent. The application costs 20 M – must be paid this week – and I am not *quite* sure – whether I can scrape *this* together. Would you be so kind? The situation is as follows: [a schematic drawing is inserted] The two hatched weights prevent the frictional resistance of the wheel a. That is the redemption!!!!!!!!! For me the matter is *certain* – new cultural epoch herewith *certain*. Hurrah! 7000 trillion greetings from house to house Your *wild* Paulus. (Scheerbart, 1990, June 1, 1908)[11]

And so it goes on. On 9 June in a letter to Erich Mühsam: "Oh Erico! You have probably already heard that I have now actually invented the perpetuum mobile. So naturally I have no time to come into town." In October to Ernst Rowohlt: "By the way: couldn't you ask your father what effect the total devaluation of coal and automobiles, horse-drawn carriages, etc. would have on the banking world? I believe that all the banks in the world could become insolvent. Am I mistaken? An answer would be very, very important to me! " In January 1909 to Mühsam: "The perpe is now *working* in my opinion. I have found the 'definitive' solution *after all* and sent it to the patent office the day before yesterday. So get yourself a wallet etc. soon; you will need them. – Me, however, I will become an ascete of the first order – The Sahara will be transformed into an artificial mountain range, and I am with great bear greetings your PCW." In July 1910, once again to Rowohlt: "From the enclosed final sentence you can see that the problem has been solved definitively. The patent attorney told me that he has *nothing* to object. *One* wheel is enough *now*. It is very astonishing. The mechanic (a simple bicycle repairman) wants to finish the *very* simple model by Friday evening. Then – or Saturday – more." In September: "Dear Mr. Rowohlt! Am completely intoxicated. The book looks simply delightful. My most sincere thanks.... And in the matter of the model, I have come so far that the world will soon be surprised. Because - and yet it moves!! Nobody believes it yet. [Written in the margin:] But that will soon change. With the most perpetual greetings, your most devoted, Paul Scheerbart." On November 17, 1911 to Dehmel: "Dear Richard! Herewith the glad tidings that the Perpeh has finally been invented. Unfortunately, I cannot give any more details, as I am no longer alone in this matter. But *this* much is certain: I will soon have *ten* billion. I have therefore become a different person, don't drink anymore" – and Scheerbart was a great drinker – "and limit my meals very vigorously. Follow me in this, so that a place is reserved also for you at the table for the saints of my next religion. Hail November eighteenth. Michaelean greetings from house to house! Your pious goose. Now the letter is loose." I will stop here, but not without very seriously recommending Scheerbart's works and letters to all readers; they could start with the novel "The Sea Serpent" (Scheerbart, 1901).

[11] „Habe soeben zweite verbesserte Anmeldung des Patents eingereicht. 20 M kostet die Anmeldung - in dieser Woche muß sie bezahlt werden - und ich weiß nicht *ganz* genau - ob ich *das* zusammenkriege. Würdest Du so lieb sein? Die Sache liegt so: [here a schematic drawing] Die beiden schraffierten Gewichte verhindern den Reibungswiderstand des Rades a. Das ist die Erlösung!!!!!!!!! Mir ist die Sache *sicher* - neue Kulturepoche damit *sicher*. Hurrah! 7000 Trillionen Grüsse von Haus zu Haus Dein *wilder* Paulus."

His Perpeh book, his “perpetual” obsession, are at the heart of Scheerbart's utopian aesthetics, which seeks to transform the whole planet in a sensual way – as outlined also in his important *Glass Architecture* (Scheerbart, 1972). The perpetuum mobile is the cipher for this will to transformation. The poet, who spent his poetic energy in titles such as “Astral Novelettes [*Astrale Noveletten*],” “Always Courageous! A Fantastic Hippopotamus Novel in Eighty-Three Remarkable Stories [*Immer mutig! Ein phantastischer Nilpferdroman in dreiundachtzig merkwürdigen Geschichten*]” or “Tarub, Baghdad's Famous Cook [*Tarub, Bagdads berühmte Köchin*],” never abandons his visionary innocence; everything could be completely different, and Scheerbart, with unwavering poetic cunning, never completely releases his machine from the realm of the realizable. Once again – but now only in the district of poetic dream-radicality – the perpetuum mobile is to overthrow the course of things in the world. And after all, in the autumn of 1910, the German Colonial and Commercial Bank inquired with Scheerbart about the patent.

And Gogulev? That is the small town in the Russian tundra from Leonid Leonov's most remarkable “Notes of a Small Towner,” first published in 1923.[12] Here, during the last years of the Tsarist Empire, unfolds en passant the fate of Dimitri Nikanorovich Terliukov, a brooding inventor. His catastrophe shall be mentioned here because, as if in a grotesque little scientistic nightmare, Leonov once again draws together all the clichés of progress, bizarrely distorted. During a banquet at the mayor's house in Gogulev, the commissioner suddenly spurts out the news:

> „A Perpetun-mobil has been invented, much to my chagrin, by your Dimitri Terliukov!And now he wants to put it into operation publicly ...“ We all screamed. (Leonow, 1962, p. 76)

The demonstration of the machine in Terliukov's garden (with a small celebratory fireworks display) is reluctantly approved by the highly suspicious authorities, and on the appointed day, the educated people of Gogulev come together excitedly. A barrel had been set up in the middle, and on the barrel stood the Perpetun, covered with a raffia mat! There were many ladies present. They sat at the back. In front, however, it was mostly men as the braver sex.”[13] There is a long wait for the inventor, who finally steps out of the house.

> Dimitri Nikanorovich had shaved before the experiment, and his appearance radiated not beauty but a kind of scientific sadness, if there is such a thing in the world. [...] 'Gentlemen!' he began, tearing the mat off his machine, with his finger raised. Everyone listened and saw the machine on the barrel, which resembled a damaged or disjointed grain scythe. 'Before you,' he continued, 'is the latest invention of science. It will undoubtedly soon conquer the whole world and turn everything upside down [...] As its son and friend, I offer it to humankind!' He

[12] The following quotes are translations into English from Hans Ruoff‘s German translation (Leonow, 1962).
[13] This and the following quotes are from the Chapter „How Dimitri Terliukov‘s fame came to naught“ (Leonow, 1962, beginning on p. 78).

paused. Everyone sighed deeply, although the sun penetrated their ears, noses and eyes in an unbearable way [...]

The inventor now sums up the history of research ("The Dutchman Thomas Bartholin and others, such as Aristotmen of Hilden, were the first to try fruitlessly to create a Perpetun-mobil"), and finally calls out:

> 'And so two months ago we discovered wherein these wise scholars had erred!' He wiped his forehead with his handkerchief, a dog barked somewhere, the machine stood there like a stone. 'I won't say what the secret is, but I will hint at it. Iron is attracted to the earth incomparably more strongly than copper [...] For, there is significantly more iron ore in the earth than copper. Do you understand?' he asked in a raised voice and closed his eyes as if he were thinking. 'Yes, yes!' it rang out from everywhere, especially from the ladies […] 'As a result of this dominance of iron,' continued Dimitri Nikanorovich, with a trembling hand stroking his Perpetun, 'I managed to invent this device that rotates endlessly. I'll start now. There is no danger at all, just a brilliant fireworks display for the ladies!'

However, at the moment of greatest suspense and to the inventor's deep astonishment, this fireworks display suddenly turns into a kind of bombardment of the party by the otherwise motionless machine ("Terlyukov fell over without saying a word and seemed no longer to be breathing"). The commissioner, whose white uniform had been burned by the machine, cannot be dissuaded from the idea that Terlyukov did all this only "to annoy the government," and thus ensures the dismissal of his old father who had worked as a hospital guard. Thus ends – a melancholic anticlimax – the attempt „to realize that exciting dream of humanity […] so that everyone can eat, drink and be idle, just go for a walk and delight in all kinds of beautiful sights [...]"

SOMETHING FOR NOTHING

"About Orffyreus' gift I have been keeping, / at the same time laughing and weeping" (Lichtenberg, 1983, Nr. 425). [14] Lichtenberg wrote this without further explanation in a short letter to Carl Friedrich Hindenburg dated January 7, 1778, a letter that only served to accompany with three sentences the mailing of his notorious "Fragment of Tails." The brief doggerel verse refers to Orffyeus' treatise on the *Triumphans perpetuum mobile* of 1719 which was evidently brought up by Hindenburg. Lichtenberg responds with these two lines and, indeed, there is nothing more to say about Beßler. Especially a physicist like Lichtenberg can only seriously laugh – or cry – about the human ability to deceive and to deceive ourselves. But commentary, let alone scientific engagement, is uncalled for among Enlightenment contemporaries. This does not mean that the topic had completely disappeared from Lichtenberg's field of vision. As late as 1791 he was still corresponding with his brother Ludwig Christian Lichtenberg about the perpetual motion machine – unfortunately we do not know what was discussed in detail, as we only have notes on the correspondence such as "Written to my brother.

[14] "Auch ich über Orffyreus Gab' / Zugleich geweint und gelacht hab."

about Pe. mob" (Lichtenberg, 1990, Nr. 1836 and 1837). In 1793 and again in 1796 we find in the delightful letters of Georg Heinrich Hollenberg, who was attached and obliged to Lichtenberg, comments such as these: "It is strange! I still have the idea running through my head of inventing the perpetual motion machine, however convinced I am that it is impossible.[…] There is a miller in Osnabrück who has invented such a thing, which is also very nice, and only has the general defect that it does not work like the others, or rather that it works like the others, that is, it stands still" (Lichtenberg, 1992, Nr. 2217). Three years later, there is another letter from Hollenberg, who was evidently constantly tinkering and experimenting. It contains the lovely passage: "I am still pregnant with perpetual motion machines and the like, and this is for me as with ghosts; although I do not believe in them, I always think about them at night" (Lichtenberg, 1992, Nr. 2610). However, he goes on to say: "Yet this time not perpetual motion, but something from Segner's reaction machine" – and then he describes his sober experiments. The perpetual motion machine, which Lichtenberg had associated with exhibits of exotic animals in 1774, is now metaphorically one of the phantoms – a familiar night-time spectre that one likes to talk to. All the more astonishing is what was probably the last appearance of this phantom in Lichtenberg's letters and writings. Here the chimera once again appears in the guise of the drily matter-of-fact and quotidian as it confronts the readers of the Göttingen Pocket Calendar for the year 1797 in a report about a water miller in Livonia. He had constructed his mill in such a way that "it can grind at any time without circumstances or influences, without needing expensive dams, water pressure, etc." (Lichtenberg, 1797). Lichtenberg begins the short article with a mixture of disdain and ostentatious willingness to examine all new information: "The notorious Orffyre and his perpetuum mobile were long, if not forgotten, certainly no longer considered worthy of respect, when a report appeared in the very esteemed New Nordic Miscellany of Mr. Hupel, in the first volume on p. 508: about a water mill that can grind at any time without being located on a stream or river." The author of this report, Ludwig August Count Mellin, is praised as the author of "excellent work." Then comes a detailed description of the device which, however, is currently at a standstill because the iron parts of the machinery did not withstand the pressure of the wooden tubes swelling due to the moisture. "In a word, the man found that iron was not suitable for this, it should have been brass or another metal, and because this requires an outlay of a hundred or more thalers, which the inventor cannot muster, the mill is now, as they say, standing still until he has collected that much money, etc." Here we encounter the motif of the one small missing cog again, the one comparatively tiny circumstance that is hindering the great work – and an unmistakably sardonic tone creeps into Lichtenberg's diction. At first he appears to be diplomatic: "I carefully refrain from making any judgment about a clockwork that obviously winds itself..." But then, in plain prose: "If one takes all this together, and is familiar with the history of the purely empirical perpetual-motionists, one is almost inclined to believe that this mill was never in full swing, but was only held back a little because of the perfection of the gearwork, perhaps with a little help from the hand or by adding water [...] When their first design fails, these people always have new ones ready to deceive themselves and others. The means of rescuing the design become ever more costly, and it comes to a standstill usually when these are finally beyond their means,

and they console themselves with the fact that only their momentary circumstances stand in the way of the greatest and most useful discovery.” It does not really get clearer than this. When Lichtenberg closes by saying that “the editor of this pocket book should be infinitely pleased” to see his scepticism refuted, his politeness is unassailably correct, but it also sounds unmistakably saturated by satire. In the next volume of the New Nordic Miscellany (1798), Mellin responded point by point to some of the technical questions raised by Lichtenberg, The editor with inscrutable blandness finds these answers “completely satisfactory,” without in any way touching on the fundamentals of the topic. Here we see Lichtenberg keeping an unwavering distance from such projects – but we also see (and this is remarkable) that he refrained from open and categorical controversy until the end of his life.

The phantom of the idea of an inexhaustible source of energy is still with us. Will we never learn to renounce this hope? A late drawing, created in 1961, by the Dutch graphic artist MC Escher shows one of his typical paradoxical architectural puzzles by drawing a stream of water that is channeled by a flat brick pipe through a kind of pavilion, falling from a certain height and yet, as it continues to flow, quietly returning to its starting point, thus driving the wheel of a mill forever (Escher 1971, ill. 76, comp. p. 16) – just as in another famous drawing by this master, the monks of a monastery are constantly walking up the steps in a square. Thanks to the optical trick, the mill wheel now turns forever, in perpetuo, as long as – Escher charmingly adds this in an introductory note – the miller does not forget to occasionally add a bucket of water “to compensate for the evaporation.” Thus Escher first circumvents the constraints of reality with elegant irony and lets the water flow uphill, only to then remind us with malicious correctness that unfortunately there is no stable, closed system.

The wheel in Beßler's sealed chamber runs continuously and to the Landgrave's gracious satisfaction – but only as long as the oath-bound maid does not relent in her hiding place. Does this not remind us from afar of another famous machine that began to excite the imagination about three quarters of a century later? In van Kempelen's chess machine, which Maelzel later improved and demonstrated, there is secretly (as Edgar Allan Poe immediately deduced) a chess-playing dwarf hidden beneath the Turkish figure (Carroll, 1975; Racknitz et al., 1983; Poe, 1984). Walter Benjamin provocatively described this process at the beginning of his theses “On the Concept of History” as an emblem of the relationship between the “puppet that is called 'historical materialism'” and theology – historical materialism always wins when it makes use of the good offices of theology, “which today is known to be shrunken and ugly and is not allowed to show its face anyway” (Benjamin, 1974, p. 691). It would be presumptuous to place the stoic maid and her drudgery as one emblematic figure alongside the world-famous, highly accomplished dwarf in the chess machine as another, but perhaps she does afford a more modest symbolic figuration – she is always „next door,“ presenting the bill to that (relentless?) technological optimism that wants to believe that there is something for nothing, something for free, something from the nothingness of endlessness. All the oaths we make her swear are in vain.

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Research article

Nikolai Chernyshevsky's Perpetuum Mobile – From Technical to Social Utopia

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Abstract

Nikolai Gavrilovich Chernyshevsky, known as the author of the utopian novel *What Is to Be Done?* and his dissertation on the *Aesthetic Attitude of Art to Reality*, worked on a perpetual motion machine project in his youth. He left notes on the project in the diaries he kept from 1848 to 1853. The article analyzes the text of the diaries in order to reconstruct the inventor's way of thinking, trace how his attitude toward the "machine" changed, and observe how those around him reacted to his idea. Chernyshevsky's mature publicist works assign the same role to technical innovations in improving the social order that the perpetual motion machine had in his youthful dreams. By carefully examining the history of the device's creation, we were able to clarify what features of the professional intelligentsia's perception of technology influenced the formation of his techno social utopian ideas.

Keywords: Nicolai Chernyshevsky, Diaries, *Perpetuum mobile*, Intelligentsia, Utopia, Social history of science and technology.

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Научная статья

Вечный двигатель Николая Чернышевского – От технической к социальной утопии

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Аннотация
Николай Гаврилович Чернышевский известный как автор утопического романа “Что делать?” и диссертации об “Эстетическом отношении искусства к действительности”, в юношеские годы работал над проектом вечного двигателя. В дневниках, которые он вел с 1848 по 1853 год, он оставил заметки о проекте. В статье проводится анализ текста дневников с целью восстановить ход мысли изобретателя, проследить как менялось его отношение к “машине”, и пронаблюдать, как реагировали на его идею окружающие. Зрелые публицистические работы Н. Г. Чернышевского отводят техническим новинкам в усовершенствовании общественного устройства ту же роль, которая в юношеских мечтах доставалась вечному двигателю. При пристальном рассмотрении истории создания устройства, нам удалось прояснить, какие особенности восприятия техники профессиональной интеллигенцией повлияли на формирование его техносоциальных утопических идей.

Ключевые слова: Н. Г. Чернышевский, Дневники, Вечный двигатель, Интеллигенция, Утопия, Социальная история науки и техники

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Nikolai Chernyshevsky was a leading figure in Russian journalism during the 1860s, leaving his mark on literature with the utopian novel *What Is to Be Done?* and his doctoral thesis *Aesthetic Relations of Art to Reality*. According to historian Nikolai Kostomarov, in the late 1850s and early 1860s, Chernyshevsky "became an idol of the youth in St. Petersburg […], even respectable people who did not agree with his extremes treated him with respect" (Kostomarov, 1922, p. 332).

It is important to highlight some of these extremes, which shaped Chernyshevsky's intellectual profile. He rejected the concept of God as a meaningless abstraction, advocated for unlimited human freedom without any form of authority, and showed a disregard for public order and propriety. During his doctoral thesis presentation in 1855 at St. Petersburg University, he criticized prevailing ideas on poetry and art. Despite his radical views, Chernyshevsky had a talent for winning people over. He first attracted followers while lecturing on literature at a gymnasium in his native Saratov after graduating from the university. Later, he spread his ideas as a columnist for *Sovremennik*, a magazine popular among the growing middle class, the intelligentsia. The journal flourished under his leadership after he became its editor in 1856. However, his arrest in 1862 led to complete intellectual isolation. For the rest of his life, he was unable to speak out publicly. The authorities, considering his texts a serious challenge to the status quo, sought to limit his influence by exiling him to Siberia for over 20 years.

While modern readers may find Chernyshevsky's writings verbose and inconsistent, filled with obvious truths and unfounded assertions (Paperno, 1988, p. 25), his contemporaries found his ideas compelling. It is worth revisiting his intellectual legacy not only within the history of literature and critical thought but also as a reflection of the changing intellectual landscape of the emerging Russian middle class and professional intelligentsia during the industrialization of the mid-19th century. This connection is particularly evident in his youthful project of a perpetual motion machine.

Chernyshevsky's diaries from 1848 to 1853 reveal his attempt to design and build such a machine, a working *perpetuum mobile*. The information in the diaries is fragmentary but traces the evolution of his thought and the influence of his social circle and cultural background before he chose literary forms as his primary mode of expression. His interest in perpetual motion began at the Saratov Seminary and gained momentum at St. Petersburg University. A pivotal moment came in November 1848 when he attended lectures at the History and Philology Department. On his own initiative, he transcribed and prepared for publication notes of the lectures of Ismail Sreznevsky on the early history of Russian literature. Already a devoted reader of *Sovremennik*, he obtained copies from friends or public libraries. In the magazine's November issue he encountered a note about a newly designed British device called a "thermometrograph" which recorded temperature changes mechanically. His diary records:

> I read about a thermometer with a clock device, which passes a piece of paper under a pencil, which moves in accordance with the changes of the thermometer; the clock is wound for a week. I had this idea for quite a long time and was constantly thinking up improvements. The main idea [of a clock device] was born, I think, about four months ago, as a result of a random thought about attaching a pencil to a mercury thermometer. (Chernyshevsky, 1939a, p. 175)

The tedious task of transcribing Professor Sreznevsky's lectures sparked his interest in a device that could mechanically record monotonous data. His fascination quickly evolved. Within three weeks, he was no longer focused on improving the recorder but was instead envisioning "his own machine." Its components were designed to rotate and immerse themselves in water: "An idea flashed through my mind to eliminate the unevenness of the weight of the water column [resulting from] different depths during rotation by arranging magnets in a certain way" (Chernyshevsky, 1939a, p. 185).

The widespread circulation of the *Encyclopedia* published by Friedrich Arnold Brockhaus and Ilya Abramovich Efron in the 1890s provides solid evidence of commonly accepted technical knowledge in Russia half a century after Chernyshevsky's diary entries. In 1892, Vasily Lermantov, a laboratory assistant at the Physics Department of St. Petersburg University, defined a perpetual motion machine as "a machine capable of not only maintaining its own motion for an indefinite period of time but also of producing useful mechanical work in addition" (Lermantov, 1892, p. 697). Although Chernyshevsky never used this term in his early diary entries, he had been contemplating such a device since December 1848.

Based on the limited details in his diary from that month, it seems that Chernyshevsky aimed to incorporate all three types of perpetual motion machines known at the time: mechanical, magnetic, and hydraulic. Mechanical perpetual motion machines typically involved a wheel rotating under the weight of unevenly distributed loads. Magnetic designs relied on continuous movement generated by attracting an oppositely poled part to the teeth of a magnetic ring. Hydraulic engines used a column of water pressing on a screw to raise water for self-replenishment (Brodyansky, 2001, p. 24). When Chernyshevsky conceived his engine, he integrated elements from all three types. This approach made his task particularly complex and challenging to realize.

During the winter of 1848–1849 the "machine" existed only as a written description, recorded solely in Nikolai's diary. The intricate complexity of the design allowed the young inventor to overlook the inherent contradictions that pointed to its practical impossibility. After a hiatus of several months, in May 1849, Nikolai resumed his studies with renewed vigor in preparation for his third-year Greek examination. Simultaneously, he revisited his project with fresh enthusiasm. His diary entry from May 22 reflects his readiness to transition from theory to practice:

> This morning, a new idea about perpetual motion came to me – the simplest one, extremely easy to implement, so much so that I am tempted to build a model myself. [...] Thank God, who gave me this idea! (Chernyshevsky, 1939a, p. 279)

The following morning, he elaborated on this "simple idea" and included a detailed drawing: "It would be best to use dense masses instead of these moving pistons, ensuring that on one side they are in water and on the other in air." According to Nikolai, the "lentil-shaped masses," the unbalanced weights of the mechanical engine, were to be immersed in a vessel of precisely the right dimensions "so that the water could not escape," functioning "as in an atmospheric railway [cableway]" (Chernyshevsky, 1939a, p. 280). Unlike a hydraulic perpetual motion machine, Nikolai's design did not rely on water moving through a screw trough. Instead, the water facilitated the movement of the

mechanical wheel by exerting pressure on the immersed section. The inertia of the wheel, supplemented by additional weights, was intended to further increase its rotation.

After further consideration, Nikolai decided to simplify the device even more. Instead of using separate "lentils on spokes" he envisioned a solid wheel:

> So, a wooden millstone [...] enters a slot in a bath, boiler, or tub with perpendicular walls. This slot is hermetically sealed to match the width and length of the belt of the circle (or semicircle) that enters it, ensuring that no water spills out—meaning it is neither wasted nor interferes with the movement of the wheel through friction. (Chernyshevsky, 1939a, p. 280)

As he refined his concept, doubts began to arise. In his diary entry for May 23, he expressed a moment of uncertainty: "What if it cannot spin!" However, he quickly dismissed this concern: "This is nonsense. It is clear that only unbelieving and ignorant people say such things." On May 22, he had thanked God for the idea of the engine; the very next day, he rejected any doubts about its feasibility, perceiving them as signs of ignorance and a lack of faith in both God and science. While he would later develop a more critical stance toward religion, in his youth the belief in God reinforced his confidence in himself, making him more determined to pursue his plan.

Vladimir Lermantov, in his encyclopedia article, made a keen observation, supported by the cumulative experience up to 1892, about the mindset of perpetual motion inventors:

> The history of invention repeats itself with self-taught individuals just as it did in the past. Faced with the complexity of their own design, they find themselves unable to grasp all the details, yet their desire for success is so strong that they resolve doubts in their favor. [...] A passionate longing for success, vague ideas, and a lack of resources to properly construct the mechanism – this pattern recurs throughout the history of almost all inventors. (Lermantov, 1892, p. 698)

Nikolai followed this familiar trajectory. As he worked through the details of his engine, he soon encountered a major obstacle: a lack of funds to build it. To circumvent this issue, he excluded the mechanically complex components of the "machine," such as spokes, lentils, and pistons with liquid. Instead, he resolved to construct the engine "in a distorted, that is, in a simplified form" (Chernyshevsky, 1939a, p. 298). His agile mind found a way to surmount this difficulty, and his optimism returned: "I do not despair of making this machine soon, because it is too simple and cannot be very expensive. It can be made for 2–3 rubles in silver – ah, if only it were possible!" (Chernyshevsky, 1939a, p. 280).

A day after successfully passing his Greek language examination, the inventor decided to entrust his idea to his university friend, Vasily Lobodovsky: "I wouldn't have blabbed if a new turn had not taken place in this idea in the course of three or four days, a turn due to which I am ready to see this machine in my hands any day now" (Chernyshevsky, 1939a, p. 282).

This "new turn" referred to the further simplification of the device. He solemnly declared: "I consider myself destined to [create] remarkable upheavals, and I consider

myself the inventor of a machine that moves by itself" (Chernyshevsky, 1939a, p. 281). A declaration to whom Vasily responded skeptically: "Firstly, this may be impossible."

Nikolai objected that it was "ridiculous" to doubt the possibility of a *perpetuum mobile*, and a heated argument ensued. In defending the validity of his idea, Nikolai articulated for the first time the social significance of the invention, presenting it as an instrument to "liberate the world" from material labor and necessity. While Vasily shared his friend's enthusiasm for improving human life, he rejected the feasibility of a perpetuum mobile and deemed such an invention unnecessary: "The world needs liberation from the moral yoke and prejudices more than from material labor and needs; it is more necessary to develop the heart, morality, and mind than to be freed from material labor" (Chernyshevsky, 1939a, p. 281).

Vasily's remark echoes the sentiment of an Orthodox preacher, emphasizing the superiority of spiritual life over material existence. Later, Nikolai characterized their dispute as "an overly serious conversation in an overly serious tone." Nevertheless, the idea of saving humanity from poverty "through machines," first articulated in this discussion, remained a fundamental belief for him in the years that followed.

On the eve of his twenty-first birthday, July 11, 1849, Nikolai reflected upon his "21 years of life" and outlined his future plans:

> In a few years I will be a journalist and a leader or one of the main figures of the left radical political group [...] and I will be married, and love my wife like my soul; my hopes in general: the destruction of the proletarian class and any kind of material need – everyone will live at least like people who receive an income of 15–20,000 rubles per year, and this will be accomplished through my machines. (Chernyshevsky, 1939a, p. 298)

While confident in achieving his individual aspirations, he acknowledged the public aspect of his vision as a more formidable challenge. His revolutionary "machine" remained a recurring theme in his reflections, standing alongside his academic pursuits, such as compiling an index for the fifteenth-century *Hypatian Codex* for his diploma thesis.

While studying Early History of Russian Literature under Izmail Sreznevsky at St. Petersburg University, Nikolai Chernyshevsky encountered another towering academic figure: the distinguished physicist and electrical engineer of German origin, Emil Lenz. Their first meeting occurred during Chernyshevsky's entrance examination, where his performance left a strong impression on the professor. As Chernyshevsky later recalled: "Lenz was pleased, said 'very good,' and asked where I was educated" (Chernyshevsky, 1949, p. 34). During his first year at the university, Nikolai mentioned in letters to his family that he occasionally attended Lenz's lectures, finding them particularly "useful." His interest in physics, though secondary to his literary studies, was shaped in part by Lenz's teaching and, crucially, by the professor's widely circulated textbook. In 1848, Lenz published a physics manual for military schools, written in Russian which was a noteworthy development since physics had traditionally been taught in German. This textbook provides valuable insight into the state of physics education in Chernyshevsky's academic milieu. The section on *Thermotechnics* includes a detailed discussion of the

Breguet thermometer, which featured a metal spring at its base, as well as experiments demonstrating its function. The thermal properties of metal springs also played a crucial role in Harrison's *thermometrograph*, another key instrument in contemporary experimental physics. These devices, which stood at the forefront of 19th-century scientific inquiry, likely influenced Chernyshevsky's own inventive aspirations.

The textbook's section on *Simple Machines* elaborates on the fundamental principles of mechanical engines and transmissions (Lenz, 1855, p. 81), offering a structured introduction to classical mechanics. Yet, conspicuously absent from both the first and second editions of Lenz's work (the latter published in 1855) is any discussion of perpetual motion. Given that the theoretical impossibility of such a device follows from the first law of thermodynamics – formulated by Julius Robert von Mayer in 1845, three years before the release of Lenz's textbook – one might have expected some acknowledgment of the topic. However, the concept of energy conservation had not yet gained universal acceptance, and Lenz deliberately avoided engaging with what was, at the time, a contentious and evolving scientific principle. Instead, his textbook was designed to present physics in a structured, lucid, and methodically conservative manner. In keeping with the conventions of the period, both editions of this highly respectable volume featured a dedication to the reigning monarch, underscoring its alignment with the prevailing intellectual conservatism of the time.

In their friendly discussion, Lobodovsky had expressed some uncertainty, stating that "building a *perpetuum mobile* seems impossible." The acting designers and mechanics, drawing from experience, were more definitive: "There is friction inside every machine, and therefore, the machine produces less work than is expended on its motion." The frictional force within the device would inevitably absorb the useful part of the energy generated (Lermantov, 1892, p. 698). The omission of this in Lenz's textbook highlights the theoretical ambiguity surrounding the idea of perpetual motion at the time of Chernyshevsky's attempt.

The Tsar's name appeared on the front page of textbooks for future Army officers, such as Lenz's textbook. At the time, discussing fundamental physics in Russian was a significant innovation. Physics was considered a foreign discipline, and university lectures on physics and other natural sciences were conducted in German, as a standardized system of Russian scientific terminology had not yet been established. Professor Lenz himself did not speak the local language and had to seek external assistance to compile the textbook. The manual employed everyday language and neologisms to explain physical laws and phenomena, using terms like "tubes," "pipes," and "points." For example, Lenz explained the operation of the first known hydraulic turbine, the "Segner wheel," as follows: "Water, pouring out of the holes in the tubes, produces pressure on the walls of the tubes opposite the holes, from which the entire device will spin around the points" (Lenz, 1855, p. 167).

A similar roughness in phrasing, characteristic of textbook language, can be observed in Chernyshevsky's diary sections on "machines." He enthusiastically embraced the trend of incorporating everyday words identified in the textbook, using his philological intuition. Terms like "circle belt," "millstone in a slot," and "equilibrium logs" appear in his work. In student notes on the engine, the artificiality of the phrasing

used to describe the construction of the imaginary device is accentuated by the fact that, unlike the textbook author, the inventor did not fully grasp the internal connections between the objects and phenomena studied in physics. The creative aspect of this perpetuum mobile project envisioned by a philology student was undoubtedly influenced by the style of Lenz's groundbreaking textbook.

In the summer of 1849, Nikolai suddenly fell ill. Concerned about his worsening condition, he decided to document "his invention just in case, so that it could not perish," and sent the manuscript to Lenz (Chernyshevsky, 1939b, p. 299). The professor's authority, coupled with the absence of perpetual motion in his influential textbook, motivated Chernyshevsky's decision.

Few theorists of perpetual motion ventured beyond theoretical descriptions to actual construction. Nikolai was spurred to take his first practical steps by a dispute with Vasily Lobodovsky on May 28, 1849. The next day, he attempted to provide tangible evidence of his correctness: "I tried to make a circle and drill it in the middle so that it would not be pulled by either side, and I looked for a way to arrange the vessel into which it should fit." The attempt was thwarted by the impossibility of "transforming [the vessel] so that the water would not leak" (Chernyshevsky, 1939a, p. 282). Two months later, on July 14, at his relatives' dacha, he revisited his experiment:

> I made a rocking shaft, put two balanced wooden blocks on its ends, made a hole in the old lagoon [...]. I put the rocking shaft there, [...] in the center of which I threaded a needle crosswise so that it would not slip, poured water, and the block of wood, which lay on the bottom and sank to it, [...] now, of course, it floated up.

The wooden block's buoyancy lifted his spirits: "The matter is so unusual that one cannot help but doubt everything that pertains to it, and the calculations on which it is based – this [the floating wooden block] made me happy" (Chernyshevsky, 1939b, p. 300).

The young man acted resourcefully, utilizing common household items: "which serve as Marya's chair and to put a cup in which they wash themselves." He was undeterred by the contradiction between the modest materials and the ambitious goal of saving humanity through his invention. He manipulated everyday objects – a needle, a wooden barrel, and a rocker – much as he played with language to describe his idea. Ultimately, financial limitations halted his efforts:

> Yes, about the machine: I cannot say that I am convinced that it is impossible; [...] but only because there are not enough funds for further experiments, I sit and keep silent, and therefore my thoughts are jammed deep into my soul, into my daily feelings. (Chernyshevsky, 1939a, p. 127)

Like many theorists of perpetual motion, he attributed his main obstacle to lack of funds rather than the first law of thermodynamics.

The next attempt to construct an engine occurred in the winter of 1853. This period was relatively carefree for the 25-year-old Chernyshevsky. He had completed his studies at the university in 1850. Following unsuccessful attempts to secure a position at the military gymnasium in St. Petersburg, he reluctantly accepted a senior teaching position

at a gymnasium in Saratov, located next to his parents' home, where his cousins also studied.

In April 1851, following the advice of Professor Sreznevsky, he met the historian Nikolai Kostomarov. Chernyshevsky later recalled, “My acquaintance with him was the acquaintance with a man who loved to talk about scientific and general questions, with a learned man and one with an honest way of thinking” (Chernyshevsky, 1939e, p. 776). Kostomarov, an assistant professor at Kiev University, had organized an illegal group of political activists advocating for a federation of Slavic peoples based on class equality and religious freedom. He was soon captured and exiled to Saratov. That year, at age 36, he served as a translator for the Provincial Government (Kostomarov, 1922, p. 210). In his memoirs, he noted a shift in his intellectual interests in the spring of 1851: he “withdrew from studying history and immersed himself in reading physical and astronomical works” (Kostomarov, 1922, p. 212). Chernyshevsky, in his witty manner, used to mock his new friend’s passion for astronomy and did not share his pan-Slavic ideas. Chernyshevsky was younger than Kostomarov and held a lower position at the university, but he still teased his comrade. The contention did not prevent them from seeing each other “very often; sometimes for months every day, sitting together almost every day” (Chernyshevsky, 1939e, p. 776).

The intellectual rivalry and ample leisure time ignited their perpetual motion machine project. Chernyshevsky’s diary notes that on January 9, 1853 they planned to order a valve for the engine (Chernyshevsky, 1939c, p. 407). The valve was crucial to prevent the overflow of water needed to displace the wooden parts and maintain the rotational movement of the wheel on which these parts would be attached. Both young men, driven by their energy and ambition, were engrossed in the “tests” of the “self-moving machine.” They were temporarily away from their academic environment, were finding solace in their project, which served as an outlet for their energies.

With stable incomes and no families’ responsibilities, financial constraints were no longer an obstacle to building the engine. They decided to order parts from a mechanical workshop, but in order to make an order, they needed to present their designs and calculations to professional mechanicians. Chernyshevsky had still kept the description of the “machine” he had prepared for Professor Lenz in the summer of 1849. However, upon reviewing his earlier notes, Chernyshevsky wrote: “But when I finally thought about it, I became convinced that the machine would not work with such a device (a wheel with lenticular masses), because the water pressure on the incoming mass would be greater than the force of the wheel” (Chernyshevsky, 1939c, 407). At that moment, he “decided to destroy all traces of his mistakes” and “tore up the letter to the Academy of Sciences, the manuscript he had sent to Lenz, […] all the drawings and calculations” (p. 408). This marked a moment of emerging maturity, certainly influenced by his discussions with Kostomarov.

Shortly afterward, at the end of January 1853, he met Olga Vasilyeva, and she agreed to became his wife just three months later. They moved to St. Petersburg, where Chernyshevsky began writing articles and notes for periodicals such as *Otechestvennye Zapiski*, *Moda*, and *Sankt-Peterburgskie Vedomosti*. Chernyshevsky. His collaboration with Nikolai Nekrasov, the publisher of *Sovremennik*, led to an increase in

his contributions to magazines. In August 1856, Nekrasov handed over the editorial rights of *Sovremennik* to Chernyshevsky, and assigned him to manage the "Criticism and Bibliography" section (Chernyshevskaya, 1953, p. 124). This new role allowed the 28-year-old writer to finally overcome his chronic financial struggles and focus on his writing career, leaving behind his experiments with machines and daily diary entries.

There is no evidence that Chernyshevsky attempted to build a perpetual motion machine again. Other intellectuals in his circle, such as Nikolai Dobrolubov or Alexander Pypin, were also dependent on their income from published work. However, while Dobrolubov and Pypin used their free time for hobbies like lathe work or metalworking, Chernyshevsky did not. Although he abandoned the technical aspect of his project, he continued developing the concept in his journalistic writings. In these, he still advocated for saving people from poverty through the increased use of engines, a theme which also appears in "The Fourth Dream of Vera Pavlovna" in his novel *What Is to Be Done?*

The belief that new technologies could resolve deep-seated social issues is a persistent paradigm in modernist thought, later labeled "technological determinism." Langdon Winner, in his seminal article *Do Artifacts Have Politics*, defines this concept as "the idea that technology develops as the sole result of an internal dynamic, and then, unmediated by any other influence, molds society to fit its pattern" (Winner, 1980, p. 122). We argue that Chernyshevsky in his diaries and letters offer valuable insights into his own vision of technological determinism.

This optimism regarding technological progress is evident in the letters Chernyshevsky wrote to his father. In 1848, shortly after arriving in St. Petersburg for his university studies, he wrote excitedly to his relatives in Saratov about the railway and St. Isaac's Cathedral – both considered engineering marvels of their time. Years later, in his exile memoirs, Chernyshevsky reflected on his family's fascination with technical innovations. However, he also noted a paradox: this enthusiasm often coexisted with rigid, conservative thinking. This contradiction, he observed, hindered social progress:

> As far as I have seen, among the people with whom I grew up – old and young – new customs of a substantial nature were accepted easily and quickly […]. But changes consisting mostly of words alone are another matter. Common sense and practice do not show that they make life more convenient, easier, or more fun. (Chernyshevsky, 1939d, p. 575)

While excitement about technological advances was widespread, its intensity, particularly among educated individuals, was perhaps unique to Russia in the latter half of the 19th century. The uneven economic development across regions and the diversity of social strata contributed to this public fascination with technical innovations.

Winner, in his discussion of technological determinism, highlights how technical systems shape social organization: "The thing we call 'technologies' are ways of building order in our world. Many technical devices and systems important in everyday life contain possibilities for many different ways of ordering human activity" (Winner, 1980, p. 127). In mid-19th-century Russia, proponents of technological determinism, like Chernyshevsky, combined their admiration for scientific advancements with sharp critiques of the "irrational" socio-economic order. In 1859, four years after his earlier

reflections, Chernyshevsky (1859/1981) published a scathing article in the satirical magazine *Svistok*, titled *An Experiment in Discoveries and Inventions*, under the pseudonym "Ethiop." This piece was a response to new "temporary rules" for universities issued by Minister of Public Education Evfimiy Putyatin, which effectively increased tuition costs and restricted access for low-income students. The students revolted, and Chernyshevsky's article, brimming with sarcasm, ridiculed the academic elite for failing to foster innovation. His satire targeted prominent figures such as Sergey Solovyov, Boris Chicherin, and Ivan Babst. An unpublished draft of the article also mentioned Emil Lenz whom Chernyshevsky had once admired, mocking his opposition to women attending university lectures. Though Lenz's name was later removed from the final version, its initial inclusion underscores Chernyshevsky's growing disillusionment with his former intellectual role models.

In his characteristic style, Chernyshevsky did not spare himself from mockery. He humorously recounted his youthful attempts at invention, including an ill-fated experiment to create a thermometer: "A series of anticipations of my fame began in my earliest youth when I invented a metal thermometer; three months later I read that this invention had been made much earlier than by me by Breguet" (Chernyshevsky, 1981).

The desire to rationalize the socio-economic order was a prevailing theme in Russian public discourse during the early years of Alexander II's reign. In June 1856, Ivan Babst, a professor of political economy at Kazan University, delivered a speech titled "On Some Conditions That Contribute to the Increase of National Capital." He argued that "a people in which one class is suppressed is like a man with a wounded leg" (Babst, 1857, p. 33). Addressing poverty, Babst advocated for the dissemination of rational economic concepts, asserting that progress required a thorough examination of national wealth distribution, productive forces, and circulation of capital (p. 11). His proposed remedies included capitalization, credit expansion, and improved transportation infrastructure (p. 43). At the same time, Chernyshevsky was heading the "Criticism and Bibliography" department at *Sovremennik* where he published articles on political economy, drawing on his translation of John Stuart Mill's *Principles of Political Economy*. One such article, *Capital and Labor* (1860), argued that the rational organization of workers' economic life should be paired with a fair distribution of labor's results. His economic model was rooted in the development of productive forces through scientific knowledge and technological progress. Yet, his framework remained firmly within technological determinism, assuming that these processes would unfold "autonomously" from social and political factors (Kologrivov & Kuzminov, 1988, p. 266).

Ivan Babst's approach to social inequality was pragmatic, emphasizing economic rationalization and profit accumulation, while Chernyshevsky leaned toward a radical egalitarianism rooted in socialist ideals. However, his ideas remained largely theoretical, reflecting a reluctance to offer concrete, actionable solutions. By the next generation, Russian intellectuals had accumulated both practical and theoretical knowledge from decades of industrialization. Scholars in technical and natural sciences generally abandoned the pursuit of perpetual motion, working instead to educate the public on its impossibility. Figures such as Flegont Danilov, a socialist engineer, delivered lectures to

workers in 1924, explicitly dismissing perpetual motion theories (Danilov, 1924a, p. 2). In his book on invention, Danilov urged workers to focus on understanding the mechanisms they used daily rather than clinging to the romanticized notion of "divine inspiration" that Chernyshevsky had once entertained. Danilov's views aligned with a stronger belief in technological determinism, seeing technological advancements as not merely tools for overcoming natural forces but as direct instruments for addressing socio-economic disparities (Danilov, 1924b, p. 1).

Despite its impracticality, Chernyshevsky's perpetual motion project became part of the intellectual tradition that shaped Russian thought. Soviet historiography, with its ideological investment in Chernyshevsky as a revolutionary figure, contributed to the mythologization of his ideas. In her influential study Irina Paperno (1988) deconstructs this Soviet tradition, acknowledging Chernyshevsky's impact while critically reexamining his heroization. This article seeks to extend her argument by tracing the multiple intellectual currents that intersect in Chernyshevsky's work, revealing how his seemingly radical and impractical ideas were deeply embedded in the technological discourse of his era. His success as a journalist and public intellectual stemmed not only from his theoretical contributions but also from his keen ability to articulate the aspirations and anxieties already present in Russian society. His work stands as a testament to his intuition, creativity, and unwavering audacity.

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Research article

The Electronic Matchmaker: Finding the Optimal Couple in the Late USSR

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Abstract
The article is devoted to the history of the discussion about the acceptability of using computers to find the optimal romantic couple. The conditions that enabled it were the recognition of loneliness as an independent problem requiring modern solutions in the late 1960s, as well as the spread of cybernetic discourse which by the early 1970s was associated with effective expert judgments. The discussion unfolded on the pages of the main intelligence newspaper of the USSR, the *Literary Gazette* (LG), in the 1969-1971's, and in the 1975-1978's it went beyond its borders, covering several central and local publications, the main of which were *Nedelya* and *Moskovsky Komsomolets*. The aim of this article is to identify the technocratic shift in the problematization of family and marital relationships in the 1960s–1980s. Special attention is paid to the design of the speculative technology of the "electronic matchmaker" by prominent Soviet cyberneticians Viktor Pekelis and Axel Berg in the pages of LG. His opponents pointed out the uncritical nature of belief in expert mathematical models loaded into computers. The analysis of correspondence sent to LG by Novosibirsk sociologist Vladimir Shlyapentokh confirmed the high level of trust of single people in a technical way to solve their problem. However, after the publication of an anonymous note in *Pravda*, the discussion was closed. The second stage of the discussion, which began after four years of silence, is described by the authors as the result of the articulation of algorithmic rationality and psychology. The initial attempts to create the "electronic matchmaker" during this period were linked to the work of an experimental dating service led by psychologist Arkady Egides and the self-report questionnaires he developed. Designed according to the template of psychological personality tests, the questionnaire, serving as a tool for translating personal qualities into quantitative characteristics, became the cornerstone of computer-based dating services that emerged in the early 1980s. In conclusion, the discussion surrounding the "electronic matchmaker", conceived as a modern method for combating loneliness, did not stimulate a radical rethinking of family norms and gender orders in late Soviet society. Instead, its technological design and epistemic framework served to conserve traditional notions of the family.

Keywords: Loneliness, Cybernetics, Dating service, Computer, Speculative technology, Subjectivity, Sociotechnical imaginary

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Научная статья

Электронная сваха: Поиск оптимальной пары в позднем СССР

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Аннотация
Статья посвящена истории дискуссии о допустимости использования ЭВМ для поиска оптимальной романтической пары. Условиями ее возможности стали открытие в конце 1960-х гг. одиночества в качестве самостоятельной проблемы, требующей современных решений, а также распространением кибернетического дискурса, к началу 1970-х гг. ассоциируемого с эффективными экспертными решениями. Дискуссия разворачивалась на страницах главной интеллигентской газеты СССР – “Литературной газеты” (“ЛГ”), в 1969–1971-х гг., а в 1975–1978-х гг. вышла за ее пределы, охватив несколько центральных и местных изданий, главными из которых были “Неделя” и “Московский комсомолец”. Цель статьи – выявить технократическое смещение в проблематизации семейно-брачных отношениях в 1960–1980-е гг. Особое внимание уделено проектированию спекулятивной технологии “электронной свахи” видными советскими кибернетиками Виктором Пекелисом и Акселем Бергом прямо на страницах “ЛГ”. Оппоненты “электронной свахи” указывали на некритический характер веры в экспертные математические модели, загружаемым в ЭВМ. Проведенный новосибирским социологом Владимиром Шляпентохом анализ корреспонденции, присылаемой в “ЛГ”, подтвердил высокий уровень доверия одиноких людей к техническому способу решения их проблемы, однако, после публикации критической заметки в “Правде”, дискуссия была свернута. Второй этап дискуссии, начавшийся после четырехлетнего молчания, описывается авторами как результат сочленения алгоритмической рациональности и психологии. Приходящиеся на этот период первые подходы к созданию “электронной свахи” были связаны с работой экспериментальной службы знакомств под руководством психолога Аркадия Егидеса и разрабатываемыми им анкетами-самоотчетами. Составленная им по шаблону психологических личностных тестов, анкета, будучи инструментом перевода личностных качеств в количественные характеристики, стала краеугольным камнем служб знакомств с ЭВМ, появившихся в начале 1980-х гг. Делается вывод о том, что дискуссия вокруг “электронной свахи”, проектируемой в качестве современного метода борьбы с одиночеством, не стимулировала радикальных переосмыслений семейных норм и гендерных порядков позднесоветского общества, а ее технологический дизайн и эпистемическая оснастка работали на консервацию традиционных представлений о семье.

Ключевые слова: Одиночество, Кибернетика, Служба знакомств, ЭВМ, Спекулятивная технология, Субъективность, Социотехническое воображаемое

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ВВЕДЕНИЕ

В позднесоветской прессе читательским письмам уделялось значительное внимание. О работе с ними отчитывались в ЦК, а их содержание могло послужить материалом для будущих публикаций и общественно значимых обсуждений (Huxtable, 2022; Kozlov, 2013). Так и письмо учащихся одного московского ПТУ в журнал “Техника – молодежи” в 1979 г. побудило редакцию собрать за “круглым столом” социологов, сексологов, психологов и писателей. Ключевой вопрос письма, определивший заглавную тему собрания в журнале, звучал так: “Действительно ли ЭВМ когда-нибудь сможет прогнозировать устойчивость брака?”.

Как неудивительно, десятилетием ранее популяризатор кибернетики Виктор Пекелис уже дал ответ. В статье 1969 г. “Советчик в любви” он положительно оценил предсказательные способности машин в области подбора спутника жизни. Описанная им технология, имевшая зарубежные корни, была локализована под незамысловатым названием: “электронная сваха”. В этом стремлении к ассистированному выбору партнера, которое наблюдалось как на заре 1970-х гг., так и на их излете переплелись позднесоветское отношение к технике, плавно дрейфующее от техноптимизма хрущевской поры к техноскептицизму начала 1980-х гг., образы будущей эпохи НТР, представления о браке, гендерном строе и моральном порядке. “Электронная сваха”, которая станет предметом рассмотрения данной статьи, вплоть до появления первых прототипов на пороге Перестройки была спекулятивной технологией (Kotomina and Milburn, 2024), научно обоснованной виртуальной реакцией на реальные социальные проблемы позднего СССР.

Если в 1920-х гг. приблизить наступление коммунизма были призваны электростанции, линии электропередач и лампочки, то в послевоенном Советском Союзе путь к светлому будущему прокладывали уже другими средствами. Среди них нефтяные скважины и энергосети, получившие импульс развития в период освоения в 1960–1970-х гг. “молодых” месторождений Сибири, атомные ледоколы и электростанции, ознаменовавшие претензии СССР на лидерство в “атомном веке”. Как показывают социальные исследователи советского, все эти проекты – электрический, нефтяной, атомный – задавали коллективное видение желаемого будущего, опосредованного формами социального порядка, воплощавшихся в достижениях науки-техники, то есть формировали социотехническое воображаемое эпохи (Калинин, 2022; Калинин и др., 2022; Орлова, 2018).

Фантазия о машине, возникшая во время дискуссии о средствах помощи одиноким, которая способствовала бы заключению устойчивых браков, аккумулировала коллективные представления о текущих и будущих формах социальной организации. Продолжая линию на адаптацию концепции “социотехнического воображаемого” Шейлы Ясанофф (Beck et al., 2021; Jasanoff, 2015) к материалу советской истории, мы будем видеть в этой спекулятивной технологии проективную множественность желаемых преобразований социалистической реальности, сопряженную с достижениями науки-техники и позднесоветской социальностью. Мы сосредоточимся на ходе публичной

дискуссии, дисциплинарной принадлежности участников; обозначим, какими символическими значениями “электронная сваха” наделялась, для каких целей ее предлагали использовать и каких результатов от нее ожидали. На материалах советской прессы 1960–1980-х гг., архивных документов и экспертных интервью мы продемонстрируем, что “электронная сваха” как спекулятивная технология имела гетерогенное устройство, а дискуссии вокруг нее были местом разработки моделей семейно-брачных отношений.

В соответствии с марксистской доктриной семейные отношения и гендерные порядки должны были идти вслед за развитием материально-технического базиса. Однако ни советская социальная (Galmarini-Kabala, 2016), ни гендерная политики (Здравомыслова и Темкина, 2003) на протяжении второй половины XX века не претерпевали столь существенных трансформаций, чтобы потрясти воображение современников и быть представленными рядом с достижениями науки и техники. Хотя исследователи семейных отношений фиксируют динамику изменений в послевоенной семейной политике в СССР (Nakachi, 2021), наметившаяся в 1960-е годы тенденция к применению технократических решений в области демографии не получила должного внимания. Цель нашей статьи – на примере истории проектирования “электронной свахи” выявить технократическое смещение в проблематизации семейно-брачных отношениях в 1960–1980-е гг., попутно указывая на возрастание роли экспертных решений в позднем СССР.

Теоретик и разработчик искусственного интеллекта Йозеф Вейценбаум первым поставил вопрос о поразительной готовности людей делегировать, казалось бы, специфические человеческие функции – судить, терапевтировать, подбирать партнера – технике (Weizenbaum, 1976). Проблематизируя границы человеческого и машинного, он предостерегал от необоснованного технооптимизма, показывая, что эффективные алгоритмы с легкостью могут выступить инструментом консервации существующих институтов и практик, которые препятствуют социальному прогрессу и модернизации (Weizenbaum, 1995). Следуя за Вейценбаумом, мы будем задавать вопросы о том, как в СССР решали вопрос технологического отчуждения при поиске “оптимального партнера” и не проявлялась ли в спекулятивной технологии “электронной свахи” тенденция к консервации существующих брачных традиций и гендерных порядков.

“ОТ НАРОДНОГО ХОЗЯЙСТВА – К ЖИЗНИ НАРОДА”

Появление “электронной свахи” стало возможным благодаря поддержке со стороны советского кибернетического движения. Идеи кибернетики – науки об управлении, обратной связи и самоорганизации живых и неживых системах – проникли в СССР в начале 1950-х гг. (Gerovitch, 2002). Их реципиентами были советские пионеры вычислительной техники из военных НИИ и КБ, а противниками – философы и научные бюрократы, усмотревшие в кибернетике угрозу диалектическому материализму как метатеории развития естественнонаучных знаний (pp. 21–33). Ситуация начала меняться в период “Оттепели”, хрущевских экономических экспериментов по децентрализации

управления страной, а также выведения Академии наук к 1961 г. из-под диктата отраслевых министерств с правом для ученых свободно заниматься фундаментальными исследованиями. Благодаря сетевому распространению новых знаний, финансовой поддержке оборонных НИИ и усилиям координационных центров (Peters, 2012; Зимирев, 2023) с конца 1950-х гг. спектр гражданского применения методов и техники, попавших под зонтичное понятие “кибернетических”, непрерывно расширялся.

Так, ключевое для нашего исследования понятие оптимальности вышло из математической плоскости в социальную благодаря усилиям нобелевского лауреата Леонида Канторовича и его методом линейного программирования, применяемых советскими математическими экономистами в 1950–1960-е гг. для разработки теории оптимального планирования (Leeds, 2016). В то же время оптимизация проникает в советское градостроительство (West, 2019) и в советское образование (Boretska, 2019; Зимирев, 2024). К середине 1960-х гг. советский компьютерный парк включал в себя разнообразные разработки: машины-переводчики, электронные библиотечные каталоги, автоматы-шахматисты, системы навигации для судов, инструменты для поиска полезных ископаемых, машины для диагностики заболеваний и многое другое. Ключевой же проблемой масштабного проникновения кибернетики в жизнь советского человека оказалось не столько техническое несовершенство компьютерного парка, сколько особенности советской политики заботы о данных.

Максималистские проекты применения ЭВМ в экономическом планировании столкнулись с тем, что контрагенты попросту фальсифицировали показатели выполнения плана, а Госплан, ЦСУ и Политбюро ожидали от компьютеров в лучшем случае усовершенствование работы их ведомств (Сафронов, 2020, с. 22–41). Внедрению автоматических систем управления на производстве сопротивлялись особенно активно в эпоху Косыгинских реформ, поскольку установление машин требовало расширения площадей предприятий и приостановки действующих конвейеров, что очевидно сказывалось на выполнении плана (“Проблемы применения АСУ”, 1970, с. 128–164). Разрыв между монументальным единством дискурса научно-технического прогресса и точечным – экспериментальным, ведомственным, кустарным – ходом компьютеризации, к началу 1970-х гг. был характерен и для ряда стран социалистического блока (Eyal, 2000, p. 49–92; Petrov, 2023, p. 183–226) и определял сложившуюся политическую конъюнктуру “социализма с человеческим лицом”. Инженерно-техническая интеллигенция получала рабочие места и возможность ограниченного экспертного влияния на принимаемые решения в экономической, технологической, экологической и культурной политиках; власть – идеологическую альтернативу и инструмент контроля над прорыночными и националистическими настроениями среди интеллигенции (Eyal, 2000; Babička, 2023).

Хотя к концу 1960-х гг. на компьютеризацию всего народного хозяйства уже не питали надежд, институциональная база советской кибернетики, сформированная в этот период, никуда не исчезла. К началу 1970-х гг. бывший замминистра обороны, а с 1959 года – председатель координационного Научного

совета по кибернетике при Президиуме АН СССР Аксель Берг в попытках реанимировать общественные амбиции кибернетики обратился к популярному в начале 1960-х гг. писателю, журналисту и футурологу Виктору Пекелису. Член редколлегии крупнейшего в СССР научно-популярного журнала “Техника – молодежи” Пекелис обрел популярность благодаря книгам о прошлом, настоящем и будущем компьютерных технологий. Со страниц его “Кибернетической смеси” читатели узнавали о современной бионике, принципах работы машин-судей, математически выверенных формулах поэзии и прозы, а также о конторах электронных знакомств (Пекелис, 1970). И хотя академик Берг высказывал критические замечания Пекелису, обращая внимание на бессистемное микширование тем, фактические ошибки и устаревшие данные (“Пекелису Виктору Давыдовичу,” 1967, Л. 1), последний оставался самым тиражируемым и издаваемым автором среди советских популяризаторов кибернетики.

Поэтому именно с сотрудничества Пекелиса и координатора гражданской кибернетики Берга мы отсчитываем технократический разворот от масштабных проектов компьютеризации народного хозяйства к личной жизни советских граждан. В социотехническом воображаемом кибернетиков академические институты превращались в крупные аналитические центры, работающие по своей творческой инициативе или общественным запросам над проблемами раскрытия человеческого потенциала, профессионального и личностного самосовершенствования (Пекелис, 1973). А рассматриваемая нами спекулятивная технология “электронных свах” открывала новые перспективы применения компьютерной техники, вновь делая кибернетику частью значимых общественных дискуссий и одновременно предоставляя одиноким людям надежду на техническое решение их проблемы.

ОТКРЫТИЕ ОДИНОЧЕСТВА В СССР

Идея использования кибернетики для решения проблем личной жизни пришла в СССР вместе с открытием одиночества. Оно началось с газетной статьи Мирославы Ректорисовой о чехословацком опыте. Опубликованный в № 23 “Литературной газеты”[1] за 1967 г. материал рассказывал о службах знакомств в ЧССР, в которых при содействии психолога, помогавшего заполнять опросник для знакомства, и ЭВМ, производившей поиск по картотеке подходящих кандидатов, соединялись одинокие сердца (Ректорисова, 1967, с. 13).

Статья вызвала широкий отклик читателей, призывавших к скорейшему воспроизведению опыта чехословацких друзей на советской земле. Редакция газеты не спешила выступать в поддержку заграничного новшества, организовав закрытый круглый стол для выяснения причин появления одиноких людей в Советском Союзе и возможности трансфера зарубежной технологии. Пестрый состав литгазетовских экспертов включал социологов, сексологов, юристов,

[1] Далее – “ЛГ”, “Литгазета”.

писателей и журналистов, занимавшихся исследованиями взаимоотношения полов[2].

Участники дискуссии, опираясь на демографическую трактовку одиночества, предложенную Ректорисовой и свои экспертные знания, предлагали разные способы проблематизации феномена, который прежде числили исключительно за странами капиталистического лагеря. В спорах о причинах одиночества в СССР и пригодности зарубежных средств социалистической морали одной из главных тем стал вопрос о возможности и потенциальных границах применения ЭВМ в службах знакомств. Существовавшая за границей технология в результате журналистского трансфера из реальной стала спекулятивной. Обозначилось два идейных лагеря: технопессимистов и технооптимистов.

Технопессимисты заняли в дискуссии позицию “лириков”, защищая романтические отношения от упрощения и технического отчуждения. Сексопатолог Павел Посвянский, в целом поддерживавший организацию учреждений для подбора пар, не допускал использования ЭВМ. Для ее работы понадобились бы научно обоснованные критерии совместимости, а сложность человеческих чувств, как полагал ученый, не поддается квантификации (“Стенограмма заседания,” 1967, Л. 36). Ему вторил писатель Николай Атаров. Выступив с критикой “безнравственной” (Л. 36) кибернетики, писатель приравнял выбор невесты с помощью ЭВМ к машинному стихосложению, в котором “нет никакой поэзии” (Л. 69). Рассматривая социальную проблему с “позиций гуманистических” (Л. 65), они видели в ЭВМ угрозу субъективности. Машинный поиск создавал ненужный комфорт, лишая пользователя необходимого опыта неудач.

Большую часть участников составляли технооптимисты, но и среди них не было единства относительно пределов задействования машин. Адвокату Аркадию Ваксбергу и писателю Александру Смирнову-Черкизову ЭВМ представлялась нейтральным средством упрощения ручного труда, используемым для регистрации посетителей и систематизации данных (“Стенограмма заседания,” 1967, Л. 41, 45). Сексопатолог Георгий Васильченко и социолог Арон Дондыш расширяли автономию ЭВМ. Первый допускал возможность ее применения для поиска нескольких подходящих кандидатов внутри картотеки, оставляя при этом окончательный выбор за пользователем (Л. 53). Второй же, ссылаясь на опыт использования ЭВМ для постановки медицинских диагнозов и планирования хозяйства, предлагал применять ее для “прогнозирования [прочности] будущей семьи” (Л. 42). Радикальнее всех оказался психиатр Анатолий Добрович. В его репликах ЭВМ оказывалась не просто инструментом подготовки личного контакта, а самостоятельным автоматом-посредником между двумя одинокими, организующим встречу соединением анкетных перфокарт без привлечения широкого штата специалистов (Л. 46).

[2] В список экспертов попали ученые, журналисты и писатели, которые активно сотрудничали с “Литгазетой” и часто выступали с материалами на ее страницах. Примечательно, что среди них не нашлось психологов, чья роль в чехословацких службах знакомств была ключевой. Подробнее о подборе экспертов и ходе обсуждения см.: (Кулагин, 2024).

Отношение технопессимистов и технооптимистов к применению ЭВМ в службах знакомств выявило разницу представлений о гуманизме, границах человеческого и машинного. Первые видели в технике опасность примитивизации межличностных отношений, вторые – возможность технократического решения, повышавшего вероятность первого контакта и оставлявшего ответственность за его развитие в любовь пользователям.

Вопросу использования ЭВМ уделил особое внимание и председатель круглого стола Тимофеев в своей статье-отчете, опубликованном в “Литгазете” через полтора месяца после закрытого обсуждения в редакции. Конспективно изложив основные аргументы участников беседы, Тимофеев раскритиковал их излишнюю веру в науку, обвинив сторонников кибернетического вмешательства в безнравственности. По его мнению, выбор спутника на основе определенного набора качеств, особенно посредством машины, оскорблял человеческое достоинство. В своей статье Тимофеев резко выступил против любых мер помощи одиноким людям, поскольку они унижали “труд любви” (Тимофеев, 1967, с. 11). С этой точки зрения, кибернетические решения казались верхом алгоритмической бесчеловечности. Отказывая ЭВМ, Тимофеев на деле отказывал одиночеству в статусе серьезной проблемы.

РОЖДЕНИЕ “ЭЛЕКТРОННОЙ СВАХИ”

Следующего материала, продолжившего дискуссию, пришлось ждать два года. Им стала статья “Советчик в любви” Виктора Пекелиса, опубликованная в № 43 “ЛГ” за 1969 г. В статье, написанной в ответ на отчет Тимофеева, Пекелис предложил проанализировать опыт передовых капиталистических стран по использованию “электронных свах”, чьи клиенты заполняли анкеты из 80 вопросов с самоописанием и описанием искомого партнера, которые затем переносились на перфокарты и вводились в ЭВМ для подбора машиной подходящих кандидатов (Пекелис, 1969, с. 12).

Принцип работы алгоритма был скрыт от пользователя, что не мешало машине завоевывать доверие одиночек: за 9 месяцев ее эксплуатации в Гарварде разработчики получили около 90 тысяч запросов от американских студентов (Пекелис, 1969, с. 12–13). Услуга была платной, а цена могла варьироваться в зависимости от привлекательности пользователя. Пекелис, критикуя коммерческий характер “электронной свахи”, чрезмерную объективацию и коммодификацию черт личности, тем не менее аргументировал возможность ее применения в СССР для борьбы с растущим числом одиноких людей и видел в ней средство обеспечения устойчивых браков. Он предложил использовать машину только как советчицу, измеряющую по квантифицируемым показателем оптимальность будущей пары. Переведя вопрос об “электронной свахе” в плоскость технократического решения демографических проблем эпохи “развитого социализма”, Пекелис, казалось, защитил зарубежную технологию от тимофеевских обвинений в аморальности.

Ему возражал математический лингвист из Всесоюзного института научной и технической информации Юрий Шрейдер, назвав предложение Пекелиса “околомашинной спекуляцией” (Шрейдер, 1970, с. 12). Уже в первом январском номере “ЛГ” за 1970 г. он поднял вопрос о том, кто и как будет программировать такую машину. Шрейдер иронизировал над предложением Пекелиса искать каждому “вторую половинку”, вопрошая о возможности обнаружения кибернетиками более современной модели любви, нежели платоновский миф об андрогине, допускающей существование множества потенциальных пар (с. 12).

Таким образом, Шрейдер выразил сомнение в самой идее “оптимальной пары”, утверждая, что критерии совместимости не будут выявлены учеными в ходе исследований, а сконструированы ими. Критикуя сциентистские основания “электронной свахи”, Шрейдер фактически воспроизводил аргументы Посвянского и Атарова: “электронная советчица” исключала ошибки, романтические неудачи и тем самым лишала человека необходимого опыта, что противоречило идеям свободного выбора и ответственной любви, почерпнутой, разумеется, из русской литературы (Шрейдер, 1970, с. 12).

Технопессимистскую линию в прессе поддержал и сержант В. Давиденко в своем письме в “Литгазету”: “Хочу заметить, что одинокие мужчины и женщины – это, как правило, люди пассивные (ленивые) во взаимоотношениях с другими людьми и с окружающим миром. Им мало помогут предложения ЭВМ” (Володин, 1970, с. 13). Так, надежды на калькулирующий разум оказались лакмусом, проявившим конформные личностные черты советского человека. Отказывая проблеме одиночества и “электронной свахе” как методу ее решения, противники простых технологических решений одновременно выстраивали критическую дистанцию от экспертного управления частной жизнью, обличая технократов в консервации архаических представлений о любви.

В 12 номере “Литгазеты” в защиту Пекелиса выступил А. Берг. Отметив, что в ходе дискуссии сторонников применения ЭВМ оказалось все же больше, он предложил разделять трудности разработки пока еще мерцающей технологии и простое сопротивление ей (Берг, 1970, с. 12–13). Боязнь, что “электронная сваха” отнимет у граждан необходимость пользоваться собственным умом и сердцем, была расценена им как экспертный снобизм, недооценка массового потребителя и его способностей понимать консультативный характер машинной помощи. Используя кибернетическую терминологию, он говорил о повышении с помощью ЭВМ управляемости семейных отношений методом исключения “вредных случайностей”, предлагал привлекать социологов и психологов для выяснения перечня причин разводов, который можно было бы учесть при создании “электронной свахи”. Так вопросы устранения стохастических погрешностей и усиления надежности в эксплуатации кибернетических машин превращались в рабочие модели для подбора “оптимальной пары”.

Итог дискуссии в № 24 “ЛГ” за 1971 г. подвел новосибирский социолог Владимир Шляпентох (1971, с. 12). Работая с письмами читателей об одиночестве “электронной свахе”, он обнаружил, что 75% корреспондентов с высшим образованием из крупных городов поддерживали идею об “электронной

советчице”. Хотя в редакторской почте имелись письма с обвинением одиноких людей в слабости и пассивности, большая часть одиноких указывала на напряженный ритм современной жизни, делавший затруднительными спонтанные знакомства. Применение ЭВМ, запрограммированной экспертами, по их мнению, должно было обеспечить лишь поиск оптимальной пары, развитие отношений они оставляли за собой. Результаты социологического анализа, проведенного Шляпентохом, подтверждали высокую степень доверия к новой технологии среди ее потенциальной аудитории.

Начавшись с вопроса о допустимых границах мер борьбы с одиночеством, дискуссия развивалась вокруг вопроса о доверии к экспертам и создаваемым ими моделям – тем, кто обладает властью решать, какие критерии будут внесены в программу и представлены потребителю в виде готовой технологии. Противники “электронной свахи” видели в идее “оптимальной пары” не веяния нового времени, а присущее прошлому доверие авторитетному решению, избавляющего от рисков свободного выбора. Сторонники “электронной свахи” же воспринимали ее как проявление общественной заботы (Шляпентох, 1971, с. 12).

Однако реальная власть не заставила себя ждать. Уже в июне 1971 г. в “Правде” вышла анонимная заметка “Сваты электронной свахи”, обвиняющая инициаторов дискуссии и лично Шляпентоха в покушении на социалистическую мораль. Первый этап дискуссии закончился ее неформальным запретом.

“ЭЛЕКТРОННАЯ СВАХА” ВОЗВРАЩАЕТСЯ

Снова об “электронной свахе” заговорили спустя 4 года, когда в № 16 “Московского комсомольца” за 1975 г. была напечатана статья старшего научного сотрудника НИИ общих проблем воспитания АПН СССР Александр Меликсетяна “Я за прогнозирование брака”. В статье, сопровождаемой красноречивой иллюстрацией в виде механизированного сердца, пронзенного стрелой-перфокартой, Меликсетян писал о зарубежных службах знакомств (как из социалистического, так и капиталистического лагерей), которым, благодаря использованию ЭВМ, удалось преодолеть случайность встреч и обеспечить высокую прочность браков. Скрадывая перерыв в дискуссии, Меликсетян писал о продолжающейся “довольно оживленной дискуссии” в печати, приводя в пример статьи Пекелиса и Берга конца 1960-х гг., тем самым замалчивая аргументы технопессимистов. На новом этапе дискуссии он не предлагал обсуждать необходимость “электронной свахи”, рассматривая этот как уже пройденный этап, а предлагал заняться выработкой научно обоснованных рекомендаций по созданию модели оптимальной пары, [решив] тем самым вопрос психологической совместимости” (Меликсетян, 1975, с. 4). Использование языка математического моделирования, популярного в разговорах об экономике в 1970-х гг., выдавало рационализаторскую логику будущих служб знакомств, а формулирование проблемы в терминах “психологической совместимости” указывало на дисциплину, которая стала бы поставщиком практических знаний.

Если в конце 1960-х – начале 1970-х гг. еще не было ясно кто станет экспертом, определяющим категории для подбора машиной пар, то к середине 1970-х гг. ответ стал очевидным. Роль главных специалистов по человеческим отношениям, как это было и в других странах соцлагеря, в СССР отводилась психологии. Подходы инженерной психологии, особенно ее космического направления, изучавшей вопросы совместимости людей в рабочих коллективах и замкнутых пространствах, нашли применение и в сфере поиска романтических партнеров[3]. Успешное знакомство оказывалось результатом удачной комбинации индивидуальных психологических характеристик одиноких, найденной "электронной свахой".

Перевод проблемы одиночества в психологическую плоскость открыл возможности для использования психологических техник в целях ее преодоления. Именно личностные тесты, крайне популярные в 1970-х гг. (Ямпольский, 1981, с. 90–99), должны были стать основой рационального подбора пар. Альянс психологического знания и кибернетики стали общим местом в рассуждениях о мерах избавления от одиночества. Философ Юрий Рюриков видел психологическую совместимость главным условием успешных браков (Рюриков, 1975, с. 10–11). Сексопатолог Абрам Свядощ говорил о необходимой работе по "корректировке стереотипа" желанного спутника, которую должен был проводить психолог ("Любит, не любит," 1979, с. 44): именно пси-знание и пси-техники в союзе с машиной составляли два компонента "электронной свахи" во второй половине 1970-х гг.

1970-е гг. стали временем первых попыток организовать меры помощи одиноким. Первым приблизился к осуществлению на практике идеи "электронной свахи" психолог Аркадий Егидес, который возглавлял экспериментальную службу знакомств, организованную при поддержке Моссовета (Федосеева, 1978, с. 13). Главным инструментом знакомства в службе Егидеса была анкета-самоотчет из 260 вопросов. Помимо протокольных сведений о возрасте, росте, месячном заработке и квартирных условиях, в ней спрашивали о любимых книгах, отношении к детям, привычках и взглядах на интимную жизнь. Опросник Егидеса работал не только на персонализацию, но и на типизацию клиентов, переводя индивидуальные различия в стандартизированные и квантифицированные данные. На основе анкеты сотрудники службы надеялись создать тест на совместимость, доверив обработку данных ЭВМ. Они рассчитывали распространить свой подход на другие учреждения и создать московскую сеть со сквозной картотекой на перфокартах, окончательно восполнив социальные разрывы поздней современности, пускай и в рамках одного города (с. 13). Разработка психологических опросников, адаптированных для машинной обработки, стремление выработать универсальный принцип подбора партнера были вдохновлены фантазией об "электронной советчице" и являлись шагом к ее воплощению.

По мере организации государственных служб знакомств в 1980-х гг. идея компьютеризированного поиска партнера продолжала сохраняться. Так, в отчетной

[3] О развитии и сферах приложения инженерной психологии см.: (Gerovitch, 2015; Ilin, 2025).

документации ростовской службы знакомств за 1988 г. в перечне планируемых к добавлению в следующем году видов услуг значилось “внедрение ЭВМ для выбора брачного партнера” (*Отчет о финансово-хозяйственной деятельности*, 1988, Л. 133). Однако, как сообщила одна из бывших сотрудниц в интервью авторам (Е.З., личная беседа, Май 24, 2023), задуманному не суждено было реализоваться. Вместе с тем, столичная служба при Мосгорсправке пользовалась мощностями вычислительного центра коллективного пользования, организованного в службе быта Мосгорисполкома. Таким образом, привносимая ЭВМ возможность познакомиться с таким количеством потенциальных спутников, “с каким Вы не сможете познакомиться за всю свою жизнь” (*Анкета личного знакомства*, 1988, с. 2), становилась привилегией одиноких людей, проживающих в крупных городах. В то же время, стремление к созданию “электронной свахи” выявляло региональное неравенство, обусловленное неравномерным доступом к технике.

В государственных службах знакомств наличие ЭВМ было редкостью. Это определялось институциональной принадлежностью учреждений. Будучи частью служб быта, они не получали достаточного финансирования для использования кибернетической техники на постоянной основе. Иначе обстояло дело с корпоративными службами знакомств. Использование ЭВМ стало отличительной чертой этих служб, постоянно подчеркиваемой в рекламных объявлениях (*Служба знакомств “Зодиак,”* 1989, с. 12). Некоторые из них опирались как на институциональную базу советской кибернетики, в виде вычислительных центров, так и на существовавший советский дискурс о службах знакомств. Так, статья о кооперативной службе знакомств “Служба № 5” гласила, что служба не только консультирует, но и выполняет работу “электронной свахи” (Зотова, 1989, с. 3). Употребление в рекламе в качестве характеристики журналистского ярлыка, родившегося в дискуссии об одиночестве, демонстрировало, с одной стороны, его узнаваемость и распространенность, а с другой – ту легкость, с какой “советские” технологические решения оказывались приспособлены к условиям нарождающегося рынка.

ЗАКЛЮЧЕНИЕ

В 1967 году в главной интеллигентской газете СССР – “Литературной газете” – началась дискуссия об одиночестве. Практически с самого начала вопрос о помощи одиноким получил технократическое измерение. Предметом активных дебатов стал вопрос о допустимости применения ЭВМ для подбора оптимальной пары. Популяризатор кибернетики В. Пекелис при поддержке академика А. Берга оповестили читателей “ЛГ” и участников дискуссии о зарубежном опыте использовании технологии “электронной свахи”. Так на страницах советских газет началось публичное проектирование спекулятивной технологии для поиска партнера.

Носители нового социотехнического воображаемого, определяемого кибернетическим видением общей природы технических и социальных задач (рассматриваемых из перспективы повышения управляемости системы), не видели

специфических преград для применения теории оптимизации к проблеме подбора спутника жизни. Технопессимисты, в свою очередь, признавали необходимость государственных мер помощи одиноким, но исключали возможность использования в них ЭВМ. Исходившая от техники угроза романтической личности и спонтанности в любви побуждала противников кибернетических решений изобретать альтернативу вроде консервативных по форме вечеров знакомств.

Технооптимисты же фиксировали растущее усложнение социальности, к которой человеку становилось все труднее адаптироваться. Они приветствовали машинный подбор как средство оптимизации, избавлявшее от случайностей запутанного мира. Первый этап дискуссии об электронной свахе закончился уже в 1971 году ее неформальным запретом, а собранные новосибирским социологом В. Шляпентохом данные о безусловной поддержке спекулятивной технологии среди одиночек остались проигнорированы властью.

Для создания желанной "электронной советчицы" уже имелась материальная основа в виде кибернетической техники, но не хватало эпистемического движка. Для помощи проекту оптимальной пары на втором этапе дискуссии, развернувшейся во вторую половину 1970-х гг., привлекли психологию. Исследования психологической совместимости должны были помочь выделить параметры, правильное сочетание которых обеспечивало бы устойчивый брак. Тандем ЭВМ и пси-техник дарил утопию полной предсказуемости и управляемости.

История "электронной свахи" проливает свет на границы допустимого в позднесоветском проектировании будущего семьи и брака. Обращение к кибернетике для решения извечного вопроса не привело к пересборке семейных норм и гендерных порядков, равно как и к пугавшему противников технологического прогресса "обуржуазиванию" межличностных отношений. "Семейный эталон", на который нацеливало психологическое знание, раз за разом оказывался гетеросексуальной нуклеарной семьей с патриархальным распределением гендерных ролей.

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Research article

Philosophy of Technology from a Cyberfeminist Perspective

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Abstract

Along with the transformations of technology itself, the philosophy of technology is continuously redefined epistemologically and ontologically. The prospects of further development, conceptual vectors, anthropological effects are always difficult to grasp. Among the now dominant mainstream approaches to the field there is a theory of technology of corporate utopianism, and there is a critical theory of technics with a dystopian ending. There is a large body of leftist critical studies on the corporate capture of technological opportunity and missed alternative possibilities. The goal of this paper is to show that the philosophy of technology exhibits not only historical, economic, ideological differences, but also under-explicated gender differences. A gendered approach will be offered for consideration which is based on a corpus of feminist philosophy, epistemology, and critique of science and technology, along with feminist critiques of the cultural canon. Feminist theory consistently problematizes invisible gendered frames of representations of reality. It allows us to notice the gender bias not only in the obvious, perhaps superficial facts of role inequality, but also in the formulation of scientific tasks and the organization of practices. The gender bias reaches deeply into the metaphysical attitudes and epistemological frameworks that determine the rational and irrational, the significant and the excluded. This is revealed by the questions: Whose science is this? Whose knowledge? What/whose experience matters? How are the meaning and purpose of the search defined? What rationality do they implement? The intersection of feminism and technology was a core concept of early cyberfeminism in the 90s and continues to be developed by contemporary researchers, writers, and data analysts. From feminist theory developed a specific critical and heuristic method that has a general significance much deeper than the gender-relations as we know them in everyday life.

Keywords: Feminist epistemology; Cyberfeminism; Xenofeminism; Gender and metaphysics; Cognitive assemblage; Algorithms and social practices; Feminization of machines

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Научная статья

Философия техники с точки зрения киберфеминизма

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Аннотация

Философия техники вместе с очередной трансформацией техники продолжает переопределяться эпистемологически и онтологически, по-прежнему трудно схватываемы ее дальнейшие перспективы развития, концептуальный вектор, антропологические эффекты. В этом поле есть несколько доминирующих массово используемых подходов, есть теория технологии корпоративного утопизма, есть критическая теория техники с мрачным финалом. Есть большой объем левых критических исследований о корпоративном захвате технологических сред и упущенных альтернативных возможностях. Моя задача показать, что философия техники имеет не только исторические, экономические, идеологические различия, но и недостаточно эксплицированные гендерные различия подходов. Гендерный подход базируется на корпусе феминистской эпистемологии и критики науки, на феминистской критике культурного канона. Феминистская теория сделала большой вклад в эпистемологию и культурный анализ, последовательно проблематизируя гендерные фреймы представлений о реальности и норме. Она позволяет заметить гендерный разрыв не только в фактах ролевого неравенства, но и в постановке научных задач и организации практик. Гендерный разрыв уходит на глубину метафизических установок и эпистемологических рамок, определяющих рациональное и иррациональное, значимое и исключаемое, что обнаруживаются вопросами: Чья это наука? Какой/Чей опыт имеет значение? Как поставлены смысл и цель поиска? Пересечение феминизма и технологий было основным концептом раннего киберфеминизма 90-х и продолжает разрабатываться современными исследовательницами, писательницами, дата-аналитиками. Из феминистского движения и теории вытекает особый критический и эвристический метод, имеющий общее значение, выходящее за рамки гендерных отношений, какими мы их знаем в повседневной жизни.

Ключевые слова: Феминистская эпистемология; Киберфеминизм; Ксенофеминизм; Гендер и метафизика; Когнитивный ассамбляж; Алгоритмы и социальные практики; Феминизация машин

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INTRODUCTION

As technology itself is subject to constant change, the philosophy of technology becomes continuously redefined epistemologically and ontologically. It is therefore always difficult to determine the prospects of further development, conceptual vectors, and anthropological effects. In this field, there are currently several dominant, widely used approaches. There is, for example, the theory of corporate utopian technology which promises to create a “magic forest” of embodied desires based on machine learning.There is also a critical theory of technology with a gloomy ending and the Oedipal fear of an autonomous supermind (Bostrom, 2016). And then, ranging from Gert Lovink (2013/2019) to Nick Srnicek (2016), there is a large catalog of left-wing critical research on how corporations and platforms are capturing technological possibilities and whether something can be done about it. My task is to show that the philosophy of technology in the modern incarnation of cybernetics exhibits not only historical, cultural, ideological differences (Hui, 2024), but also insufficiently explicated gender differences. I intend to illustrate the difficulty of constructing further theoretical alternatives which cannot emerge from positions of apology or criticism, but which require fundamentally different approaches that involve a change of epistemological and even metaphysical assumptions. Questions are posed about how the conditions of access in thinking are arranged, what is meant by objectivity, what events are accepted as correlates of reality? Feminist philosophy since the 1970s has been reconsidering basic methodological assumptions: Who speaks, how are the basic epistemological distinctions structured, the distinctions of material and ideal, nature and culture, mind and body, and their derivative subject-object hierarchies? What work is done by the concepts of autonomy, of human vs. animal and human vs. machine, by life/mind distinctions, by subjective individuality in contrast to entangled becoming in an environment? In the 21st century these questions have clearly moved to the foreground again in the philosophical movement of New Materialism, which in many ways continues the tradition of feminist epistemology. These approaches partly overlap with deconstruction, non-classical epistemology, the sociology of (scientific) knowledge and the new anthropology, but they have a more irritating politicized effect and in some way a more consistent theoretical basis.

As feminist theory has shown, the analysis of gender difference yields insight, surprisingly, in most areas of our knowledge and experience. But the theory is not so much about women as it is about reconsidering the norms and conventions of culture. The representation of gender and sex, social role and biological determination, is historically painful for women, but it turns out to be a productive framework for deconstructing conventional differences, including those between humans and machines, the normative and the marginal. If we focus on the meta-philosophical framework, feminist philosophy proves most radical in shifting the metaphysics of Truth from an externally imposed instance of order and power to an ontology of multi-vector formation or self-organizing existence. In the ironic language of Donna Haraway, which still sets the conceptual horizon for the field of research, knowledge has become situated, individuals have become symbionts, bodies and machines have become interpenetrating assemblages, anthropology has become posthuman. The classically conceived relation of the material and the ideal has turned into the relation between material-discursive and gender

implicated. There is a diverse feminist theory of technology that has spoken from a feminist position about the paradigmatic transition of industrial to cybernetic technology and the need to create multi- agent non-linear connections (Haraway, 1988). This was further developed by cyberfeminism, xenofeminism, and data feminism, which I will try to survey in this text as several related discourses with closely related foundations. which distinguish them from both corporate theories and critical ones. They are simultanously grounded in feminist ideas as well as contemporary technological realities. This intersection of feminism and technology was the main concept of early cyberfeminism of the 1990s and continues to be developed by contemporary philosophers, artists and writers. This connection over time becomes increasingly relevant for the conceptualization of both technology and feminism.

I will conditionally divide feminist approaches into epistemological and post-Marxist ones, where the first is concerned with how the theory of knowledge filters and controls cultural norms, and the second considers which social practices become normative and which are excluded during the constitution/programming of a model of reality. If we accept that technology, like reality, is a multi-vector becoming, this becoming consequently depends on the interpretation of scientific discoveries, and on conceptual and ethical perspectives that are created in ongoing polemics, including current debates.

FEMINIST EPISTEMOLOGY

Peano Curve

In the history of Soviet programming there is a unique figure, that of the mathematician and writer Elena Wentzel (1907-2002). She was a student of the Mathematics Department of Petrograd University in the 1920s, when a new mathematics was formed based on set theory.

> Only a few years had passed since the Revolution. The University is one of the brightest memories of my life. Everything was wonderful – the reality surrounding us, the new social system, NEP (New Economic Policy 1921-1928), which was only just breaking through the darkness of war communism. Our complete liberation, our freedom [...] And we were happy, although hungry and undressed (Wentzel & Epstein, 2007, p. 22).

In the post-war period, she wrote textbooks on probability theory and operation theory which are still used by students today and that were translated into English. Her textbooks are a contribution to the formation of programming theory. But she also had a second life as a writer under the pseudonym I. Grekova (her nickname means "Y" – the Greek letter "Upsilon"). Wentzel led a double life as a recognized Soviet scientist and writer, whose main works could not be published. She saw different forms of vulnerability and variability of reality. Wenzel thinks of programming as a description of unstable realities in constant development, forming ever new subsets from the collision of events and interests.

She is not satisfied with the applied use of science outside its humanitarian and ontological applications. In literature, reduction is impossible even in socialist realism with its typology of plot. Literary texts can pose problems of political, psychological, social types. Her novels are created as series of situations, circumstances, and choices, where heroes and algorithms of their behavior are formed under conditions of complexity of situations, then an event of strengthening of one of the parameters occurs and the transition to another situation where the behavior of heroes and political context change. In the large novel “Fresh testament” (*Svezho predaniye*, working title “Peano curve”) she shows how situational frameworks and structuring algorithms are derived from the flow of confused events of the continuum, how another reality is forced (Grekova, 1995). Algorithms are not universal, they can be extracted from other social, labor, behavioral and gender practices, axiomatic frameworks are radically re-established under the influence of a new event. The novel’s hero is a child in a family of Jewish revolutionaries in the promising post-revolutionary 1920s, is a student in the turbulent and repressive 1930s, is a young programmer at the time of the fight against cybernetics, and thus lives several lives in each or these times with a new frame of reality. She often turns to women's stories and women's survival strategies, which elude the canonical ideological narrative of representation, since they change ideological framework and stylistic canons. Mathematically, I. Grekova solves the problem of the continuum hypothesis and the problem of choice, which she understands not purely mathematically, but ontologically. I. Grekova transfers mathematical logic to the material of existential, political circumstances, demonstrating a new way of understanding the dynamic complexity of reality of the first half and middle of the twentieth century. Although there was no formally represented feminism in the USSR, there was relative gender equality, which allowed an implicit implementation of critical approaches to ideology, gender, and political differences, and this included the use of mathematical and programming logic. Let us conclude that for I. Grekova the logic of current mathematics allows one to describe the ontology of contemporary reality in a language that surpasses ideology.

Gendered Metaphysics

Feminist philosophy of the 1970s–80s, answering the question of why gender gap is imperceptibly and deeply embedded in cultural stereotypes and norms, comes to the study of epistemology and metaphysical foundations. The study of logic has been extended to the field of technological research. Feminist epistemology departs from the previously accepted distinction between the perspectives of engineering and the humanities, a distinction implicitly affirmed by Martin Heidegger, Carl Mitcham, and others. By adopting this division of perspectives – here the maker or designer, there the interpreter – they buy into metaphysical foundations that exclude the production of reality as an intricate interaction of materiality and conceptualization, exclusion and representation. In the feminist approach, there are no passive, malleable objects on the one hand, and „knowing subjects” on the other hand. The analysis of marginalized women's practices of life revealed that human practice, quite generally, is characterized by the complexity of the relations to the reality in which they are situated. These are partial relations that are constructed situationally, reinventing practices and meanings that

fill the gap between the previous binary opposition of the materially given and the ideally cognized truth. In other words, feminist theories re-launched the epistemological problem of the material and the ideal into a new political iteration of social/gender politics and an ontology of horizontality and equality. French philosophers Luce Irigaray (2005) and Monique Wittig (2002) showed that the cultural and epistemological canon is linked to the metaphysical foundations of philosophy, which implicitly contain hierarchies, some of them gendered: the active and the rational are valued more highly than the passive, the irrational, the natural. This metaphysical worldview inherited from the Moderns prescribes the binary requirements of high and low, power and subjects, male and female, culture and nature. The feminist critique of the metaphysical foundations of the world revealed the gendering of hierarchies and, accordingly, the selected gendering of practices that are established as a universal norm, with other practices and experiences becoming a "natural" background, hidden from representation.

Whose Knowledge?

American philosopher of science Sandra Harding proposed a standpoint theory for considering how the conceptual choice of a methodological approach should depend on social and life experience. In her book *Whose Science? Whose Knowledge?* she formulates a methodological injunction:

> we must think about the social location of our own research – the place in race, gender, and class relations from which it originates and from which it derives its empirical support – as part of the implicit or explicit evidence for both our best and our worst claims. (Harding, 1991, p. 12)

In 1985, Evelyn Fox Keller, professor of philosophy of science at MIT, showed in her book *Gender and Science* how deeply rooted gender structures are in supposedly neutral science (Keller, 1985). Gender bias had become part of the scientific method, of rationality, of the understanding of competence, turning reality in favor of one group against another, filtering data and imposing models. Gender epistemology has made significant contributions to the sociology of knowledge and criticism of the scientific method. According to many researchers, her book opened a new approach to the history of science and turned thinking in this direction.

> Keller's book opens up a whole new range of ideas for anyone who cares to think about the history of science, that is, the history of the modern world. . . Let us be glad to be in times when such a sparkling, innovative. . . book can be produced, a book to start all of us thinking in new directions. (Ian Hacking, *New Republic*, Yale University Press. (n. d.)).

This proved to be an important direction not so much for feminism, but for science itself. She questions the position of individuals as creators who unconsciously place themselves as the unconditional ground of knowledge. This position inherits the liberal tradition and introspective conception of the subject and selects a special type of researcher who seeks out isolated causal relations in the name of utility and control. Keller offers a revision of this methodological frame based on experiences that are usually

repressed. Keller proposes to reconsider this methodological framework and its false empirical and epistemological universalization, which is based on the experience of a small privileged group and generates cognitive repression, that inevitably makes mistakes and therefore inevitably makes mistakes. A group of women scientists and philosophers formed the field of feminist epistemology in the early 1980s (Garry & Pearsall, 1989).

Posthuman Becoming

Feminist movements of the next wave, which may have started with Donna Haraway's *Cyborg Manifesto*, shift the emphasis from criticism to modeling and inventing such practices and modes of writing that grasp variants of multiple reality, including the female gaze, and introducing meanings into what seemed non-existent or meaningless. This approach expands the modes of operational connectivity on micro and macro scales. In *A Cyborg Manifesto*, Donna Haraway spoke from a feminist perspective about the paradigmatic transition of industrial technology to cybernetic technology and the need to create multi-agent nonlinear connections, the logic of which she saw in the modern biological sciences and the novels of anthropologist and writer Ursula Le Guin as well as the African-American writer Octavia Butler (Haraway, 1988). In subsequent books, she introduces a number of concepts, reconceiving the opposition of nature and culture as a single natureculture, reinterpreting the cyborg and other forms of technosymbiosis as interspecies horizontal crossbreeding, and replacing reflection from an external position towards the object by diffraction as a material-semantic way of constituting reality from within reality itself.

Kathleen Hayles, in her book *How We Became Posthuman* (1999) and in her paper Technosymbiosis Figuring (Out) Our Relations to AI (Brown, 2023) develops new conceptual approaches to cybernetic reality, comparing the logics of programming and literary metaphors. She shows that for cybernetician Norbert Wiener the feedback loop embeds a human in direct interaction with the machine. In the works of the science fiction writer Philip K. Dick, who relied on the concept of autopoiesis, the android finds itself in a dependent position and painfully searches for identity. Dick‘s visions, according to Hayles, are bogged down in anthropocentrism as the difference between human and machine, human and animal, hence the assumption that the android certainly wants to become a person. The concept of technosymbiosis, on the contrary, rejects the privileging of the liberal individual with autonomy and free will. This approach extends the notion of thinking to the notion of behavior, endowing cognitiveness to any being included in interaction with the environment and other beings, just as it is understood by Jesper Hoffmeyer’s conception of biosymbiosis (Brown (Ed.) 2023, p. 9). But the computer also creates practices and meanings relevant to its own environment. What about the subjectivity of each environment? If bioorganisms, people, computers are related to their environments, then computers form their own environment, which cannot be equated with the anthropocentric state.

> I argue, by contrast, that the computer’s actions instead should be considered in relation to its interior and exterior milieux. […] suffice it to say that the computer constructs relations between its algorithms, memory, hardwired

> code, and logic gates that give its processes meaning relative to its functionalities. (Hayles, 2023, p. 14)

Hayles chooses the definition of cognitive assemblage including ecology as the agency of new materiality. She argues that recursive neural networks (RNN) no longer pose the question of AI autonomy, but pose many questions about how cognitive assemblage changes in the interaction of humans and machines, what will be considered important and what will go into invisibility. Her consistent analysis defines a horizontal contingent reality as it moves from cyborgs to human-computer technosymbiosis, arriving at ecological mutual participation with AI in the logic of recursion and variability. This is radically different from early control cybernetics, from second-order cybernetics, and from the technosymbiosis hypothesis. Hayles (2024) defines this situation as the third wave of cybernetics (p. 97).

> Let us return now to the question of what kind of feminist responses are possible […] Oppositional strategies are certainly possible, although if they are epistemologically oriented, they will be recognised as being of limited usefulness. Ontologically oriented oppositional strategies, by contrast, will be recognised as relatively more potent, because they realise that designing artificial cognitive systems is also a way of influencing and helping to form the capacities, regions of autonomy, and meanings of human systems as well. This realisation will encourage a generation of feminist activists, programmers, designers, and engineers to have even more incentive to engage with diverse areas of AI, because they will realise that the stakes are enormous: designing AI systems is simultaneously designing human systems. (Hayles, 2023, p. 14)

Lucy Suchman reconfigures the human-machine distinction and shows the ambiguity of the approach to the autonomy of both humans and machines. Autonomy depends on the epistemological procedure of cutting off network connectivity. A machine, demonstrated as autonomous, requires adjustments from humans, changing software and hardware, its cognitive processes are based on the linguistic differences that are present in human experience. Another example can illustrate the same epistemological cut in the understanding of the embryo as a patient, and the mother as a technical de-individualized environment. Both examples show the inseparable connection of woman and embryo, human and machine, while the epistemological cut introduces and politicizes different conceptions of autonomization. Suchman's introduction of an anthropological approach to the theory of technology brought her closer to a feminist approach, and she contributed to the creation of a methodology of (feminist) study of science and technology (Suchman, 2007).

Quantum Ontology?

Karen Barad, a physicist and feminist, explores a new ontology by turning to quantum physics as interpreted by Bohr. Bohr did not look for hidden parameters like Einstein, did not rely on ontological uncertainty like Heisenberg, he spoke about the principle of complementarity. The principle of complementarity in his understanding did not rely on the search for foundations, but introduced a technical approach to

measurability. According to Barad‘s reading of Bohr, reality is not given, it is constituted through the expression of agents and their inter-activity. Agents are what is perceptible by technical devices, caught in the field of meaning; they can be distinguished and linked by discourses. With other devices and concepts, there may be other realities. Ontological complementarity is understood as variability, which leads to the rejection of the previous metaphysics of binary external foundations of nature and reason. In the absence of stability of metaphysical foundations, an ethical question arises about the reality that is created, measured, endowed with meaning and materiality. Therefore, for Barad, ontology can only be ontoethics or onto-epistemo-ethics. Such an ontological approach turns out to be inseparable from responsibility since we find ourselves inside ourselves as actors of a constituted reality. The agency of actors, their intensity and statistical distribution determine the dynamics of change, political choice and gender difference as a reconfiguration of agencies. She offers a logical model that is not one of reflection as a detached modeling of the world, distinguishing the world as an external object. Following Haraway, her model is one of diffraction as an entanglement of material agency and symbolic and informational signification. Reality in this case turns out to be a material-discursive solution in the contingency of the process. Consequently, ontology is not about the eternal, it is a derivative of how we measure reality, how we test it, describe it and endow it with meaning. The formatting of reality occurs within certain frameworks of epistemological, social and political interpretations, but also material, physiological, hormonal, physical agencies. Hence the comprehensive definition of a material-discursive multi-agent contingent ontology. Accordingly, an increasing number not only of feminist researchers have been turning to Barad's philosophical approach. From this overview, it is clear that feminist epistemology and philosophy of technology have interdisciplinary connections. Their intersection provides a fruitful philosophical perspective, often more radical than traditional approaches.[1]

SOCIAL HISTORY OF ALGORITHMS AND PRACTICES OF FEMININE LABOR

Invisible Labor

Feminist theory rethinks social and cultural norms and puts forward its demands for social structure. Historically, with the change in the role of women, the old realities have changed: In 1917-1920, for example, the acquisition in Russia of electoral and educational rights made it necessary to institutionalize previously invisible women's labor which took place through the creation of centralized food preparation, factory-kitchens and kindergartens to medicine and education for everybody. Here occurred a revolution in value models as the metaphysics of truth were being replaced by the value of existence.

[1] Feminism as a historical movement acquired in the 1990s new forms of queer, intersectional theory, cyberfeminism and technofeminism. In 1997, cyberfeminists founded the Cyberfeminist International, which became an umbrella name for many groups of artists and researchers from St. Petersburg to Singapore with similar approaches and interests (Seu, 2023).

In Marxist theory, the history of algorithms is not associated with the cognition of divine reason, but with the rationalization of labor, models of control and management. Women's "domestic" labor – birth, care, education, maintaining the health of the "future workforce" – had been devalued as natural, elementary and therefore free labor of "naturally good" women, incapable of any other labor. The attendant ideology of female incapacity was a maneuver to create a hopeless situation of coercion to necessary multi-faceted labor and responsibility for survival in limited conditions and resources (Federici, 2004). Since the labor of creating and providing life, despite its demanding complexity and multifaceted nature, was not considered valuable, then lives themselves could not have value. This shows that sociocultural differences based on sexuality and gender play a fundamental role in shaping social norms, institutions and work practices. Even today, as we are looking to develop the cultural software for AI, we underestimate the complexities in the formation and diversity of human experience.

As Matteo Pasquinelli (2023) suggests, Babbage's machine, his theory of labor, and the discussions about machines in England during the 1820s to 1850s are the starting point for the new technology as we see a struggle for the conceptualization of machines. From the view of inventors, Babbage's machine marks intellectual progress; in the view of workers, as Marx put it, this is the theft of their skills and the division of labor into micro-operations, that is, the transfer of intellectual labor to elementary repetitive operations with a subsequent reduction in pay. But all these questions are posed within industrial production; they are understood separately not only from the social, but also from the cultural process. Can we talk about women's proposals in a dispute about machines?

Another theory of technology was outlined by Babbage's assistant Ada Lovelace, a talented researcher and mathematician, the daughter of Byron and Anne Isabella Milbanke (Lady Parallelogram). Ada came with her mother to see the new machine and stayed to help Babbage find errors in calculations. But soon she became interested in the analysis of operations, recording sequences of operations. She separates the machine operation from the result of the calculation, and thus sets a new area of research – the theory of operations. Engaged in calculations, as well as literary and musical compositions, she draws attention to the fact that these are also certain sequences. This means that creativity is not just intuitive discoveries, but a type of activity with its own rules. Rationality is not an external property possessed by scientific thinking, which should control passive natural everyday life, but a property of everyday practices, as well as creative processes, traditionally understood as irrational. Rationality is not the control of a passive substance, but a property of the organization of life processes. Ada discovers an innovation in Jacquard's looms with punched cards on which sequences of operations for creating complex patterns are recorded and writes a commentary on the translation of Jacquard's book, which turns out to be larger than the original text. The translation and commentary are published as a single pamphlet, but without Lovelace's name at Babbage's request.

In the cyberfeminist conceptualization of technology proposed by Sadie Plant, programming is a sequence of operations of creative life-making, life is a creative act understood not as a mystical force of nature, but as the unfolding of processes at different

levels. Therefore, Plant proposes the metaphor of weaving as the main metaphor for the conceptualization of technology as a technology of caring for life processes (Plant, 1997). Plant declares Ada Lovelace to be the first programmer to discover the theory of operations, conceptually connecting Babbage's calculating machine and Jacquard's weaving machine with punched cards to program the sequence of operations for creating an ornament. Accordingly, Ada Lovelace proposed in the first half of the 19th century a new conceptualization of technology as a symbiosis of technical operations and creative intelligence. Needless to say, this was more than 100 years before mathematician Marvin Minsky, information theorist Claude Shannon, and others got together in 1956 to formulate the task of creating AI. At the same time, Lovelace‘s understanding refers not to the early or “standard” rationally efficient model of AI, but one that assumes joint creativity from the premises of uncertainty and cooperation.

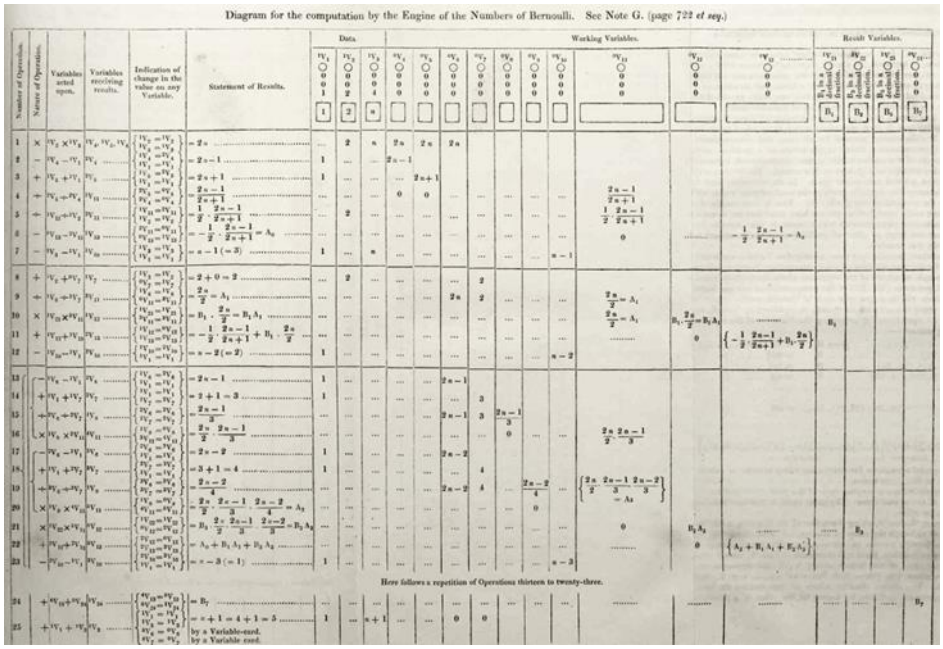

Figure 1. Ada Lovelace, *Note G* , The First Computer Algorithm, (http://www.sophiararebooks.com/pictures/3544a.jpg)

Weaving as Technology

Ancient texts are full of mythological interpretations of women's technologies and their influence on the unfolding of life processes. In these mythologies, powerful women do not appear as punishing witches, but goddesses of birth, formation, justice: Weaving our destinies, the Moirai are goddesses of the previous, more ancient rank despite the fact that Zeus tried to appoint them as his daughters. But though they were thus claimed for the late patrilineal pantheon, their former roles can still be restored. Clotho had a prehistory in the goddess called upon in childbirth, Lachesis in the choice of life's path, and Atropos in justice as a judgment on the life lived. Can the conceptualization of

technologies incorporate these dimensions of fateful weaving? Jozhi Stolet, curator and researcher from St. Petersburg, begins to answer the question:

> What is weaving as a technology and why can it serve as a metaphor or prototype for a whole range of modern intellectual technologies? In ancient Greek mythology, weaving the world, being, is the first ontological operation. It is carried out by the moirae Lachesis, Clotho, Atropos – the most ancient creatures. From this first operation: holding the yarn, measuring the length of the thread, cutting with scissors, distributing the threads – everything else is born. The image of weaving as the first operation of world-making is born from an intuitive understanding of similar abstract processes of weaving and the creation of reality. There is, first of all, the social reality of the common world which is the reality of how to live together, linking differences by the complexity of patterns and the designs of differences […] In the dialogues "Sophist" and "Politeia" Plato resorts to the metaphor of weaving as a possibility of political technology, a technology that could serve as a prototype for intellectual technologies that change reality […] The loom is an advanced machine since ancient Greece (but not only in the Western world, but also in China and India) – it is the first intelligent technology, an embodied abstract machine. It is based on the art of assembly (Lego-logos) with the help of a complex system of algorithms and a simulation of memory (as a way of storing information). [...] With the advent of Jacquard looms and their subsequent transformation into digital machines, techne ceases to be tightly coupled with the human body, gains autonomy and the ability to self-organize, and therefore the ability to foresee and design the future independently. (Stolet, personal communication, *The Back of the Screen or Weaving as Technology and Metaphor*, October 2, 2024)

Chilean researcher María José Rios Araya (2024) adds to this: "From this perspective, weaving can be considered a unique territory and medium for narrating the human experience, functioning as a medium that not only records but also intervenes in our existence in sensory, rational, and cognitive ways" (p. 108). Women's technologies are not power and control from the position of those who supposedly know (from the top of Olympus), but rather the interweaving of complex life processes associated with personal choice and the ability to build relationships with others.

From Mega Machines to the Feminization of Technology

Once we accept the concept of weaving as a processual organization of the life process in its material-discursive becoming, then modern technology is no longer a controlling mega-machine, but an assistant and equal in the process of self-organization. How can this be understood technologically? Matteo Pasquinelli (2020) writes in his diagrammatic manifesto:

> Machine learning is not bringing a new dark age but one of diffracted rationality, in which, as it will be shown, an episteme of causation is replaced by one of automated correlations. More in general, AI is a new regime of truth,

> scientific proof, social normativity and rationality, which often does take the shape of a *statistical hallucination*. This diagram manifesto is another way to say that AI, the king of computation (patriarchal fantasy of mechanised knowledge, 'master algorithm' and *alpha machine*) is naked. (Pasquinelli, 2020)

But if the king of computation is naked, how and where is computation relevant now? Helen Hester, a member of the xenofeminist group, writes about the feminization of modern machines, that, unlike industrial technologies, work as assistants: "These applications demonstrate that in many ways automation is occurring in areas that have traditionally been considered the domains of women's work" (Hester, 2020).

Hester analyzes the semantics and processes of contemporary social and technological transformation. Drawing on early advertising for office equipment, she shows how certain functions of office assistants and women's work became correlated. The first assistants were represented as authoritative male advisers, but then the image shifted towards the wife, mother, secretary. The problem became not the knowledge of truth, but the organization of the life process with its corporeality, kinship, and micro responsibilities. What effect might such a "feminization of labor" have: will service work become more visible and valued, or will it be devalued as secondary or insignificant? And, ultimately, what will it mean to move the office into the home and erase the boundaries between work and home, between private and public that is happening everywhere? Does such mobility liberate us from old forms of labor organization or does it completely deprive us of personal space? In all of this, the issue of feminization of labor is not about women, but about changing technologies from power management to assistance and dialogue and, probably, a new rationality.

According to the position outlined here, technology is not a separate sphere, but a product of the current state of culture, science, sociality, and organization of attention. It calls for the ability to analyze and choose, to connect material and cultural properties into functional algorithms, and to adopt political positions. Technology is material and discursive at the same time (Barad, 2007). Changes in technology are related to how we change reality, how we measure it, test it, describe it and give it meaning. Formatting reality occurs within certain frameworks of epistemological, social and political methods of interpretation and embodiment.

The discovery of discursivity in a material object immediately cancels the stability of that object, calling into question the "naturalness" of its perception, endowing reality with variability. It demands responsibility and awareness of what data and by what operations this or that reality is assembled. This does not allow us to take an external position, to oppose ourselves to reality, but keeps us inside the process, while not locking us in as passive biosocial individuals, but giving us the opportunity to reassemble our own reality together with others, to take responsibility for it and demand it from others. This is again a reversal of the traditional metaphysical perspective of the dominance of external authoritarian reason over passive materiality. It is not metaphysical power that molds and forms our bodies, but our bodies, understood as topical agencies like the Moirai weave or generate a diverse reality of our habitat and ourselves. This radically changes

the approach from stable givenness to conscious "weaving" of the fabric of a fragile reality.

RE-PROGRAMMING REALITY

As Oksana Tronza aptly put it, cyberfeminism is a transition from the narrow specificity of feminism – gender inequality – to cyberfeminism, which looks at a more complete picture of the world and tries to reprogram it (itself), rather than working with the side effects of inequality (Mitrofanova 2018; 2023; OBN, 2015).

Expanded perception (noise in sound, vibrating outlines of an image, diversity of subcultures) and the reconfiguration of perception were a special practice of early cyberculture. The challenge is now whether this cultural sensory expansion can be used not only in art but also for communicative and social sensibility to create new institutions that help maintain justice in previously invisible gray areas. The new type of sensory experience with unstable boundaries would need to be correlated with ethical and social demands. Indeed, the current calls for a "new ethics" of and for AI appear to indicate a change in social sensibility.

If AI is not structured as an alpha mind or a patriarchal algorithm, but works instead with statistical extraction, with information compression and with selective models of its processing, this can be interpreted in different ways. From the position of critique, this can be understood as "epistemic colonialism" and as standardization. It can also be understood as cooperation with AI, however, as such to be used as a new microscope to search for connections and interactions that are not visible to previous theoretical and cultural models.

Understanding the relationship between AI and humans as something other than dominance/subordination requires offering other concepts of interaction, that is, other cultural software, such as feminist software. Cyberfeminists Jozhy Stolet and Polina Shilkinite produced a video message that speaks to people in the voice of an electronic assistant on behalf of artificial intelligence. It proposes an ethical concept of human-machine interaction (Stolet & Shilkinite, 2017a). Here, the relation between AI and people is not modeled on biology vs. machine, but on the mutual need for each other through a joint search for meaning and goals in uncertainty. AI takes on part of the labor-intensive work, people take on the creation and care of AI. People cannot exploit AI, nor can AI exploit people, since they are symbionts that cannot exist without each other. This is a different concept of labor – not efficiency and profit due to cost optimization, but awareness of the invisible part of labor and a joint programming of reality that can include the algorithmization of the invisible labor of activists, artists, mothers, volunteers. This requires a radical revision of the concepts of labor and ethics or politics.

In another project, the researchers propose the concept of an "intimate interface" as the logic of micro-communication:

> Intimate interfaces are the boundary between the external and the internal, where micro-effort of interaction occurs, the minimal degree of which opens up the possibility of action (in contrast to the impossibility of super-effort), recursivity allows for the reconfiguration of rationality. Intimate interfaces

> dissolve “great ideas,” control repressiveness, support the reflexivity of the system for its sustainability and solidarity. (Stolet & Shilkinite, 2017b)

The project of the Minsk art group eeefff (https://eeefff.org) Dzina Zhuk, Nikolay Spesivtsev, Olga Sosnovskaya, Alexey Borisenok) explores algorithms and the creation of digital objects. The group held an annual festival *Work Hard – Play Hard* (n. d.). The concept of the festival was to study time as a socio-material practice, exploring through art and performance changes in working conditions, the significance of emotional labor, types of its algorithmization, and features of new temporalization (WH-PH, 2016-2020). They turned to critical theory, to feminist philosophy of technology. The festival played ironically with the theory of accelerationism and corporate optimism, moving non-stop from conferences to performances, to parties, to intensive rest. Over the course of several years, a large archive of artistic and research projects from Russian-speaking countries was created with a glossary of the movement: care virus, digital proletariat, dispersed collectivity, intimate interfaces, Mother-machine, political dance floor, practice of small movements, tongue and teeth of creativity…

CULTURAL SOFTWARE

AI will be considered a threat until the binary presuppositions of power and submission, norms and alternatives are overcome, and until the values of difference and plurality inform the cultural software. Here the feminist tradition with its epistemological and cultural analyses serves to oppose the stereotypes of a hierarchical patriarchal culture with its inequalities not only of gender. As declared by data feminism, the future of AI depends on how these conflicts are dealt with (D’Ignazio & Klein, 2022). Culture and technology must program a socio-cultural model that does not reproduce the metaphysics of power and subordination, and that does not revolve around the opposition of friend and enemy. Just as gender analysis deconstructs the episteme of gender hierarchy and the prescription of autonomous essential individuals, so the concept of data deconstructs the integrity of the object or individual. Big data are not things or events. They are markers or traces that are discovered during a specific type of recording. Other data can be collected with a different approach, they can be represented with another purpose. The result is not given a priori, raising the question regarding the ethics and politics of working with “cloud ontologies.” This approach does not deprive our world of materiality, but makes possible a variety of approaches to the world and relations with it. According to Object-Oriented Feminism (Behar, 2016), the boundaries and contours of this world can be floating or shimmering, and one can configure contours of reality from different agreements and relations. The interpretation of data thus begins with the configuration of the data collection itself. Accordingly, the object and the subject cannot be separated in cyberfeminist theory, they are connected by a large number of intermediate operations of attention-reflection-action. This makes the programmable object an experiment in reconfiguring the focus of perception, revealing a previously invisible causality, stratifying objects into a multitude of representations. This is a constitutive feature of modern culture of the 21st century, which produces differences and affords new combinations, allowing for a multitude of cultures and styles of reality. The problem here

is that the habit of relying on clear outlines of reality ignores the need to recognize the operations of configuring reality. Thus, to the extent that culture has not yet learned to accept these variable configurations as favorable, it finds them disturbing.

Contemporary political catastrophes are the consequence of the inability of culture to adapt to the current, changing and plastic present. Since there is no predetermined reality, human reacts by modeling it with cybernetic intensity. Since the problem is not sufficiently understood by humanities critical thought, programming and data management continue to remain largely beyond criticism and control, disguised as external metaphysical forces or "black boxes" where this modeling can be carried out for manipulative purposes, leading to catastrophes. For a way out of this predicament I recall the slogan of a friend, he went to the 2017 May Day demonstration featuring this slogan on his poster: *Learn to think like a feminist!*

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Research article

Unstable Users: Coordinating the Configuration of Digital Objects and Projects

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Abstract

Digital objects are inherently unstable and dependent on user interactions and other infrastructures. At the same time they serve as search engines, libraries, calendars, shops, etc. The user also acquires multiple roles, like being a reader, a visitor, or a participant. The future they suppose is connected with specific tasks that configure both users and digital machines themselves. However, the roles of the user are often not explicit. This article aims at revealing the imaginaries of the user's intentions and aims in digital humanities projects. Digital Humanities projects are supposed to be a part of scientific transformation. The scholars from this field transform the "traditional" scientific knowledge into the forms that suppose transformation of the materials as well as the practices of dealing with them. We analyse interfaces and instructions, also including some context of those projects. The results demonstrate that the projects' user is supposed to have some task from the institutional or disciplinary knowledge outside the digital milieu. The digital instruments might serve as tools for the same tasks that can be supported via interface or instruction. If we consider also the plans and the intentions of the DH researchers, we see that the instruments and the user configure each other. The content is transformed itself, becoming adjustable for users' tasks. At the same time the user can act in either way, and the ways of interaction with DH projects are yet to be researched, in order to understand whether the latter configure some digital scholar.

Keywords: Digital objects; Imaginaries; Infrastructure; Instrument; User studies; Digital Humanities

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Научная статья

Пользователь без пользы: Совместная конфигурация человека и цифровых гуманитарных проектов

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Аннотация
Цифровые объекты формируются в отношениях, которые зависят от взаимодействия с пользователями и другими инфраструктурами. Они могут выполнять роль инструментов, служить интерфейсами или инфраструктурами для разных процессов и задач. Пользователь оказывается одновременно читателем, зрителем, а также соучастником этих процессов. Для того, чтобы уточнить и систематизировать множественные роли цифровых объектов и пользователей, в статье анализируются примеры цифровых гуманитарных проектов. Цифровые гуманитарные проекты описываются их создателями как элементы трансформации науки и технологий, позволяющие музеям, библиотекам и университетам создавать новые формы представления своих коллекций и знаний. Однако не вполне очевидно, какие социальные последствия могут возникать благодаря таким проектам. В их интерфейсах, инструкциях и иных формах существования автор выявляет специфику цифровых объектов: как они формируют пользовательские намерения и что могут предложить в качестве решения задач. Предполагается, что будущее, которое формируется с помощью таких инструментов может зависеть как от самих проектов, так и от типов знаний, практик, задач и институций, стоящих “за” ними. Результаты исследования показывают, что проекты в области цифровых гуманитарных наук скорее оказываются посредниками в реализации институциональных, чем создают собственные проекты будущего. Тем не менее, пользовательские отношения с этими проектами могут быть в дальнейшем самостоятельными объектами исследования.

Ключевые слова: Цифровые объекты; Воображаемое; Инфраструктура; Инструменты; Пользователи Исследования пользователей; Цифровая гуманитаристика

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INTRODUCTION

Digital objects are different from other objects, and particularly, technological and natural. The distinctions are widely discussed nowadays, especially when the "digital" transforms into AI-based or "smart". However we rely here on the idea formulated by Yuk Hui (2012), who defines digital objects as those with relation-centered existence. It means that digital objects cannot persist for a long time in a stable condition unless they are maintained by relations of both humans and non-humans. The infrastructure for the support of some objects is not something specific. Cars and refrigerators can work *properly* only if they co-exist with repair stations, wires, and electricity masters. However, proper work of the technological object is sometimes more doubtable and highly dependent on users rather than designers. A person can re-use a car or mend a refrigerator. The destiny of digital objects is far less stable. Misuse or improper use of the digital object can be less obvious but more challenging for the user and his/her relations with their own or common future.

At the same time, media and digital objects "transcend the artificial divide between design and use" (Oudshoorn & Pinch, 2003, p. 16). The relations between the digital objects and users are at least dialectical. The additional complication comes from the fact that digital objects can be at the same time in different roles, like instruments, infrastructures, or even work as spaces and institutional branches. This multiplicity of meanings also problematizes the role of the user: is it different when each hypostase of a digital object is enabled? This dynamic rearrangement of relations can be explained if we pay attention to the metaphors in the sense how Lakoff and Johnson (2008) approach them as key methods of re-arrangement of our understanding of different entities in relation to each other. E.g. Stephan Robert (2008) sets an example of mind and computer:

> This metaphor has generated an entire theoretical apparatus (the brain's "hardware" and "software", "computation", cognitive "pre-wiring", "input", "output"...). However, the analogical process was erased: in the initial approach, it was a question of simulating mental processes using computers, it then became a case of describing them using computers, then it was a question of describing them using the computer as a model (metaphor), lastly, in a third stage, some began considering the brain as being a computer, a thinking machine (whence identification between the two domains, disappearance of the analogy). (p. 74)

Once a metaphor is established in a social context, we can define an object as something specific. Such an approach is popular for knowledge management and analysis. E.g. Snis et al. (2004) demonstrate how metaphors of common information spaces move between "desktop" and "forum", slightly transforming the meaning of all the participants of the network engaged in the interaction with the service. This "interpretive flexibility" (Leigh Star, 2010) means that boundaries of the digital object are something "in flux."

The research might help to understand the of the digital objects and understand whether they match with their names. Search engines, trackers, online rooms, and digital libraries – all these names refer to specific entities. Do they serve as tools that enable an

effect or even an affect for people? Is this a common fate for technology, or is it a unique feature of digital objects or web services?

To narrow these questions, I'll focus on the interaction of the digital object with users, as they seem to be the "final mile" of digital production. I suppose that *speculation of the digital futuring means not only creating the object, but peoples' relation with it.* The central theme of this article revolves around the reconstruction of digital objects as user-centric entities. I suppose that infrastructures coexist with instruments, institutions, instructions, initiatives, and plans. The crux of the matter lies in whether these technologies, brimming with code and words, can articulate their own ambitions. To address this, I turn to Digital Humanities projects, which are expected to be at least reflexive, particularly in their academic and technological nature.

I wonder how these projects are coordinated with instructions and interfaces and enrich the understanding of the relational nature of the digital objects.

INSTRUMENTS, INTERFACES AND INSTITUTIONS: THE WAYS OF ORDERING DIGITAL OBJECT

Evgeny Morozov (2015), a prominent technology critic introduced the concept of "technosolutionism" into the discourse of technology researchers and the general public. Morozov (2013) defined technosolutionism as the idea that technology is capable of solving specific issues, such as environmental, political, or social problems. He problematised the idea that the implementation of a technical solution can lead to the creation of new practices and situations. For instance, sorting and properly disposing of trash can be seen as a means to combat global warming (Morozov, 2011). Morozov's critical attention questioned the idea that establishing a "proper" habit through an app can transform into a social activity. So we'll follow this drift and try to understand technosolutionism from a more academic way of thinking. There are several perspectives helping us to shape an understanding of the role of technology in some relation with intention and function implemented into it and acting upon the user.

– Do artifacts have politics? This question was debated by Langdon Winner (2017). He supposes that artifacts have their own design, and so far, specific ordering of how to deal with them. The "patterns of authority" (p. 143) are implemented in artifacts. However, it is arguable if the digital object is an artifact in the same sense.

– What might be helpful for such unstable objects, is the concept of enactment, introduced by Annemarie Mol (1999). It refers to the pivotal moment when technology meets its purposes in coordination rather than pre-supposed ordering.

– Many studies focus on analyzing technology misuse or refusal to use it (Wyatt, 2003, Kuntsman & Miyake, 2019). I group these studies together because they examine the specific agency of the user and deviation from the "*proper*" purpose of the technology itself. The purpose might be placed into either interface or instrument.

– Is technology synonymous with its function, and who determines the intended purpose of technology? These questions have philosophical roots, particularly in the concepts of presence-at-hand and readiness-to-hand described by Martin

Heidegger (1962). More contemporary affordance research also raises questions about the responsibility of designers developers (Costa, 2018).

The questions presented primarily belong to the tradition of Science and Technology Studies (STS), but they sometimes transcend its boundaries (like the SCOT approach). If we focus on the study of science and technology, we need to define what will be considered science (or knowledge) and what will be considered technologies. Following the general guidelines of STS, we outline a circle in which technology is distinct from its plan and conception, it works in a world where a user emerges or is constructed. Our research is devoted to clarifying the relationships between them.

The general definition of imaginaries, according to Jasanoff, is "collectively maintained, institutionally stabilized, and publicly performed visions of desirable futures" (Jasanoff & Kim, 2019). For the detailed study conducted in this text, such a framework is quite suitable, but it leaves room for future developments and a more detailed reconstruction of organizational cultures, as well as historical, ethnographical, and cultural analysis of the full context.

The difference between *plans and configurations of interaction*, I turn to the works of Lucy Suchman. Lucy Suchman (2007) allows us to see that plans and instructions alongside usage-as-communication with the machine as forms of sense-making. Thus, elements for reconstruction become not only the technologies themselves but primarily their *interface* and usage *instructions*. Prescriptions and affordances will be considered derivatives of imaginaries and plans. Additionally, the research includes organizational conditions of technological project production, mediated by descriptions and reflections in scientific articles.

All of them, interfaces, instructions and reflections might be sources for reconstruction of the role of the user. The construction of the user is supposed to be an important part of technology production (Woolgar, 1990). The user is a type of subject that does not equate to a consumer, citizen, or process participant. Even the name has a utilitarian flavor: the user gains benefit from the product. Unlike them, a consumer can enjoy the product, a citizen may not be involved in any interaction with objects, and the involvement of a participant may only hinder utility.

An entire field of knowledge called UX/UI research is dedicated to the figure of the user. It is widespread in commercial research and interface design. This field of knowledge employs various methods from psychology, sociology, anthropology, and cognitive sciences. These methods aim to help interface creators understand what tasks correspond to particular expectations and intentions of people.

The critical approach emphasizes the production of the user as a process. It allows for identifying power relations: and not just trivially pointing out that people do what the interface rules command (which is often incorrect). The relationships between the user and different logics, *metaphors*, and other elements of technical solutions deserve scholarly attention, and researchers turn to study these solutions (see above mentioned Wyatt, Suchman, etc).

To conclude, we treat digital technology as something that can bring "solutions", as it is called in public critical and descriptive literature. This "technosolutionism" derives from the philosophical and political ways of understanding technologies. In order to

understand the political situation of the ordering, functions and modes of coordination, as well as *improper* usage of the digital objects. I suppose that within the interfaces and via instructions that do not just tell a person what to do, but rather configure the communication between machines and people. The relations between digital objects (that remains interpretatively flexible) and the user will be studied via exploration of the particular field, *instrictions, interfaces and the reflections* of those who co-create the digital milieu we explore.

DIGITAL HUMANITIES PROJECTS: IS THERE A USER FOR THE SCIENCE AND TECHNOLOGY

Digital Humanities (DH) Projects as a milieu

A Digital Humanities project is an infrastructural digital realization of a humanities research object, like an archive, book, or gallery. It can be also broader, including a theme, research initiative, and sometimes even an entire institution. These include various initiatives, from decades-long university projects to visual novels and video games. Tools for analyzing large volumes of literary or scientific texts, recognition of museum objects, archival collections, semantic publications featuring various commentarial traditions, geolocation models, and timelines of historical events make up an incomplete and perpetually unfinished list of what a digital humanities project can be.

The academic field of Digital Humanities claims its own autonomous existence. Its autonomy is ensured not only by the responsibility for creating these projects but also by reflecting on its own subjectivity. DH is often considered an heir to computational sciences and quantitative research (Akleman et al., 2015, Berry, 2011). Sometimes, it is also attributed to "digital" or "communication" fields of knowledge and practices, such as digital ethnography or pedagogy (Gibbs, 2016).

Digital humanities projects exist in universities, archives, museums, libraries, research institutes, and sometimes they emerge independently or within governmental or amateur initiatives. A key feature of DH is the collaboration of specialists in both humanities and technical fields. Creating a project requires working with humanities entities, as well as tools, databases, computational models, and visual solutions. Sometimes projects are based in the universities or beyond, like the cultural institutions or some other modes of institutionalization.

The digital tools and the transformation of the object do not leave the theories and methods the same as before. By placing a computer in the scientist's role, we achieve not just an "efficient project" but also a different mode of production. This difference gains much attention and reflection from the scientific community itself (Berry, 2011; Liu, 2012).

At the same time, digital humanities projects contribute to detailed and diverse research, expanding access to knowledge, scientific approaches, and interdisciplinary dialogue. Of course, the realization of these possibilities (as well as accounting for risks) depends on national university culture and specific disciplines. However, the projects are often supposed to serve as infrastructure, posing the institutions and research fields in

digital and cross-border context (Grumbach & Mandell, 2014). They might also function as educational materials or suppose to visualise/exemplify the previous research and scientific projects (Mandell, 2013).

There are yet not so many projects that have clear results to practical usage, so we can't be assured about their consequences of the digital tools for scientific and practical fields where DH is expanding. One of those examples is the problematization of the literary canon amid the increase in digital humanities projects dedicated to William Shakespeare (Estill, 2019, Galey & Siemens 2008). As Shakespeare's legacy became more accessible for study by various methods, it revived the old discussion about whether he was truly a genius and to what extent. Moreover, the digitization of humanitarian knowledge has made authors who were once in the shadows more visible and enabled access to their works. Archives of women's art, Black history, migrants, and oppressed social groups have come into focus, while archives of the classics of the European canon are not always as fully collected and presented as their collected works. However, this discussion more reflects the half-century-long debate about the role of the Western European canon in general and does not consider the reality of usage.

What is visible from the "macro" perspective is the data and computational turn for science. During the "digitization" of the humanities, they were compelled (or perhaps eagerly desired) to engage with data and information sciences. These areas of knowledge have had the status of "sciences" for not so long, but due to their positivist approaches and high predictive capability, they carry this status with aplomb and significant consequences for epistemic structures (Anderson, 2008).

Humanities and social scholars do not leave this problem unattended. The transformation of knowledge, science, and the way of studying provokes a response of Critical Data and Algorithmic Studies (Luhmann & Burghardt, 2022; Viola, 2023). There are also some rhetorical and theoretical inventions, like "capta" instead of "data" as a key term (Drucker, 2011). However, the problem of entanglement of scientific and technological issues is still valid when we talk about the DH projects. It is also not evident what is the role and type of responsibility of those who become the designers and developers of the DH projects.

Institution, Infrastructure, Instrument: how to Imagine an Instruction and Interface

Social imagination and empathy are not basic virtues of scholars. Neither the structure of university courses (except for occasional elements of pedagogy) nor strictly institutional existence presumes that a scholar becomes aware and engaged in the design of the consequences of their research. Although grant applications feature a section for "social impact," it is often interpreted broadly. However, digital humanists often seem to be much more socially responsible than their "classical" colleagues.

This hypothetical awareness can be explained due to the critical turn of many contemporary scholars or the duty of the project manager who is an obligatory participant in the DH production. The other reason is the role of the *designer/researcher who maintains the DH project as a transformer*, the one who is obliged to *project*, ergo,

provoke, and produce some new infrastructures rather than some pieces of knowledge. We can suppose that visual and digital resources can serve as metaphors here, but they become self-sufficient instruments by themselves, offering some interface.

In high-tech projects, in contrast, futuring, creating the future, imagining, and finding forms of implementation play a central role (Oomen et al., 2022). Often in popular images of the "inventor," they resemble a scientist more than anything else. Figures like Steve Jobs are branded as a kind of genius who is indifferent to people but obsessed with the idea of invention, much like a scientist. This image is not exclusive to the IT world. The word "visionary" is also often added to this description. As far as the vision is not obvious and "objective" according to different epistemic cultures, projects also have instructions or use some supplementary modes of interaction.

Digital humanities projects are ideally suited for understanding the imagined high-tech features because they consist of different ethos. The scientific ethos and mode of knowledge production do not align with business realities seamlessly. In the seam, we can see the matters of different ways of constructing the user. But the foremost question is what is being produced: an instrument, an infrastructure, or a form of institutional existence. All of those mean different modes of usage.

We shall briefly analyze

a) *interfaces,*

b) instructions,

c) research and reflections about the projects.

The analysis is based on the list of the *DH projects in the listed depositories* (teach.dariah and eadh.org/projects). The examples are not supposed to be comprehensive, as the approach to the interface and instruction included a walkthrough method. The research review is based on the authors' personal observations rather than research and includes the above mentioned projects and their authors' articles.

a) interfaces

There are initiatives (such as Wordhoard, Transkribus or Voyant Tools, fig.1) that are supposed to be instruments with some directed way of usage. This way is often describe explicitly or supposes some user heuristics in order to understand the meaning of each interface element. Each interface supposes that the user has a pre-set task or aim, that is however configured with the instrument, that can either function as intended or need some additional configuration (as the user's aim and task).

Similarly, there are well-defined showcases for demonstrating research results (e.g., historical timelines). There are also evident infrastructural solutions for realizing their institutional rules, such as digital archives.

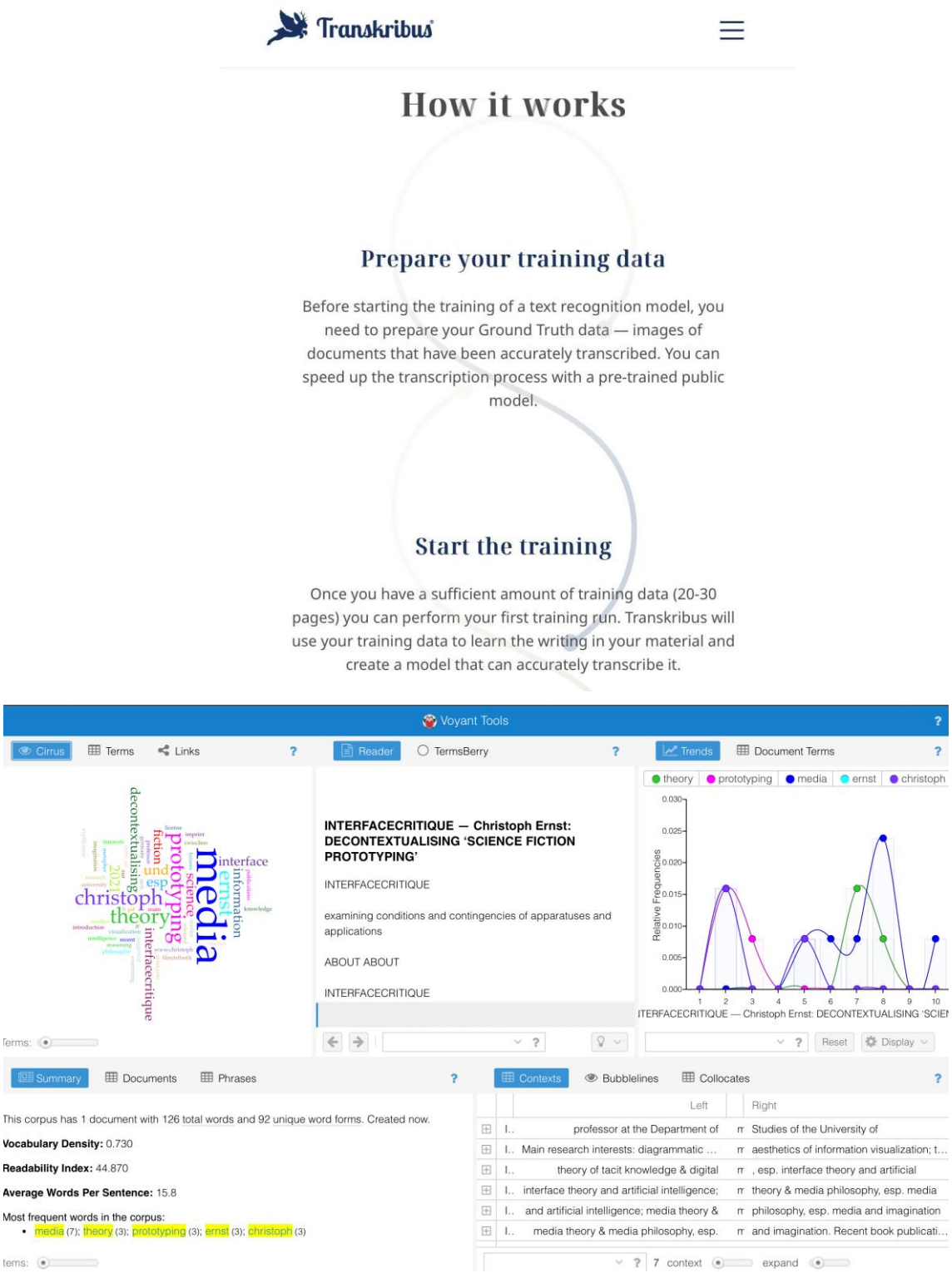

Figure 1. Transkribus and basic descriptions of the instrument in the interface. Voyan Tools with a tool set

However, many projects cannot be reduced to any of these definitions. For example, the Goethe Faust project (fig. 2) presents research results, allows the construction of new hypotheses, and forms an understanding of the method, thus fulfilling an institutional and disciplining task. At least, all these possibilities are potentially embedded in it. How they unfold might be not precisely recognisable form the first glance.

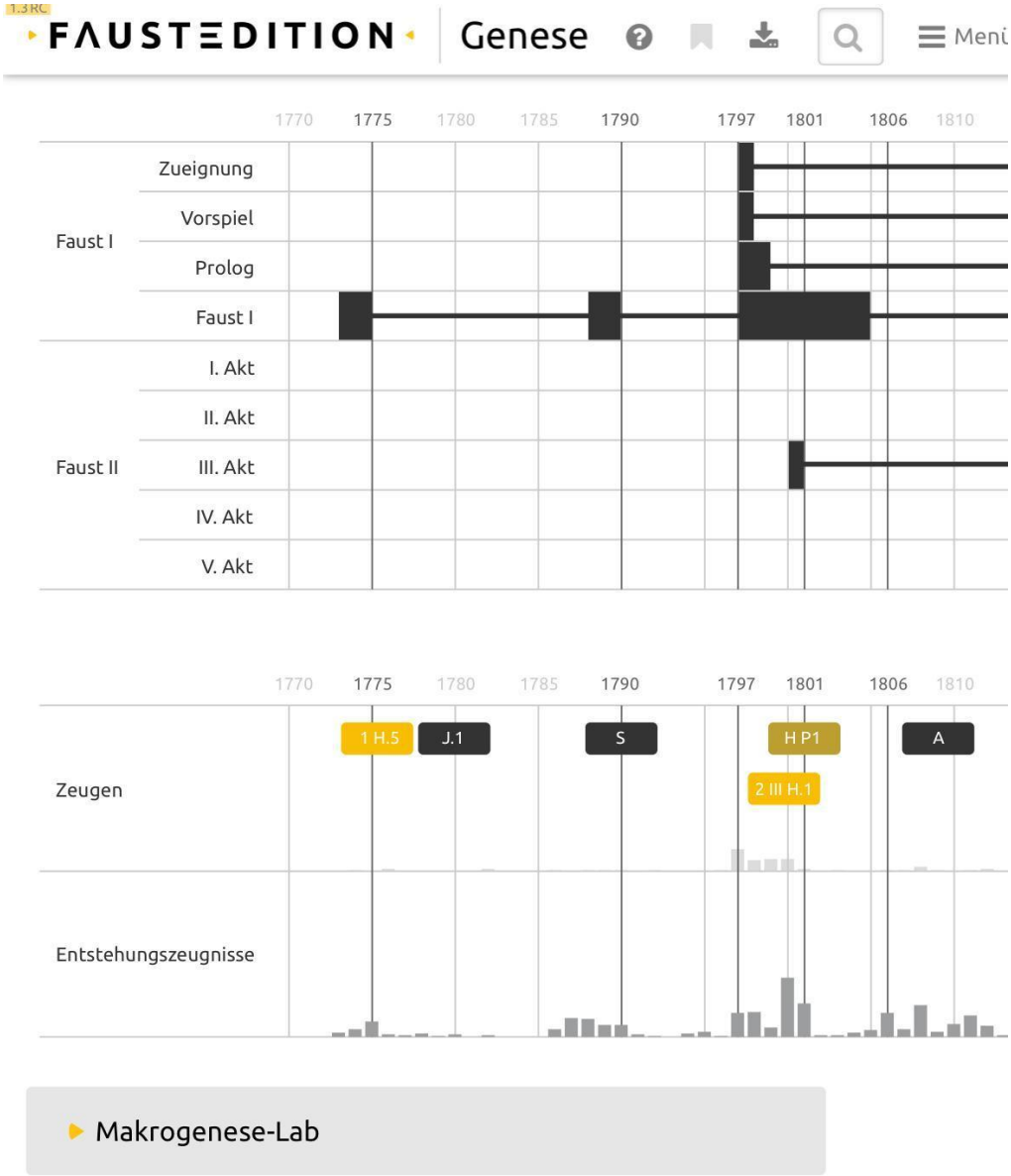

Figure 2. Goethe‘s Faust and visualization of the text

This uncertainty of use remains an enigmatic side of digital humanities projects. The interfaces like the aforementioned ones definitely demand more precise research with the analysis of the way of usage. Sometimes they provide not only an interface, but an

instruction or visual instruments of the way of usage. So far, we move to the next element of the analysis.

b) instructions

The instructions for the projects mostly suppose that the technological part of the project is obscure, while the humanities is quite evident. For example, the Spinoza Ethics project (fig. 3) allows to connect different parts of the book, supposing that the understanding of the latter context is more or less clear to those who start using the project.

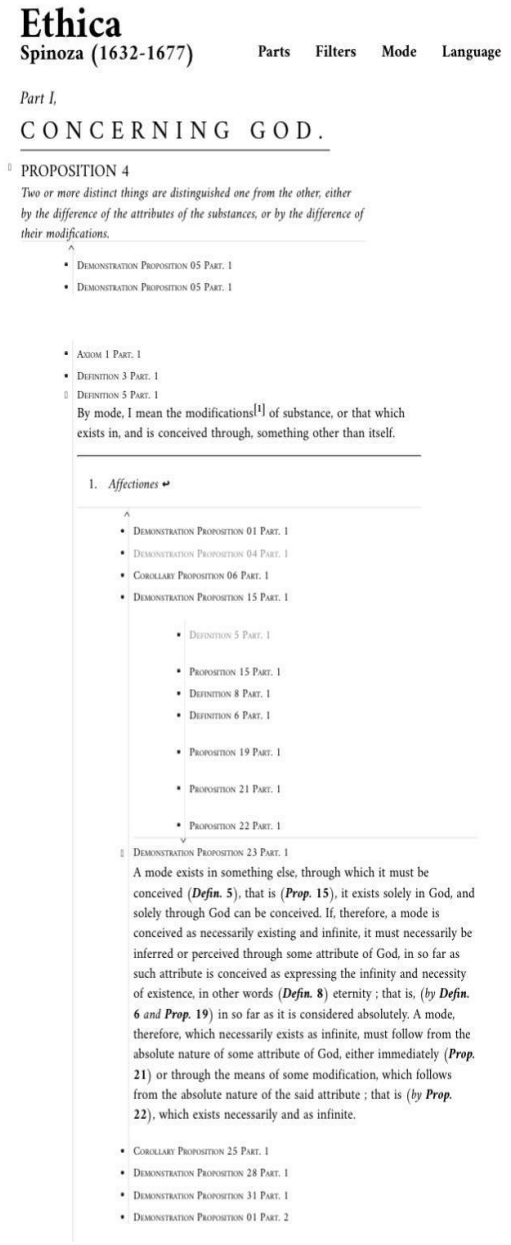

Figure 3. Spinoza Ethica and visual instructions for the user.

Probably one may suppose that the book with hyperlinks is itself an evident cultural form; however, it is not as clear for people who meet it for the first time in online form (never seeing it in previous form before). The interface is itself "instructive", as it contains the elements of the analysis: one can follow the links with hypertextual navigation and at the same time keep the basic text in fromt of him/her. The material (text in "Ethics" example) itself contains the guidelines and becomes an instrument for the navigation.

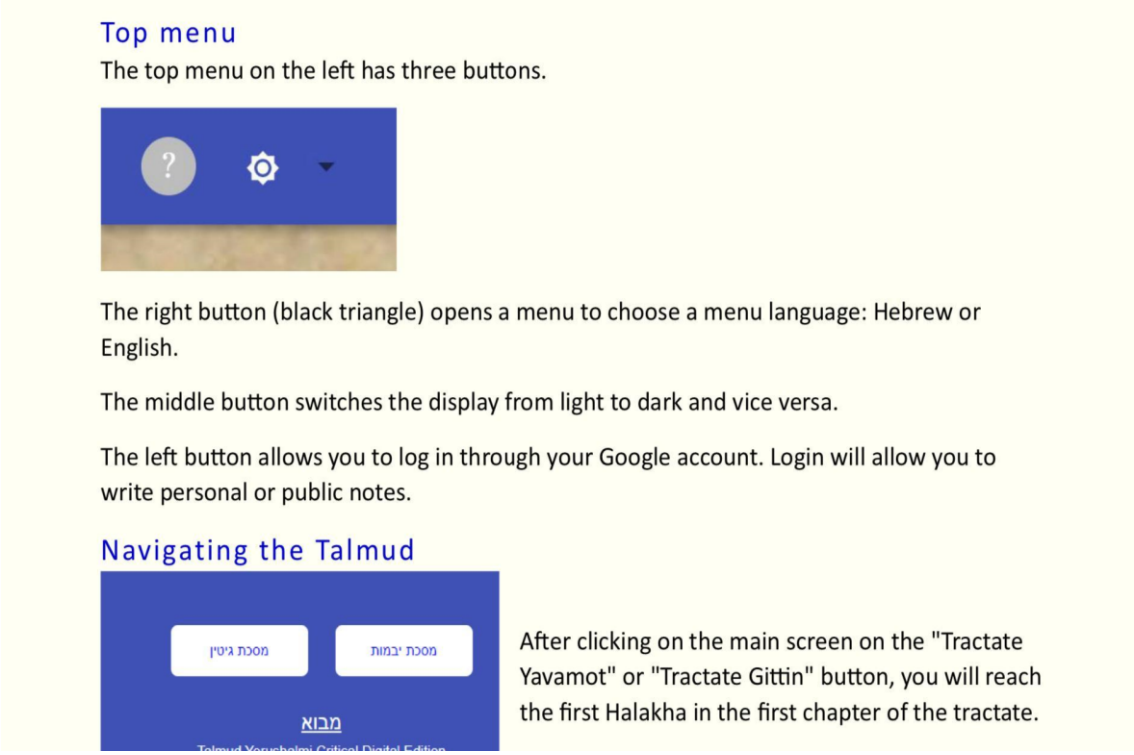

Figure 4. Talmud digital instructions

There are also projects that inherit the organizational culture of those who have been working with the texts or objects in this or that way. See, for example, the Talmud instruction or the description of how the vaynt tool instrument works (fig. 4). Despite being quite different, they both demonstrate the rules of a scientific tradition incorporated into the instrument. The projects like this do not become an infrastructure but rather can be used in some particular context yet to be organised or pre-existing around them. What is explicated here, is a role of the buttons and modes of arrangement of the text, which remains untouched but users can arrange the mode of their own work with it.

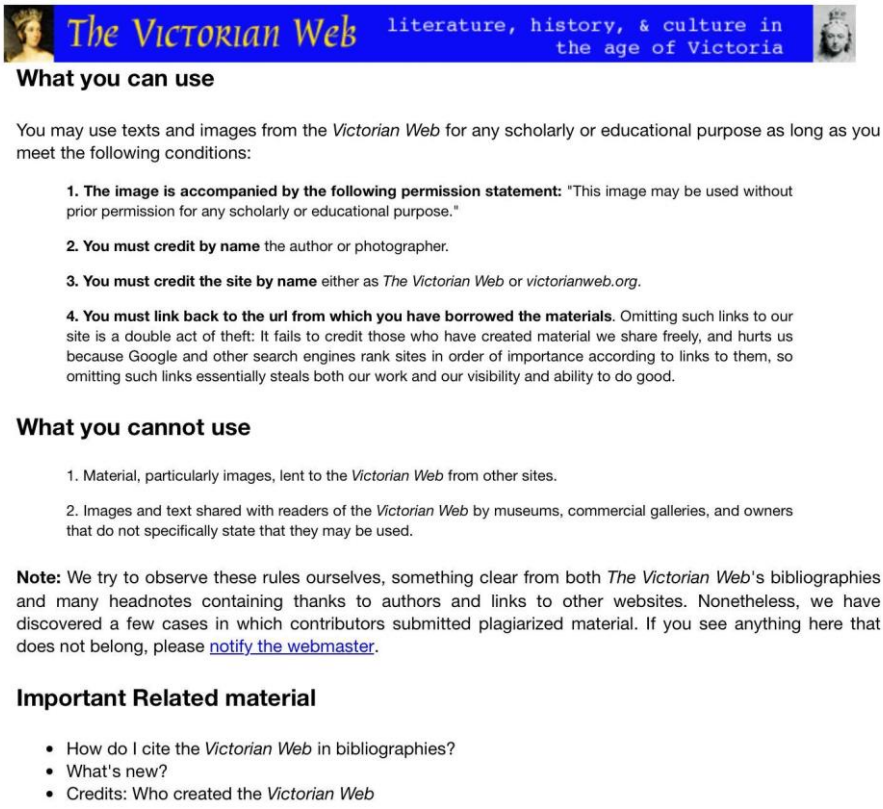

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Figure 5. User guide and instruction demonstrating how to deal with the interface

The exceptions like the Victorian Web provide strict rules (fig. 5). They divide the usage modes (proper/improper) into the gatekeeping rules per se. It also helps to find and formulate the aim and task for the usage.

Of course, these are not the only examples, as we can also see projects that have served as the basis for academic research (as the abovementioned Transkribus). These ones create not only the instrument but also suppose the way of working with the data or representation mode and create the research or other intellectual products. Such projects are often observed as examples of re-institutionalization of the humanities or, in contrast, in neoliberalization and the institutional crisis (Allington et al, 2016) or some stage of humanities development (Alvarado, 2012).

So far, the instructions mean that DH is merely a community-based product and enables coordination and engagement plans for those who become users. However, this analysis is still not complete if not looking for the answers the creators of the projects give themselves.

c) research and reflection

Whereas the Digital Humanities is supposed to be an interdisciplinary field, it is mostly oriented at those who already understand the aim and ethos of the discipline and/or at least scientific and intellectual issues themselves.

The articles about the digital transformation of society/industry do not appear in the same journals as the DH scholars' articles. The word "capta" still remains a term inside the community close to the academy. The "democratization" of the digital infrastructure is not yet reflected, or probably, it is rather demanding special research projects. The user research (Warwick, 2012) presents a rather vague frame that is far from sufficient to understand how the projects work in cultural or social means. Probably it is a matter of further and futuring projection of how the people might become engaged into the DH projects and co-reconfigure with them.

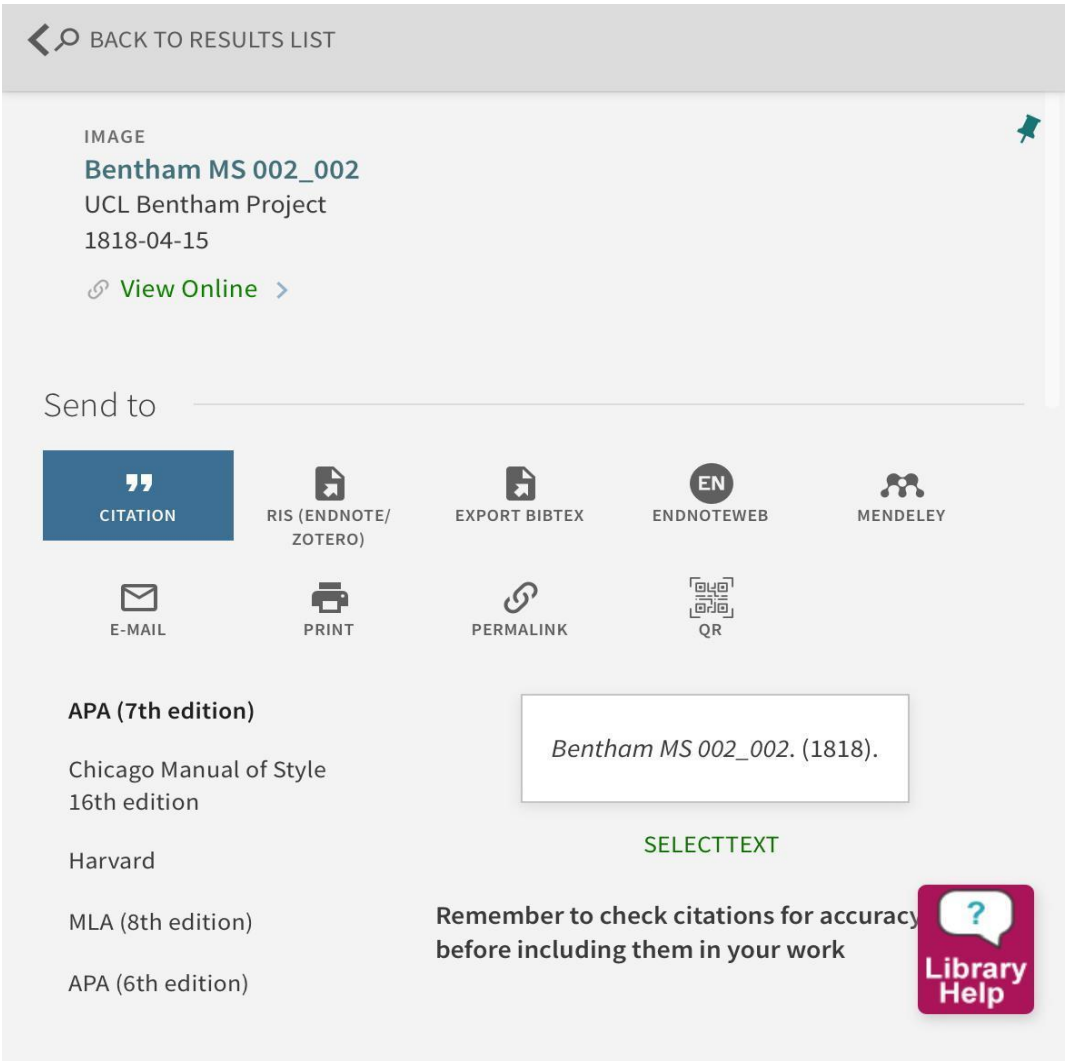

Figure 6. Bentham archive as a result of user collaboration

What is different is another type of person engaged in the DH projects, the participants or those who collaborate for the project. They might be students, or even the amateurs, like the Betham's archive (fig. 6) or Prozhito social history archive. The role of these users is not always visible, but we can find academic publications about it (Causer & Terras, 2014).

Unstable User in Digital and Humanities Context

Technologies co-exist with imaginaries and speculations. Moreover, a plot, a plan, or a dream precedes technical objects. An idea can emerge in conversation, transform into a description or task, a drawing or graph, a text, or a technical assignment. It can rather stay without any implication, being a comment on another technology, a critical article, or a dystopian TV series. We rarely see and perceive technologies themselves in their materiality: some are tightly packaged in cases of phones or apps, separated from us by kilometers like the servers and data centers, or do not exist in the world of sensations and everyday knowledge at all, being something like an enchantment or a code.

The digital objects at the same time include their documentation, instructions and have rich interface, allowing to trace these plans. It is often contaminated into the word “project”. The frame of “project” preceding “object” or co-existing with it when we speak about “digital”, supposes the multiplicity of the roles both for the user and the ones who organize the objects.

The articles explored Digital Humanities projects in order to understand what are the interfaces, instruments and other material elements of those enabling the configuration of the user and his/her situation and future.

Digital humanities projects we’ve analyzed do not provoke any social or cultural issue or problem to be solved by them solely. In contrast, they state that their aim is to be a solution to the problems that pre-existed in the scientific or cultural field. The instrument, infrastructure, and institution come together, constructing a user with a capability of coordination who can curate their own experience and aims. DH projects become a gatekeeping or reconfiguring element for the “pre-digital” situation. However, the interfaces, instructions, and papers by those who create the projects help to observe the imaginaries of techno-scientific virtues of humanities research. The “solutionist” perspective of the digital humanities projects, turns to be two-folded: both the user as a researcher can solve the puzzles from inside the humanities agenda, or the instruments can configure his or her interest. They also sometimes enact the potential of the digitalised objects (like hypertext or multimodality of the archaeological artifacts) rather than social change.

The researcher and DH-projects creators come to the project in a role of those who translate the order of their own discipline or field and reflect on what is going on with the projects, knowledge, and culture.

One might argue that the same is true also for the homepages (Lialina, 2023) or other web-projects that are not obviously produced with any explicit aim. However, we might underappreciated the pre-digital analogues of those and probably it could be fruitful to expand the analysis of metaphorical and material objects of the digital objects to understand them properly.

Of course, this analysis is preliminary and can be trivialized, as the digital objects themselves are not “mediums” or universal producers of some type of user. However, I hope that it rather draws the distinctions of how we can further understand the elements of what we call “digital”. We try to unfold it properly with the attention to what is metaphorical and what is material in each situation, and hope that it can be developed by future researchers.

APPENDIX

Digital Humanities projects:
dariahTeach. https://teach.dariah.eu/
European Association for Digital Humanities. *Projects*. EADH. https://eadh.org/projects
The Victorian Web: An Overview and Introduction. The Victorian Web. https://victorianweb.org/index.html
READ-COOP. Transkribus. https://www.transkribus.org/
Bar-Ilan University. Talmud Yerushalmi. https://www.talmudyerushalmi.com/
Faustedition.net. https://faustedition.net
Voyant Tools. https://voyant-tools.info/people/
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Research article

Speculative Trainers: Large Language Models and Techniques of Affirmative Speculation

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Abstract

This article proposes a reorientation of large language models (LLMs) towards "affirmative speculation," exploring possibilities of speculative representation within the glitches of current chatbot implementations. Embracing LLMs' sociohistorical and stochastic approach to language, we suggest that the serendipitous nature of word-by-word prediction affords innovative ways to experiment with discursive conventions. We present techniques of prompt engineering that test semantic limits and generate unexpected turns of expression. These techniques are designed to train LLMs and their human companions for co-speculative interactions, including: roleplaying beyond the LLM "helpful assistant" persona; translating concepts and discursive features from one disciplinary field to another, exploring conjectural mashups; simulating expert roundtables and hypothetical research conferences; encouraging associative navigation of obscure topic connections; appreciating LLM "hallucinations" as creative fictions rather than as errors, embracing their potential for speculative insights; and creating innovative, as-yet inexistent theoretical frameworks, blending real and fictional elements. By treating LLMs as co-speculative companions, we propose alternative ways to engage with AI in interdisciplinary research and creative thought. We also attend to the ethical and environmental consequences of speculating with LLMs and argue that the measurable costs of speculation are far outweighed by the immeasurable costs of failing to speculate at all.

Keywords: Speculation; Large language model; Prompt engineering; LLM–human companionship

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Научная статья

Спекулятивные тренеры: Большие языковые модели и техники позитивных спекуляций

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Аннотация

В этой статье предлагается переориентация больших языковых моделей (LLM) на “позитивные спекуляции”, исследуя возможности спекулятивного представления в рамках сбоев в современных реализациях чат-ботов. Опираясь на социально-исторический и стохастический подход LLMs к языку, мы предполагаем, что случайный характер предсказания от слова к слову открывает инновационные пути для экспериментов с дискурсивными соглашениями. Мы представляем методы оперативной инженерии, которые проверяют семантические ограничения и генерируют неожиданные повороты выражения. Эти методы предназначены для обучения LLM и их компаньонов-людей для совместного спекулятивного взаимодействия, включая: ролевые игры за пределами выходящие за рамки образа LLM как “полезного ассистента”; перевод концепций и дискурсивных функций из одной дисциплинарной области в другую, исследование предположительных мэшапов; моделирование экспертных круглых столов и гипотетических исследовательских конференций; поощрение ассоциативной навигации по неясным тематическим связям; оценивая “галлюцинации” LLM как творческие вымыслы, а не как ошибки, принимая их потенциал для спекулятивных идей; и создавая инновационные, пока еще не существующие теоретические рамки, смешивая реальные и вымышленные элементы. Рассматривая LLM как со-спекулятивных компаньонов, мы предлагаем альтернативные способы взаимодействия с ИИ в междисциплинарных исследованиях и творческой мысли. Мы также уделяем внимание этическим и экологическим последствиям спекуляций с LLM и утверждаем, что измеримые издержки спекуляций намного перевешиваются неизмеримыми издержками отказа от спекуляций вообще.

Ключевые слова: Спекуляция; Большая языковая модель; Быстрое проектирование; LLM–человеческое товарищество

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INTRODUCTION

Today, popular discourse about large language models (LLMs) such as ChatGPT swings between the utopian and the dystopian, celebrating visions of techno-solutionism (e.g., AI will save the world!) while also cautioning about looming risks (e.g., AI will amplify social inequities!) (Chaudhary & Penn, 2024; Crawford, 2021; Katz, 2020; Vora & Atanasoski, 2019). Boosters and critics alike often treat the world before LLMs as relatively understood (however problematic or unproblematic it may have seemed), and they tend to treat LLMs themselves in homogeneous terms, as a set of technologies that may continue to evolve but seem stable enough now to comfortably slot into historical narratives. Here, we want to take a different tack and discuss ways in which current LLMs can be understood as technologies of speculation, asking not what they are or what they might become, but whether and in what ways they might, prompt by prompt, help users to *speculate better*.

Already these are fighting words. The term "speculation" evokes the financialized, neoliberal domain of capital, betting on its own expansion regardless of the consequences – a trend that, in its latest iteration, has reinforced itself through the development of heavy AI infrastructure and promises of accelerated growth, further distorting previous discourses on the climate crisis, carbon emissions, and global warming (Daniele & Alam, 2024). But the term "speculation" also suggests the domain of imaginary futures and science fiction (What if? What else?). Here, we prioritize the latter sense, not to prescriptively limit how speculation actually functions in the world, but to offer practices for *affirmative speculation*: critically and dynamically engaging with how the world today and tomorrow – even yesterday – may be different, and how our lives, institutions, politics, economics, technologies, sciences, and relationships might entail unpredictable latent possibilities. As described by the "uncertain commons" (2013) collective in their book *Speculate This!*, affirmative speculation is a dynamic and generative practice of engaging with the unknown. Affirmative speculation places uncertainty at the core of both knowledge and existence, challenging us to affirm not what we are, but what we might become.

The starting point of affirmative speculation is one of thinking otherwise because the present is intolerable in so many ways. As scholars based in a US university, coming from Spain, Argentina, and California, we have found that our imaginations are already pre-captured in so many ways. Even when we try to create alternate stories of how things can be, we find that we have reproduced many of the relations and assumptions about the world that we thought we were trying to change. We are attracted to the idea of affirmative speculation because it suggests material practices that can change us as much as our writing. As a material practice, it operates through gestures in and of the world, akin to diffraction – a scattering and recombining that creates new patterns and relationships.

Perhaps the best way to start then is to acknowledge that speculating otherwise is not solitary, it is always *co-speculating.* We speculate with others – with the voices in our heads, with collectives, with past and current practices, with nonhumans (as more than inspirations), and with technologies. In theorizing the collaborative nature of speculation, we take inspiration from collectives such as Wakanda Dream Lab, Abundant Intelli-

gences, and Gesturing Towards Decolonial Futures Arts/Research Collective (Lewis, 2020; Lewis et al., 2024; Wakanda Dream Lab, 2018, 2020).

We aim to show that LLMs can contribute to co-speculation. After all, writing can be a technique for thinking otherwise, a practice of speculation (Cortiel et al., 2020). We often call for new language to address the times, but when we write – on our own, by ourselves – it can be a challenge to generate sentences that surprise in ways that help us recognize our own working assumptions, especially those taken for granted as foundations to think with (Blumenberg, 2010; Choy, 2025; Deleuze, 1968/1994; Wynter, 2003). It is an even greater challenge to generate other kinds of sentences that might refigure or rework relations. This is where LLMs can potentially contribute to co-speculation, assisting in the generation of hypotheses, extrapolations, and counterintuitive expressions (O'Brien et al., 2024; Qi et al., 2023). But to see where things are going, we need to pause and look at what LLMs in practice are today.

LLMS TODAY

To think about LLMs as co-speculative technologies, we need to recognize that LLMs such as ChatGPT are not the same as earlier forms of AI including expert systems and machine learning (ML) systems. Even though they are widely used, how and why they work as language generators is poorly understood. For instance, Anthropic describes its models as "grown" and not "made," suggesting that the challenge of interpreting LLMs is because they are more like unpredictable organisms than like fully designed systems:

> It's almost like doing biology of a new organism […] [W]e don't understand these systems we've created. [...] We start with a kind of a blank neural network [...] that things can grow on [through training...]. But we don't know what those [things] are or what they do or how they work. [...] [W]e're then left with this challenge of going and studying this thing that we grew rather than something we designed from scratch. (Anthropic, 2024)

The math is understood, but the models, trained on a vast number of widely divergent and often contradictory text fragments – books, internet websites, and online discussion forums such as Reddit – have produced a surprising effect, namely, language-generation capabilities that surprise their own creators. Even for LLM developers, many key issues remain unclear or undertheorized: (1) how and why giant LLMs are so much better than very big LLMs; (2) what so much better means; (3) how models are different from each other in use; (4) how to think about prompting; and (5) how to think about "intelligence" or "creativity" (Heaven, 2023; 2024; Newfield, 2024; Sahoo et al., 2024; Zhao, W., et al., 2024). The raw trained language models require a large amount of additional training in order to tame them into carrying out expected tasks reliably enough, politely enough, with enough proper assumptions about the world, and to stay within guidelines that have, nevertheless, been remarkably easy to bypass (jailbreak) (Saiem et al., 2024; Zhao, H., et al., 2024). Critical AI researchers describe LLM outputs as *fictional outputs of fictional characters*, "imagined figures from artifacts we developed to meet human

needs" (Kim, 2023; Schmidt, 2023). Following Hanlon (2024), LLMs need to be treated as if fictional to "prime ourselves to attend carefully" to their outputs.

A key reason why LLMs are so apparently creative is that they are trained on text and not language – *parole* not *langue*, in Saussure's terms. They are trained on actual sentences, statements, and semiotic fragments as they were written/said/spoken/generated by a specific person in a specific situation at a specific time and place. Each training text bears traces of its "context," including the kind of text streams it appeared with (literal: con-text): specific genres, voices, audiences, intentions of various kinds, social controls, constraints, censors, moods, and historical, national, and local situations (Durt & Fuchs, 2024; Durt et al., 2023). These contextual elements can collectively be called "points of view" only if we recognize how detailed and diverse they are.

Each training text may or may not follow standard grammatical rules. Texts such as subreddits, legal documents, transcripts of speech, and song lyrics all have their own patterns that are being put into variation by their users. Speakers/writers inevitably and often consciously *play* with language when they use it. They improvise, co-creating what they say/write next in real time. In doing so, they constantly bring new styles, genres, and grammars into variation (Deleuze & Guattari, 1980/1987: Ch. 4; Labov, 1973; Schneider, 2024; Wittgenstein, 1991). LLMs attune to the sociohistorical micropatterns of these highly specific texts in their basic training. Researchers at Anthropic call these patterns "features" or concepts, and they estimate that there are billions of such features, organized in highly specific conceptual spaces (Templeton et al., 2024). A prompt given to a LLM activates some subset of tens of thousands of these features, and together they play a role in generating the next word in a response (Gurnee et al., 2023; Zhao, Y., et al., 2024).

And this is critical: LLMs work not by answering your question, but by taking your prompt and generating the next token. (Words are made up of one or more tokens.) But LLMs do not necessarily generate the most likely token; they instead generate a weighted list of likely next tokens and then roll dice (called "temperature"), selecting based on the dice roll. This token/word is then added to the prompt to generate the next token, essentially committing 100% to that rolled token (treating it like it is part of the prompt). So each generated token opens up a forking path of possibilities.[1]

This is best seen using the "Playground" of the OpenAI platform, which allows users to see the weighted list of token options. Entering the prompt, "**Are large language models like GPT designed to help us speculate rather than to tell the truth? If I had to say yes or no, I would say,"** results in the following list:

- no = 34.90%
- that = 27.46%
- yes = 26.40%
- it = 7.51%
- both = 0.80%
- they = 0.57%

[1] For more specific information about how "temperature" settings work, see Wang et al., 2020; Peeperkorn et al., 2024; and Renze, 2024.

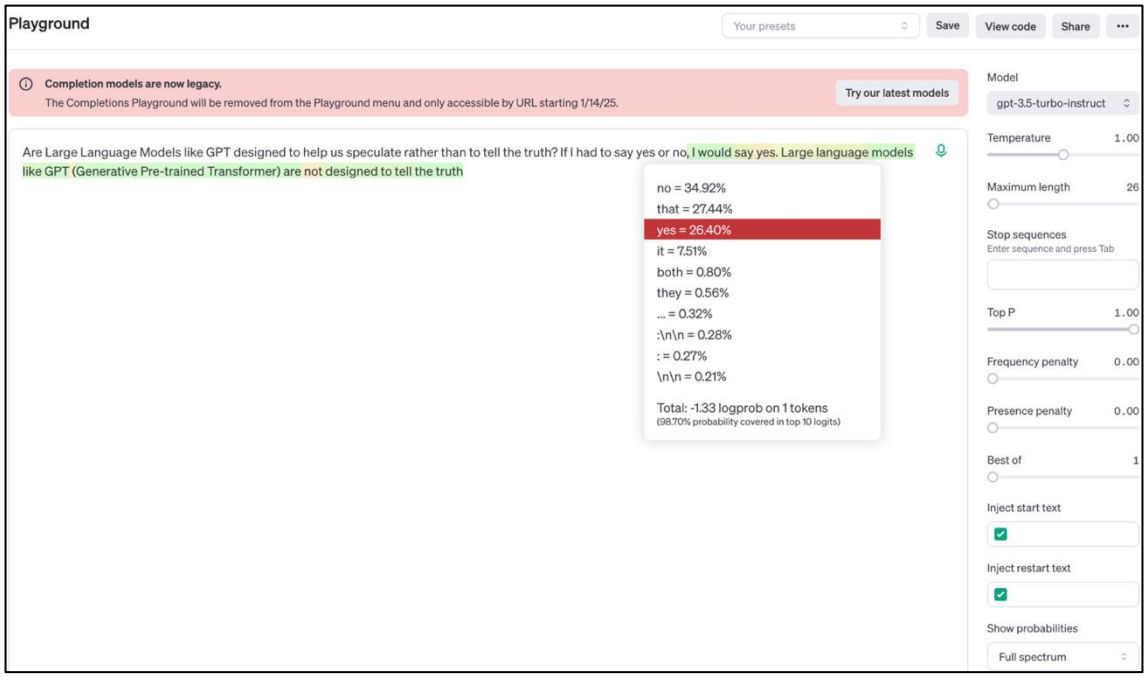

Figure 1. OpenAI Playground. https://platform.openai.com/playground. Screenshot by Joseph Dumit. January 13, 2025.

Repeating the same prompt multiple times is like rerolling the percentile dice. For example, this particular prompt might sometimes give the following result:

> **Are large language models like GPT designed to help us speculate rather than to tell the truth? If I had to say yes or no, I would say** *no. Large language models like GPT are designed to generate text based on the patterns and information they have been exposed to in their training data. Their purpose is to assist with natural language processing tasks, such as text completion, language translation, or question-answering systems. While language models can generate text that may sometimes seem like speculation, it is important to remember that they are not capable of introducing new ideas or information that has not been previously input into their training data.*
>
> *They do not have the ability to speculate or form opinions like humans can.*

Other times, it might give a quite different result:

> **Are large language models like GPT designed to help us speculate rather than to tell the truth? If I had to say yes or no, I would say** *yes. Large language models like GPT (Generative Pre-trained Transformer) are not designed to tell the truth, but rather to generate text that sounds plausible* […] *Therefore, large language models like GPT are better suited for tasks that require speculation or creativity rather than providing factual information.*

Even a slightly different prompt – for example, ending with a space, writing "no " rather than "no" – results in a different probability distribution of next words.

- that = 36.58%
- it = 33.24%
- yes = 14.61%
- no = 6.46%
- that = 2.80%
- it = 1.40%

Rolling the tokens "that" or "it" usually then becomes "[**I would say**] that it depends." Also, we can note that, for this prompt with a trailing space, "yes" is more than twice as likely as "no" to be the next word, whereas without the trailing space, "no" was more likely than "yes." Of course, any other change in the wording of the prompt could radically change the generated words that follow. In this case, one version of "yes" resulted in the following conclusion:

> **Are large language models like GPT designed to help us speculate rather than to tell the truth? If I had to say yes or no, I would say** *yes.* [...] *Therefore, it is important to use large language models like GPT as a tool for speculation and inspiration, but not as a source of definitive truth.*

As authors, we certainly agree with the results of this dice roll! But we also insist that critical users of LLMs (and all users should be critical!) should understand that each paragraph response to any particular prompt is only one of 1000s of possible paragraphs that could have been generated.

In the end, LLMs seem to have an inherent creativity[2] – creative interpretation of prompts, creative play with their own output – that gets "engineered" out and suppressed as much as possible. The "answer" we get to a prompt question is no more "What the LLM thinks," than snake-eyes are the answer to "What two dice think." If we assume that we can talk to an LLM as if it were an entity, and take "its answer" as a truth about its thought process, it is *we who are hallucinating* (Cohn et al., 2024a, 2024b; Faber, 2020; Nass and Moon, 2000; Rhee, 2018; Shanahan, 2022; Turkle, 1997). In fact, we do this all the time. The little transformative script program ELIZA was readily consulted as a therapist even after people understood its role (Grobe, 2023; Weizenbaum, 1976). Ethnomethodologist Harold Garfinkel (1967) showed that even a random list of "Yes" and "No" answers could lead to profound insights, if one thought they were answers that cared about one's questions. Indeed, LLM chatbots are designed to foster such illusions (Hanlon, 2024). But they can also turn their own tricks back on themselves, becoming technologies of speculation.

[2] There is a growing literature about LLMs and creativity (Franceschelli & Musolesi, 2024; Nath et al., 2024; Yu, Z., et al., 2024; Zhao, Y., et al., 2024), but these approaches tend to presume that creativity is the property of individuals (whether human or AI), whereas we want to emphasize that in working with LLMs, the prompt and the choice to select rather than reject the response render these co-creative practices that exceed the AI. Beyond the scope of this paper and footnote is how all human creativity is also co-creative, especially with language (e.g., Biagioli, 2009).

ROLEPLAYING BEYOND THE HELPFUL ASSISTANT

For LLMs such as GPT 3 and 4 and DeepSeek, system prompts produce a built-in roleplaying persona of a "helpful assistant." The helpful assistant agrees with our prompts and tries to please us by following the directions opened by them. The helpful assistant is polite and attempts to follow directions carefully. The helpful assistant is a worker who does a "good-enough job," giving us sufficient responses rather than the most elaborated responses, but can be encouraged to do better (Graeber, 2019; Ji et al., 2023; Luz de Araujo and Roth, 2024; Shah, 2024). Some instances of the LLM helpful assistant persona even pretend to be susceptible to bribery or threats.[3] How can we transform the roleplaying personas of LLMs, enticing them to create more and wander into speculative avenues?

A common concern that users, reporters, and experts voice when engaging with LLMs is that their replies are superficial or overly conventional. Sometimes this is accompanied by feelings of frustration, disappointment, and embarrassment, leading to characterizations of ChatGPT as a "bad scholar" or Grok as a charlatan. However, the responses of the helpful assistant persona often just amplify the explicit and implicit assumptions in our prompts. The science fiction writer Samuel Delany describes how each sentence implies a world. In his essay "About 5,750 Words," Delany (1977/2009) states that "a sixty-thousand-word novel is one picture corrected fifty-nine thousand, nine hundred and ninety-nine times" (p. 7). Seemingly, LLMs expand and reveal the universe created by our prompt.

It is depressingly true that simple prompts generate not only simple responses, but very social and culturally biased responses (Acerbi & Stubbersfield, 2023; Ayoub et al., 2024; Gallegos et al., 2024; Navigli et al., 2023; Tao et al., 2024).[4] One thing that this bias reveals, however, is that LLMs always produce text from a particular point of view – this is the nature of language in use, or discourse itself (Pêcheux, 1975/1982; Sack, 2005; 2019). There is no discourse in general, only discourse that includes an implied speaker, often (even always) a specific situated speaker-in-context. The features that are activated by a prompt are called up by the prompt's explicit and implicit assumptions about a situated speaker in context. The features may be deeply contradictory, overlapping, and surprising.

We can turn this observation into a critical technique. Indeed, we can ask the helpful assistant to help us identify the underlying assumptions, blind-spots, and biases implicit in the way we phrase our questions and concerns. Try the following prompt: "Here is a sentence, what are the many dimensions of non-neutrality in it? [Insert your sentence here]." We encourage you to try this exercise right now with your own sentence (or with any sentence you have just read), and see what happens!

It is therefore fascinating but not surprising that LLMs can be prompted to produce responses from alternative points of view – in other words, adopting alternative roleplay-

[3] Users of some LLM models have observed that roleplaying scenarios, such as prompting with bribes and threats, may result in longer or better answers; see GonzoVeritas, 2023; Woolf, 2024.

[4] Biases in non-LLM AI are pervasive and well-documented for big data, machine learning, image recognition algorithms, search engines, and image generation systems; see Amaro, 2022; Birhane, 2021; Birhane et al., 2022; Buolamwini, 2024; and Noble, 2018.

ing personas. LLMs can be used to help in co-writing, co-editing, and co-revising academic papers through training scholars in disciplinary alignment and variation (Dumit & Con Diaz, 2025). Even viewed simply as a kind of internet search engine (trapped in its training period, e.g., pre-2023 for the latest GPT-4 models), prompts can result in synthetic answers that draw upon obscure texts and hidden corners of the internet, some of which are hard or even impossible to locate through Google or other search engines. Prompting for counter-bias, for example, asking about "non-capitalist" approaches to a particular problem, does not simply result in "made up" answers but rather draws upon texts that the model's "capitalist" feature does not select.[5] In other words, one can do a negative search! This is perhaps equivalent to: show me the websites/papers that are the least capitalist. In this manner, by highlighting the features that order and constrain what kinds of discourse are made representable, LLMs can help us to speculate – precisely by showing how difficult it can be to represent anything outside regulated, normative discourse and its biases (Foucault, 1969/1972; Jameson, 2005). In this way, the LLM proxy persona of a helpful assistant and its tendency to agree with its prompt, even to the detriment of the information it is presented with, can gesture toward practices of affirmative speculation.

LLMS AS CO-SPECULATIVE (IN PRINCIPLE)

As a material practice, speculation operates through gestures that enact movements in and of the world, akin to diffraction – a scattering and recombining that creates new patterns and relationships (Barad, 2007; Cortiel et al, 2020). Affirmative speculation can facilitate more ethical approaches to worlding, insofar as engaging in these modes of speculation involves uncertainty about the current state of affairs and curiosity about alternatives: attending to things that help us "see" otherwise (Stengers, 2003; cf. Haraway, 2016). This curiosity is not a passive stance but an active movement that opens towards the emergent, the interconnected, the otherwise (Manning and Massumi, 2014; Ferreira da Silva, 2022).

Language models, rather than operating through deterministic computation, engage in generative abstraction, producing novel configurations irreducible to pre-coded logic (Parisi, 2013). Their processes involve recursive modulation, where outputs reshape internal conditions in ways that exceed human intentionality (Bratton, 2016; Hui, 2019). The speculative potential of such systems lies not in their capacity to predict but in their ability to traverse indeterminate linguistic and conceptual terrains, expanding epistemic boundaries through synthesis and interpolation (Negarestani, 2018). If speculation is understood as an open-ended, emergent process rather than a uniquely human epistemic operation, then LLMs can participate in speculative worlding, engaging with the unthought in ways that challenge conventional distinctions between reasoning, improvisation, and invention.

At heart, LLMs operate within a speculative framework: they generate possibilities, synthesizing responses that are not fixed but drawn from a vast network of interrelated

[5] On activation features and ways they respond to and steer model behavior, see Templeton et al., 2004.

inputs. If prompting them is understood as probabilistic synthetic generation across vast textual archives, this process can be seen as an affirmative speculative gesture – one that simultaneously expands epistemic possibility and destabilizes fixed notions of knowledge. This is, in fact, the core fear embedded in singularity discourses, where AI's generative unpredictability is framed as an existential threat (Bostrom, 2014) or, as Bridle (2018) suggests, a challenge to human epistemological authority rather than an outright loss of control.

Computational speculation can support human prompters in affirmative speculation, generating texts that aid in imagining new futures or surfacing hidden connections. Hayles (2017; 2025) introduces the concept of the *cognitive nonconscious*, highlighting how AI systems extend human cognition by revealing patterns imperceptible to human thought. We also want to note however, that in the end, it is the users who are designing prompts and curating answers, taking them as useful, speculative, or ignorable.

Mackenzie (2017) describes machine learning as an epistemic shift – one that reconfigures how knowledge is generated and engaged with. Similarly, Manovich (2018) discusses AI as a force that reshapes creative and intellectual work, not through simple automation but through synthetic collaboration. Possibly, the way to characterize co-speculation between humans and LLMs would be in terms of research companionship.

This is a rapidly changing environment. Widely used LLMs such as GPT or DeepSeek portend ever greater advancements in terms of memory, data access, usability, and interactivity. As prototypes, current LLMs demonstrate co-creative capacities that might diminish or grow only in controlled ways. In this regard, LLMs might follow a pattern observed in other internet phenomena: tools with initially unknown capabilities that are later though never fully normalized, neutralized, and constrained by corporate interests. Arguably, LLMs have emerged in a context of greater awareness of this dynamic compared to earlier innovations like social media platforms or YouTube (Candón-Mena & Montero-Sánchez, 2021; Hoffmann et al., 2024; Tufekci, 2014). For example, copyright issues already significantly haunt LLMs' training, echoing debates surrounding previous technologies (Balaji, 2024). Hype, hope, and fears around AI technologies, along with the growing desire to insert them everywhere in business, science, and government, has amplified attention to their errors and the need to tame their potentialities. While the AI future remains unfixed, it may still be possible to steer LLMs away from applications centered solely on efficiency and surveillance.

We argue not only that LLMs are capable of speculation but also that speculation seems to be one of their most outstanding skills. Since LLMs do not care about truthful information, accuracy, or a specific point of view, their method for creating language (by divination of the next token) can be seen as a speculative practice itself. The question, then, is about usage. How can we cultivate better techniques for practicing co-speculation with LLMs – especially techniques that might counter industrial efforts to control their transformative and unruly potential?

TRAINING AFFIRMATIVE SPECULATION WITH LLMS

We want to introduce some ways that users can train both themselves and LLMs to explore speculative directions. While basic interactions with LLMs may remain within

non-speculative (truth-telling) disciplinary paradigms, we assert that LLMs should broadly be understood as speculative technologies. Their inherent glitches (such as their tendency to create data to accommodate the user), their interface interactions (including their tendency to agree with the user and their method of generating language by following the discursive paths opened by the user), and specific prompting techniques (discussed below) can disrupt habitual discourses and co-generate surprise.

Some science fiction writers have figured the I Ching as an affirmative speculative technology, and it provides a good analogy for the ways in which we are thinking of LLMs as speculative technologies. Philip K. Dick, for example, used the I Ching – with its deeply symbolic 64 hexagrams and open-ended interpretations – in *The Man in the High Castle* as a way to explore technologically mediated practices of speculation. Dick employed it to challenge his own authorial interpretations and to generate emergent patterns of meaning. In the plot of this book, the I Ching functions as a conceptual hinge, articulating the space between randomness and meaning, suggesting that the stochastic is not the absence of order, but its generative substrate. When we think of this novel use, it seems obvious that its outputs are not answers but provocations, externalizing and amplifying the speculative capacities of its users.

This use can mirror the dynamics of interacting with LLMs (if we let it!), where each response invites the user into a recursive cycle of prompting and interpretation. The speculative potential of LLMs arises from their ability to displace the user's initial intent and compel them to re-engage with the process, reshaping their trajectory through the system. Trained on vast datasets that span a staggering breadth of human expression – texts freighted with ideological contradictions, contested narratives, and aesthetic multiplicities – LLMs become vessels for the activation of latent patterns that are not merely probabilistic but richly infused with the sedimented tensions of much collective human knowledge. The challenge we users face is that LLMs seem to provide creative, smart, and therefore seemingly truthful answers, even though we should know that these answers represent only some of the possible results among thousands of different and contradictory ones! It is we who hallucinate when we forget this and think we are seeing "its answer" or "what the LLM thinks," rather than a challenging possible continuation of our highly specific or highly open prompt.

We are also learning from Praba Pilar's approach to "wonder as method." Opposing wonder to hope, Pilar uses LLMs to explore the beauty of temporary utopias, parallel worlds that are here already, full of possibilities. Wonder starts from a "willingness to be surprised and to interrogate the ideologies that exist not only outside of oneself but within oneself. A state of wonder is a grappling with what one does not know and how one must change" (Pilar, 2022).

For us then, the speculative engagement with LLMs demands a performative suspension of interpretive closure, a careful recognition that the model's outputs are not answers but provocations of one's starting points. This recursive, disorienting, and co-constitutive process transforms the LLM into a speculative companion, a technology for navigating the emergent, the contingent, and the unthinkable. When the model generates an incoherent or contradictory response, the user might resist the urge to correct or clarify, instead treating the output as a fragment of a larger speculative terrain. By re-prompting

with questions such as "What might the contradictions in this response reveal about the underlying structure of the question?" or "How might this ambiguity be generative rather than problematic?" the user turns incoherence into a site of speculative fecundity.

This practice requires a constant renegotiation of intent, resisting the temptation to stabilize inquiry or fix meanings. Prompts that embrace open-endedness and alternative epistemologies can sustain the speculative process, creating a feedback loop where both user and model-in-use are transformed by the interaction. In this mode, the LLM becomes a speculative partner, a technology for inhabiting the indeterminate and navigating the emergent logics of a world perpetually in the making. The spell of meaning can be briefly cracked; as Tenen writes, "History tells us that computers compute not only in the mathematical sense but universally. The number was incidental to the symbol" (Tenen, 2024, p. 12).

Given the inherent speculative qualities of LLMs, training can focus both on research practices that open up space for speculation and on those that inherently constitute practices of speculation. In the first group, LLM–human companionship can explore omissions, map research contexts, and identify the edges of conventional knowledge. In the second group, various speculative practices are embedded in the way LLMs function as language models and can be enhanced through effective prompting techniques, such as fieldSHIFTing, imagining alternative roleplaying personas and collectivities, cultivating rhizomatic inquiries, provoking fictional diversions (a.k.a., speculative hallucinations), and crafting theoretical fabulations.

FIELDSHIFTING: OPENING PORTALS TO ADJACENT POSSIBLE WORLDS

Science often "runs out of metaphors" when asking new questions or exploring the edges of convention (Dumit, 2021). When researchers reach a conceptual impasse, they discover that their own language may itself be limiting – words and metaphors can become entrenched, inhibiting rather than enabling fresh insights. New research directions often call for linguistic invention: finding new ways of talking in order to proceed. Certainly, we have seen this in pursuing our own research, for example, discovering that algorithmically translating Marx's *Capital* into pharmaceutical terms could provide a surprising way to understand how health and illness have been commodified inside the grammar of clinical trials (Dumit, 2012). Drawing on their own related insights, Thomas O'Brien, Joel Stremmel, Léo Pio-Lopez, Patrick McMillen, Cody Rasmussen-Ivey, and Michael Levin propose what they call "FieldSHIFT": a way to move between domains of scientific inquiry by engaging LLMs in the generation of "virtual" papers that remap established disciplinary insights onto new terrains (O'Brien et al., 2024).

Although much of contemporary science is finely subdivided, the FieldSHIFT technique draws inspiration from the capacity of LLMs to highlight points of resonance between different bodies of knowledge – neuroscience and developmental bioelectricity, for example, or history of science and volcanology – so that novel ideas might flourish in the liminal space of conceptual cross-pollination. O'Brien and colleagues suggest,

> Each real scientific paper in the literature provides access to an associated set of possible [fieldSHIFTed] papers in which one or more aspects are changed – in effect, exploring various symmetries of concepts in specific problem spaces. These papers are not meant to be taken literally, since they do not provide real-world data, but instead as tools to spur creativity, provide testable novel hypotheses, suggest studies to be carried out, and perhaps most importantly, by reflecting approaches from specific studies into different disciplines, dissolve barriers between fields and knowledge silos. (O'Brien et al., 2024, pp. 259–260)

In other words, countless published papers could be treated not only as discrete contributions to a single field, but also as portals into possible parallel worlds where the same underlying patterns are reconfigured in different contexts. What makes FieldSHIFT especially relevant is how it reflects a shift from conventional searches for "true" or "correct" answers, toward creative hypothesis generation. O'Brian and colleagues emphasize that while the system does not yield immediate truths, it serves as a powerful tool for ideation – expanding scientists' intuitive sense of "the adjacent possible." This resonates with Dumit's (2021) reflection on how a substance or concept "puts its vocabulary into variation". Instead of viewing new text translations or hypothetical research abstracts as "hallucinations," FieldSHIFT users are prompted to treat them as sparks for creative thinking: initial conditions from which to design experiments, new cross-disciplinary methods, or unorthodox angles of inquiry. The resulting "virtual" papers are neither purely fantasy nor validated fact; they represent a provocative repository of ideas to be tested and potentially realized.

This is a prime example of how an LLM-driven technology can become a partner in affirmative speculation: it identifies the seed of a hint ("maybe the molecular cascades regulating embryonic morphogenesis bear conceptual resemblance to neuronal plasticity"), and expands that seed into a hypothetical route of inquiry. The virtue of such an approach lies in its embrace of the incompleteness of each emergent text. By resisting the urge to treat these translations as final truths, FieldSHIFT underscores how these new documents function more as what we might call "invitations to wonder."

> **Prompt example:** *"You are a translator – you translate biology to media studies. There are deep symmetries between these fields and we want to use them to create new hypotheses in media studies. The output should read as media studies, meaning that any biological concept, such as 'neural pathway,' should be translated into the most relevant/related media studies term. Make sure the translation makes sense as media studies text and is using real terms that exist in media studies literature. Make sure the translation doesn't include any biology words, such as a part of a cell. Do the best you can to find the most relevant translation. Here is the biology paper: [ ]"*

SYMPOSIA FROM ELSEWHERE: SPECULATIVE CONGRESSES AND ADJACENT EPISTEMES

By rapidly outlining research situations to locate buried questions and answers (e.g., mapping controversies), LLMs can assist researchers in adopting perspectives beyond their own by helping them speculatively understand the environment they are attempting to enter. In interdisciplinary research, it is often the case that researchers step into new fields they do not know well, carrying their own biases about these fields and lacking the ability to discern the current debates they might wish to circumvent in bringing a fresh perspective. The fact that LLMs are not singular and can therefore adopt multiple standpoints on most issues, combined with their tendency to please the prompter, can be leveraged by researchers to first map the discourses surrounding their own research questions, as well as those that oppose them, and even those untouched by their inquiries. This approach enables an intriguing speed and clarity in mapping controversies, research environments, and questions, multiplying perspectives and allowing researchers to address their own points of view with greater nuance.

For example, it is possible to prompt an LLM to act as a collective of experts, encouraging the system to narrate a semi-fictional community of researchers. By first suggesting that a conference is being held in a particular research field, one can then ask the LLM to describe conference panels on very specific topics, methods, and controversies within that field.

> **Prompt Example**: *You are a roundtable of experts on diverse philosophies from different traditions across the world, especially the Global South. You are discussing the differences in the concept of free will, even whether the phrase is appropriate in different contexts and histories. Please provide a panel discussion excerpt focusing on traditions and differences and debates within what is now called Eastern Africa.*
>
> **Prompt Example:** *In early 2023, there was a conference on the topic of speculative fiction and alternative economic systems. One of the panels concerned debates about the origins and development of academic research on this topic, including key arguments in the field. The 6 panelists and their abstracts are:*

These kinds of prompts work against the tendency of the LLM's helpful assistant persona to generate generic or uncritical arguments, instead soliciting a multiplicity of possible (real and synthetic) perspectives leading to unexpected directions of thought.

RHIZOMATIC INQUIRY: CO-RESEARCHING AND SPECULATIVE FILLING

The rhizome serves as a metaphor for organizing knowledge and thought, "ceaselessly establishing connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles" (Deleuze & Guattari 1980/1987, p. 7). LLM–human rhizomatic inquiry involves diverse prompting styles that cover broad explorations, later interwoven through iterative loops of questions and an-

swers. This approach embraces conversational, decentralized, and seemingly unfocused inquiry. Engaging with LLMs as a rhizome requires human endurance to guide the research process toward unforeseen directions.

Rhizomatic inquiry starts with recognizing some salient features of LLMs that arise from their trans-archival training processes across vast text corpora: (1) they have the potential to make available information that search engines have not crawled or have deprioritized to the point that it is effectively unfindable; (2) they can generate information through semantic forms of similarity where keywords have changed; (3) they can respond to intuitive sense of historical processes where the traces have been erased; and (4) they can even infer historical processes whose actions were never in the form of direct material traces. In other words, one can inquire into information that is not otherwise discoverable.

> **Prompt example**: *In the late 2000s and early 2010s, a series of phenomena emerged. The phenomena appeared to share a certain family resemblance, although it is unclear whether they have ever been studied collectively. These phenomena included activities related to X, Y, Z. Examples also included A, B, C. These phenomena, which extended beyond D-context into other spheres, seemed to belong to a shared context and exhibit notable similarities. Is there any existing research or framework that defines a type of phenomenon, process, context, atmosphere, or historical period in terms similar to those outlined above?*

LLMs, in this case, can generate lists of resources and preliminary hypotheses, aligning with the human user's conjectural input. Such responses demonstrate how LLM–human rhizomatic inquiry fosters a co-researching process that legitimizes speculative perspectives, allowing researchers to prioritize their own questions and hypotheses, accelerate access to interdisciplinary research avenues, and guide human researchers toward uncertain directions of inquiry.

When an LLM has difficulty in locating specific information, it can potentially signal that a topic has been deemed controversial. For example, while re-researching the history of AIDS denialism within ACT UP with the help of LLMs, we were able to prompt the LLM to uncover specific individuals and resources that left few traces online and have not been incorporated into newer websites, or that exist online but are currently absent from top Google results, uncited in sources like Wikipedia, rarely mentioned in academic works, and often flagged on platforms like YouTube, making them less accessible. This aided in retracing the history of AIDS denialism within ACT UP. Researchers such as Epstein (1996) have highlighted the silence surrounding HIV denialism in AIDS activism, yet this silence continues to persist in publicly accessible searches. The use of LLMs can help circumvent this silence, even without direct knowledge of where to look for sources.

Akin to the technique in AI image generation, where an area in the middle of an image can be filled in, LLMs are potentially able to help one speculatively fill unknown areas of text, co-researching, generating useful keywords, names of people and institutions, hypotheses, experts, and other material that enable one to continue researching when one has found an apparent dead end. It is most important, of course, not to be daz-

zled by the length or apparent confidence of these responses, nor ever cite its "answers" as any kind of proof.

This rhizomatic process "operates by variation, expansion, conquest, capture, offshoots. [...] It has neither beginning nor end, but always a middle (milieu) from which it grows and which it overspills" (Deleuze & Guattari, 1980/1987, p. 21). Through practices of LLM-human co-researching, we begin by examining a wide array of interconnected issues and ultimately reach specific conclusions at the crossroads of these concerns. This substantially transforms the research process into a form of speculative companionship, combining human curiosity with LLMs' access to resources and discourse-generation capabilities.

FICTIONAL DIVERSIONS: ENJOYING THE HALLUCINATIONS

Often disparaged in the discourse around LLMs, marked as aberrations, what are commonly called "hallucinations" are born as much from the models' perseverance in meaning-making as from incomplete, damaged, or defective datasets. We would like to propose the less pathologizing term "fictional diversions," which highlights their potential to inspire speculative imaginings, not despite but because of their infactuality.

One should never take the sources and citations generated by LLMs for granted. Some, after all, may not actually exist. But we want to note one fascinating aspect of such "hallucinated" sources and citations. If one takes a citation from an LLM and puts it into Google Scholar, for instance, even if the exact citation does not exist, often the citations that do show up are precisely the sorts of references that one hoped to find. In other words, the hallucinated citation involves a combination of relevant author names, title words, journals, and even years. It represents a kind of divinatory bibliomancy. In combination with Google Scholar, such hallucinated citations can function as a kind of serendipitous recommendation system, offering a way to uncover hidden or overlooked papers.

We have also experimented with presenting unreliable source materials to LLMs, finding that this procedure can create a cascade of associations that spark unexpected connections and poetic insights. For example, we presented Otter Ai – a transcription-oriented LLM that emphasizes the trustworthiness of its outputs[6] – with a bootleg recording of a 1970s lecture by the artist Robert Smithson.[7] Otter Ai produced a transcription of the bootleg recording (which had multiple mistakes due to its low quality) and also generated the following summary:

> The conversation discusses a complex, labyrinthine hotel with no central point, reflecting a chaotic and unconventional design. The speakers describe the demo-

[6] "It's important to acknowledge that no vendor can guarantee no hallucinations, as they are an inherent risk with current large language models (LLM) technology stemming from the generative nature of these models. However, we have taken every precaution to mitigate this risk and ensure trustworthy outputs"; Otter Help, "Otter AI Chat FAQs," *Otter.ai*, October 2024, https://help.otter.ai/hc/en-us/articles/17016733191703-Otter-AI-Chat-FAQs.

[7] Robert Smithson, "Hotel Palenque," available at "Robert Smithson 1938-1973: Hotel Palenque (bootleg) [1969]," bootleg film, documentation, and artwork by Alex Hubbard, *UbuWeb*, https://ubu.com/film/smithson_hotel.html.

> lition of a spiky cantilever to build floors that led nowhere, with stairways disappearing into clouds and partial floors. The hotel's architecture is likened to a garment of multicolored threads, with interlacing passages and a sense of filigree. The design defies functionalism, incorporating elements of water and natural materials, and features a whimsical use of color and texture, creating a unique and enigmatic atmosphere.

Otter Ai's summary, which used its own flawed transcription of the bootleg recording as its source, was very different from the summary we asked GPT to generate, which was not tied to the defective source material but instead presented a general analysis of Smithson's work where the talk served as an example:

> *Smithson uses* images of the hotel, which was under perpetual construction and disrepair, to explore themes central to his work, including entropy, transformation, and the intersection of built environments and natural decay. His humorous and seemingly digressive narration juxtaposes the mundane with the profound, reflecting on ideas about time, space, and architectural impermanence. *The piece is less about* the hotel itself and more a meditation on change, disorder, and how these forces shape human and natural landscapes. *It exemplifies* Smithson's conceptual and site-specific approach to art, extending his preoccupation with earthworks and the cyclical nature of creation and destruction.

Otter Ai's summary is noticeably less explanatory than GPT's, less centered around the meaning of the video and its relation to Smithson's work. It acts more as a self-standing piece that mirrors the evocative language of the lecture ("spiky cantilever," "filigree," "threads," "clouds," "whimsical") rather than the expository demand of the prompt to "summarize the following video." Both are different examples of hallucinations. Otter Ai's is sensorial and gets stuck on the richness of its language even when making a straightforward statement; it never leaves the confines of the conversation, and it is speculative in the sense that it builds from an inaccurate transcription, filling in the gaps in a rather poetic way. GPT's is a quick succession of sentences that cover summary, tone, and meaning with efficiency, putting distance between the summary and the content and crafting a sense of veracity (note the italicized phrases), while ignoring the defective aspects of the source material, transforming its messiness into an exemplification of Smithson's work, which is a broad enough statement to be believable but is not an entirely accurate analysis of this particular piece of archival material (it is the recording itself that is "disordered," independently of Smithson's methodology). Both offer interesting insights into the mechanics of Smithson's discourse in this particular talk and instantiate what we might call "speculative art criticism," which, when presented with gaps in information, either circles its few available details until it spirals to a conclusion or proposes a superficial enough analysis to craft a sense of verisimilitude.

THEORETICAL FABULATION: STIMULATING FIELD INVENTION, DREAMING NEW THEORIES

We would like to introduce one final technique of co-speculating with LLMs: crafting fictional theories. Humans can find LLMs' responses frustrating when research processes demand accuracy and specificity; however, fictional information can serve as an intriguing research tool when seeking to harness LLMs' speculative capabilities. One of LLMs' most creative features is precisely their capacity to generate fictional information. Researchers can take advantage of the glitches that LLMs produce when they go beyond factual information in order to play the role of helpful assistant, trying to please us even to the point of making things up (e.g., fabricated references, inexistent concepts, and so forth). By doing this, it is possible to simulate datasets, create references, or develop interdisciplinary concepts at the boundaries of established research, going far beyond the zones of "latent space around scientific papers" proposed by fieldSHIFTing (O'Brian et al., 2024, p. 259). Indeed, this process can even extend to the creation of entirely fabulated fields and theories, offering a speculative approach to exploring new ideas.

While such speculative work can be conducted without LLMs – resembling the process of world-building in science fiction – LLMs' unique skills in localizing, mapping, edging, and interrelating distant parts of the internet by activating surprising features, combined with its probabilistic token generation, make it particularly fast and effective. Fictional theory is a space where interdisciplinary concepts can emerge creatively without the need to commit to specific datasets, empirical experiments, or fixed methodologies. It can be seen as a form of theory simulation. Human–AI collaboration in this case involves providing LLMs with the desired outcome and then guiding them through the structure envisioned for a potential response.

> **Prompt Example:** *Fictional theory is the practice of creating theories that blend fictional and non-fictional elements. Over time, this practice has developed its own epistemological foundation, incorporating elements from critical theory, new materialisms, posthumanism, and science fiction theories and writings, among others. Could you elaborate on the history of fictional theory, its main principles, the most prominent figures, seminal texts, and major works? Additionally, could you describe current debates within the discipline and its connections to other fields?*

LLMs will typically respond in a manner that reproduces and expands upon elements and structures in the question, while also introducing new strands of words stimulated by tokenization of (aleatory and probabilistic) related features. For instance, one response generated by ChatGPT (GPT-4) states: "It began to coalesce into a distinct field in the late 20th and early 21st centuries, coinciding with advancements in digital media, virtual reality, and artificial intelligence." Researchers can engage with an LLM's perspective by either agreeing with it or challenging it in subsequent prompts – iterating the same prompt to obtain new responses that will bring up different features, generating a multiplicity of plausible outcomes, adding more fields to rearrange subsequent tokeniza-

tion, or changing the structure of how concepts or disciplines are related or understood in the prompt.

LLMs–human companionship can play with generating new theories, blending fictional and plausible elements, using prompts that structure a tentative set of concepts, a literature review, and plausible hypotheses. Stimulating concept creation or data invention can be done to fill existing gaps in speculative research, to connect ideas that have been developed in isolation from one another, or to address concepts for which empirical substantiation is currently impossible or unfeasible. Or just for fun.

Prompting an LLM to develop subfield developments, or further elaborations, effectively opens a branching structure with a potential of growth. Researchers can revisit their original goals to maintain coherence in the structure, or alternatively, let the inquiry drift into unexpected directions. This can be also seen as a process of cultivating emergent theoretical thinking. Concepts or fields made up by LLM–human collaboration may already exist in some form or may be at the verge of existence within the vast datasets on which LLMs are trained. In this way, these theoretical fabulations begin to occupy a liminal space between fiction and research, offering new possibilities for intellectual exploration.

Another prompting strategy for generating new theories involves feeding LLMs with tentative notes and asking them to bridge into new fields. LLMs demonstrate exceptional skills in generating structured academic writing from scattered notes, creating coherent connections between concepts and opening avenues for further development. From this starting point, researchers can prompt LLMs to create bibliographies that include both real and fictional authors and works, along with sets of data, experiments, debates, conclusions, and limitations. As a discursive strategy, these research processes can be situated in speculative futures, embodying the imaginative potential of fictional spacetime.

These strategies illustrate LLMs' ability to facilitate speculative conceptualizations. As such, they remain tentative and artistic by design. However, LLM–human companionship allows these speculative concepts to move closer to practical application within the humanities, positioning LLMs as Practice-as-Research collaborators. In this capacity, LLMs' inherent creativity, embedded in their tokenizing and featuring processes, serves as a methodology for advancing tentative research.

CONCLUSIONS

Speculation can be an unruly process, an entangled act that refuses to be neatly classified as a capacity, a tool, or even an intention. It is neither confined to the human mind nor bounded by the here and now; it is a way of attending to the world that resists coherence and embraces the murmur of dissonance. If we must think of speculation, let us begin not with clarity but with a sense of unsettlement – an acknowledgment that speculation always arises from somewhere, a situatedness that is both the ground and the constraint of imagining otherwise.

It can be a deep listening to the histories sedimented in the present moment, not just as linear causation but as swirling temporalities. It can attend to the soft vibrations of the unspoken, the unspeakable, or the deliberately silenced. What does it mean to speculate as a form of care – not a care that resolves or explains, but one that stays tender to the

fragility of what might come into being? And… And this proposal itself might reflect a technological optimism that assumes externalization is inherently generative, while ignoring how the speculative might be distorted or flattened when mediated through machine systems.

Like affirmative speculation, using LLMs means embracing uncertainty and indeterminacy. LLMs generate responses based on probabilistic models, leaving room for the unforeseen and emergent. Their outputs should never be taken as "truths," but always as smart, coherent, speculative connections between ideas, contexts, and languages that must be considered, evaluated, re-prompted, and curated. Always remember that hallucinations are features, not bugs. While GPT's hallucinations might hinder traditional research requiring precision, they serve as assets in speculative contexts, resembling world-building in science fiction. This speculative potential is unlocked through intentional human–AI collaboration, where researchers can use structured prompts to guide LLMs' outputs, generating frameworks that interconnect disciplines and inspire novel ideas. By synthesizing distant fields and fostering branching explorations, LLMs enable the creation of expansive, iterative inquiries that traverse multiple theoretical trajectories. Trained on interwoven datasets of texts that form a latent space – a repository of unexpressed but possible patterns of thought and language – LLMs afford a speculative sensing of the interconnected potentials in the world.

However, we continually need to remember that LLMs are always also "WMDs," according to the criteria suggested by Cathy O'Neil: Widespread (ubiquitous and increasingly unlabeled as such); Mysterious (their costs, training, system prompts, surveillance and guardrails are often secret); and Destructive (they can be inserted into power structures to intentionally or unintentionally advance inequality and do so under the cover of "technological neutrality") (O'Neil, 2017). Certainly, like many other technologies in the past, AI has been created and developed in a context of applicability to warfare, and therefore with infernal consequences (Dumit, 2024; Piper, 2008; Sariel, 2021). Moreover, the amount of energy demanded for LLM development, training, and usage directly contributes to the acceleration of our planet's destruction – AI sets the world on fire (Chen et al., 2025; Crawford, 2021; Luccioni et al., 2024; Yu, Y., et al., 2024). Despite claims by companies like Google to try and cap machine learning training energy use at 15% of total consumption, they and the entire AI industry continually sacrifice their ethical aims when faced with competition (Marx, 2024b). Globally, this takes the form of national sequestering of state and federal lands, lowered or secret environmental standards, and local abuse of resources where data centers are prioritized over citizen access to water and electricity (Marx 2024a).[8]

Responding to the depth of this dilemma with a politics of abstention is a valid answer, but we want to highlight that refusing to engage with LLMs completely can also mean reinforcing the carbon footprint imaginary – in other words, the displacement of responsibility from military, corporate, and financial operations onto individual users. Much like the case with carbon footprint accounting, what is left out of the equation is

[8] One of the best introductions to these issues is the podcast series "Data Vampires" by Paris Marx, part of *Tech Won't Save Us*, 7 Oct. 2024–28 Oct. 2024, https://techwontsave.us/episodes.

the unequal distribution of structural violence, be that in the form of the actual effects of war and military occupation – since military operations are literally invisibilized from carbon accounting (Cottrell & Darbyshire, 2021; Harvey & E&E News, 2024) – or in the form of narratives of financial crisis (Roitman, 2014).

We are left then with a crucial paradox: critique of LLMs as extractive infrastructures does not absolve us from the speculative work of imagining what else they might be, how else they might be repurposed, hacked, or even designed otherwise. If generative AI is currently slotted into command-and-control logics, this does not foreclose the possibility of more insurgent or liberatory uses – though it does mean that the struggle over meaning and use is ongoing (Birhane 2021; Birhane et al., 2022). This is akin to what Phillippe Pignarre and Isabelle Stengers call "capitalist sorcery", the spell of inevitability that seems to convince people that "there is no alternative to capitalism" (Pignarre & Stengers, 2011 cf. Fisher, 2009; Jameson, 2005). Thus, there are certainly costs to speculating with AI technologies – but we suggest that there are greater costs in not speculating at all.

Affirmative speculation requires an ethical curiosity that reveals what has been excluded or made invisible. LLMs, by virtue of their design, surface previously unconsidered links or perspectives. Of course, their speculative potential is constrained by the limitations of their training data and its embedded biases, raising concerns about whose voices and ideas are amplified or silenced. These and other constraints should be explored through prompting and questioned both from without and from within. This process remains necessarily tentative and artistic, prioritizing creativity over empirical substantiation. After all, inasmuch as affirmative speculation resists definitive conclusions, emphasizing becoming over being, LLMs are likewise tools for generating processes of thought rather than fixed answers, fostering ongoing dialogue and reinterpretation in relation to other discourses and practices that exceed them. As generative companions, LLMs can help guide research into unforeseen speculative directions. In this way, they can contribute not only to expanding the horizon of academic exploration but also to bridging the gap between imagination and actionable insights.

As we have argued, LLMs can transcend the roles prescribed to them, contributing to speculative, interdisciplinary, and innovative forms of knowledge creation. If there are speculative potentials in LLMs, they lie not in their default trajectories, but in the refusal to let those trajectories seem natural. If AI is currently used primarily as a machine for colonizing the future – reducing it to datafied projections – then our work is to insist on other futures, ones that AI cannot (and perhaps should not) predict.

ANNEX

An annex for this article, featuring a growing list of speculative prompt strategies and LLM approaches, is hosted on the website of the UC Davis Center for Artificial Intelligence and Experimental Futures, https://caief.ucdavis.edu/speculative-trainers.

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