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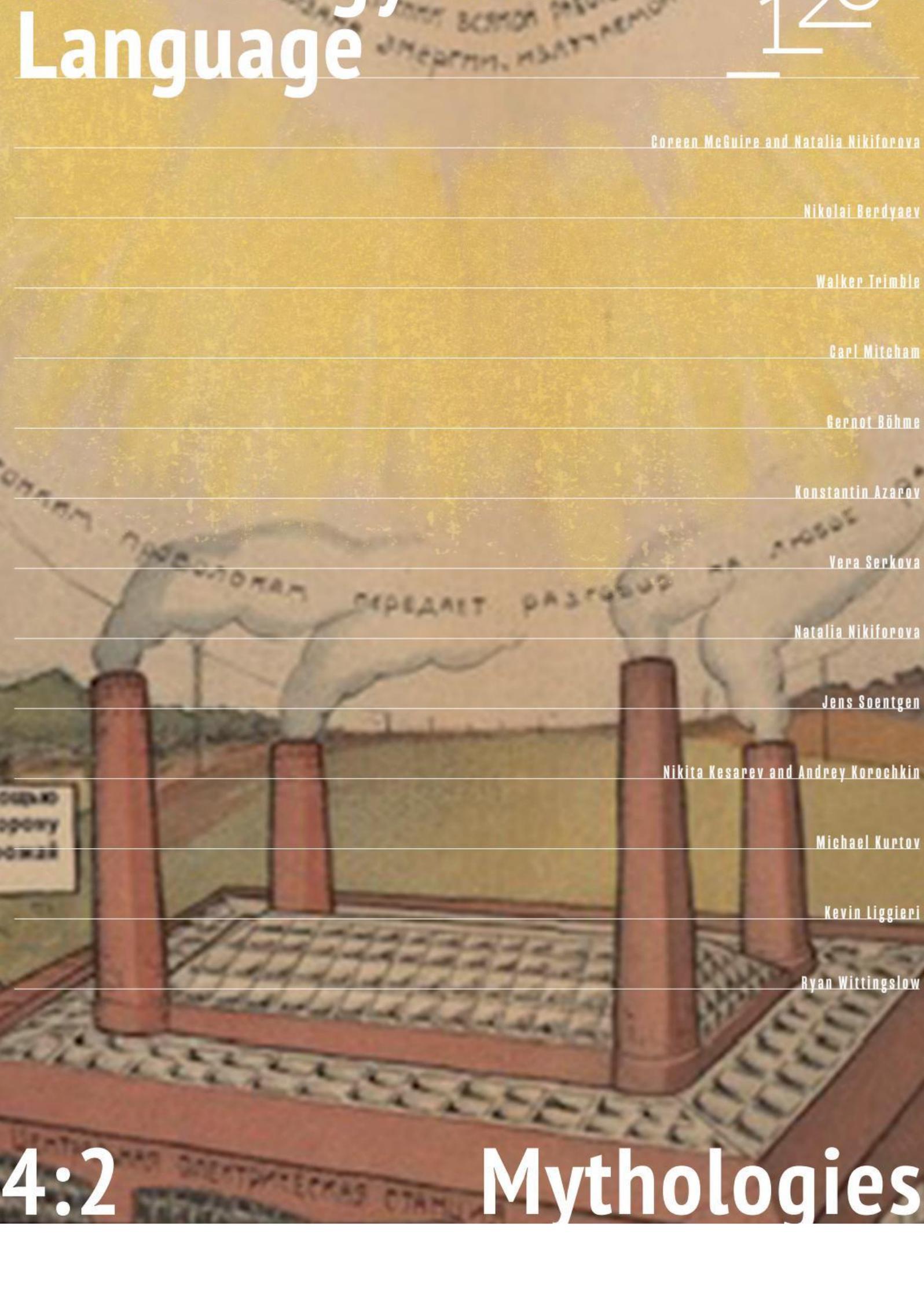
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Mythologies



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Special Topic:
Mythologies.
The Spirit of Technology in its Cultural Context
Guest Editors
Coreen McGuire and Natalia Nikiforova



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Editorial introduction

Mythologies: The Spirit of Technology in its Cultural Context

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Abstract

With its subtle reflection on the essence of modernity, intellectual alarmism, and counter-positioning of the spiritual and the material, Nikolai Berdyaev's essay „Man and Machine“ is a productive point of departure for reflections on the Spirit of Technology in its Cultural Context. A new translation of Berdyaev's 1933 essay and two critical commentaries (Trimble, Mitcham) set the stage for seven research articles which examine the spirit of technology from various perspectives and cultural contexts. The authors work on the problematization of the myth of modern mentality (Böhme), national specificities in the conceptualization of progress and technology (Azarov, Nikiforova, Soentgen), the philosophy of cosmism (Serkova), the politics of technology (Kesarev and Korochkin), and the interaction of technology and religion (Kurtov). The history of electricity in Russia, narratives of resource scarcity in Germany, an intercultural comparison of COVID-tracing apps provide concrete exemplars - complemented by studies of memory in the museum and of the Chinese looking back into the future. A general account is offered in a critique of Yuval Noah Harari's juxtaposition of a natural order and an imagined order, of natural science and a social fabric woven merely from stories. This collection of papers closes with a critical juxtaposition of a belief in the inevitability of major breakdowns and a belief in the efficacy of minor repairs.

Keywords: Philosophy of technology; Modernity; Nikolai Berdyaev; National identity; Yuval Noah Harari; Technological myth; Politics of technology

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Редакторская заметка

Мифологии: Дух технологии в культурном контексте

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Аннотация

Благодаря тонкому размышлению о сущности современности, интеллектуальному алармизмом, противопоставлению духовного и материального эссе Николая Бердяева “Человек и машина ” является продуктивной отправной точкой для размышлений о Духе техники в ее культурологическом аспекте. Новый перевод эссе Бердяева 1933 года и два критических комментария (Тримбл, Митчен) подготовили почву для семи исследовательских статей, дух технологии рассматривается с различных точек зрения и в различных культурных контекстах. Авторы работают над проблематизацией мифа современной ментальности (Бёме), национальных особенностей в осмыслении прогресса и техники (Азаров, Никифорова, Сентген), философии космизма (Серкова), политики техники (Кесарев и Корочкин), и взаимодействие техники и религии (Куртов). История электричества в России, нарративы о нехватке ресурсов в Германии, межкультурное сравнение Covid-приложений для отслеживания представляют собой конкретные примеры, дополненные исследованиями памяти в музеях и китайцами, оглядывающимися в будущее. Общий обзор предлагается в критике противопоставления Ювалем Ноем Харари естественного порядка и воображаемого порядка, естественных наук и социальной ткани, сотканной просто из историй. Этот сборник статей завершается критическим сопоставлением веры в неизбежность больших поломок и веры в эффективность малых починок.

Ключевые слова: Философия техники; Современность; Модерн; Бердяев; Национальная идентичность; Харари; Технологический миф; Политика технологий

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This special issue takes as its point of departure Nikolai Berdyaev's essay "Man and Machine", first published in 1933 (Berdyaev, 1933/2023). Nikolai Berdyaev (1874–1948) was a prominent figure within multiple intellectual strands, including Russian religious thought, existential philosophy, and philosophy of technology. He started as a revisionist Marxist philosopher and continued working with the idealist religious visions of spiritual revival and spiritual revolution evident in "Man and Machine." In 1922 he was expelled from the USSR but continued working first in Berlin and then in Paris. He was a famous and successful thinker; his works were translated into multiple languages in his own lifetime.

Berdyaev's philosophy coalesced around ideas of freedom and a conception of ethics that makes freedom possible and valuable, and centered on the concepts of creativity and "spiritual aristocracy." One of the central themes of his later philosophical works was to interpret the specificity of Russian culture through the lens of orthodox religiosity. As Carl Mitcham points out, spirituality and religious thinking became for him a lens through which he looked at technology, its relationship to objectivity, and its meaning in a technological age. Paradoxically, for Berdyaev Christianity worked to demythologize technology.

As Walker Trimble's (2023) accompanying essay to the Berdyaev translation makes clear, technique is not distinguished from technology in Russian. The concept of *technika* in the Russian language was impacted by German engineering and philosophical discourses and so encompassed a wide range of meanings, including machinery, practical skills, and engineering knowledge (Nikiforova, 2015). Just as in English, the concept of technique is incorporated into the word technology (Schatzberg, 2006, p. 487). This conflation is distinct from the Continental languages, which maintain technique to refer to the methods of production and technology to denote its study (p. 489). For Berdyaev, the sense of this division is maintained by distinguishing between technology as broad and narrow — as an industry and an art. It can be both prosaic 'the business of engineers' and spiritual 'the last love of humankind.' Yet his thesis maintains a division between the spiritual or cultural and the technological world, with the former setting the bounds for the latter

Berdyaev's text thus joins a constellation of texts from the early twentieth-century in which was shaped the discourse of modern culture as a process of disenchantment. German intellectuals like Max Weber, Oswald Spengler, and Georg Simmel were united with Russian authors who shared similar attitudes, such as Petr Engelmeyer, Sergey Bulgakov, and Pavel Florensky. Lorraine Daston (2022) has recently characterized this trend as a reflection of the move to characterise the new modern mentality as based on scientific rationality and technology. Daston points to the elusive nature of this phenomenon — and emphasises the influence of these texts on the emergence of an early twentieth-century historiography that traced the emergence of modern science to the scientific revolution. In these works, modern science 'was not the science of Albert Einstein, whose theory of general relativity had just been spectacularly confirmed by the social eclipse expedition in 1919, but rather the science of Galileo and Isaac Newton that had forged modernity' (Daston, 2022, p. 18). We see this trend refracted and qualified in Berdyaev's text. Though when writing in 1933, he maintained he was living 'in the age



of Einstein, not in the age of Darwin’ and emphasized the importance of physics in moving the limits of science outside of sensory perception; he specifically attested to the innocuousness of physics, emphasizing that ‘New discoveries in physics have a positive meaning and are innocent, they testify to the power of human consciousness.’ In contrast the replacement of the Ptolemaic system by the Copernican system was identified by Berdyaev as starting the ‘beginning of modern times’ contributing to the conception of the modern self and triggering technologies’ ‘terrible power of realisation.’ We see an echo of this thinking in Böhme’s (2023) discussion of Yuval Noah Harari which highlights Harari’s ‘unshakeable’ belief in science, and his characterisation of the life sciences as fundamentally opposed to the self and the soul. For Berdyaev too there was an idealized past, a telluric period of humanity, when its existence was defined by the specific mystical and metaphysical attitude towards the earth. His argument contributed to the shaping of the myths of modern mentalities. In this respect, Berdyaev’s text is also a historiographical statement that shapes a narrative about the history of technology based on its cultural characteristics. The decisive difference to Harari may be that Berdyaev refused the idea of technology arrogating to itself a spiritual power. Harari, in contrast, does not appear to leave room for the human spirit to maintain itself against technology (Böhme, 2023; Mitcham, 2023; Trimble, 2023).

The shaping of myths and the meanings of technology across languages and cultural contexts unify the papers in this special issue which all respond to different aspects of the Berdyaev text, such as his preoccupation with the past. For instance, Azarov’s (2023) article for instance, links the myth of progress in China to the conception (embedded in the language itself) of history as knowable — ‘it is the past that is ahead.’ In this way, the Chinese vision of technological progress was constructed from the perspective of existential strategies of self-cultivation. Similarly, Serkova (2023) considers the philosophy of Nikolai Fedorov in relation to the importance of the past and the technologies of the museum as critical for maintaining scientific knowledge as a ‘cathedral of scientists’.

Berdyaev’s insight that the natural ‘was given a kind of normative character’ in the ‘technological era’ is further reflected in Nikiforova’s (2023) article on Soviet electrification and natural resources, which explains the development of the use of peat on a mass scale to fuel Soviet electrification. Soviet engineers and authorities embarked on a campaign of public education and science communication to transform peat from a cheap and accessible commodity to a valuable scientific and modern resource. Here, we find the spirit of technology in socialism, which ‘could be realised only through electricity’. Yet the conception of peat as an abstract energy source capable of sustaining the technologies of the new utopia contrasted with the embodied nature of citizen’s involvement in energy production. Nikiforova’s explanation of what was happening on the ground collapses the division between man and machine maintained by Berdyaev by emphasising the sensorial nature of identifying and collecting peat. Understanding its botanical composition necessitated the development of practiced tacit knowledge ‘squeezing peat to feel its texture’ and observing how ‘it smears and stains one’s hand.’ Similarly, Soentgen’s (2023) article reveals how cultural myths of scarcity shaped discourses around the necessity of a ‘technological fix’ that could augment the deficit of



natural resources Soentgen particularly highlights the ideological underpinnings of such myths by emphasising that the naturalisation of scarcity has ideological purposes.

In the sequence of exemplary cases, Kesarev and Korochkin (2023) finally examine the implications of national political cultures manifested in mobile COVID-tracing applications. Different value orientations are reflected in the way technologies presuppose the level of control over citizens, as well as the level of engagement and civic consciousness. Their comparison of several apps contributes to the long running discussions within STS studies of the relative power and agency of objects and their users, and the related question of the extent to which the governance of things can be traced.

As a Christian existentialist, Berdyaev distinguished religion and technology, yet termed technology a new quasi religion; a fetish and totem of modern humanity. Kurtov (2023) reconsiders this distinction, showing that if analysed with attention to materiality and cultural practices of usage, interaction with technology can be interpreted as *techno-religious Gestalt*. In Kurtov's view, the religious background of Russian culture, eschatology, and its attitudes towards the future order of things defined both the essence of technology and the forms of interaction with it. Kurtov elegantly weaves together the problematic religious specificity of Russian culture, its reflection in language with interpretation of technology, and cultural practices shaped around it. He implicitly offers a way of categorizing Berdyaev's approach within a deeply antagonistic framework in which Berdyaev's focus on spirituality becomes more of a provocation than an inspiration.

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Research article, translation

Man and Machine (the Problem of Sociology and the Metaphysics of Technology)

Nikolai Berdyaev

New Translation by Walker Trimble (✉)

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Abstract

In 1933, the Russian philosopher Nikolai Berdyaev (1874–1948) published the essay ‘*Chelovek i Mashina*’ (‘Man and Machine’) in a Parisian journal for Russian exiles. While the article has seen numerous translations, so far an accurate and annotated version is lacking in English. While ‘Man and Machine’ is an important historical *raisonné* of thought about technology in its time, it is also one of the first critiques of the deep importance of technology for Soviet totalitarianism. Berdyaev believes that modern civilisation puts tools in the place of their users and that, if we do not reassess our aims in life, the advances and comforts provided by technology will lead to our destruction as human beings. Berdyaev contrasts this situation with the eschatological views of Nikolai Fedorov and the ‘cosmists’ who neither rejected technology nor fell into submission before it. As a ‘Christian existentialist’, Berdyaev holds that the highest aims of humanity are those in which we realise our place as bearers of the image of God. Technology used to this end can lead us toward our self-realisation.

Keywords: Nikolai Berdyaev; Nikolai Fedorov; Technological epoch; Organism and organisation; Russian cosmism; Technology as culture; Stalinism; Eschatology; Spirit

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Научная статья, перевод

Человек и машина (проблема социологии и метафизики техники)

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Аннотация

В 1933 году русский философ Николай Бердяев (1874–1948) опубликовал очерк “Человек и машина” в парижском журнале для русских эмигрантов. Хотя существует множество переводов на разные языки, до сих пор отсутствует точная и аннотированная версия статьи на английском языке. В то время как “Человек и машина” является важным историческим обоснованием размышлений о технологиях своего времени, это также одна из первых критических статей о глубокой важности технологии для советского тоталитаризма. Бердяев считает, что современная цивилизация ставит инструменты на место их пользователей и что, если мы не пересмотрим наши цели в жизни, то достижения и удобства, предоставляемые технологией, приведут к нашей гибели как человеческих существ. Бердяев противопоставляет этому положению эсхатологические взгляды Николая Федорова и “космистов”, которые не отвергли технику, но и не подчинились ей. Как “христианский экзистенциалист”, Бердяев считает, что высшими целями человечества являются те, в которых мы осознаем свое место как носителей образа Божия. Технологии, используемые для этой цели, могут привести нас к самореализации.

Ключевые слова: Николай Бердяев; Николай Федоров; Технологическая эпоха; Организм и организация; Русский космизм; Технология как культура; Сталинизм; Эсхатология; Дух

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Man and Machine (the Problem of Sociology and the Metaphysics of Technology)¹

I.

It would be no exaggeration to say that the question of technology concerns the fate of man and the fate of his culture.² In the age of those of little faith, in the age when not only faith in the old religion but also that of 19th century humanism is in a parlous state, the only compelling faith for modern civilised man is the faith in technology, in its power and in the endless course of its development. Technology is the last love of humankind and, swayed by the object of our love, we are ready to exchange this object for our own image.³ Everything that happens to the world comes to nourish this new human faith. We longed for a miracle of faith once it had seemed to us that miracles were no more. And now technology produces real miracles. The problem of technology is very disturbing for Christian consciousness in particular, and it is a problem that Christians have yet to comprehend. Christians maintain two attitudes towards technology and both are inadequate. Most consider technology to be religiously neutral and impartial. Technology is the business of engineers. It brings improvements to life, which Christians also enjoy. [4] Technology multiplies the benefits of life. But this does not particularly affect Christian conscience or consciousness, nor does it pose any particular spiritual problem. A minority of Christians experiences technology in an apocalyptic sense. They are terrified of its increasing power over human life, they are ready to see in it the triumph of the spirit of the antichrist, the beast emerging from the abyss. Abuse of the apocalyptic is especially characteristic of Russian Orthodoxy. Anything we do not like, anything that violates the familiar, is quickly announced as the triumph of the antichrist and a sign that the end is at hand. This is no more than an idle resolution. It is based on the affect of fear.

¹ Original Russian publication in *Put'*: *Organ russkoi religioznoi mysli* — a journal for Russian texts that was published in Paris under the French name *VOIE, Revue religieuse russe* (Berdyayev, 1933). The Russian original can be found online, also a version in modern Russian: https://runivers.ru/upload/iblock/31b/Put_N38_05.1933.pdf and <http://www.odinblago.ru/path/38/1>. The pagination of the original publication is here provided in brackets. Original footnotes are designated [N.B.], translator's footnotes signed [W.T.]. This new translation is accompanied by an extensive introduction and commentary (Trimble, 2023). — For the original English translation Berdyayev's first name was rendered 'Nicholas' rather than 'Nikolai' (Berdyayev, 1934/2012; 1972).

² '*Chelovek*' — While the title preserves the period English 'man', in fact '*chelovek*' is not marked for gender and generally means 'a/the human'. It is difficult to preserve good English style and always render the term as 'human' or 'humankind', so 'person', 'mankind', 'man', and 'we' are all taken as variants. Moreover, the text is generally known in the English-speaking world by the title of its first translation into English: 'Man and Machine' (Berdyayev, 1934/2012). It is not clear that the discussion of Berdyayev's text would benefit from updating it anachronistically. [W.T.]

³ '*Tekhnika*' — Russian does not distinguish 'technique' from 'technology'. We render most instances as 'technology' with a few exceptions, such as in the next sentence.

'*Obraz*' — the image in the sense of 'image and likeness', 'form', 'example', 'structure'. While modern readers might be surprised by the irruption of 'Christian consciousness', with '*obraz*' Berdyayev has already prepared his readers for the Orthodox Christian understanding of the creation of man in God's image fulfilled and restored in the incarnation and expressed in 'holy images' as icons. [W.T.]



And neutrality is also lazy, it simply fails to recognise the problem.

Technology can be understood in both a broader and narrower sense. Τέχνη has the meaning of both industry and art. Τεχνάζειν means to fabricate, to create with art. We are talking not only about the technology of economics, industry, the military, transport and the comforts of life, but also about the technique of thought, versification, painting, dance, law, even about the technique of spiritual life, the mystical path. So, for example, yoga is a kind of spiritual technique. Technology everywhere teaches you to achieve the greatest result with the least expenditure of effort. And this is especially the case in the technology of the technical, economic age. Yet, unlike the master technicians of earlier cultures, the achievements of quantity have overrun those of quality. Spengler, in his new little book *Der Mensch und die Technik*,⁴ defines technology not as a weapon but as the battle itself. Yet, technology certainly has always been a means, a tool, and not a goal in and of itself. There can be no [5] technological goals in life. There can be only technological means while the aims of life must lie in some other arena, in the field of the spirit. The means of life very often replace the aims, they take up so much space in human life that the aims of life can resolutely and utterly disappear from one's consciousness. And in our technological era, this happens on a grand scale. Of course, technology for a scientist making scientific discoveries, for an engineer making inventions, can become life's principal content and purpose. In this case, technology, as knowledge and invention, acquires a spiritual significance and relates to the spiritual life. But the substitution of the goals of life by technical means can mean a diminution and extinction of the spirit, and this is what is now the case. Technical tools by their nature are heterogeneous both to the one who uses them and to the one for which it is used, heterogeneous to man, spirit, and meaning. This is related to the fateful role the domination of technology plays in human life. One of the definitions of the human, as *homo faber*, the tool-maker, so common in the histories of civilisations, already testifies to the substitution of the aims of life with the means of living. Man is undoubtedly an engineer, but he invented the art of engineering for purposes beyond his limits. And, as such, this replacement is a repetition of the Marxist materialist understanding of history. While it is indisputable that the economy is a necessary condition of life; without economics, a person's mental and spiritual life is impossible, nor is there any possibility for ideology. But the purpose and meaning of human life does not lie at all in this necessary basis of life. What is most powerful in urgency and necessity, [6] is not at all what has the greatest worth. What is most worthy is not the strongest thing that can stand above all else in its pomp and hierarchical dominion. One could say that the most powerful thing in our world is raw matter, but it is also the least worthy. In our sinful world, God seems to be worthless, He was crucified by the world, but it is He who is the supreme worth.⁵ Technology holds such sway in our world not because it is supremely worthy.

We face a basic paradox: culture is impossible without technology, the very emergence of culture is connected with it, yet the final victory of technology within

⁴ Berdyaev is referring to Oswald Spengler's *Der Mensch und die Technik. Beitrag zu einer Philosophie des Lebens* [Humanity and Technology. Contribution to a Philosophy of Life] (Spengler, 1931) [W.T.]

⁵ And that the highest values are those that exert the least influence is well argued by Nicolai Hartmann in his *Ethics*. [N.B., see Hartmann, 1926]



culture, the entry into the technical era, leads culture towards its destruction. There are always two elements in culture – a technical and a natural-organic element. And the final victory of the technical element over the natural-organic element means the rebirth of culture into something else that itself has no resemblance to culture. Romanticism is a reaction of the natural-organic element of culture against its technical element. Since Romanticism revolts against classical consciousness, it revolts against the predominance of the technical form over nature. The return to nature is an eternal motive in cultural history. In it one can sense the death of culture at the hands of technology, the death of human nature in its wholeness. The desire for wholeness, for organicity is also a characteristic feature of Romanticism. The thirst for a return to nature is the memory of a lost paradise, the thirst for a return to it. And always the way to paradise is blocked. French [7] Thomists like to make a distinction between *agir* (πρακτόν) and *faire* (π ο ι η τ ή ς).^{6,7} This is an old scholastic distinction. *Agir* means the free exercise of human strength, *faire* means the creation of products, fabrication. In the first case, the centre of gravity lies in the person, in the creator, in the second case in the product. The technical era requires a person to fabricate products and, moreover, in the greatest quantity with the least expenditure of effort. The human becomes an instrument of production. The thing is set above the person.

It is possible to establish three stages in the history of humankind: the natural-organic, the cultural in the proper sense, and the technical-mechanical. These stages correspond to the differing attitudes of the spirit to nature: first the immersion of spirit in nature, then the separation of spirit from nature and the formation of a special sphere of spirituality, then active mastery of the spirit of nature, domination over it. These stages, of course, must not only be understood chronologically, they are fundamentally different modes. And the man of culture still lived in the natural world. This world was not created by man but was taken as created by God. Humanity was connected with the earth, with plants and animals. A huge role was played by Telluric mysticism, the mysticism of the earth. It is well known that plant and animal religious cults were of great importance, such cultic elements were then transformed and taken into Christianity. According to Christian beliefs, man is dust and to dust he shall return. Culture in its fluorescence was still surrounded [8] by nature, it was enthralled by gardens and animals. Flowers, shady parks and lawns, rivers and lakes, well-bred dogs and horses, birds are all part of culture. People of culture, no matter how far they went from natural life, still gazed at the sky, at the stars, at the fleeting clouds. The contemplation of the beauties of nature is itself mostly a product of culture. Culture, the state, everyday life, were comprehended organically by analogy with living organisms. The prosperity of cultures and states seemed also to be a biological process. Culture was full of symbols, earthly forms were written in the heavens, these were signs from the other world given in this world. Technology as such is alien to symbolism, it is realistic, it reflects nothing, it creates a new reality, everything is here and now. It tears the person away from nature and from the worlds of others.

⁶ See, for example, Jacques Maritain's book *Art et scolastique*. [N.B., see Maritain, 1920]

⁷ *'Delat'* – Berdyaev notes the distinction between *agir* and *faire* in French because the Russian verb *'delat'* does not distinguish 'do' and 'make'. [W.T.]



What matters most for our subject is the distinction between an organism and an organisation.⁸ The organism is born from natural cosmic life, and to itself gives birth. Birth is a mark of the organism. An organisation cannot be born and cannot give birth. It is made by human activity, it creates, though its creativity is not the highest form of creativity. The organism is not an aggregate, it is not made up of parts, it is whole and is born whole, the whole precedes its parts and it is present in each part.⁹ The body grows, develops. The mechanism created by the organisational process is made up of parts that cannot grow and develop, in it the whole is not present in its parts and does not precede its parts. The organism exhibits [9] an intentionality which is immanent to it, invested in it by the Creator or nature, determined by the dominance of the whole over the part.¹⁰ The organisation has a completely different kind of intentionality, invested in it by the organiser from the outside. The mechanism is composed with the subordination of the specific aims of its construction, but it is not born with a purpose inherent to it. The clock acts with clear intention, but it has no intentionality beyond that of the person who made or wound it. While the organised mechanism in its intentionality, in its directedness, depends on the organiser, it yet has its own inertia that can act upon, and even enslave, the organiser. There have been organised bodies in history, similar to the life of organisms. Then the patriarchal system and the natural economy seemed organic and even eternal in their organicity. The organic system was usually represented as created not by man, but either by nature itself, or by the Creator of the world. For a long time there was a belief in the existence of an eternal objective order of nature, with which human life must be coordinated and subordinated. The natural was given a kind of normative character. What agreed with nature seemed both good and just. For the ancient Greek and for mediaeval man there was an unchanging cosmos, a hierarchical system, an eternal *ordo*. Such an order existed both for Aristotle and for St Thomas Aquinas. The earth and the sky formed an unchanging hierarchical system. The very understanding of the immutable order of nature was connected with an objective theological principle. And now technology in its form, which has been triumphant since the end of the 18th century, has destroyed this belief in the eternal order [10] of nature and has destroyed it in a much deeper sense than evolutionism has. Evolutionism recognises change, but these changes occur at the same stage of natural reality. Evolutionism arose principally from the biological sciences. Development itself was understood as an organic process. But we do not live in the age of biological sciences, we live in the age of physical sciences, in the age of Einstein, and not the age of Darwin. The physical sciences are not as conducive as the biological sciences to an organic understanding of the life of nature. Biology adopted a mechanistic explanation in the second half of the 19th century, but it favoured organic understanding in other fields, such as sociology. Naturalism, as it developed in the second

⁸ ‘*Organizatsiya*’ – The contrast ‘organism/organisation’ is more evident in Russian than in English. That ‘-isation’ as a suffix is built upon ‘-ism’ suggests that the latter is causally dependent upon the former. This is equivalent to the born/made distinction. [W.T.]

⁹ See Driesch, *La philosophie de l’organisme*. [N.B., see Driesch 1921]

¹⁰ ‘*Tselesoobraznost*’ – On the basis of the context, this has been translated as ‘intentionality’. The Russian word (lit. ‘goal-directedness’) does not convey the particular semantic or epistemological sense usually given to that term. [W.T.]



half of the last century, recognised development in nature, but this development took place along nature's eternal order. Therefore naturalism especially valued the principle of the regularity of natural processes, something much less valued by modern science. Modern technology sets man before a new nature that is not at all a product of evolution, but a product of the ingenuity and creative activity of the person themselves. It is not an organic process, but an organisational process. This is the meaning of the entire technological era. The domination of technology and the machine is primarily a transition from organic life to organised life, from vegetativeness to constructiveness. From the point of view of organic life, technology means a dis-incarnation, a rupture in the organic bodies of history, a rupture of flesh and spirit.¹¹ Technology sets forth a new stage of reality, and this reality is the creation of man, the result [11] of the breakthrough of the spirit into nature and the introduction of reason into spontaneous processes. Technology destroys old bodies and creates new ones that are not at all like organic bodies. It builds organised bodies.

And the tragedy is that the creation revolts against its creator and no longer obeys him. The mystery of the fall of humanity in original sin is in the rebellion of the creature against the Creator. It repeats itself throughout the history of humankind. The Promethean spirit of man is unable to master the technology he has created, to cope with the emergence of uninhibited, unprecedented energies. We see all this in the processes of rationalisation in the technical era, when the person is replaced by the machine. Technology replaces the organic-irrational with the organised-rational. But, at the same time, it generates new irrational consequences in social life. The rationalisation of industry has resulted in unemployment, the greatest disaster of our time. Human labour is being replaced by a machine. This is a valid contest that could, for its part, annihilate human poverty and slavery. But the machine does not obey at all what a person demands of it, it has its own laws to dictate. Humanity says to its machines: 'I need you to make my life easier, to make me stronger.' The machine answers humanity: 'But I do not need you, everything can be done without you. You can disappear.' Taylor's system is an extreme form of rationalised labour, and it turns the person into an improved machine. The machine wants a person to accept its image and likeness. Yet humankind is made in the image and likeness of God and cannot become the image and likeness of a machine without ceasing itself to exist. Here we are faced with the limits of the transition from the organic-irrational to the organised-rational. [12] The organisation associated with technology presumes an organising subject; i.e. an organism which itself cannot be turned into a machine. But the organisation tends to turn the organiser himself from an organism into a machine. The very spirit that created the machine and technology can neither be completely mechanised nor technologised. It must always have its own irrational beginning. But technology wants to master the spirit and to rationalise it, turn it into an automaton, enslave it. And this is the titanic struggle of man and the nature he is technologising. At first, man was dependent on nature, and this dependence was a vegetative and animal dependence. But here begins a new dependence of man on nature,

¹¹ 'Razvoploschenie' – The more natural translation would be 'disembodiment', but Berdyaev is clearly referring to the 'image' of man in the incarnate Christ which technology *undoes*. [W.T.]



on a new nature, a technical-mechanical dependence. This is the whole agony of the problem. The human organism, its psychophysical organism, was formed in another world and adapted to the old sense of nature. It was a vegetal-animal adaptation. But man has not yet adapted to the new reality that is revealed through technology and the machine. He does not know whether he will be able to breathe in the new electric and radioactive atmosphere, in a new cold, metallic reality devoid of animal warmth. We do not yet know how destructive the atmosphere created by our own technical discoveries and inventions is for us. Some doctors say that this atmosphere is dangerous and destructive. And the innovations of man in the instruments of destruction greatly exceed those of medicine to make him whole. It turned out that it is easier to invent poisonous gases to cut down millions than to invent a cure for cancer [13] or tuberculosis. The human body turns out to be defenceless before our inventions. The discoveries related to organic life turn out to be much more difficult than those related to the inorganic world, where we enter a world of miracles.

II.

The domination of technology and machines opens up a new stage of reality, one defying scientific classification, a reality that is not at all identical with the reality of the mechanical and physio-chemical. This new reality is visible only from history, from civilisation, and not from nature. This new reality develops in the cosmic process later than the other stages, after complex social development, at the heights of civilisation, though it is also a host for mechanical, physical and chemical forces. Art has also created a new reality not found in nature. We can say that the characters and images of artistic creativity represent a special kind of reality. Don Quixote, Hamlet, Faust, Leonardo's Mona Lisa or Beethoven's symphonies are new realities not known in nature. They have their own existence, their own destiny. They affect people's lives, generating very complex consequences. People of culture exist among these realities. But the reality that art reveals has a symbolic character, it reflects the ideological world. Technology, on the other hand, creates a reality devoid of any symbolism, here reality is unmediated. This also applies to art, because in technology [14] art itself is reborn. Consider the cinema which is, little by little, taking the place of the old theatre. The impact of cinema is enormous. But it is reliant on technical discoveries, amazing discoveries in the field of light and sound, that would have been miraculous to people of previous ages. Cinema has taken possession of expanses that the theatre was completely powerless to master: oceans, deserts, mountains, just as it takes possession of time. Through talking cinema and the wireless¹² the actor and singer are not addressing an intimate audience where a small number of people have come together in a particular place, but perform before the vast masses of all humankind, in all parts of the world, all countries and peoples. This is the most powerful tool that could unite humanity, while it could also be used for the most wicked and vulgar purposes. Cinema testifies to the power of realisation inherent in modern technology. It has brought forth a new reality. But this reality that technology has

¹² 'Wireless' – orig. lit. 'TSF' – *télégraphie sans fil*, radio. [W.T.]



made possible amounts to a radical change in our relations to space and time, it is the creation of the spirit, the human mind, the will, the application of human intentionality. This is a superphysical reality, not spiritual and not psychical, but namely superphysical. There is a sphere wherein operates the superphysical, as well as a sphere wherein operates the superpsychic.

Technology has a cosmogonic meaning, through it a new cosmos is created. In his recent book, *Reflexions sur la science des machines*, Lafitte says that, along with inorganic and organic bodies, there are also organised bodies – the kingdom of machines, [15] a peculiar kingdom.¹³ This is a new category of being. The machine is actually neither an inorganic nor an organic body. The appearance of these new bodies is connected with the difference between the organic and the organised. It would be utterly false to put the machine in the inorganic world on the grounds that it derives its reality from the mechanico-physico-chemical elements of inorganic bodies. There are no machines in inorganic nature, they exist only in the world of society. These organised bodies do not appear before the human, as inorganic bodies do, but after the human and through the human. Humankind managed to call something to life, to bring forth a new reality. This is an indicator of humanity's terrible power. It points to our creative and sovereign vocation in the world. But it is also an indicator of our weakness, our penchant for slavery. The machine has enormous not only sociological, but also cosmological significance. It poses with extraordinary acuteness the problem of the fate of man in society and in the cosmos. This is the problem of the relationship of man to nature, personality to society, spirit to matter, the irrational to the rational. Though many books have been written on the subject, it is extraordinary that a philosophy of technology and machines has not yet been created. While much ground has already been laid for the creation of such a philosophy, the most important element is lacking – the machine and technology have yet to be conceived as a spiritual problem, as an element of human destiny. The machine is viewed only from the outside, as a social projection. But from the inside it is a question of the philosophy of human existence (*Existenzphilosophie*). Can we exist only in the old cosmos, the physical and organic, which was conceived as an eternal order, or can we [16] exist in a new, different, still unknown cosmos? Christianity, bound as it is to the fate of humanity, has been set before a new world, and it has yet to come to terms with this new position. This state of affairs also determines the construction of the philosophy of technology as it must be resolved in spiritual practice before it can be resolved as philosophical conceptualisation.¹⁴ This is always the case, whether or not philosophical conceptualisation is capable of recognising it.¹⁵

What does the technological epoch and the emergence of a new cosmos mean for

¹³ Berdyaev here refers to Jacques Lafitte whose 'mechanology' also influenced Gilbert Simondon (Lafitte, 1932, see Sandrone, Vaccari, Lawler, 2022). [W.T.]

¹⁴ '...v dukhovnom opyte... filosofskom poznanii' – The opposition of 'spiritual experience' and 'philosophical understanding' is less precise in English than in Russian. Earlier Berdyaev used the term 'opyt' in the sense of scientific experimentation, here some of the concreteness of that sense passes over to the phrase 'spiritual opyt'. 'Poznanie' also means 'apperception', and 'perception'. [W.T.]

¹⁵ Friedrich Dessauer's book *Philosophie der Technik* is an experiment in the philosophy of technology. [N.B., see Dessauer, 1927]



the fate of humanity? Is this the materialisation and death of the spirit and spirituality, or may it have some other significance? The rupture of the spirit with the old organic life, the mechanisation of life, gives the impression of the end of spirituality in the world. Never has materialism been so strong. Technology tears away the fusion of the spirit with historical bodies. That fusion once seemed to be an eternal order and, for many, the spirit disappears once separated from the flesh. The technological era indeed brings with it a great deal of death. Soviet technological constructs make an especially macabre impression. But their originality is not in the technology itself – they have accomplished nothing new. America has gone much further and the Soviets are unlikely to catch up with it. What is original in Soviet communist Russia is the spiritual phenomenon that is exposed in its relations to technology. Here is something truly unprecedented, a phenomenon of a new spiritual type. It is this, its eschatology, which makes such a macabre impression, Christian eschatology in inversion.

Technology and economics as such can be [17] neutral, but once the spirit adopts an attitude toward both technology and economics, the question inevitably becomes a spiritual one. Sometimes it seems that we live in an era of the final predominance of technology over wisdom in the ancient, noble sense of the word. The technologisation of the spirit, the technologisation of the mind, can easily seem like the death of both spirit and mind. Christian eschatology connects the transformation of all things with the action of the Spirit of God. The eschatology of technology awaits a final possession of all things, a final domination over them with the help of its instrumentation. Therefore, the answer to the question of the meaning of the technological era from a Christian and spiritual point of view may seem quite clear and simple. But actually, the problem is much more complex. Technology is also dual in its meaning, like everything in this world. Technology takes a person off the ground, it strikes at any mysticism of the earth, the mysticism of the maternal principle, which played such a role in the life of human societies. The actualism and titanism of technology is directly opposed to any passive, vegetal-animal gestation, gestation in the womb of mother earth, *Magna Mater*, it destroys the comfort and warmth of organic life that has clung to the earth. The meaning of the technical era is primarily that it ends the Telluric period in the history of humankind, when man was defined by the earth not only in the physical sense, but also in the metaphysical sense of the word. This is the religious meaning of technology. Technology gives a person a sense of the earth's planetary nature, a completely different sense of the Earth than that which was characteristic of man in previous eras. A person feels completely different when they sense the depth, [18] the sanctity, the mysticism of the earth; when one feels the earth as a planet flying into infinite space, among infinite worlds, when one is able to separate from the earth, to fly through the air, to be transported to the stratosphere. This change of consciousness theoretically took place already at the beginning of modern times, when the Copernican system replaced the Ptolemaic system, when the earth ceased to be the centre of the cosmos, when the infinity of worlds was revealed. Pascal was yet horrified by this change whilst it was merely theoretical, he was frightened by the silence of infinite spaces and worlds. The cosmos, the cosmos of antiquity and the Middle Ages, the cosmos of St Thomas Aquinas and Dante has disappeared. Then humanity found some compensation – a fulcrum upon which it could



shift the centre of personal gravity into the ego, into the subject. The idealistic philosophy of modern times is a compensation for the loss of the cosmos, in which man occupied his hierarchical place, in which he felt surrounded by higher forces. But technology has a terrible power of realisation, and it gives the stark sense that the ancient cosmos with earth at the centre is no longer. It changes, revolutionises the whole being of modern man. And the result in relation to the person is contradictory and ambivalent. Humankind was frightened when the infinity of spaces and worlds was revealed, it felt lost and humiliated, no longer the centre of the universe but an insignificant, infinitesimal speck. The power of technology continues the work of revealing the infinity of spaces and worlds into which the earth is thrown, but it also gives a person a sense of its own power, the possibility of mastering the infinite world, in it there is also a sense of human titanism. Humankind is being made for the first time, finally, [19] king and lord of the earth, and perhaps all things. The attitude to space and time is in radical change. Previously, humanity clung to Mother Earth in order not to be crushed under space and time. Now it is beginning to master space and time, it is not afraid to cleave itself from the earth, to fly as far as possible into space. This, of course, is a sign of our maturity, we no longer seem to need the care and protection of our mother. Thus the struggle is at once much more severe while technology makes life more convenient. There are always these two sides to technology: on one hand, it brings with it convenience, comfort and ease, and on the other hand, it demands greater severity and grim fortitude.

The old cultures took possession of only a small space in small masses. Such was the perfection of past culture: in ancient Greece, in Italy during the Renaissance, in 17th century France, in Germany at the beginning of the 19th century. This is the aristocratic principle of culture, the principle of cultivating qualities. But the old culture is powerless in front of enormous *quantities*, it cannot adopt the appropriate means of selection. Technology acquires for itself huge spaces and huge masses. Everything is done on a global scale, everything extends to the entire human mass in the era of technological domination. This is its sociological significance. The principle of technology is democratic. The technical era is the era of democracy and socialisation, everything becomes collective. In it new collectives are organised which once were occupied by the old cultures of vegetal and organic life. This vegetal life, which had received its religious [20] sanction, fashioned organisation. This then has been made redundant for the human masses, in the modern sense of the word. Order, and even a very stable order, could be maintained without organisation in the modern sense of the word, it was maintained by the organic limits set upon it. Technology, on the other hand, gives the human a sense of terrible power, and it is a product of the will to power and of expansion. This will for expansion, which gave birth to European capitalism, inevitably calls forth the masses to their historical life. Then the old organic order collapses and a new form of organisation, one given by technology, becomes inevitable. Undoubtedly, this new form of mass organisation of life, this technologisation of life, destroys the beauty of the old culture, the old way of life. The mass technical organisation of life destroys all individualisation, all that is peculiar and original, all becomes a faceless mass devoid of form. In this age



production is massive and nameless. Not only is the outer, conformable¹⁶ side of life devoid of individuality, but so is the inner emotional life. And, as such, the romantic reaction to technology is to be expected. The resistance of figures such as John Ruskin and Leo Tolstoy is to be expected, a resistance founded on both morals and aesthetics. But any utter rejection of technology is impotent and inconsistent. They can only approximate a defence of more primitive and backward forms of technology and not its utter rejection. Everyone reconciled themselves to the steam engine, to railways, but they were also opposed in their own time. You can refuse to travel by aeroplane, but you will use railways and cars, you're not fond of the Métro, but you willingly ride the streetcar, you are fond of silent films, but you cannot bear the talkies. [21] We are very inclined to idealise the cultural epochs that came before us and that did not know the automobile, and this is very understandable in our disfigured and stultifying lives. But we forget that the old, non-technical life was associated with the terrible exploitation of people and animals, with slavery and enslavement, and that the machine can be an instrument of liberation from this exploitation and slavery. Pushkin's poem 'The Village' beautifully depicted this duality of the past. He describes the extraordinary charm of the Russian village and the landowner's life in it, but suddenly recalls that it is based on enslavement and on a hideous falsehood. In the problem of idealising the past we find the paradox of time. The past that we like so much and was so beguiling never actually took place. This past has been drawn through our creative imagination, through purification, and it gets released from the evil and ugliness that had infected it. We love only the past attached to eternity. For the past never was in the past, the past is only an integral part of our present. In the very past there was another present and in it is evil and ugliness. This means that the eternal is the only thing you can love. Thus there is no return to the past and there is no desiring it. We can only want to return to the eternal past, but this eternal has been singled out by us in some transformative creative act, freed from its darkness. It is impossible to think of a return to living off the land and to the patriarchal system, to the exclusive predominance of agriculture and the workshop in economic life, as Ruskin wished. This is not possible for us, we must live out [22] our destiny. The new human masses, pushed into the arena of history, demand new forms of organisation, new tools. But what we call the 'technological age' is no more eternal than any other. The epoch of the unheard-of power of technology over the human soul will end; but it will end not with the denial of technology, but with technology's submission to the spirit. Humankind cannot remain chained to the earth and depend on it for everything, but neither can he decisively break away from it and go into space. Some kind of connection with the land will remain, and agriculture will remain, without which a person cannot exist. To break into paradise, into the garden of Eden is not given to man until the end and transformation of the world, the whole cosmos. But there will always be a memory of paradise and longing for paradise, there will always be a trace of paradise in natural life, in gardens and flowers, in art. The inner connection of the human with the soul of nature is the other side of its relationship to it. The final displacement of it by technical actualism disfigures not only nature, but also man. The future of humanity cannot be thought holistically, it

¹⁶ 'Plasticheskii'. [W.T.]



must be complex. There will be reactions against technology and machines, efforts to return to primordial nature, but technology and the machine will never be destroyed while humankind walks the earth.

III.

What is the main danger that the machine poses to man, a danger that can already be observed? I fear it is a fundamental danger to the spirit and spiritual life. The machine and technology shall inflict terrible defeats upon the human spiritual, [23] and especially emotional, life, on human sentiments. The mental, spiritual, and emotional element is fading in modern civilisation.¹⁷ So we can say that, while the old culture was dangerous for the human body, either neglecting, pampering, or coddling it, mechano-technical civilisation is dangerous primarily for the soul. The heart can scarcely bear the touch of cold metal, it cannot live in a metal casing. These procedures that lead to the destruction of the heart, as the core of the soul, are characteristic for our age. Among the most prominent French writers of our age, for example, Proust or Gide, it is no longer possible to find the heart as an integral organ of a person's mental life. Everything has degraded into an intellectual element and into sensory impressions. Keyserling is absolutely right when he speaks of the destruction of the emotional order in modern technological civilisation, and when he calls for a restoration of this order.¹⁸ Technology deals terrible blows to humanism, to the humanistic worldview, to the humanistic ideal of man and culture. The machine is inherently anti-humanistic. The technological conception of science is completely opposed to the humanistic understanding of science, and is in conflict with the humanistic understanding of the perfection of human nature. This is at once the same question of the attitude to the soul. Though it may at first seem surprising, technology is less dangerous for the spirit. In fact, we can say that we live in the era of technology and the spirit, and not in the era of the mental and the soul. The religious sense of modern technology is precisely that it puts everything under the sign of the spiritual, and therefore can lead to the spiritualisation of things. It requires that the spiritual be exerted upon things. [24]

Technology ceases to be neutral, it has not been neutral for any length of time, nor is it indifferent to the spirit, nor to questions of the spirit. And, in the end, it is impossible for anything to be truly neutral, something can seem neutral only up to a certain point and only superficially. Technology has a deadly effect on the soul, while at the same time prompting a strong reaction from the spirit. While the soul, left to itself, turned out to be weak and defenceless before the increasing power of technology, the spirit may be yet strong enough. Technology makes man into a cosmiurge. Compared with the tools that modern technology puts into the hands of a person, his former tools seem like toys. This

¹⁷ *Dushevno-emotional'naya stikhiya* – Previous references to the 'spiritual' have used the term 'dukhovniy', here he speaks of the 'soul' (*dushá*). Here this is roughly equivalent to the German 'Geist'; e.g., '*dushevnyaya bolezn*' – '*die Geisteskrankheit*'. This contrast between spirit and soul is also important later where *dusá* is then close to *die Seele*, and *dukh* represents the expression of human energy and willful activity. [W.T.]

¹⁸ See his *Meditations Sud-Americaines*. [N.B., see Keyserling, 1932]



is especially evident in the technology of war. The destructive power of former weapons of war was very limited and localised. The old cannons, guns and sabres could not exterminate masses of humanity, destroy large cities, endanger the very existence of culture itself. Meanwhile, new technology has made this possible. And, as in everything, technology puts terrible force into the hands of the person, which can itself become destructive. Soon peaceful scientists will be able to shock not only at an historical, but also at a cosmic level. A small handful of people with the secrets to technology in their hands will find it possible to hold hostage the whole of humankind. This is quite conceivable. Renan had foreseen this possibility. But when our race is given the power with which it can rule the world, and can destroy a significant part of humanity and culture, then everything becomes dependent on the spiritual and moral state of a person, what they will use this power for, what kind of spirit this person has. [25] The question of technology inevitably becomes a spiritual question and, in the end, a religious question. The fate of humanity depends on it. The wonders of technology, always dual in nature, require an unprecedented spiritual tension, immeasurably greater than those of previous cultural eras. Human spirituality cannot be organically vegetative. And we face the demand of a new heroism, both internal and external. The human heroism once associated with war is coming to an end, in the last war it was practically non-existent. But technology requires of us a new heroism and we constantly read and hear of its manifestations. Such is the heroism of scientists who are forced to leave their offices and laboratories. Flying into the stratosphere or sinking to the bottom of the ocean requires, of course, real heroism. Heroism is required by the brave flights of aeroplanes battling raging storms. Manifestations of human heroism begin to reach out to cosmic spheres. But the strength of the spirit demands, first of all, a technology that does not enslave or destroy us. In a sense, we can say that we are talking about matters of life and death. Sometimes such a terrible utopia comes to the surface. There shall come a time when there will be perfect machines with which man could rule the world, but there will be no humans at their helm. The machines themselves will behave with perfection and achieve maximum results. The last people themselves will turn into machines, but then they will disappear because of the uselessness hinderances of organic respiration and the circulation of the blood. Factories will produce goods with great speed and perfection. Cars and aeroplanes will fly. With the wireless, [26] music and song will ring around the world, the speeches of our forebears will be reproduced. Nature will be conquered by technology. The new reality created by technology will remain in cosmic life. But there will be no man, there will be no organic life. Such ghoulish visions sometimes appear. Their outcome depends on the exertion of the strength of the spirit, whether humanity will escape such a fate. This is where the exclusive power of technologisation and machinisation can lead – to non-existence in technical perfection. We must not give technology full autonomy, allow it complete freedom of action, it must be subordinated to the spirit and spiritual values of life, like everything else. But the human spirit will cope with this grandiose task only if it is not isolated and does not rely only upon itself. It will cope only when it will become united with God. Only then will the image and likeness of God be preserved in the human and, as such, will man be preserved. And this is the difference between Christian eschatology and technological eschatology.



IV.

The power of technology in human life entails a profound change of religiosity. And we should say directly that it is a change for the better. In the technological, machine age, the inherited, habitual, everyday, socially conditioned type of religiosity weakens and becomes more and more belaboured. The religious subject is changing, it feels less connected with traditional forms, with vegetal-organic life. Religious life in the technological and machine age requires a more intense form of spirituality, [27] Christianity becomes more internal and spiritual, more free from social influence. This is an inevitable process. It is very difficult in the modern world to keep the form of religion determined by inherited, ethnic, family, socio-moeitic influences. Religious life becomes more personal, more impassioned and, as such, more spiritually determined. This, of course, does not at all imply a kind of religious individualism, because the very conciliarity and ecclesiasticism of religious consciousness has nothing in common with sociology. But in another respect, the power of technology can have fatal consequences for spiritual and religious life. Technology masters time and radically changes our attitude to time. Technology allows a person to actually master time. But technological actualism subordinates the person and his inner life to time's ever-accelerating progression. In the frenzied speed of modern civilisation, in this flight of time not a single moment remains an end in itself, and not a single moment can be stopped, as if we were actually exiting from time itself. There is no way out of time in the life of a single moment (*Augenblick*) in the sense that Kierkegaard uses the word.¹⁹ Each moment should be replaced as soon as possible by the next, and all moments remain in the flow of time and therefore disappear. It is as if there is nothing inside each moment except striving for the next moment, it is in itself empty. But such a mastery of time through rapidity and speed turns into enslavement under time's flow. This means that technological actualism in its relation to time shatters eternity and makes it more and more difficult for a person to relate to eternity as such. We have no time for eternity. [28] As soon as possible we must move from one moment to the next. This should in no way mean that we should see only the eternal in the past, a past which is always being torn asunder by the future. The past is no more part of eternity than is the future, and both past and future belong together to time. Indeed, in both past and future, and at any time, it is possible to enter into eternity, into a precious, saturated moment. Time obeys speed's machine, but it shall not be overcome or defeated by it. And thus we face a problem: can we hold on to those moments of contemplation, contemplation of eternity, God, truth, and beauty in our present state? The person undoubtedly has an active vocation in the world and, indeed, there is some truth in the principle of actualism. But the human being is also capable of contemplation, and in contemplation there is an element that defines one's ego. There is creativity in contemplation itself, that is, in our relation with God. The formulation of this problem further convinces us that all the diseases of modern civilisation are generated by a discrepancy between the mental organisation of a person inherited from other times and a new, technical, mechanical reality from which there is no escape. The human soul

¹⁹ Berdyaev is here referring to Kierkegaard's (1844/1981) notion that „the fullness of time is the moment as the eternal“ (p. 90). [W.T.]



cannot withstand the speed that modern civilisation demands. This requirement alone is inclined to turn the person into a machine. And this is a painful process. Modern man tries to strengthen himself through sport, and with this combat a form of anthropological regression. And there is no denying the positive significance of sport and its return to the ancient Greek attitude to the body. But sport itself can turn into a means of destroying the person, deformity [29] instead of harmony when not subordinated to the holistic, harmonious idea of the person. Technological civilisation is essentially impersonalistic, it does not know and does not want to know the individual.²⁰ It requires of the human activity, but does not want the person to preserve their individuality. And it is especially difficult for a person to remain an individual in our civilisation. Individuality is the opposite of the machine in everything. First of all, it is unity in diversity and integrity, it assumes its goal from itself, it does not agree to be turned into a part, into a means or an instrument. But technological civilisation, but technologised and mechanised society, each want man to be a part of them, their means and instrument, they assure at all costs that the human dispense with its unity and integrity – they want the person to cease to be an individual. And there will be a terrible struggle between the individual and technological civilisation, the technologised society, the struggle of man and machine. Technology is always ruthless to all that lives and exists. And pity for what lives and exists must limit the power of technology over life.

Machinism, triumphant in capitalist civilisation, distorts first of all the hierarchy of values, and the restoration of the hierarchy of values is a limitation of the power of machinism. This problem cannot be resolved by returning to old mental structures and to the old natural-organic reality.²¹ And, at the same time, the nature of modern technical civilisation, and what it does to humanity is unbearable to Christian, not to mention human, consciousness, [30] the consciousness of human dignity. We stand before the question of saving the very image of humanity. The human is called to continue peacemaking; and his work is like the eighth day of creation, he is called to be the king and lord over the earth. But the work he does, and the work to which he is called, enslaves him and distorts his image. A new person appears, with a new mental structure, with a new image. The old person, the man of the past, took himself for an eternal man. There was the eternal in him, but he was not an eternal man. The past is not eternal. A new person must appear in the world. And the difficult question is not his relation to the old man, but his relation to the eternal man, to the eternal in the human. The image and likeness of God in man is eternal. It is this which gives a person an identity. There is no way that this can be given a statistical understanding. The image and likeness of God in man, as in a natural being, is revealed and confirmed in its dynamics. This is the relentless struggle against the old, old man in the name of the new man. But machinism would like

²⁰ *Lichnost* – For the sake of consistency, and to contrast with the rendering of *‘chelovek’* as person, this is translated here as ‘individual’ and ‘individuality’; however the English term is rather hollow in comparison with the Russian. The term is better understood as ‘person’, ‘personality’ and ‘identity’ in the sense of ‘establishing one’s identity’. Etymologically, the term descends from the noun *‘lik’* (‘face’), the term also used for the faces of icons. [W.T.]

²¹. An interesting book by Cina Lombroso, *La rancon du machinisme* , invests too much faith in the possibility of returning to domestic types of civilisation. [N.B., see Lombroso 1931]



to replace in man the image and likeness of God with the image and likeness of the machine. This is not the creation of a new person, it is the extermination of the person, the disappearance of the person, replacing him with another being, with a different, non-human existence. This is the whole agony of the problem. Humanity created the machine, and it can give him a proud awareness of his dignity and strength. But human pride can turn imperceptibly into human humiliation. A truly new being may appear, but it is no longer a human being. And this is not at all because the person belongs to the old world, and [31] the new world must change the person and replace the person with another type of being. Throughout its historical destiny humanity itself has changed, it has been old and new. But in all times, old and new, the human has touched upon eternity, and it is this that has made us human. The new person finally breaks with eternity and decisively attaches himself to the new world, which he must master and subjugate. Without immediately noticing it itself, this being will cease to be a person. The human becomes dehumanised. The question arises: to be or not to be a person, not an old person who should be overcome, but just a person in oneself. Since the emergence of human self-consciousness, which reached its expression in the Bible and in ancient Greece, this problem has never been raised with such acuteness and depth. European humanism believed in the eternal foundations of human nature. This faith it received from the Greco-Roman world. Christianity believes that humankind is a creation of God and bears His image and likeness, that man is redeemed by the Son of God. Both faiths strengthened the European man, who considered himself a universal man. Now this faith has been shaken. The world is not only de-Christianised, but also dehumanised. This is the whole severity of the question that the monstrous power of technology has set before us.

A remarkable attempt to resolve that question before us belongs to the brilliant Christian thinker Nikolai Fedorov, the author of *Philosophy as a Common Cause*.²² For him, as for Marx and Engels, philosophy is not there to cognise a theoretical world, but to remake it. Philosophy must be a project. Humanity is called to actively master the elemental forces of nature. [32] This has brought us death, regulating and ordering not only the social, but also cosmic life. Nikolai Fedorov was an Orthodox Christian, and the rationale for his ‘common cause’, the cause of victory over death and the return of life to all the dead, was a Christian one. But he also believed in science and technology, he held in them an extraordinary belief. He made no deification of science or technology – because he believed in God and Christ – but science and technology were for him the greatest tools of man in the victory over nature’s elemental, irrational, mortal forces. He held faith in the wonders of technology and called for their perfection. Fedorov’s example is interesting to us because it combined faith in the power of technology with a spirit directly opposite to the one which prevails in the technical era. He hated the machinism of modern civilisation, hated capitalism created by prodigal sons who forgot their fathers. He has a formal resemblance to Marx and communism, but was the complete opposite of them in spirit.²³ Nikolai Fedorov is one of the few figures in the history of Christian

²² Compare previous allusions in this text to „cosmic life“ and Fedorov’s cosmism (Fedorov, 1906-1913). [W.T.]

²³ See Setnitsky’s interesting book *On the Final Ideal*. Setnitsky’s book represents the Fedorovian school of the Soviet period where the religious elements of his worldview have been weakened. [N.B., see



thought, almost the only figure, who has overcome a passive understanding of the apocalypse. The apocalypse is a revelation about the historical destinies of man and the world and about its end, about the final reckoning. But this revelation can neither be understood deterministically nor fatalistically. The end, the last judgement and the eternal damnation of many are not at all predetermined by divine or natural necessity, they are not at all fatal. A human being is free and called to activity, the end depends on the human. Apocalyptic [33] prophecies are conditional. If Christian humanity does not unite for the common cause of mastering the elemental mortal forces, for the victory over death, and for the restoration of universal life, for the regulation of world life, if it does not create a kingdom of Christian spiritualised labour, if it does not overcome the dualism of theoretical and practical reason, mental and physical labour, then Christian truth and Christian brotherhood and love in the fullness of life cannot be realised. If death will not be defeated by the power of Christian love and the power of science and technology, then there will be the kingdom of the antichrist, the end of the world, the last judgement and everything that is described in the apocalypse. But all this is avoidable should we take up the ‘common cause’. Fedorov’s eschatology differs from both the typical Christian eschatology and from the eschatology of modern technology, the religion of machinism. Indeed Russian communism is a stark reminder of the little-appreciated Fedorov. He raised the religious question of human activity and technology in all its acuteness. The power of technology and the machine as connected with capitalism was born in the bowels of the capitalist system, and the machine has been capitalism’s most powerful tool. Communism has entirely adopted this hyper-machinism and technologism from capitalist civilisation and has created a real religion of the machine, which it worships as a totem. Undoubtedly, if technology has created capitalism, then it can also contribute to overcoming capitalism and in creating a different, more just social order. It can become a powerful tool in solving the social issue. But in this case, everything will depend on which spirit wins, what sort of spirit the human will be. Materialistic communism [34] subordinates the problem of man as an integral soul-body being to the social problem. It is not the person that should organise society but society that should organise the person. But, of course, the opposite is true: the human is primary, the human must organise society and the world. And this organisation will depend on what kind of person the human is, what kind of spirit he is. And the human is taken here not only as an individual being, but also as a social being with a social vocation. Only then does a person have an active and creative vocation. Very often in our era, people wounded by machinism say that a machine cripples the human, that the machine is to blame for everything. Such an attitude humiliates us and is beneath our dignity. The machine is not responsible for anything. Man is the maker of machines, the machine is not to blame for anything, and it is unworthy to transfer responsibility from the person itself to the machine. It is not the machine, but the human which is guilty of the terrible power of machinism, it is not the machine that has immobilised the man, but the man who has immobilised himself. The problem must be transferred from without to within. The power of technology and machines over human life is limited by the work of the spirit. The work of man himself

Setnitsky, 1932



depends on the tension within his spirituality. A machine can be a great tool in our hands, in our victory over the power of elemental nature, but for this a person must be a spiritual being, a free spirit. There is a process of dehumanisation in the world, dehumanisation in everything. But the man himself is to blame for this dehumanisation and not the machine. Machinism is only a projection of this dehumanisation. We, for example, see this dehumanisation of science in modern physics, with its [35] extraordinary discoveries. Physics studies invisible light rays and inaudible sound, and this leads beyond the limits of the world of light and sound familiar to man. Einstein also leads away from the spatial world familiar to man. New discoveries in physics have a positive meaning, they are guilty of nothing, they testify to the power of human consciousness. Dehumanisation is a spiritual state, it is the attitude of the spirit towards man and the world. Everything leads us to the religious and philosophical problem of man.

The person can be absorbed by an increasingly unfolding cosmic infinity. Christianity freed man from the power of cosmic infinity that surrounded him in the ancient world, from the power of the spirits and demons of nature. It put him on his feet, strengthened him, made him dependent on God and not on nature. But at the heights of science, heights that have only become attainable at the heights of civilisation and technology, with the independence of man from nature, man himself discovers the hidden secrets of cosmic life and discovers the action of cosmic energies that had once lain dormant in the depths of natural life. This testifies to man's power, but it also puts him in a new, dangerous position in relation to cosmic life. A demonstrated ability of a person to organise disorganises them internally. Christian consciousness also must confront a new problem. The Christian response to the new position of the human in the world presupposes a change in how Christian consciousness understands our vocation in the world. The problem of Christian anthropology is put at the centre. [36] Neither patriotic nor scholastic anthropology, nor humanistic anthropology can satisfy us. From the cognitive side, the problem of philosophical anthropology moves to the centre. Man and machine, man and organism, man and cosmos are all problems of philosophical and religious anthropology. In their historical destiny, a person goes through different stages, and our fate is always tragic. In the beginning, humanity was enslaved to nature, and we began a heroic struggle for our protection, independence and liberation. We fashioned culture, states, national unity, social classes. But we then became slaves to the state, to nationality, and to the classes we created. Now humankind is entering a new period where it wants to master irrational social forces. We create an organised society and advanced technology, we make man an instrument of organising life and the final mastery of nature. Yet we become a slave to organised society and technology, a slave to the machine into which society has been transformed and into which humanity itself is imperceptibly transformed. But the problem of human liberation, the domination of the spirit of nature and society, is ever being posed in newer and newer forms. This problem can be solved only by an awareness that puts humanity above nature and society, that puts the human soul above all the natural and social forces that must obey it. That which freed humankind must be accepted, and that which enslaved humankind must be rejected. However, this truth about humanity, the truth of its dignity and vocation, is embedded within Christianity; though perhaps history has not adequately revealed, and has often distorted



it. The path of the final liberation of humankind and the final [37] realisation of his vocation is the way to the kingdom of God. This not only the kingdom of heaven, but also the kingdom of the transfigured earth, the transfigured cosmos.

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Research article

Reading Nikolai Berdyaev's 'Man and Machine'

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Abstract

This article introduces the author's English translation of Nikolai Berdyaev's article 'Man and Machine' ninety years after its initial publication. It appeared in the journal *Put': Organ russkoi religioznoi mysli* ('The Path: Organ of Russian Religious Thought'). Established in 1925, *Put'* was the journal of Berdyaev's own Religious-Philosophical Academy founded in exile. The journal had a free-thinking, clearly anti-Soviet bent while also feeling the pulse of European temperaments. We examine Berdyaev's work in its historical context, its references and influences, including the special role of Russian cosmism. While noting the popularising and dated character of his positions, we maintain the continued relevance of Berdyaev's argument that machines should assist humanity in achieving goals that transcend humanity rather than humans being mere agents in the progress of machines. We compare this position with the current angst over Artificial Intelligence as expressed, for example, in the works of Yuval Noah Harari who treats the tool and the human as equal agents in history. We argue, in contrast, that one should view intelligent machines as partners in progress toward transcendent goals rather than interlocutors or competitors. The prescience of Berdyaev's argument is, alas, borne out by the fact that we have lost much of a sense of what such transcendent goals for humanity might mean.

Keywords: Philosophy of technology; Berdyaev; Christian existentialism; Cosmism; Futurism; AI; Yuval Noah Harari

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Научная статья

Читая “Человек и машина” Николая Бердяева

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Аннотация

Данная статья представляет авторский английский перевод статьи Николая Бердяева “Человек и машина” спустя девяносто лет после ее первоначальной публикации. Статья появилась в журнале “Путь: Орган русской религиозной мысли”. Основанный в 1925 году, “Путь” был журналом Религиозно-философской академии Бердяева, основанной в эмиграции. Журнал был свободомыслящим, явно антисоветским, и в то же время чувствовал пульс европейского темперамента. Мы рассматриваем творчество Бердяева в его историческом контексте, его отсылки и влияние, включая особую роль русского космизма. Несмотря на популяризаторский и устаревший характер некоторых позиций, мы подчеркиваем неизменную актуальность аргумента Бердяева о том, что машины должны помогать человечеству в достижении целей, выходящих за рамки человечества, а не люди должны быть просто агентами прогресса машин. Мы сравниваем эту позицию с нынешним беспокойством по поводу искусственного интеллекта, выраженным, например, в работах Юваля Ноя Харари, который рассматривает инструмент и человека как равноправных агентов в истории. Напротив, мы утверждаем, что интеллектуальные машины следует рассматривать как партнеров в продвижении к трансцендентным целям, а не как собеседников или конкурентов. Увы, дальновидность рассуждений Бердяева подтверждается тем фактом, что мы во многом утратили представление о том, что могут означать такие трансцендентные цели для человечества.

Ключевые слова: Философия техники; Бердяев; Христианский экзистенциализм; Космизм; Футуризм; ИИ

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Reading Nikolai Berdyaev's essay 'Man and Machine' ninety years after its first publication is like finding an old cassette tape in a shoebox. The label is smudged, you're not sure whether it is worth seeking out the apparatus to interpret the medium. Perhaps it is a hash of old popular songs already available in any quantity and combination on YouTube. The lilliputian amounts of data surely mean there is little to be found there. On its surface, 'Man and Machine' is a piece of cock-prophecy, a revue of opinions already well covered by popularisers such as Oswald Spengler and betraying an ignorance of more serious works such as Paul Valéry's 'Conquest of Ubiquity' (1928) or Martin Heidegger's *Being and Time* (1926). The Christian element seems a shorthand for 'European tradition,' far too chummy with cultural essentialism and Hitler just in power. Yet, like the cassette, there is a beguiling physicality in the moveable spools with their black magnetic ribbon, harkening to a time when you could feel data between your fingers, when songs could be exchanged like valentines. It is at least a historical object worth deciphering despite its out-of-date forms. Indeed, in comparison with the cock-prophecs of our age who disclaim all manner of dystopias and utopias, it is not Berdyaev's prescience which is so important as it is the persistent relevance of this critique. And there are some thin, fragmentary voices, old voices, that have some disturbingly relevant things to say.

Nikolai Berdyaev (1874–1948) was an influential Franco-Russian philosopher and cultural commentator. Caught up in the energy of the Moscow left around the Revolutions, he first adopted Marxism and its social critiques, but later regarded them as inadequate to deal with the major questions of human nature. He is often referred to as an 'Existential' philosopher, and the importance of freedom and human will resembles the work of later French existentialists, but his '*Existentialism*' is much closer to French readings of 19th century German philosophers of life such as Kierkegaard and Schopenhauer. Several major books and collections, *The Philosophy of Freedom* (1911), *The Meaning of Creativity* (1916), *The Spiritual Origins of Russian Communism* (1917–1918), *The Destiny of Humanity* (1931), and *The Russian Idea* (1946), have been widely translated and have exerted broad influence. Some of his finest and most relevant ideas remain his analyses of Dostoyevsky, his perceptive and informed refutation of Soviet ideology, referenced in this article, and his analysis of his contemporaries in *The Types of Religious Thought in Russia*, including the 'cosmists' which we shall discuss here.

'Man and Machine' first appeared in the journal *Put': Organ russkoi religioznoi mysli* ('The Path: Organ of Russian Religious Thought'). Established in 1925, *Put'* was the journal of Berdyaev's own Religious-Philosophical Academy founded in exile. With priests shot and imprisoned in Soviet Russia, the vibrant theological school of Moscow had found refuge in Paris where it would go on to shape Orthodox theology over the 20th century. As an independent academic, founder and general editor of *Put'*, Berdyaev regularly contributed book reviews and popular articles on politics, philosophy, and theology. Much like our own times, Russians in exile were trying to make sense of the new world they had found themselves in. The journal had a free-thinking, clearly anti-Soviet bent while also feeling the pulse of European temperaments. Publication continued until 1940 two months before the German invasion of Paris.

'Man and Machine' appeared in the May 1933 edition and soon received an



excellent translation into French (probably corrected by the author). German and Croatian translations appeared in 1934 along with a rather poor version in English. A Dutch translation appeared in 1935. The article is stylistically uneven with a number of clunky repetitions betraying some haste in composition. Overly literal translations by overly hasty translators also tend to garble a number of the author's points. Nevertheless, the text has since been regarded as a historical contribution to the philosophy of technology and an important source for Berdyaev's ideas.

Appearing in 1933, 'Man and Machine' is necessarily coloured by both the murmurings of Stalinist terror and the rise of Nazism. Surveying the literature to which the text refers, it is evident that Berdyaev's article is a work of popular philosophy engaging primarily with what was sitting on the editor's desk. He mentions Nicolai Hartmann's (1926) *Ethik*, the criminologist Gina Lombroso-Ferrero's (1931) *La Raison du machinisme* (Fr. trans.), the then-popular Count Herman von Keyserling's (1932) *South American Meditations* (Fr. Trans.) with its similar spiritual and anti-Western critique. The physicist and Catholic pacifist Friedrich Dessauer's (1927) *Philosophie der Technik. Das Problem der Realisierung* and Hans Driesch's (1921) *Philosophie de l'organisme* (Fr. trans.) are mentioned in passing. The impetus for Berdyaev's article is probably Oswald Spengler's (1931) slim volume *Mensch und die Technik*. Following after *The Decline of the West* (Spengler, 1918–1922), Spengler sees technology as an element of the Faustian man whose destruction of the world under the dominion of technology is inevitable. Some of Spengler's themes appear directly in Berdyaev's text: 'Der Herr der Welt wird zum Sklaven der Maschine [The master of the world becomes the slave of the machine]' (Spengler, 1931, p. 74). Another counterpoint is Jacques Lafitte's *Réflexions sur la science des machines* (pub. 1932) where the machine is a natural outgrowth of humanity, a type of social organism.¹ This influence comes in the contrast between organism and organisation (Lafitte, 1932/1972, p. 107). Yet whereas Spengler sees the development of Faustian man as a stage of evolution and Lafitte as an alternative life form, Berdyaev regards the technical as a mode of human being and activity that is natural but not inevitable. Berdyaev's technological 'organisation' is a bit like Iain McGilchrist's (2012) version of the two hemispheres of the brain: the left has come to dominate the Modern, but the right is still there, murmuring like Cassandra while the captains of IT and industry dribble over the commanding heights. Berdyaev resolutely maintains that it is possible for humanity to change course and reposition itself in relation to its tools. In contrast to Spengler's Wagnerian fatalism, for Berdyaev there is always a choice. That choice is cradled and nourished in Christian civilisation and only through God comes the possibility of humanity to fully realise itself in freedom. Thus Berdyaev sees the fundamental integrity of human nature as essential and its corporate movement through history as essential. Over the final decade of his journal's publication, Berdyaev would come to argue, like Spengler, that democracy was nearing its end and that the

¹ 'Ainsi, dis-je, tous ces faits nous montrent, avec une grande évidence, que nous avons dans la série des machines une série évolutive étroitement comparable à celle qui est constituée par les êtres vivants; que l'étude de cette série relève de méthodes étroitement comparables à celles de la biologie; que les problèmes qui sont posés par cette étude sont étroitement comparables aux problèmes biologiques' (Lafitte, 1932/1972, p. 108).



Soviet Union had set before us a forking path: to the left was the dictatorship of technology and mass dehumanisation, the path of the antichrist, to the right was the Christian brotherhood of freedom, creativity, and self-realisation. The path humanity chose would determine whether it was to be dominated by its own God-given will or the greedy, all-consuming creations of its hands.

Of significance are also works Berdyaev fails to reference. Despite his discussion of *technē* in the ancient world, Hermann Diels' magisterial *Antike Technik* (1920) does not appear. Berdyaev also betrays no knowledge of Paul Valéry's 'Conquest of Ubiquity' (1928). This work, a precursor to Walter Benjamin's 'The Work of Art in the Age of Mechanical Reproduction' (1935), bears some interesting comparison with Berdyaev's piece. Like Valéry, Berdyaev balks at the homogenisation of a life dependent on the spirit of technology, yet Valéry's analysis is less social and more psychological. For example, both consider the mass reproduction of culture. Valéry sees that the omnipresence of music from the radio will replace (and thus manipulate) the constant narrative of rhythms and melodies that shape our internal life. Berdyaev, on the other hand, is concerned with communicative ubiquity. Messages which were conveyed in the theatre from a living and present actor suddenly are addressed to everyone and no one. The 'vulgarity' that Berdyaev finds in the cinema is in part a reference to his reaction to Soviet culture. Perhaps this hinders him from seeing the significant power of the moving images of which Soviet filmmakers were masters. But he clearly identifies that speech presumes a special relation between the speaker and the addressee, an essential element of the ephemeral and intimate nature of theatre. The actor on the movie reel speaks to everyone and no one and therefore the audience knows that it is anyone and no one, and this is not a humanising event. Valéry's perspective went from the social to the spiritual – the radio infiltrates your internal music. Berdyaev's goes from the spiritual to the social – the speaker to the world. The subtitle to his piece is 'the problem of sociology and the metaphysics of technology'. It was the 1930s that would conclusively demonstrate the political and social power of technology to convey a 'message'.

Over that decade Berdyaev's views would continue some of the themes of this essay. He predicted that the world would arrive at a new middle age, that technology would be new forms of magic, even black and white magic. In time, religion and technology would begin to replace one another revealing the need for a new consciousness. While such bloviations were used to remove Berdyaev from the list of Nobel prize candidates (see Marčenko, 2016), it was not long before Nazi 'scientists' would be breeding aurochs and looking for the Holy Grail. In fact, the bizarre mixing of mediaeval fantasy and science fiction that emerged in the 1970s, and that multiplies with astonishing facetiousness in films and video games, seems right along Berdyaev's train of thought.

Berdyaev distinguishes between prophecy and prediction. The prophetic imagination is that which gives meaning to current history, and this is one of the author's pretensions. Yet when we see projections that have come to pass, such as mass communication and the Internet, or the mass destruction of weapons such as the atomic bomb, the distortions of the body that come from cosmetics and sport, rather than painting the author with glowing eyes and a quivering staff, we should consider the extent to which



such consequences were latent, yet observable, in his own time. We have the tendency to view technological developments with breathlessness, as things that are ‘life-changing’, ‘without precedent’, ‘never before seen’. Berdyaev’s ‘prophecy’ can help us find historical, causal roots to our present age.

As a Russian philosopher in the tradition of Vladimir Soloviev (1853–1900), Berdyaev occupies a special critique with respect to Western rationality. For these thinkers, the rational is opposed to the reason given to human nature as the image and likeness of God.² The mechanistic (or mathetic) rationality of the 18th century leads to an unreasoned destruction of human integrity. When done poorly this approach is no more than 19th century revanchism. When done well, it resembles the argument of Lorraine Daston (in Erickson et al. 2013) that Modern rationality, which was taken to be a human faculty, becomes gradually replaced by an algorithm. In their more subtle moments, these critiques hold that the Modern sees truth value only in reductionism. This disregards the purposes of thinking and being as putting things together, as recognising that activity and agency demand the recognition of wholes and not just constituent parts. This approach has important roots in Orthodox theology and is a critique which still bears a great deal of relevance for the theory of biology and its need for natural kinds.

On the other hand, it seems as though Berdyaev falls far short of anticipating the digital age. He writes ‘But the reality that art reveals has a symbolic character, it reflects the ideological world. Technology, on the other hand, creates a reality devoid of any symbolism, here reality is unmediated.’ This betrays a certain logocentrism and naiveté with respect to the manner in which a technological medium itself has ideological content and can be entirely built upon symbolically-mediated systems. Nonetheless, his perception elsewhere that the creation of new media would collapse space and time into new technocracies anticipates Francis Fukuyama’s (1992) ‘End of History’ while a greater parallel comes in Hans Ulrich Gombrecht’s (2014) ‘Broad Present’ where the constant access to information and context means we lose a sense of both past and future. Berdyaev, after Kierkegaard, argues that when we exist in one moment only to move on to the next we have no sense of time. This makes us unable to step outside of time to contemplate the eternal. For Berdyaev, dystopian technocracy creates not an endless present, but a false eternity. Technological objects are ‘superphysical’, they are additions to a spiritual reality that, like eternity, is the foundation upon which the temporal derives its existence. Futurologists such as Fukuyama regard whatever age they herald as a *trend*, in the language of the market, their reality extends only as far as their marketability.

Consider another populariser of our day, one perhaps comparable to Berdyaev in gifts and foresight. Yuval Noah Harari’s (2014) *Sapiens* is a fine example of what we can call the ‘perspectivism’ of our current position. Rather than viewing humans as a user of tools for individual tasks, the tool and the human are equal agents in history. His famous quote ‘We did not domesticate wheat, it domesticated us’ (Harari, 2014, p. 193) is no less imperialistic than Berdyaev’s Christianity (it could be applied to rice, but what about maize or sorghum?), but it is certainly post-human. *Sapiens* is a fine piece of rhetoric and can perform the moral task of taking humanity off its pedestal, seeing other ‘organisms’

² This perhaps first appears in Solovyov’s (1874/1996) *Crisis of Western Philosophy*.



and ‘organisations’ with their own perspectives. But it blinds Harari to things that would have been luridly obvious to Berdyaev. For example, in a recent piece for *The Economist* magazine, Harari (2023) argues that Artificial Intelligence (AI) poses fundamental risks to humanity. Just as with *Sapiens* and his later techno-hubristic *Homo Deus*, AI and mankind are on an even keel. The technology is there, it is coming. How can we resist it? This is the contestive form in which we set the debate, as if AI were a meteorite coursing toward the earth and not something that we have made, designed, financed, and sold. ‘We have just encountered an alien intelligence, here on Earth. We don’t know much about it, except that it might destroy our civilisation.’ While Harari offers reasonable proposals regarding governmental regulation, the cosmic encounter is staged between two equal combatants. Rather I would venture we know just about everything about AI, much more than we know about ourselves. And we have utter control over its sustenance and future, much more than we can say about ourselves. And what is the virtue of this battle between culture that humans create and that created by AI? Why should one be defended over the other? The way that Harari writes how ‘[h]istory is the process through which laws and religions shape food and sex’ makes one rather think that AI is the better alternative. Just as Berdyaev predicted, AI has ‘hacked the operating system of our civilisation’ because, beyond the metaphor, we have made civilisation into a machine. Furthermore, apropos Berdyaev’s ‘problem of sociology’, the question ‘what can we do about it’ is not prefaced by the question of ‘who is doing this and why?’ and this speaks rather to the political, financial, and bureaucratic elements to which Berdyaev had tipped his neo-mediaeval lance, and to which Harari makes no mention.

This is not because Harari has turned himself into a clean-shaven cyborg, it is because his notion of humanity takes it as a species like any other. It is a species that, as Heidegger said, is a ‘world-maker’, but that is just one of its features, like photosynthesis in plants, the trunk on an elephant, or geolocation on your smartphone. Harari’s (2016) *Homo deus* is a species with supercharged features. That humanity would reach beyond itself for something that is not in its ‘service’ is incomprehensible to Harari. Berdyaev argues that centering the ‘service’ of our needs and comforts immediately enslaves us to that which we must then service. This is much more prescient than Spengler and far more reminiscent of Aldous Huxley’s (1932) oddly contemporary *Brave New World*. In comparison with Berdyaev and Huxley, Harari is merely tootling his Tesla round the *Matrix*.

Berdyaev writes: „The human organism, its psychophysical organism, was formed in another world and adapted to the old sense of nature. It was a vegetal-animal adaptation. But man has not yet adapted to the new reality that is revealed through technology and the machine. He does not know whether he will be able to breathe in a new electric and radioactive atmosphere, in a new cold, metallic reality devoid of animal warmth. We do not yet know how destructive the atmosphere created by our own technical discoveries and inventions is for us.“ (Berdyaev, 1933/2023, p. 14) This ‘atmosphere’ is literal – the smoke of factories – but he sees the movement away from the natural world as a global phenomenon, as a question for humanity and not an individual that has sloughed off its duty to the species. In his day, Dadaism and Supremacism attempted to give technical objects a poetic and archetypal form. That,



ninety years later, we would still fret over the extent to which ‘the heart can scarcely bear the touch of cold metal’ may mean that the tension between the organic and the organism, and leafy groves or brutalist apartment blocks, is never going to pass. It is not something we can adapt out of.

On another front, when China, Japan, and India dominate IT development, it is hard not to see that this essential Christian man for Berdyaev is just another form of cultural imperialism. But this is where Berdyaev’s prophecies and predictions bear out the vacuity of our current position. In the Orthodox tradition that informs Berdyaev, since we were made in the image of God, both our nature and our aims in life are determined beyond ourselves. Indeed, that humanity is meant to strive toward something higher is hardly just a Christian notion, it is evident in the ancient Indian edicts of Ashoka and Confucian morality. In the second half of the 20th century that place was occupied by ‘liberal values’. We use our creations to bring us beyond ourselves to our ideals. The domination of technology inverts this aim: we focus on our creations and then set them in place of ourselves. That simple human comforts, bureaucratisation, an overweening state, and will to power would result from this inversion would have been evident in Berdyaev’s day. Yet it is disquieting to observe how far this movement has gone and how insidiously unremarkable it has become.

The beginning of ‘Man and Machine’ mentions the tendency of Christians to view technology in eschatological terms and as the advent of the antichrist. A cursory reading of his article would paint Berdyaev with the same brush, yet he has quite a different view, and this is where we find ‘Man and Machine’s’ most important, if not direct, contribution. Early in his essay he notes: ‘Technology tears away the fusion of the spirit with historical bodies.’ He then continues that Soviet technology is peculiar for its spiritualisation of technology, its eschatology that is Christianity in a macabre inversion. In part this is Berdyaev’s critique of Marxism as false eschatology, but it also alludes to the relationship of the end times with the ‘historical body’ of the human species – the resurrection of the dead, the reappearance of all humanity in its fusion of spirit and flesh. Berdyaev sees in *Homo sovieticus* and the modern spiritual demands of technology a grisly parody of this end of history. But this does not mean that technology has no place in the spiritual ends of mankind.

Certainly Berdyaev was correct in noting a mystical element to Soviet technologism. Subsequent history bears this out from popular science, science fiction, and the massive place of the Soviet space programme. There was no greater influence on this element of Russian culture than the eccentric visionary Nikolai Fedorov (1829–1903), the reputed father of ‘cosmism’. His ideas had a significant effect upon such figures as Dostoyevsky, Vernadsky, Soloviev, and Tsiolkovskiy, the conceptual father of the Soviet space programme. Berdyaev wrote an impassioned article, ‘The Religion of Resurrection’ (1915), about Fedorov’s (1906–1913) only work, *Filosofia obshchego dela* (*Philosophy of the Common Task*), compiled posthumously by his students. Fedorov is Berdyaev’s philosopher of technology.

Fedorov starts with the very Orthodox principle that the main aim of life is to overcome death. We must wish for eternal life and for our own resurrection from the flesh after death, but we must especially wish for the resurrection of others, our loved ones and



our ancestors. When Berdyaev writes that Fedorov may be alone among Christians in taking eschatology as a project (he was not alone, in fact), he means that it is beneath the capacity of our freedom to passively expect God to do what He might wish us to do for ourselves, and which, if He wills it, we can do. If conquering death is the end point of our species, we must dedicate our lives to accomplishing it. This view presumes a faith in progress atypical for most Christian thinkers (and for practically any conservative one) and a sense of the ‘historical body’ that is rooted in that progress. It is not a faith, however, that sets its aims on technological innovation alone, nor is it one that relies on modestly attainable goals. Since we will cease dying and be resurrecting all the dead, our planet will not be able to contain the scores of billions of deathless inhabitants. Since the bodies of the dead become soil that produces wheat and other food, we effectively eat the bodies of our ancestors. Universal resurrection would require matter that had nourished several generations being used at once. Fedorov believed it was the task of science and technology to resolve these issues. Obviously we must colonise other planets to create homes for our vast human numbers. His students became pioneers of rocket and spaceship design. Technology must also be used to replace the matter that had been shared across generations, we must have new bodies made up of different materials. For this reason many regard Fedorov as a pioneer of trans-humanism (see Groys, 2018). Never mind that we have not the foggiest idea how to find and collect the matter to make new bodies, or how to unite body and soul again; all these things can be understood and determined scientifically and realised through the single, united, brotherhood of humanity though its tools over the aeons it takes to accomplish its task.

Fedorov’s ideas are astonishing for their theological woolliness and their bizarre unfeasibility. But they have behind them a number of crucial principles: humanity must direct itself wholly to that which is its highest purpose. This is at once completely un-utilitarian, and at once expresses the slogan ‘The greatest good for the greatest number’ more literally than the bourgeois J. S. Mill could ever have imagined. Furthermore, human activity is not an end to a means, it is, as Berdyaev says, a *project*. We express our humanity not necessarily by achieving goals but by the pursuit of what is best. This is what is meant in Fedorovian language by the union of ‘practical and theoretical knowledge’ pursued by ‘un-scientists’ (*neuchenye*). Finally, and what is often missed in the strange bombast of the cosmists, this is a work of reverence and love. A life devoted to the practice of universal resurrection is an act of reverence for God’s design and dispensation, life, the human person, and love for one’s fellows and predecessors. It is also a universal project for humanity as a species. Fedorov’s ‘Common Task’ is a call to all humanity to unite itself toward this goal, abandon all war and national aggression, take up a life of science which is a life of constant striving in reverence.

In these we see the tremendous contrast of Fedorov and Berdyaev from the likes of Spengler, Valéry, or Lafitte in the *optimism* of our place in relation to our creations. Reading Fedorov, the sheer ludicrousness of his positions becomes grating; yet adopting his principles, even as a kind of imaginative exercise, one finds startling contrasts with our own lugubrious present. There is no reason why he would not support bioengineering, or the ‘vegetal-organic’ explorations of bio-art. In this he exceeds Berdyaev’s distinction between the organic and ‘cold metal.’ He would quite conceivably support many aspects



of AI, which would expand human capabilities and seek to understand the origins and principles behind life. Yet the cosmist's AI is no threat to humanity because it has at its centre a progress rooted in life and mutual love.

Thus the greatest lesson of 'Man and Machine' ninety years after its first publication is that our current anxieties are misplaced. There is a great deal of tension that the advent of AI will rob knowledge workers of their uniqueness. But that uniqueness is now understood as a feature (playing chess, composing music) atomised as a commodity. Berdyaev's Christian human is a creature whose features are only in the service of its face. Like the face of Martin Buber (whose work Berdyaev reviewed in the same issue as this article) and Emanuel Levinas, Berdyaev's face (Russ. *lik, litso*) is an absolute category. It is person, personality (*lichnost'*) uniqueness, individuality. But it is not the uniqueness of intellectual property law, but the character and volition that allow the person to move forward. For Fedorov and Berdyaev our freedom is no feature, it is a talent that demands cultivation. It is also a responsibility.

Berdyaev writes, 'There will come a time when there will be perfect machines with which man could rule the world, but there will be no humans at their helm.' Contrary to Harari, I believe we can take this prophesy to mean not that the time has come when our creations can outthink us, but that the time may have come when humanity itself has forgone the character that would make it different from its machines. This in itself would not be problematic if our machines were to develop a morality, or a teleology, superior to ours, and they may yet do so if, as some experiments in artificial life forms have indicated, morality is a part of nature (Nowak et al., 2010). Yet since we have set no purpose forward for ourselves, is it not foreordained that we should imitate what is around us? If the environment we expose ourselves to is almost exclusively digitised, is it any surprise we begin to replicate our thoughts in digitally replicable ways? If an AI text generator builds its algorithms upon the probability of a correspondence between corpora, the most reliable product is going to be the one that receives the longest set of non-repeating iterations. If the products of AI are indistinguishable from our own statements, perhaps we spend too much time repeating ourselves. This is what most concerns me: that we choose to imitate our machines before they choose to eliminate us.

In the fervent recent interactions between ChatGPT and humans, one is struck by the artificial dialogism of the exchanges. One asks a practical question and gets, sometimes, a perfectly reasonable answer, and one is astonished at how reasonable it is. But, after all, any text you read has half its meaning supplied by yourself – be it an ancient inscription or a few strokes of found graffiti. We are frustrated that this non-human interlocutor requires that we regard it as a person, but that is part of the nature of communication. I, for one, am suspect that we continue this vexing dialogue because our habits of political discourse occlude what are the real, all-too-human aims of these innovations – power, capital, and more power. What Fedorov and Berdyaev are asking us to do, I propose, is not to stand face-to-face against our creations but to stand shoulder to shoulder with them. For these two philosophers there was a horizon, a purpose, toward which humanity and its machines could set our sights. What is that purpose for us?



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Short Communication

Berdyaev Returns

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Abstract

Religious criticisms of technology attempt to examine it from the perspective of ethics, with ethics resting, at least in the Abrahamic traditions, on some relationship to divinity. The religious dimension of human life has both practical and theoretical sides: morals and theology. Although these two subjects cannot be completely separated, it is useful to consider religious critiques that approach technology from the perspective of practical religious life or of religious thought, that is, theology. Nikolai Berdyaev sought to elucidate the basic characteristics of the technical age and how it brings to a close the earth-centered period of human history and democratizes society. Accepting the new civilization as historically given, he inquires into its religious consequences: What is the religious meaning of the technical-mechanical form of civilization? According to Berdyaev and Jacques Ellul something radically important is being lost in the technoscientific lifeworld in which technology has become a dehumanizing, life-distorting addiction. The only truly human or spiritual way forward is by renewing and reapplying the radical Christian tactic of attacking all false gods. Just as Christianity demythologized the natural-organic world of myths and superstition, Christianity can reassert human freedom and spiritually by demythologizing the technical-mechanical world. The attack on the false gods of nature disenchanting nature, opening a pathway to the modern science of nature, and thereby to modern technology and the techno-lifeworld. Now the same tactic must be re-deployed to torpedo our enchantments with and by technology.

Keywords: Nikolai Berdyaev; Jacques Ellul; Natural-organic; Technical-mechanical

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Краткое сообщение

Бердяев возвращается

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Аннотация

Религиозная критика технологии пытается рассмотреть ее с точки зрения этики, а этика, по крайней мере в авраамических традициях, основывается на определенном отношении к божественному. Религиозное измерение человеческой жизни имеет как практическую, так и теоретическую стороны: мораль и теологию. Хотя эти два предмета нельзя полностью разделить, полезно рассмотреть религиозную критику, которая подходит к технологии с точки зрения практической религиозной жизни или религиозной мысли, то есть теологии. Николай Бердяев стремился выяснить основные характеристики технического века и то, как он завершает геоцентричный период человеческой истории и демократизирует общество. Принимая новую цивилизацию как исторически данную, он задается вопросом о ее религиозных последствиях: Каково религиозное значение технико-механической формы цивилизации? По мнению Бердяева и Жака Эллиуля, в технонаучном жизненном мире, в котором технология стала дегуманизирующей, искажающей жизнь зависимостью, теряется нечто радикально важное. Единственный по-настоящему человеческий или духовный путь вперед лежит через обновление и повторное применение радикальной христианской тактики нападения на всех ложных богов. Подобно тому, как христианство демифологизировало природно-органический мир мифов и суеверий, христианство может вновь утвердить человеческую свободу и духовность путем демифологизации технико-механического мира. Нападение на ложных богов природы лишило природу чар, открыв путь к современной науке о природе, и тем самым к современной технологии и техно-жизни. Теперь та же тактика должна быть применена вновь, чтобы атаковать нашу зачарованность технологией.

Ключевые слова: Николай Бердяев; Жак Эллиуль; Естественно-органическое; Технико-механическое

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It was while doing research that led to the early 1970s publication of the Mitcham & Mackey *Philosophy and Technology* collection (Mitcham & Mackey, 1972) and *Bibliography of the Philosophy of Technology* (Mitcham & Mackey, 1973) that I discovered Nikolai Berdyaev's essay on "Man and Machine." It struck me as articulating a position with which I, as a young man disenchanted with middle class American culture, an opponent of the Vietnam War, and a recently converted Catholic – converted in part by a graduate seminar on Thomas Aquinas – had some sympathy. Berdyaev's article was the lead piece in a section of *Philosophy and Technology* labeled "Religious Critiques," a section that followed the much larger section of "Ethical Critiques."

Religious criticisms of technology also attempt to examine it from the perspective of ethics but now ethics resting, at least in the Abrahamic traditions, on some relationship to divinity. The religious dimension of human life has both practical and theoretical sides: morals and theology. Although these two subjects cannot be completely separated, I took it as useful to classify articles in the religious critiques section according to whether they approach technology from the perspective of practical religious life or of religious thought, that is, theology.

Nikolai Berdyaev was among the earliest Christian thinkers to recognize that technology (or technique) poses special problems for Christian culture. In "Man and Machine" he situates these problems within a historico-theological framework. According to Berdyaev, history is divided into three main periods: the natural-organic, the cultural, and the present technical-mechanical. Central to differentiating among these periods is the distinction between organism and organization. Extending notions we find in German vitalist philosophy, Berdyaev conceives of an organic entity as one with an inherent purpose, whereas organizations (such as machines) derive whatever purpose they might have from an extrinsic user.

In consequence, each type of entity is characterized by a different kind of activity. The difference between the natural-organic and the technical-mechanical periods is the predominance of organisms in the former and organizations in the latter; the transition from one period to the other occurs as the activity of mechanical construction is substituted for that of natural growth.

However, in between the organic and the organized is a third kind of object, the object of art, the presence of which characterizes the cultural period of history. Art produces neither strictly organic nor simply organized objects. Art, while using organization, prolongs the natural world into the human realm in a way that organizations do not; perhaps it may be said to point toward or symbolize the organic by means of organization.

As a historical religion Christianity arose within and became closely associated with the artistic activities of the cultural period. But this period has come to an end, to be replaced by the technical-mechanical era. The question therefore arises: Is the conjunction of Christianity and art merely accidental? Which kind of activity – artistic or mechanical construction – is most in harmony with the Christian way of life?

Berdyaev refuses to deal directly with this question. Instead, after trying to elucidate the basic characteristics of the technical age – how it brings to a close the earth-centered



period of human history and democratizes society – he prefers to ask: What is the religious meaning of the technical-mechanical form of civilization? In other words, he simply accepts the new civilization as historically given and inquires into its religious consequences.

His inquiry here points in two directions. On the one hand, technique destroys the earth-centered, telluric or autochthonic forms of religion, and creates grave dangers for the emotional aspects of life and the autonomy of the person. On the other, technical civilization “requires a more intense form of spirituality.” When human beings have the power to destroy the world, “then everything becomes dependent on the spiritual and moral state of a person, what they will use this power for, what kind of spirit this person has.” Technological civilization calls for a spiritual renewal to control the dehumanizing and enslaving powers of technology (Berdyayev, 1933/2023).

But the natural-organic world once enslaved human beings as well, under the guise of myths and superstitions. Just as Christianity demythologized that world, and deprived it of its enslaving power, so Berdyayev implies, can Christianity reassert human freedom and spiritually by demythologizing the technical-mechanical world. It is interesting to note here that the translation used in *Philosophy and Technology*, the only one available at the time, dropped a lengthy reference to the Orthodox theologian Nikolai Federov, who “combined faith in the power of technology with a spirit directly opposite to the one which prevails in the technical era” (Berdyayev, 1933/2023).

What Berdyayev argued is markedly similar to what Jacques Ellul would argue two decades later. Something deeply important is being lost in the technoscientific lifeworld in which technology has become a dehumanizing, life-distorting addiction, if not an idol – but there is no going back. The only truly human or spiritual way forward is by renewing and reapplying the radical Christian tactic of attacking all false gods. The attack on the false gods of nature disenchanting nature, opening a pathway to the modern science of nature, and thereby to modern technology and the techno-lifeworld. Now the same tactic must be re-deployed to torpedo our enchantments with and by technology.

Echoes of Berdyayev’s argument can also be found in the intellectual quarters of the conservative Christian revival in the United States. Rod Dreher (2015), conservative Christian American expatriate writer now living in Hungary, in „The End of Our Time“ included a lengthy quotation from Berdyayev’s (1933) *The End of Our Time*. There is a clear continuing appeal of Berdyayev’s mixture of apocalypse and spiritual rebellion that deserves to be interrogated from the perspective of other religious traditions.

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Research article

Harari: The New Grand Narrative

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Abstract

During his life-time, Gernot Böhme (1937-2022) provided a wide range of studies on alternatives in science, on a social science of nature, on Kant and the alienation of reason, on an ecological aesthetics, on phenomenology of the living body, on architecture and atmosphere, on invasive technologies, and much more. All of these reflect his commitment to make philosophy matter for the practice of living in a world that is shaped by modern science and technology. Twelve days after his 85th birthday and only a few days before his death, the *Neue Züricher Zeitung* published his critical essay on the popular writings of Yuval Noah Harari which, according to Böhme, provide a contemporary myth of the transcendence and demise of humanity through technology. Böhme's critical arguments are important because they expose how such myths leave us mystified, even paralyzed – fixated on prophecies of redemption or doom. Seeking to break Harari's spell, Böhme proposes to pose differently the question of the human self.

Keywords: Yuval Noah Harari; History and Narrative; Organisms and Algorithms; Evolutionary Humanism; Self-Knowledge

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¹ For general background see Böhme 2001, 2012, 2017a, 2017b.



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Научная статья

Харари: новый великий нарратив

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Аннотация

При жизни Гернот Бёме (1937-2022) провел широкий спектр исследований по альтернативам в науке, философии природы, Канту и отчуждению разума, экологической эстетике, феноменологии живого тела, об архитектуре и атмосфере, об инвазивных технологиях и многом другом. Все это отражает его стремление сделать философию значимой для практики жизни в мире, сформированном современной наукой и технологиями. Через двенадцать дней после его 85-летия и всего за несколько дней до его смерти “Neue Züricher Zeitung” опубликовала его критическое эссе о популярных произведениях Юваля Ноя Харари, которые, по словам Бёме, представляют собой современный миф о превосходстве и гибели человечества с помощью технологий. Критические аргументы Бёме важны, потому что они показывают, как такие мифы оставляют нас в замешательстве, даже парализованными – заикленными на пророчествах об искуплении или гибели. Стремясь разрушить чары Харари, Бёме предлагает иначе поставить вопрос о человеческом “я”.

Ключевые слова: Юваль Ной Харари; История и повествование; Организмы и алгоритмы; Эволюционный Гуманизм; Самопознание

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Harari: The New Grand Narrative²

HISTORY AND (HI)STORIES

Yuval Noah Harari is Professor at the Hebrew University in Jerusalem. His subject area is universal history, but he interprets it much more broadly than it is typically done. In his book *Sapiens: A Brief History of Humankind* (Harari, 2014) he presents universal history as the history of the species *Homo sapiens*, so within the context of natural history. Harari has also expanded the methodological approach to history as a narrative. Specifically, he characterizes the emergence of humans as *Homo sapiens* from the group of hominids through the invention of language as a narrative.

According to Harari, the superiority of *Homo sapiens* over other hominids, which began to emerge around 40,000 years BC, is due to their unique ability to talk about non-real things, that is, the ability to engage in fiction. With this, humans have gained a principle for organizing increasingly larger groups of people. It should be noted, though, that the organizing power of narratives – or *stories* – does not come from their content but from the shared belief in them.

This distinction is important because Harari often simply talks about fictions and fantasies, such as when he says that the power of money is based on a fiction. He also does not distinguish between fairy tales and legends, such as the concept of the divine right of kings. This distinction would also be important. There is fiction and then there is fiction. The literary genre ‘fiction’, for instance, is made up precisely of such stories which one does not believe to be real.

However, there are powerful stories which large groups of people believe – religions are of this kind. According to Harari, the sequence of religions structures the universal history of humankind, and he does not hesitate to call capitalism and finally digitalization (the religion of dataism) religions as well. There are forms of human organization that are based on the shared belief in a story. Sociologist Ferdinand Tönnies refers to them as communities, distinguishing them from societies: While communities

² „Harari: The New Grand Narrative [Harari: *Die neue Große Erzählung*]“ is the title of Böhme’s manuscript which was originally written for his family. The print edition of the NZZ chose the title “How Things are Coming to an End for Humanity [*Wie es mit dem Menschen zu Ende geht*],” adding the subtitle: „Historian Yuval Noah Harari explains a world to us that we couldn’t understand even if it existed already [*Der Historiker Yuval Noah Harari erklärt uns eine Welt, die wir selbst dann nicht verstehen könnten, wenn es sie schon gäbe*].” The online-edition of the NZZ offered a longer title and subtitle: „Yuval Noah Harari is the Pop Star among Historians. But fundamentally, he sees himself as a Prophet. His Vision: He knows why Humanity is coming to an End. – The Israeli best-selling author explains to us a world that we can only understand once it no longer exists. It’s hard to resist the pull of his suggestions. [Yuval Noah Harari ist der Pop-Star unter den Historikern. Aber im Grunde versteht er sich als Prophet. Seine Vision: Er erkennt, warum es mit dem Menschen zu Ende geht. Dem Sog seiner Suggestionen kann man sich kaum entziehen]“ – see <https://www.nzz.ch/feuilleton/yuval-noah-harari-ist-der-pop-star-unter-den-historikern-aber-im-grunde-versteht-er-sich-als-prophet-seine-vision-er-erkennt-warum-es-mit-dem-menschen-zu-ende-geht-ld.1663934> – This English translation restores some passages which were cut in the original publication, it also restores Böhme’s own section-headings. The manuscript and newspaper publication did not include footnotes and references, these were added as part of this English-language edition. – We thank Gernot Böhme’s family, especially Rebecca Böhme, for supporting this publication.



are united by the command of an authority or a shared belief, societies are formed through interactions among their members, based on division of labor and the market, for example (Tönnies, 1887/1957). Since Harari does not make this distinction, human history becomes according to him a history of religions, a sequence of believed fictions.

But modern socialization differs from traditional communalization. Harari overlooks this, and therefore he also fails to recognize the worldwide interconnectedness of people, which represents a new form of human organization that transcends societies. He misleadingly refers to it as a “global village” (Harari, 2014). If one refers to interconnected human ensembles as societies, their socialization is based in an infrastructure, in this case the World Wide Web, and people's affiliation is defined by their being connected to it. A shared belief is no longer necessary. Therefore, labeling this networked interconnectedness of people a new religion is misguided. It is a mystification of current events.

THE END OF GRAND NARRATIVES

Already in the 1930s Martin Heidegger spoke of the modern age as the “age of the world picture” (Heidegger, 1976) – thereby limiting the reach of this concept to a specific historical period. Related to this skepticism is François Lyotard's (1984) call to abandon the “grand narratives” that were meant to justify the rationality of the sciences and instead to strive for consistency in regional discourses.

Unconcerned by such scruples, Harari has set out to conceive a new grand narrative himself. In short, it states that our era of human history is heading towards an end, hopeful or doomed. This is because humanity is either transcending itself to become superhuman or godlike, or obsolete. Either way, the era of *Homo sapiens* is coming to an end.

Harari wants to turn this grand narrative into the dogma of postmodern humanity. He wants people to believe his story. He presents himself as a teacher of humanity. And it is difficult to resist the suggestiveness and the vivid examples he employs in his books. Finally, he prophesies where the history of humankind is headed.

Harari essentially identifies three main tendencies: First, war as a form of human interaction will be overcome; second, diseases will disappear or be eradicated; and third, individual happiness will be achieved for all. Harari tries to make plausible by way of statistics the impressive advancements that humanity is making towards these goals.

But the overcoming of mortality, the happiness of humans, and their perfection [*Vervollkommung*] as gods is only one side of his prophecies. The tremendous progress in medicine – or as Harari calls it: of biology – which enables the transition into the transhuman, also renders humans obsolete. At least “en masse,” that is, as workers and warriors: Their business is taken over by algorithms. What is to be done with the superfluous masses of people? According to Harari, the elites will no longer care about them anymore because these are no longer needed.



NEW ENLIGHTMENT

All the things and conditions that seem important to us are, according to Harari, mere fantasies and fictions. In his book *Homo Deus*, he writes: “All large-scale human cooperation is ultimately based on our belief in imagined orders. These are sets of rules that, despite existing only in our imagination, we believe to be as real and inviolable as gravity” (Harari, 2016, p. 197).

Accordingly, only scientific facts are said to be truly real. Everything else: fiction, fantasy. In this regard, Harari distinguishes three types of entities: There are firstly the things and facts, objective reality; secondly, the subjectively felt experiences that nowadays are summarily referred to as ‘*Geist*’, or ‘mind’ in English. Crucial to Harari's ontology is the third type, namely intersubjective entities or fictional realities.

These entities come into existence when we believe in something or, as Harari writes, when we „ascribe real power to the contents of our imaginary stories” (Harari, 2016, pp. 207-208). But this evidently falls short, since the ‘reality’ of these fictions does not depend on an individual's belief. Money, the state, and even gods belong to the category of intersubjective entities. Harari leaves their nature ambiguous, describing them with the air of Enlightenment as mere fantasies, yet attributing “real power” to them. What this quasi-reality of intersubjective entities consists in, remains unclear.

With his devotion to science, Harari could have investigated this in biology. Slime molds are initially and primarily single-celled organisms, but under certain environmental conditions they can form organisms, some of these even with functional cell differentiation. This example shows that the formation of higher organisms does not require forms of consciousness in the individual elements. What is characteristic is that higher forms of organization become autonomous entities, confronting individual humans as quasi-objective powers. But what kind of autonomy is this?

Intersubjective entities exist as institutions. These institutions may well be based in realities, but what is more important is that they are sustained by a number of people who represent them and who, in turn, are authorized by the institution – by officials.

The institutions do not depend on specific individuals for their existence. They also outlive the individuals associated with them. While narratives may secure the legitimacy of institutions, they do not constitute them. They appear as givens to any individual person. Only since the time of the French Revolution do we suppose that the State, as a republic, is based on the assent of all individuals. But this assent is, in fact, only a supposition: Every person is born as a citizen into the State.

The reality of the State is based on the disposal over material means of violence. Historically, this has coalesced as the State's monopoly on violence. Although the individual person is no longer subservient it is evident also in the case of the State that the “intersubjective entity” at hand is not constituted by the individual's belief in fictions, but that individuals in their disposition as citizens are shaped by the higher-level organization into which they are born.



ARE ORGANISMS NOTHING BUT ALGORITHMS?

Algorithm has become a buzzword. It is fashionable to see algorithms at work everywhere. This is owed crucially to the fact that social networks create profiles of individuals using the data they gather, and these can then be utilized, for example, for individually tailored advertising. Harari follows the trend by seeing algorithms as the most important form of interaction within and between organisms. This is due to the realization that DNA enables metabolic processes in the organism, including growth, and that these processes are to be understood not simply as causality but rather in terms of information processing.

Organisms are thus supposed to be algorithms. This thesis is central to Harari's "grand narrative." But is it true? If organisms, including us humans, are algorithms, then we can be controlled just as well or even better from the outside after sufficient further development of artificial intelligence (AI). Subjective reactions and the mind then become superfluous according to Harari. What we call happiness could be produced by neuronal, hormonal, or genetic control.

In terms of the history of philosophy, Harari's thesis that organisms are algorithms is Platonism. What the human being really is, according to Plato, is the idea of the 'human.' In the second part of *Faust*, Goethe demonstrated in his story of the artificial human being, of the homunculus, that a human being is as such not even viable when it is existing only in a vial – lacking the material.

But even the thesis that the human being is a whole made up of form and matter could be falling short, because organization can change matter in its elements. The emergence of a higher unity does not simply assemble the many elements like Lego blocks but modifies them. Such organization of organisms cannot be understood in analogy to downloading a software program. An organism is therefore not simply an algorithm.

Moreover: Organisms are living beings, but this they are only in symbiosis with others. This has recently been emphasized for humans, since until now human beings have largely considered themselves as existing separately from other living beings. While this separation did not exclude metabolism, the life process of the human organism was thought to be self-contained.

This, however, is not the case: Humans can only live in symbiosis with bacterial strains in their intestines that involve trillions of organisms. And this is not simply a parallel process. The togetherness of the human with bacterial strains is actually a joint existence. And this is simply not compatible with the view that humans are algorithms that could just as easily be run in an AI machine.

HARARI'S FAITH IN SCIENCE

Yuval Noah Harari is a historian and as such a humanities scholar. But this has not inspired in him the slightest doubt of 'science' in the sense of natural science.³ This fails

³ Böhme alludes here to the German *Geisteswissenschaft* (for the humanities) and that other 'science' of the natural sciences [*Naturwissenschaften*].



to recognize a central aspect. It is precisely because of its objectivity that natural science is not answerable to questions of meaning. That is what the ‘humanities’ are for, including the science of history (*Geschichtswissenschaft*). Harari tells the story⁴ of humankind as a succession of religions. Accordingly, for him, the study of history becomes the grand narrative of the creation of human meaning through religions.

This is also true of modernity: On the one hand, it is characterized by the scientific revolution, which leads to the emptying of the meaning of the world. On the other hand, however, it has for the purpose of finding meaning entered into a pact with humanism, i.e. the faith of humans in themselves. This means that while modern science robs the world of meaning, this is substituted by humanism as the faith of humans in themselves. The characteristic example of this pact, alongside liberalism and communism, is the third variety of humanism: National Socialism as so-called evolutionary humanism. According to Harari, the Nazis believed in the evolution of humanity in a pact with scientifically based racial hygiene.

This pact, however, was rendered obsolete by genetic research after the Second World War, which proved that the genetic differences between the so-called races are much smaller than Hitler had to believe at the time. This insight exonerates evolutionary humanism from the stain of National Socialism. Thus Harari writes in *Homo Deus*: “Not all evolutionary humanists are racists [...] Evolutionary humanism played an important part in the shaping of modern culture, and it is likely to play an even greater role in the shaping of the twenty-first century.” (Harari, 2016, p. 349).

After this cleansing of national socialism, one might consider resuming the basic intent of this kind of humanism by other means – and this Harari does: “They (the scientists of our days) increasingly argue that human behaviour is determined by hormones, genes and synapses, rather than by free will” (Harari, 2016, p. 263)

So, what the Nazis wanted to achieve through racial hygiene could today be achieved much more elegantly by way of hormones and genetic manipulation: The enhancement of the human being.

In all of that, Harari's faith in science remains unshakeable. Scientific papers are cited as truth. This is especially true of the life sciences: They have “ditched the soul” (Harari, 2016, p. 161). And in general: “The better we understand the brain, the more redundant the mind seems” (Harari, 2016, p. 155). And apparently, we are so far along that we can dispose of the concept of freedom as well. The human being is not free but controlled by biochemical processes in the brain.

For the disposal of the concept of freedom one typically appeals to an experiment conducted by the American physiologist Benjamin Libet in 1985. Test subjects had to make decisions and press certain buttons accordingly. It was shown that in the brain of a test person there is already a potential for the action “a few milliseconds to a few seconds” before the action. This is observed before the test person “decides” to perform the action, before they become aware that they want to perform this action (Libet, 1985).

⁴ Here Böhme writes in the German original “*Geschichte*.” So he plays with the ambiguity of the word because it can be translated as “story” or as “history.”



Harari quotes experiments that confirm Libet's results, but none that relativize or refute them. For him, it is clear: 'Freedom' is an empty concept, just like 'soul.' "When a biochemical chain reaction makes me desire to press the right switch," he writes, "I feel that I really want to press the right switch. And this is true. I really want to press it. Yet people erroneously jump to the conclusion that if I want to press it, I *choose* to want to. This is of course false. I don't *choose* my desires. I only *feel* them, and act accordingly." (Harari, 2016, p. 384).

The last sentence is a fallacy. At the moment when my desire becomes conscious to me, I have the possibility to decide against it. One can act against one's desires. But Harari fails to recognize that consciousness provides an additional degree of freedom. His conclusion: After sufficient development of algorithms, democratic elections would be unnecessary. Based on personality profiles or direct capture in the brain of tendencies for action, it would be possible to determine which party a person will vote for.

This can be easily refuted by using a voting advice application to determine which party one would vote for⁵ – then choosing another party, perhaps as a matter of defiance or due to a consideration which the app did not provide for. The crucial point is that Harari posits a direct transition from desire to action, while – as tradition has established since Socrates – freedom resides precisely in the conscious examination of one's own desires.

GETTING TO KNOW THE SELF

Harari's faith in natural science is also evident in his endorsement of a behaviorist approach that is oriented solely to observable and quantifiable behavior. According to Harari, algorithms know you better than you know yourself (Harari, 2016, p. 530). But what might that mean? Harari refers here to the automatic profiling that social networks create for individual people. They are formed on the basis of the traces that individuals leave behind on the internet.

From this point of view, „knowing someone better than they know themselves“ is knowledge from the outside that is oriented exclusively to the human being as a phenotype. This corresponds to the approach of science: Whether an individual is glad or depressed, etc., is read off the data that can be tapped from their skin or their brain. But the self that human beings have to contend with is not in how they appear, but in the way they are given to themselves.

This way is quite vague and comes from afar. The self is to be distinguished from the conscious 'I' which every human being must develop in order to be acknowledged as a mature human being and to acknowledge oneself. And it is to be clearly distinguished from the outward appearance which people have to create for social reasons. However, when it comes to serious decisions, a person must try to act not only according to certain criteria, but in such a way that they are "in agreement" with themselves through their actions (Böhme, 2001).

In order to do so, humans must get to know their own self of which they normally have a vague sense only, and which is still slumbering and undefined within them. A

⁵ Böhme refers to the German *Wahl-O-Mat* which ascertains the level of agreement between a voter and the positions held by the various political parties. The user might then choose to vote accordingly.



decision in serious situations thus implies simultaneously a clarification and a determination of what one actually is. And how should algorithms know any of this? For their profiling and tracking they rely exclusively on data, they are radically behaviorist, and Harari is with them.

FINAL DAYS AND THE PRESENT [ENDZEIT UND GEGENWART]

In light of the sometimes astonishingly pompous assertiveness with which Harari advocates his theses, it is remarkable that such terms as humility and resilience appear in his more recent *21 Lessons for the 21st Century* (Harari, 2019). Crucial for this turn is the final chapter on meditation. Faced with an apocalyptic outlook, Harari finally arrives at the question of how we should live now, namely with a certain humility – and in such a way that our resilience, our power to resist is strengthened.

While in the first two books [*Sapiens* and *Homo Deus*] he acted more or less as a teacher of humanity, Harari here takes a step back and expresses himself very personally. He talks, for example, about the content and intention of the Vipassana meditation that is practiced by him. He describes the practice of this meditation as awareness and exploration of what shows up in the stirrings of consciousness. For example, he asks himself what anger actually consists in. He is thus dealing with the substance of what is called ‘mind’ – in the German translation unfortunately rendered as *Geist*.

Mind or *Geist*, in Harari’s first two books these are something to be disposed of, along with the soul and God. But now emerges a way of taking seriously spiritual-mental phenomena. Nonetheless, Harari still regards the contents of the stream of consciousness as pure information and insinuates that we are ultimately only information-processing machines which should rather be “controlled” by machine algorithms.

Yuval Noah Harari’s anthropology thus continues in failing to recognize what is crucial about the phenomena of consciousness: their being implicated or affected [*Betroffenheit*]. To be sure, he now states that suffering – after all a subjective reality – is the real reality: “[...] [t]he most real thing in the world is suffering” (Harari, 2019, p. 356). After such a sentence, will he still be able to commit as he did before to humanity’s grand project of *abolishing all suffering*?

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Research article

Laozi and the Myth of Progress in China

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Abstract

The Chinese myth of progress is one of the most comprehensive and systematic alternatives to its Western counterpart. It is particularly worth considering at a time when the West's progressive mythology is stagnating. Laozi played a special role in the creation of this alternative and his section 11 demonstrates an implicit form of the philosophy of technology elaborated by the Chinese progressivist reformers of the 19th century. In turn, the reformers' Daoist connotations help to reconstruct and validate the philosophy of technology in Laozi. Laozi studies have an additional explanatory strategy through Laozi's influence during a critical time for his civilization. This article uses Sinology methodologically, comparing ideas from Laozi and Chinese intellectuals of the 19th century to reconstruct and interpret new meanings in Laozi's philosophy. It considers the psychological-comparativist approach by Evgeny Torchinov and others, making it possible to connect their comparativist approach to the Daoist philosophy of technology for the sake of future existential analysis of the techno-human situation from Laozi's perspective. Laozi and other Daoist thinkers suggest existential strategies, even in a world where everything is mathematized. Berdyaev's "new heroism," about staying human in the age of machines, has an unexpected ally in Laozi and his tradition. Therefore, Laozi is vital for understanding the technological age.

Key words: Laozi; Technology; Heroism; Liang Qichao; Becoming

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Научная статья

Лао-цзы и миф прогресса в Китае

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Аннотация

Китайский миф прогресса – это, возможно, главная альтернатива мифу западному. Он особенно ценен, когда западная прогрессивная мифология стагнирует. Лао-цзы сыграл особую роль в создании этой альтернативы. 11 чжан из трактата Лао-цзы демонстрирует имплицитную форму философии техники, разработанную далее китайскими прогрессистами-реформаторами XIX века. В свою очередь, даосские коннотации реформаторов помогают реконструировать и обосновать эту философию техники. Исследователи Лао-цзы могут прибегнуть к дополнительной объясняющей стратегии, рассматривая влияние Лао-цзы в критическое для Китая время. Статья методологически полагается на синологию для реконструкции и интерпретации Лао-цзы в сравнении с идеями китайских интеллектуалов 19 века. Анализ построен вокруг психолого-компаративистского подхода Е. Торчинова и др., для возможности соединения компаративизма и даосской философии техники и экзистенциального анализа техно-человеческой ситуации в духе Лао-цзы. Лао-цзы и другие даосские мыслители предлагают экзистенциальные стратегии даже в мире, где все математизировано. Новый героизм Бердяева, помогающий остаться человеком в эру машин, нашел неожиданного союзника в лице Лао-цзы и его традиции. Таким образом, Лао-цзы остается актуальным в технологическую эпоху.

Ключевые слова: Лао-цзы; Технология; Героизм; Лян Цичао; Становление

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INTRODUCTION

The Chinese myth of progress is probably the most comprehensive and systematic alternative to its Western counterpart. Time itself in China is reversed at the level of grammar and prepositions: the day after tomorrow in Chinese is *houtian* (后天) a sky behind me, while the day before tomorrow is *qiantian* (前天), the sky in front of me. In the West, the future is ahead of the subject, while in China it is the past that is ahead, because the past, unlike the future, is known and seen in the historical perspective, just as the space in front of a human subject can be physically seen. The Western myth of progress, even in this most basic grammatical category, changed in translation upon entering China before being further refracted. The millennia-old civilization served as the limit, the refractory lens, and the occasion to accept and re-think the myth of progress. When the Western myth of progress is stagnating, it is especially worth considering the Chinese alternative. It promises humanity a better future if in a different grammar. Moreover, the study of Laozi suggests an additional explanatory strategy because of Laozi's influence during a critical time for his civilization. To show this, the perspectives of Wei Yuan, Zheng Guanying, Liang Qichao and others are given below. They are very different figures. It makes the similarities between them and Laozi more significant. In older literature, Laozi is often referred to as Lao-tzu, Lao Tseu, or Laotse.

Remarkable work has been done by international scholars to address the philosophy of technology proposed by Laozi and other Daoists, regarding more reflective employment of technologies (Parkes, 2021), philosophical urbanism (Wenning, 2023) and comparative environmentalism (Abe et al., 2022; see Graham, 2021). The reception of the Western myth of progress and science in China has also received significant attention from different perspectives, including general cultural history (Elman, 2006), biography (Wang, 2022) and economics (Zhou, 2022). As the role of Laozi in the reception of the myth of progress has not been covered by recent scholarship, it will be considered below.

LAOZI AND TECHNOLOGY IN THE INSTRUMENTAL MODE

Laozi's view on technology follows the trend of his time, which was that of nostalgia. The great empire of Zhou was falling apart and the clashes of petty warlords were filling China with violence and instability. History in China is a narrative of decline from an ideal past, because the fundamentals of Chinese culture were established in the inter-dynastic period. Unlike the Confucians, who believed in having an enlightened ruler and aristocratic bureaucracy, the Daoists, like Laozi and Zhuangzi, placed their faith in the inner world of the individual. The ideal past of Daoism is different from that of Confucianism; it is pre-dynastic and pre-civilizational in nature. However, Chinese culture has a strong tendency towards balance, and pessimism is outweighed in Daoism with the possibility of independent individual perfection (Laozi, 6–8).¹ The Daoist

¹ It is customary to cite Laozi's work by referring not to a specific edition but to the numbered sections. In the following, the citations refer to the translation by M. Roberts (Laozi, 2001a), occasionally to the translation by Tkachenko (Laozi, 2001b).



attitude to technology is equally balanced, there is a hint about technology to handle technology. In fact, even the word “dao” (道) itself has a link to technology, because “the original meaning of “dao” was (...) later expanded to also indicate a method or a technique” (Chen, 2018, p. 113).

In section 11, Laozi speaks of the void, or of what-is-not (無 *wu*), and the relations the void has with different human inventions. Laozi provides one example for each of the basic categories of cultural objects: technology (wheel), art (chalice), and architecture (house). The chalice has four sides but works because of the void that lies between these, and the same can be said about houses. The spokes of the wheel meet in the wheel’s center, in the empty space where a chariot’s axle would connect to make the wheel usable. The void is germane to all three categories. In the natural world, there is a dialectics of being and nonbeing. According to Laozi, we are not void and should imitate water (Laozi, 8) rather than wheels or houses. Human beings are capable of bestowing criteria of usefulness, while wheels and chalices can only be used. In Laozi (2001), as Roberts comments, “[t]he sage observes but does not intervene or try to exploit the process” (p. 31) of the interactions of opposites, which complement each other as much as they conflict.

The technology in Laozi should exist but in a non-used state (“使有什伯之器而不用,” Laozi, 80). In Roberts’ translation (Laozi, 2001a), the lines are “make sure they have no use for tools / That do the work of tens or hundreds.” Tkachenko translates the same lines as “ships and wagons will be, but better out of use” (Laozi, 2001b). The “tool” here is *qi* (器), an instrument, vessel or utensil, a Chinese character deeply ingrained in Chinese culture and civilization, and thus carrying significant ambiguity (Hui, 2016, p. 99). The void is visually present in the character for *qi*, which is marked with the element *kou* (mouth, 口), repeated four times to surround the central element as if it were the doors and windows of a house.

The sage should have mastery over instruments as well as the sagacity never to use them. The sage should “occupy himself with what is ready-to-hand (*to chto pod rukoi*)” (Laozi, 72 in Laozi, 2001b). In section 8, the ideal state of the Daoist master is given. As Roberts translated section 8, “[p]erfect mastery works like water / [a] boon to every living creature”. As Roberts comments, “[t]he word translated ‘boon’ in line 2 is *li*, a primary term for the Mohists, who judge government policy by the standard of what is most useful to the people” (Laozi, 2001a, p. 46). Section 8 implicitly refers to the instrumental mode as a necessary way to approach technology (Laozi, 80). This mode is particularly significant, because it was echoed during the Chinese reception of modern science and technology in the 19th and early 20th centuries. As earlier sections of Laozi and later Daoist tradition teach us, we need to cultivate ourselves first and our tools second. Torchinov (2007), D’Ambrosio (2020) and others give a detailed account of the Daoist methodology of nourishing the inner self. It is a way to cultivate the “new heroism” Berdyaev (1933/2023) calls for and predicts.



LAOZI'S LEGACY IN THE CHINESE RECEPTION OF THE TECHNOLOGICAL REVOLUTION

The first intensive contact between Europe and China happened during the Han and Roman empires. The periods of disorder that followed saw two corners of Eurasia disconnected, with the brief exception of the Mongolian empire, which enabled the introduction of a huge number of Chinese technologies to the West. Europe and China met again in the early years of the Qing period. Even after the Renaissance in the West and the collapse of the Ming dynasty and the Manchurian conquest in the East, the technological level of the two regions was comparable. Porcelain was “one of the most abundantly manufactured and widely circulated commodities in the early modern world” (Chen, 2022, p. 222), and only China then knew how to produce it. Western scholars tried to solve the mystery of chinaware. Francis Bacon suggested that porcelain came from cement buried in the earth (Elman, 2006, p. 78). However, the mystery endured until 1712, when Jesuit Father d'Entrecolles visited Jingdezhen, a city devoted entirely to ceramic production, a huge industrial center lit day and night to operate the kilns to produce chinaware. D'Entrecolles was able to share with the West a detailed account of the sloping dragon-shaped kilns used in Jingdezhen (Elman, 2006, p. 78).

Jesuits made an impressive career at the imperial court in China because their astronomy was better at predicting rare celestial events. Chinese dynasties traditionally categorized unpredicted events as omens that should affect the state policy (Torchinov, 2007, p. 67). This led to fewer unpredicted events, making it easier to govern China. This astronomical superiority of the West gave rise to interest in what was called “Western learning” (西学 *xixue*). Mei Wending, during Kangxi's reign, traced Western learning to the alternative ancient Chinese cosmological model of “spherical heavens” (Elman, 2006 p. 42). This move recalls how Laozi's followers invented the idea that Laozi journeyed to the West and founded Buddhism in India. This invented narrative helped and limited Chinese reception of Buddhism. The same form of nativization happened with Western learning.

The Chinese believed in a square earth under a circular sky, however, in the Han period, there were ideas about the world resembling an egg, with the earth as the yolk and the heavens as the sphere around it. Mei launched the trend of Westernization as the return of China to its origins, by suggesting that the latter model influenced the West. The “emphasis on unifying European and Chinese knowledge was a tactic that would continue until 1900” (Elman, 2006 p. 20). The Jesuits also wanted to present their knowledge as native to China, to gain a foothold in this new territory (Elman, 2006 p. 26). At the same time, the scholastic nature of Jesuit knowledge pushed China away from uniting new Western ideas and mechanical engineering, because “Jesuits (...) still accepted the Aristotelian notion of movement based on an object's own elemental makeup” (Elman, 2006 p. 91).

The next stage began when the First Opium War heated up China's intellectual climate (Elman, 2006 p. 101). One of the most prominent intellectuals, Wei Yuan, produced the slogan “to restrict the barbarians with their own hands” (“夷之长技以制夷”), which gained popularity not only in China but also in Japan (Kobzev, 2002, p. 446).



The subject of war and its instruments were despised in both Daoist and Confucianist segments of traditional Chinese thought. Wo Ren, another prominent intellectual, believed a country's foundations were "etiquette and the support of the civilians, not diplomatic tactics and modern technologies (...), to defeat the foreigners, (...) we shall seek the scholar with good manners" (Zhou, 2022, p. 17). However, the instrumental mode noted in Laozi reappears. The ideal Chinese literati were supposed to master Western weapons in order to use them defensively to limit the West's imperial ambition. These Western weapons and other instruments should be retained, dedicated to a very narrow focus, quite in the spirit of Laozi.

Another important slogan of the period is "Chinese teachings are for the foundations (*ti*), Western learning is for practical use (*yong*)" ("中学为体，西学为用"), formulated by Zheng Guanying (Kobzev, 2002, p. 444). The pair of *ti* and *yong* (体用) is related to Laozi through his ancient commentator Wang Bi (Tang, 2001, p. 26), who was definitely a follower of Laozi, albeit an original thinker in his own right (D'Ambrosio, 2022).

However, Wei Yuan and other reformists' efforts had only limited success. To receive Western tools was not a technical but a polytechnic process, with numerous technologies intermingled with each other and the necessity of domestic developmental ability to adopt the West's inventions. It generated purely economic problems: "[t]he technological switch toward steel and armored warships in Europe highlighted the difficulty of transporting iron and coal to make steel in coastal China" (Elman, 2006, p. 175). It was not enough to buy western technological tools and weapons and set them aside as Laozi teaches (*Laozi*, 80). China needed institutions to technologize itself.

LAOZI AND TECHNOLOGIZATION OF CHINA

The first wave of Westernization in China ended after the Second Opium and First Sino-Japanese wars. "A polity which functioned on the basis of symbolism, rather than managerial efficiency, was defeated during the Opium Wars by the British Empire" (Weigelin-Schwiedrzik, 2020, p. 297). It was a failure of the approach to technologies "understood merely as instruments" (Hui, 2016, p. 32). To truly acquire the Western tools, global reform was needed. Kan Youwei suggested imitating Peter the Great (Kobzev, 2002, p. 465). A new slogan, "seek wealth", replaced the slogan "seek weapons". Xue Fucheng required the building of trains, telegraph stations and other new inventions (Zhou, 2022, p. 32). At the same time, the traditional ways of governing China attracted attention as needing urgent reform.

As Chinese intellectuals began acquiring Western tools, they missed out on the mathematization of practical mechanics (Elman, 2006 p. 91). This started to change in the late 19th century. The process of mathematization encountered in China a fundamental problem: Chinese culture, unlike the West's, viewed mathematics as merely a tool. The "literati had understood mathematics as a tool. With the introduction of advanced algebra and calculus after 1850, the Chinese began to view mathematics as a field of learning with its own principles" (Elman, 2006 p. 91).

The world of numbers in the European tradition is viewed as a purpose in itself.



From Husserl to Spengler, Western intellectuals associated Westernness itself with the mathematical will to infinity. The symbolism of skyscrapers incorporates it physically (Sokolov, 2020, p. 273). Though China has a great mathematical tradition, and the ancient *Classic of Changes* influenced Leibniz's mathematical innovations (Palmquist, 2019, p. 3), Leibnizian calculus did not arrive in China through the Jesuits. Mathematization and mechanization are interdependent and deeply germane processes. In this sense, mechanization of Western humanity, to use Berdyaev's terminology, or its cyborgization, to use a more modern lexicon (Sokolov & Morina, 2021), began with Pythagoras's tetractys. Berdyaev (1933/2023) showed how mathematization damages the contemporary concept of time. Time disappears when it is not considered qualitatively, for example, in terms of day and night or childhood and maturity, but quantitatively, in terms of hours, minutes and seconds. As a result of the end of the existential dimension of time, claims Berdyaev, we have no time for eternity. However, it is hard to see how time is special in this regard, and why other sides of the human world are secure from mathematization, or why it is not mathematization but geometrization (Hui, 2016, p. 202) that is considered a dangerous procedure in this regard. In traditional China, in the spirit of Laozi and Daoism, mathematics was the art to demonstrate the beauty of the changes in the world that lacked fixed features, while in the West, since Euclid, mathematics has aimed to present the ideal eternal order underpinning the phenomenal world (Yuan, 2002, p. 519). Nietzsche criticizes the disregard of fleeting and phenomenal levels of existence in Platonism and its derivatives as life-hostile (*lebensfeindlich*) (Nietzsche, 1999, p. 83). Even though it is necessary to see not only antagonism towards Plato in Nietzsche but also influence (for example, as given in Branco, 2020), the life-hostile attitude is, at least partially, the result of Platonism and, speaking more generally, of the ontological status of mathematics in the West.

Mathematization got its first foothold in China in the late 19th century and the reaction was quick to follow. The global crisis of positivism found in China extremely fertile ground, as the connotations with Laozi resonated with new intensity. Berdyaev mentioned the revolt of Tolstoy against technology (1933 p. 20) and Tolstoy was accepted in China as a thinker first and a writer second (Wang, 2018, p. 65). There were complex and deep connections (密切的接触) between Tolstoy and Chinese anarchists of the early 20th century (Wang, 2018, p. 68). The Tolstoyan influence reached not only Anarchists but also Marxists, like Li Dazhao, who said that he was awakened by Tolstoy's thought as if it was “a blow by a Zen master's staff and a shout” (棒喝 *bang he*) (Wang, 2018, p. 70). Tolstoy also influenced conservatives, like Liang Qichao. In 1902, Liang put on the cover of the first issue of the journal *New Novel* (《新小说》) a portrait of Tolstoy (Wang, 2018, p. 65). In this regard, the close acquaintance of Tolstoy with Laozi (Azarov, 2021, p. 16) should have played a significant role. In China, Tolstoy is even called the “Russian Laozi” by such contemporary scholars as Xie Nandou (谢南斗) and Cao Haiyan (曹海艳).

In 1918-1919, Liang Qichao made a trip to the Paris Peace Conference. The technological horrors of the Great War shocked him deeply. Liang reported his experience in “Record on Travel Impressions in Europe” (《欧游心影录》), where he claimed the



Europeans were suffering from moral bankruptcy because of the First World War (Elman, 2006, p. 225) and were “placing their hopes in China when thinking of the threats arising from the material civilization” (Fröhlich, 2020, p. 18). Immediately following the “Record,” Liang (1999) wrote a commentary on Laozi. Not surprisingly, Liang sees a special practical dimension (“第三部门是说道的作用”) to the ancient Chinese philosopher (p. 3111). Daoism, rehabilitated by Liang as a “moderate” (*se 嗇*) outlook on progress and history, with naturalism (*ziranzhuyi* 自然主义) as China’s cornerstone, is contrasted with the ethical relativism of the First World War, where patriotism and humanism clashed (Liang, 1999, p. 3116). Liang believed that, following the war, the Europeans would be drawn to a more spiritual and peaceful Eastern civilization (Elman, 2006 p. 225), and that “Chinese culture could rescue humanity from the dominance of Western civilization” (Li, 2020, p. 126). Liang, just like Tolstoy, suggested a project of inner, or ethical, progress to replace the discredited idea of technological innovation.

CONCLUSION

The Chinese language holds a deep truth about historical existentiality. We move blindly through history, it is a backward movement, a moonwalk. We do not know the future, and to try and rush progress is as smart as running backwards.

In China, there were two main stages in which the myth of progress was received during the 19th-century. The first was purely instrumental and canonically germane to Laozi. The second was polytechnic and mixed with the anti-positivist revolt represented by such intellectuals as Liang Qichao and his group. The second stage also reveals the difference between Western and Chinese mathematical philosophy, with the latter being deeply indebted to Laozi and other Daoists. Liang Qichao was also deeply influenced by Laozi. With regards to Laozi studies, the 19th-century shows the instrumental mode in the implementation of technology, in particular the relevance of Laozi’s section 11.

At the same time, the presence in Laozi of a particular attitude towards technology allows access to the Daoist methodology of self-cultivation as a way of achieving the “new heroism” Berdyaev saw as necessary for our pan-technological age. Laozi and other Daoist thinkers suggest existential strategies, even in a world where everything is mathematized and the quantitative approach threatens to become universal.

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Research article

Memory Technology in the Philosophy of Nikolai Fedorov

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Abstract

Nikolai Fedorovich Fedorov is one of the most original interpreters and critics of the direction of technical progress, which he identified with the beginning and development of industrialization. His “Philosophy of the Common Task” is well known. However, the theoretical “substructures” which are not directly related to the theory of the “Common Task” deserve attention in how they strengthen its basis. Thus, his views on cultural memory and the ways of fixing it remain little explored in the philosophical literature. The purpose of the study is to analyze the importance of cultural memory for the formation of the national spirit and connection of generations, and the role assigned to the museum in this process. This research is based on an axiological method, drawing on critical studies of Fedorov's philosophy in Russian and international interpretations of his work. The function of the museum in the processes of preserving the memory of the preceding culture is revealed. The ways of inheriting basic cultural values through the meaningful collection of museums are analyzed. This understanding of the importance of the museum in the life of people is compared with contemporary concepts and discussions around the museum as an institution or a business. The discussion of Boris Groys and Douglas Crimp on the purpose of the museum in contemporary cultural practice is taken as the basis for this.

Keywords: Russian religious philosophy; Nikolai Fedorov; Cultural memory; Museum; Cultural oblivion; Boris Groys; Douglas Crimp

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Научная статья

Технология памяти в философии Николая Федорова

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Аннотация

Николай Федорович Федоров – один из самых оригинальных интерпретаторов и критиков направления технического прогресса, которое он принял с начала индустриализации. Его “Философия общего дела” хорошо известна, однако те теоретические “подструктуры”, которые не имеют прямого отношения к теории “общего дела”, заслуживают внимания, тем не менее они укрепляют ее основу. Таким образом, его взгляды на культурную память и способы ее фиксации остаются малоизученными в российской философской литературе. Цель исследования заключается в анализе важности культурной памяти для формирования национального духа и связи поколений, а также роли, отводимой музеем в этом процессе. Исследование основано на аксиологическом методе при поддержке критических исследований философии Н. Федорова в российской и зарубежной аналитике. Раскрывается функция музея в процессах сохранения памяти о предшествующей культуре. Анализируются способы наследования основных культурных ценностей через содержательное собирание музейных коллекций. Понимание важности музея в жизни народа сравнивается с современными концепциями и дискуссиями вокруг музейного дела. За основу взята дискуссия Бориса Гройса и Дугласа Кримпа о назначении музея в современной культурной практике.

Ключевые слова: Русская религиозная философия; Николай Федоров; Культурная память; Музей; Культурное забвение; Борис Гройс; Дуглас Кримп

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Nikolai Fedorovich Fedorov is one of the most original Russian thinkers of the nineteenth and early twentieth centuries. Fedorov was perhaps the most irreconcilable critic of the direction of technical progress that modern civilization had taken. Its essence becomes from the end of the 19th century technical progress, slipping out of moral control, the consequence of which is that both science and the society that generates it are transformed into “slaves of industrialization” (Fedorov, 1982, p. 487). This progress becomes a dangerous uncontrollable force, not subject to any considerations, the logic of consumerism and economic gain. It is this, according to Fedorov, that becomes the cause of the self-destruction of culture and the basis of future historical cataclysms. Fedorov believes that it is high time to ask the question about the real usefulness of science: “about science as it is and as it should be” (Fedorov, 1982, p. 489). The concept of “revival of the dead” “resurrection of the fathers” is the basis of Fedorov's philosophical teaching. It was sharply criticized, starting with Nicholai Berdyaev, who saw in Fedorov's main ideas “religious naturalism” (Berdyaev, 1989, pp. 441, 447). Fedorov was seen as a representative of Christian anthropology (*N.F. Fedorov: pro et contra*, 2004, p. 127), orthodox Christianity, and even “a precursor of transhumanism. This extremely difficult question has more than once been a stumbling block in understanding the essence of Nikolai Fedorov's teachings. Valentin Nikitin puts the question like this: “Before assessing Fedorov's doctrine, it is necessary to understand, and this is fundamentally important: does the era of God's Revelation continue in history and human creation, according to the New Testament words ‘The Spirit breathes where it wants’ ” (John 3:8) and “Here I create everything new” (Rev. 21:5)? Or these great words exhausted themselves, the completeness of Revelation has already been given to us and its epilogue was the VII Ecumenical Council?” (Nikitin, 2004, p. 751). Nikitin suggests that Fedorov's Orthodoxy is “Orthodoxy prophetic” (p. 754). O. Masloboeva (2020) sees Fedorov's Orthodoxy in the contexts of practical, near and far, goals of humanity. Fedorov's Orthodoxy has been questioned on more than one occasion: Georgy Florovsky, Vasily Zenkovsky, Vladimir Ilyin, Sergei Bulgakov, and Georgy Fedotov (*N.F. Fedorov: pro et contra*, 2004, p. 753) have evaluated the dogmatic meaning of Fedorov's doctrine. Discussions continue today (Cantarelli, 2018; Fukui, 2021, Masloboeva, 2020, Mjør, 2020). The orthodox basis of N. Fedorov's worldview is the subject of analysis in *The Oxford Handbook of Russian Religious Thought* (Emerson et al., 2020). A remarkable researcher and commentator of Fedorov's works, Svetlana Semyonova analyzes all the “stumbling blocks” on the way to the ideal of the Universal Cause, not being afraid to voice and comprehend with all seriousness and without any reduction those questions that arise from Fedorov's opponents (as cited in Gacheva, 2021, p. 20).

Semyonova has carried out enormous research work, prepared a collection of Fedorov's works for publication, and she and Gacheva have valuable commentaries on Fedorov's works (Gachev, 2022; Gacheva, 2021; Semenova, 2020a; 2020b; 2022). But with few exceptions (Alekseeva & Alekseev, 2018), the side, but extremely important as an essential addition to the basic philosophy of Common Task, Fedorov's ideas about its cultural staples and foundations, in particular the concept of memory developed by him, are not considered.



But the problem of true and worthy application of the achievements of science has another side, connected with history, with the inheritance of the culture of the past, with memory as the basis of any future development.

Fedorov believed that human genius, especially in the sciences, is spent on the destruction of culture. The destructive energy should be redirected to create an authentic, dignified human existence. In Fedorov's work "The Museum, Its Meaning and Purpose" he writes that his contemporary "Iron Age" is marked by a scornful and arrogant attitude towards the "traces of the past," which are seen as "museum dust," "museum garbage," "museum scrap," "rags," while the museum itself looks like the "tomb of things," their "sarcophagus." In this light, the museum becomes a symbol of a collection of unnecessary objects, things that are out of use. Museum values seem to demonstrate their helplessness, inactivity and uselessness, contrasting with utilitarian, "necessary" and "useful" objects. Meanwhile, according to Fedorov, a culture based on a blind theory of progress, without history and memory, is an example of a "chaotic civilization" that has lost its kinship (Fedorov, 1899/1995b, p. 114). This culture cuts off its origins, it is doomed to disappear, and therefore humanity should think about ways to overcome this vice of a civilization built on an unthinking theory of progress (about the consequences for us of such a civilizational "bias" – Shestakova, 2021). The philosophy of memory, in which a huge role is given to the museum, can be a counterbalance to the ill-conceived policy of progress. The metaphor of a museum for Fedorov is an "ark" in which everything that is the past is collected, stored for future life and held as a living present. The museum is the social institution that protects and even brings back to life certain fragments of reality. This applies, above all, to memorial museums, but both art repositories and natural history collections are filled with objects and the memory of events necessary for the historical existence of people and culture. A museum is primarily a preservationist construct. But it is necessary to find heirs and recipients of this memory: when the past is seen from the position of "outdated" and the present is governed exclusively by considerations of benefit, the inheritance becomes problematic.

When utilitarian values completely determine the ontological significance of an object, the internal organic logic of life is violated. If values are grounded, antiquity seems absurd – a transcendental dimension ("eternity") is not possible in culture, and the museum becomes superfluous, an unnecessary luxury. Even man himself, in the dimension of "usefulness" alone, can at some point be written off as a decrepit, worthless creature. From Fedorov's point of view, the constricted currents of spiritual inheritance will not allow the people to remain the same kindred spiritual and natural organism in the future. The people need a soil and blood kinship, they need a foundation, the unity of origin, the commonality of origins, loyalty to historical destiny. These themes were raised by Fedorov in the context of the analysis of the museum as a living hearth of culture: "the transfer of all remains of life to the museum were transferred to a higher authority, to the field of research, in the hands of descendants, one or more generations" (Fedorov, 1899/1995b, p. 372). In a review article on the French Exhibition of 1899 in Moscow, Fedorov writes of the temptations of a foreign culture as "a Pandora's chest" (Fedorov, 1906/1995a, p. 442) This exhibition made a stunning impression on Fedorov with its imposed and totally alien form for Russian worldview: "The French Exhibition



in Moscow is an invitation to a governess or governess for all Russia. In our subjugation to the West, our depersonalization, we cannot go any further” (Fedorov, 1906/1995a, p. 451). The collection of things of this kind, common at the time of Fedorov's life, is reinterpreted by him from the perspective of cultural teleology: a museum is not so much needed for storage, it is not an end in itself, and not even just for research, but for the life of the past in a present living recipient. Nikolai Fedorov develops the ideas of authentic inheritance. A museum, in this light, must live up to its purpose – to be the guardian of the spiritual connection of generations: 1) it should unite science, religion and art; 2) collections should not be a random collection of incompatible objects; 3) science should rebuild and serve life, not destruction and destruction; 4) the museum should become a “cathedral of scientists,” 5) scientists should investigate the reasons for the separation of scientists and non-scientists (Fedorov, 1906/1995a, p. 377).

The different attitude towards the museum is reflected in the contrast of the two symbols of the museum: 1) as a repository for the preservation of historical heritage and antiquity; 2) as a grave, a collection of dead objects, ashes, lifeless, dead, as a graveyard for useless, non-functional, hopeless “martyred” material.

For Fedorov, an even more important mission of the museum opens up: a museum is needed to resurrect everything that has died. Nikolai Fedorovich Fedorov was one of the few Orthodox Christians who truly and seriously embraced the dogma of resurrection from the dead.

Fedorov's religious ideas are the most difficult and controversial point for understanding his philosophy. But without them it makes no sense at all. Fedorov is a religious philosopher; it would be more accurate to say that he is a deeply religious man. He is a Christian who is not a Sunday churchgoer, but subordinates his entire existence to Christian precepts. In his life, this true ascetic of the faith embodied what in Russian culture is commonly called “righteousness.” He was an ascetic in everyday life, hence his maximalism, and the impossibility to exclude from his integral philosophy the idea of the “resurrection of the fathers.” He believed that in the twentieth century, when science became the main form of knowledge realization, it should be questioned in a special way. The Museum offers the possibility of embodying one of the points of the Christian creed – “resurrection from the dead,” that is, the idea of material resurrection, when “all that felt will also be restored, in the resurrected generations all worlds will unite and a boundless field for their union will open, and only it will make internal discord unnecessary and impossible” (Fedorov, 1906/1995a, p. 377-377).

In the light of avant-garde pragmatics, the dispute about “museums and archives” only aggravates with time, and the problem of confrontation between culture and civilization acquires a new meaning. Oswald Spengler's (1918/2021) ideas which Fedorov developed in his own way turn out to be important in assessing the consequences of the utilitarian strategy and complete orientation on technological progress in the cultural self-actualization of the people.

In relation to cultural memory this is a question about the purpose, organization, sources of funding, structure, exposition concept, communication policy and even about the necessity of the very existence of the museum as a cultural institution. Pragmatism and utilitarianism of modern culture, attempts to “desacralize,” “deconstruct,”



“deontologize,” “depoliticize,” in a word, new forms of its separation from the collective basis and collective values, negate the meaning of inheriting cultural codes. Already in the twenty-first century, a debate between Boris Groys (2013) and Douglas Crimp (1995) on the purpose of the museum has emerged as a continuation of the utilitarian “reassessment of values”. This controversy stems from an awareness of the obvious changes that are building up in contemporary art (sometimes it is worth specifying, in what can now be called “art”) in the “postmodern” era. In general, Crimp's argument boils down to the thesis that such contemporary art (without a claim to uniqueness, without a fixed artistic work, without a creative credo, usually fictitious), does not need to be kept in a special repository. The structure of contemporary art has changed, and with it the traditional exposition policy in contemporary museums has become a thing of the past. Only the old museums are on the defensive, and all this leads to the following, as Anatoly Rykov (2014) accurately (and in full accordance with Fedorov's worst expectations) expresses the state of contemporary museology: “The concept of 'museum' <...> has almost exclusively negative connotations. The museum is associated with the dominant ideology, the political establishment, intellectual corruption, cultural conservatism, totalitarianism, populism, the fetishization of art for commercial purposes, colonialism, and so on” (p. 94).

Groys (2013), while generally sharing Crimp's fears about the favorable prospects for the museum in the new “post-reality” and criticizing the museum as a place where artifacts are snatched from their related historical and cultural surroundings, still believes that there is no worthy substitute for the museum exhibition as a place for concentrating art objects according to the principle of “originality and authenticity” (p. 41).

A museum is the “keeper” of culture. In a broad historical and cultural context, it is also a collection of qualified specialists – art historians, tour guides, restorers, experts, researchers, curators of museum values. It is a memorial complex of artifacts, selected according to a certain principle, and a place to store this collection. It is also the public, enlightened to the extent of their knowledge, education, taste, ability to see and understand works of art, to keep the memory of the achievements of national and world culture. An enlightened public is also a national treasure. Art, memorial, biographical, historical, archaeological, natural science and technical museums perform extremely important functions of a center of cultural memory and education of contemporaries, transmission of values, connection with the glorious past of the people and humanity (Serkova, 2020).

Nikolai Fedorovich Fedorov was convinced that there is no future for a people's culture without the past. This idea, which might have been called trivial at the end of the 19th century, has to be defended and justified today. Without it, however, we risk to fall from our century, which Fedorov called “iron,” straight into the Stone Age.

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Research article

“Useless Fossils”, Precious Waste, and Streams of Energy: Soviet Electrification and Natural Resources for the Socialist Future (1920s – 1930s)

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Abstract

The young Soviet state was captivated by the idea of technological development, and the vision of progress that centered around the possibilities of electrical energy. The vision of electricity was accompanied by utopian and futuristic connotations. Technological progress was associated with Socialist political order and a desirable social future, the key characteristics of which were material abundance and social equality. The possibilities of electrical energy and of the future energy grid determined the attitudes toward nature and natural resources formulated and popularized by engineers, economists, and politicians. Soviet electrification was based on two conceptual foundations. First, reliance on local fuels (peat, oil shale, low-grade coal, water) to remove the dependence on foreign fuel. Local fuel contained moisture, ash and sulfur and required specific technical solutions (German boilers often failed). A second aspect consisted in rational fuel use. This meant the combination principle and use of secondary energy resources. Combines were understood as enterprises where the waste from one production became a raw material for another production (ash from oil shale was used to make building materials). Mineralogist Alexander Fersman spoke of “non-useful fossils” – it was necessary to use all extracted raw materials, even seemingly useless. Economists called waste a treasure and urged enterprises to use them. It is possible to speak more broadly of the Soviet culture of reuse and careful treatment of waste. This conceptualization of resources affected the materiality of electrification.

Keywords: Electrification; GOELRO; Soviet unified energy system; Peat; Hydropower; Communism; Natural resources; Commodification of nature; Resourcefulness

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Научная статья

“Бесполезные окаменелости”, драгоценные отходы и потоки энергии: Советская электрификация и природные ресурсы для социалистического будущего (1920–1930-е гг.)

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Аннотация

Молодое советское государство было захвачено идеей технологического развития и видением прогресса, которое было сосредоточено вокруг возможностей электрической энергии. Представления об электричестве сопровождались утопическими и футуристическими коннотациями. Технологический прогресс ассоциировался с социалистическим политическим строем и желаемым социальным будущим, ключевыми характеристиками которого были материальное изобилие и социальное равенство. Возможности электрической энергии и будущей энергосистемы определяли отношение к природе и природным ресурсам, сформулированное и пропагандируемое инженерами, экономистами и политиками. Ресурсная политика советской электрификации базировалась на двух концептуальных основах. Во-первых, было принято решение опираться на местное топливо, чтобы снизить зависимость от дальнепривозного (торф, горючие сланцы, низкосортный уголь, вода). Эти виды топлива содержали влагу, золу и серу и требовали особых технических решений. Второй аспект заключался в рациональном использовании топлива, который предполагал принцип комбинирования и использование вторичных энергоресурсов. Под комбинатами понимались предприятия, где отходы одного производства становились сырьем для другого (например, выделяемая зола использовалась для производства строительных материалов, а тепло – для отопления). Минералог А. Ферсман использовал выражение “неполезные ископаемые”, имея в виду необходимость необходимо использовать все добытое сырье, даже то, что кажется бесполезным. Экономисты называли отходы сокровищем и призывали предприятия использовать их. В более широком смысле можно говорить о советской культуре повторного использования и бережного отношения к отходам. Такая концептуализация ресурсов влияла на материальность электрификации.

Ключевые слова: Электрификация; ГОЭЛРО; Советская объединенная энергетическая система; торф; гидроэнергетика; Коммунизм; Природные ресурсы; Коммодификация природы; Находчивость

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INTRODUCTION

The young Soviet state was captivated by the idea of technological development, and the vision of progress that centred around the possibilities of electrical energy. For Vladimir Lenin, who was one of the promoters of electrification, it constituted “the second program of our Party.” It was critical to transforming Russia from a “small-peasant basis into a large-scale industrial basis,” and quite literally would bring “enlightenment” to the masses. Thus, as he claimed, “Communism is Soviet power plus the electrification of the whole country.” The vision of electricity was accompanied by utopian and futuristic connotations. Technological progress was associated with Socialist political order and a desirable social future, the key characteristics of which were material abundance and social equality. The possibilities of electrical energy and of the future energy grid determined the attitudes toward nature and natural resources formulated and popularized by engineers, economists, and politicians. This paper examines how the view of nature and technological progress was conceptualized by Soviet engineers and authorities. I observe the coexistence of two major trends in expert and cultural discourses – the extensive use of resources and the commodification of nature together with resourcefulness, and a careful treatment of waste and seemingly useless substances. This vision made the imaginary map of the USSR complex and multi-layered – not only coal and mineral ores organized space and industrial locations, but also peat, water, oil shale and various types of waste. Usage of natural resources for energy production, and inclusion of waste products in the production of energy and manufacturing procedures stimulated the idea of industrial combines and a transformation of the country into a huge technosocial factory.

The totalizing vision of technology by Soviet technocrats resonates with Nikolai Berdyaev’s idea of technology as dominating over and defining human existence, albeit these two positions differ in possible consequences of such domination. In Berdyaev’s view technology displaces culture and creativity, becomes opposed to them and acts destructively. Berdyaev criticized the socialist project for its “technical eschatology” and the fetishization of technology: “Communism has entirely adopted this hyper-machinism and technologism from capitalist civilisation and has created a real religion of the machine, which it worships as a totem” (Berdyaev, 2023, p. 24). The unprecedented enthusiasm with which the Soviet state took up technology, in Berdyaev's vision is associated with the death of wisdom, spirituality and human nature. Berdyaev's view is as determinist as the ideas of electrification by Lenin and Gleb Krzhizhanovsky, but where he saw destruction and dehumanization, Soviet technocrats saw perfect technosocial coordination and new order.

THE GOELRO PLAN AND THE MYTH OF PROGRESS

The starting point of Soviet electrification was the GOELRO Plan (Plan of the State Commission for the Electrification of Russia), adopted by the Council of People's Commissars in 1920. The plan envisaged the development of the energy sector, as well as of the entire economy. The vision of natural forces in the USSR at the dawn of industrialization was based on the idea of electricity as a flexible energy, capable of



transforming virtually any natural phenomenon into a useful force. As Alexander Bogdanov (1919), philosopher and scientist, pointed out in his course on political economy: “Electricity can easily be obtained from any forces of nature by their scientific and technical transformation – from the energy of chemically burned coal, waterfalls, the force of sea tides, the force of the wind ... electricity is easily transformed into other forms of energy, easily divided into small parts. It is the most flexible form of energy” (p. 163). It was as if socialism could be realized only through electricity, which by its very nature produced the transformation and connection of heterogeneous forces and energies, both social and material. Electricity, associated with constant transformations of energy, was consonant with the spirit of the political revolution (Kalinin, 2022, pp. 403 – 407). Soviet purveyors of electrification saw electricity not only as an infrastructure, but also as a means of cultural and anthropological transformation.

Electrification was not limited to infrastructure, electricity was also associated with the creation of the “new Soviet man” and literal renewal of human nature. Communism required not only new technology, but also this new man, born of the revolutionary environment and capable of generating a new society. This idea had no strict concept, it was developed by a variety of thinkers (Alexander Bogdanov, Alexei Gastev, Maxim Gorky, Anatoly Lunacharsky, Anton Makarenko). It was about a new cultural hero – physically and intellectually developed, able to create, a collectivist, a conscious and independent moral actor.

The movement of scientific organization of labor, whose theorist was Gastev, was also associated with technological transformation. Gastev was sure that electrification was supposed to find its resonance in the biology of the modern human being, calling for the creation of a “master plan of popular energetics” (Gastev, 1923). In one of his works he declared: “Our first task is to take up that magnificent machine which is so close to us, the human organism. This machine has the luxury of mechanics – automatism and rapidity of activation. The human organism has a motor, there are “gears,” there are shock absorbers, there are advanced brakes, there are fine regulators, there are even manometers” (Gastev, 1972, p. 45). Gastev’s concept implied the transformation of human subjectivity and the formation of a mutual connection between humans and machines. Moreover, Gastev believed that humans needed to change and develop themselves in order to stand on the same level as electrification:

“Electrification of Russia means the transformation of a Russia-village into a vast Russia-city. The people, for whom electrification is intended, must be straightened: their psychology must be urbanized. It is not about literacy, it is not about enlightenment” (Gastev, 1923, p. 21). And another quote: “The new citizen of Russia only then will be worthy of electrification, only then he will not distort it, if his eye will act as a real mechanism of photographic camera” (Gastev, 1923, p. 50).

In addition to rational and economic perspectives, energy industry was laden with utopian meanings. Electricity was associated with material abundance, industrial progress and social equality. In the public discourse and propaganda of technology, the key motif was the prospective man’s total triumph over nature. In such a manner, Vsevolod Borisovich Veinberg (physicist and researcher of solar engineering) in his popular science brochure *Conquering Power* (1928), wrote that unused natural power was



“organically unpleasant to see” and that it was difficult to admire a waterfall, wistfully wondering how many kilowatts it could provide (Veinberg, 1928). The commodification of nature was the guiding idea in the interpretation of fuel resources throughout the first half of the twentieth century. At the same time, the geographical distribution of resources in the USSR was referred to as a “natural injustice”, “nature’s mistake” or “nature’s curse,” since deposits of coal and powerful water sources were located far from the most important industrial centers. Creation of the electrification infrastructure was seen as a way to resolve the existing natural imbalance.

UNIFIED ENERGY GRID

The theme of overcoming nature and conquering space became particularly relevant after the adoption of the new energy program (referred to as the second GOELRO) at a special All-Union conference in 1932 (Lomov, 1932). The new program was designed for the next 15 years and was based on a fundamentally new conceptual model – the creation of a unified high-voltage power grid, that would be controlled from a single center (whereas the original GOELRO plan gravitated towards a more decentralized distribution of energy facilities and the creation of regional systems). The future electricity network was seen as the great “equalizer,” with wires and electric lines stretching through towns and cities, making even the remotest periphery equal to the center. On a symbolic level, power lines and railways created a metaphorical skeleton for the vastness of the backward country.

The concept of a unified network was created and presented by academician Alexander Chernyshev in 1931. A unified network was not just a sum of mechanically connected regional grids of neighboring districts. This system was supposed to have a high-voltage backbone – a set of nodes with switching devices, allowing to connect or disconnect individual large units and even regional power systems. Thus, it would be possible to change the total power capacity in the overall system in case of an accident by switching on or off the necessary units. Such a system allowed uninterrupted power supply, could eliminate accidents and allow for transfer of reserves (Kukel-Kraevskiy, 1936, p. 6). For 1930s it was a futuristic idea, that nevertheless directed engineering imagination. This conception started to be implemented in practice starting from 1950s.

The new electrification program suggested novel principle of spatial location of power plants. With the development of electricity transmission, it was not necessary to fully reckon with the geological and geographical circumstances and place energy facilities at a distance from industrial factories. This is how engineer Yu. Flakserman put it about the new possibilities in his report at the conference on the second GOELRO plan: “If previously there was a requirement to build power-intensive industries in areas close to power plants, now we can develop these industries at a distance of 300 to 400 kilometers from the central district station. Energy transmission itself is so much cheaper that this aspect ceases to play a decisive role in determining the location of enterprises...Thus we gain a certain economic freedom of maneuvering” (Lomov, 1932, p. 31). This idea of conquering space was embodied later in projects of superpower electricity lines that connected regional energy sectors.



RESOURCE POLICY OF ELECTRIFICATION

Coal accounted for more than 60% of the fuel balance of the USSR throughout the twentieth century, and coal was also used in the metallurgical industry to melt cast iron needed for the development of machine tools and industry. During the First Five Year Plan initiated in 1928, the exploration of new deposits in the east of the country was actively pursued. At the same time, methods were developed for burning coal in a pulverised state, which allowed the use of low-caloric, so-called “lean coals” as energy fuels. The importance of coal for industry and power generation in the USSR was accompanied by crises and coal shortages – industrial production all over the country was developing rapidly and required more electricity, the transport of coal was complicated and expensive and was not able to cover the needs throughout the USSR.

In these circumstances, it was decided to base the resource policy for electrification on two conceptual pillars – the use of local fuels (instead of using coal for example from Donetsk or Kuzbass) as well as their rational application (i.e. chemical treatment and maximum use of waste products). These provisions were outlined in the GOELRO plan and were refined in subsequent planning documents.

New local fuels had to be discovered, researched, and created – in the sense that many substances that were literally lying underfoot could prove to be a valuable resource. Time, effort, and scientific work had to be invested in order to turn an ordinary substance into a fuel. Ivan Alexandrov (electric and hydraulic engineer, one of the authors of the Dneproges hydroelectric power plant project), commented on the ignorance of the country’s resources: “Is our country rich in resources? To such a question, I would answer that it is not about our country, but about our culture. If our culture is raised to a sufficient height, we will have inexhaustible riches” (*Geograficheskie century*, 1931, p. 12).

The very understanding of resources was formulated by engineers, economists and geologists in connection with the principles of interrelated production chains and processes. Soviet mineralogist Alexander Fersman used the expression “useless fossils,” referring to the combined use of resources, which meant full usage of the entire extracted rock mass (*Geograficheskie century*, 1931, p. 22). In his opinion, it was necessary to learn how to combine production processes so as to use both useful and useless minerals. According to Fersman, what previously seemed unnecessary in the light of new advances in science and technology could become precious, and “geologist-pro prospector of the new type should not search, but has to create minerals” (*Geograficheskie century*, 1931, p. 23). Fersman gave the example of nepheline, a by-product of apatite mining. Nepheline was considered a useless and extremely dangerous substance, but research showed that it could be used to produce aluminum and create new technological chains. Thus, nepheline turned from a waste product into an asset.

Rational use of a substance meant the maximum use of all properties and forms of a given natural resource. For this purpose, a system of technological combination and use of secondary energy resources was proposed (Gleb Krzhizhanovsky, Ivan Alexandrov). Combines were understood as enterprises which encompassed various manufacturing units for the complex processing of the same raw material. Waste from one production process became raw material for another manufacturing process (for example, ash from oil shale was used to make building materials, exhaust heat was used for heating, coke



was used for chemical production, etc.). According to Soviet economists, combines were possible only in a socialist economy, because they could transcend the boundaries of a single capitalist enterprise. This principle also relied on the idea of the universality of electricity and its transformations into heat and movement.

Rational use of fuels was also inscribed in the project of “chemicalization” of the national economy, that involved enriching local fuels (gasification and carbonization of coal and peat), as well as treating fuels as raw materials for producing new substances. Possible waste-products that appeared as a result of chemical and physical enrichment of fuels were represented as valuable matter. For example, as it was stated in the Report on Rational use of Soviet Fuels (1930), it became possible to use the gas from coke oven (that previously was just burnt under the ovens) to produce ammonia, methanol and artificial gasoline (*SSSR. Komitet po khimizacii*, p. 39).

In the light of the conceptions of the combine (a set of manufacturing plants under one management, treating the same resource), chemicalization of fuels and the development of electric transmission, the understanding of waste underwent considerable transformations and got new cultural connotations. Waste was not something useless anymore, but rather a resource waiting for adequate application. In this vein the theme of waste was represented in popular texts (Lazarev, 1931) and children’s literature (Mikoni, 1934).



Figure 1. Poster “Where Electricity Comes from and What's the Use of It” (Skharov, 1921)



GOLD UNDER THE FEET. PEAT AS A FUEL SOVIET ELECTRIFICATION

So called high-caloric fuels (coal and oil) were seen as useful for metallurgy and machine building, while smaller industries (textiles, paper, chemicals, public utility services) were reoriented towards local fuels. It was peat that Lenin and Krzhizhanovsky mentioned at the dawn of GOELRO as a rational alternative that could support industry. Peat, spongy material formed by the partial decomposition of plants accumulated in bogs, is a substance not ideal as a fuel and requiring hard manual labor for extraction. But in the Soviet energy system it was incorporated into the discourse of modernization and put at the forefront of scientific and technological development (Bruisch, 2020). Peat gradually began to play a more prominent role in the energy sector of certain regions – in Moscow, Leningrad, the Belarusian Republic, the share of peat in the fuel balance reached 50%.

Research on the localization of peat deposits, mechanization of peat extraction, analysis of its properties and methods of use were actively supported by the authorities. This works were initiated under the Main Peat Committee, and in 1926 the Research Institute of Peat Industry was founded. It had an experimental station, chemical laboratories, factory of construction materials and an experimental field on a drained peatland nearby Moscow (Radchenko, 1929).

In 1929 the Museum of the Institute of Peat Industry was established. The exposition demonstrated that peat was an advanced and valuable resource for the socialist economy. The exhibition opened with a political-economic section. The central exhibit of the hall was a world map with peat reserves, where the USSR was clearly marked as possessing 70% of the existing peatlands. The department on the use of peat in the national economy focused on the theme of chemicalization and methods for processing peat – carbonization, gasification, processing of peat tar, production of insulating plates for housing construction. Gas obtained from peat was capable of replacing oil, according to Soviet scientists. Peat could also be used to produce liquid fuels, gasoline, paraffin and wax for leather and paper industry. The realization of all the possibilities of peat, according to the museum exposition, was possible in the socialist economy through the principle of technological combination (Rufin, 1935, pp. 19 – 20).

The extraction and use of peat was widely promoted in visual culture, popular science books, fiction, and children's literature. One of the key motifs was the transformation of peat into energy, emphasizing the results that this substance could bring into being. For instance, in the poster “Where Electricity Comes from and What's the Use of It” (1921), peat is called “underfoot gold” (Polonsky, 1925, p. 166, see Fig. 1). The poster demonstrates the possibilities of electricity to transform the industry and everyday life of the village, and also presents the process of electrification as a form of energy exchange between nature and humanity (the starting point of the entire composition is the sun – “the source of all work and life”).

Similarly, Alexander Peregudov's novel *The Sun Treasure* shows peat as a resource for transforming the country and workers themselves. The main character, peatmeister Kopnov, talks about the potencies of peat, that arrived from the depths of centuries.



People discovered peat and transformed this dirty substance into electric energy. And the word “peat” meant for Kopnov not only the substance itself, but also what it could do, releasing the energy of the sun embedded in it (Peregudov, 1932). The campaign for the mechanization of peat extraction (hydraulic method of peat extraction, milling, elevator method) was widely covered. A series of short movies were made and distributed around the country by direct order of Lenin in 1921. This narrative fused the idea of the bog as a bleak and useless space with the most modern technology of the future.

Peat was an easily accessible and cheap substance – it was possible to extract and use it as fuel, fertilizer, or household commodity even without complicated machinery. The ways of using peat were known before the October Revolution. However, the use of this “treasure close at hand” was limited because of the low dissemination of information and lack of demonstration facilities (Vagin, 1913). Soviet authorities deployed a large-scale propaganda of peat, and highlighted the need for the population, including children and peasants, to get involved in the work on its search and use. The topic of peat extraction and the opportunities to use and process peat were covered in the school program and political education in villages. Compared to coal or oil, peat was accessible – peat deposits can be found at a depth of 1 meter. This proximity of the resource suggested not just informational familiarity of the masses with this raw material, but also individual and bodily encounter with it.

The theme of citizens’ involvement in the theme of energy production from local fuels can be observed in the history of local studies (*kraevedenie*). The study of the native land, its resources, its bogs, forests and soils allowed to correlate individual experience and local practices with the problem of the country’s fuel crisis and the creation of a national energy system. By 1931 the goals of *kraevedenie* were officially formulated as having national importance and associated with the discovery of local natural resources necessary for the strengthening of socialist economy (Kozlov, 2012). Manuals on *kraevedenie* contained advice on how to describe the region and its natural resources (productive forces in Marxist language). For example, a handbook for schools of Novozybkovo in Moscow region contained a section on how and why bogs should be described, how to assemble a collection of peat specimens, how to create a school exhibition of peat (Eremenko, 1925, p. 23 – 25). An article by the Pskov Society of Local Historians described the experience of a rural school, that organized a peat patch on clay and bricks and cultivated peat vegetation in the school nature corner (Poznai svoi krai, 1929). Pupils had to describe peat samples using scientific methodology and were urged to refer to specialized texts. For example, the “Methodology for the Field Study of Vegetation and Flora” by Vasiliy Alekhin (with two editions in 1932 and 1938) taught the method of estimating the age of sphagnum moss, which was the basis of peat, by counting the rosettes of the *Drosera* plant (Alekhin & Syreischikov, 1926). In 1920s and 1930s within the campaign of bringing science to the masses and establishing relations between experts and the lay public, numerous village and *kolkhoz* laboratories (so called hut-laboratories) were organized in the USSR. These labs involved peasants in experiments with fertilization, stimulation of plant growth and research of local natural resources. The manual for conducting field experiments with peat for hut laboratories describes the method of compiling a peat cadaster. Villagers were supposed to determine



botanical composition of peat, the degree of decomposition of plants, the level of ash content. The brochure gave guidelines on how to do that – by looking carefully at the color of peat layers, squeezing peat to feel its texture, and see whether it smears and stains one’s hand. Plants should be examined through a microscope and compared with the Atlas of Plant Remains in Peat (Istomina et al., 1938).

The development of peat industry embodied main principles of resource management policy for electrification. It stimulated the use of local fuels instead of relying on Donetsk coal. Archaic and infertile swamps acquired the status of the advanced technological facilities on the Soviet imaginary map of energy distribution. Transformative capabilities of electrical energy together with the chemicalization project exemplified peat as a substance with high potency that only waited to be released (see fig. 2). The proximity of peat to the earth surface and to the peasants’ dwellings made peat a good training item that a non-expert public could see, touch, feel and study in order to relate the local landscape and their individual experience to the national scale.

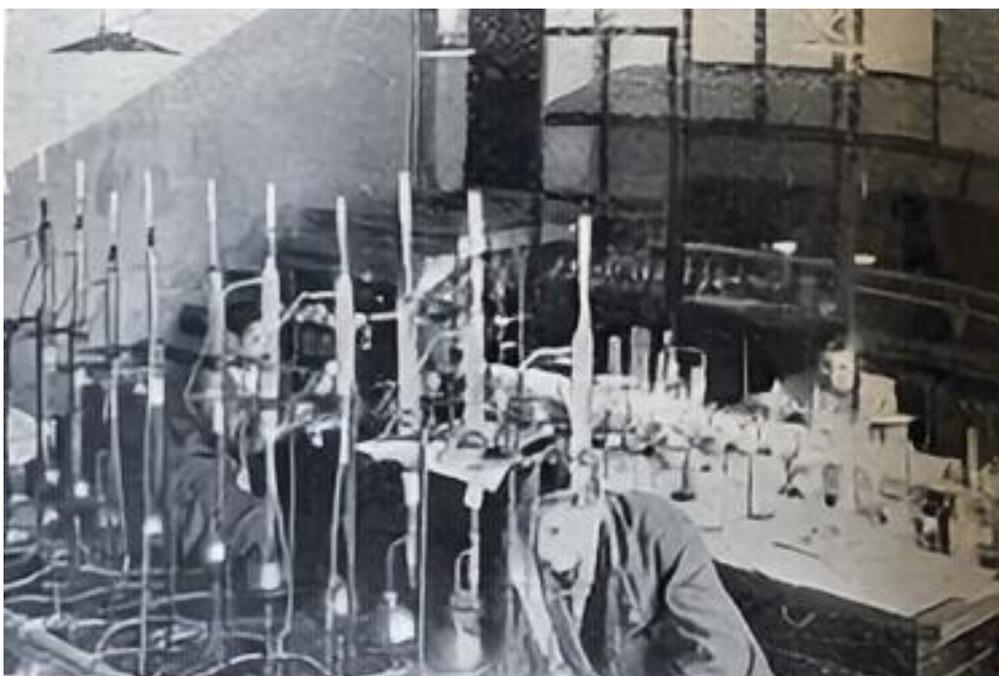


Figure 2. Chemical Laboratory of the Institute of Peat Industry (Rufin, 1935).

WATER AS A SYMBOLIC AND ENERGY RESOURCE

The importance of hydropower was outlined in the GOELRO plan already in 1920. However, the authors of the program attributed large hydropower plants to a distant perspective, focusing on smaller local power plants for the initial stage. It was assumed that during the construction of the first hydroelectric stations, professional experts would grow, scientific institutions would be established. But most importantly, the theme of water as a source of electric power would be understood and supported by the masses,



who would be able to “feel the importance and all the significance of using the living force of water streams” (Elektrifikaciya i vodnaya energiya, 1920). Not only gigantic power plants will boggle the imagination, even small-scale hydroelectric stations, that peasants would build with their own efforts in villages will perform important work – they will show the possibilities of electricity to the lay public and engage the entire population in the agenda of electrification (Elektrifikaciya i vodnaya energiya, 1920).

The GOELRO included 8 hydroelectric complexes on the Volkhov, Svir rivers, Belaya River in the Caucasus, Chusovaya in the Urals, Katun in Altai, and Chirik in Turkestan. By the end of the first two five-year plans 32 major stations were built (Nesteruk, 1963, p. 71). The emblematic and significant object of the first Five Year Plan was the Dneproges station, launched in 1932. It was the most powerful at that time in the USSR and in Europe. It became a major energy center, which shaped a large-scale industrial complex with aluminum, ferroalloy, magnesium plants. Dneproges, designed by Ivan Alexandrov and Alexander Vinter, became a research center and engineering school for the whole country (Nesteruk, 1963, pp. 74 – 76).

The period of the first and second five-year plans was also accompanied by a detailed study of water resources. A water cadaster was created, and the mountain regions, Central Asia, and Siberia were studied in details. The “primacy of coal” in the energy sector was associated with underinvestigation of other energy sources. Water was seen as a potential and inexhaustible source of energy due to its constant renewal by nature itself (*Trudy Pervogo kraevogo*, 1932). Water power, driven by nature itself, required no labor or expense for operation, transportation, or fuel preparation. Powerful plants supplied high-tech industrial industries, thus freeing up fossil fuel for thermal plants and technological processes in other parts of the country, relieving the burden on railroads. Water energy and the rivers themselves were compared to the blood circulatory system that gave life to an industrial organism (Beshenib, 1932).

As the concept of a unified power grid evolved, hydropower plants began to be viewed not as separate regional power centers, but as complex nodes linked to the overall industrial system. In the 1920s it was common to design separate unconnected hydroelectric facilities as isolated regional energy centers. In 1925, the State Planning Committee (Gosplan, the agency responsible for central economic planning in the Soviet Union) established a water sector to design the basic principles of water management. In 1929 the All-Union Committee of Water Management was created, it was responsible for the coordination of needs and plans for water use between different industrial branches and regions. In the 1930s, planning principles of water management switched to interconnected “basin schemes” that took into account energy production and water use on large adjoining territories.

Engineer Alexey Miller-Shulga noted in a complex description of Soviet energy resources that the concept of basin development and inter-basin relations became the foundation of water management development by the end of the 1930s. The conceptual framework of water management acquired the idea of “spatial redistribution of water resources” and withdrawal of water from natural streams and reservoirs. The golden standard of hydraulic engineering design became the concept of river flow regulation. The regulated river flows and artificial water reservoirs were seen as a universal



technological fix since they promised to solve a set of issues simultaneously – to create deep waterbodies for navigation, provide controllable energy resources not dependent on seasonal fluctuations, construction of high-pressure dams for irrigation. For example, in 1932 a large-scale conference of engineers, scientists and economists was held to discuss the program of complex development of the Volga river. The basic principles of the project included the creation of interconnected hydroelectric facilities, which would be included in a unified power system, as well as the creation of a system of canals, locks and reservoirs to maintain the depth of the Caspian Sea, ensure navigation and fish farming (*Problemy Volgo-Kaspiya*, 1934). In this framework river and its adjoining territories was seen as a nature-industrial combine.

Energy demands were a priority in the planning of water use. Asynchronous water regimes in rivers allowed for transfer of electricity and compensation for power shortages through the so called “inter-basin regulation” (Shimelmits & Rubinshtein, 1958, p. 4). Interconnection of numerous hydroelectric plants and their integration into the unified national power grid made it possible to eliminate breakdowns, produce cheap electric power and save on keeping less reserves. This became possible because hydropower stations located in different time zones and regions with diverse seasonal conditions allowed for maneuvering resources (water or electric power). Besides that, it was much easier to stop, launch or change the regime of functioning of a hydroturbine, in comparison to a thermal power plant. Thus, interconnection of power plants using fuel and water ensured stable and steady functioning of the whole system.

Cultural representations of hydropower promoted the motif of modernization, the transformation of traditional spaces and practices, and the renewal of society associated with hydropower construction. The power of natural and constructed waterfalls, grandiose dams controlling powerful flows of water and water energy, produced a wide repertoire of images of renewal, transformation and aspiration for the future. In Marietta Shaginyan’s (1931) novel *Hydrocentral*, built around the construction of hydroelectric power stations in Armenia, water, organized into canals and hydro stations, is a symbol of the future modernized Armenian Republic. Shaginyan paid attention to the contrast between the green, water-soaked north and the arid south of Armenia. The future hydroelectric power plant will connect, level out and balance differences and the natural unjustness between the regions.

Images of powerful water streams resonated with labor enthusiasm. The new Soviet power plants produced not only electric energy, but also a cultural identity – they became megaprojects, capturing the imagination, organizing people around them and molding the “new Soviet man” – a collectivist, techno-optimist, responsible for his own future. In the novel *Energy* (1932-1938) by Feodor Gladkov (1934), that narrated about the construction of the Dneproges, the inexhaustible power of the future hydroelectric power plant is linked to the “inexhaustible energy of the people” (p. 63). In his notes on the creation of the novel, Gladkov, who visited the construction site, wrote about the “energy of the masses” creating the world’s greatest hydroelectric plant (Gladkov, 1934, p. 502). Similarly, Arnaud Arevian, the hero of Shaginyan’s *Hydrocentral*, was striving for real work and “real existence,” spoke of himself: “Now under the Soviet system ... I have the right to work happily, I am not ashamed of loving labor passionately, I dare to waste



myself as much as I can. And in me all the floodgates are up, the power is flowing” (Shaginyan, 1931). The power plant itself is called in the novel “a spring of new energy” – not only electrical, but also a source of new challenges for the technical intelligentsia, new plans and labor achievements. Collectivism, joint participation in labor and creation were fundamentally important here. The engineer in *Hydrocentral* compared human being and hydropower plant: both were insignificant alone, but mattered in a collective (mutually feeding each other, as in an energy system) (Shaginyan, 1931).

Approaches to the development of water resources during the 1920s and 1930s were technocratic, seeking to subordinate natural and climatic regimes to economic and industrial goals. This period was characterized by a modernizing discourse that praised growth of capacity of machinery, as well as the utilization of as many resources as possible. In literature and culture, water was represented as an inexhaustible and cheap source of energy, capable not only of producing energy, but also of stimulating socialist consciousness and producing regional and national identity based on techno-natural harmony.

CONCLUSION

The structure of fuel consumption changed throughout the 1920s and 1930s. This was due to the discovery of new deposits and types of fuel, the development of new forms of fuel processing, as well as the restructuring of the energy industry. The GOELRO plan emphasized the importance of large power plants located near water sources or large fossil fuel deposits. In this scheme, power plants were to become regional energy centers, that would organically generate energy-intensive industrial facilities around them. This “organic generation” of new industries and so to say new modes of life was characteristic of both large-scale and small power plants. For example, the role of dwarf rural hydroelectric stations was seen primarily as symbolic. These novel technological objects were supposed to impress the peasants, to engage them in the theme and agenda of electrification. The use of local fuels such as peat and low-carbon coal was actively promoted and supported by the program of chemicalization, that suggested transformation of previously useless substances into valuable resources.

After 1931, the unified power system of the USSR became the core idea of electrification. New model of energy system was supposed to eliminate injustices and errors of nature in the territorial location of resources through a system of high-voltage networks and control centers. In this new concept, local fuels continued to play a role, but in a different way, more as tools for stabilizing the system and maneuvering capacity between areas. Thus, water resources began to be considered not as a substrate of large regional energy centers attracting industries to them, but as complex facilities or even as service structures for the maintenance and development of a unified power system.

For the 1920s and 1930s, peat extraction, as well as the creation of hydroelectric complexes, were imbued with a utopian impulse and technological optimism. The projects of artificial large water reservoirs, as well as bog drainage did not anticipate future environmental or sociocultural problems that would only become present in the public discourse later, in the 1960s – such as the problems of drained bogs and ecosystem



disruption, fires, agricultural and ecological problems on the immersed lands, as well as tragedies of people and loss of cultural memory in the submerged villages. In the period of early electrification and industrialization, environmental and cultural issues became subordinated to the primacy of technology – at this stage, nature had to be subjugated, transformed to conform to the contours of the energy system, making the country one big energy-industrial combine.

In the romantic post-revolutionary period, ideas about progress and its development were inseparable from the vision of the new forthcoming society and the “new man.” The conceptualization of electric energy and natural resources, providing the transformation of matter and capturing collective imagination, assumed a techno-natural harmony subordinated to the logic of industrial production.

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Research article

No Resources, but a lot of Skill: A German Political Myth and its History¹

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Abstract

While during the 19th century Germany was characterized by the formula “land of poets and thinkers.” after WWI another phrase and self-characterization became popular: Germany was framed as a country that compensated with science its lack of resources. This self-description passed more or less unaltered through the Weimar Republic, the NS-State and still is very prominent in present political discourse. Its sources, parallels and political implications are analysed in this essay. The technical achievements of, for example, Haber and Bosch to make a strategically important raw material available in any quantity from “mere air” was seen as a way out of the predicament that foreign powers could block access to important substances at any time. This finds its philosophical counterpart in Arnold Gehlen's thesis of the deficiency of human beings that can be compensated by technology and by way of institutions. The notion of the resource-poor nation that relies on the inventiveness of its engineers finally results in a focus on applied science and technology.

Keywords: History of chemistry; Techno-politics; Political narratives; Material resources

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¹ The text is a completely revised and expanded version of Soentgen, 2014.



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Научная статья

Без ресурсов, но с умениями: Немецкий политический миф и его история²

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Аннотация

Если в XIX веке Германия характеризовалась формулой “страна поэтов и мыслителей”, то после Первой мировой войны стала популярной другая формулировка и самохарактеристика: Германия была представлена как страна, которая компенсировала недостаток ресурсов наукой. Это самоописание прошло более или менее неизменным через всю дальнейшую историю и до сих пор занимает видное место в современном политическом дискурсе. В этом эссе анализируются его источники, параллели и политические последствия. Технические достижения, например, Габера и Боша, позволившие сделать стратегически важное сырье доступным в любом количестве из “простого воздуха”, рассматривались как выход из затруднительного положения, когда иностранные державы могли в любой момент перекрыть доступ к важным веществам. Это находит свой философский аналог в тезисе Арнольда Гелена о недостатках человеческих существ, которые можно компенсировать с помощью технологий и институтов. Представление о бедной ресурсами нации, которая полагается на изобретательность своих инженеров, в конечном итоге приводит к концентрации внимания на прикладной науке и технологии.

Ключевые слова: История химии; Технополитика; Политические нарративы; Материальные ресурсы

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² Текст представляет собой полностью переработанную и расширенную версию статьи Soentgen, 2014



Resources are in Germany by no means just a technical-economic topic with ecological overtones. The intensity with which the stock market, publicists, but especially politicians react to discussions of scarcity, especially of high-tech raw materials, cannot be adequately explained by referring to a supposed scarcity that actually exists ‘in the real world.’ Ten years ago already, a study on the scarcity of “rare earths” – a certain group of elements that is particularly needed in high-tech industries – came to the conclusion that nobody knows exactly, just how scarce these materials really are (Zepf, 2013, pp. 114-117). Incorrectly, the group name „rare earths“ suggests a kind of natural scarcity and obscures the fact that scarcity must be relativized at least twice, namely in relation to the availability of other goods and in relation to current or projected economic demand.

The topic of “raw materials” has been discussed in Germany for at least 100 years within the framework of a myth, without the consideration of which the current discourse and its particularities can hardly be understood. In this context, a myth is understood as a traditional narrative that serves a political, metaphysical or even religious function, i.e. it serves to explain or also legitimise.

The discourse on raw materials in Germany has a mythical dimension in quite this way, it is not as technical or sober as it appears. By way of the oft-varied formula of a country poor in raw materials whose only wealth or capital is its brains, knowledge, or know-how, the myth helps project a powerful self-image that has been telling Germans for a while who they actually are in contrast to others. This narrative scheme is particularly popular among politicians who talk about the economy and education, also among entrepreneurs and application-oriented researchers. In 2009, for example, the chairman of the board of the German Aerospace Center (DLR) declared: “a resource-poor country must invest in brains, invest in technologies” (Jung, 2009). This was to justify why his centre was sticking to plans for a moon mission despite the financial crisis. There is similar talk elsewhere. Wherever innovation conferences are held in the country, wherever an industrial development is launched, or new funding initiatives celebrated for the cooperation between business and science, this formula will be heard. It always sounds innocent and fresh, unspent, and plausible.

However, the formula has a history of around one hundred years, which resonates strongly in the current political talks of the “scarcity of raw materials.” In it, as in other effective myths, error and truth mix in a strange way.³ For on the one hand, Germany is by no means poor in resources or even raw materials, certainly not in comparison to other countries of similar size. In a dictum directed at the ore deposits of the old German Empire, economist and historian Werner Sombart stated: “The lands of the German crown were the Mexico and Peru of the earth before the discovery of America” (Sombart, 1916/1987, p. 519, see also Rüger, 1939, p. 3 or Deutschlands heimlicher Reichtum, 2023). Even after two world wars, Germany was until recently the world's largest producer of lignite, only recently overtaken by China. It has enormous deposits of potash salt, no shortage of important building materials such as sand, gravel, or limestone, also has considerable metal and uranium deposits and is particularly well endowed

³ On political myths in Germany, see Münkler, 2009, pp. 9-30; the myth examined here is missing in Münkler's collection.



ecologically with fertile soils, water, rivers and forests, not to mention the aesthetics of its cultural landscapes, some of which are still preserved here and there today.

German iron ore and especially coal deposits were central prerequisites for the emergence of German steel-making the German chemical industry. Without the abundance of ecological resources, Germany would never have become a densely populated country. Without its enormous fossil mineral resources it would never have risen to become the leading industrial nation in Europe. There is a shortage of resources only in the case of oil and a few metals or minerals. On the whole, the supposedly self-evident description of Germany as a resource-poor country is a myth that is not backed up by facts.

This myth has its roots in the decades after 1918. At that time, the lost world war was often explained by the legend of the stab in the back. Equally powerful, however, were explanations that pointed to the blockade of key raw materials, especially oil. The geologist Ferdinand Friedensburg quotes the *communis opinio* when he writes in his 1939 book “*Das Erdöl im Weltkrieg* [Oil in the World War]”: “numerous weighty voices in the camp of Germany's opponents have attributed the overwhelming final success to the superiority that the Entente possessed over the Central Powers in the supply of mineral oil” (Friedensburg, 1939, p. 121).

The concern of being cut off by a blockade from raw materials that are essential to warfare was already being ventilated in Germany in the 19th century. Although France's blockade attempt in the Franco-German War of 1870/1871 was unsuccessful, the blockade was considered a potential risk in a war on two fronts (Fehr, 2009, p. 59). Nevertheless, the precautionary measures taken by the German Empire until 1914 remained rather modest and proved largely ineffective during the war. A short military conflict had been expected and, as the war progressed, the German Empire found itself in a dire situation of increasing scarcity and shortages. In the publications of the time, attempts were discussed to make up for almost all imported goods through domestic materials, mostly with little success.

The solution was modeled on the example of saltpetre which was of central military importance as an explosive charge for mines and as a propellant charge for ammunition. This substance, which was as indispensable for warfare as steel was for weapons production, could be supplied in sufficient quantities despite the blockade. Saltpetre was made technically available via ammonia thanks to Fritz Haber's invention, which was further developed into a large-scale industrial process by Carl Bosch and his team. Now, the German Reich was no longer dependent on saltpetre supplies from Chile or India. As early as 1913, as Sandro Fehr was able to prove on the basis of a discovery in the BASF company archive, a contract was concluded between the state explosives and powder factories on the one hand and BASF on the other. In this contract the latter guaranteed to deliver a certain quantity of nitric acid to the state explosives producers every month “in the event of mobilisation” (Fehr, 2009, p. 62, see also Fehr, 2015).

After the war the technical achievement of Haber and Bosch to make a strategically important raw material available in any quantity from “mere air” (albeit with the help of fossil energy such as coal or natural gas) was seen as a way out of the predicament that foreign powers could block access to important substances at any time. This achievement



is everywhere present in the literature of the 1920s and 1930s: “it will remain unforgotten to anyone who experienced the World War with any consciousness how German technology in particular conjured nitrogen for the needs of the army as well as agriculture into our hands by completely new means from the air” (Weule, 1922, p. 60). Similarly, the Swedish Nobel Prize winner Svante Arrhenius summarised the general opinion in 1921 when he wrote: “One has often ... heard that it was the schoolmaster who won the 1870 war against France, – now it is the chemist who turned the advantage in Germany's favour in the first year of the war. Without his help, Germany, cut off from all saltpetre-producing countries, would have been crippled for lack of munitions after only the first three months of the campaign” (Arrhenius, 1922, p. v). In the literature on raw materials, the Haber-Bosch process was soon joined by the synthesis of rubber from “coal and lime” by Fritz Hofmann, the invention of synthetic fibres that replaced cotton, but also, in retrospect, the invention of beet sugar by the Berlin chemist Andreas S. Marggraf and Franz Achard in the late 18th century.

The journalist and writer Anton Zischka (1942) bundled such success stories and gave them the punchy title “Inventors Break the Blockade.” This was the title of his 1937 book, which deserves to be singled out from the plethora of similar titles from the 1920s and 1930s because of its immense, not only national, but international circulation (see Weber, 1999). Books of this kind were promoted by National Socialist cultural policy, but also arose spontaneously and had already been published before Hitler came to power. At the behest of Fritz Todt, Zischka's work became mandatory reading in German schools and the myth he transported became a definitive part of the self-image of what was now National Socialist Germany. It thus stood alongside the better-known racist myths and complemented the doctrine of a people without ‘*Lebensraum* [living space].’

The narrative was now mostly this: Due to the victorious powers of the world war, Germany was already cut off from important raw materials during the war, but even more so afterwards. The war opponents have no shortage of raw materials of all kinds due to their extensive colonial empires, where cruelty reigns. But German inventors, especially German chemists, through their self-sacrificing work, found ways to produce those substances in any quantity from very simple basic materials available in Germany. This would liberate first of all Germany, but then would free from the chains of the monopolists also the whole, enslaved world. Progress, prosperity, and peace for the whole world are the goals of those scientists whose only desire is to serve humanity with their research and free the poor and suppressed victims of colonialisation. This primarily refers primarily to chemists Industrial chemistry was, after all, very influential in the Nazi Reich, with some managers and chemists involved in the Holocaust (see Soentgen, 2017 on the industrial projects of IG Farben in Auschwitz, ,see also Soentgen, 2019, pp. 131-150 and Maier, 2015).

Max Hessenland (1938), professor of chemical technology in Königsberg, which was Prussian at the time, sums up this view of history in the preface to his book “*Deutschlands Kampf um Rohstoffe* [“Germany's Battle for Raw Materials”]:

There is an old saying that goes: 'Necessity is the mother of invention'. This saying has never been so true of any people as it has been of the German people. Since the beginning of the war, and perhaps even more so since the harsh Versailles



dictate, the need has become so great that only the German inventive spirit can come to the rescue. Deprived of all colonies and foreign raw materials, we have claimed a colonial empire of our own, which is not recorded on the atlas and which no one can snatch from us. It is the vast empire of science and technology. (...) We now have the land of unlimited possibilities within the borders of our own fatherland. In this infinite colonial empire, the laboratories are, as it were, the gardens and plant nurseries in which, by the expert hand of the researcher, new species are bred, nurtured and cared for, often over years of laborious trials, until they become strong enough to be transplanted into the plantations, i.e. the factories.” (p. 9-10)

As examples of such successes, he mentions synthetic dyes such as indigo, synthetic saltpetre (Haber-Bosch process), artificial silk and synthetic petrol.

From such descriptions it becomes clear how in the formula “no raw materials, but brains” the national self-image is formed in contrast to the European neighbours France and especially England which is despised as a “trader nation.” Those “traders” walk over corpses, as dramatized, for example, in a 1938 German book “*Blutgummi* [blood rubber]” by Karl Fischer. In contrast, Germany's path via chemical synthesis is not only an economic necessity, but is, according to the self-representation, supported by deeply humanistic values.

In the four-year plans of the National Socialist government, self-sufficiency was implemented as a political goal. It served to prepare for war. In the propaganda of the Nazi newspaper *Völkischer Beobachter* this self-image is further bundled: “We are poor in raw materials, and that is why we are the ones who are bringing up a new age of technical and chemical development” (quoted from Berndt, 1938, p. 219).

After 1945, in the supposed “zero hour” of a new beginning, racism and the “*Lebensraum* [Space for Life]” doctrine were officially condemned and removed from the treasure-chest of national myths as best they could. Very few now spoke and wrote of a people without space. The doctrine of resource-poor country, however, survived, not only through the books of Anton Zischka or Aloys Schenzinger which continued to find thousands of readers in revised new editions (Schneider, 2004). As much as the year 1945 signifies a *caesura* in German history, it must be pointed out that there were also numerous continuities.

If Werner Abelshauser's (2004) statement that “German history since 1945 is above all economic history” (p. 11) is correct, and if it is true that the “West German Federal Republic ... long resembled a successful economy in search of its political *raison d'être*” (p. 11), then the peaceful, purely economic formula „no raw materials, but brains“ fits this perfectly. For this formula, there was no “zero hour,” no “collapse” or *caesura*. There is something immediately obvious about it. It finds its philosophical counterpart in Arnold Gehlen's thesis, disseminated since 1940, that the 'human being,' compared to animals, is a “deficient being” (Gehlen, 1966, pp. 20, 33, 83) that can only maintain itself with the help of technology and by way of institutions. Although this philosophical formula has older predecessors – Gehlen refers especially to Johann Gottfried Herder – it is expanded in Gehlen's work in such a way that it has questionable political implications, for example, the warning against damaging existing institutions (for a criticism of this, see Hagemann-



White, 1973). In any case, however, the narrative of the resource-poor country contains practical implications in political discourse, namely the promotion of applied science and technology. In this, it becomes evident how it joins up with the older self-definition of Germany as a “land of poets and thinkers,” which goes back to the early 19th century and which characterizes Germany not as a mere technological, but as a cultural nation.

Exposing the political-cultural dimension of the resource issue has consequences for the understanding and evaluation of current discourse on the question of resources. This discourse must be questioned just as critically as the formula of the resource-poor country itself. Raw materials are not scarce per se. The naturalisation of scarcity has ideological purposes. It conceals the economic and power-political interests that motivate the interest in *certain* raw materials. We have to ask: which raw materials are scarce for whom in relation to which projects?

In other respects as well, the formula of a country poor in raw materials should be questioned. Not only because it inappropriately diminishes the ecological, geographical and geological prerequisites of Germany's economic power. But also because in this self-image intellectual activity is reduced to applied research. The well-known characterisation of the land of the poets and thinkers may sound enraptured and romantic. The more modern self-characterisation, however, is a programme for intellectual shrinkage. It ties intellectual activity to economic goals, which are not questioned further, but are taken to be natural. Is there no more drive in present day Germany to continue to be a cultural nation? In any case, the formula from the 19th century had a broader horizon than the novel popular self-image of a people of clever engineers who compensate their alleged lack of resources with inventiveness.

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Research article

Tracing the Tracing Apps: A Technical Response to Covid in Cultural Comparison

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Abstract

The paper is concerned with studying the tracking apps developed and employed by governments to control the Covid 19 pandemic. Such apps have been implemented by almost all states in the world, however, with different mechanisms. In the present study, three groups of apps are identified, according to their level of control and surveillance (low, medium, high). Apparently, a higher degree of control, as well as the obligation to install them, should correspond to greater efficiency, but it also coincides with greater risk of exposing users' personal data. As much as this assumption tends to be correct, for determining the efficiency or inefficiency of tracking apps, other factors need to be analyzed. This might be socio-political in nature, such as the public's trust in the actions of governments, or technical, i.e., concerning the actual performativity of such devices. The article also highlights the question of how the use of technology can affect our understanding of freedom and personal responsibility. The international comparison shows, overall, that there are no universals but many cultural determinants. In particular, there is no universal fear of data security that could explain a certain technological design. The study of alternative Covid-tracking applications allows us to see the confluence of ideological, philosophical and technical concepts in the modern world. Their evaluation cannot proceed in isolation from cultural dynamics and value orientations.

Keywords: Corona pandemic; Tracing Apps; Privacy; Trust; Responsibility; Efficiency and performativity; Intercultural comparison of technologies

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Научная статья

Отслеживая приложений для отслеживания: Технический ответ на Covid в культурном сравнении

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Аннотация

Статья посвящена изучению приложений для отслеживания, разработанных и используемых правительствами для борьбы с пандемией Covid 19. Такие приложения были внедрены почти во всех государствах мира, однако с использованием различных механизмов. В настоящем исследовании определены три группы приложений в соответствии с их уровнем контроля и слежки (низкий, средний, высокий). По-видимому, более высокая степень контроля, а также обязанность по их установке должны соответствовать большей эффективности, но это также совпадает с большим риском раскрытия персональных данных пользователей. Несмотря на то, что это предположение, как правило, верно, для определения эффективности или неэффективности приложений отслеживания необходимо проанализировать другие факторы, социально-политического характера, такие как доверие общественности к действиям правительств, или технические, то есть касающийся реальной производительности таких устройств. В статье также освещается вопрос о том, как использование технологий может повлиять на наше понимание свободы и личной ответственности. Международное сравнение показывает, в целом, что нет универсалий, но много культурных детерминант. Изучение альтернативных приложений Covid-трекинга позволяет увидеть слияние идеологических, философских и технических концепций в современном мире. Их оценка не может происходить в отрыве от культурной динамики и ценностных ориентаций.

Ключевые слова: Пандемия коронавируса; Мобильные приложения; Конфиденциальность; Доверие; Ответственность; Эффективность и производительность; Межкультурное сравнение технологий

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INTRODUCTION

In 2019, a new strain of coronavirus emerged, producing the disease called Covid 19. It became a serious problem that led to great losses and thousands of human casualties. Digital technologies played a significant role in solving the problem of maintaining social interactions during the period of forced isolation, allowing people to work, learn, and entertain themselves without leaving their homes. However, digital technologies were also called upon to directly combat the spread of infection. Due to the universal increase in digital literacy and the popularization of the market for mobile applications aimed at limiting the spread of the virus, such applications as StopCovid, Social Monitoring, TraceTogether, and many others have emerged.

The specific design of the applications that were created to track contacts in order to combat the spread of the coronavirus reflects certain cultural and philosophical characteristics of the countries that were using them. The national specificity was vividly reflected in the development of technologies to combat the coronavirus, which took place under conditions requiring maximum speed and efficiency. As early as the mid-20th century, Lewis Mumford (1964) noted: “from late neolithic times in the Near East, right down to our own day, two technologies have recurrently existed side by side: one authoritarian, the other democratic, the first system-centered, immensely powerful, but inherently unstable, the other man-centered, relatively weak, but resourceful and durable” (p. 2). Here the philosopher opposes different technologies that have not just different, but opposite goals. In our case, the goal of the technologies under consideration is the same, but employ different ways of implementation, which are manifested in technological solutions and then affect the organization of people, social and technical systems. As Langdon Winner (1998) wrote, “The things we call 'technologies' are ways of building order in our world” (p. 29). Usually, the influence of technologies on social life has long-term and difficult to trace consequences: “Consciously or unconsciously, deliberately or inadvertently, societies choose structures for technologies that influence how people are going to work, communicate, travel, consume, and so forth over a very long time” (p. 29). In the case of applications designed to combat the spread of the coronavirus, their impact on society and effectiveness can be assessed relatively quickly. In addition to asserting that artifacts have politics, Winner was referring to general ideas of governance, whereas modern digital technologies can be a tool of control and management in the most direct and immediate sense.

METHODS

The method of research is the analysis of 73 different applications. The majority of them are so-called tracing apps: applications that track user contacts or the whereabouts of infected persons. Applications from the Czech Republic, Poland, India, Australia, Russia, China, Germany, the United States, Taiwan, and other countries were considered (see Appendix 1). For the study, both the application itself and the data offered by the creators were used, as well as ratings and descriptions of users, media materials and papers dedicated to applications.



All software products listed in the article were created with the participation of the state. The control factor may reflect both the characteristics of the epidemiological situation and certain cultural characteristics of the inhabitants of a particular region. As a result, the most important factor from a philosophical point of view is the level of control over the user.

RESULTS

Levels of Control

The study identified three general levels of control: low, medium, and high. Applications with low control levels were most characteristic of European countries and Australia. The majority of these apps only required Bluetooth protocols to detect nearby devices within a radius of up to 50 meters and establish temporary connections for encrypted data exchange and a phone number to receive notifications of possible infection.

The functionality of such apps was limited to notifying users of their contact with a possible or confirmed carrier of the virus. These apps received many downloads in various app stores (for example, the Czech app eRouška had over 1.7 million downloads, and the Polish app ProteGOSafe had around 1.5 million) because they were easy to use and low-risk with minimal device load. Apps that tracked user contacts were collectively referred to as “tracing apps.”

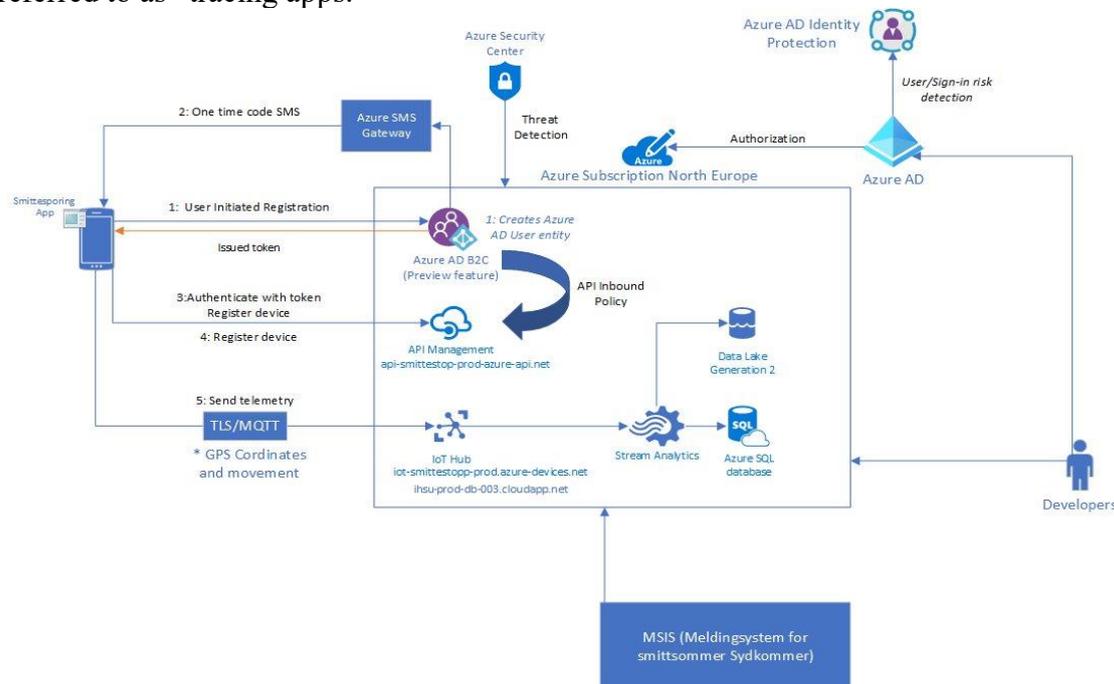


Figure 1. Information Circulation Scheme (Smittestop, 2020).



It is worth noting that about half of the tracing apps operated for no more than a year. Technical issues were a common reason for app closure. For example, the Norwegian app Smittestop was disabled under public pressure after it became known that the app had certain problems with user data protection.

As Marius Sandbu (2020) writes in his article “Technical Analysis of Smittestop backend Azure,” the application does not have any backend protection, which allows an attacker to access the user database in real time, the data in this database is also not securely encrypted, therefore an attacker will be able to use the stolen data for selfish purposes. In addition, the application operates on Azure data centers located in Ireland, which makes the data even more vulnerable (Fig. 1).

All these problematic features show not so much the incompetence of the development team itself, as the insufficiently attentive attitude of the government, which was the customer and sponsor of the project. It failed to adequately respect the personal data of citizens who were at risk of theft by third parties as a result of negligence. Getting any personal data (phone number, geolocation, passport data) at the disposal of an attacker can lead to damage to the data holder – from disclosure of his place of residence, to fraud using his phone number, even obtaining a microloan in his name.

Therefore, the Institute of Public Health issued an official apology and soon the application stopped working. However, this case is an exception rather than something ordinary. An example of society's reaction to manipulation of citizens' data is the situation in the United States. In 2019, the American Pew Research Center conducted a survey in which more than 4000 people participated. The purpose of the study was to find out how much Americans were aware of the fact that they are being watched and how they protect their personal information on the Internet. The survey results showed that 8 out of 10 Americans (about 3,200 out of 4,000 respondents) believe that they cannot escape surveillance by the government or private companies. In addition, almost all respondents stated that they had at least once in their lives received advertising that was directed to them based on their Internet search queries or other actions on the network, which confirms the fact of a third-party usage of the user's personal data (search query history) (Auxier, & Rainie, 2019). This is due to the fact that in the modern world more and more information about us is collected and stored on the Internet, as well as with the development of technologies that allow us to track our online activities. However, only 28% of respondents said they were taking any steps to protect their personal information online (Business FM, 2020). This may be because many people do not know how to protect their privacy online, or do not consider this problem important enough. A study by Douglas Leith and Stephen Farrell indicates that apps consist of two separate components: a “client” app managed by the national public health authority and the Google/Apple Exposure Notification (GAEN) service, that on Android devices is managed by Google and is part of Google Play Services. And if in most cases the client does not cause any particular complaints from the point of view of confidentiality (although the privacy of the Irish, Polish, Danish and Latvian apps could be improved), the part related to Google Play Services raises a number of questions. It contacts Google servers roughly every 20 minutes, potentially allowing location tracking via IP address. In addition, the phone IMEI, hardware serial number, SIM serial number and IMSI,



handset phone number etc are shared with Google, together with detailed data on phone activity. This data collection is enabled simply by enabling Google Play Services, even when all other Google services and settings are disabled, and so is unavoidable for users of GAEN-based contact tracing apps on Android (Leith & Farrell, 2021).

Another major problem with tracing apps is the lack of user responsibility. The most affected by this factor was the COVIDsafe application, developed under the leadership of the Australian government. For example, a resident of Australia was quoted as saying, “(the installation of the application) is voluntary, and I decided that I can do without the application for now. It can be put under an anonymous login, but if contact is suddenly recorded for more than 15 minutes with the carrier of the virus, the data is found through the medical system, and doctors contact the person by phone number to inform him that it makes sense to isolate and do a test for coronavirus” (BusinessFM, 2020). From this one can infer that the “doctors” perform the function of push or SMS notification, but no more. The recipient of such notification still reserves the right to completely ignore it and does not bear any responsibility for such an act. “They explained that Amazon will be responsible for storing application data, and everyone is afraid of leaks. I heard that about 5 million people have installed the application – out of 25 million people, that is, every fifth” (BusinessFM, 2020). Despite the absence of any data on the reliability of the private information protection system, as well as due to the lack of obligation to use the application, most of the people who installed it did not use its functionality. Accordingly, this application detected only 2 cases of infection and was closed due to inefficiency.

A logical conclusion from the experience of using applications with a low level of control was the need to increase the latter in combination with the most thorough study of all aspects of the application concerning users' personal data, especially the protection of personal data.

Lucie White and Philippe van Basshuysen argue that the efficiency of applications would be greater if some pseudonymized data were stored on a central server, and not only on users' smartphones, which privacy advocates have cautioned against (White & Basshuysen, 2021). At the same time, data on the central server can be stored using identification numbers, and not user data. The general information on the server allows you to monitor the infection situation as a whole, improving the quality of data. In practice, centralized systems have not been fully implemented. Attempts made in the UK and Australia were unsuccessful, as they could not identify contacts with sufficient accuracy due to the difficulty of designing a functional app on Android and iPhones without the support of Apple and Google (who only support decentralised app architectures).

The next level of control that we have identified is the average level. In it, as we found out, there is supposed to be an exchange data between several devices, including their transfer them to some third party which is a state structure in one form or another. Personal data is transmitted only to a limited extent, or is not distributed. The use of the application is voluntary. Compared to a low level of control, it is worth noting that at a low level the information requested was no more than a phone number, even location data was not required, unlike in the average level.



After analyzing all the characteristics of the applications, we have identified the main difference from low control. This main difference is a slight deviation from strict confidentiality. For example, the Ito (Germany) application worked as follows: If a person had a positive test result, he or she received a code from the Department of Health, which one can enter in the application. Then the pseudonymous ID of the person is uploaded along with the confirmation of a positive test. All users regularly download the latest information for local data comparison on their devices. When the device of a person who has been in contact with an infected person recognizes this pseudonymous identifier, the person will be informed – without revealing the actual identity. Another example is the Covid Shield app of Sri Lanka where a mobile app runs in the background to collect random IDs and exchanges them with nearby phones with Covid Shield installed. It periodically downloads common random identifiers from the server and compares them on each user's device to determine if a possible infection has occurred. If we briefly analyze these two applications, we can conclude that the Ito application (Germany) collects information specifically about the user, as opposed to low-level applications that collect information such as phone number, address, etc. And Covid Shield (Sri Lanka) is based on impact notification technologies provided by Apple and Google, which is currently the most secure approach to maintaining privacy. Thus, we can draw a general conclusion that these applications are fairly vivid examples of clear difference from the low level.

However, in some states, applications directly invaded the privacy of users. Such applications have been identified by us as applications with a high level of control. It should be noted that the more information the application receives about the user, the wider its functionality can be. However, the requirements for the application increase proportionally. Four software products will be considered as examples of applications with a high level of user control: Chinese “AliPayHeathCode,” Singapore “TraceTogether,” Russian “Social Monitoring.” Examples will be considered in ascending order of control.

The TraceTogether app, released on March 20, 2020 and still functioning to this day, requires the user's geolocation, phone number, and passport data to work. It is precisely the latter that sets TraceTogether apart from lower-level apps – it literally gets a copy of the user's identity document, which expands the capabilities of the application. For example, TraceTogether can call an ambulance to the user's location, which will be informed in advance about the user's condition, show the location of the nearest medical centers and blood transfusion points suitable for the user. Despite the daunting requirements and lack of any responsibility for not using the app, Singapore's population continues to use it according to official statistics provided on the Singapore government website (Singapore Government, n.d.). This reflects the philosophy promoted through this application. The headline on the application's homepage reads: “Trace Together, Safe together,” which reflects the main aspect of the application – massiveness. Naturally, the more people conscientiously monitor their contacts, the more effective the application will be.

The effectiveness of the application depends not only on the number of installations but also on the degree of trust users have in it. The number of active TraceTogether users



(90% of the country's population, which is about 5,000,000 people) shows a high level of trust in the government, as well as a high level of personal responsibility and a sense of involvement in such a large-scale project. Therefore, based on the fact that citizens are extremely loyal to government actions, to achieve mass usage the application need not be mandatory but only recommended for use.



Figure 2 Permissions requested by the Social Monitoring application (presented in two languages)

The Social Monitoring app turned out to be more controversial. The app was distributed in Moscow, so the potential coverage could be more than 12,000,000 people, but its specifics differ from those listed above. The official website of the Mayor of Moscow provides the following description: “Social Monitoring” is a mobile application that helps the city ensure compliance with self-isolation. It is primarily used by those who



have been diagnosed with “coronavirus infection,” i.e., potential users are people who have already been infected with the coronavirus. This factor was probably the main reason why the application was mandatory for installation. It worked as follows: infected users were required to take a photo of themselves at the appointed time, after which the photo, with its geolocation attached, was sent for processing to prove compliance with quarantine regulations. Thus, a resident of Moscow was to establish that they were conscientiously observing the requirement to self-isolate. However, problems arose in almost all aspects of the application's work and quickly reduced citizens' level of trust. The first thing that caught the eye when installing the application was the list of permissions, which differed in several ways from that given on the Mayor of Moscow's website page dedicated to the application.

For the Android operating system, the following requirements were announced: “Take a photo,” “Access to location,” “Background mode of operation,” but after installation, the following confirmation window appeared, which contains many more items (Fig. 2).

The next problem with the Social Monitoring app were the calls and notifications that came at night. According to the decision of the Department of Information Technology, 458 fines totaling about 10 million rubles were canceled due to the fact that the demands to send a photo within an hour came at night. After that, sending notifications at night was prohibited, but another 34.5 thousand fines remained unpaid, and it is not possible to find out how many of them were issued by mistake. In addition, according to user reviews on GooglePlay, AppStore and Irecommendd.ru most users were dissatisfied with the instability of the application, with frequent failures, the quality of technical support, or its complete absence, the complexity of creating the conditions necessary for the snapshot. As a result, the average score accorded to the application in the GooglePlay (2020) shop was 1.3 out of 5 possible points, based on 14.2 thousand reviews, in the AppStore (2020) it was 1.2 out of 5, based on 7.5 thousand reviews. The technical component of the application also had some serious problems. A study of the source code of the application conducted by representatives of the telegram community “IT and COMP” revealed the fact that data is transmitted to the servers of the Moscow City Hall via http protocol, which does not involve data encryption. At the same time, along with the user's data, an IMEI identifier is also sent – a unique identifier of the device in the network. The facial recognition system used in the application belongs to the American company identix.one, therefore, the data of Social Monitoring users is very likely to get to the servers of this company. It was also revealed that the posted e-mail address for user support service did not belong to the subordinate city hall of the State Institution “Information City,” but to the company “Gaskar Integration.” Thus, the situation with Social Monitoring resembles the situation of Smittestopp. However, unlike other applications, Social Monitoring is mandatory and has more serious problems with the quality of its implementation with a larger volume of collected data about the user. At the same time, there were no protests against the use of the application, whereas the subsequent introduction of QR codes confirming vaccination for visiting public places was not without protests, some of which were associated with the unacceptability of using this digital identifier in public.



In Israel, an application was developed that seems very similar in functionality to Social Monitoring – AMAN. The main differences were the free distribution of the application through the AppStore and the verification of compliance with self-isolation based on GPS data, and not on photos constantly sent through the application. The Aman app was created in Israel at the beginning of the COVID-19 pandemic in March 2020. It was designed to help law enforcement agencies monitor people who should be quarantined but do not comply with it. In the first month of using the app, more than 1 million downloads were registered. However, not all users were happy with its functions. Some people have expressed concerns about privacy violations and the possibility of data abuse. Several users have sued the Israeli government, claiming that the app violates their constitutional rights. The advantages of the Aman application are that it allows you to control people who should be quarantined and prevent the spread of COVID-19. It also helps law enforcement agencies respond quickly to quarantine violations. According to the data provided by the Government of Israel, in the first three months of using the application, more than 5,000 cases of quarantine violations were registered which were revealed thanks to the application. Israel was one of the first states outside East-Asia to impose involuntary surveillance measures as a means to combat the virus. To do this, the tool previously used to combat terrorism, developed by the internal security service (Shin Bet) was declassified and implemented to track the location of coronavirus patients, identify infection-chains and notify citizens who have been in close proximity to an identified patient to self-quarantine (Gekker & Ben-David, 2021, p. 149). Although there was a legal battle against its use, it was promoted by only a relatively small group of activists, while the majority of Israelis reacted calmly to universal tracking. The original Shin Bet's surveillance system, called simply “the Tool,” was not specially created during the pandemic, but it has been in operation since 2002 and used for continuous trawling collection of all available cell-phone data from every mobile device in Israel and the Palestinian Territories (Gekker & Ben-David, 2021, p. 150). Therefore, in this case, the technical means already existed, they were simply retrained to track the possible spread of Covid. A Bluetooth-based phone app was also developed in Israel (however, not very successfully), but “the Tool” was already in place anyway, which facilitated its mandatory adoption (Das, 2021).

Another application that serves to monitor the user's compliance with the self-isolation mode is the Magen application (Ministry of Health, 2021). One of the main advantages of this software product is that it allows the tracking of user's movements in real time, efficiently permitting to monitor compliance with the self-isolation regime. Users who have been diagnosed with COVID-19 or have been in contact with an infected person get access to the application and must confirm their location and quarantine compliance. In case of an infraction against the rules, the application sends a notification, reporting a violation of self-isolation protocol to the local health services. However, despite these advantages, the Magen application also has a number of disadvantages. For example, the application requires a GPS receiver always turned on, which consumes a lot of energy and quickly drains the device's battery (Moyal, 2020). Digital technologies have been used most consistently to prevent the spread of Covid-19 in China, where telecom operators can collect and use location data that is not constrained by user privacy issues.



Data from hundreds of millions of smartphones with GPS enabled were collected by the government to track the user's route and assess the likelihood that a person is exposed to COVID-19 by comparing his position with that of infected individuals or groups (Iandolo et al., 2021). Users with the highest level of risk were identified using AI, so in some cases they could not understand how and why the “red status” was indicated which did not allow free movement.

China has introduced a number of technological solutions to combat the spread of Covid-19. The state has created a contact tracking system that uses GPS data, mobile networks, and CCTV cameras to monitor people's movements. If someone is infected with Covid-19, the system can quickly identify who they have been in contact with and isolate them (Bogdanov, 2020).

Every person who decides to use a certain COVID tracing app faces the need to sacrifice their privacy to varying degrees in order to fight COVID-19, but a greater sacrifice does not always mean a more effective result. For example, despite the number of permissions obtained by the app (see Fig. 2), the Russian app Social Monitoring was suspended due to incorrect operation (frequent unwarranted fines, lack of encryption, use of elements from other apps that operate with personal user data). Thus, it is necessary to ensure a balance between protecting personal data and the effectiveness of fighting COVID-19. To do this, data anonymization methods such as encryption and pseudonymization can be used which allow maintaining user confidentiality while providing the ability to track contacts and identify the infected. In addition, it is important to regularly check the functionality of applications and eliminate any errors found to avoid the unlawful use of users' personal data.

COVID Tracing-apps in Action

Although the use of COVID tracing-applications has been widespread around the world, debates about their usefulness have remained just as popular. It is practically impossible to assess and compare the effectiveness of these applications, both due to the lack of data and the influence of unaccounted factors. Certainly, there are many ways to model their impact, but they are weakly oriented towards real situations, and often assume a simplified, macro-level mathematical model that assumes homogeneous mixing of the population. Nevertheless, there are several empirical studies demonstrating that messages about contacts with sick individuals can slow the spread of the disease. For example, in Taiwan, the effectiveness of a text warning system used among 627,386 individuals who came in contact with SARS-CoV-2 was shown and compared to the general population who did not use such a warning system. The number of cases decreased from 19.23 to 16.87 per 1000 individuals (Jenniskens et al., 2021). The use of the “Test and Trace” application, adopted on the Isle of Wight (UK) by 34,000 individuals, is also interesting. People who came in contact with an individual marked as positive based on a self-report were provided with social distancing advice, which led to a reduction in R_0 (basic reproductive rate) from 1.3 to 0.5. Moreover, after 3 weeks of use, the incidence of SARS-CoV-2 diagnoses declined by around 90 (Kendall et al., 2020).

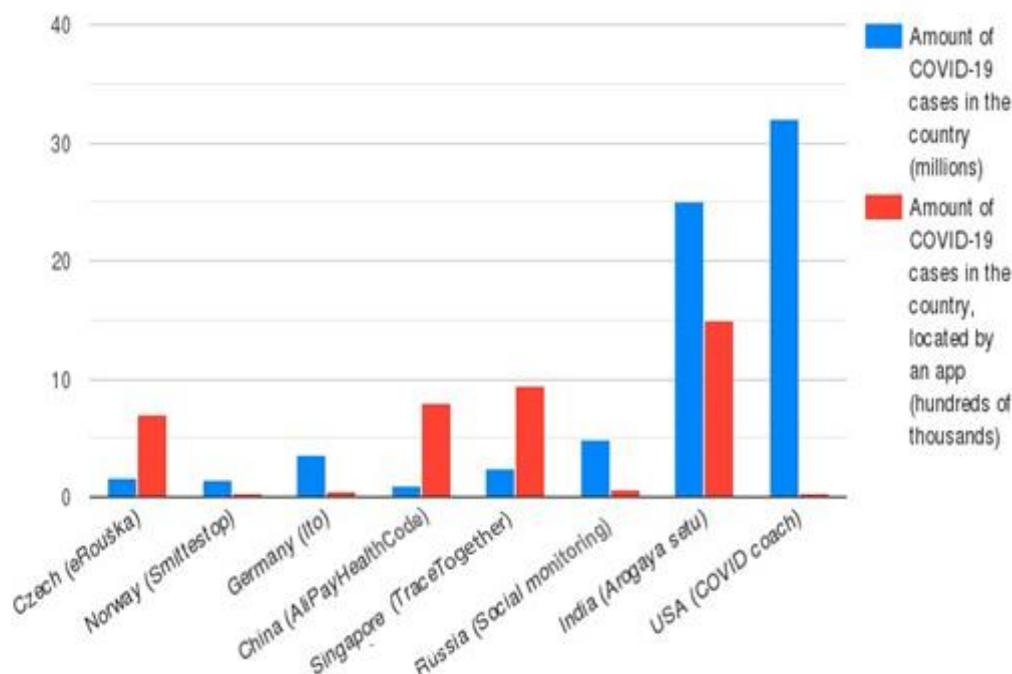


Figure 3. App efficiency

Based on the data illustrated in the diagram above (see Fig. 3), several conclusions can be drawn:

- 1) The most effective in terms of the number of detected cases of infection is the Indian app Arogaya Setu, but if we consider the effectiveness of the app as a percentage of the total number of cases detected by it, then the Indian software product is in 4th place, having only about 6% (the lowest result are the ones of Smittestop – 2%, Social Monitoring and Ito – 1%, and COVID coach – 0.07% (National site of US health care, 2021)). The leader in percentage terms is the Chinese AliPayHealthCode with a result of approximately 80% case detected. ERouška and TraceTogether have 43% and 38% respectively.
- 2) Practice shows that the Chinese methodology of universal mandatory implementation of an app that has access to most of users' information allowed to minimize the number of cases of infection and slow down the spread of the virus at the cost of users' privacy and freedom. At the same time, Singapore's TraceTogether was not mandatory to install and also requested important personal user data (passport data, geolocation), but the result was almost half lower than that of AliPayHealthCode.
- 3) The COVID coach app turned out to be the least effective among those presented. Despite extremely low requirements (the app requested access to geolocation, but



collected data only for past time, i.e. it would be very difficult to track the user due to the use of outdated geo-data, but identifying contact with a potential carrier of the virus would not be difficult.), and the presence of an active data encryption system, the app turned out to be ineffective.

- 4) From points 2 and 3, it can be concluded that the Chinese app was effective because mandatory installation and use allowed to solve the issues of spread, trust, and responsibility of users (every citizen living in one of the areas where the use of AliPayHealthCode was introduced was obliged to use it in order to have the opportunity to access any places of mass gathering). The Singaporean app was probably less effective because it was not mandatory, so some potential users refused to risk their personal data. The COVID Coach app, developed in the USA, can be called ineffective. Probably, the reason for the low efficiency was the distrust of Americans towards the government (research on this topic was mentioned in the article). Therefore, despite the low level of control of the app over the user, general distrust did not allow users to allow any additional intervention in their own lives by the state. The reason for the low efficiency of the Smittestop app is almost identical – the app had several technical problems that endangered users' data, so citizens practically stopped using the app. Below in the diagram, we presented our assessment of the effectiveness of the analyzed apps (see Fig. 4). As you can see on the scheme, the amount of detected cases is not the criterion which, taken alone, allows to judge the efficiency of apps without any supporting information.



Figure 4. Apps rating by the number of COVID cases detected

DISCUSSION

The pandemic has dramatically exposed the issue of the boundaries of private life and the public good, which in the modern world moved from ethically philosophical to the category of relevant practical. In the interaction of technological and management solutions in China, Iandolo et al. see the manifestation of Collective Knowledge in an Unpredictable Environment (Iandolo et al., 2021). Reacting fast and technologically prepared, the authorities prevented a large-scale spread of the virus. On the other hand, for the effective implementation of Bluetooth-based applications, civic consciousness



was required, that is, people had to understand the responsibility for the spread of the virus and voluntarily install the application and responsibly treat its recommendations.

At the same time, we must not forget about the essence and work of technology, and about the idea of it. Modern digital technologies do not allow citizens to independently assess the principles of their work, which makes it possible to mislead or use information for propaganda, political and other purposes. This makes it difficult to form an objective opinion. Moreover, technical problems and shortcomings become part of the political and ideological discourse. The more voluntary the use of an application is, the greater the responsibility and role of citizens in their effectiveness. On the other hand, the efficiency of centralized technologies, responsible for the control of movements, also implies the acceptance by citizens of high-level digital control. Users' relation to application usage varies between countries of Europe (Witteveen & Pedraza, 2021), more so between countries with greater differences of cultural and ideological values. A study conducted in France shows that, with trust in the government, the development of a tracing app contributes to the healthy mental state of the population (Kurtaliqi et al., 2022). In Germany, among respondents who had trust in government decisions, the level of application use is significantly higher (Munzert et al., 2021). In the US, individual characteristics of residents play a greater role in the adoption of the application than the difference between decentralized design vs. centralized design, location use, and the presentation of security risk (Li et al., 2021). Thus, there is no universal fear of data security that could explain a certain technological design. The choice is determined by certain archetypes or myths that dominate in certain countries.

The study of alternative Covid-tracking applications allows us to see the confluence of ideological, philosophical and technical concepts in the modern world. The evaluation of public health applications and other technologies is deeply related to personal and social life and cannot be conducted in isolation from the dynamics of value orientations.

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Appendix 1. List of analyzed applications.

1. ERouška – Czech Republic
2. ProteGOSafe – Poland
3. Smittestop – Norway
4. Social Monitoring – Russia
5. AliPayHealthCode – China
6. COVIDsafe – Australia
7. Ito – Germany
8. Covid Shield – Australia
9. TraceTogether – Singapore
10. AMAN – Israel
11. COVID Alert – Canada
12. NHS COVID-19 – United Kingdom
13. Rakning C-19 – Iceland
14. AarogyaSetu – India
15. StopCovid – France
16. StaySafePH – Philippines
17. MySejahtera – Malaysia
18. Shlonik – Oman
19. CoronApp – Colombia
20. Immuni – Italy
21. TraceCovid – Switzerland
22. Care19 – USA
23. COVID Alert NY – USA
24. NZ COVID Tracer – New Zealand
25. BeAware Bahrain – Bahrain
26. Corona-Warn-App – Germany
27. COVID Tracker Ireland – Ireland
28. StaySafe – New Zealand
29. EHTERAZ – Qatar
30. COVIDWISE – USA
31. COCOA – Japan
32. StopCOVID NI – Northern Ireland
33. StaySafePH – Philippines
34. Ehteraz – Qatar
35. Tawakkalna – Saudi Arabia
36. Selangkah – Malaysia
37. CoronaCheck – Switzerland
38. Kwarantannadomowa PL – Poland
39. PeduliLindungi – Indonesia
40. SwissCovid – Switzerland



41. ImmuneHR – Croatia
42. GISAID EpiCoV app DE – Germany
43. COVID-19 AlertaSIS – Peru
44. MyTrace – Malaysia
45. StopKorona! – Serbia
46. EVA Check-in TW – Taiwan
47. Koronavilkku – Finland
48. KoronaStop LT – Lithuania
49. Co-WIN IN – India
50. BeAware UAE – UAE
51. ArogyaSetu Bridge IN – India
52. Ehteraz Oman – Oman
53. COVA HP IN – India
54. Tarassud+ – Morocco
55. COVA Punjab IN – India
56. BeAware Kuwait – Kuwait
57. Tawakkalna KSA – Saudi Arabia
58. StopCovid BE – Belgium
59. Sehha UAE – UAE
60. BeAware Qatar – Qatar
61. Immuni IT – Italy
62. WeTrace SG – Singapore
63. SafeEntry SG – Singapore
64. HealthHub SG – Singapore
65. CA Notify – California, USA
66. Coronamelder NL – Netherlands
67. COVID Coach – USA
68. COVID Symptom Study US – USA
69. HealthBridge HK – Hong Kong
70. LeaveHomeSafe HK – Hong Kong
71. MySejahtera MY – Malaysia
72. CovidPass CH – Switzerland
73. SwissCovid App CH – Switzerland



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Research article

Russia and Europe: The Culture of Breakages and the Culture of Repairs¹

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Abstract

The article uses the method of technotheological analysis to study the differences between the cultures of Russia and Western Europe. The analysis consists in identifying the techno-religious *Gestalt*, that is, the relationship between the religious background and the things against that background, which is considered as the basis of culture. In order to examine culture in this light, a compact conceptual language can express this unity. Breakages and repairs are such concepts. From a religious perspective, things can break in two ways. There are “this-worldly” breakages which are those that can potentially be repaired: Minor Breakages. And there are “other-worldly” breakages, that is, those that are unrepairable: Major Breakages. Major and Minor Breakages and Repairs form a quadrant of concepts which serve to highlight the specificity of Russian and Western European cultures. Russian culture can be correlated with the culture of breakdowns, the Western European culture is a culture of repairs: They are technotheologically inverse to each other and are in a relation of chiasm. On the one hand, there is a lack of fear of Major Breakage along with the expectation of Major Repairs, with attention to Minor Breakages and no care of Minor Repairs. On the other hand, there is fear of Major Breakages and inattention to Minor Breakages coupled with skill in Minor Repairs and disbelief in the possibility of Major Repairs. This contrast can be exemplified in the thinking of the Russian avant-garde.

Keywords: Russia and Europe; Breakdowns; Repair; Gilbert Simondon; Technotheology

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Научная статья

Россия и Европа: Культура поломок и культура починок²

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Аннотация

В статье используется метод технотеологического анализа для изучения различий в русской и западноевропейской культурах. Анализ заключается в выявлении технорегиозного гештальта, то есть отношения между религиозным фоном и вещами на этом фоне, рассматриваемого как базис культуры. Разработан компактный концептуальный язык, выражающий единство технического и религиозного: это понятия поломок и починок. С учетом религиозной перспективы все может ломаться двумя способами: есть “посюсторонние” поломки, которые потенциально могут быть исправлены, то есть Малые Поломки; и есть “потусторонние” поломки, то есть те, которые невозможно исправить, Большие Поломки. Большие и Малые Поломки и Починки образуют четверицу понятий, которые применяются для выявления специфики русской и западноевропейской культур. Русскую культуру можно соотнести с культурой поломок, западноевропейскую культуру с культурой починок: они технотеологически обратны друг другу и находятся в отношении хиазма. С одной стороны – отсутствие страха перед Большой Поломкой и внимательность к Поломкам Малым наряду с ожиданием Большой Починки и безразличием к Малым Починкам. С другой стороны – страх Больших Поломок и невнимательность к Малым Поломкам в сочетании с искусностью по части Малых Починков и неверием в Большую Починку. Примером этого хиазма может также служить мысль русского авангарда.

Ключевые слова: Россия и Европа; Ремонт; Поломки; Гилберт Симондон; Технотеология

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² Статья представляет собой переработку трех работ автора, опубликованных на русском языке: «Россия: сверхнесовпадение» (Colta.ru, 12.08.2014), «Россия и Европа: поломки и починок» (Colta.ru, 4.07.2017) и «Русский авангард как конфликт культуры поломок и культуры починок» (Траслит, №23, 2020).



THE TECHNOLOGICAL PERSPECTIVE

This text aims to explore Russian culture from a perspective called technotheological. According to this perspective, the foundation of each culture lies in the relationship between the beliefs, either explicit or implicit, and material things. Technotheology examines the religious and the technical in their unity, which is intrinsically structured as a *Gestalt*, i.e. a figure-background relationship: things are always surrounded by some religious background and carve out specific figures on it.

This conception was inspired by Gilbert Simondon's writings where he claims that both, religious and technical thought diverge from a magical unity (as a result of its supersaturation and subsequent phase shift) (Simondon, 1958) and, thus, are isomorphic to each other (Simondon, 2014). Simondon's thesis on the isomorphism of the technical and the religious is reminiscent of the God-Building trend (Anatoli Lunacharsky, Maxim Gorky) and Russian Cosmism (Nikolai Fedorov). What Simondon brought new compared to these ideas is, firstly, the assertion of unity (not to be confused with identity!) of the technical and the religious, and secondly, an indication of the structure of their relationship: this is the structure of Gestalt (as elaborated by German *Gestalt* psychologists).

To think of technics and religion “as one” means to think things theologically and to think theology “materially,” technically. This method differs from both the “material turn” in religious studies³ and the mediology of religion (Debray, 2001), as neither approach achieves the balance between the technical and the religious thought: priority is given to the material, as previously, to the “spiritual.” Technotheology claims to look from the “middle” (from the “metropolis,” against which religion and technics are like “provinces”), sublating the compromised opposition between “archaic” and “modern.” It also differs from Simondon's own philosophy, in which the tension between religion and technics is sublating, mediated by aesthetic and philosophical thought: technotheology posits that we are able to grasp religion and technics in their separateness, or rather, to grasp not them themselves (due to the asymmetry and mutual reversibility of figure and background, this is impossible), but the relationship between them. This relationship is expressed by the *contour* – an active phenomenal line between figure and background.

In order to examine culture in the light of the unity of technics and religion, it is necessary to develop a compact conceptual language, concise concepts that would express this unity; such concepts are *breakages* and *repairs*.

Observing the behavior of things in everyday life, we can see that they frequently break and require our intervention for repairs. Such a view is not a maker's but a user's one, a naïve phenomenological view (as it was revealed in Heidegger's *Being and Time*). Nonetheless, the very making of things also encompasses microcycles of breakages and repairs, and the maker himself can be seen as an ordinary user in situations beyond his expertise.

Taking into account the religious perspective, things can break in two ways. There are “this-worldly” breakages which are those that can potentially be repaired: let's call them *Minor Breakages*. And there are “other-worldly” breakages, that is, those that are

³ See, e.g.: *Material Religion*, edited by B. Meyer; D. Morgan; B. Plate; C. Paine. Berg Publishers.



unrepairable: let's call them *Major Breakages*. Minor Breakages are synonymous with: everyday obstacles and mishaps, annoying bullshit, imperfections of the world, absurdity, accidents, failure, roadblocks... Major Breakages are synonymous with: death, insanity, the end of the world, Satan, existential disorientation, catastrophe, total loss...

If breakages are problems, repairs are solutions, and they can also be divided into two types: Minor and Major, “other-worldly” and “this-worldly.” Synonyms for *Major Repairs* include: miracle, “salvation,” God, “Führer” (charismatic leader), “communism.” “technological singularity,” immortality, resurrection... Synonyms for *Minor Repairs* are: everyday life in resistance to the forces of entropy, “cultivating one's own garden,” labor, technical warranty, public institutions, sustainable development, civilization...

The proposed quadrant of concepts – Minor Breakages, Major Breakages, Minor Repairs, Major Repairs – can grasp the techno-religious *Gestalt*, i.e. the relationship between religious background and technical figures within a particular culture. The techno-religious *Gestalt* is viewed as the basis of culture in the same sense as economics is considered the basis of culture in the Marxist doctrine. The background is always elusive, as we can't focus on it by definition (without turning it into a figure), so it is the primary object of the technotheological analysis.

RELIGIOUS BACKGROUND OF RUSSIAN CULTURE

A technotheological analysis of the religious background of culture can draw on Max Weber's sociological analysis of religion. In the context of Russian culture, an attempt at such an analysis was conducted by David Zilberman (1977) in “Orthodox Ethics and the Matter of Communism.” It can be argued that the religious background of Russian culture is formed by two fundamental influences: 1) Eastern Christianity and 2) pagan cults, specifically the cult of Mother Earth.

1) On a doctrinal level, Eastern Christianity differs from its Western counterpart due to the Greek inclination for apophatic theology over cataphatic, the dogma of the distinction between essence (*ousia*) and energies (*energeies, operationes*) in God, and the dogma of filioque.⁴ The Greek Fathers contend that God's essence is neither knowable nor unknowable, but rather *hyper*-unknowable: though absolutely inaccessible to our knowledge, it is still somehow accessible. What we can deal with are the “energies” or “operations” of God, which are as related to His essence as rays are to the sun (see, e.g., Lossky, 1957). In the West, such a perspective has been deemed heretical, absurd, nearly pagan (as the monotheistic God appeared as two deities). The Thomistic dogma embraced by the Roman Catholic Church asserts that God's essence is unknowable but paradoxically also fully identical to His *energeia* (Latin *actus*).

If God's essence remains unknowable, then so too is the essence of things: for humans, access to things is not barred epistemologically, by our cognitive abilities, as with Kant's thing-in-itself, but rather ontologically. Yet, a bearer of the Eastern Christian religious background can deal with the “operationality,” the “processuality” of things. Speaking of things technical, this could mean that technology in the Christian East is not

⁴ We do not touch here on the cultural differences associated with the filioque; see more about this in Danilevsky 1895/2015 as well as in my work: Kurtov (2014).



so much about the essence of technology itself, but rather the process of technicization, and moreover, the technicization of that which cannot be entirely technicized (since it cannot touch the essence of the things). Technical operations lack a final cause, as they would if they would lead to some essence of things, thus becoming self-sufficient and interesting in themselves. In contrast, largely under the influence of Saint-Simon and Auguste Comte, technical operations in the West coincided with the essence and final cause of technology: this is precisely what gave rise to the positivist idea of technological progress.

The history of the philosophy of technology in the 19th and 20th centuries vividly demonstrates this difference: from Fedorov to Soviet avant-gardists and science fiction writers, technology was conceived in a utopian fashion, as problematizing the non-coincidence between mortality and eternity, between Earth and outer space, between human equality and social inequality – non-coincidences that can be genetically traced to the non-coincidence of divine essence and energies. Contrastingly, in the West, from Saint-Simon and Marx to Heidegger, technology was rather a tool for invoking the coincidence between science and history, present society and its future, humans and things. It also had a utopian character, but its degree of utopianism was inversely proportional to the technical (divine!) perfection. Only with Heidegger was this utopianism removed: perhaps not in the way the West had intended, but its fate ultimately coincided with technology.

It is maybe in breakage that the non-coincidence of the divine essence and energies is best expressed. What is important is not the breakage as such, but the fact that it redirects attention from the thing as an essence (God, State, commodity...) \approx to its operability. Operability is how a thing becomes itself, its internal structure, its life as an individual organism. As soon as the thing begins to coincide with the world, to gain a stable essence within a socio-economic cosmos, interest in it diminishes. This phenomenon intrigued American historian of Russian science Loren Graham, who observed that while Russian technical achievements are undeniable, they are seldom implemented and commercialized (Graham, 2013).

2) The second factor in the formation of the Russian religious background is the “pagan”, polytheistic – the residual presence of the cult of Mother of Earth in everyday life of Russian speakers. This life is unimaginable without profane language – so-called “Russian mat”: philosopher S. Bulgakov (1923) once noted that its role for Russian culture was underestimated even by Dostoevsky. Russian mat, according to linguists, goes back to the Slavic cult of Mati Syra Zemlya [Mother Damp Earth] (Uspensky, 1994). Like many other chthonic belief systems, it incorporates motifs of death and rebirth. The essential difference between Russian profanity and profanity in Western European languages is that the latter is often aimed at Christian figures (blasphemy against the Virgin Mary or Jesus), while the former is exclusively pre-Christian, “pagan”: it ultimately designates the desecration of Mother Earth.

From a technotheological perspective, the task of obscene language is to convey in a compact form mental states related to some “otherworldly” breakages or repairs (*doesn't work! / works well!*). One of the most popular Russian obscene words refers, by its root, to the female reproductive organ, but has an actual meaning of some



“otherworldly” Major Breakage. This supposedly unspeakable word is a kind of apocalypse without eschatology, the end of the world without hope of salvation. Regular exposure to or usage of such language re-enchants the reality of those involved: on the one hand, it helps them to navigate situations of total disarray, on the other hand, it accustoms them to living within the cyclical time of “pagan” cultures (cycles of deaths and rebirths), time without exit. However, the combination of these polytheistic residues with the Orthodox Christian residues produces a more complex and ambiguous cultural picture: there is still an exit from the cyclical time, yet it seems to be located externally, since the linear time of Christianity is associated with the masculine rather than the feminine principle, manifested in the cult of Earth.

CONFIGURATION OF THE RUSSIAN TECHNO-RELIGIOUS *GESTALT*

The religious background of Russian culture, defined in this way, contributes to the following configuration of breakages and repairs:

1) Russian culture is characterized by *a lack of overt fear of Major Breakages*: Major Breakage is already embedded in the Orthodox Christianity as the hyper-unknowability of God (breakage of logic); Major Breakage is already present in everyday Russian language – by way of the curse-word’s obscenity (breakage of language). We can find traces of these “mythical” residues in such different but influential works as the novel “Generation II” (1999) (where II stands for the obscene expression) by the contemporary Russian writer Victor Pelevin, or the treatise “Cosmology of the Spirit” (1956) by the Soviet Marxist Evald Ilyenkov, in which the author calls for a worldwide “fire” – the destruction of the universe for the sake of its rebirth. All Russian history of the last centuries can be seen as a movement from one Great Breakage to another.

2) Russian culture is characterized by *the expectation of Major Repair* – hoping for an instant miraculous correction of everything without any work. In the Orthodox Christianity, a Major Repair of individual existence – salvation of the soul – is not conditioned by either mundane merits (as in Protestantism) or even by divine grace (as in Catholicism): as the Byzantinist Sergey Ivanov (2016) showed (following Victor Zhivov), it is often an outcome of random events or just luck. The Russian history of the last centuries can also be viewed as a series of fantasies about the Major Repair – in the form of the charismatic leader, God, chance, revolution, the conquest of space and other fantastic technical achievements.

3) Russian culture is characterized by *attention to Minor Breakages*. Whenever a Minor Breakage is detected or caused, Russians seem to exclaim with satisfaction: voilà, we said that if it is broken above, it is broken below! The prevailing Western narrative surrounding “Russian hackers” can thus be accounted for by the technothological perspective: the cultural context makes breakage valuable and interesting in itself.

4) Russian culture is characterized by *non-mastery of Minor Repairs*. Minor Repairs are simultaneously very comprehensible and totally incomprehensible to Russians: It is comprehensible because representatives of this culture are constantly engaged in them one way or the other – sociologists called it “the repair society” (Gerasimova & Chuikina, 2004). It is incomprehensible because Russians engage in repairs semi-consciously,



meaning they often do not fully pay attention to them. In Russia, repairs are a strange psychomotoric response to Minor Breakages, something like an itch or a compulsion. Unlike Western Europeans, Russians recognize that Major Breakages cannot be addressed by way of Minor Repairs – climate change cannot be repaired by improving car-emissions – but only with a Major Repair. Such a view is personified, for instance, by the “superfluous man” – a popular character of 19th-century Russian literature and late Soviet cinema.

Now let’s compare this configuration—which can be called a *culture of breakages* – with the configuration of the Western European techno-religious *Gestalt*, which is the basis for the *culture of repairs*.

THE CHIASM OF RUSSIAN AND WESTERN TECHNO-RELIGIOUS GESTALTS

In noumenal reality everything breaks down with approximately the same frequency everywhere, yet the filters of national culture produce different phenomenologies of breakages and repairs. Thus, due to a different religious background, Western European culture rests upon a different techno-religious *Gestalt*, which, as we will show below, stands as an inversion of the Russian one.

1) Western European culture is characterized by the *fear of the Major Breakage*. This can be explained by specific aspects of Roman Catholic and Protestant theology, the doctrine of original sin, the iconography of the Last Judgment and Purgatory, depictions of Satan – all of which are absent in the Orthodox Church. These contributed to the strict disciplining of society, the creation of a tyrannical self-censor. Various methods of protection against the Major Breakage have been developed in the West. In the social realm, the most widespread method of such protection is legalism, or “juridism” – a phenomenon largely criticized by the Slavophiles, notably Aleksey Khomyakov (1839/2008) and Ivan Kireyevsky (1839/1979). In the realm of thought it is rationalism, the Cartesian *cogito* that serves as insurance against madness.

For Descartes, the father of European rationalism, the main existential concern was to understand how to avoid cognitive errors, how to make sure that he wasn’t asleep or insane at any given time. What protects us from such big errors is the guarantee of the existence of an all-good and perfect God, a God who would never deceive. Without this guarantee – adopted by Descartes from the earlier Scholastic tradition – reason is incapable to grasp the surrounding reality. But to ensure the very fact of the existence of the “I” – even if this “I” perceives the world in an absolutely distorted way – one does not need God. It is enough to have the “natural light” of human reason, which, while doubting the surrounding reality, proves its own reality: at least something is working! Descartes’ faith in the ability of reason to maintain an unbroken, automated doubt was later “deconstructed” by another Frenchman, Jacques Derrida: what if madness infiltrated that very doubt? What if we were mad even before we started thinking? Descartes dismissed, “neutralized” this possibility from the outset: I may make some mistakes, he says, or I may even be asleep, but I am definitely not mad. It means that for a rationalist, the reason, or the “thinking I”, is also modeled after the “trouble-proof,” “fail-safe,”



perfect God: as Derrida (1963/2005) noted, “for Descartes, God alone protects me against the madness” (p. 70).

Let us translate this into technical language: European rationalism, based on its theological background, does not allow for the possibility that *ab initio*, from the very beginning everything is broken and not working. Alternatively, it can be said that rationalism rests upon excluding the possibility of a Major, “otherworldly” Breakage, thus rests upon an irrational fear of the Major Breakage. Technotheologically speaking, for a rationalist, everything can be broken in a small way, in details, in “this-worldly” reality, but not at large, in “otherworldly” reality: God cannot be mad, laws of nature cannot be random, and reason cannot be non-functioning. Once we have secured these guarantees, we can confidently proceed to reasonable arrangements of personal and social life, to Minor Repairs.

2) Western European culture is characterized by *skill in Minor Repairs*. In philosophy, this is expressed in the Cartesian “rules of method” – a belief that small orderings can solve any major problem. In social life, this is the ability to build institutions, discipline labor, regulate everyday life... (everything the “lazy” and “anarchic” Russians seem incapable of). The European material or intellectual product can be secondary, superficial, redundant, but it is always “well done,” which is one of the hallmarks of skill in repairs. For Russians, this fact has always been a subject of envy and admiration: no matter how “patriotic” they might be, everyone acknowledges that the best cars are German, and the worst are Russian.

3) Western European culture is characterized by *disbelief or skepticism about Major Repairs*. See, for example, Hölderlin’s *Hyperion*: “It would be very nice if people like me occasionally met someone who would upset them a little, who taught them to wage small wars because we always want only major wars, where heavens and hell fight, or peace that would be like the peace of embrace, full union or full separation, but halfness is precisely what we, sons of man, are here for” (Hölderlin, 2008). For Western Europeans, there is no need for Major Repair, as it seems to them that everything can be done with Minor Repairs. These may appear to be not so Minor, if only one doesn’t have to rely much on the Major Repair! The last Major Repair in Western Europe was the French Revolution, and all subsequent repairs were only “minor” reactions to historical Major Breakages (especially the consequences of World War II).

4) Western European culture is characterized by *inattention to Minor Breakages*. It can be assumed that it is the fear of the Major Breakage that reduces sensitivity to Minor Breakages. However, this does not mean that Western Europeans are unable to deal with them, it’s just that they don’t value them for themselves. Minor Breakages are like a shadow on the divine face, an annoying flaw in the perfect system of the universe. Strangely enough, such an attitude to Minor Breakages allows one to cope with them in a truly efficient way (since they don’t hypnotize, don’t distract). If there is no “otherworldly” breakage, then “this-worldly” breakages have no place in the universe; they should be removed routinely.

As can be noticed, the listed characteristics of Western culture are opposite to the characteristics of Russian culture. In a technotheological perspective, the relationship between Russian and Western European cultures is that of *chiasm*: Western culture vainly



tries to prevent the Major Breakage with Minor Repairs, whereas Russian culture vainly awaits a Major Repair to fix Minor Breakages.

The differences in techno-religious *Gestalts* also give rise to differences in the understanding of freedom in Western European and Russian societies. For Western society, freedom is the “freedom of repairs”: the ability to control state power and re-elect its leaders, influence capitalist companies, ensure a comfortable living standard, etc. For Russian society, freedom is the “freedom of breakages”: the opportunity to escape state structures, experiment with the social order, disassemble copyrighted devices, etc. (The complete denial of the state laws in Kropotkin’s anarchist doctrine can also be traced back to this religious background – to a more anarchic position of the Spirit in the construction of the Trinity without the Western filioque addition.) The Western perception of corruption and “doublethink” phenomena in Russian society as unequivocally negative disregards the difference in anthropological (technotheological) perspectives: what for some are breakages requiring regular repairs, for others are breakages protecting against over-regulating repairs. Indeed, which is more free – a society where everything is permanently being repaired or a society where everything is permanently being broken?

CONFLICT BETWEEN THE CULTURE OF BREAKAGES AND THE CULTURE OF REPAIR

The chiasm of Western European and Russian techno-religious *Gestalts* is only a particular case of a broader conflict between the culture of breakages and the culture of repairs. This clash is manifested not only in Western Europe’s relationship with Russia but also with America. An example is Bernard Stiegler’s (2016) book *In the Disruption: How Not to Go Crazy?*, dedicated to the “disruptive” impact of digital technology on contemporary society and culture. To get out of the state of “madness” in which we all are today due to “disruptive innovations,” Stiegler argues, we must focus not on the “neo-barbarian” American culture of hackers – these are supposedly outdated – but on the “makers’ culture,” which creates new things (here we see all the elements of the techno-religious *Gestalt*: fear of the Major Breakage, disinterest in Minor Breakages, skill in Minor Repairs). In the international context, the culture of repairs is represented today by the so-called ethics of technology, flourishing in universities and government committees.

The conflict between the culture of breakages and the culture of repairs can also be observed within a single national culture. A recent example: one part of American society creates “disruptive” technology that potentially leads to multiple Minor Breakages – the large language model GPT-4 – while another part demands suspending its development to avoid the Major Breakage (the destruction of humanity by AI) and gain some time for Minor Repairs (aligning the AI and adapting people to it).

An older but more studied example of this conflict within national borders is the Russian avant-garde of the 1900–1930s. How can the Russian avant-garde be described in terms of breakages and repairs? It has been a unique situation, which can be described by two processes: *the Major Breakage had been completed, the wait for the Major Repair had been over* [доломали, дождались].



Minor Breakage is the key to Russian avant-garde aesthetics. For an avant-garde artist, a thing always appears somewhat broken, and their task is to either break it a bit more or entirely. First of all, Shklovsky's "estrangement" as the breaking of everyday perception comes to mind ("We come to the definition of poetry as speech that is decelerated, twisted"). This also includes various theories of breakages applied to poetry, such as Kruchyonikh's concept of "shift" [сдвиг] as a universal poetic category: "lexical deformation of the phrase," that is, breaking grammar and syntax. Vasilisk Gnedov's "zloglas" ("evil voice") provides another example: opposition of "consonance of concepts" to "dissonance of concepts," that is, breakage of hearing. The images of breakage were widely used as metaphors: "Poems should be written in such a way that if you throw a poem out the window, the glass will break" (Daniil Charms). Common for the avant-garde is the (meta)theoretical call for breaking things: "...the color stream liberated from reason, in the first stage, annulled the thing as a cause, then began to deform it and finally destroyed it completely" (El Lissitzky's 1922 manifesto "Overcoming Art", the section on the "Destruction of the Thing").

The Russian avant-garde differs from its Western European counterpart in that it has moved from contemplating breakages to the necessity of repairs. This tendency is most evident in Constructivism. The very process of revealing the structure of a thing requires its breakage, disassembly, disjuncture. Yet, in Constructivism, this breakage is immediately followed by the consideration of how the knowledge gained from it can be used to "repair" all modern architecture. We observe the same progression in Malevich: the breakage of things into primary forms must be prolonged by their reassembly, reparation. Perhaps only in Kandinsky's work the breakage of the thing is not accompanied by a turn towards functionality (which might explain why he was more relevant in Western Europe). In its extreme form, this transition – from breakage to repair – was clearly marked by Wolf Gordin (1921), who wrote that "pananarchy", "anarchy of the spirit" (that is, Major Breakage of the Spirit) must be replaced by the "All-Plan", "Bio-Plan" (that is, Major Repair of the Spirit) (pp. 98-100).

For the avant-garde authors, the Major Repair was already close, almost accomplished, allegedly due to the work on Minor Breakages – which, in its turn, triggered the Major Breakage. These two attitudes toward things harmoniously combined, and there was no contradiction between them. However, when the transition from the culture of breakages to the culture of repairs occurred, a talent for Minor Repairs was needed, which Russian culture *de facto* did not find in itself.

This contradiction marks the theoretical heritage of Aleksei Gastev. On the one hand, he called for optimal automation, that is, mastering Minor Repairs. On the other hand, if we compare this call with similar projects in labor psychology or management in the West – such as Ford's or Taylor's – one can notice how ecstatic, exalted it was, as if it could only arise and exist in the conditions of the long-awaited Major Repair. It seems that in the context of Russian culture Minor Repairs can be effectively carried out only in anticipation of the promised Major Repair. And interesting here is that the latter immediately begins to overshadow and suppress the former. If representatives of Russian culture are invited to "turn on the locomotives of history" or become a "mechanic of other's time" (Gastev, 1922/1972), they are unlikely to go to the factory after that; instead,



like the heroes of A. Andrei Platonov’s stories, they will embark on the construction of labor and technical utopias (that is, engage in Major Repair).

And then finally came the Major Repair – Stalinism... Or the Major Breakage? ...It is not difficult to confuse repair with a breakage when it comes to the “otherworldly.”

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Research article

Between Technology and “Humans”: The Idee of an Anthropological Signature in Human- Machine Interactions

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Abstract

The problem of today's technology is no longer just the result of an apocalyptic fear, alienation or Promethean shame, but rather that today technology is ‘humanized’ and therefore adapted to human beings. Mobile devices flatter us. They ensnare our bodies, our minds and our egos. The various attempts to describe technology – for instance, as applied natural science, as a means of preparing resources for economic ends, as a neutral system of means or as an expression of the human spirit – no longer impact our approach to technology. For despite the often depicted doomsday scenarios and an empathic pessimism about technology, concrete technology, in both our working lives and our everyday life, is no longer a problem. My paper will examine this asymmetry more closely from an epistemological and a historical standpoint. It will indulge neither in euphoric nor in dystopic descriptions of humans as cybernetic machines or as the victims of technology, but rather as the yardstick and goal of all technology. I will therefore focus on particular (techno-)anthropological positions (Gilbert Simondon, Arnold Gehlen, Hermann Schmidt). Therefore I want to work out how knowledge of the human (anthropological knowledge) and knowledge of technology (technological knowledge) cross-fertilized, complemented and transformed one another. It thus becomes all the more interesting why this confrontation between “human” and “machine” is still described in the classical anthropological terms that were used by Gehlen and Schmidt. The human-machine interface is very different today but it is still discussed in the familiar categories. This is the success of the anthropological signature. The discourse about modern technology and the anthropological foundation of modernity does not call for post-, trans-, or anti-humanistic images, but rather well-known humanistic-anthropological ones.

Keywords: Anthropology of technology; Human-machine interaction; History and philosophy of technology; Arnold Gehlen; Humanization; Ontology; Adaption

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Научная статья

Между технологиями и “людьми”: Идея антропологической подписи в человеко-машинных взаимодействиях

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Аннотация

Проблема современных технологий – это уже не просто результат апокалиптического страха, отчуждения или прометеевского стыда, а скорее то, что современные технологии “очеловечены” и, следовательно, приспособлены к людям. Мобильные устройства нам льстят. Они заманивают в ловушку наши тела, наши умы и наше эго. Различные попытки описать технологию – например, как прикладное естествознание, как средство подготовки ресурсов для экономических целей, как нейтральную систему средств или как выражение человеческого духа – больше не влияют на наш подход к технике. Ибо, несмотря на часто изображаемые сценарии конца света и эмпатический пессимизм в отношении технологий, конкретные технологии, как в нашей работе, так и в нашей повседневной жизни, больше не являются проблемой. В моей статье эта асимметрия будет рассмотрена более подробно с эпистемологической и исторической точек зрения. Он не будет предаваться ни эйфорическим, ни антиутопическим описаниям людей как кибернетических машин или жертв технологий, а скорее как эталону и цели всех технологий. Поэтому я сосредоточусь на конкретных (техно)антропологических позициях (Гилберта Симондона, Арнольда Гелена, Германа Шмидта). Поэтому я хочу выяснить, как знание о человеке (антропологическое знание) и знание о технике (технологическое знание) взаимно оплодотворяются, дополняются и трансформируются друг в друга. Таким образом, становится тем интереснее, почему это противостояние “человека” и “машины” до сих пор описывается в классических антропологических терминах, которыми пользовались Гелен и Шмидт. Человеко-машинный интерфейс сегодня совсем другой, но он по-прежнему обсуждается в знакомых категориях. Это успех антропологической подписи. Дискурс о современных технологиях и антропологических основаниях современности требует не пост-, транс- или антигуманистических образов, а общеизвестных гуманистически-антропологических.

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INTRODUCTION. CONCEPTUALIZING THE EXCEPTIONAL POSITION OF THE “HUMAN”

Be obedient / Broom, be hiding / And subsiding!

-Goethe, *The Sorcerer's Apprentice*

Most of the history of Western reflections on technology describe it as a superior and uncontrollable force. This idea can be found at the threshold of the 19th century in Johann Wolfgang Goethe's “The Sorcerer's Apprentice,” in Marxist accounts of industrialisation and capitalisation, in Karel Čapek's play „RUR – Rossumovi Univerzální Roboti“ from the 1920s (in which the term “robot” was first used) right up to the atom bomb (1945), space travel (the 1960s) and genetic engineering (the 1980s). Accounts of technology as an uncontrollable “demon”, as a problem of the dialectic of the enlightenment, or as a symptom of “Promethean shame” are often pessimistic (McNeil, 1990; Landes 1969; Hauskeller 2014; Dijk 2000). The German philosopher of technology, Günther Anders came up with the following pointed formulation. “Technology has now become the subject of history, with which we are only 'co-historical’” (Anders, 1956/1980b, p. 108). For Anders – and in view of the grave changes brought about by nuclear power in the 1950s we can only agree with him – technology is no longer a means but a “preliminary decision” (Anders, 1956/1980a, p. 2). Technology has become a force that shapes human beings rather than the inverse (Malafouris, 2013; Chakrabarty, 2019). But besides these critical assessments of technology that saw the western “human being”¹ as the victim of an unstoppable automatization, there were other voices in the philosophical discourse that understood technology, following the tradition of Ernst Kapp, Ernst Cassirer or Marshall McLuhan, as human culture and thus as human objectivity (Kapp, 2018; Hoel & Folkvord, 2012; McLuhan, 1964). If we understand human culture, with Hegel, as „Objective Spirit“, then technology always starts from and returns to the human (Clark & Chalmers, 1998; Clark, 2003; Boldyrev & Herrmann-Pillath, 2013).

This means the dystopian idea of a radical separation between the human and technology loses its hold for two reasons. On the one hand, technology cannot be “inhuman” or “anti-humanistic” because it is always connected to some kind of an “anthropology” (which means a study and an idea of “human being”).² On the other hand, it shows the perspective how technology can be reintegrated into the human realm and

¹ This assumption is problematic, as historical, sociological and philosophical research has repeatedly pointed out (Oldenziel, 1999). Unfortunately, however, this assumption is still efficient and in use. The present study is therefore more concerned with the influence and concrete relevance of an anthropophilic model. The research paper is funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – Project number 492533313. My research is about the co-construction of learning and technology. I focus here on the transformation of the subject of learning in historical and philosophical ways.

² I use „anthropological“ in this paper throughout as short-hand for considerations of “philosophical anthropology. See for this notion of historical and philosophical anthropology Tanner, 2020; Plessner, 2019. I thank the reviewers for their very productive comments and corrections.



thus controlled. In the anthropocentric view, the difference between technologies and other physical objects, or in other words, the metaphysical status of technologies, is reducible to the human mind (designers, policy makers, users, etc.). Accordingly, researchers such as John Searle (2007) and Amie Thomasson (2007) understand technologies in terms of the intentions of designers and users. The human “master” brings his technological “servant” back under control (Krajewski, 2018) or, as Goethe poetically expresses it. “Be obedient / Broom, be hiding / And subsiding! / None should ever / But the master, when expedient, / Call you as a ghostly lever!” (Goethe, 1798/1999, p. 276-279). In this narrative, where technology is integrated into culture, the human being not only has good prospects but, more significantly still, has the ability to act in the face of an apparently overwhelming technology. In 1947, the French philosopher of science, George Canguilhem, pointed out that it is “the rationalization of techniques that makes us forget the irrational origin of machines. The machine is a cultural fact” (Canguilhem, 1992; Fiant, 2018; Schmidgen, 2014). Canguilhem's student, George Simondon, took up this idea, but went beyond it. In his book “On the Mode of Existence of Technical Objects” (Simondon, 1958/2017), Simondon advocated understanding technology rather than seeing it in terms of Marxist alienation. When examining technical artifacts, the human operator should try to understand technology as a cultural fact (De Vries, 2008; Hui, 2016). Simondon did not outline a classical, that is, anthropocentric, philosophical anthropology, but instead devotes his efforts to the problem of different biological and technical forms of existence. The human being, while classified as part of the realm of the living, has no priority over other forms of existence (animals, machines) (see for this Quasi-Other as a Subject Ullmann, 2022). But even though Simondon is not solely concerned with investigating the human, he does distinguish between life and technology. This brings the hermeneutic notion of “understanding” into play (Binzberger, 2009; Coeckelbergh, 2014). Technical objects cannot themselves understand and interpret the information they produce (Floridi, 2019; Romele et al, 2020). Humans understand meaning, machines do not. Humans discover meanings. Meaning is the sense that an event acquires in relation to existing forms; meaning is what causes an event to have informational value.

The living and the technological thus have different modes of existence. Un light of the distinction between “understanding” and “explaining” indicates technology as a cultural fact belongs to the sphere of the humanities. But since only humans understand meaning and machines do not, the human being is more than a machine – and thus the concept of understanding allows us to rethink and reintegrate machine in human-relations. Thus Simondon contends that the complex 'human-machine' relationship has to be rethought and technology has to be integrated into human history and society. According to Simondon, people are too all too readily angered by the activity of machines, because they believe that the machine is playing the role of humans. It's the classic fear that machines will replace us humans. But since humans misconceive themselves and their situation when they take themselves to be just technological subjects and “bearer of tools” (Simondon, 1958/2017, p. XVI), Simondon instead argues for a “change of roles”, for redefining human beings as machine operators (p. 81). This idea of the human being as an operator and a mediator of the machines is thus based on a completely different



conception of the “human.” The latter is no longer, as Günther Anders (1956/1980a) puts it, a victim or a “garden gnome in his own machine park” (p. 25), but now has the possibility of acting and interacting. In 1958, during the heyday of a cybernetics that analogized the human and the machine (Liggieri & Tamborini, 2022; Pickering, 2010; Rid 2017), Simondon wrote clearly and unambiguously against the technocentric and excessive equation of humans and machines. “man [sic] has for so long played the role of the technical individual that the machine, once it has become a technical individual, still appears like a man occupying the place of another man, when it is, on the contrary, man who in fact provisionally replaced the machine before truly technical individuals could emerge. In all judgments made about the machine, there is an implicit humanization of the machine whose deepest source lies in this change of role; man had learned to be a technical being to the point of believing that the technical being, once it becomes a concrete being, begins illegitimately to usurp the role of man.” (Simondon, 1958/2017, p. 81). The negative “a-synchronicity” of humans in relation to machines which Anders explained in terms of a Promethean shame, becomes a positive asymmetry in Simondon’s philosophy. The implied position of the human is no longer seen as disadvantageous with respect to faster, more powerful and more intelligent machines, but as itself advantageous. The argument here is that the human being, as a psychophysical being (and as an inventor of technology) that cannot be fully quantified, is *more* than the machine.

A (TECHNO-)ANTHROPOLOGICAL INVESTIGATION FROM AN EPISTEMOLOGICAL AND HISTORICAL POINT OF VIEW

My paper will examine this asymmetry more closely from an epistemological and historical point of view. It will indulge neither in euphoric nor in dystopic descriptions of humans as cybernetic machines (Coeckelbergh 2022) or as the victims of technology (Heidegger 1977; Wendland et al. 2018), but rather as the yardstick and goal of all technology. I will therefore focus on particular (techno-)anthropological positions (Heßler, 2018), showing how knowledge of the human (anthropological knowledge) and knowledge of technology (technological knowledge) cross-fertilize, complement and transform one other. It is for this reason that theory and practice, idea and concretion, philosophy and engineering cannot be separated from one other. The present study of anthropological reflections in mid-20th-century discourse will examine the questions of how the protagonists in philosophy and technological science were in dialogue with anthropology in seeking a solution to the problems found in an anxiety-ridden approach to technology. This solution was brought forward both in the philosophical and practical domains.

The underlying problem is that of how human-machine relations and thus also subject-object problems were historically described and constructed. Different antagonisms (master-servant, power-powerlessness, freedom-compulsion, etc.) fed into a discourse that suggested both uneasiness and fear of technology. From the 1950s onwards, it was engineers, physiologists, psychologists and philosophers in particular who presented this unease as an imbalance. The self-image of the human was seen as



being in jeopardy, which gave rise to competitiveness, a sense of being threatened and fear in the face of technology.

Yet research hitherto has not examined how philosophical anthropology makes reference to the networks, ideas and dialogues in the technical sciences. This is surprising since German anthropology, in particular, understood itself as being fundamentally empirical (Gehlen, Plessner) and in dialogue with the empirical sciences (Gruevska 2022). And although anthropological thinkers like Arnold Gehlen investigated technology, the central importance of anthropological knowledge for engineering and its conceptions of human-machine interactions in the mid-20th century has not been extensively researched. And while it was precisely the combination of theory and practice that could bring forth an entirely new image of the “human,” philosophical research has for the most part been limited to the study of abstract ideas about technology. Accordingly it is a major research desideratum to investigate how anthropology provided new models for interpreting the human and technology that were then taken up and used in a technological context. Another desideratum is examining how the reflections and conceptual formulations that we find in these philosophical theories were themselves influenced by practical research.

This article will examine this interaction in detail. Therefore I will focus on the philosopher Arnold Gehlen and the control engineer Hermann Schmidt. Both tried to address this perceived imbalance (between humans and technology) in the mid-20th-century by using anthropological models that ascribe a special position to the human.

In the following, I will discuss different theories that are provided with anthropological arguments. These anthropological arguments are divided into those that are more theoretical (Arnold Gehlen) and then those that are more concrete (Hermann Schmidt). Both of these approaches do, of course, interact and intersect with each other. The respective arguments, the images of the human, and the concepts of technology connect with and complement each other. The conclusion will briefly consider the question of how the anthropological signature of the technical sciences has strongly affected modern human-machine interactions. The development of this argument is carried out with the help of previously unpublished archival material.

THEORETICAL AND PRACTICAL APPROACHES

In 1957, the first German nuclear reactor, the Munich reactor in Garching, became operational. In that same year, Arnold Gehlen's bestseller “Die Seele im technischen Zeitalter” (translated as “Man in the Age of Technology”) was published in the famous book series “Rowohlt’s German Encyclopaedia“ (Gehlen, 1980; see further Grigenti, 2016; Schacht, 2015; Fischer, 2009). This encyclopaedia was a canonical and influential work in the emerging Federal Republic of Germany. Gehlen diagnosed Germany as being “uneasy with technology,” an unease fed by the rapid emergence of new technologies (including nuclear power), a feeling of powerlessness in the face of technology, and an existential fear that humans beings were going to be replaced by machines. Gehlen's text represented a dialogue between philosophy and engineering. it was an extension of a series of lectures he had given at the VDI (Association of German Engineers) special



conference entitled “The Transformation of the Human through Technology” (1953) (Gehlen, 1953, pp. 149-153). Not just Gehlen, but also psychologists, physiologists and technicians from the ranks of the VDI felt themselves compelled to react to the *topos* of “technology as a demon” (Floridi, 2016).

As the most influential anthropologist of the 1950s, Gehlen takes as his point of reference the concrete conceptions of technology. He describes them as “the ability and means [...] by which humans make nature serve themselves by recognizing, exploiting and playing off its properties and laws against one another” (Gehlen, 1957/2004, p. 141). Technology thus belongs of necessity to the essence of the human (pp. 7, 141, 147-148, 151-153). In this respect, Gehlen defines the human and technology in essentialist terms, seeing technology as the “big man” who is “witty and tricky, life-promoting and life-destroying like them [humans, K.L.], with the same broken relationship to primeval nature” (pp. 7-8.)

Technology and human are basically both “*nature artificielle*,” artificial nature. According to Gehlen (1957/2004), “witty” and “tricky” technology becomes the “mirror image of the essence of the human” (p. 165). Technology as a cultural fact is a “reflection of the human being” (p. 169). In Gehlen’s anthropology of technology the human and the machine come together. Gehlen thus refers to a concrete technological phenomenon, that of *automatism*. In a shrewd move Gehlen makes automatism – the fear of the 1950s – into a human characteristic. Technology therefore becomes human rather than the human becoming technological. The simultaneous fear and “fascination of the automatism of a machine,” according to Gehlen, are rooted in the “resonance” between the human and the machine (Gehlen, 2004, p. 15). The “fascination of the automatism” exercised by a machine is not an intellectual stimulus, but lies “far deeper” in the “phenomenon of resonance” (p. 15-16). Gehlen uses this concept of the “phenomenon of resonance” to refer to the fact that human beings are also characterized by automatisms (movement, rhythm, etc.) and following this analogy human processes are only transposed onto the machine. Gehlen structurally connects his anthropology with technology through the phenomenon of resonance.

Understood in this way, the machine “objectifies” the inner qualities of the human being. The phenomenon of resonance indicates a self-image of the human through a technical mediator. Thus, only through technology do humans understand themselves, that is, as mediated by the outside. For Gehlen (1953), the human is an “automatism in very central areas of his nature,” in physiological, rhythmic processes (p. 151).

In spite of this circular-relational approach between the human and technology as regards physiological automatism and the phenomenon of resonance, from the perspective of Gehlen's (1965a) anthropology the human remains a “special design of nature,” i.e. “a quite unique, otherwise untried overall design of nature” (p. 15). As distinct from cybernetics and in partial likeness to Simondon’s understanding, the anthropologist Arnold Gehlen recognizes “that [the] technical control loop has the same form of causal relationship as the human action loop and numerous internal bodily regulations” (Gehlen, 1957/2004, p. 22). But he also notes in an anthropocentric manner that “the elements that enter into this form are fundamentally different. Human and



regulation automation are fundamentally different in their *essence*” (Gehlen, 1957/2004, p. 22).

It is in the context of a discussion of the looping-relational cognitive process that takes place between the human and technology (i.e. the phenomenon of resonance) that Gehlen directly refers to the former chairman of the VDI Technical Committee for Control Engineering, the physicist Hermann Schmidt (Bissel 2011; Fasol 2002). Schmidt was not only a defining presence in Gehlen's philosophy of technology, but even more so in the VDI in the 1950s and 1960s. Schmidt had planned public and programmatic VDI conferences (such as the aforementioned special conference “The Transformation of the Human through Technology”) and discussed topics (especially in the VDI group “Humanity and Technology”). Schmidt thus provided a major impetus for anthropological-holistic thinking in the VDI as well as for the then contemporary German anthropological discourse. Schmidt and Gehlen had already been in contact for Schmidt had invited Gehlen to the VDI conference in 1953. Schmidt thus stands at the intersection of philosophy (anthropology) and technology. He is the link between the disciplines. Anthropological and technical knowledge could circulate and be transformed through his networks, conferences and public relation work.

Just as Gehlen was not only interested in philosophical questions, the engineer Schmidt is not only interested in technical questions. He also asks anthropological questions in an era of new and complex human-machine relations. “How do we find our way back to our undivided existence as a physical and spiritual unity in the midst of the technological world? ” (Schmidt, 1954/1965b, pp. 50, 55) Schmidt's emancipatory answer is that we must make “human history” out of technological events (pp. 50, 55). We must transfer the “*ordo naturae* of technological events into the *ordo humanus*” (pp. 50, 55). For Schmidt, overcoming unease and powerlessness in the face of technology can only occur through the human being's circular-relational self-empowerment. The sovereign human being must once again treat technology as a part of itself. Schmidt's view of the human being is decidedly holistic-anthropological. Accordingly, Schmidt (1953a), like Gehlen and Anders, recognizes the fear, the “unease,” and the Promethean shame in the face of technology but sees therein, as he put it in 1953, the historical sign that “humanity has not yet found the right relationship to the technological world.” This is a “fateful problem” to which neither engineers, anthropologists, nor physiologists have contributed any meaningful solutions (Schmidt, 1953a).

On his diagnosis, the prevalent approaches have simply headed in the wrong direction. “In today's anthropology,” Schmidt declares, “technology is severely undervalued, and it is because of the disregard of technology or its only summary treatment that the essence of the human is not clearly seen” (Schmidt, 1956). Schmidt is not, however, concerned with forging a coalition of engineers that positions itself against critical humanities scholars such as Heidegger, Adorno, Horkheimer and Anders. He is instead concerned with the insight that the problem permeates both sides. Modern technology reveals something new about the relationship between the human and nature.

In Schmidt's idea of a relation, the human can only return to itself, others, or nature through a technological detour. Technology becomes a mediator between all three elements. But the human must not become alienated in this mediation and despite of



Schmidt's (cybernetic) terminology of technical control and objectivity (automatism, resonance phenomenon), we would miss the mark if we saw the external (scientific-technical) thinking as simply related to the inside of the human being, since this would degrade the human being to the level of a "thing" (Schmidt, 1953a). The human who occupies a special position is important, Schmidt claims, precisely because "as the self-knowledge of the real" it transcends what is empirically quantifiable in its being (Schmidt, 1966).

The fact that human beings can be in a state of change at all is related with Schmidt's idea of humanity. Schmidt, who had already been preoccupied with biological and anthropology in 1940 when he was active in the Technical Committee for Control Engineering, that is, at the time when Gehlen's „Der Mensch“ (Gehlen, 1987) was first published, refers in a Nietzschean fashion to the fact that the human being is an unfinished animal that has to create an environment for itself "by mechanizing and recognizing" in a "circle" (Schmid, 1964, p. 749). In the demarcation from nature, the human must become its own (cultural) work and thus "perfect" itself. Thus, although the human is biologically determined in its incompleteness as a defective creature, it can emancipate itself creatively through a "historical deed" (Schmidt, 1965a, p. 10-11).

For Schmidt, anthropology thus demands that people become "historical" (ibid.). Despite this emancipation, Schmidt claimed that holistic individuation was no longer possible because of scientific specialization. Humanity itself has become "problematic," because it "no longer [knows] what it is," as Schmidt says in allusion to the anthropologist Max Scheler (Schmidt, 1953/1965b, p. 36; Scheler, 2009). In 1954, Schmidt was pessimistic about the course the "West" had taken during the last half century, seeing it as characterized by the loss of an "internal and external security," whereby humans lost their position in the world in the face of modern technological developments (Schmidt 1954/1965b, p. 48). Schmidt's philosophical and technical idea of a control loop comes into play here. The implicit philosophical principle at work here is also evident in Gehlen's phenomenon of resonance.

The control loop constitutes itself as a "causal ring". as such it represents more than a "causal chain of control" but as a "unifying element" also forms a "whole." It is "the universal structure of technology" as well as the "organisational form of the living body" (Schmidt, 1953b, p. 181). The control loop is thus the objectification of a basic relation. Schmidt sees this as providing the possibility of human self-contemplation through the technical object. For Schmidt, self-contemplation is reflection on the real situation in which one finds oneself (Schmidt, n.d.b, p. 19). Understood in this way, technology and humanity are not in an antagonistic relationship, because it is technology that makes self-knowledge through reflection possible. Only the technical figure of the feedback or control loop makes self-knowledge through reflection possible, because we have adopt a technical stance towards ourselves at the latest since the middle of the 20th century, this is a common denominator of humanity and technology. Knowledge of the object (f. e. human body, human brain) becomes self-knowledge, because self-knowledge is knowledge of an object in its real situation. Technical knowledge is combined with anthropological knowledge.



It has been claimed that there are similarities between this position and Ernst Kapp's organ projection theory. However, Schmidt's model occupies a decidedly different position. His notion of “objectification” contradicts Kapp's “organ projection” which, according to Schmidt, refers to the overall state of technology. As a relation between human beings and the world Schmidt's “objectification of the psycho-physical working circle” does not concern the overall state of technology and therefore is “not organ projection, [for] no organs are projected, but it unfolds the basic relation to nature“ (Schmidt, n.d.a, p. 2). If human existence is thus understood as entering a relation with nature, human existence without mechanization is impossible. Technology is an inseparable part of human existence. Following this central philosophical and practical insight, however, the study of technology needs to take an anthropological turn. The Socratic demand “Know thyself” (*Gnothi seauton*) can therefore only work, according to Schmidt, via the circular relation that involves the technological objects – and it itself technical. constituting a feedback loop.

In summary, the human position is by no means devalued by the technological 'other' in Schmidt's concrete anthropology. Instead, the human remains the most important subject of knowledge in the control loop. Schmidt alludes to Kant in this context. the human cannot be the “absolute beginning” of a free action, but is rather “purpose,” “goal,” and “absolute end” of such an action (Schmidt, 1953/1965b, p. 42).

It becomes clear that Schmidt is an important representative of a kind of control engineering that is grounded in holistic-philosophical discourses. In doing so, it assumes a psychophysical wholeness of life that eludes quantification. Schmidt's anthropological concept of a regulatory objectification did not attempt to “remove the human being from the circular-relational context” (Schmidt, 1964, p. 752), but seeks to integrate it into the cognitive process as a living human being (psychophysical entity). Only in this way the collective singular “human” could encounter the technological world in an active and creative way.

CONCLUSION.

THE SUCCESS OF AN ANTHROPOLOGICAL SIGNATURE

Almost 50 years after the founding of Apple and after the first German nuclear reactor became operational, the question “But what is the 'problem' of technology?” takes on a new urgency (Blumenberg, 1963/1996, p. 10). It is clear that the „problem“ is no longer just the result of an apocalyptic fear, alienation, or Promethean shame, but rather that today technology is „humanized,“ adapted to human beings. Mobile devices flatter us. They ensnare our bodies, our minds, and our egos.

The various attempts to describe technology – for instance, as applied natural science, as a means of preparing resources for economic ends, as a neutral system of means, as an expression of the human spirit – no longer impact our approach to technology. For despite the often depicted doomsday scenarios and an empathic pessimism about technology, concrete technology, in both our working livings and our everyday life, is no longer a problem. By becoming in the second half of the 20th century technology epistemologically and practically „humanized“ and embedded in the human



world, technology returned to the “universe of the self-evident, to the lifeworld” (Blumenberg, 1963/1996, p. 37; also Campe et al., 2000). Hans Blumenberg (1963/1996) observed that “the technical as such becomes invisible when it is implanted in the lifeworld” (p. 37).

Technology has been adapted to a special anthropocentric model of the “human being” and the human environment. In addition to the frequently cited problem of how the technologically possible can have a normative impact on humans, the question of how the human condition has normatively impacted technical implementation has to be considered as well. We must examine modern human-machine concepts (industry 4.0, usability, smart homes, etc.). Therefore, we must examine the background of the arguments of an anthropology of technology and the principles of technical design. We must ask the question anew of how and why human-technology interactions are understood and structured following the model of interpersonal interactions as well as anthropological or holistic ideas.

We are also called upon to closely investigate whether the manifold players in the The Fourth Industrial Revolution (Industry 4.0) or Affective Computing try to shape technology in their concrete imagination according to a 'human measure' so as to make it seem less alien and easier to handle (Gould, 1996). There is no doubt that new machines, technical milieus and digital working environments involve a theoretical and practical modification of the image of “human” and “machine.” A 1920s tram driver or a 1960s pilot worked with very different technical systems than today’s completely networked user. A modern user can no longer understand new technology using older concepts of interaction. Contemporary digital and networked machines rely on a new concept of the machine, one that goes beyond the dichotomy between trivial and non-trivial or between the classical and the post-classical machine (Hörl, 2012). It thus becomes all the more interesting why this confrontation between “human” and “machine” is still described in the classical anthropological terms that were used by Gehlen and Schmidt. The human-machine interface is very different today but it is still discussed in the familiar categories. This is the success of the anthropological signature. The discourse about modern technology and the anthropological foundation of modernity does not call for post-, trans-, or anti-humanistic images, but rather well-known humanistic-anthropological ones.

Anthropological-holistic arguments and anthropophilic („human centered“) interface designs are still successful in our digital world. They are accepted and they generate efficiency in human-machine interactions. Although Michel Foucault rightly says that the sciences should awaken from their “anthropological sleep” and stop “talk[ing] about man, about his reign or his liberation” (Foucault, 2001, p. 342), it is precisely this anthropological slumber that has decisively influenced human-machine design on both the theoretical and practical levels. Anthropology, humanism, and anthropocentrism are economically efficient. An analysis of the theoretical and practical approaches to an anthropology of technology shows that the generation of acceptance involves more than just rhetoric. Rather, our lifeworld is determined by the design of user-friendly interfaces. These interfaces are oriented towards the subjects as living, psychophysical users. It is this anthropological signature of technology that enables us to handle, deal with, and live with technology. The concrete technical-anthropological



reflections that I have present here are all the more important because the “problem of technology,” which is an intuitive part of our life-world, otherwise remains largely concealed by considerations about abstract *pros* and *cons* of technology.

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Between Technology and “Humans”:
The Idee of an Anthropological Signature in Human-Machine Interactions
Между технологиями и “людьми”:
Идея антропологической подписи в человеко-машинных взаимодействиях



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Research article

On the Use of Linguistic Concepts in Design

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Abstract

It is conventional to talk about contemporary design norms and practices in linguistic terms, such as in the cases of ‘design language’, ‘pattern language’, and so on. However, the extent to which design is like language is not obvious. Given that observation, my intentions in this paper are to perform an exploratory analysis of the limits of talking about design in terms of its linguistic features. This paper is divided into four parts. The first offers a brief picture of what I take to be the necessary conditions that must be met for something to be properly considered a natural language. In the second part I examine the ways in which design is like language in that design possesses both semanticity and grammaticality. The third part addresses the fundamental question at the heart of this paper: is design literally a natural language, in the sense of satisfying all relevant conditions? To this, I respond in the negative, arguing that design cannot be properly considered a language. Because designed objects are functional, they are necessarily absent the arbitrariness that is integral to natural language. Finally, and given that design is not literally a language, I conclude with a brief discussion of the status of linguistic concepts in design as a productive metaphor.

Keywords: Language; Design; Grammaticality; Semiotics; Functions; Arbitrariness

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Научная статья

Об использовании лингвистических концепций в дизайне

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Аннотация

Принято говорить о современных нормах и практиках дизайна в лингвистических терминах, например, как в случаях “язык дизайна”, “язык паттернов” и т. д. Однако степень сходства дизайна с языком неочевидна. Учитывая это наблюдение, в данной работе я намерен провести исследовательский анализ ограничений, связанных с обсуждением дизайна в терминах его лингвистических особенностей. Статья разделена на четыре части. Первая предлагает краткую картину того, что я считаю необходимыми условиями, которые должны быть соблюдены, чтобы что-то могло рассматриваться как естественный язык. Во второй части я исследую, чем дизайн похож на язык в том смысле, что дизайн обладает как семантической, так и грамматичностью. В третьей части рассматривается фундаментальный вопрос, лежащий в основе этой статьи: является ли дизайн в буквальном смысле естественным языком в том смысле, что он удовлетворяет всем соответствующим условиям? На это я отвечаю отрицательно, утверждая, что дизайн нельзя считать языком. Поскольку спроектированные объекты функциональны, в них обязательно отсутствует произвольность, присущая естественному языку. Наконец, учитывая, что дизайн не является языком в буквальном смысле, в заключение я кратко обсуждаю статус лингвистических понятий в дизайне как продуктивной метафоры.

Ключевые слова: Язык; Дизайн; Грамматичность; Семиотика; Функции; Произвольность

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INTRODUCTION

It is conventional to talk about contemporary design norms and practices in linguistic terms, such as in the cases of ‘design language’, ‘pattern language’, and so on. A UX designer, for example, might invoke a ‘design language’ to talk about the standards and norms that help guide the development of a new feature in a mobile phone application. The design language, in this case, works to help guarantee that users of the app can infer how to make use of the new feature considering some set of previously established aesthetic or procedural standards. So too might an urban designer talk about ‘pattern language’ to highlight the ways in which an urban system’s subordinate parts, and the relationships between those parts, contribute to the functioning of the system. ‘Pattern language’ is thus used to make clear the ways by which the designed objects within that system conform to some set of rules governing, if imperfectly, the design and use of that system (cf. Alexander et al., 1977).

However, given all this talk about the ‘language’ or ‘languages’ of design, a question arises: to what extent is a ‘design language’, a ‘pattern language’, or whatever else like the kind of thing to which we normally refer when we talk about ‘language’? That is, to what extent is design akin to the natural languages that human beings possess and employ? Are they genuinely linguistic expressions subject to similar levels of grammatical organisation, or are ‘design language’, ‘pattern language’, and similar expressions metaphors about design that hinge upon some fruitful similarity between natural languages and the language-like but non-linguistic features of design?

This is not immediately obvious. It is also not something—at least as far as I can tell—that is really addressed in the design literature: the limits of the usefulness and legitimacy of talking about design in terms of its linguistic features is rarely questioned. This should give us pause. After all, simply because design bears certain similarities to language does not mean that we should just talk about design in terms of its linguistic features—at least, not without good reason. Considering this observation, my intention in this paper is to perform an exploratory analysis of the limits of talking about design in terms of its linguistic features.

This paper is divided into four parts. The first offers a brief picture of what I take to be the necessary conditions that must be met for something to be properly considered a natural language. In the second part I examine the ways in which design is like language in terms of possessing both semanticity and grammaticality. The third part addresses the fundamental question at the heart of this paper: is design literally a natural language, in the sense of satisfying all relevant conditions? To this, I respond in the negative, arguing that design cannot be properly considered a language. Because designed objects are functional, they are necessarily absent the arbitrariness that is integral to natural language. Finally, and given that design is not literally a language, I conclude with a brief discussion of the status of linguistic concepts in design as a productive metaphor.



LANGUAGE

When philosophers and linguists talk about ‘natural language’, we’re not simply talking about the fact that linguistic signs possess ‘semanticity’: that is, the fact that linguistic signs are tied to certain semantic meanings. After all, semanticity presents quite a low bar. There are lots of semantically rich forms of communication—dogs barking to indicate a threat; politely clapping at a game of golf; throwing a punch in a nightclub—that are nonetheless obviously non-linguistic. We need more precise standards of demarcating natural language from non-language.

The linguist Charles F. Hockett (1958) presents a conventional example of such a standard. In his influential textbook *A Course in Modern Linguistics*, he describes the seven ‘key properties’ that he takes all natural languages to share (pp. 574–580).¹ These are as follows:

1. By ‘duality’, Hockett highlights that linguistic strings are composed of meaningful lexical and morphemic units, which can then be further reduced to meaningless phonetic units.
2. ‘Productivity’ entails that human beings can generate novel utterances with these meaningful lexical and morphemic units, subject to the rules and conventions of the language being spoken.
3. ‘Arbitrariness’ means that there is nothing that guarantees that linguistic signs be like the things they represent. Although linguistic expressions may in some cases be onomatopoeic or be otherwise iconic, there is nothing that *demand*s that linguistic expressions be iconic. Instead, semanticity is merely a matter of convention.
4. ‘Inter-changeability’ points towards the fact that human beings are not bound with respect to the signals that we can send or receive. All speakers of a language can both understand and articulate any given message that is expressible within that language.
5. ‘Specialisation’ entails that the primary function of language is for communication. This is distinct from an utterance or behaviour that communicates without necessarily having a communicative function. Shivering, for instance, communicates that the person shivering is cold even though the function of shivering is to preserve bodily homeostasis.
6. ‘Displacement’ means that, by ordering the parts of language in the right way, we can use language to refer to and discuss things that are not physically present and/or do not exist.

¹ It’s worth noting that these seven key properties are only Hockett’s first pass at furnishing the necessary criteria for language. Moving into the 1960s he would significantly expand this taxonomy, ending up with no fewer than 16 ‘design features’ (the updated version of ‘key properties’) that linguistic systems needed to possess to be considered languages proper (Hockett, 1963). However, considering my relatively modest intentions with this paper, I will not be dealing with the full suite of Hockett’s design features here. However, I *would* like to use this opportunity to make clear that my choice to use ‘key properties’ rather than the later ‘design features’ is intentional. I am deeply unconvinced that natural language undergoes anything like what we might consider a purposive design process, and I have no desire to muddy the waters further by potentially implying that it does by referring to the ‘design features’ of language.



7. Finally, ‘cultural transmission’ means that language is learned in a social setting, as opposed to being something which we possess by instinct or genetic endowment.

With these seven criteria in hand, we can acquire a more precise picture of language: that is, as a specific kind of unplanned but broadly conventional linguistic practices that emerges and develops iteratively, through use, by communities of speakers. Although Hockett’s taxonomy has suffered some criticisms in recent years for sitting poorly with contemporary scholarship in evolutionary linguistics and other domains (for a representative example, see Wacewicz and Żywiczyński, 2015), it nonetheless constitutes the customary, if somewhat contentious, benchmark for discriminating between fully realised human languages and other communication systems. It is also useful because it establishes just how high the standard is for something to be properly considered a natural language.

For instance, per Hockett’s criteria, the barking of a dog cannot constitute an example of a language. While barking possesses semanticity in that it denotes the presence of something the dog takes to be a threat, and—as a corollary—serves as both a warning to the perceived threat and as an alert to any friendly creatures nearby, we would be hard pressed to claim that it has a feature like Hockett’s ‘displacement’. This is because the barking of dogs is not bound by grammatical structures. Without these structures—without features like tenses, or grammatical subjects and objects, or whatever else—a dog cannot refer to threats that are not physically present. They cannot report upon or tell stories about prior, future, or imagined threats; they can only communicate on the threats that they take to be present in the here-and-now.²

Hockett’s criteria also make clear that other more complicated forms of expression and communication can also fail to meet the criteria to be natural language. Art, for example, is often said to be a language. The reasons for this intuition are clear. Artworks certainly meet several key features as outlined by Hockett: the relationship between signs and their referents can be arbitrary; artistic tropes and history are learnable; they can refer to unreal things; and so on. This is, in part, why it is conventional to take artworks as position-assuming artefacts; we treat them as artefacts with things to say. Nonetheless—and as philosophers like Mary Mothershill (1965), Joseph Margolis (1974), and others have argued—artworks are insufficiently conventional to be properly linguistic. Per Margolis (1974):

[...] works of art are not simply novel expressions of some sort *in a language*; they institute new conventions that are not readily collected as admissible expressions formed from a relatively stable vocabulary and finite grammar. It is one of the firmest contributions of the new linguistics that a so-called natural language [...] must have a finite grammar capable of “generating” (in effect, describing or accounting for the grammatical structure of) an infinite set of eligible or well-formed sentences. Nothing remotely like a finite and common grammar

² Although his motivations are obviously different, cf. Wittgenstein’s (1953) comment in *Philosophical Investigations*: “A dog believes his master is at the door. But can he also believe his master will come the day after tomorrow?” (p. 174).



has ever been plausibly formulated for the various arts—certainly not for the whole of the fine arts, or for any of the arts distinguished by medium, period, school, style, artists, or in any other comparable way. The best that we have been able to do in this regard is to specify the relatively *common properties* of any constellation of works of art that have been thought worth discussing together. (p. 178)

So, while it might be possible to identify a kind of grammaticality or orderliness within artistic signs, this grammaticality stops well short of being an actual grammar. For instance, artworks exhibit neither Hockett's 'duality' nor 'productivity'. Artworks are not constituted by a shared corpus of meaningless atomic units; there are no identifiable 'art phonemes' of which artworks are composed. Duality is thus a non-starter. Furthermore, even if there did exist such entities, the rules and conventions that govern the creation of art objects with these entities have insufficient normative traction to meet Hockett's productivity criterion. The relationships between the constituent parts of an artwork and the whole, and the relationships between artworks, are simply too loose-jointed and lissome for the claim to obtain. This means that, even if artworks were to meet all Hockett's other criteria, art is prevented from meeting the criteria to be considered an expression of natural language.

DESIGN

So, what about design? To begin, it is worth acknowledging that, as in the case of art, it is easy to see why designers talk about design norms and practices in linguistic terms. There are two reasons for this ease. First, designed objects certainly *look* as if they meet some minimal threshold of semanticity. The individual things that constitute a given design system have functions in a way that seems (at least superficially) like the ways that words mean things. Because a) designed objects have certain aesthetic features and technical functions and not others, and b) those features and functions are the consequence of the intentions of some agent or agents, design processes and outputs can readily be situated within the broader context of human meaning-making.

Second, designed objects also possess grammaticality—even more so, arguably, than artistic signs. This is because most designed things only make sense when appropriately embedded and ordered within a broader network of other designed things. Using my laptop computer to write this paper, for instance, requires not only that my computer be in basic working order, but also rests upon a vast concatenation of physical and intellectual infrastructure: a dizzying array of energy and communications networks, universities and research institutes, funding instruments, education and research policies, and so on. For my machine to work in the manner that I need, there also needs to exist a dynamic ecosystem of complementary parts, all working together in the right way. This complementarity is why contemporary designers so readily appeal to linguistic terminology – 'design language', 'pattern language', 'design grammar', and so on – when they talk about design. They are identifying some overarching system that organises and makes coherent the functions, relationships, and qualities of the entities within that system. They are highlighting these things and their respective functions are ordered in some orderly, 'grammatical' way.



Strangely, and despite how apparently useful linguistic concepts are when applied to design, the textual corpus suggests that this is a relatively recent development. Indeed, as far as I can tell the tendency to use language metaphors to talk about design practices and objects very much began in the middle of the 20th century: a consequence of the general design discourse that emerged during the various Modernist movements of the early 20th century. Using Google n-gram data as a crude proxy for general use, the term ‘design language’ is basically absent from the corpus before and during the 1950s, the odd exception aside (Watkins (1946) is one such example). However, this changed in the early 1960s: the use of ‘design language’ within that corpus increased many hundred-fold between 1961 and 1986. ‘Pattern language’ is even easier to track, with the term having been coined by architect Christopher Alexander in 1968 and popularised in his book *A Pattern Language* (1977). ‘Design grammar’, meanwhile—the least popular of these options—first appeared in the 1950s and became established by the middle of the 1980s.

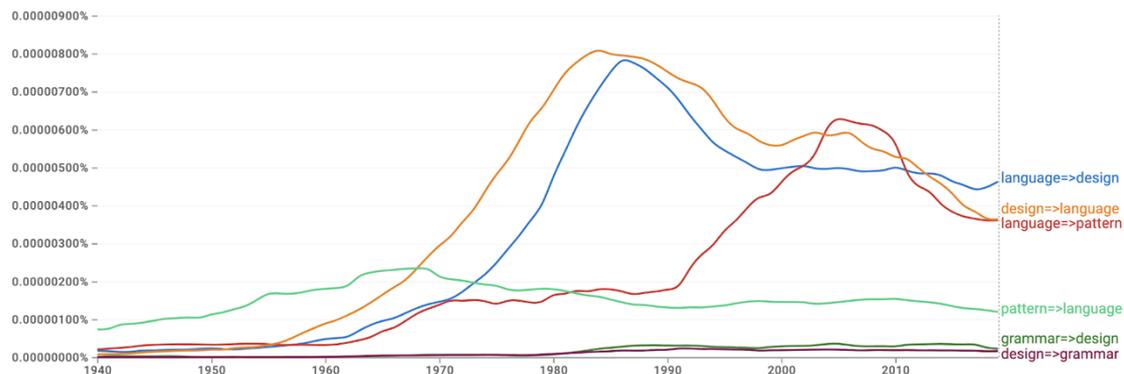


Figure 1. Google Ngram data showing changes in the number of dependency relations between ‘language’ and ‘design’, ‘language’ and ‘pattern’, and ‘design’ and ‘grammar’ between 1940 and 2019. These dependency relations capture constructions like “a design language”, “the language of design”, “language in design”, and so on. The relatively flat value for ‘pattern=>language’ suggests to me that this dependency relation has little to do with the 1977 publication of *A Pattern Language*, and more to do with work in other disciplines, like linguistics, interested in linguistic patterns.

While I have little interest in offering a complete historical account of why language metaphors struck such a chord with designers in the 20th century, it’s probably the case that designers in this period were at least partly influenced by the systems theories of figures such as biologist Ludwig von Bertalanffy (1976) and architect and futurist R. Buckminster Fuller. It is these theorists we have the most to thank for our present understanding of design as taking place within a networked ecosystem of complementary parts, both natural and artificial. To quote Fred Turner (2008) in his monograph *From Counterculture to Cyberculture*: “[Fuller] saw the material world as the reflection of an otherwise intangible system of rules. [...] Fuller linked that system of rules not only to the natural world, but also to the world of industry” (p. 56).

Complementarity, in conjunction with semanticity, is what makes design seem like a linguistic enterprise. It is both meaningful and orderly in a way that languages seem



meaningful and orderly. Consequently, there is probably something *useful* about speaking about design in linguistic terms: it helps to capture some facts of the matter about design that might otherwise escape our notice. To quote a representative sentiment from the design literature:

Design bears certain similarities to language. There is the domain of *semantics* and that of *syntax*. There are syntactic rules (grammars) about how things go together, and there are semantic rules about the interpretation or evaluation of these assemblies. A design must meet the requirements of both the syntax and the semantics of a “design language” (Coyne and Snodgrass, 1995, p. 40).

However—and despite the fruitful similarities between language and design in terms of structure and semanticity—the comparison can only take us so far. Consider again Hockett’s seven key properties of natural language: ‘duality’, ‘productivity’, ‘arbitrariness’, ‘inter-changeability’, ‘specialisation’, ‘displacement’, and ‘cultural transmission’. While it’s undeniably the case that designed objects meet some of these criteria (cultural transmission, productivity, and inter-changeability, for instance), and *potentially* the case that designed objects meet, whether partially or in full, other criteria (I could imagine, though would not necessarily endorse, non-silly arguments in favour of design possessing duality, displacement, and specialisation), designed objects do not meet the arbitrariness criterion: that is, they do not meet the requirement/claim that there is nothing that guarantees that linguistic signs be like the things they represent.

ARBITRARINESS

Hockett was by no means the first person to highlight the fact that language signs are arbitrary. It is certainly a cornerstone of the semiotic theories of the early 20th century, such as in the cases of the ‘semiology’ of Ferdinand de Saussure or the ‘semiotics’ of Charles Sanders Peirce. De Saussure in his *Course in General Linguistics*, for example, argued that the arbitrariness of the linguistic sign was nothing less than the first principle of his semiotics. He writes:

The bond between the signifier and the signified is arbitrary. [...] The idea of “sister” is not linked by any inner relationship to the succession of sounds *s-ō-r* which serves as its signifier in French that it could be represented equally by just any other sequence is proved by differences among languages and by the very existence of different languages: the signified “ox” has as its signifier *b-ō-f* on one side of the border and *o-k-s* (*Ochs*) on the other (de Saussure, 2011, pp. 67–68).

However, he argues, we should not confuse ‘arbitrariness’ for thinking that language then is some linguistic free-for-all, governed only by the whims and fancies of its speakers. Instead, he wants to highlight that there is nothing beyond convention that ties a sign to what it signifies. “The word *arbitrary*”, he claims, “should not imply that the choice of the signifier is left entirely to the speaker [...]; [instead,] I mean that it is unmotivated, i.e. arbitrary in that it actually has no natural connection with the signified”



(Saussure, 2011, pp. 68–69). Or, as he writes later in the book, “Because the sign is arbitrary, it follows no law other than that of tradition, and because it is based on tradition, it is arbitrary” (p. 74).

Peirce’s position on linguistic signs is similar, if more complex. This is because his sign theory is an attempt to furnish a much more general picture of reference, signification, representation, and meaning than the psychological picture of semiotics offered by de Saussure. Peirce was not just interested in linguistic signs, but signs of all kinds: the way that words mean things, yes, but also the systems of reference that underpin the meaningfulness of non-linguistic signs like photographs, animal tracks, and the like. Peirce’s commitments are motivated by the assumption that while language can be and often is a constitutive part of our semiotic systems, there is nothing necessarily linguistic about semiosis. Instead, he argues, semiosis takes place in *all* mental activities – all thoughts – regardless of whether those mental activities (driving a car, assembling a piece of flat-pack furniture, cooking a meal) are linguistic or not. As he puts it, “The only thought, then, which can possibly be cognized is thought in signs. But thought which cannot be cognized does not exist. All thought, therefore, must necessarily be in signs” (Peirce, 1868, p. 111).

Peirce divides the sign into three kinds: ‘icons’, ‘indices’, and ‘symbols.’ Put simply, an ‘icon’ is a sign that derives its significance from looking like the thing that it signifies. For instance, a vector image of a bicycle is an icon of an actual bicycle. An index, meanwhile, is tied to what it signifies by causation rather than appearance. A weathervane is an index for wind direction because it is a causal consequence of the wind blowing one way and not another. Finally, symbols are those signs that have no relationship to what they refer; they are arbitrary. Words, Peirce (1894/1998) thinks, are signs of exactly this sort:

Any ordinary word, as “give,” “bird,” “marriage,” is an example of a symbol. It is *applicable to whatever may be found to realise the idea connected with the word*; it does not, in itself, identify those things. It does not show us a bird, nor enact before our eyes a giving or a marriage, but supposes that we are able to imagine those things, and have associated the word with them (p. 9).³

Designed objects though, are not arbitrary or symbolic like words. The reason why chairs possess certain common features is not a purely arbitrary expression. They do not follow “no law other than tradition”. Instead, when we think about any designed thing, integral to what it *means* is what it *does*. It is at least in part a consequence of its ‘proper function’: that is, the job for which the object was designed (cf. Krampen 1995, p. 522).⁴

Consider a chair. Chairs are objects designed to properly fulfil the function of sitting; they offer people a place to plonk down their bottoms and rest their weary legs.

³ While most semioticians follow in Peirce’s footsteps on the fundamentally symbolic nature of linguistic signs, this is not universally held to be the case. Pharies (1985), for example, argues forcefully against this view.

⁴ ‘Function’ is a contested word in philosophy of technology and engineering, but I take the ‘proper function’ of an object to denote the intended use of that object as fixed by a designer. For a picture of my full position please see Wittingslow (in press).



This is the ‘signified’ bit of a chair sign. But what about the signifier? How does the chair communicate that it is an object for sitting? Were the chair an example of a strictly symbolic or arbitrary sign, a chair could only communicate its appropriateness for sitting by mere association and convention. However, that’s not what happens in this case. Instead, the chair signifies that it is an object with the function of offering a place to sit by making clear that it furnishes a flat surface of an appropriate height and capable of comfortably bearing the appropriate weight. The relationship between the signified and its signifier—between the function of the chair and the way the chair object appears to us—is thus an example of an *index* rather than a symbol. The way the chair appears is a causal consequence of its function as an object upon which to sit.

Of course, not all the features of a given chair are going to be tied up in its function (though several famous Modernists argued that they should be). Features like colour and historical style are likely to be symbolic to greater or lesser degrees; the fact that a chair is Art Nouveau rather than Art Deco, for instance, is primarily a cosmetic difference rather than a functional one. Regardless, of all the features that a given chair might possess, the ones that are integral to ascribing chair-ness are indexical rather than symbolic. Being indexical rather than symbolic, the relationship between signified and signifiers when it comes to design objects is not arbitrary. Being non-arbitrary, design cannot constitute an example of a language.

CONCLUSION

In summary, I think it’s clear that design is not and cannot be a language. Even if design were to fulfil all other criteria (and I’m not at all convinced that it can), it straightforwardly fails the arbitrariness criterion. And yet, there’s also clearly something useful about talking about design in this way. Given that, how should we best think of the use of linguistic concepts in design?

I am of the view that we should not shy away from the use of linguistic concepts in design, albeit with the caveat that they constitute a form of metaphor. A metaphor – “an affair between a predicate with a past and an object that yields while protesting”, in the words of Nelson Goodman (1976, p. 69) – is an example of a necessarily false claim that nonetheless tells us something true about its subject. The power of a metaphorical statement like Shakespeare’s “Juliet is the sun” does not derive from Juliet (the primary subject of the metaphor) literally being like the sun (the secondary subject of the metaphor) but instead works because Juliet is, in most respects, rather *unlike* the sun.

For this metaphor to function, for example, we cannot simply apply all secondary subject predicates to the primary subject willy-nilly. Instead, we need to ascertain those predicates that we could reasonably assign to both the primary and secondary subjects: predicates such as ‘is bright’, ‘is life-giving’, and so on. It is on these grounds that metaphors are meaningful. However, there are also sun predicates that should obviously not be applied to Juliet. Some, such as ‘is the G-type main-sequence star at the heart of our solar system’, or ‘is the site of a massive ongoing fusion reaction’ are clearly inapt.

This phenomenon is generalisable to all metaphors. There are always going to be predicates that, while apt for the secondary subject, are inapt for the primary subject. And



indeed, there *must* exist a mismatch of predicates between the primary and secondary subject: after all, were they all in alignment, the primary and secondary subjects would share an identity relationship rather than a metaphorical relationship. Nonetheless, we take this mismatch to be fruitful because it can highlight certain predicates applicable to the primary subject that might otherwise not be obvious.⁵ This offers one way of thinking about the use of linguistic concepts in design: one that makes clear that, while linguistic concepts are useful in the way that other metaphors are useful, the fact that they are necessarily false means that they are limited in their scope and applicability.

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⁵ This account is, of course, an egregious simplification of the current state-of-the-art when it comes to philosophical scholarship on metaphors. However, given that a precise account of how metaphors function is unnecessary for this paper, I hope that you will forgive my brevity and crudeness.



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