Evolution and Fantasy in the Stalinist Scientific Imaginary

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Abstract

This dissertation argues that official narratives about human evolution contributed to the disappearance of science fiction (*fantastika*) during the Stalinist period and continued to constrain the genre following Stalin's death. I examine how scientific controversies concerning biology, evolution, and materialism informed what kind of science could be depicted and how. Under Stalin, the human of the present day emerged as the singular endpoint of all evolutionary development. Following Stalin's death, this teleological, anthropocentric metanarrative remained an impediment to revitalizing *fantastika*. I trace this development through readings of three authors, Alexander Beliaev, M. Il'in, and Ivan Efremov, whose creative outputs align with critical points in the development of the Stalinist scientific imaginary.

Alexander Beliaev's most famous novels, *Professor Dowell's Head* (1925) and *The Amphibian Man* (1928), depict new technology waging a frightening but exciting assault on old ways of understanding the human. The break between scientific cultures of the 1920s and those of the Stalinist period can be seen in the harsh critical response that met Beliaev's fiction upon its republication in the late 1930s. I focus on how scientific approaches to further "improving" the human form were relegated to the category of baseless fantasy. M. Il'in's popular science books *The Story of the Great Plan* (1930) and *Men and Mountains* (1935), which chronicle the transformation of the natural world by the forces of Soviet industry, offer the clearest example of a literary device that I term "dialectical *skazochnost'*." Using this device, authors narrativized the dialectical transformation of matter using metaphoric language, particularly anthropomorphism

and personification, that was associated with the *skazka*. Non-living nature's metaphoric transformation into human or animal forms enacted a metanarrative about the tendency of all matter to become more "rational" and human-like. Lastly, I look to the writing of Ivan Efremov to chart the reemergence of *fantastika* from under the policy of the "close aim," a term for the unofficial interdiction against any *fantastika* that ventured beyond the immediate future. I draw on archival records of the Science Prose Section, a group within the Writers' Union who met between 1945 and 1951 to discuss science writing, to better understand the policy of the close aim. I argue that Efremov was unable to fully break Stalinist-era creative barriers with his novel *Andromeda Nebula* (1957) because he remained committed to the Stalinist ideal of all evolution converging on contemporary humans.

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Acknowledgements

After watching the 1962 film adaptation of *The Amphibian Man* early on in graduate school, I joked that I should make Beliaev's novel the subject of my dissertation. Several years later, I fear that I have taken the joke too far. The real seed of this project was Kevin Platt's excellent seminar, which provided me with the opportunity to first examine how Ivan Efremov's futuristic utopia was modeled on Alexander Bogdanov's *Red Star*.

I express my deep gratitude to my dissertation committee for their sage advice and continued encouragement. I am particularly grateful to my primary advisor, Justin Weir. In addition to providing valuable academic feedback, he has been a vital source of moral support as I have navigated both the standard tribulations of graduate school and unexpected hurdles, such as the outbreak of a global pandemic followed by Russia's declaration of war against Ukraine during the time that I attempted to conduct research in Moscow. William Mills Todd III, in addition to providing constructive advice as I wrote my dissertation, challenged me to develop a more expansive way of analyzing narratives and thinking about institutions in his thoughtful seminars. I thank Nariman Skakov for his generous suggestions and guidance in navigating research in Russia.

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Introduction

The humor of the Strugatsky brothers' 1965 novel *Monday Begins on a Saturday* derives from the tangled relationship between science and magic. A chance encounter leads Sasha, a cybernetics expert, to the Scientific Research Institute of Sorcery and Wizardry, an organization staffed by mythological characters who study the supernatural. Sasha reflects on how a lifetime of hearing about the "miracles" of Soviet science had not readied him for the genuine miracles, fantastic beings, and wonderous inventions that he witnesses at the Institute. He thinks to himself: "As a rule, science, in which we believe (and often blindly), prepares us long in advance for coming miracles, and we only get a psychological shock when we face the unforeseen, some kind of hole in the fourth dimension, or biological radio communication, or a living planet… or, say, a hut on chicken legs."[1] Sasha speaks about official science as if it was a religious creed. The Strugatskys ironize the bloated rhetoric that hailed every accomplishment of State science as "miraculous" by contrasting it to a genuinely supernatural mode of fantasy.

Those topics Sasha lists as inducing a "psychological shock" encompass several modes of science and fantasy, all of which had been impermissible under Stalin. The "hole in fourth dimension" is a black hole, a phenomenon first predicted by the theory of general relativity, which had been viewed as a threat to the official philosophy of dialectical materialism. The "biological radio" references B. B. Kazhinsky's 1962 book of the same name. Kazhinsky, who originally trained as an electric engineer, expounded a theory of electromagnetic telepathy, which grew popular in the 1920s but disappeared in the 1930s. In 1962, he sparked a renewed interest in telepathy with the publication of his pre-Stalinist research. The "living planet" alludes to Stanislaw Lem's groundbreaking 1961 science fiction novel *Solaris*, a standout title from the

[1] A. Strugat͡skiĭ and B. Strugat͡skiĭ, *Ponedel'nik nachinaetsi͡a v subbotu* (Detskai͡a literatura, 1965), 39.

post-Stalinist revival of science fiction, in which the Strugatskys likewise participated. The "hut on chicken legs" points to Baba Yaga's home, one of the most recognizable images of Slavic folklore. "Bourgeois" science, the paranormal, science fiction, and myth all violated rules about the sanctioned relationship between miracles, fantasy, and science that had solidified during the Stalinist period. For the Strugatskys' narrator, it is this array of "miraculous" artifacts that retain the luster of the genuinely fantastic in contrast to official science. How did the Stalinist culture of science both draw on and define itself in opposition to the fantastic? This is the central question that I explore in my dissertation.

In surveying the place of the fantastic from the late 1920s through the early Thaw period, I build upon existing scholarship on Soviet science fiction, which has focused primarily on the genre's boom in the 1920s and Thaw revival. The intervening Stalinist period is typically glossed over because under Stalin's rule science fiction was greatly restricted in how it could depict the future. I highlight the particular ideological imperatives and taboos that molded the heterogenous utopian energies and scientisms of the NEP period into a singular practice and image of science under Stalin. A more robust understanding of the Stalinist conception of science allows, in turn, for a better assessment of *fantastika*'s re-emergence.

The primary object of my study is *nauchnaya fantastika*, a Russian-language term that translates literally to "science fantastic" and best corresponds to "science fiction." When possible, I opt for the term *fantastika* rather than "science fiction" to both underscore *fantastika*'s status as an autonomous literary tradition whose practitioners defined it against Western science fiction and to reinforce *fantastika*'s dependency on the concept of the fantastic. Rather than proposing a precise, formal definition of the fantastic, I trace its multiple and ever-changing uses, especially as it was employed in relation to science. I use the term "science writing" to capture

all those texts concerned with promulgating an idea of science, whether it be *fantastika*, popular science, or "science prose," a short-lived genre concocted in the 1930s as an alternative to the former styles. I aim to trace the function of science writing within the "scientific imagination," a term by which I identify the politics of what was considered scientific, how the scientific could be communicated, and for what end science could be practiced. The term "imagination" connotes image-making, and it is this visual aspect of scientific discourse that particularly interests me. The story of *fantastika*'s flourishing in the post-revolutionary period, disappearance under Stalin, and halting reemergence following Stalin's death cannot be told without a consideration of how the politics of science both influenced and were influenced by aesthetic concerns. In the same vein, I make frequent reference to the "image of science."

The Communist Party's monopoly on envisioning the future was a primary impediment to writing *fantastika*. During the NEP period, communist utopia was distant, and *fantastika* was a site for imagining possible Soviet futures. Stalin overturned this temporal paradigm and declared that utopia had already been achieved, so the future could not radically differ from the present.[2] In this stifling atmosphere, *fantastika* nearly disappeared. Following Stalin's death, *fantastika* underwent a renaissance, though authors remained unsure of what elements of the official Soviet narrative were open to reimagining as they once again imagined the future. Was the future a place where things would be different or similar and to what degree?

A secondary theme of my dissertation is the place of the human subject in adjudicating the limits of the fantastic. *Fantastika*, popular science, and the critical conversations that accompanied them asked how or whether humans might develop as society and technology

[2] For more on the utopian character of Stalinism, see Richard Stites, "Stalinism and the Restructuring of Revolutionary Utopianism," in *The Culture of the Stalin Period*, ed. Hans Günther (New York: Palgrave Macmillan, 1990), 78–94; Evgeny Dobrenko, "Socialist Realism and Stasis," in *Utopian Reality* (Brill, 2013), 193–202.

advanced. One observes, concurrent with the Stalinist insistence that socialism had already been established, an ever greater scientific rejection of the possibility that the human form might change. The issue of human evolution had long irked Marxist thinkers, who wished to acknowledge the human as a material being, subject to the same biological laws that govern plants and animals, and as the privileged subject of history, subject to laws of historical development that were not reducible to biology. Under Stalin, this problem was partially resolved by insisting on a clear division between humans and the natural world, then declaring that man was embodiment of rationality towards which all other forces would develop.

Fantastika, once the province of imagining alternative paths of human evolution, was now criticized for trespassing against this anthropocentric teleology. The New Soviet Man, the human embodiment of Soviet values, was defined against the non-human: demihuman "freaks" who populated *fantastika* in the 1920s, the subjugated natural world, and the monstrous extraterrestrial. This process exposes how the aesthetic project of sculpting the New Man's neoclassical form intersected with scientific narratives of human change. To demonstrate this convergence, I devote particular attention to the depiction of biology, evolution, and materialism. The imaginary of science, as it emerged under Stalin, united the human, rational, and beautiful against the non-human, irrational and ugly.

I base my study primarily on close readings of *fantastika* and popular science texts, examining how they responded to a changing imaginary of science. Book reviews, articles debating the place of *fantastika*, and discussions about the production of science writing furnish a sense of how science ought to be depicted. I arrange my three chapters around three authors, each of whom was central to the larger dialogue about the relationship between science and the fantastic in his respective period. Alexander Beliaev's frightening *fantastika* exemplifies a style

prevalent during the NEP period, and the heavy criticism that his fiction encountered upon its republication in the 1930s illuminates the extent to which the scientific imagination had changed after Stalin's rise to power. M. Il'in's stories from the early 1930s about the industrial conquest of nature offer an opportunity for further examining the official image of science during the First Five-Year Plan and the subjugated place of the fantastic within it. Ivan Efremov's *fantastika*, celebrated for inaugurating the genre's post-Stalinist revival, reveals how critics and practitioners of the genre consciously struggled against the ideological prohibitions that had made writing *fantastika* near impossible under Stalin.

While this methodology makes legible the prevailing critical conversations around *fantastika*, it by necessity ignores the many authors, especially in the 1920s, who presented alternative visions of how fantasy and science might fit together. In letting the critical literature of the time guide my reading, this study runs the risk of reinscribing the same retrospective genealogy of Soviet science writing that Party critics assembled. In the most extreme cases, official accounts traced a direct line from 18th-century Russian science popularizers to the triumphs of Soviet science: Lomonosov's odes prefigure the successes of the Soviet space program. I ignore the *fantastika*-adjacent work of Vladimir Mayakovsky, Andrei Platonov, or Alexei Tolstoy, to give examples of authors who received ample critical attention during the 1920s, in favor of the texts which received continuous mention in conversations about *fantastika* in the 1940s and 1950s. Likewise set aside are Sigizmund Krzhizhanovsky and Mikhail Bulgakov, who have since become central figures in considering the science fictive imagination of the 1920s but had difficulty finding official publication at the time of their writing. Consistently visible works, rather than those that defied the official narrative of Soviet science,

provide the most stable points of reference for comprehending *fantastika* as it was understood by contemporary writers, editors, and readers.

Theory

Theoretical accounts of the fantastic, science fiction, and the grotesque provide a critical vocabulary for formally analyzing science writing. Scholarship on the mythopoetics of Socialist Realism, especially Katerina Clark's concept of the spontaneity-consciousness dialectic, and recent work on posthumanism direct my theoretical understanding of how literary and scientific discourses intersected to tell the story of Soviet science and the central place of the human within it.

In examining the narrativization of Soviet science, I draw guidance from Gillian Beer, who, in her monograph *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction,* charts the mutual influence between literary language and Charles Darwin's *Origin of Species*. Above all, I heed her attempt to avoid either reducing fictional narratives to the scientific concepts with which they engage or, conversely, to see the cultural narratives underlying scientific inquiry as overdetermining explanations of a particular scientific belief. Rather, I strive to recognize in Soviet narratives of biological, cultural, and material evolution what Beer sees in Darwin's language and those who responded to it. That is, as Greg Levine puts it in his forward to Beer's study, that "the language in which Darwin's theory is articulated is thick with the culture in which Darwin lived and that fully to understand the 'science,' one must recognize how the language contributed to it, evoked resistances, entailed compliance."[3] Beer observes the inherent fictionality of an epistemic shift: "When it is first advanced, theory is at its most fictive. The awkwardness of fit between the natural world as it is

[3] George Levine, "Forward," in *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction,* 3rd ed. (Cambridge University Press, 2009), xii.

currently perceived and as it is hypothetically imagined holds the theory itself for a time within a provisional scope akin to that of fiction."[4] The historical period under study in this dissertation, especially the early Stalinist period, likewise saw authors, scientists, and philosophers striving to establish the physical rules of their world and to determine how those rules revised understandings of "the natural world as it is currently perceived." Above all, they worked to answer narrative questions: who is a character in this story, what is the source of the character's agency, what signifies narrative progress.

Departing from certain aspects of the literary analysis that I reference, I am less interested in making overarching claims about the mechanics of genre or the formal differences separating one genre from another. Like so many ideologically charged terms in the Soviet period, "the fantastic," "the utopian," and "the real," to name those discussed most frequently in this dissertation, often operated as floating signifiers, used more to signal one's ideological position than to offer positive semantic meaning. This is particularly true of the early Stalinist period, in which a more fixed ideological rhetoric began to emerge and the consequences for failing to "speak Bolshevik" grew more draconian. Thus, I resist defining a true *fantastika* in opposition to a fallen version in the Stalinist period. Such an approach affirms the observation made by Sibelan Forrester and Yvonne Howell that *fantastika* "functions more as a field of intersecting discourses than as a clearly delineated genre," and this characteristic "foregrounds the interdisciplinary connections between the history of Soviet science and technology, political and economic development, and social and literary history."[5]

[4] Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*, 3rd ed. (Cambridge University Press, 2009), 1.
[5] Sibelan Forrester and Yvonne Howell, "From Nauchnaia Fantastika to Post-Soviet Dystopia," *Slavic Review* 72, no. 2 (SUMMER 2013), 219.

Tzvetan Todorov's canonical definition of the fantastic aids thinking about how the device dramatizes a break with an older scientific order. In *The Fantastic: A Structural Approach to a Literary Genre,* Todorov describes the fantastic as that which stands between the uncanny and the marvelous. In an instance of the uncanny, Todorov writes, "the laws of reality remain intact and permit an explanation of the phenomena described." The marvelous, on the other hand, is explicitly supernatural, as it requires that "new laws of nature must be entertained."[6] Todorov thus defines "the fantastic" as the moment of hesitation between belief and disbelief in the supernatural; "the fantastic occupies the duration of this uncertainty."[7]

Todorov's definition assumes a clear understanding of the laws of reality that is shared by both author and reader. In science fiction texts, Todorov writes, "the initial data are supernatural: robots, extraterrestrial beings, the whole interplanetary context. The narrative movement consists in obliging us to see how close these apparently marvelous elements are to us, to what degree they are present in our life."[8] However, his concept of the fantastic can be recast as a moment of epistemic confusion, in which the laws of reality themselves come into question. The function of the fantastic in the early Soviet Union can be understood against this changing stability of scientific law. An initial wave of *fantastika* emerged out of a celebration that the laws of reality governing the pre-revolutionary world had been dashed. The thin boundary between the real and the supernatural signified the radical, still-unformed possibility of the emerging order. Stalinism dictated a singular vision of the future and consolidated scientific law. The fantastic was still referenced, but it now strengthened the distinction between the real and the supernatural by

[6] Tzvetan Todorov, *The Fantastic: A Structural Approach to a Literary Genre*, trans. Richard Howard (The Press of Case Western Reserve University, 1973), 41.
[7] Ibid., 25.
[8] Ibid., 172.

casting the fantastic "moment of hesitation" as the result of not properly understanding the reality of Soviet science in the first place.

Soviet ideologues often boasted that, to a naive observer, the Soviet Union might seem fantastic, and this confusion arose from the observer's attempt to understand Soviet accomplishments according to an outdated conception of the scientific laws underpinning reality. An example demonstrates how this trope functioned: In his 1932 book *Dneiprostroi: The Biggest Dam in the World*, D. Saslavsky brags about the massive dams constructed in accordance with Lenin's GOLERO plan. Saslavsky rebukes H. G. Wells, who had dismissed the GOLERO plan as utopian impossibility after visiting the Soviet Union several years earlier, in 1920. As you walk near the Volkhov hydroelectric plant, Saslavsky writes, "you imagine yourself transplanted to fairyland."[9] Wells could not "vest this Utopia with flesh and bone," because, as a "professional dreamer and fantast" he "refused to give credence to the fiery oratory forecasting our electrified tomorrow."[10] It is reasonable to balk before the scale of these Soviet dams, which surpass conventional wisdom. Wells errs, when, lacking a proper understanding of Soviet technological possibility, he mistakes the uncanny (that which remains within the bounds of the possible) for the marvelous (that which actually *is* impossible).

Darko Suvin provides a foundational definition of science fiction in *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre*. He designates science fiction, a label under which he includes both Western science fiction and Russian *fantastika*, the literature of "cognitive estrangement." In his conceptualization of estrangement, Suvin draws on both Viktor Shklovsky's concept of *ostranenie* and Bertold Brecht's idea of "Verfremdung,"

[9] D. Saslavsky, *Dnieprostroi: The Biggest Dam in the World* (Moscow: International Press, 1932), 9.
[10] Ibid., 16.

alternatively translated as "alienation."[11] Suvin describes "cognitive estrangement" as the process of taking a "fictional ('literary') hypothesis and [developing] it with totalizing ('scientific') rigor […]. The effect of such factual reporting of fictions is one of confronting a set normative system […] with a point of view or look implying a new set of norms […]."[12] "Cognitive" designates the reader's approach to the genre. When reading "cognitive" literature, the reader assumes that the fictional world is the same as our own, apart from whatever novel technology has been introduced. "Cognitive" fictions can be differentiated from those "anti-cognitive" varieties of estrangement, such as myth, fantasy (a category in which Suvin includes ghost, horror, Gothic, and weird stories) and the folktale, all of which disregard the causal laws of the empirical world.[13] Suvin's uses the term "novum" to refer to the fictional hypothesis or novel technology introduced by the author.

Metamorphoses of Science Fiction remains one of the strongest overviews of Russian-language *fantastika*, but Suvin's restrictive approach hinders his study. Suvin uses his framework to differentiate science fiction from adventure literature, popular science, and varieties of fantasy. Spiegel sees Suvin's invocation of *ostranenie* and narrow definition of cognitive estrangement as an appeal to both his fellow academics and those in the science fiction community. A pioneering scholar of the genre, Suvin wished for science fiction to be taken seriously, and part of elevating his project was to delimit "real" science fiction from lower quality, fantastic literature.[14] Whatever Suvin's motivation, an understanding of *fantastika*'s

[11] Suvin's idea of estrangement differs from those of Shklovsky and Brecht. In short, for Shklovsky and Brecht, *ostranenie* and alienation are formal devices used in otherwise realistic texts to "make strange" something that exists in the reader's world. Science fiction, in contrast, naturalizes its "strange" element, which is not realistic. See Simon Spiegel, "Things Made Strange: On the Concept of 'Estrangement' in Science Fiction Theory," *Science Fiction Studies* 35, no. 3 (November 2008): 369–85.
[12] Darko Suvin, *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre* (Yale University Press, 1979), 6.
[13] Ibid., 8.
[14] Spiegel, "Things Made Strange," 374.

evolution during the "fallen" Stalinist period requires the inclusion of works that Suvin denigrates as sub-science-fictional and varieties of fantasy that lie outside the bounds of cognitive estrangement. Stalinist science writing, of which *fantastika* was one variety, self-consciously drew on or slipped into the mode of myth and folk tales. Under Stalin, Soviet critics denied *fantastika* its novum and insisted that it be nothing more than fictional stories about real scientific developments.

Suvin outlines an ideal version of science fiction, raising the question of how and why the genre was prevented from fulfilling these standards in practice. I argue that under Stalin scientific prognostication, whether in *fantastika* or popular science, invited criticism when it strayed into the grotesque, a style in opposition to which much sanctioned science writing was defined. There arose a demand to depict science "positively," in contrast to the "pessimistic" science fiction of the West, which was decried as "disgusting" and "frightening." Objections to the grotesque were not limited to fictional depictions of science. If a scientific theory, especially one concerning human biological development, had grotesque implications, that was taken as a sign of the theory's error. Though Soviet critics rarely used word "grotesque," the term accurately captures a certain kind of revulsion before bodily deformation that was condemned in stories of experimental surgical modification and extraterrestrials alike. Science was enlisted to solidify the human subject, and the grotesque, a touchstone of early *fantastika*, was exiled from the genre.

My examination of the grotesque in science writing draws on Mikhail Bakhtin, who explores how the grotesque body represents a general ontological instability. In *Rabelais and His World,* Bakhtin writes that the grotesque "ignores the impenetrable surface that closes and limits

the body as a separate and completed phenomenon.[15] Such a blurring "leads man out of the confines of the apparent (false) unity, of the indisputable and stable."[16] The vocabulary of bodily rupture and disintegration that Bakhtin uses to describe the function of the grotesque makes clear its fundamental incompatibility with the Stalinist image of the human, who stood atop a clearly defined hierarchy that separated him from lesser forms of animal and non-living matter. To blur that distinction risked threatening the Marxist metanarrative of reason's triumph through the human conquest of the environment. Technology should only strengthen the division between man and nature.

Crucial for understanding the role science and technology played in this larger story of Marxist development is the central opposition between the "elemental" (*stikhiĭnyĭ*) and the "conscious" (*soznatel'nyĭ*), which Katerina Clark identifies as the core dynamic of Socialist Realism. In *The Soviet Novel: History as Ritual*, Clark theorizes the spontaneity-consciousness dialectic as the schema by which the Soviet Socialist Realist novel provides an account of the Marxist-Leninist idea of historical process. In this model, "consciousness" (*soznatel'nost'*) means that which is premeditated, guided by correct thought, and disciplined. The "spontaneous" or "elemental" (*stikhiĭnost'*) is "consciousness's" opposite: that which is sporadic, anarchic, or guided by impersonal or natural forces. The task of Socialist Realism, writes Clark, is to provide object lessons in the working-out of this paradigm.[17] Clark uses this formula primarily to explore character development in the Socialist Realist novel, in which the "spontaneous" anger of the *lumpenproletariat* grows "conscious" through political education.

[15] Mikhail Bakhtin, *Rabelais and His World*, trans. Hellene Iswolsky (MIT Press, 1968), 317-318, 370.
[16] Ibid., 48.
[17] Katerina Clark, *The Soviet Novel: History as Ritual*, 3rd ed. (Bloomington: Indiana University Press, 2000), 16.

Clark's framework also lays out the ideological undergirding of the Stalinist campaign of "conquering nature," which provided the narrative impetus for much science writing beginning with the First Five-Year Plan in 1928.[18] By harvesting natural resources and industrializing the countryside, the "elemental" forces of nature were brought under the yoke of man's rational thought. As the "conscious" was synonymous with *human* thought, popular science became a site for ever more emphatically proclaiming the victory of man over the natural world.

The spontaneity-consciousness dialectic narrativizes the theory of Leninist vanguardism, which informed Soviet attitudes towards nationalism and ethnicity. The Party saw itself directing the disorganized energy of the *lumpenproletariat* and nature alike. If "consciousness" brought the "elemental" closer to the human, then, by extension, those lacking political consciousness appear less human as well. It remains a subject of scholarly debate how Soviet national policies reflected or differed from Western colonialism.[19] The study of how popular science writing made "more human" uneducated men and untamed nature alike abuts the official policy of cultivating "national consciousness" among underdeveloped ethnic minorities. The blurred distinction between virgin nature and "primitive" peoples within *fantastika* stems from the genre's origin in pulp journals alongside adventure stories in which explorers travel to the far ends of the Earth or, at very least, the most exotic reaches of the Soviet Union.[20] The grotesque, the non-human, the "elemental," and the "unenlightened" occupied a common space in the Soviet imaginary. Though

[18] For a more detailed account of the Stalinist rhetoric towards nature, see Douglas Weiner, "The Great Transformation of Nature," in *Models of Nature: Ecology, Conservation, and Cultural Revolution in Soviet Russia* (Bloomington: Indiana University Press, 1988), 164–77.
[19] For an overview of these debates, see Francine Hirsch, *Empire of Nations: Ethnographic Knowledge and the Making of the Soviet Union* (Cornell University Press, 2005); Terry Martin, *The Affirmative Action Empire: Nations and Nationalism in the Soviet Union, 1923-1939* (Cornell University Press, 2001); Slavic Review "Forum: The Multiethnic Soviet Union in Comparative Perspective" [essays by Adeeb Khalid, Adrienne Edgar, Peter Blitstein, Mark Beissinger]. *Slavic Review* 65 (2006): 231-303.
[20] For more on the adventure origins of *fantastika*, see Matthias Schwartz, "How Nauchnaia Fantastika Was Made," *Slavic Review* 72, no. 2 (SUMMER 2013): 224–46.

not the focus of my dissertation, this overlap provides a starting point in asking how science and "the fantastic" related to attitudes towards race and ethnicity.

My discussion of the central place of the human in science writing draws on recent posthumanist scholarship, a field staked on problematizing anthropocentrism, which functioned as the telos of Stalinist progress. Posthumanists interrogate the idea that there exists an essential, rational human subject, easily defined against the non-human. As Colleen McQuillen and Julia Vaingurt point out in their introduction to *The Human Reiminaged: Posthumanism in Russia*, there are challenges to bringing an approach that is "distinctly postmodern and Western" to bear on Russian thought.[21] Yet the angle of interrogation suits the historical moment under examination. The Soviet experiment can be thought of as an Enlightenment project of human perfection *par excellence*, especially the vein of Russian transhumanism and its resonance in the figure of the New Man.

Grouping Soviet philosophers, scientists, and writers interested in human evolution and technology under the heading of "transhumanism" may be anachronistic because they did not think of themselves in these terms. Nevertheless, the label identifies an aspiration towards human alterability and physical betterment that was central to thinking about technological possibilities in the NEP period and became a primary target of criticism in the backlash against *fantastika* in the following decades. Current accounts of transhumanism in Russia tend to stress the continuity between Nikolai Fedorov's thought and certain utopian aspirations of the Soviet project.[22] Fedorov, the father of Russian Cosmism, extolled man as the culmination of evolution and, drawing on his idiosyncratic brand of Russian Orthodoxy, argued that mankind had an obligation

[21] Colleen McQuillen and Julia Vaingurt, "Introduction," in *The Human Reimagined: Posthumanism in Russia* (Boston: Academic Studies Press, 2018), 6.
[22] See, for example, Anya Bernstein "Introduction," in *The Future of Immortality* (Princeton University Press, 2019), 1-34.

to seek immortality through resurrecting the dead and colonizing space. Fedorov's ideas about directed evolution and the messianic aspirations of technology reverberated throughout the early Soviet period more widely in the writing of the varied thinkers central to my study, such as Maxim Gorky, Alexei Bogdanov, Vladimir Vernadsky, Aleksei Gastev and Konstantin Tsiolkovsky. To risk generalization, all showed an excitement at the potential for technology to enable human self-perfection. Though Stalin suppressed self-declared Cosmists, Fedorov's technological triumphalism can be felt in the ideal of the New Man. As Vaingurt and McQuillen observe, "Stalin's plan to restructure life comprehensively is a maximalist expression of the demiurgic spirit that characterized Cosmism."[23] However, as a look at the shifting bounds of the fantastic makes clear, Stalinist scientific politics were deeply concerned with the limit and shape of human transformation, leading to a much more reigned in image of the future than earlier iterations of Russian transhumanist thought. This reduced horizon of transformation persisted into the post-Stalinist period, when writers and critics struggled to reconcile a renewed interest in *fantastika* and transhumanist thought to an imaginary of science hostile to them.

Overview

The three chapters of this dissertation center on individual authors whose creative outputs align with critical points in the development of the Stalinist scientific imaginary and the role of the fantastic within it. Put simply, these chapters ask why *fantastika* disappeared, what came after its disappearance, and how it reemerged following Stalin's death.

Chapter one looks at the work of Alexander Beliaev, the "Soviet Jules Verne" whose writing became synonymous with the kind of *fantastika* that proliferated in the pulp journals of the NEP period, and traces that style's decline as the imaginary of science shifted. Beliaev's

[23] McQuillen and Vaingurt, "Introduction," 30.

fantastika, especially two of his earliest and most enduring stories, *Professor Dowell's Head* (1925) and *The Amphibian Man* (1928), drew upon excitement about revolutionary biological technologies to facilitate human evolution. Enthusiasm for the material transformability of humans aligned with a celebration of science as a tool to combat outdated, religious ideas. Beginning in 1928, the popular imaginary of science retreated from this iconoclastic mode. Science became "useful" and divested of its transgressive, transhumanist charge. In the late 1930s, Beliaev republished his work after making edits in accordance with new ideological dictates. A harsh critical response showed a particular distaste for Beliaev's exploration of surgical themes, demonstrating how technology was no longer permitted to intrude into the body. This episode makes tangible the difference between NEP era and early Stalinist popular science cultures.

Chapter two examines the relationship between science and fantasy in popular science writing of the early Stalinist period. I argue that nature's fantastic personification in science writing about the development of natural resources in the 1930s was an attempt to depict nature's transformability according to the laws of dialectical materialism. This phenomenon, which I term "dialectical *skazochnost'*," arose out of debates about the proper use of the fantastic language of the *skazka*, controversy about how to depict the dialectical movement of matter, and an imperative to show the human domination of the natural world. To demonstrate the genesis and function of dialectical *skazochnost'*, I focus on *The Story of the Great Plan* (1930) and *Men and Mountains* (1935), two texts by Il'ia Marshak, better known by his penname, M. Il'in. These works heavily feature dialectical *skazochnost'* and were touted as exemplars of a new, Soviet science writing to be imitated. With this, I show how the *skazka*, a genre that had initially been

derided as "fantastic," became a foundational element of the newly cast metaphoric dialect of Stalinist science, particularly in stories about man's technical domination of the natural world.

Chapter three examines late Stalinist *fantastika* and the immediate post-Stalinist effort to move beyond it. By the 1940s, *fantastika* suffered under the weight of the "close aim," a policy that forbade any stories about science that were not set in the present or the immediate future. Early in his literary career, Ivan Efremov wrote close aim *fantastika* about explorers and archeologists, occasionally chafing against the restrictive temporal ideology of Stalinism as he began to explore questions about human evolution. Immediately after Stalin's death, Efremov exceeded the limit of the close aim with his novel *Andromeda Nebula* (1957), which was set 2,000 years in the future. Building on the particularities of Stalinist science outlined in the first two chapters, I show how Efremov's recovery was partial. Despite his great attention to human evolution, Efremov's future citizens greatly resembled those of the present day. Efremov reiterates the anthropocentric rhetoric that underlay objections against Beliaev and fueled the "war against nature" out of which Il'in had spun his Stalinist *skazki*. Efremov's novel sparked a widespread reevaluation of *fantastika*, but, even as critics praised Efremov's creative daring, their critical vocabulary remained founded on the idea that *fantastika* was good to the extent that it popularized real science. The fantastic struggled to outgrow its negative connotation.

These shifts correspond to developments in the image of the human in the Soviet science imagination. The late NEP period saw the revolutionary transhumanisms unleashed by the revolution subjugated to the emerging classicism of Stalinism. Beliaev received ever greater criticism for participating in the celebration of the more malleable body that had appeared everywhere from the excited writings of Trotsky and Gastev to breathless articles about organ transplants in the popular press. Both Il'in's science writing and the critical conversations

surrounding it fixate on anthropomorphism. Fantastic depictions of nature were allowed if they showed the natural world transforming to appear more human. The New Man had now been enshrined as the telos towards which language and nature alike had to develop. Efremov's *Andromeda Nebula* ushered in an era of "humanist *fantastika*," but his fiction evinces the indebtedness that human subject owed to the Stalinist New Man. Efremov fantasized about life across the cosmos evolving to appear like contemporary humans in appearance and custom.

The three chapters tell the story of how science mediated understandings of material change. Beliaev's era celebrated the physiologically impossible, with that impossibility itself being a challenge to staid, pre-revolutionary underestimations of science's power. Under Stalin, excitement about science led to the production of the possible *skazka*. Transformation remained principal, but it had to be based on the now settled, official philosophy and practice of science. In the post-Stalinist period, there was a desire to recuperate some of the vitality of NEP scientific optimism, but a bounded horizon of change remained in place. The dialectical resolution of the past two epochs resulted in a kind of normalized impossibility, where science was simultaneously tasked with expanding boundaries, whether into space or of human development, while remaining within its Stalinist confines.

Chapter 1:

Taming Beliaev's Monstrosities

Introduction

Why did *fantastika*, one of the most popular genres of the 1920s, nearly disappear by the early 1930s? The crisis faced by *fantastika* at the end of the NEP period was the culmination of a conflict between the real and the fantastic in official discourse that had been smoldering over the course of the 1920s. As has been frequently remarked, a fantastic utopianism characterized many strands of thought that competed for institutional approbation in the 1920s.[24] At the same time, the Bolsheviks made constant appeals to the hardnosed realism of their philosophy and rule: Marxism was a science; socialism was the imposition of rational order on primordial forces that had hitherto guided human affairs. By the end of the decade, the fantastic had taken on a negative connotation and the boundaries of the real were more clearly defined. In 1928, beginning with the Great Break, the dramatic reorientation of economic policy to spur collectivization and industrialization, there came a push to develop and enforce a distinctly Marxist science, reducing the variety of post-revolutionary scientific fantasies to a singular ideology of science. Similarly, Socialist Realism was enshrined as the sole acceptable form of art, further limiting the expression of that which declared itself fantastic.

This tidy explanation elides the more difficult question of what was promoted to reality, what was banished to fantasy, and why. To explore the intersection of science, fiction, and ideology on either side of the cultural revolution, I reframe the evolving relationship between the

[24] See chiefly Richard Stites, *Revolutionary Dreams: Utopian Vision and Experimental Life in the Russian Revolution* (Oxford: Oxford University Press, 1991). See also Susan Buck-Morss, *Dreamworld and Catastrophe: The Passing of Mass Utopia in East and West* (Cambridge, Mass.: The MIT Press, 2000). For a study of the genealogy of the techno-scientific utopian imagination of the 1920s, see Anindita Banerjee, *We Modern People: Science Fiction and the Making of Russian Modernity* (Middletown: Wesleyan University Press, 2013).

real and the fantastic within a broader question that would not only contribute to the waning of *fantastika* but also inform the interlinked scientific and aesthetic regimes of Stalinism: how or whether the human could be physically remade under socialism. Scientists, writers, and philosophers initially celebrated the materialist providence of human beings by theorizing how man might be perfected with human ingenuity. Yet the concept of humans as the product of materialist evolution came to sit uneasily with the imperative to intervene in that evolutionary process. By the 1930s, the avatar of the revolution ceased to be a technologically modified, transhumanist being and was replaced by the unblemished New Man. This latter subject could still be improved, but progress was no longer conceived of as a physical reconstruction of the human form.

The retreat from the "fantastic," evolved body to the "realistic" limits of the existing human form can be registered in both the cultural and scientific spheres. Avant-garde artists and writers of *fantastika* alike, responding to the narratives that proliferated in popular science journals, had once imagined people breaking the shackles the body's physical limitations. Similarly, scientists working on topics related to human biology had once welcomed the imposition of rational order on the wilds of the human body. Under Stalin, agriculture became the sole acceptable domain of biological improvement. The development of plants and animals could be directed, but humans became off limits to technological modification.

To explore this shift and how it explicates the crisis of *fantastika*, I examine the work of Alexander Beliaev, arguably the most prominent writer of the genre in the 1920s, who, in his fiction, presented the body as an unfinished project, open to intervention and perfection. Beliaev's wide readership and near synonymity with *fantastika* makes him a prime candidate for studying how the genre developed into the early Stalinist period. *Professor Dowell's Head*

(1925) and *The Amphibian Man* (1928), Beliaev's two most enduring works, depict science violating the body to overcome human limitations. In *Professor Dowell's Head,* the alarming story of a head which has been detached from its host and reanimated, Beliaev asks whether such technologically assisted immortality is worth the sacrifice of one's body. The story drew on contemporary interest in the boundary between consciousness and material being, a classical dualism that underlaid everything from the monist philosophies of Cosmists to factions of mechanistic materialists in the academy. With *The Amphibian Man*, a novel about a youth granted the ability to breath underwater thanks to surgically implanted shark lungs, Beliaev self-consciously channeled contemporary excitement among biologists for outlandish interspecies transplants to "improve" the human form.

Beliaev himself was not intimately involved in the fierce scientific and philosophical debates about the place of the human and the mechanics of evolution that occurred throughout the 1920s and 1930s. This distance allowed his *fantastika* to showcase the multiple sources that together informed a popular image of human malleability in the NEP period. The shocking tone of Beliaev's early fiction drew on existing traditions of adventure literature and a culture of popular science that relished frightening readers with tales of science gone too far. Beliaev was also influenced by the iconoclastic tone of official atheism campaigns, which celebrated teaching the ignorant "shocking" scientific truths to combat non-scientific understandings of the natural world. As a close reading of Beliaev's fiction demonstrates, the author remained unsure of whether technology ought to be benign or disturbing and whether human transformation was exciting, hubristic, or both. Such ambivalence, acceptable in the 1920s, grew impermissible by the 1930s.

The revision and republication of Beliaev's fiction in the late 1930s allows us to compare the incipient image of Soviet science and the discourse of *fantastika* in the NEP period with its later Stalinist iteration. Beliaev's fiction went out of print in the late 1920s but was reprinted a decade later, starting in 1937, with substantive changes. Edits in the later editions efface fear. Sometimes, the word "frightening" was simply struck. Elsewhere, scenes were more substantially reworked to downplay frightening aspects, especially those about the astonishing consequences of human alteration. Republication provided an opportunity for a new generation of critics to stress the impossibility of Beliaev's fiction conceits in the fully formed vocabulary of Stalinist science.

With this reading of Beliaev, I underscore the role of *fantastika* as a point of contact between aesthetic and scientific understandings of the human. Beliaev retreated from depicting radical transformations of the body, adhering to both the emerging narrative demands of Socialist Realism and the growing distaste for actively transforming the human in the biological sciences. Beliaev's critics in the 1930s, many of whom were either philosophers engaged with debates in the natural sciences or scientists themselves, critiqued *Professor Dowell's Head* and *The Amphibian Man* just as much for being beyond the pale of scientific possibility as from a sense of revulsion. With this, these critics demonstrated the marrying of aesthetic and biological "common sense." The suggestion that technology might alter the body was fantastic, frightening, and negative; that technology could assist the human conquering of nature, a category now set apart from the human, was realistic, useful, and benign. Science could not produce something disgusting.

Drawing upon existing studies that have contextualized Beliaev within the biomedical and evolutionary debates of his time, I argue that aesthetic depictions of and scientific

engagements with the human body worked together to foreclose a sense of the human as an object of further alteration.[25] With this diachronic reading of Beliaev's work, I bring together two groups of scholars: those who identify Beliaev as representative of a generation of *fantastika* writers who wrote "adventures of the body" saturated with fear about the possibilities of science and technology run amok and those who read in Beliaev's work a scientific optimism.[26] A look at Beliaev's *oeuvre* across time proves both of these interpretations correct. Beliaev began as a writer of "adventures of the body," a style that was influenced by Wellsian stories of scientific hubris, antireligious tales, and transhumanist ideas about the reconfiguration of the human. Later, Beliaev endeavored to bring this style in line with a growing imperative to depict science as useful, benign, and unconcerned with physically altering the body. Where the boundary between

[25] How Beliaev's fiction reflects the "visionary biologies" of his historical moment is the subject of Alexei Krementsov's chapter on Beliaev and Mikhail Bulgakov's depictions of isolated organs in 1920s *fantastika*. See Nikolai Krementsov, "Professor's Head: Isolated Organs," in *Revolutionary Experiments: The Quest for Immortality in Bolshevik Science and Fiction* (Oxford University Press, 2014): 39-64. The transition from biological to sociological understandings of the human at the end of this era of experimental biology receives passing mention in the conclusion to *Revolutionary Experiments*, but the topic is not central to Krementsov's thesis.
Muireann Maguire provides a deft reading of how Beliaev responded to both narratives about evolutionary science and a general fear of bodily deformation in early Soviet literature. In "Gothic Bodies," Maguire demonstrates how narratives about deformation conflicted with the emerging one of the perfected, utopian body of Socialist Realist hero. This fear clustered particularly around the boundary between man and animal. See Muireann Maguire, "Gothic Bodies," in *Stalin's Ghosts: Gothic Themes in Early Soviet Literature* (Peter Lang, 2013), 89–138.
Maguire focuses more on the scientific aspect of this story in her excellent article, "Post-Lamarckian Prodigies: Evolutionary Biology in Soviet Science Fiction." She places Beliaev's *Amphibian Man* alongside other examples of Lamarck-inspired fiction about directed evolution, a tendency that she similarly saw eclipsed by the onset of the Great Break. See Muireann Maguire, "Post-Lamarckian Prodigies: Evolutionary Biology in Soviet Science Fiction," *New Zealand Slavonic Journal* 43 (2009): 23–53.
I differ from Maguire in deemphasizing the particular mechanics of evolution in Beliaev's *fantastika* (genetic inheritance versus acquired characteristics) and focusing more on how Beliaev and his reception responded to a tension between an initial enthusiasm about materialist understandings of the human and an eventual rejection of biological interventions built upon that understanding.
[26] For examples of the former reading, see Roman Arbitman, "Back in the 1960s: Notes by a Man Who Wasn't There," *Science Fiction Studies* 31, no. 3 (2004), 408; Matthias Schwartz, "How Nauchnaia Fantastika Was Made," *Slavic Review* 72, no. 2 (SUMMER 2013): 230. For an example of the latter reading, see Dominic Esler, "Soviet Science Fiction of the 1920s: Explaining a Literary Genre in Its Political and Social Context," in *Russian Science Fiction Literature and Cinema: A Critical Reader* (Academic Studies Press, 2018), 142. Additionally, two Russian-language biographies of Beliaev provide a thorough account of the author's life, though they are lighter on interpretation: Zeev Bar-Sella, *Aleksandr Beli͡aev* (Molodai͡a gvardii͡a, 2013); Boris Li͡apunov, *Aleksandr Beli͡aev: Kritiko-biograficheskiĭ ocherk* (Sovetskiĭ pisatelʹ, 1967).

fantasy and reality might have once been blurred, it came into focus on the form of the human of the present day.

I supplement my study of Beliaev's two most popular novels with a reading of his minor, 1930 novel *The Underwater Farmers*, in which he tempers his themes in response to criticism against *fantastika.* The resulting story about a group of enterprising workers who build underwater dwellings from which they harvest seaweed closely resembles *fantastika* of the "close aim," which was to dominate the genre for the next twenty years. In addition to creating a kind of production novel-*fantastika* hybrid, Beliaev retreated from the transhumanism celebrated in his earlier works. His characters use diving suits and construct underwater dwellings. Technology no longer penetrates the skin; instead, it shields the body from the harsh forces of nature, allowing humans to make use of oceanic vegetation.

By focusing on discrete characteristics of human being in Beliaev's fiction on either side of the Great Break, I provide a scientific-aesthetic genealogy of the Stalinist New Man. Existing studies note the common origin of Soviet eugenics, Cosmist dreams of technological transfiguration, and Constructivist human metallurgy but are less interested in how the development of these prototypes into the neoclassical body of the Stalinist New Man reflects a shift in philosophical and scientific perspective.[27] What did it mean that the New Man was, in Jochen Hellbeck's words, "more humanist," a change that he characterizes as re-endowing

[27] Bernice Glatzer Rosenthal, in tracing the influence of Nietzsche on Bolshevik ideas about the total transformation of the Soviet subject and society, makes a passing mention of the history of Soviet genetics, noting the tension between Marxist and Darwinian stories of human development. See Bernice Glatzer Rosenthal, *New Myth, New World: From Nietzsche to Stalinism* (University Park: The Pennsylvania State University Press, 2002), 284-286. Pat Simpson draws parallels between the idealized bodies produced by Gastev and other members of the 1920s avant-garde and Soviet discourses of Darwinism. She leaves unexplored the fate of these interlinked modes of thinking. See Pat Simpson, "Imag(in)Ing Post-Revolutionary Evolution: The Taylorized Proletarian, 'Conditioning,' and Soviet Darwinism in the 1920s," in *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Dartmouth College Press, 2009), 226–61.

Gastev's machine man with a human soul?[28] Similarly, Rolf Hellebust, studying the political symbolism of metal imagery in the 1920s, especially the trope of humans transforming into metal or machine, observes that in the 1930s "the forging of the New Man again becomes a mere abstraction, its broader implications—both positive and negative—hidden below the surface."[29] What was the scientific counterpart of this metaphoric reorientation and what larger retreat from human development did it represent? The surgical incisions of NEP-era popular science and *fantastika* can be contrasted to the mutilated bodies that Lilya Kaganovsky studies in her investigation of the virile masculinity epitomized by the Stalinist New Man.[30] Whereas the wounded Stalinist body betrayed an aspiration towards an idealized, intact masculinity, the transhumanist bodies of the NEP era embodied a desire to overcome human limitation. Under Stalin, the best human of the present, off limits to material tinkering, became concomitant with the bounds of development.

I argue for the central importance of "human materialism," the imagined ability of science to physically improve the human subject, in policing and formulating this new, Stalinist reality. Curtailing human malleability updated the metanarrative of the Soviet socialism, the "rationalization" of all things "elemental," by ascribing limits to the two categories. The conceptual bounds erected around the human—between human and nature, between human and any conscious being that would *exceed* the human—established during the late 1920s and early 1930s would have great consequences for the imaginary of science for the duration of Soviet rule. The "useful" technology called for during the First Five-Year Plan was useful for a human

[28] Peter Fritzsche and Jochen Hellbeck, "The New Man in Stalinist Russia and Nazi Germany," in *Beyond Totalitarianism: Stalinism and Nazism Compared* (Cambridge University Press, 2009), 317.
[29] Rolf Hellebust, *Flesh to Metal: Soviet Literature and the Alchemy of Revolution* (Cornell University Press, 2018), 30.
[30] Lilya Kaganovsky, *How the Soviet Man Was Unmade: Cultural Fantasy and Male Subjectivity under Stalin* (University of Pittsburgh Press, 2008).

subject who was no longer granted the possibility of himself further evolving. The impetus to "make human" the natural world would guide depictions of nature and applications of the fantastic for the remainder of the Stalinist period. When *fantastika* struggled to reemerge after Stalin's death, the question of how or whether the human might evolve was a central difficulty. Fiction and human change alike were limited with the containment of the transhumanist fantasies out of which Beliaev's fiction emerged.

***Fantastika* in Context**

Writers, publishers, and critics of *fantastika* endeavored to determine the proper balance of the fantastic and the real, a task that required addressing underlying assumptions about what scientific reality was and how it ought to be communicated. The dominant paradigm of popular science during the 1920s did not differ greatly from that of the pre-revolutionary period. This approach focused on combating superstitious, unscientific thinking and employed language of the "miraculous" and "fantastic" to excite readers about the power of science. By the 1930s, the fantastic had acquired a derogatory sense. Officials insisted that all science writing, whether *fantastika* or popular science, be "useful" in form and content. Writing should serve the use of educating readers about science, and the science about which it educated them should be useful in constructing socialism.

How to balance the fantastic and the real in science fiction, especially as it concerned the genre's pedagogical use, had been an active question since the genre's inception. Beliaev cited H. G. Wells and Jules Verne as sources of inspiration, and he was not alone in his admiration. The titans of Western science fiction enjoyed enormous popularity throughout the early Soviet period, and their names continued to be the chief points of reference as writers and critics debated the form and function of *fantastika* in the coming decades. Wells and Verne took

different approaches to the question of how the adventure element of their fiction should relate to its scientific content, displaying diverging attitudes towards science itself. Arthur Evans suggests that the difference between Verne's "hard/didactic" *voyages extraordinaires* and H.G. Wells's "speculative/fantastic" "scientific romances" are the two central modes of science fiction around which the genre has since evolved.[31] Pierre-Jules Hetzel, Verne's publisher, both made explicit the pedagogical value of Verne's stories to readers in prefatory materials and mentored Verne to meet those educational goals.[32] In contrast, Wells used scientific material to bolster the impact of his stories and held a more critical stance towards science.[33]

A line can be drawn between Verne's enlightenment optimism for the ability of his exciting stories to teach the public and the similar pitch made by journals of Soviet *fantastika* in the 1920s. For example, this comparison was made explicitly in a 1928 biographical sketch of Verne's life that ran in *Around the World* (*Vokrug sveta*), one of the leading journals of adventure stories and *fantastika*. The article's author, Iakov Perel'man, was a leading author and editor of popular science who had begun his career publishing popular science writing in the late 19th century and continued to shape attitudes towards popular science through the 1920s.[34] Perel'man stressed the educational potential of fantasy as he explained that in 1863 the readers of Verne's first science-fiction story, "Five Weeks in a Balloon," "didn't know whether this was a fiction (*vymysel*) before them or a truthful report of a real journey." Perel'man highlighted praise for science fiction from the secretary of the French Academy:

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[31] Arthur Evans, "Nineteenth-Century SF (Part I: History)," in *The Routledge Companion to Science Fiction* (Routledge, Taylor & Francis Group, 2009), 13.
[32] For more on Hetzel's educational philosophy and how he molded Verne's fiction to fit those views, see Arthur Evans, "The Hands of Hetzel," in *Jules Verne Rediscovered: Didacticism and the Scientific Novel* (Greenwood Press, 1988), 23–31.
[33] Evans, "Nineteenth-Century SF (Part I: History)," 21.
[34] For more on Perel'man, see T.I. Mishkevich, *Doktor zanimatel'nykh nauk: Zhizn' i tvorchestvo I͡Akova Isidorovicha Perel'mana* (Znanie, 1986).

> In the place of the wonders of old fairy tales (*chudes starykh volshebnykh skazok*), Jules Verne puts new wonders (*novye chudesa*). […] The latest successes of the natural sciences are the main subject of his works. Skillfully maintaining interest serves his educational aims. The reader, having learned with pleasure many instructive things after reading [Verne's] essays, has a desire to know even more: [Verne's essays] awaken scientific curiosity.[35]

In his praise, Perel'man indicated what he would like *Around the World* to offer readers, who could find Beliaev's *The Amphibian Man* elsewhere in the same issue. There was no perceived conflict between fantastic plots and scientific enlightenment. Exciting, fictional "wonders" could capture readers' attention as they learned about technology and the natural world. One set of miracles, founded on superstition, could be replaced by a new set of correct, scientific ones.

Other chief publishers of *fantastika* in the NEP era also had their start prior to the revolution and shared Perel'man's attitude towards entertaining science popularization. Peter Soikin, the biggest prewar publisher of light fiction, received permission to restart his publishing house in 1922. He published a variety of popular science and adventure literature materials, including one of the leading journals of *fantastika*, *World of Adventure* (*Mir prikl͡iuchenit͡i*), which had begun as a supplement to the popular science journal *People and Nature* (*Priroda i l͡iudi*). Similarly, in 1925 Vladimir A. Popov, who had published adventure stories before the revolution, launched *The World Tracker* (*Vsemirnyĭ sledopyt*). Soon after, Popov relaunched *Around the World*, another one of the primary venues for *fantastika*, as a supplement to *The World Tracker*. By 1930, *Around the World* was published every ten days and had a circulation of up to 300,000 copies.[36] This cohort of science popularizers saw public science education as a good in its own right, even if science remained divorced from any immediate "use." Their

[35] I͡a. Perel′man, "Zhi͡ul′ Vern: K stoletii͡u so dni͡a rozhdeni͡ia," *Vokrug sveta*, no. 2 (1928): 29–31.
[36] Schwartz, "How Nauchnaia Fantastika Was Made," 229.

apolitical, generalist approach captured a rapidly growing curiosity about global science and technology.[37]

The vocabulary of scientific magic and "wonders" that ran through these journals was in keeping with the general spirit of science popularization at the time. In public lectures and brochures, medical researchers used a language of miracles to brag about the rejuvenating powers of forthcoming technologies.[38] Anti-religious science proselytizers approached the same religious tenor they wished to replace in their zeal for the promises of science.[39] In this atmosphere, the division between science and fantasy was thin. Matthias Schwartz observes that *nauchnaya fantastika "*appeared to be a vehicle with a bare minimum of semantic coding, able to redefine the nightmarish-secretive semantics of the term *fantastic* with the help of the Romantic-revolutionary claims of the term *scientific*."[40]

As part of the First Five-Year Plan, which begun in 1928, the state began a full-scale, institutional reorganization of science. Preeminent historians of Soviet science, Loren Graham and David Joravsky, stress that the greatest result of this reorganization was a change in tone. Scientists now had to declare their loyalty to the Soviet project and explain how their work benefited the construction of socialism.[41] Debates about the establishing an official Soviet philosophy of science were of little interest and minor import to most practicing scientists, who "used philosophical metaphors as the intellectual decor and ideological guidelines" but did not

[37] James Andrews, *Science for the Masses: The Bolshevik State, Public Science, and the Popular Imagination in Soviet Russia, 1917-1934* (College Station: Texas A&M University Press, 2003), 62-68.
[38] Maria Tutorskaya, "Medical Propaganda: Fairy Tales and Miracles of Surgery," in *Geriatrics and Ageing in the Soviet Union* (Bloomsbury, 2023), 35–50.
[39] Stites, *Revolutionary Dreams*, 105-109.
[40] Schwartz, "How Nauchnaia Fantastika Was Made," 235.
[41] Loren Graham, *Science in Russia and the Soviet Union: A Short History* (Cambridge: Cambridge University Press, 1993), 98; David Joravsky, *Soviet Marxism and Natural Science 1917-1932* (New York: Columbia University Press, 1961), 250-271.

otherwise pay the state's new scientific orientation much attention.[42] Whatever the effects of these changes on the practice of science, there were great repercussions for those in the sphere of science popularization, who now had a more exact script to which they had to adhere.

There arose a similar pressure to justify all cultural production as politically useful. Like the suspicion that pre-revolutionary scientific practices brought with them the contagion of reactionary thought, thinkers argued over the extent to which inherited artistic forms carried with them dangerous, pre-revolutionary modes of thinking. The official cultural position had remained liberal through the NEP period. Trotsky urged the Party not to take any stance in the literary sphere. Bukharin recognized the enormous popularity of adventure stories and suggested that they be enlisted in promoting Bolshevik ideology. Most critics, especially those who later shaped official policy, remained suspicious of mass literature. Boris Dralyuk, in his study of the Russian detective serial (the red Pinkerton) in the early 20th century, observes that the attitude towards pulp, adventure literature remained antagonistic between 1907 and 1934, with genre literature seen as vapid and ideologically pernicious.[43] As the cultural revolution began along with the First Five-Year Plan, there arose a more uniform line of literary theory. The Russian Association of Proletarian Writers (RAPP), who had been some of the harshest critics of *fantastika*, consolidated institutional favor and laid the theoretical foundation for Socialist Realism.[44]

There was little room for *fantastika* within this new cultural program, and the volume of *fantastika* published declined precipitously. By 1932, nearly all of the former publishers of

[42] Alexander Vucinich, *Empire of Knowledge: The Academy of Sciences of the USSR (1917-1970)* (Oakland: University of California Press, 1984), 89.
[43] Boris Dralyuk, *Western Crime Fiction Goes East: The Russian Pinkerton Craze 1907-1934* (Brill, 2012), 4.
[44] For an overview of these changes, see Evgeny Dobrenko, "Literary Criticism and the Transformations of the Literary Field During the Cultural Revolution, 1928-1932," in *A History of Russian Literary Theory and Criticism* (University of Pittsburgh Press, 2011): 43-63.

fantastika had shuttered, and the state withdrew Western adventure fiction from the shelves of libraries despite its enormous popularity.[45] While there had been forty-seven science fiction titles published in 1927, only four were published in 1931 and one each in 1933 and 1934.[46] *The World Tracker*, the journal that specialized in *fantastika* and adventure literature in which Beliaev published his most popular work, had closed. One writer recalls how, starting in 1930, the journal began to reduce its very high print-run and ceased operations altogether by December 1931.[47] Even before closing down in 1931, *The World Tracker*'s content had changed dramatically. By 1929, stories about the civil war had replaced the *fantastika* of Beliaev and foreign favorites like Verne and Wells.[48]

Human Materialisms

The injunction to promote "useful" science cannot fully explain the disappearance of a transhumanist enthusiasm of the 1920s, even if dreams of physically altering the human were intimately tied up with the fantastic mode of popular science that was brought to heel. Dreams of human malleability in the 1920s continued a long running interest among the radical intelligentsia for using a materialist understanding of the human to engineer the ideal person. A survey of philosophical, artistic, and scientific ideas about improving the human body in the 1920s shows a broad enthusiasm for the idea of directed, "creative" human evolution, which was presented as real, useful, and of immediate utility to the building of socialism.

Nikolai Chernyshevsky, the 19th-century socialist writer and critic, provided the main antecedent to the scientific-aesthetic project of the Soviet New Man with his 1863 novel *What is*

[45] Schwartz, "How Nauchnaia Fantastika Was Made," 236.
[46] Darko Suvin, "The Utopian Tradition of Russian Science Fiction," *The Modern Language Review* 66, no. 1 (January 1971), 152.
[47] S. M. Golit͡syn, "'Vsemirnyĭ sledopyt,'" *Detskai͡a literatura*, no. 3 (1966): 31.
[48] S. M. Golit͡syn, *Zapiski u͡tselevshego* (Orbita, 1990), 438.

to be Done? (*Chto delat'?*) and his related attempt to elaborate a materialist account of human nature, most famously in his 1860 essay "The Anthropological Principle in Philosophy." Rakhmetov, a minor character in *What is to be Done?*, became an icon of revolutionary self-education and self-discipline. In his scientific writing, Chernyshevsky laid out a general theory of human self-direction within a monist, mechanical vision of evolution in line with that of leading natural scientists. He argued that all human behavior could be explained by reference to the chemical processes that constituted life and the advancement of socialism required a conscious, voluntary effort towards self-transformation.[49] Chernyshevsky's views corresponded to a larger interest in evolution, materialism, and their political repercussions among radicals in the 1850s and 1860s.[50]

How Frederic Engels related human evolution to the program of building socialism was also of consequence for Soviet Marxists. Engels's most fully articulated thoughts on the matter were published in *The Dialectics of Nature*, an unfinished manuscript that was published posthumously in the Soviet Union in 1925. Engels objected to mechanistic accounts of evolution, like that espoused by Chernyshevsky, hoping to develop, instead, a unifying dialectical theory of the natural sciences and history. Engels celebrated Darwin's blow against those who believed man's appearance was the result of supernatural design. Still, Engels remained committed to the idea of evolution necessarily moving towards the goal of producing a conscious being. Man, armed with "natural law," a heading under which Engels grouped both natural and social laws,

[49] Pat Simpson, "Imag(in)Ing Post-Revolutionary Evolution," 233-4.
[50] For a summary of Chernyshevsky's objection to Darwinism, see James Allen Rogers, "Russian Opposition to Darwinism in the Nineteenth Century," *Isis* 65, no. 4 (December 1974), 489-493. For an in-depth study of the various objections of 19th century Russian intellectuals to the Malthusianism underlying Dawrin's "struggle for existence," see Daniel Todes, *Darwin without Malthus: The Struggle for Existence in Russian Evolutionary Thought* (New York: Oxford University Press, 1989). See also I͡a. M. Gall, *Bor'ba za sushchestvovanie kak faktor ėvoli͡utsii* (Nauka, 1976). For an overview of the controversies surrounding the relationship between matter and consciousness at the time, see Victoria Frede, "Materialism and the Radical Intelligentsia: The 1860s," in *A History of Russian Philosophy: 1830-1930* (Cambridge University Press, 2010), 69–89.

could be the steward of his own destiny. Engels specifically denied that the laws governing animal behavior could be applied directly to humans, and it was by consciously planning society that man shed whatever vestige of animality still governed him.[51] How to distinguish "taking control" of human evolution from a reduction of human behavior to biological or chemical principles would remain a point of difficulty for Soviet thinkers.

The basic insight that man's material being could be utilized to better humanity linked Bolsheviks, members of the avant-garde, Cosmists, science popularizers and experimental biologists. While I focus on how Beliaev responded to an excitement about human malleability portrayed in the popular science press, Beliaev's was part of a widespread celebration of technology's ability to physically reshape the human body as an assertion of "conscious" human thought over the "elemental" forces of nature. The underlying narrative of applying human reason to correct or improve upon the nature would persist into the Stalinist period, but the body would cease to be a valid site for transformation.

In an oft-quoted passage from *Literature and Revolution*, Leon Trotsky connects the rational reorganization of society to the transformation of the physical body. Just as society will be consciously planned, so will man subdue the "unconscious" (*bessoznatel'nyĭ*), "elemental" (*stikhiĭnyĭ*) components of the body and subject "breathing, the circulation of the blood, digestion, [and] reproduction […] to the control of reason and will." Thus, the human will "enter into a state of radical transformation," the result of which will be "a greater equilibrium in the work of his organs and a more proportional developing and wearing out of his tissues."[52]

[51] Richard Weikart, "Fredrich Engels: Evolution and the Dialectics of Nature," in *Socialist Darwinism: Evolution in German Socialist Thought from Marx to Bernstein* (International Scholars Publications, 1999), 53–61.
[52] L. Trot͡skiĭ, Literatura i revoli͡utsi͡a (Politizdat, 1991), 196; Leon Trotsky, *Literature and Revolution*, trans. Rose Strunsky (Russell & Russell, 1957), https://www.marxists.org/archive/trotsky/1924/lit_revo/index.htm.

Trotsky remained enthusiastic about eugenics following his expulsion from the Soviet Union in 1929, as evidenced by his 1934 essay "If America Should Go Communist," in which he tried to differentiate a racist, backwards-looking, Nazi application of eugenics from an imagined communist one. After the hoped-for American communist revolution, Americans might "apply genuine scientific methods to the problem of eugenics" resulting in "a new breed of men—the first worthy of the name of Man."[53]

The ideal of the improved body among the avant-garde can perhaps best be seen in the work of Aleksei Gastev. In his poetry, Gastev frequently depicted man merging with machine or physically transforming into a machine, a theme that was similarly explored by his fellow Proletcult writers. In 1920, Gastev founded the Central Institute of Labor, where he translated these metaphoric aspirations into a concrete program by coaching laborers in moving with maximal efficiency.[54] A similar desire to forge a new person underlay the work of members of the avant-garde such as director Dziga Vertov, who expressed a desire to create the "perfect electrical man," and the constructivist writer Sergei Tretyakov, who wished to write "propaganda towards the forging of the new person."[55]

Anindita Banerjee surveys the competing biological modernities that competed prior to the instantiation of the Stalinist New Man and identifies the "organist ideal," an alternative configuration of the relationship between humans and the material world that competed for dominance in the early 20th century. Those who advocated for the "organist ideal," such as Konstantin Tsiolkovsky and Alexei Bogdanov, sought "to transform humans from helpless

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[53] Leon Trotsky, "If America Should Go Communist," *Liberty* 12, no. 12 (March 23, 1925): 20–23.
[54] For more on Gastev's vision of mechanizing man, see Richard Stites, "Man the Machine" in *Revolutionary Dreams*, 145-164.
[55] Sergei Tretiakov, *LEF* 1 (1923): 201; Dziga Vertov, "We—Manifesto on the Disarmament of the Theatrical Cinematography," *Kinofot* 1 (1992), trans. in *Art and Revolution*, exh. cat. (London: Haayward Gallery, 1971), 96, both quoted in Simpson, "Imag(in)Ing Post-Revolutionary Evolution: The Taylorized Proletarian, 'Conditioning,' and Soviet Darwinism in the 1920s," 235.

victims into a monistic, integrated, and immortal collective."[56] Dreams of "integration" rested upon a sense of human malleability. Tsiolkovsky imagined humans developing radically new bodies to suit their exploration of space. In the future, people might expand to the size of asteroids, sprout with wings, or grow photosynthetic appendages for harnessing solar rays. Bogdanov believed that blood transfusions had a revitalizing effect, and, by a process of mutual blood exchange, humans could dramatically extend their lifespans. He describes this experimental technology in his 1908 foray into *fantastika*, *Red Star*. Blood transfusions had particular appeal to Bogdanov because of his great interest in the collective. In sharing blood, the physical boundaries between people could be partially dissolved, and humanity would approach a collective body. Bogdanov founded a blood transfusion institute in 1926 and died at the hands of his own experimentation in 1928.[57]

Nikolai Fedorov contributed to the zeal for science overcoming human bodily limitations with his philosophy of Cosmism, which heavily influenced such thinkers as Tsiolkovsky, Vladimir Vernadsky, and the Biocosmists, who carried Fedorov's ideas into the 1920s. In the late 19th century, Fedorov advocated for the "Common Cause," his term for man's collective task of harnessing science to overcome death through the colonization of space and the resurrection of our ancestors. [58] This process was made possible by the materialist-inspired insight that the particles floating about space may have once been alive; thus, humans can be brought back to life through the collection of "ancestral dust."

[56] Banerjee, *We Modern People*, 122.
[57] For a summary of Bogdanov's experiments with blood transfusion, see Douglas Huestis, "Alexander Bogdanov: The Forgotten Pioneer of Blood Transfusion," *Transfusion Medicine Reviews* 21, no. 4 (October 2007): 337–40.
[58] For an overview of Fedorov's philosophy, see Elisabeth Koutaissoff, "The Philosophy of the Common Cause," *The Slavonic and East European Review* 62, no. 1 (1984): 98–101.

Fedorov's idea of the gradation of matter from dead to "conscious" provided the basis for the evolutionary-materialist narratives of his successors. For example, in a 1925 essay titled "Panpsychism, or Everything Feels" (*Panpsikhizm, ili vsë chuvstvuet*), Tsiolkovsky laid out a theory of materialistic monism in which there is a clear hierarchy of matter. Dead matter, as the least "sensitive" form of matter, lies at the bottom of his hierarchy. Plants and animals are likewise sorted according to their sensitivity, with man being the most sensitive animal currently known. In a variation of Fedorov's Common Cause, Tsiolkovsky argues that humanity ought to colonize space in order to convert as much matter as possible into the most "sensitive," evolved form: man.[59] In contrast to the Stalinist successors of this anthropocentric fantasy, who posited man as the endpoint of evolution, Tsiolkovsky was certain that there existed beings more perfect than man somewhere in the universe or that the human was not the final form in man's evolutionary journey.

Vernadsky likewise saw man as the embodiment of reason. For Vernadsky, reason was a disembodied essence reminiscent of Hegel's *Geist*. Its quantity grew over time, acting through humans to increase the logical order of the planet. This terrestrial reshaping would culminate in the noösphere, Vernadsky's term for a kind of *avant la lettre* Anthropocene.[60] Cosmism also lived on in the work of the Biocosmists, an anarchist-inflected group that sprung up around A. Agienko, who published under the pseudonym A. Svyatogor in the early 1920s. Svyatogor felt that Fedorov's conception of resurrection, which involved collecting the remains of one's ancestors, was too mechanistic. He wished instead for a more "creative" approach to

[59] Konstantin T͡siolkovskiĭ, "Panpsikhizm, ili vse chuvstvuet," in *Russkiĭ kosmizm* (Moscow: Ad Marginem Press, 2015), 201–27.
[60] See chapter 3 for a full discussion of Vernadsky's anthropocentrism.

resurrection.[61] For Vernadsky and the Biocosmists too, the current human form was not necessarily the culmination of reason's triumph.

The varied evolutionary visions that circulated throughout the 1920s did not emerge from any one account of evolution. Particularly influential were those who offered hypotheses about how "higher forms" of matter naturally arose, such as pre-Darwinist Jean Lamarck, who believed in a "perfecting principle," according to which life organically trends towards more complex organisms. It was this metaphysical insight that Darwin combated with his idea of natural selection. Similarly influential was French philosopher Henri Bergson's idea of creative evolution, which held that a "vital force" (*élan vital*) drives the creative impulse towards greater complexity. Regardless of the proposed force (or absence thereof) underlying the evolutionary process, these thinkers shared a vision of the human, crowned by rational sense, enacting and furthering that supremacy through the active reorganization of the body. The "elemental" portions of the physical body could be made more "conscious." These hypotheses delighted in the shock of transgressing the limits of the current human form, a violation that saw the indistinct division between reality and fantasy as an index of human possibility rather than a lack of scientific rigor.

Evolution, Eugenics, and the Retreat from Human Materialism

By the end of the 1920s, those biologists who had once celebrated human malleability pivoted towards a "practical" application of evolutionary technologies to improve livestock and plant cultivation. Human behavior became solely understood in terms of social-historical forces that could emphatically not be reduced to biological terms.[62] With this retreat, imagining the

[61] I. Vishev, "'Filosofiia obshchego dela' N. F. Fedorova i biokosmizm," in *Filosofiia bessmertiia i voskresheniia* (Moscow: Nasledie, 1996), 179–85.
[62] Krementsov gives an overview of the forms of "visionary biology" abandoned following the Great Break in the conclusion to *Revolutionary Experiments*. See Krementsov, "Epilogue: An Unending Quest," in *Revolutionary*

human body developing beyond its present form, which had once seemed eminently possible and had inflamed the imaginations of many, was relegated to the realm of baseless fantasy.

This distinction mapped roughly onto the question of nature versus nurture but exceeded it. Theories of genetic inheritance and Lamarckism, the belief in the inheritance of characteristics acquired during an organism's lifetime, initially vied for institutional favor.[63] Advocates of both theories shared a desire to direct evolution and argued that their preferred theory would aid the building of socialism. This conflict is most often recounted in reference to Trofim Lysenko, but, by the time of Lysenko's ascent in the mid-1930s, biology had already discounted the human as an "object" of evolutionary science.[64] While enthusiasm for managing the course of nature persisted through the 1920s into the Stalinist 1930s, eugenics had been officially banned by 1930. Genetics would meet a similar fate, largely because of its association with eugenics, by 1936.

The changing priorities of the Bolsheviks towards questions of human evolution, especially concerning the boundary between man and animal, can be illustrated by one of the most sensational episodes of early Soviet biological science: Il'ya Ivanov's attempts, in the 1920s, to crossbreed humans and primates.[65] Ivanov was an expert on artificial insemination with

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Experiments, 194-199. See also Amir Weiner, "Nature, Nurture, and Memory in a Socialist Utopia: Delineating the Soviet Socio-Ethnic Body in the Age of Socialism," *The American Historical Review* 104, no. 4 (1999): 1114–55.

[63] For an in-depth account of the debates between Lamarckists and geneticists in the 1920s, especially concerning how they both appealed to Darwin and Marx, see Gaissinovitch, A. E. "The Origins of Soviet Genetics and the Struggle with Lamarckism, 1922-1929." Translated by Mark Adams. *Journal of the History of Biology* 13, no. 1 (Spring 1980): 1–51.

[64] See, chiefly, Loren Graham, *Lysenko's Ghost: Epigenetics and Russia* (Harvard University Press, 2016); David Joravsky, *The Lysenko Affair* (The University of Chicago Press, 1970). See also Joravsky, *Soviet Marxism and Natural Science 1917-1932*, 296-310; Alexei Kouprianov, "The 'Soviet Creative Darwinism' (1930s–1950s): From the Selective Reading of Darwin's Works to the Transmutation of Species," *Studies in the History of Biology* 3, no. 2 (2011): 8–31; Nils Roll-Hansen, *The Lysenko Effect: The Politics of Science* (Humanity Books, 2005).

[65] My reading of this episode draws on the scholarship of Kirill Rossiianov, especially his two articles: Kirill Rossiianov, "Beyond Species: Il'ya Ivanov and His Experiments on Cross-Breeding Humans with Anthropoid Apes," *Science in Context* 15, no. 2 (2002): 277–316; K. O. Rossiianov, "Opasnye sviazi: I.I. Ivanov i opyty skreshchivaniia cheloveka s chelovekoobraznymi obez'ianami," *Voprosy istorii estestvoznaniia i tekhniki*, no. 1 (2006): 3–51. For a summary of how Rossiaanov's claims contrast with (perhaps more dubious) research into the

a research interest in interspecies hybridization. In the early 1920s, Ivanov proposed a research expedition to travel to French Guinea, where he would attempt to hybridize humans and apes. After petitioning Lunacharsky, Ivanov received two letters of support from Bolshevik higher-ups, who celebrated the experiment's as a victory for materialism against religious thinking.[66] This support aligned with broader Bolshevik support for Darwin, who served as a synonym for materialism against "reactionary" modes of thought such as theology and metaphysics.[67] Ivanov traveled to Africa in 1926 and failed to bridge the zygotic barrier, though hybridization experiments attracted the attention of the American media and the support of the American Association for the Advancement of Atheism.[68] Ivanov returned to the Soviet Union and moved operations to Sukhumi, where he solicited human volunteers whom he would attempt to impregnate with the sperm of a 26-year-old orangutan.

Ivanov continued to receive Bolshevik support. In 1927, the Academy of Sciences, which was still autonomous from the Bolsheviks, rejected Ivanov's request for funding, citing his objectional practices with respect to human subjects. Two years later, Ivanov's request was granted by the Communist Academy, an organization founded to produce Marxist academics parallel to the politically agnostic scientists in the Academy of Sciences. The Society for Materialist Biologists, the specific group that granted Ivanov approval, formed the Commission on Interspecific Hybridization of Primates to oversee Ivanov's work. While this overseeing group included both adherents of genetic inheritance and Lamarckism, all shared a belief in the active guiding of biological evolution.[69] Ivanov was arrested in the purges of 1930, not because

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episode, see Alexander Etkind, "Beyond Eugenics: The Forgotten Scandal of Hybridizing Humans and Apes," *Studies in History and Philosophy of Biological and Biomedical Sciences*, no. 39 (2008): 205–10.
[66] Rossiianov, "Beyond Species," 286.
[67] Nikolai Krementsov, "Darwinism, Marxism, and Genetics in the Soviet Union," in *Biology and Ideology: From Descartes to Darwin* (University of Chicago Press, 2010), 231.
[68] Rossiianov, "Beyond Species," 294.
[69] Ibid., 304.

his experiments were considered scandalous, but because, as a member of an older generation of scientists, his bourgeois class origin attracted accusations of "wrecking." Ivanov's patrons suffered similar political defeat. Though Ivanov would have his civil status restored, he died before being able to return from Alma-Ata, where he was serving his exile.

While the case of Ivanov shows Bolshevik approval of research that emphasized man's animal origins, the history of eugenics in the early Soviet Union demonstrates the Bolshevik's more complicated relationship to how that knowledge could be applied.[70] Even as scientists disagreed over the mechanics of evolution, eugenics was initially warmly received. Proponents attempted to distance themselves from Western "negative eugenics," which was characterized by the sterilization of the poor and undesirables, in favor of "positive eugenicists," which would propagate the genetic material of the best and brightest. To Lunacharsky and other Bolsheviks, eugenics aligned with a deeply held belief in the ability of people to direct their own progress.[71]

Even before the official interdiction of eugenics in 1930, there had been a retreat from the branch of science. Iurii Filipchenko, who, together with Nikolai Koltsov, oversaw the cluster of institutions and journals which lead the Soviet eugenics movement since the early 1920s, had, by 1925, shifted the Bureau of Eugenics away from eugenicist research. Filipchenko focused instead on the genetics of plant and animal cultivation. Among the nearly two thousand participants at the First All-Union Congress on Genetics and Breeding in 1929, there was not a single session on human genetics.[72] By 1930, the study of eugenics had been dissolved, and it was no longer mentioned in adjacent fields; eugenics became a term associated with "bourgeois science."[73] The

[70] For an overview of the strands of eugenicist thought in the Soviet Union as they grew out of debates between geneticists and Lamarckians, see Loren Graham, "The Great Debates about Human Heredity in 1920s Russia," in *Lysenko's Ghost: Epigenetics and Russia* (Harvard University Press, 2016), 49–67.
[71] Nikolai Krementsov, "From 'Beastly Philosophy' to Medical Genetics: Eugenics in Russia and the Soviet Union," *Annals of Science* 68, no. 1 (2011), 90.
[72] Ibid., 81.
[73] Ibid., 84.

study of human genetics survived for several more years by distancing itself from eugenics before, during the Great Terror, its association with eugenics caused it, too, to be vigorously prosecuted.[74]

The emerging, central focus of "Marxist-Darwinism," Krementsov's term for the Soviet accord between the two systems of thought, was the transformation of plants and animals towards the practical end of increasing production.[75] With the Great Break, science was to follow the practical needs of the country, and, after the start of collectivization in 1929, the Soviet Union's agricultural needs were great. The period also saw a pushback against "mechanistic" understandings of human nature. Any extrapolations of human relations from their biological bases were prohibited. Mark Adams ventures that no field that linked the biological and the social survived the Great Break, a distinction captured in the new pejorative "to biologize" (*biologizirovat'*).[76]

This reorientation away from directing human evolution was on full display at the 50th anniversary of Darwin's death in 1932. Soviet writers, officials and scientists marked the date with a jubilee that included lectures, broadcasts, and a number of publications, all of which hailed Soviet science as the rightful inheritor of Darwinism.[77] The place of the human within the 1932 celebration remained somewhat confused. Speakers and writers drew a contrast between Western Darwinists, who used Darwin's idea of the survival of the fittest to promote racial hatred, and his Soviet adherents, who harnessed Darwin's insights towards more productive

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[74] Ibid., 87.
[75] Krementsov, "Darwinism, Marxism, and Genetics in the Soviet Union," 240.
[76] Mark Adams, "The Soviet Nature-Nurture Debate," in *Science and the Soviet Social Order* (Harvard University Press, 1990), 101.
[77] For a summary of the 1932 Darwin jubilee and a contrast between this Darwin jubilee and those that proceeded and followed it, see Eduard Kolchinsky, "Darwin's Jubilees in Russia," in *The Literary and Cultural Reception of Charles Darwin in Europe* (Bloomsbury, 2014), 288–315; Ė. I. Kolchinskiĭ, "Sovetskie i͡ubilei Ch. Darvina i lysenkoizm," *Studies in the History of Biology* 7, no. 2 (2015): 10–52. See also Krementsov, "Darwinism, Marxism, and Genetics in the Soviet Union," 237-9.

ends. It was the practical, agricultural uses of Darwinism that Isaak Prezent, head of the biology sector of the natural science section of the Communist Academy, celebrated in *Darwin's Theory in the Light of Dialectical Materialism*, one of the notable publications prepared for the jubilee. This emphasis on how Westerners were mistaken for extrapolating social Darwinism or racial hierarchy from Darwin's thought appeared alongside the continued recognition of Darwinism as a cudgel against religious thinking. Liberal mention was made of the 1925 Scopes Trial, during which a Tennessee science teacher was prohibited from teaching evolution. Westerners were simultaneously insufficiently materialist in their understanding of man's origins and foolish to reduce human behavior to evolutionary terms.

Perhaps the centerpiece of the jubilee was a speech delivered by Bukharin titled "Darwinism and Marxism," which likewise distanced the fact of human evolution from the possibility of tampering with the human body. Delivered before the Academy of Sciences and the Communist Academy, Bukharin's talk was published widely and included as an introduction to a new edition of *The Origin of Species.*[78] Bukharin defended a genetic theory of evolution against those who believed in the inheritance of acquired characteristics, still an ongoing topic of debate, while delineating between the human as a product of biological evolution and the human as a product of social circumstance. To differentiate between the domain of biology and the domain of sociology, Bukharin expanded upon a contrast that Marx made between evolutionary development and human technological development in *Capital*.[79]

Bukharin's point rested on a convoluted distinction between two sets of "organs": the biological organs of plants and animals and technology, the "organs" of human labor. Marx,

[78] Krementsov, "Darwinism, Marxism, and Genetics in the Soviet Union," 238.
[79] For the full footnote referenced by Bukharin, see Karl Marx and Frederick Engels, *Capital: A Critique of Political Economy*, vol. 35, Collected Works (International Publishers, 1996), 375.

Bukharin observed, praised Darwin for bringing attention to the "organs of plants and animals," a form of "natural technology" (*estestvennai͡a tekhnologii͡a*) analogous to the "productive organs" that form of the basis of man's social organization. After quoting Marx, Bukharin delineated between the two sets of organs:

> Here Marx brilliantly reveals all the principal differences between a system of natural (*natural'nyĭ*) organs and a system of technical tools of labor, though he refers to both as "technology." Organs are natural (*estestvennyĭ*), and tools are artificial (*iskusstvennyĭ*). Organs were formed spontaneously (*stikhiĭno*), and tools were made by man (man, in contrast from the animal (*zhivotnyĭ*), "a tool making animal").[80] Organs are a means of passive adaptation, and tools are instruments of active adaptation. Therefore, the history of species happens (*delaetsi͡a*), while the history of society is made by people themselves.[81]

Bukharin wished to distinguish between the passive process of natural evolution and the active process of technological development in order to keep separate historical materialism and biology. He clarified this point in the conclusion to his essay, where he reiterated that Soviet scientists must defend Darwinism against both religious obscurantism and those who "apply" biological theories to socio-historical problems.

Bukharin's reading is less useful in explaining why human technology should not "improve" the process of human evolution or the human physical body. Bukharin repeated Trotsky's central opposition in *Literature and Revolution* between "conscious" human thought and the "spontaneous" or "elemental" physiology of animal life. Yet, where Trotsky used this thinking to imagine the reorganization of human organs, those relics of nature's "spontaneity," Bukharin directed human technology *away* from the human subject and towards plants and animals, a category that distinctly excluded the human. Bukharin further indicated that people

[80] Bukharin offers this quotation in English, referencing the definition of man given by Benjamin Franklin and quoted by Marx in Chapter 7, Volume 1 of *Capital*.
[81] N. I. Bukharin, *Darvinizm i marksizm: doklad na torzhestvennom zasedanii, posvi͡ashchennom pi͡atidesi͡atiletiiu so dni͡a smerti Charlza Darvina* (Akademii nauk, 1932), 26.

are not counted among the "plants and animals" in his conclusion. There, he forecasted that Darwinist science would lead to "zoo- and phyto-engineering on a societal scale," a program of use from which the human is absent.[82]

Man's animality remained a stubborn problem. Bukharin referred to humans as "a tool making animal," a designation that at once divided humans from their animal origin and reinstated it. Bukharin's use of the word "organs," in addition to bringing to mind Trotsky, recalls Serge Voronoff, the Russian-born, French surgeon who delighted the international press with his research on the revitalizing effect of interspecies organ transplants and whose work Beliaev referenced as an inspiration for *The Amphibian Man*. By, however obscurely, setting the "organs" of plants and animals apart from those of man, Bukharin demonstrated the new taboo against human malleability, which had once been the natural use case for "applied" evolutionary science.

The study of genetics, including human genetics, persisted into the mid-1930s under the new moniker "medical genetics," though its time was limited, due to its continued association with eugenics. Any attempt to downplay this link was not helped by Hermann Muller, an American-born geneticist, vocal proponent of eugenics and Soviet sympathizer. Muller relocated to the Soviet Union and soon after his arrival in 1933 assumed leadership of the Institute of Genetics. From this prominent position, Muller continued to promote eugenics despite its taboo nature, and, in 1936, mailed a copy of his eugenicist manifesto, *Out of the Night: A Biologist's View of the Future*, directly to Stalin. In a letter that accompanied a copy of the book, Muller argued that the science of eugenics has much to offer the Soviet cause, for there is no biological evidence that man has been perfected: "Human nature is not immutable, or incapable of

[82] Ibid., 34.

improvement, in a genetic any more than a social sense."[83] Muller distanced himself from a Nazi form of eugenics and avoided reductionism. A directed human evolution would enhance social evolution, as outlined by Marx. That same year, at a 1936 session of the Lenin All-Union Academy of Agricultural Sciences, Muller highlighted the eugenicist component of his work, playing directly into the hands of Lysenko and his supporters, who attacked their institutional opponents by emphasizing an equivalency between genetics, eugenics, and fascism. By the end of the following year, Muller had fled the Soviet Union, the Institute of Genetics was disbanded, and Muller's team had been shot.[84]

In summary, the 1920s saw a widespread celebration of humans as material beings subject to the same laws of evolution and transformation as all other matter. Thinkers advanced various ways of taking control of human evolution. During the first half of the 1930s, the idea of perfecting the human through biological intervention became outright forbidden, both because it might commit the theoretical mistake of "reductionism" and because of its fascist connotations. This retreat from human transformability aligned with a reformulation of the cultural poetics of science. The future would no longer be radically different from the present, and science, accordingly, had to shift from being an iconoclastic force that violently overturned outdated notions of the human and society alike to a way of enlarging the present. Fantastic stories of human transformation, such as Beliaev's, register this epistemic-aesthetic shift, where the reevaluation of science was just as much about updating its content as it was rethinking its tone.

[83] Hermann Joseph Muller, "Muller's 1936 Letter to Stalin," 1936, Lilly Library LMC 1899 Box 1 Series: Writing, Writing by Muller, Lilly Library, https://collections.libraries.indiana.edu/muller/items/show/465, 1.
[84] For a summary of the brief life of "medical genetics," including Muller's role in it, see Vasiliĭ Babkov, *Zaria genetiki cheloveka: Russkoe evgenicheskoe dvizhenie i nachalo meditsinskoĭ genetiki* (Progress-Traditsiia, 2008), 557-568, 662-666; Adams, "The Soviet Nature-Nurture Debate," 101-7.

Professor Dowell's Head

Professor Dowell's Head, which launched Beliaev's career as a writer of *fantastika* and remains one of his most popular stories, found the author expressing two conflicting attitudes towards science. He both terrified readers with a story of science gone awry and argued, along with his publishers, that his story was meant to stoke interest for eminently realizable technologies. These attitudes could more easily coexist in the mid-1920s when stories about the shocking possibilities of science were in harmony with a general desire to explore the boundless potential of the present. Beliaev's frightening conceit relied upon a materialist understanding of consciousness, and the author argued that eliciting disgust in his readers offered an object lesson in materialist reality. Even if this educational reading of *Professor Dowell's Head* was an after the fact justification of his story, Beliaev still demonstrates the boundary-blurring power of the fantastic, which was initially not so clearly separated from the benign utility of scientific reality, as it would be under Stalin.

Professor Dowell's Head was first published in serial in *The Worker's Newspaper* (*Rabochai͡a gazeta*) in June and July of 1925 before it was picked up by *The World Tracker*. A year later, Beliaev published the story as a novella with a print run of 4,000 copies. Despite the popularity of *Professor Dowell's Head*, the story was not published again until 1937, when Beliaev expanded it into a full novel. This new version was first serialized in both the Leningrad newspaper *Change* (*Smena*) and *Around the World*. A book edition appeared the following year, in 1938, with a print run of 10,000 copies. The revised story has since gone through more than 50 reprintings.[85]

[85] Nikolai Krementsov, "Off With Your Heads: Isolated Organs in Early Soviet Science and Fiction," *Studies in History and Philosophy of Biological and Biomedical Sciences*, no. 40 (2009), 88.

The plot of *Professor Dowell's Head* revolves around an alarming technology that allows heads to live on, disconnected from their host bodies. The story begins with Marie Lauren answering a mysterious job posting to work for the conniving Dr. Kern.[86] Marie Lauren is tasked with caring for Professor Dowell's head, which has been separated from Dowell's body but remains sentient and floats in a jar. Though initially repulsed by the ghastly sight of Dowell's unattached head, Marie Lauren builds a relationship with Professor Dowell. She learns that it is thanks to the professor's own surgical innovations that his head might survive independent of his body. Kern conspires to take credit for the Professor's groundbreaking research, and the captive Dowell cannot stop him. Marie Lauren intervenes. In the 1937 revision, Beliaev added to this core plot, but the basic story remained the same.

Professor Dowell's Head is light on details about the technology that Kern and Dowell use to bring Dowell's head back to life. This omission was noted by critics, especially those in the 1930s who saw *fantastika* solely as a means of popularizing science. Instead, Beliaev posed a moral question: Does Dowell's technology go too far? Beliaev allows some ambiguity, but the story ultimately feels like a cautionary tale against science run amok. Both Dowell and Kern endorse the organ reviving experiment. Dowell knows that he is the captive of Kern but insists that, no matter his suffering, he would like to see his research through because the advancement of science is worth any suffering.

Beliaev dramatizes the quandary of whether Dowell's pain is worthwhile by emphasizing Marie Laurent's terror. When Marie Laurent first encounters Dowell's head and recoils, Kern reminds her that her response is born out of ignorance: "We are scientists, thus we intrude upon

[86] Beliaev changed the female protagonist's name between the 1920s and 1930s editions of *Professor Dowell's Head*. She was originally named "Miss Adams." In the 1930s, Beliaev changed her name to "Marie Laurent," perhaps to underscore the French setting of the story. I will refer to her only by her later name, "Marie Laurent," to avoid confusion.

the ‘unshakable laws’ of nature, defy death itself and take the livelihood from miracle-workers and God himself.”[87] The reader, sympathizing with Marie Laurent and recognizing Kern as the story’s antagonist, has little reason to agree with Kern. Disgust seems like an appropriate response to that which violates the laws of nature.

Later, Beliaev pokes fun at the breathless tone of popular science, despite his own participation in such sensationalization, in a scene that foregrounds the sinister, enchanting power of science. Kern invites journalists and scientists to a public presentation of the miraculous surgical technology that he has plagiarized from Dowell. Beliaev depicts the press’s uncritical thirst for such garish spectacles:

> Near the stage, at their tables, was a lively (*ozhivlënnyĭ*) anthill of newspaper correspondents, sharpening their pencils for stenographic notes.
>
> On the right was a row of cameras set up to capture on tape every moment of the Kern’s fascinating presentation of the animated (*ozhivlënnyĭ*) head. On the stage was an honorary presidium of the most important representatives of the scientific world. In the middle of the stage was a pulpit. On [the pulpit] was a microphone for broadcasting speeches around the world via radio. A second microphone stood before Miss Watson’s head [one of the other heads reanimated by Kern and Dowell]. […] Skillfully and modestly applied makeup gave the head of Marie Laurent a fresh and attractive look, smoothing the bad impression that her head should have made on the unprepared spectators.[88]

Beliaev underscores the volume of media present and Kern’s ability to deceive.

[87] Aleksandr Beli͡aev, *Golova professora Douėli͡a* (Moscow-Leningrad: Zemli͡a i fabrika, 1926), 10.
[88] Ibid., 55–56.

There is no mention of human operators for the cameras and microphones that will disseminate every moment of Kern's presentation. Attending experts are mute. Kern's speech will reach its audience unmediated. A fresh coat of makeup will easily fool the "unprepared spectators." Beliaev uses the word "animated" to describe both the "anthill of newspaper correspondents" and the head of Marie Laurent, suggesting that both are under Kern's control. Science is wielded like black magic.

After Kern finishes his speech, Marie Lauren rushes onto stage and tells the audience not to listen to Kern. He has killed Dowell and keeps Dowell's head captive, she explains. Some correspondents drop their pencils. Beliaev continues to emphasize the media's appetite for such spectacle: "Only the cameraman vigorously turned the handle of his camera, gladdened at the unexpected trick that ensured the tape of the sensation would be a success." Marie Lauren's intervention causes some to see the display of Miss Adam's revived head "with horror and pity, like one who came from the grave." Kern does his best to cast doubt on Marie Lauren's expose. She has gone insane, he explains, because of her weak mental constitution, and he assures the crowd that they will take care of this "sacrifice to scientific duties."[89] Kern slyly puns at the expense of the severed heads who have likewise been sacrificed to fuel his careerism. Marie Lauren finds herself involuntarily committed to an insane asylum, and Dowell's son intervenes to rescue the brave whistleblower. The pair reunite with Dowell's head, which is now close to death. Dowell bemoans that he has not finished the experiments that he began. Dowell's son brings Kern into an adjacent room, and, in the 1926 book edition, a gunshot rings out, signaling Kern's summary execution. Beliaev edited this detail out in subsequent editions. Regardless of

[89] Ibid., 59-60.

how Kern meets justice, many have suffered, and technology has brought society no closer to achieving immortality.

Is the media to blame for being easily manipulated? Has the resurrecting power of this technology been tainted by Kern's unscrupulous approach? Beliaev explored the ability of new biological technology to terrify and the ease with which it might fall into the wrong hands. That such innovations might benefit society received little attention. The text strongly suggests that Beliaev sides more with those who are disturbed than his stoic scientists, who assure all that there is nothing to fear. There is an irony that Beliaev transparently participated in the very sensationalism that he critiques. The original printing of *Professor Dowell's Head* in *The Worker's Newspaper* began every installment with a gory illustration of Dowell's head: A tube dangles from Dowell's throat, and Dowell stares impassively at the reader.

Editorials that accompanied the story argued that the it had a scientific grounding and was instructive to the extent that it challenged religious superstitions. Such a reading seems to run counter to the thrust of Beliaev's story, as it would agree with Kern's foreboding assertion to a frightened Marie Lauren that science ought to "intrude upon the 'unshakable laws' of nature." Were readers really meant to celebrate Kern's violent technology? This interpretive confusion highlights the fact that there existed no settled program of how to depict the prevailing scientific optimism. Technology could appear disturbing and still be good.

An unattributed afterword that accompanied the story's original 1925 serialization in *The Worker's Newspaper* opened with the admission that *Professor Dowell's Head* was, of course, "fantasy and fiction" (*fantazi͡ia i vydumka*) but stressed the "firm scientific ground" on which the story stood. Among the evidence cited were examples of successful transplants: The heads of insects have been successfully swapped, and a human organ had been made to live outside the

body. The afterword ended with a passage from "Successes of Modern Surgery" by Professor Oppel', then a leading surgeon, who recounted bringing back to life a patient whose heart had ceased beating. Oppel' concluded: "I do not wish to dream, prophesize or fantasize (*fantazirovat'*). […] The power of surgery is yet to come."[90] The quote from Oppel' reinforced the idea that Beliaev explored a real scientific possibility (rather than idly fantasizing) and was useful as a lesson in scientific consciousness-raising.

A preface titled "From the Editors" that ran in *The World Tracker* before *Professor Dowell's Head* struck a similar tone. The editors mentioned several successful attempts to revive various organs after they had been separated from the body. While today one can "only fantasize" about occurrences such as those narrated by Beliaev, "we live in that era, when yesterday's 'unrealizable fantasies' become the commonplace of everyday life." Beliaev's story was the "*logical* conclusion" of contemporary experiments.[91] Here too, there was a clear implication that the story might transcend fantasy and become real. In short, the editors praised the science that appeared frightening and destructive in the narrative itself.

The preface from *The World Tracker* participated in an iconoclastic antireligiosity that would become incoherent once Soviet ideology held that science could not appear scary. The editors hypothesized that, should an experiment like the one depicted in Beliaev's story succeed, it would open before us "amazing (*izumitel'nye*) vistas" and be "just as great a blow to religious superstition as, in its time, Darwin inflicted upon Biblical fairytales (*skazki*) about the creation of earth."[92] The argument recast the frightening mood of Beliaev's fiction as a challenge to the reader. If the reader was "amazed," as Beliaev himself depicted his characters, this feeling was

[90] "Posleslovie," *Rabochai͡a gazeta*, July 7, 1925.
[91] "Ot redakt͡sii," *Vsemirnyĭ sledopyt*, no. 3 (1925), 17. Emphasis in original.
[92] Ibid.

only a remnant of an outlook soon to be shed. It was good, it followed, that Kern "play God," for humans had assumed God's post as the leaders of their own destiny. Though such an interpretation of *Professor Dowell's Head* seems dubious, Beliaev rehearsed this same argument in *The Amphibian Man*, in which his scientist protagonist stands trial before a judge who accused him of meddling with the laws of nature.

Professor Dowell's Head attracted few reviews upon its initial publication. The two reviews that appeared, both written by Party members involved in the still-forming, state apparatuses for administering science, exhibit more of a confusion over how the real and the fantastic ought to be balanced in *fantastika* than any objection to either the frightening mood or the particular surgical theme of Beliaev's story.

Constantin Loks, secretary of Glavnauka, a state body founded in 1921 to guide scientific institutions, published a review of *Professor Dowell's Head* in *Print and Revolution* (*Pečat' i revoljucija*) in 1926.[93] He found Beliaev symptomatic of the larger problem that writers of *fantastika* knew too little about science to successfully use it as the basis of their fiction. Writing "fantastic stories based on a scientific hypothesis is extremely seductive with its seeming ease and limitless possibilities," Loks observed. But even those with "the most superficial knowledge of chemistry and biology" now wish to write about "flight to neighboring planets, the release of atomic energy, and the resurrection of the dead." However, artistic work that involves science should explore the specific details of what future technology might look like instead of reveling in its spectacle. His chief criticism of Beliaev's fiction was less that Beliaev's premise was unrealistic; rather, Beliaev failed to explain how his premise might work. Loks praised the plotting of *Professor Dowell's Head*, showing an acceptance of the genre.

[93] K. Loks, review of *Golova professora Douėl͡ia*, *Pechat' i revoli͡utsi͡ia*, no. 8 (1926): 200–201.

Sergei Dinamov, a graduate student at the Association of Research Institutions of the Social Sciences (RANION), appraised *Professor Dowell's Head* more favorably than Loks in a review for *The Book Peddler* (*Knigonosha*).[94] Dinamov would go on to become the editor of *The Literary Gazette* and the Central Committee's secretary of the arts in the early 1930s. He applied the same basic critical formula as Loks: *Fantastika* ought to be a reasonable extrapolation from a feasible scientific hypothesis. Dinamov identified *Professor Dowell's Head* as a work of *nauchnaya fantastika* whose style bore similarities to that of the Pinkerton and ruled that Beliaev avoided the common pitfall in *fantastika* where the fictional conceit is not given proper foundation. Beliaev's "bold hypotheses," Dinamov wrote, "seem probable."

These reviews provide a glimpse of how representatives of official science related to *fantastika* in the mid-1920s. Both critics hailed from the tangle of newly formed organizations that helped shape and administer science during the NEP period. Glavnauka worked closely with the State Scholarship Council to integrate "bourgeoise" scientists into socialist projects.[95] Dinamov had studied at the Institute of Red Professors, an organization designed to bolster the ranks of communist academics and remedy the lack of Marxists working in Russia's institutes of higher learning. Their desire to have *fantastika* adhere to reality reflected an official line of thinking that grew as the 1920s progressed. At the same time, these reviews and the ancillary material that accompanied *Professor Dowell's Head* show how all initially agreed that Dowell's surgical techniques were included in such reality. Human malleability, they agreed with Beliaev and his editors, was a real scientific possibility.

As the real-life examples of organ revivals and exciting surgical developments cited by these writers and critics evince, Beliaev built his story upon a popular fascination with surgical

[94] S. Dinamov, review of *Golova professora Douėl͡ia*, *Knigonosha*, no. 39 (1926): 28.
[95] Vucinich, *Empire of Knowledge*, 113.

and biological technologies. Krementsov contextualizes *Professor Dowell's Head* within the popular science culture of its day and observes that the story's publication somewhat predated a general craze in the popular science press for stories of reanimated organs sparked by the experiments of Sergei Briukhonenko.[96] A doctor from the Moscow Chemical-Pharmaceutical Institute, Briukhonenko created a device called an *autojector* which allowed him to circulate blood to the severed head of a dog. This invention bore an eerie resemblance to the fictional pump that pushes air through Professor Dowell's throat in Beliaev's story. The coincidence, Krementsov argues, was just that: The publication of Beliaev's story predated Briukhonenko's presentation of his research before the Second All-Union Congress of Pathologists in Moscow by a few months, and Briukhonenko had been working on his invention before the publication of *Professor Dowell's Head*.

While Briukhonenko's invention did not initially attract much attention, interest in Briukhonenko's research steadily grew, culminating in mainstream coverage and images of reanimated dog heads appearing on the covers of popular science journals. In response to this public enthusiasm, officials offered Briukhonenko institutional support, and his work received greater academic attention. As Krementsov details, official and academic reactions remained dwarfed by the response from the popular science press, who celebrated Briukhonenko's research as the first step towards a victory over death. This interest in *Professor Dowell's Head* and Briukhonenko corresponded to a larger zeal for the ability of science to smash the preexisting laws of nature on the path of human advancement. It was precisely this sense of penetrating and improving the human body, especially when the resulting human was physically

[96] Krementsov, "Professor's Head': Isolated Organs," 42-57.

altered, that attracted criticism upon the republication of *Professor Dowell's Head* over a decade later.

The republication of Beliaev's work in 1937 was surprising, given that it occurred at the height of the Great Purge, a time when questions of ideology were particularly sensitive and accidental deviations could be fatal. The process appears to have been initiated by Beliaev himself. In an undated letter addressed to Grigoriĭ Mishkevich, an editor at the state publishing house for children's literature, Beliaev asked why his work had been neglected. Young readers wrote him continually, Beliaev explained, and they wished to know where they could find his novels, especially *Professor Dowell's Head* and *The Amphibian Man*.[97] His request for their republication, evidently, was accepted, and, in 1937, *Professor Dowell's Head* was reserialized in the newspapers *Change* and *Around the World*.

The case for their republication appeared in *The Literary Gazette*, where various scientists argued that Beliaev's fiction could encourage interest in the sciences among young readers. The first of these articles, titled "A Writer Left Alone" by V. Kremnev, appeared in 1938.[98] Kremnev bemoaned the fact that the Leningrad Writers' Union has neglected the author of *fantastika*, a genre which had become scarce. Kremnev's article was followed by an open letter titled "The Writer Who Popularizes Science," which further showcased support for Beliaev's republication by the scientific community.[99] Among the letter's signatories were Boris Weinberg, a physicist and glaciologist, Sofia Natanson, a specialist in photochemistry, and Moris Eygenson, an astronomer. Lacking were any scientists working more closely on the biomedical topics that Beliaev discusses in his fiction. The letter, which was accompanied by a second note

[97] RGALI, f. 630, op. 1, d. 1458, 82-86.
[98] V. Kremnev, "Pisatel′ ostalsi͡a odin," *Literaturnai͡a gazeta*, no. 8 (February 10, 1938): 4.
[99] "Pisatel′, populi͡arizuiushchiĭ nauku: Pochemu ne izdai͡utsi͡a knigi A. R. Beli͡aeva?," *Literaturnai͡a gazeta*, no. 21 (April 15, 1938): 2.

from Kremnev, stated the need for *fantastika* such as Beliaev's in order to attract young readers to the sciences, though a discussion of how Beliaev depicted science was absent from these brief endorsements. Both of the articles calling for Beliaev's republication in *The Literary Gazette* referenced Tsiolkovsky's endorsement of Beliaev and the fact that Beliaev's fiction had become a rarity at book markets. These specific details appear to be lifted from Beliaev's own letter, which was never mentioned or published. It seems likely that Beliaev's private request was reframed as a popular demand from readers and the scientific community. New print editions of *Professor Dowell's Head* and *The Amphibian Man*, among other works, soon appeared. A slew of negative reviews would follow, making it apparent that those calling for a republication of Beliaev's fiction had failed to consider how its scientific content clashed with a Stalinist scientific imaginary that had no room for Beliaev's grotesque transhumanism.

Yakov Rykachev, characterized by Evgenii Kharitonov as "one of the infamous RAPP 'specialists' of adventure and [*nauchnaya fantastika*] literature in the 1920-1940s," took the 1938 publication of *Professor Dowell's Head* as an opportunity to condemn Beliaev's story in the journal *Children's Literature* (*Detskai͡a literatura*).[100] Rykachev's core contentions with *Professor Dowell's Head* were that the book lacks any historical grounding, robbing it of the ability to discuss "social ideas," and that the fantastic scientific premise of the book, devoid of a relationship to real science, exists solely for the purpose of entertainment. In a key passage, Rykachev denigrated *Professor Dowell's Head* as so "entertaining," a quality that he associated with a Western tradition of science fiction, that the story was practically "translated." His criticism makes clear how a Stalinist image of science defined itself against a Western counterpart:

[100] Evgeniĭ Kharitonov, *Nauka o fantasticheskom: Bio-bibliograficheskiĭ spravochnik* (Moscow: Manufaktura, 2001), 197.

> *Professor Dowell's Head* is a variety of translated novel (*roman perevodnyĭ*), so to speak: it is Western entertaining (*razvlekatel'noĭ*) *fantastika* that is characterized by the use of pseudoscientific material to amuse the reader with grotesque images and introduce an element of guignol and horror into the familiar, making disgusting (*opostylevshiĭ*) the world of the everyday entertainment novel.[101]

Key in Rykachev's criticism is the equivalency between the disgusting and the unscientific. This same scientific-aesthetic coupling would appear in criticism of *The Amphibian Man*.

In a subsequent issue of *Children's Literature*, Beliaev defended *Professor Dowell's Head* similarly to how he had a decade earlier. He pointed out the scientific reality of "reviving" separated organs and explained how his exciting story could attract young people to science.[102] As evidence of his story's plausibility, Beliaev pointed to the experimental successes of Briukhonenko, who, since *Professor Dowell's Head*'s original publication, had achieved widely publicized success and received support from the Soviet government.[103]

Yet coverage of Briukhonenko's successes in the 1930s also demonstrates a change in tone from the 1920s, when his experiments had first been reported. Reporters did in the 1930s not shy away entirely from the grand implications of Briukhonenko's life-sustaining experiments. In a 1935 article in *Izvestia*, a journalist noted that Briukhonenko foresaw uses of his artificial blood circulators beyond their "practical implications" in sustaining patients during surgical operations; blood circulation technology might help revive a corpse 30 or 40 minutes after its death.[104] A 1937 article in *Pravda* titled "The Institute of a Second Life" predicted that on the basis of Briukhonenko's work "the problem of resurrecting the human organism might also be solved."[105] Still, the tone of these reports paled in comparison to those that had run a

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[101] I͡a. Rykachev, "*Golova professora Douėli͡a*," *Detskai͡a literatura*, no. 1 (1939), 53.
[102] A. Beli͡aev, "O moikh rabotakh," *Detskai͡a literatura*, no. 5 (1939): 23–25.
[103] For an overview of Briukhonenko's life and the work, see Igor E Konstantinov and Vladimir V Alexi-Meskishvili, "Sergei S. Brukhonenko: The Development of the First Heart-Lung Machine for Total Body Perfusion," *The Annals of Thoracic Surgery* 69, no. 3 (March 1, 2000): 962–66.
[104] F. Danilov, "Iskusstvennoe krovoobrashchenie," *Izvesti͡a*, August 20, 1935.
[105] L. Beregovoĭ, "Institut vtoroĭ zhizni," *Pravda*, January 4, 1937.

decade earlier, which had readily hailed Briukhonenko's experiments as science's "victory over death," which, one writer raved, sounded as fantastic as Beliaev's fiction but was "no *skazka*."[106] Before, the invocation of the fantastic had been to science's credit. In the 1930s, resurrection seemed reduced to a technical problem.

The problem with Beliaev's defense of *Professor Dowell's Head* in 1939 was not that his *fantastika* had no scientific basis, it was that frightening spectacle was no longer believed to hold pedagogical value. When *Professor Dowell's Head* had first been written the grotesque lay on the side of scientific advancement as a force for disturbing settled boundaries. Rykachev's "disgust" brought together an aesthetic and biological common sense in rejection of radical transformations of the human body.

The Amphibian Man

A similar tension between biomedical science as a transgressive, frightening force and an insistence that such science need not frighten the reader shaped the writing and reception of Beliaev's most famous story, *The Amphibian Man*. Here too, Beliaev would assert that his *fantastika* held educational value and, upon republication, find that both the biological science on which he had based his story and the cultural narratives about science to which he appealed had changed dramatically. In *The Amphibian Man*, published over the course of 1928 in *Around the World*, Beliaev tells of the reclusive, Argentinian scientist Salvator, who heals the local poor with his experimental surgical techniques. Salvator hones his medical skills by stitching together animal hybrids, including his most prized creation, Ichthyander, a young human man who gains the ability to breathe underwater after Salvator provides him with a set of shark lungs. Even more explicitly than in *Professor Dowell's Head*, Beliaev couched his frightening scientific

[106] G. Grebnev, "Golova, otrezannai͡a ot tulovishcha, zhivet," *Komsomol'skai͡a pravda*, May 22, 1927.

conceit, the grotesque medical experiments performed by Salvator, as a challenge to those who clung to an antiquated, religious view that science should not so radically tamper with the human body.

Beliaev drew heavily on H.G. Wells's *The Island of Doctor Moreau*, which likewise features a grey-haired doctor concocting novel animals in an exotic setting. Salvator also takes after Serge Voronoff, who became synonymous with animal-human hybridization due to his headline-catching experiments grafting additional pairs of testes to various animals and people, an operation that he claimed "rejuvenated" his subjects by boosting testosterone production. In an afterword to *The Amphibian Man*, Beliaev quoted Voronoff's 1928 book *The Conquest of Life* (*La Conquête de la Vie*), in which Voronoff detailed the successes of his grafting operations. Such surgeries, Voronoff boasted, pave the way to harvesting other organs from our closest evolutionary relatives. Beliaev may have also borrowed from a French story by science fiction author Jean de La Hire titled *The Man Who Can Live in Water* (*L'Homme qui peut vivre dans l'eau*), which had first been published in a newspaper in 1909 and was republished in book form in 1926. The main character of La Hire's tale is a fish-man named l'Hictaner who resembles Beliaev's amphibian man in name and appearance.[107] Whatever his source material, Beliaev appended to the nautical conceit a love story (Ichthyander falls for a beautiful, human woman) and an adventure plot (local pearl divers seek to capture Ichthyander and enlist them in their operation). As before, Beliaev dramatized the import of his scientific subject with scenes in which the uninitiated are shocked by encounters with scientific oddities that seem to exceed the bounds of nature.

[107] Zeev Bar-Sella, *Aleksandr Beli͡aev*, 234-6.

If, in *Professor Dowell's Head*, Beliaev had suggested that the violence of scientific development might not justify its outcome, he tried to depict science more positively in *The Amphibian Man*, though a reliance on startling the reader persisted. The didactic core of *The Amphibian Man* is most clear in a scene in which Salvator is brought to trial for his controversial experiments. Beliaev uses Salvator's trial scene as an opportunity to reiterate stock arguments about religious feeling retarding scientific progress. Salvator argues that he stands accused along with Charles Darwin and the only plaintiff in the case is God. His scientific work may appear strange, but he labors towards the concrete end of healing diseased bodies. For the reader, there is no question of Salvator's innocence. In addition to seeing that Salvator's skill has aided locals while his animal hybrids have proved harmless, the reader has grown fond of Ichthyander, the human face of Salvator's technology. The fear motivating Salvator's religious prosecutors stands as a rebuke to those who, when encountering scientific progress, might recoil in terror, afraid that such things break the bounds of natural law, rather than respecting medical technology for redefining those boundaries. Fear before science is clearly coded as religious ignorance.

Though they bear a superficial resemblance to one another, Beliaev's treatment of his biomedical theme in *The Amphibian Man* differs greatly from how it was developed by Wells in *The Island of Doctor Moreau*. For Wells, science makes even more fragile the already tenuous boundary between man and beast. Wells's titular doctor dismisses the pain that he inflicts on his experimental subjects: "So long as your own pain drives you," Moreau expounds, "you are an animal, thinking a little less obscurely what an animal feels." To think in terms of pleasure and pain, Doctor Moreau continues, "is the mark of the beast." The true scientist must overcome such considerations. "The study of Nature makes a man at last as remorseless as Nature," Moreau

concludes.[108] The narrator dismisses such arguments as "sophistry." Wells uses the adjective "grotesque" to describe Moreau's animal subjects no fewer than 16 times. The reader's sympathies consistently lie with Doctor Moreau's beastly creatures rather than the sadistic doctor. At the close of his novel, the narrator, having witnessed Moreau's twisted science, cannot help but see the bestial in the everyday habits of his human kin. At best, Moreau's experiments are a hubristic attempt to overcome the division between man and animal. At worst, they reveal the lie of science's enlightenment pretensions; the pursuit of science makes Moreau more grotesque than any of his beasts. The reader's dislike of Moreau and revulsion at encountering the doctor's concoctions feels justified.

Beliaev made science cement the boundary between man and animal in his attempt to adapt Wells's science-fiction theme to an inchoate, Soviet ideology in which technology could only make man more human and science had to be shown in a positive light. Beliaev's doctor likewise sees science as a wedge between the human and the animal, but Beliaev, unlike Wells, supports this claim. The problem with man, Salvator explains in the climactic trial scene, is "that he has not ceased to be an animal… rude, evil, and foolish."[109] Pressed on why he created an amphibian man, Salvator replies that "man is not perfected (*sovershenen*)" and science can grant him further evolutionary advantages.[110] Ignorance and the rejection of science keep man from perfecting himself, from harnessing technology to direct evolution and leave at a greater distance the remnants of our animal past. Where Wells's animal-human hybrids are pain-stricken and grotesque, Beliaev's are charming curiosities, Ichthyander chief among them.

[108] H. G. Wells, *The Island of Doctor Moreau* (Penguin Books, 2005), 73-5.
[109] Aleksandr Beli͡aev, *Chelovek-amfibii͡a: nauchno-fantasticheskiĭ roman* (Zemli͡a i fabrika, 1929), 178.
[110] Ibid., 180.

At the same time, Salvator's explanation reads like Beliaev's excuse for deliberately frightening the reader. Even if Beliaev's use of the grotesque rests on the reader overcoming her revulsion, it still relies on that initial shock, a move that Beliaev further defended in an afterword to the story which was included in both the story's first publication in a 1928 issue of *Around the World* and the book edition of the work that was published later the same year.[111] There, Beliaev spelled out the already overt antireligious subtext of his story. *The Amphibian Man*, Beliaev claimed, was based on true events. Beliaev explained that his fictional doctor, Salvator, was based on the Argentinian physician Salvador Mazza, who augmented locals with grotesque, "useful" body modifications such as altering arms so that they might bend 180 degrees and cutting pockets into skin. In Beliaev's telling, the real-life Salvador won the admiration of local peasants for these experiments. Claiming to quote Salvador Mazza himself, Beliaev wrote that these adjustments were "for the requirements of contemporary civilization." The real-life Salvador was similarly brought to court by an ignorant public in 1926. Beliaev further stressed the antireligious use of his story when he drew a comparison between the trial of Salvator and the Scopes trial. The difference between the Scopes "monkey trial" and Salvator's experiments, Beliaev observed, lay in the fact that "Scopes taught the *theory* of evolution, and Salvator realized that theory in *practice*, artificially transforming (*preobrazovat'*) the human body."

Beliaev also insisted that the frightening aspects of his story were in keeping with the natural course of evolutionary development. While the particular animal hybrids described in *The Amphibian Man* do not exist, Beliaev admitted, nature does provide its own fair share of deformities, offering as evidence the existence of a tailed child from Samoa and one-eyed animals, which Beliaev referred to as "freaks" (*urody*). Placing these genetic aberrations on the

[111] Aleksandr Beli͡aev, "Posleslovie k romanu 'chelovek-amfibii͡a,'" *Vokrug sveta*, no. 13 (1928), 200–202.

geographic periphery was in keeping with the standard fare of *Around the World*, which was full of exotic adventure stories set far from the imperial core. Alongside this explanation appeared illustrations of the tailed child, a one-eyed piglet, and a diagram illustrating Haeckel's law, according to which the human embryo, in the course of gestation, passes through stages of development equivalent to the evolutionary journey from lower to higher forms. In Beliaev's example, one sees the human embryo first resembling those of a lizard, a hen, and a deer before becoming fully human. Such images, Beliaev explained "all look fantastic enough, but, nevertheless, this play of nature is fact, and not fantasy."[112]

Beliaev's parade of oddities and language of "freaks" struck a similar tone to the stories about human evolution that ran in mainstream anti-religious publications. Compare, for example, Beliaev's presentation with the article "Are Humans Related to Monkeys?" (*Rodn͡ia li chelovek obez'͡ianam*) by professor N. A. Flerov in a 1926 issue of *The Godless* (*Bezbozhnik*), the official journal of the League of Militant Atheists.[113] To demonstrate the evolutionary proximity between man and other members of the animal kingdom, Flerov offered readers a number of medical oddities, including Haeckel's observations about the similarities between an early-stage embryo and "lower" forms of life accompanied by a diagram of human fetal development. Flerov also provided an illustration of a "dog-man," a person who, in the 1870s, traveled around Russia and showed off his abnormally long facial hair in exchange for money. Such "bestial marks" (*zverinye primety*), Flerov explained, usually went away over the course of human gestation, but they occasionally persisted for an individual's entire life, resulting in "various freaks" (*urodi*). These traits, he assuaged his readers, which had previously been thought of as God's punishment, could now be safely and soberly understood as the product of evolution.

[112] Ibid.
[113] N. A. Flerov, "Rodn͡ia li chelovek obez'͡ianam," *Bezbozhnik*, no. 3 (1926): 6–7.

Beliaev conceded that Ichthyander's shark-lung transplant was not currently possible but ventured that science may catch up, for, with the "dizzying" pace of medical science, such an operation seemed "less fantastic than it would have a few decades ago." Beliaev quoted *The Conquest of Life* by Voronoff, who wrote that the close of the century there still existed a "dogma" according to which "only nature is capable of supplying a living being with the intended organs," a belief that has been challenged by the "daring idea that man has the right to participate in the creation of life." Beliaev added that it remained unknown where the "boundary" of that "daringness" would be.[114]

Reality and fantasy remained interlinked. Reality was itself sufficiently "fantastic" to permit flights of fancy, as the limits of human possibility and form remained unknown. Transgression, including the grotesque, emphasized this unclosed, open-ended journey. At the same time, the genetic aberrations that the reader might find revolting were, in fact, drawn from reality. Thus, they were not fantastic at all. Once citizens became acclimated to the scientific reality of evolution and the accompanying possibility that people might direct it, the "freaks" of nature would cease to seem grotesque.

A similar case for the scientific firmness of *The Amphibian Man* was made in a forward by V. Potemkin that accompanied the second and third editions of book, published in 1928 and 1929, the last before the novel's substantial rework and republication in 1938.[115] Potemkin stressed the scientific basis of Beliaev's interest in organ transplants, a branch of science with "practical utility" which distinguished it from "thoughtless" Western science fiction about surgical doctors, such as Maurice Renard's 1908 novel *Doctor Lerne, Demi-God* (*Le Docteur*

[114] Beli͡aev, "Posleslovie k romanu 'chelovek-amfibii͡a.'"
[115] V. V. Potemkin, "Predislovie," in *Chelovek-amfibii͡a* (Leningrad: Zemli͡a i fabrika, 1929), 1–4.

Lerne, sous-dieu).[116] Potemkin admitted that there existed some controversy over the possibility of interspecies transplants, like those depicted in Beliaev's story, but the successes of experimental medical researchers such as Alexis Carrel, Nikolai Kravkov, Eugen Steinach, and Serge Voronoff demonstrated the eminent possibility of such surgeries. In this, "*fantastika* bit by bit [was] transforming into reality." Potemkin did not address the frightening mood of *The Amphibian Man*, as the author himself had, but Potemkin's stress on the real, "useful" scientific basis of Beliaev's story offers a point of reference in tracking how such experimental technology was decisively excluded from the category of the "real" as the Stalinist program of science solidified.

The pantheon of surgeons and biologists cited by Potemkin represented a popular excitement about human malleability that would soon change. The French surgeon Alexis Carrel was a leading expert on organ transplantation, for which he had won the Nobel Prize in Physiology or Medicine in 1912. Carrel held renown in the Soviet Union, where he became a corresponding member of the Russian Academy of Sciences in 1924. This honorary position was never rescinded despite Carrel's soon becoming a proponent of eugenics of the emphatically anti-Soviet variety. In 1935, Carrel published *Man, the Unknown*, where, among other things, he argued that the proletariat owes their lower social class to inherited defects.

For those in the 1920s, Voronoff and Steinach stood for the ability of the biological sciences to overcome the limits imposed by nature. Voronoff had learned surgical techniques from Carrel and gained international renown, along with fellow pioneering endocrinologist Steinach, for his research into the "rejuvenating" effects of hormones. Their experiments gripped the Soviet popular science press of the 1920s, where it was varyingly used to ponder the

[116] Renard's story was itself heavily derivative of *Doctor Moreau*, and Renard included an acknowledgement to Wells in the introduction to his novel.

possibility of human immortality and prove the nonexistence of God.[117] Though Voronoff was not a eugenicist, as he did not meddle directly with genetic matter, he called attention to how his grafting technique improved upon natural evolution, a subtext that was made explicit in coverage of his experiments. For example, in 1928 the literary and popular science journal *Thirty Days* ran an essay by Voronoff titled "To Live Young," the title of which was framed by a smiling young woman and a pair of chimpanzees.[118] Among other points, Voronoff discussed how the evolutionary proximity between humans and monkeys allowed for the successful transplantation of simian organs into people.[119]

A 1934 issue of *Nature*, the leading Soviet journal on the natural sciences, displays the reappraisal of Steinach and Voronoff's miraculous experiments within a Stalinist scientific paradigm more reluctant to permit manipulation of the human body. The issue opened with an article by the Soviet philosopher and scientist Bonifaty Kedrov on the "crisis in the natural sciences." Emphasis was placed on the interlocking priorities of further developing agricultural technologies, giving the sciences a proper socialist foundation, and the mounting threat of fascism. Following the theme of the ongoing reorientation of the natural sciences were a pair of articles that made direct reference to Steinach, Voronoff, and the fraught attitude towards using biological science to direct human improvement: "Directing the Mechanics of Animal Development" by the biologist Mikhail Zavadovsky and "Eugenics in the Service of National-Socialists" by Hermann Muller.

Zavadovsky made passing reference to both Voronoff and Steinach as he recounted recent accomplishments in livestock breeding, such as artificial insemination and altering the

[117] Eric Naiman, "Discourse Made Flesh: Healing and Terror in the Constriction of Soviet Subjectivity," in *Language and Revolution: The Making of Modern Political Identity* (Routledge, 2002), 246.
[118] Sergeĭ Voronov, "Zhit′ molodym," *Tridt͡sat' dneĭ*, no. 5 (1928): 64–72.
[119] Ibid., 68-69.

gender of livestock embryos using hormones. Zavadovsky recounted how, upon opening a lab to study animal development at Moscow State University, he received a letter from Steinach, who expressed admiration for the robust state support that Zavadovsky received for his work. Steinach bemoaned having to maintain his lab at his own expense.[120] Zavadovsky's team also investigated a technique popularized by Voronoff, whose experiments Zavadovsky derisively characterized as "sensational in all parts of the world."[121] Zavadovsky reported disproving Voronoff's claim that wool production could be increased by grafting an additional testicle to a ram. In these mentions of Voronoff and Steinach there was an implication that the superior funding and organization of socialist science allowed Zavadovsky to succeed where his more sensational foreign forerunners had fallen short. Though their association with radical surgical improvements to human subjects had been clearly played up in the Soviet press just a few years earlier, it now went unremarked upon.[122] Within the circumscribed space of livestock and plant cultivation, Zavadovsky bragged that his work in "zootechnics" would lead scientists from simply imitating nature "to the control of a living organism, as an engineer controls a machine."[123] This Gastevian simile, which one might have been directed towards controlling the human body, could persist as long as it was directed away from people and towards plants and animals.

The potential ideological pitfalls of scientifically managing human development were addressed in Muller's article, "Eugenics in the Service of National-Socialists," which immediately followed Zavadovsky's. Muller did his best to rid genetics of its Nazi connotations.

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[120] M. M. Zavadovskiĭ, "Upravlenie mekhanikoĭ razvitiia͡ zhivotnykh," *Priroda*, no. 1 (1934), 93-94.
[121] Ibid., 98.
[122] For example, the ram operation that Zavadovsky discredits is described by Voronoff alongside several other animal experiments in *The Conquest of Life*. The bulk of Voronoff's book concerns how these experiments would affect human subjects.
[123] Zavadovskiĭ, "Upravlenie mekhanikoĭ razvitiia͡ zhivotnykh," 93.

Nazi race science, Muller explained, attempts to distract the proletariat with the suggestion that the "real struggle of the day is in the biological rather than the economic sphere."[124] By arguing that the Nazi program of eugenics was in bad faith, Muller hoped to show that Nazi appeals to genetic science "in reality have no relation to the principles of genetics," a branch of science which retains its place "in the improvement of the life of mankind […] just like the use of chemistry, or mechanization, or medicine."[125] Muller further qualified that applied genetic science in no way resolves the economic and social problems. His contortions to defend genetics against its association with Nazism or the charge of reductionism contrasts sharply with Zavadovsky's boastful tone. Little room was left to envision or celebrate the possible applications of human genetic science.

A heavily revised edition of *The Amphibian Man* came out in 1938, and Beliaev's revisions attest to the new tone and orientation of Stalinist science. Grotesque details about the frightening "real-life" experiments to which Beliaev had alluded in his original afterword were removed. Additionally, Beliaev sometimes wrote out characters' fright at the sight of scientific novelties. Both the blurring of the boundary between man and animal and the depiction of characters reacting to that blurring with disgust were lessened.

In the original version of *The Amphibian Man*, Christo, a naive interloper, stumbles upon Salvator's "garden of wonders," where the doctor's various biological creations roam. Christo is shocked to see children surgically altered to appear more bestial. "Each of them had some strange characteristic," Christo observes. "Some had long monkey tails. […] Several children had arms and legs that seemed to be turned out at the joints." Others had pockets sewn to their skin or a surgical modification that allowed them to "run at the same speed both forwards and

[124] G. G. Mëller, "Evgenika na sluzhbe u nat͡sional-sot͡sialistov," *Priroda*, no. 1 (1934), 100.
[125] Ibid., 105.

backwards." Monkeys, meanwhile, "had absolutely no hair on their bodies." Christo is left befuddled. He "could not decide whether they were really monkeys, or people."[126]

All of the specific surgical enhancements provided to the children were removed from the 1938 edition. Instead, Beliaev wrote:

> These children were the patients of Salvator. Many of them had undergone serious operations and owed their lives to Salvator. The recovering children played, ran in the garden, and then, when they had recovered, their parents took them home.[127]

Not only do the children no longer appear like monkeys, but the monkeys also appear more human. Tailless and lacking fur, they chat with the children. As before, Beliaev concluded, "Christo at times could not decide whether these were real monkeys or people."[128] Salvator's surgical technology now serves an emphatically medicinal purpose. The Stalinist vision of science had no room for the revulsion engendered by violations of the human body: Science could speed evolution and transform the "elemental" animal into "conscious" man, but the inverse was not allowed.

Other changes between the two editions show Beliaev dialing down more fearsome details or simply removing lines about Christo's alarm at what he had seen in Salvator's "garden of wonders." Two examples prove illustrative:

In the original edition of *The Amphibian Man*, Christo, after taking in Salvator's experimental work, "thought that he was delirious, that he had been overcome by nightmares." He splashes water on his face "but the nightmares didn't disappear."[129] In the revised edition, Christo "thought that he was delirious" and splashes water on his face, "but nothing helped."[130]

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[126] Beli͡aev, *Chelovek-amfibii͡a* (1929), 48-9.
[127] Aleksandr Beli͡aev, *Chelovek-amfibii͡a* (Leningrad: Detskai͡a literatura, 1938), 39.
[128] Ibid., 40.
[129] Beli͡aev, *Chelovek-amfibii͡a* (1929), 44.
[130] Beli͡aev, *Chelovek-amfibii͡a* (1938), 36.

Beliaev invokes the same wonder, but tiptoes around the word "nightmares," used twice in the original. Revulsion is reduced to disbelief.

Elsewhere, the majority of grotesque details remain, but the most outlandish and those that touched on the human are omitted. Beliaev removed a passage in which he describes Christo's fright upon encountering the "living corpse" of a local native amid Salvator's creations. The body, "deprived of heart and consciousness," would suddenly "come to life," its arms and legs "twitching convulsively" when stimulated by an electric current.[131] A proceeding passage in which Christo encounters various two-headed beasts and hybrid monstrosities was preserved. One can see Beliaev laboring in his revised story to see whether a certain kind of boundary crossing, central to the repulsive effect of the grotesque, could be retained, while specific boundaries between man and animal, living and dead might be kept intact and a general fear downplayed. The chorus of negative reviews upon the novel's republication answered that this attempt to curb revulsion had not succeeded, as Beliaev's primary animal-human hybrid, the titular amphibian man, remained. Beliaev's *The Amphibian Man*, which once stood on the cusp of real science, had now trespassed its limit in tone and subject matter.

The Amphibian Man received little critical attention when it was first published, but its republication attracted a number of critical responses. As was the case with *Professor Dowell's Head*, the original reviews of *The Amphibian Man*, published in the late 1920s, showed a confusion over how to assess *fantastika*, with Salvator's fantastic technology attracting criticism for its scant technical specifics. Critics in the NEP period did not indicate that Beliaev's fictional surgeries were unreasonable, only that they were underresearched. By the late 1930s, that was no

[131] Beli͡aev, *Chelovek-amfibii͡a* (1929), 47.

longer the case, and reviewers harped on the impossibility of Beliaev's scientific premise, especially as it concerned the transformation of the human body.

A 1928 *Izvestia* review of *The Amphibian Man* written by N. Kar was critical of the book while affirming the potential educational value of *fantastika*. The publication of *The Amphibian Man*, Kar began, offered an opportunity to reflect on the role of the science-fiction novel in literature. Kar argued that Beliaev failed to attract the masses to science, though he conceded that it was no easy task. The Soviet Union continues to lack a "charming fabulist, in love with the scientific discipline and capable of giving the country a high artistic interpretation of a scientific theme."[132] Beliaev's mistake, Kar wrote, was that his novel fails to educate the reader. The result was a "mongrel of scientificness, turning into meager *fantastika* with a superficial social tendency." Professional envy likely motivated Kar's criticism. Bar Zellers identifies N. Kar as Nikolai Karpov, the author of a number of unsuccessful works of *fantastika*, including a 1925 novel titled *The Rays of Death* (*Luchi smerti*).[133]

Discussion of Beliaev following the republication of his work in the late 1930s followed the by then well-established criteria that *fantastika* ought to be firmly based on and popularize real science. It had become obvious that Beliaev's treatment of his subject was unrealistic. For example, in a 1939 article in *Children's Literature* titled "Pathways of *Nauchnaya Fantastika*," Vladimir Vladko, best known for his 1935 story "The Miracle Generator" (*Chudesnyĭ generator*), praised the exciting plotting of Beliaev's fiction but gently chided the author for his unrealistic premise. Beliaev's mistake in his story about "a man with a mix of respiratory organs for water and air environments" arose from his "not using those opportunities to enhance the educational value of his novel." While authors of *fantastika* must always take *some* creative

[132] P. N. Kar, review of Chelovek-amfibii͡a, *Izvestii͡a*, August 8, 1928.
[133] Zeev Bar-Sella, *Aleksandr Beli͡aev*, 243.

liberties with science, such assumptions, Vladko argued, should always have a "scientific justification" and a "realistic perspective," qualities *The Amphibian Man* lacked.[134]

Anton Vital'evich Nemilov separated realistic from fantastic surgery in a harsh afterword that accompanied the 1938 edition of *The Amphibian Man*.[135] Nemilov, a renowned specialist in the field of histology and prominent popular science writer, focused on the infeasibility of the "scientific" procedures in the revised text. Tissue and gland transplants are possible, Nemilov admitted, and were even an admirable scientific project. In keeping with the dicta of the "war on nature," which guided much public science discourse of the 1930s, Nemilov affirmed that the goal of both workers and biologists (such as "Darwin and his followers Timiryazev, Michurin, [and] Lysenko") was the "reworking of nature."[136] Like others, Nemilov contextualized the novel by enumerating advances in organ and tissue transplants, primarily experimental attempts at organ transplants between various animals. Such work was still in its infancy. In one graphic example, he detailed an animal experiment in which scientists grafted mammary tissue on the site where an ear would normally grow.

While science might "rework nature" in altering the bodies of animals, there was a resistance to similarly tinkering with human bodies. Nemilov reasoned that man might receive an organ from an animal close to him in the evolutionary chain, such as a great ape, but to make use of a fish organ, as did Ichthyander, would be incredibly difficult. Nemilov's objection, though surely grounded in his real scientific expertise, betrayed a fear about the grotesque implications of modifying the human body, as Nemilov fixated on the monstrous consequences that the

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[134] V. Vladko, "Puti nauchnoĭ fantastiki," *Detskai͡a literatura*, no. 7 (1939), 14.
[135] For more on Nemilov and his role as an author of popular science writing, especially his 1925 book *The Biological Tragedy of Women*, see Eric Naiman, *Sex in Public: The Incarnation of Early Soviet Ideology* (Princeton: Princeton University Press, 1997), 191-198.
[136] A. Nemilov, "Posleslovie professora A. Nemilova," in *Chelovek-amfibii͡a* (Leningrad: Detskai͡a literatura, 1938), 177.

surgery performed in *The Amphibian Man* would entail if performed in reality. A real-life Ichthyander, Nemilov observed, would be "unlikely to preserve a human form" because his two sets of lungs would require him to resemble a massive fish, a "disgusting (*bezobraznyĭ*) creature, absolutely helpless on land."[137] Nemilov reminded his reader that those who wish to explore the far reaches of nature neither "augment themselves with the wings of a bird, nor the gills of a fish;" rather, they build machines.[138] Nemilov determined that Beliaev has "completely broken with the laws of nature and his fantasy has no basis in reality, even in the future."[139]

Shklovsky, in his review of the 1938 edition of *The Amphibian Man*, showed a little more sympathy towards the difficulties that faced writers of *fantastika*. He responded to the severity of Nemilov's new afterword, which he quoted at length. The resulting novel, Shklovsky wrote, was a "strange amphibian: a purely fantastic (*chistofantasticheskiĭ*) novel to which the gills of scientific refutation are sewn."[140]

Nemilov's criticism of Beliaev's scientific premise was also cited by the critic A. Ragozin in a multi-page, extremely negative review of *The Amphibian Man* for *The Literature Review* in 1938. Ragozin found fault with Beliaev's the hackneyed, adventure plot and stiff dialogue, but the novel's chief sin was its scientific pretension. For Ragozin the only sanctified use of *nauchnaya fantastika* was the popularization of science, which necessitated that a work stays within the realm of scientific possibility. He mocked Beliaev's scientific premise for being too outlandish, characterizing a speech by Salvator about colonizing the bottom of the sea as "more enthralling than any *skazka."* Ragozin continued in a sarcastic tone: Unlike the daring Beliaev, "musty scientific thought has not yet dared cross the cherished boundary separating man

[137] Ibid., 180, 182.
[138] Ibid., 181.
[139] Ibid., 179-80.
[140] Viktor Shklovskiĭ, "*Chelovek-amfibiia͡*," *Detskai͡a literatura*, no. 20 (1938), 40.

from dolphins and crabs."[141] The common-sense solidity of that interspecies boundary, clear to Ragozin and his readers in the late 1930s, was something that biomedical science realistically destabilized ten years earlier.

In 1940, an entire issue of *Children's Literature* was dedicated to *fantastika*, and an article by a Professor Frolov, titled "*Fantastika* and Science" referred to *The Amphibian Man* in a discussion of the many forms of technological change that a writer of *fantastika* might document. Frolov began by making a distinction between Jules Verne, who described technological advances but not how they affected the "inner structure of man," and Wells, who brought *fantastika* into the domain of biology. Frolov saw Wells's treatment of biology as "very far" from the work of "contemporary experimental physiologists, especially in their work with higher animals, let alone man." In Frolov's eyes, Beliaev was similarly. The amphibian man "sins against physiological truth," as a fish-human hybrid would "excrete 70 liters of water, as is the case with frogs, who excrete as much water as they weigh."[142] Frolov spent the remainder of his short article complaining that writers of *fantastika* have not done enough to explore how technology might influence the "inner structure of man" but limited permissible changes to vague shifts in human psychology. Like Nemilov, Frolov distanced the "reality" of science from changes to human physiology and illustrated his point with gruesome details. If developments in neuroscience had any effect on humans, they would do so, Frolov suggested, without disgusting physical consequences.

A final example further demonstrates how the dreams of bodily transfiguration that had fueled Beliaev's NEP-era fiction had become taboo. Aleksander Ivich, a prominent, mid-century critic of *fantastika*, took aim at Beliaev's stories *Professor Dowell's Head* and *The Amphibian*

[141] A. Ragozin, review of *Chelovek amfibii͡a*, *Literaturnoe obozrenie*, no. 24 (1938), 13, 14.
[142] I͡u. P. Frolov, "Fantastika i nauka," *Detskai͡a literatura*, no. 4 (1940), 29.

Man in a 1940 article titled "The Science Fiction Story," which was published in *The Literary Critic*. In addition to scolding Beliaev for unrealistic extrapolations from his scientific premises, Ivich repeatedly pointed out how Beliaev violated the laws of nature, especially those governing the human body.

Both *Professor Dowell's Head* and *The Amphibian Man* were insufficiently scientific. Ivich pointed to Nemilov's afterword as evidence that *The Amphibian Man* "broke entirely from the real laws of nature" and ought to be stripped of the word "science" in the subtitle "a science-fantastic novel."[143] Ivich had a strong distaste for the novel's surgical themes. Dr. Salvator, Ivich reasoned, "absolutely ought to be tried for the mutilation (*iskalechenie*) of the boy, out of whom, without a clear scientific goal and while keeping his discovery entirely secret from his contemporaries, he created an amphibian."[144] In his criticism, Ivich sided with Salvator's fictional accusers, whom Beliaev had written to represent the intransigent religious opponents of scientific progress.

Ivich ruled that the scientific import of *Professor Dowell's Head* was no greater than that of *The Amphibian Man*. He observed that the experiments to revive detached organs continue to his day, so Beliaev had not misstepped in his choice of subject matter; however, Beliaev erred when he skimped on the details of how such "fantastic" experiments might be undertaken, skipping straight to their consequences. It would have been useful, Ivich wrote, to depict man's study of physiological processes and his ability to influence them. Ivich was incensed at the suggestion that surgery might be used to resurrect someone: "Such a monstrous (*chudovishchna͡ia*) operation could not be accepted as a real possibility," for such an

[143] A. Ivich, "Nauchno-fantasticheska͡ia povest′," *Literaturnyĭ kritik* no. 7-8 (1940), 156.
[144] Ibid., 158.

"immortality contradicts all that we know about nature."[145] Ivich accused Beliaev of both "mechanism" and "idealism," the two chief sins of scientific thinking of the time (though they were usually thought of as in opposition to one another). *Professor Dowell's Head* "brings the reader to the realm of idealistic dreams of miracles and immortality."[146]

In his conclusion, Ivich cited the following passage from a chapter from Engels's *The Dialectics of Nature* titled "The Part Played by Labor in the Transition from Ape to Man" to argue that humans should not be subject to scientific tampering:

> we are reminded that we by no means rule over nature like a conqueror over a foreign people (*narod*), like someone standing outside nature—but that we, with flesh, blood and brain, belong to nature, and exist in its midst, and that all our mastery of it consists in the fact that we have the advantage over all other creatures of being able to learn its laws and apply them correctly.[147]

Ivich stated that the conflict between Beliaev's *fantastika* and Engels, in the cited passage, is self-evident: "It is as if Engels wrote these words specifically in opposition *The Amphibian Man* and *Professor Dowell's Head.* It is precisely like conquerors (*zavoevateli*) that Beliaev's surgeons impinge upon human nature."[148] However, Ivich, in search of support for his discomfort with the direct alteration of man, misreads Engels. Engels divides reasoning man from nature but emphasizes the continuity between the human and the natural world. The very same passage, Engels's mandate to "learn [nature's] laws and apply them correctly," had only recently been cited as justification for the various philosophies and sciences of improving the human. Ivich seems most drawn to Engels's simile of "[ruling] over nature like a conqueror over a foreign people," which he uses to make a point about the violence of direct interventions on the

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[145] Ibid., 159.
[146] Ibid., 160.
[147] Ibid., 161; English translation from Frederick Engels, "The Part Played by Labour in the Transition from Ape to Man," in *Dialectics of Nature*, trans. Clemens Dutt (Progress Publishers, 1934), https://www.marxists.org/archive/marx/works/1876/part-played-labour/index.htm. The parenthetical Russian is Ivich's own.
[148] Ivich, "Nauchno-fantasticheskai͡a povest′," 161.

body, though Ivich's interpretation contradicts Engels. To view the human body as an extension of nature, to accept that humans "exist in [nature's] midst" rather than "standing outside nature" would be to apply a common lens of scientific interrogation to human, animal, and plant bodies alike. Ivich made the opposite point: Beliaev's surgeons (Ivich underscored their profession) are like Engels's "conquerors" in doing violence to a human subject, who, Ivich implied, ought to be treated differently than animals or plants. All surgery, in Ivich's reading, becomes elevated to intrahuman violence.

Beliaev's edits to *The Amphibian Man* and the responses it garnered indicated a new scientific- aesthetic "common sense" concerning experiments on the human body. Animals, as a continuation of the natural terrain, were open to "correction," but the human was outside that territory. Frightening details about organ transplants might have once been used to smash superstition and remind readers that evolution muddied the distinction between man and beast. Now, readers were reassured that the hierarchy of evolutionary progress distanced them from unthinking animals. Readers could find comfort in the fact that surgical alterations, such as those imagined by Beliaev, were beyond scientific possibility. Frolov's use of the word "sin" and Nemilov's directly invoking the "laws of nature" are telling. Ironically, science had shifted from a force that could combat religiosity to one that was spoken about with a vocabulary of religious reverence. This consensus was expressed in terms that drew an equivalency between physical revulsion (fright, disgust, perceived monstrousness) and the limits of science. Such delimiting seemed less a product of sober scientific discernment than a new gut conviction that Soviet science would never produce grotesque results.

The Underwater Farmers **and Beliaev in the 1930s**

With the publication of *The Underwater Farmers* (*Podvodnyĭ zemledel't͡sy*) in 1930, Beliaev abandoned the theme of human transfigurement and adopted a model of near-future *fantastika* that would become dominant for the next twenty years. While not nearly as popular as *Professor Dowell's Head* or *The Amphibian Man*, *The Underwater Farmers* signaled a decisive break with Beliaev's earlier fiction, as the author responded to the criticism so far leveraged against *fantastika*.[149] The technological novum in *The Underwater Farmers*, the ability to dwell in the shallow oceans and harvest seaweed, aids Soviet industrialization rather than reimagining human biology. Though characters still experience fear before novel technology in *The Underwater Farmers*, the stakes of such fright are appropriately lowered. Transgression, a former element of both *fantastika* and the science imaginary more largely, is absent.

Between the publication of *The Amphibian Man* in 1928 and the publication of *The Underwater Farmers* in 1930, Beliaev wrote a great deal, but his treatment of science remained relatively consistent. In 1929 alone he wrote two novels and a number of stories. The first of his 1929 novels, *The Air Seller* (*Prodavet͡s vozdukha*), tells the frightening story of an evil businessman who plans to extract oxygen from the atmosphere and, once the world's inhabitants are suffocating, sell it back to his captive market. In *The Man Who Lost His Face* (*Chelovek, poterі͡avshiĭ lit͡so*), Beliaev describes a comedian named Presto who has risen to fame thanks to his skill at making bizarre facial expressions. Presto falls for a beautiful woman who cannot bring herself to love someone so hideous, and he seeks the help of a doctor who surgically alters his face to appear beautiful. As a result of the operation, Presto loses his expressive face, and his acting career implodes. He grows embittered and begins seeking revenge by deforming the faces

[149] Leonid Geller, *Vselennai͡a za predelom dogmy: razmyshleni͡ia o sovetskoĭ fantastike* (Overseas Publications Interchange Ltd, 1985), 72; Li͡apunov, *Aleksandr Beli͡aev*, 72.

of others. In 1940, Beliaev published a heavily revised edition of *The Man Who Lost His Face* under the new title *The Man Who Found His Face* (*Chelovek, nashedshiĭ svoë li͡so*). Similarly to how Beliaev downplayed fear before biomedical science in his other republished titles, in this new edition Presto uses the occasional of his surgery to reflect on the injustices of capitalism rather than growing alienated.

In *The Underwater Farmers*, Beliaev describes a group of enterprising Soviet citizens who, upon realizing the untapped agricultural potential of seaweed, decide to build an underwater farm off the Russian coast in the far East. With the help of a scientist in Petersburg, their idea comes to life. The novel alternates between episodes showcasing daily life on the underwater farm, wonder-filled passages of the Soviet workers exploring their ocean surroundings, and scenes of Pinkerton-esque suspense as the Soviets spar with a group of Japanese fishermen determined to wreck the underwater farms. A conversation between characters about how their work contributes to the First Five-Year Plan places the story in the immediate future.

Beliaev had set much of his fiction in the present before—most of his full-length work besides his 1927 novel *Struggle in Space* (*Bor'ba v ėfire*) had a contemporary setting—but never had he so downplayed the role of the scientist or the potential danger of technology. In *The Underwater Farmers*, technology is unambiguously good and follows directly from the needs of enterprising workers, reflecting the long-standing push by authorities to have the proletariat "lead" science. Such an approach to science can be contrasted with Salvator's self-directed (if beneficent) research in *The Amphibian Man*. New technology in *The Underwater Farmers* only arises to fill a gap demarcated by the workers themselves. Interestingly, the rationale that the upstart workers have for colonizing the shallow oceans—that it opens up an expanse of

previously unreachable natural resources to development—evokes Salvator's rationale for giving gills to Ichthyander: granting humans access to the untapped resources of the ocean. Technology had changed from surgical intervention to workaday equipment, a contrast that would be sustained throughout the book.

Beliaev greatly reduces the visceral shock generated by technological novelty, which had been one of the primary drivers of dramatic action in his previous fiction. Scenes of light humor between those living in the underwater farm break up more adventure-focused portions. Vanushka, a seasoned hunter, worries about how to balance working below the ocean's surface with spending quality time with his wife, Marfa, who lives on the nearby shore and refuses to join the crew underwater. When pressed, she insists that it is a "sin for a baptized person to live underwater, for water was created by the Lord God for fish, not for man." She calls her husband an "atheist" (*bezbozhnik*) and a "*vodi͡anoĭ*," a water spirit from Slavic mythology who often appears as an old man plastered with moss and muck.[150] Both insults echo those lobbed by the antagonists of *The Amphibian Man*. A bishop labels Salvator "godless," and the latter appellation, "*vodi͡anoĭ*," recalls the term that Beliaev's pearl divers use for Ichthyander: "sea devil" (*morskoĭ d'i͡avol*). When Vanushka offers his wife a salary to join him and perform household chores in the workers' underwater habitation, she hesitantly agrees, and all are surprised at how quickly she becomes accustomed to the new environment. Marfa's only holdout is a refusal to switch to an electric samovar. She is very often referred to as "old lady" (*starukha*), underscoring her generational remove from those young Soviet citizens more readily able to embrace the new world of socialism. The drastic difference between Marfa's teasing her husband and the trial scene in *The Amphibian Man* speaks to how the trope of fear before science

[150] Aleksandr Beli͡aev, "Podvodnye zemledel′t͡sy," in *Sobranie sochineniĭ v vos'mi tomakh*, vol. 3, (Molodai͡a gvardii͡a, 1963), 278-9.

had been reworked. Marfa's religious objection diminishes when she experiences the continuity between new and old ways of living. In contrast, in *The Amphibian Man*, religious fear before Ichythander identifies a fundamentally different perspective on human design.

Beliaev's few uses of the term "fantastic" in *The Underwater Farmers* similarly downplay the transgressive power of technology. Certain eminently realizable or actually existing technologies might *appear* fantastic but are not in reality. Before, *fantastika* celebrated a horizon of technological possibility so vast that it was at times difficult to distinguish the realistic from the fanciful. Now, the real was easy to distinguish from the fantastic, which could only appear as a kind of misapprehension.

For example, after the central characters hatch a plan to build an underwater farm, they petition local officials to procure the necessary materials to begin their operation, and, in a moment that would become a trope of Socialist Realism, the eager workers meet resistance from a small-minded bureaucrat: "But the man in glasses [the bureaucrat] was against 'fantastic projects.'"[151] The bureaucrat's error is made obvious by the narrative framing of the passage. *The Underwater Famers* begins with the characters having already built their underwater farm, then leaps back in narrative time to recount the farm's genesis. Beliaev repeatedly informs the reader of the bureaucrat's glasses, and this epithet marks his physical remove from the labor of the workers in the field. Beliaev's use of quotation marks further mocks the bureaucrat's misperception. The reader recognizes that building an underwater farm is not a "fantastic" idea, even if she might have thought it so before beginning the novella.

The second instance of the word "fantastic" in *The Underwater Farmers* occurs as Vanushka explores an underwater cave. An otherwise unremarkable passage about the cave's

[151] Ibid., 244.

interior demonstrates the newly delineated relationship between humans and nature in this reworked version of *fantastika*:

> It was good that Vanushka had such a strong lamp! In bright light [the cave] was not frightening.
>
> The further Vanushka ventured head, the more elegant, richer, and beautiful the walls of the cave became. Stalactites descended from the ceiling in *fantastic* laces. The points of stalagmites rose from the bottom of the cave to meet them. In some places, stalactites and stalagmites met, forming elaborate columns, reminiscent of Chinese ivory carvings.[152]

Here, the fantastic is synonymous with the unexplored reaches of the natural world which are made visible only thanks to advances in technology. Such lush description had long been a fixture of adventure literature. A whiff of the exotic can be sensed in calling the cave's interior evocative of Chinese ivory. Technology is not frightening, as it had been in Beliaev's earlier work. Instead, the natural carries the potential to frighten and becomes less wild with the help of technology.

In its final occurrence, the word "fantastic" is reduced to an allusion. Volkov and Gruzik, two of the main characters, notice that their underwater habitation has grown to a bustling center of activity. When they exit their underwater home, they are no longer alone. They now encounter "numerous workers, who slowly walked in diving suits, reminiscent (*napominai͡a*) of fantastic Martians."[153] The fantastic shifts from an actual object in the world to a point of reference. In appending the *"*fantastic" to "Martian," Beliaev draws a line between the realistic fictional world in which *The Underwater Farmers* takes place and the kind of interstellar *fantastika* that came before it. In earlier *fantastika,* Martian bodies represent something unlike man, an alternative evolutionary path. Beliaev invests diving technology with the power to approximate fantastic

[152] Ibid., 256. Emphasis added.
[153] Ibid., 296.

transformation while reassuring the reader that such fantasy is nothing more than a referent. The reality of *The Underwater Farmers* derives from denying the possibilities of an earlier iteration of *fantastika*.

Following the final installment of *The Underwater Farmers* was an unattributed article titled "Fact and fiction in the novel *The Underwater Farmers*" which further brought to heel the fantastic and shed light on how *fantastika* could be useful. "The novel of A. Beliaev *The Underwater Farmers* not only attracts our attention to the development of the ocean's riches, seaweed, but aims to contribute to [that development's] intensity in the future," the article began.[154] *Fantastika* should not only bring attention to science, as science popularizers had done before; it should also guide that interest in a useful direction. The article went on to emphasize the abundance of seaweed and salt available in the ocean and ventured that the fictional, underwater dwellings in *The Underwater Farmers* were not outside the realm of scientific possibility. "The project of the rationalization and mechanization of planting and picking seaweed is not at all fantastic. […] True, there is still a way from here to 'underwater farming,' but the idea of it is far from fantastic," the author concluded.[155] As in the story itself, one sees a tension between the desire to emphasize how "fantastic" were the accomplishments of the Soviet state while chastising the reader for considering them fantastic in the first place. Beliaev's novel was symptomatic of a break in popular science discourse away from science for its own sake towards a more explicitly politicized, "useful" form of science that was directly tied to the needs of the developing Soviet economy. [156]

[154] "Chto pravda i chto vymysel v romane 'podvodnye zemledel′t͡sy,'" *Vokrug sveta*, no. 22–23 (1930): 359.
[155] Ibid.
[156] Andrews, *Science for the Masses*, 130-134

Beliaev continued to publish throughout the 1930s even as criticism mounted against the sort of *fantastika* with which he had begun his career. Eventually, he encountered so much difficulty supporting himself on writing alone that he resumed practicing law. Not all his Stalin-era stories were as explicitly earthbound as *The Underwater Farmers.* Beliaev drew inspiration from Tsiolkovsky and produced several stories about space travel, including a 1933 novel titled *A Leap into the Void* (*Pryzhok v nichto*), which he later rewrote with Tsiolkovsky's direct input in 1935. Unfortunately, Tsiolkovsky passed away that same year, and they were not able to complete the project. In 1936, Beliaev published the result of their joint labor, *Star KETs*, a story about everyday life aboard a space station, the title a clear allusion to his recently deceased mentor. Despite its cosmic setting, the fantastic remained reduced. Similar to *The Underwater Farmers*, a focus on the continuity of domestic life as people explored space showed people fundamentally unaltered by technology.

Two essays from the early 1930s found Beliaev thinking aloud about the ideological shifts that had taken place over the course of the First Five-Year Plan and rendered the original incarnation of his brand of *fantastika* incoherent: a 1933 editorial addressed to H. G. Wells titled "The Lights of Socialism, or Mr. Wells in the Shadows" and a 1934 editorial titled "We Will Create Soviet Science Fiction."

In the 1933 editorial, Beliaev scolded Wells for his 1921 book, *Russia in the Shadows*, in which Wells spoke critically of Soviet Russia immediately following the revolution. Beliaev entreated Wells to return to Russia and see how those wild visions of the "Kremlin dreamer," Wells's epithet for Lenin, had become reality. Wells's criticism was an attractive target for

flipping the "real" and the "fantastic" as they had appeared to naive Westerners, and Beliaev was not the only one to publicly rebuke the Western science fiction author.[157]

Beliaev chastised the supposedly visionary Wells for doubting the utopian aspirations of the Bolsheviks. With his vision of the Dnieper dam, Lenin "saw more here than the professional prophet, the famous English writer." In the shadow of the dam "you 'breathe the future.'" Beliaev triumphantly marked Wells's error:

> Do you hear that, the famous writer, the unsurpassed fantast, prophet and seer of the future, the specialist in social utopias? The fantasy city has been built! Come and visit and look at it with your own 'clairvoyant' eyes. Compare it to your own cities in the shadows![158]

Here, as in *The Underwater Famers*, the real and the fantastic collapse in favor of reality's victory. Reality was still fantastic in that it seemed to exceed the bounds of what was natural, even as Beliaev boasted that the scope of the Soviet Union's accomplishments should be abundantly clear to anyone properly fantasizing about the future. Beliaev's rhetoric reflects the emerging figure of Stalinist utopia, which was no longer located in the future but in the already-existing present. The passage was all the more striking given Beliaev's own deep indebtedness to Wells. Tasked with both being more fantastic than a past generation of *fantastika* and emphatically realistic, *fantastika* was stretched to incomprehension. Beliaev soon articulated this tension explicitly.

Less than a year later, Beliaev published an article titled "We Will Create Soviet Science Fiction" in *Literary Leningrad*. There, he outlined in clear terms how a complete subjugation of

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[157] For example, Saslavsky makes a near identical point a year earlier in *Dnieprostroi: The Biggest Dam in the World*. In the introduction to an edited volume about Wells's influence on Soviet fiction, Galya Diment suggests that Beliaev appealed to Wells in hopes that the English writer might be able to reinvigorate Soviet science fiction, though, as she points out, it is unclear how Wells would have read Beliaev's plea given that Wells had no knowledge of Russian. See Galya Diment, "Introduction: 'The Wells Effect,'" in *H. G. Wells and All Things Russian*, ed. Galya Diment (Anthem Press, 2019), 6.

[158] Alexander Belyaev, "The Lights of Socialism, or Mr. Wells in the Shadows," in *H. G. Wells and All Things Russian*, trans. Galya Diment (Anthem Press, 2019), 194.

the fantastic to the real, as he had performed in his letter to Wells, made the genre very difficult to write.[159] Many critics, Beliaev noted, had complained about the fact that *fantastika* had nearly ceased to exist. Beliaev observed that he had been charged with writing *fantastika* that failed the requirement to "[show] the promise of the development of technology in a planned socialist economy." The difficulty of producing *fantastika*, Beliaev wrote, came from the problem of coming up with "assumptions" that were both firmly based on science and not simply a retelling of scientific fact, to find the "correct proportion between scientific and plot material." This dichotomy between form and content accurately characterized the schemata according to which Beliaev's many critics would continue to judge him. If *fantastika* had originated as a melding of edifying scientific popularization and thrilling adventure novels, the former influence had now totally eclipsed the latter, not because such pulp literature was seen as unartistic (though critics were still happy to call it such) but because science as a source of frightening excitement put it in tension with a benign scientific reality.

Beliaev bemoaned the vague, jargon-laden character of the Party philosophy. Asking the question of how to craft a plot about a classless society, which would presumably be devoid of conflict and therefore lacking narrative interest, Beliaev lamented that the author, "at his own peril," "is forced to extrapolate the laws of dialectal development and predict in what form the 'struggle of opposites' and 'negation of negations' will take under communism." The "struggle of opposites" and the "negation of negations" allude to two of the most prominent laws of dialectical development. The high vocabulary of dialectical change, even if it had saturated public consciousness, remained obscure when translated into practice. One had to look towards toward the singular safe topics: the conquering of nature and construction of large-scale industry.

[159] Aleksandr Beli͡aev, "Sozdadim sovetskui͡u nauchnui͡u fantastiku," *Literaturnyĭ Leningrad*, August 14, 1934, http://az.lib.ru/b/beljaew_a_r/text_1934_sozdadim_sovetskuyu_nauchnuyu_fantastiku.shtml.

The fantastic might be invoked as an allusion to what this new version of Socialist Realist popular science had replaced, but the fantastic as it had existed before no longer had a place in the Soviet imagination of science.

Conclusion

Through Beliaev's fiction, one can observe how the reorientation of science that took place following the Great Break in 1928 clashed with a *fantastika* tradition premised on the frightening possibilities of science. In the process of making science "useful," writers, critics, and officials reassessed how science ought to be popularized and which paths of scientific development were realistic. Science's ability to frighten had aligned with a post-revolutionary cultural moment which celebrated the potential of rational thought to radically transform life. As the Communist Party progressed from that initial stage, the future developed from a utopian blur to a concrete project of administration and industrialization. The imaginary of science followed suit, and science became a tool for serving state needs rather than facilitating alternative futures.

Criticism clarifies the formal pressures placed on *fantastika*. Beliaev's fiction responded primarily to pressure to depict science differently rather than a push to abandon the adventure-fiction style of his work. The structure of Beliaev's stories did not change dramatically between *Professor Dowell's Head* and *The Underwater Farmers*, even as the latter attracted far less ideological criticism. The key difference lay in the function of fear in the respective narratives. Without the ability to imagine alternative futures or to depict the shock of such difference, *fantastika* floundered.

These overarching trends map to the specific reassessment of human materiality within Soviet scientific discourse. During the NEP period, human "elementality" could be made "conscious" by both social and scientific intervention, as it remained unclear where, exactly,

human biological evolution fit into the story of historical materialism. It seemed possible, for the Cosmists, the avant-garde, Bolsheviks and experimental biologists alike, that humans, in their current form, might not be the final manifestation of reasoning matter. Coinciding with the Stalinist insistence that tomorrow's utopia would much resemble the present, such transhumanist dreaming was abandoned. The New Man, as he emerged under Stalin, differed in this way from his transhumanist predecessor, who could be further perfected with the application of new technologies. In the early 1930s, it became common sense that only "lower" forms of matter, such as plants, animals, and the non-living environment, could be physically "made conscious." Human enlightenment could only occur through political education.

The useful, what grew to be seen as realistic levels of change, and what was banished to the domain of the fantastic followed these cultural metanarratives. The visceral language of disgust with which many critics attacked *The Amphibian Man* demonstrated this new, scientific-aesthetic conservativism. Biological possibilities that had once seemed eminently realizable were labeled fantastic, replacing utopias of physical difference with a Stalinist utopia that reproduced the present in greater size and scope. Both technology and the human subject produced by technology had been decisively constrained.

Chapter 2:

A Dialectical *Skazka*

Introduction

By the early 1930s, *fantastika*, a popular genre with which writers had explored excitements and anxieties about science and technology, had largely disappeared. What came in its wake? What happened to the fantastic, utopian scientific imaginary that the genre had exhibited? The afterlife of *fantastika* can be best understood by examining the larger question of how depictions of science were crafted in opposition to the fantastic in the early Stalinist period. The fantastic, along with the associated notion of the utopian, became the rhetorical opposite to a Soviet program of science, which was devoted to the utilitarian task of building socialism. Yet, as a look at the formulation of popular science writing in the 1930s will demonstrate, these polarities remained locked in an uneasy orbit as the fantastic continued to be a point of reference and source of imaginative potential for the purported disenchanted realism of Stalinist science. This phenomenon is most evident in the use of metaphor in popular science works, especially those that depicted the transformation of nature by Soviet technology. There, figurative language once censured for being fantastic received praise for translating abstract scientific concepts into images comprehensible to mass readers.

To trace this phenomenon, I look at the animated nature trope, which appeared frequently in science writing of the 1930s. During the First Five-Year Plan, an oft-repeated slogan called for the Soviet Union to "conquer nature." The phrase encapsulated a prevailing antagonism towards the natural world, which was to be subdued and plundered of its riches. To dramatize Soviet technological triumph, writers expanded nature's conquest into an extended metaphor: Soviet workers and scientists were depicted squaring off with deserts, rivers, and mountains that appear

to consciously struggle against the yoke of human control. The animation of nature demonstrated matter's mutability according to a popular conception of dialectical materialism.

The surprising connection between nature's figurative animation and dialectical materialism arose out of Samuil Marshak and Maxim Gorky's simultaneous embroilment in the "*skazka* debates," a series of polemics in the latter half of the 1920s and early 1930s about which varieties of figurative language could be permitted in books for young readers, and their leading roles in establishing a popular science vernacular. In the *skazka* debates, Natalia Krupskaya and a group of critics associated with RAPP had showed a particular distaste for anthropomorphism, primarily the talking animals that populated children's *skazki*. Marshak defended *skazochnost'*, meaning the "*skazka*-like," which had come to be primarily associated with personification, anthropomorphization, and any other interchange of characteristics between humans, animals, machines, and non-living nature. Such figurative language, Marshak argued, best illustrated the transformative power of dialectical materialism, which had been reduced, in its popular articulation, to a vague sense of matter being "in motion." With this, literary and scientific discourses converged to generate "a new poetics of science," to borrow Matthias Schwartz's term, one of the most visible manifestations of which was the metaphoric transformation of non-living nature into human, machine, or animal form.[160]

This episode invites an interrogation of the sense of re-enchantment beneath the surface of Soviet science, an issue ancillary to the question of how or to what extent Stalinist culture signaled a break from the fantastic, utopian energies of the 1920s. For example, Douglas Weiner, observing how, in the 1930s, nature was "portrayed almost as a consciously antisocialist force which needed to be suppressed," concludes that "this failure to despiritualize nature testified to

[160] Matthias Schwartz, "A New Poetics of Science: On the Establishment of 'Scientific-Fictional Literature' in the Soviet Union," *The Russian Review* 79, no. 3 (July 2020): 415–31.

the incomplete fashion in which the scientific revolution had been absorbed into Russian culture, despite a decade of Bolshevik scientific materialism."[161] I argue that dialectical *skazochnost'*, as displayed in the animated nature trope, did not signal a failure of despiritualization or a residual animism; rather, dialectical *skazochnost'* illustrated the ability of all matter, living or non-living, to operate according to a conscious, human logic. Dry realism had to be enlivened with *skazochnost'* to demonstrate a newfound, dialectical worldview. "Spiritualization" or "enchantment" become misleading terms for evaluating the depiction of science, as they suggest an oversight or slippage, rather than a conscious choice to incorporate the metaphoric vocabulary of the *skazka*.

To understand the emergence, function, and significance of this popular expression of dialectical materialism, I look at the work of Samul Marshak's brother, Ilya Marshak, better known by his pen name, M. Il'in.[162] In the first half of the 1930s, Il'in authored two books: *The Story of the Great Plan* (1930) and *Men and Mountains* (1935). These works, along with the critical discussion that accompanied them, demonstrate how dialectical materialism was translated from Frederic Engels's original concept to a sense of the ceaseless movement and transformation of matter. I supplement my reading of Il'in with other examples of the animated nature trope in prominent Soviet texts about large-scale construction projects during the First Five-Year Plan: Constantine Paustovsky's *Kara-Bugaz* (1932), Marshak's poem "War Against

[161] Douglas Weiner, "The Great Transformation of Nature," in *Models of Nature: Ecology, Conservation, and Cultural Revolution in Soviet Russia* (Bloomington: Indiana University Press, 1988), 169. For a similar observation about the core anti-rationalism of Soviet science, see Istvan Csicsery-Ronay, Jr., "Towards the Last Fairy Tale: On the Fairy-Tale Paradigm in the Strugatskys' Science Fiction, 1963-72," *Science Fiction Studies* 13, no. 1 (March 1986): 1–41.

[162] Matthias Schwartz provides the only other major scholarly work on Il'in's science writing. For a discussion of how Il'in's writing fulfilled the aspirations of science prose, see Schwartz, "A New Poetics of Science." For a comparison between Il'in's poetics of science and that of the avant-garde, particularly Aleksei Gastev and Sergei Tret'iakov, see Matthias Schwartz, "Factory of the Future: On M. Il'in's 'Scientific-Fictional Literature,'" *Russian Literature* 103–5 (April 2019): 259–81. I differ from Schwartz in situating Il'in's fiction in the context of the *skazka* debates and exploring the underlying politics of anthropocentrism.

the Dnieper" (1931), and the collective volume *History of the Construction of the White Sea-Baltic Canal* (1934).

The narrativization of dialectical materialism for a popular audience reduced its complexity and integrated it into the larger story of Marxist development. Nature, in its metaphoric transformation, could become more human-like (therefore perfected), but man could not regress back towards nature. Comparisons were permitted if they manifested the conversion of "elemental" (*stikhiĭnyĭ*) nature into "conscious" (*soznatel'nyĭ*) man or machine, enacting, on the level of metaphor, the spontaneity-consciousness. Most of all, dialectical *skazochnost'* allowed for the dramatization of an epistemic break with the "old" world, which was characterized by a passive attitude towards nature that arose from an inability to comprehend nature's flexibility. To harness the resources required to fuel Soviet civilization, citizens needed to recognize natural forces, previously seen as immovable, could indeed be altered and made available for human use. Like the philosophy of dialectical materialism itself, nature's fantastic, figurative representation was subordinated to the demands of Soviet construction.

It remains difficult to parse the varied motivations that went into the formation of dialectical *skazochnost'*. A proposed correspondence between dialectical materialism and *skazochnost'* allowed Gorky and Marshak to rehabilitate the richer, more playful writing style that had come under attack during the *skazka* debates. The free use of *skazochnost'* was particularly relevant as the two worked to increase the quantity and quality of Soviet children's writing throughout the 1930s. Furthermore, dialectical *skazochnost'* bore the stamp of Gorky's long-held Promethean ideal of man's self-perfection through the domination of nature. This interest aligned with his preoccupation with "god-building," (*bogostroitel'stvo*), the project that he undertook alongside Alexei Bogdanov and Anatoly Lunacharsky to construct communist

myths and rituals that would replace those vacated by the state's official atheism.[163] Thus, nature's animation in texts from the early 1930s was just as much an attempt to explain a simplified version of dialectical materialism to a general readership as it was a vehicle for its practitioners to further their pre-existing literary and philosophical agendas.

The polemics over science prose and what a dialectical materialist account of science should look like resulted in an implied set of guidelines authors could follow to justify their work as ideologically sound. As scientists had to demonstrate how their work agreed with (or, better yet, was inspired by) dialectical materialism, they were presented with the task of translating the nebulous language of Marxist philosophy of science into scientific practice. Many scientists wrote popular science books under Marshak's editorial hand or were inspired by the dominant images of science popularized by Gorky. Even if the techniques found in the work of Il'in were not as prominent in the work of other scientists, science prose and the publishing infrastructure around it provided a clear example of how to narrativize Stalinist science. What sort of tropes, language, and metaphors gestured towards this new, proper, dialectical materialist view. In this, a reduced fantastic entered the general lexicon of science.

The Ambiguities of Utopia

The fraught place of utopia in the early 1930s informs an understanding of the fantastic, with which the utopian was closely associated. That the Stalinist cultural project was functionally utopian, even as official rhetoric emphasized Stalinism's un-fantastic utilitarianism is well discussed.[164] A great amount of scholarship on the cultural transformation between the pre-

[163] For Clark's reading of how god-building influenced Stalinist rhetoric, see Katerina Clark, *The Soviet Novel: History as Ritual*, 3rd ed. (Bloomington: Indiana University Press, 2000), 152–155. For further reflection on Gorky's philosophy of god-building and how it informed his ideas of human transformability, see Douglas Weiner, "Man of Plastic: Gor'kii's Visions of Humans in Nature," *The Soviet and Post-Soviet Review* 22, no. 1 (January 1995): 65–88.

[164] For a characterization of Stalinist utopia and a discussion of how it differs from the utopian energies of the 1920s,

Stalinist 1920s and Stalinist 1930s either stresses radical difference or illuminates hidden continuities between the two periods.[165] Another framing of the transition between the 1920s and the Stalinist period asks how to understand the classicism that characterized Stalinist culture, especially in literature and architecture. What past did this classicism draw on and how did it contribute to a utopia of the eternal present?[166]

Though the Stalinist 1930s were just as utopian and fantasy fueled as the proceeding 1920s in their ambition, official rhetoric emphasized that what had seemed impossible in the past was now realistic. In turn, fantasy and utopia became terms of derision; "realism" and "truthfulness to life" became the slogans of the day.[167] This pivot is on full display in *The Short Course* (1938), Stalin's condensed, official Party history, in which Stalin castigates socialists outside the Marxist-Leninist tradition as "utopians" and "idle dreamers" who based their analysis on an idealism "divorced from the real life of society."[168] Stites refers to the ascent of Stalinism as a "fantasectomy" performed upon the utopian thinkers of the Soviet Union, especially writers

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see Richard Stites, "Stalinism and the Restructuring of Revolutionary Utopianism," in *The Culture of the Stalin Period*, ed. Hans Günther (New York: Palgrave Macmillan, 1990), 78–94. Katerina Clark observes the treatment of science and technology in Soviet literature alternating between forward-looking utopian and focused on the present. She sees the NEP period as unutopian, the First Five-Year Plan as utopian, and the remainder of the 30's and 40's as a shift back towards the present-focused. See Katerina Clark, "The Changing Image of Science and Technology in Soviet Literature," in *Science and the Soviet Social Order*, ed. Loren Graham (Cambridge, Mass.: Harvard University Press, 1990), 259–98.

[165] See chiefly Boris Groys, *The Total Art of Stalinism* (Verso, 2011); Richard Stites, *Revolutionary Dreams: Utopian Vision and Experimental Life in the Russian Revolution* (Oxford: Oxford University Press, 1991). Vladimir Paperny views the two periods as manifestations of a larger cycle between two dominant modes of culture. See Vladimir Paperny, *Architecture in the Age of Stalin: Culture Two* (Cambridge: Cambridge University Press, 2002). The historical literature on the subject of the Great Break and Great Retreat also asks about the extent of cultural change. See Shelia Fitzpatrick, *The Cultural Front: Power and Culture in Revolutionary Russia* (Cornell University Press, 1992); Nicholas Timasheff, *The Great Retreat: The Growth and Decline of Communism in Russia* (E. P. Dutton & Co., 1948).

[166] Antony Kalashnikov, "Historicist Architecture and Stalinist Futurity," *Slavic Review* 79, no. 3 (Fall 2020): 591–612.

[167] Hans Günther, "Socialist Realism and Utopianism," in *Socialist Realism Revisited: Selected Papers from the McMaster Conference*, ed. Nina Kolesnikoff and Walter Smyrniw (Hamilton: McMaster University, 1994), 29–41.

[168] David Brandenberger and Mikhail V. Zelenov, *Stalin's Master Narrative: A Critical Edition of the History of the Communist Party of the Soviet Union (Bolsheviks), Short Course* (Yale University Press, 2019), 258-9, quoted in Hans Günther, "Soviet Literary Criticism and the Formulation of the Aesthetics of Socialist Realism, 1932-1940," in *A History of Russian Literary Theory and Criticism* (Pittsburgh: University of Pittsburgh Press, 2011), 90–108.

of science fiction.[169]

Science and technology, already the subject of fascination in the first decade of the Soviet Union, were discussed even more fervently through the 1930s. Jeffrey Brooks, in his study of Stalinist public culture through an extensive reading of *Pravda*, provides a glimpse into the scale of this mania. From 1921 to 1927 *Pravda* published seventeen editorials on science and technology. The figure grew to 54 from 1928 to 1932 and increased to 84 from 1933 through 1939. The amount of space given to science and technology trebled from the 1920s to the 1930s. *Teknika*, "meaning engineering or, broadly, technology" he observes, "worked as a mantra" in the slogans that ran through the paper.[170]

In this context, the disappearance of *fantastika*, despite the official, continued obsession with science and technology, feels less surprising. With its very name the genre announced an association between the scientific and the fantastic at a time when realism was the watchword of the day. The far-future, utopian variety of *fantastika* was in clear conflict with an ideology that saw itself as realistic and scorned as hubris any vision that went beyond the current five-year plan.

Popular science writing was a space particularly receptive to this tension. There, authors asked what they could learn from *fantastika* as they worked out a description of "realistic" science that was, in its all-transformative, awe-inducing aspirations, both fantastic and utopian. The unstable relationship between fantasy and the espoused utilitarian basis of Soviet science has received scholarly attention, but these accounts sometimes generalize the Soviet attitude towards science, eliding the complicated relationship between fantasy, metaphor, and science that a

[169] Stites, "Stalinism and the Restructuring of Revolutionary Utopianism," 89.
[170] Jeffrey Brooks, *Thank You, Comrade Stalin!: Soviet Public Culture from Revolution to Cold War* (Princeton, 2000), 80.

closer examination of the early Stalinist period demonstrates was a subject of constant re-negotiation.

In the mid-1930s, this conflict was on full display in editorial discussions surrounding "A Glimpse into the Future" (*Vzgl͡iad v budushchee*), one of seven books planned by Gorky to celebrate the 20th anniversary of the October Revolution. The proposed book series was to have volumes dedicated to the past, present, and future of the Soviet Union. "A Glimpse into the Future" would collect narratives about what the future of the Soviet Union might look like with a particular emphasis on the forthcoming transformations engendered by science and technology. An article in *Pravda* reported a well-intended inaugural meeting for the book, which was to depict "the great socialist dream."[171] The attendees featured scientists, academics, and leading Party theoreticians, such as Karl Radik. Other prominent writers present included M. Il'in and Aleksei Tolstoy. With Gorky's death in 1936, the project was scrapped. Even without the finished manuscript, the *Pravda* article summarizing the meeting demonstrates the tension between the fantastic and the real in official science narratives as prominent artists and scientists asked what it means to be a "dreamer" and the role of "fantasy" in a country where, according to the Party line, reality had superseded fantasy.

Quotes from attendees stressed that reality had become more fantastic than fiction. H. G. Wells was censured for being "unscientific" and depicting a "motionless" bourgeoisie social world. To call an image of the world "motionless" was to code it as undialectical and an obstacle to the socialist construction. An academic conjectured that one must be a poet to imagine the consequences of electrification and that for this "miraculous source of cultural transformation […] there is almost no limit to fantasy [in the Soviet Union], and this fantasy is entirely real."[172]

[171] "Vzgl͡iad v budushchee," *Pravda*, June 14, 1935.
[172] Ibid

The same held for Arctic exploration: "scientific dreaming cannot keep up with the demands of practice."[173] The Moscow of the future was to be "a magical fantasy (*volshebnai͡a fantazii͡a*) even the most inspired poems are unlikely to tell about."[174] The article concluded by suggesting that scientists are equivalent to artists:

> And it was clear that Soviet *fantastika* is a word that denotes creativity, therefore the scientist's hypothesis coincides with the dream of a thinker or poet, and the beautiful picture of the future that stands in front of us is an indispensable part of current creative work.[175]

With this final inversion, one can see the extent to which the fantastic provided a reference point in constructing a real opposed to it. Reality was to be just as ambitious as any form of the fantastic and recognized as such. However, the properties of material reality and how it ought to be depicted were themselves the subject of contemptuous debate. By examining how dialectical materialism, the Marxist philosophy of natural science, was established and incorporated into a narrative of Soviet progress, one can observe how the transformative connotations of the fantastic were utilized to depict Soviet industrialization.

Depicting the Dialectic

What is dialectical materialism? Put briefly, dialectical materialism is a form of materialism.[176] That is, it begins with the premise that only matter and energy exist, and their behavior is governed by specific laws. The world exists independently from the human observer, and all phenomena are ultimately knowable and understandable by way of scientific explanation. As Loren Graham explains, the outlook was "an effort to steer between the extremes of

[173] Ibid.
[174] Ibid.
[175] Ibid.
[176] For a more detailed account of how dialectical materialism was formulated as a philosophy of science and put into practice in the Soviet Union see Loren Graham, *Science and Philosophy in the Soviet Union* (Alfred A. Knopf, 1966).

reductionism and vitalism."[177] Reductionism is the attempt to explain one "level" of phenomena by way of a more basic one, such as explaining biological behavior in terms of chemistry or "reducing" a chemical phenomena into the terms of physics. Vitalism holds that "higher" beings, such as humans, cannot be explained based on materialist principles. Dialectical materialism differs from standard materialism in viewing dialectics as the best analytical tool for understanding the continual motion of matter.

Within the Soviet academy, conflict over establishing an official program of dialectical materialism emerged in the mid-1920s with a dispute between mechanists and Deborinites. Mechanists believed that the dialectic could be generalized from scientific observation; therefore, science needed no special philosophical reevaluation. The Deborinites, followers of the prominent philosopher A. M. Deborin, enjoined anyone practicing science to first reach a solid understanding of Marx's engagement with the dialectic. While the Deborinites enjoyed temporary victory, they fell out of favor in the early 1930s following the Stalinist dictum that *partijnost'*, or "party-minded-ness," shorthand for deference to the Party line, be the last word in questions of theory. What mattered most was that science support Soviet development by proving the feasibility of the Party's ambitions.[178]

Until the Great Break in 1928, these debates had largely been the conducted by communist social scientists rather than those working in the natural sciences. In 1929, Stalin called for theory to catch up to the practice of science, even as it remained unclear what, exactly, it meant to "Bolshevize" the sciences.[179] Between 1929 and 1932, the Academy of Sciences, the

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[177] Loren Graham, *Science in Russia and the Soviet Union: A Short History* (Cambridge: Cambridge University Press, 1993), 101.

[178] David Joravsky provides an authoritative account of both the conflict between the mechanists and the Deborinites in the late 1920s and the eventual routing of the Deborinites in the quest to "Bolshevize" the sciences in the early 1930s. See David Joravsky, *Soviet Marxism and Natural Science 1917-1932* (New York: Columbia University Press, 1961), 215-229, 250-271.

[179] Joravsky, *Soviet Marxism and Natural Science 1917-1932*, 251, 255; Sheehan, *Marxism and the Philosophy of*

central node of scientific research since the pre-revolutionary era and a site of initial resistance to the politicization of science, was reorganized and brought under the control of the Communist Party.[180] This effort was bolstered by The All-Union Association of Works in Science and Technology for Cooperation in Socialist Construction (VARNITSO), an organization established in 1928 to fight resistance to the Sovietization of science. [181]

In practice, the Sovietization of science was characterized by a solidification of institutional control over the practice of science, the training of proletarian scientists, and the push for practically minded interdisciplinary collaboration, instead of the specialized, primary research that had been characteristic of pre-revolutionary science.[182] Crucially, scientists now needed to qualify their work as dialectical materialist, but the extent to which a pronounced fealty to dialectical materialism effected the actual practice of science is a topic of ongoing scholarly speculation.[183] Certain disciplines, such as physics and evolutionary biology, were concretely altered by these debates. Others could more easily get by with a cosmetic application of the new official discourse.

In the early 1930s, the definition of dialectical materialism was rapidly retreating from the subject of scholarly debate among philosophers and scientists to a calcified set of principles. Until Stalin boiled down the philosophy of dialectical materialism into a set of catechisms in

Science: A Critical History (London: Verso, 2017), 203.
[180] Loren Graham, *Science, Philosophy, and Human Behavior in the Soviet Union* (New York: Columbia University Press, 1987), 10.
[181] Alexander Vucinich, *Empire of Knowledge: The Academy of Sciences of the USSR (1917-1970)* (Oakland: University of California Press, 1984), 126.
[182] Graham, *Science, Philosophy, and Human Behavior in the Soviet Union*, 11-14; Nikolai Krementsov, *Stalinist Science* (Princeton: Princeton University Press, 1997), 31-53; Vucinich, *Empire of Knowledge*, 132.
[183] Loren Graham argues that dialectical materialism initially offered a productive model for thinking through scientific problems, but the inflexible, Stalinist version of the philosophy was not generative. See Graham, *Science in Russia and the Soviet Union*. Alexei Kojevnikov similarly pushes back on the idea of a purely antagonistic relationship between science and ideology. See Alexei Kojevnikov, *Stalin's Great Science: The Times and Adventures of Soviet Physicists* (Imperial College Press, 2004). See also Vucinich, *Empire of Knowledge*, 123-256.

Dialectical and Historical Materialism, a chapter in *The Short Course*, there was a shifting set of texts to which those hoping to understand and apply dialectical materialist methods referred. Stalin's own text was largely lifted from Bukharin's 1921 *Historical Materialism*, which itself had been influential until Bukharin fell out of favor in 1929. [184] The authoritative text for a Marxist philosophy of science was Engels's *Anti-Dühring* (1878). Also canonical was Lenin's *Materialism and Empirio-criticism* (1909), though Lenin's work was aimed at a particular epistemological dispute with Bogdanov and grew more influential in the mid-1930s.[185] In 1925, the Marx–Engels–Lenin Institute in Moscow published Engels's unfinished manuscript for *Dialectics of Nature*, in which Engels had continued to theorize a dialectical-materialist approach to the natural sciences. This latter text became the authoritative work to which all scientists had to appeal following 1929.[186]

In *Anti-Dühring* and *Dialectics of Nature*, Engels expresses dialectical materialism as an intervention against a naïve materialism that fails to grasp matter's dialectical movement. Earlier philosophers, Engels writes in the introduction to *Anti-Dühring*, instilled "the habit of observing natural objects and processes in isolation, apart from their connection with the vast whole; of observing them in repose, not in motion; as constants, not as essentially variables; in their death, not in their life."[187] Whereas dialectics "comprehends things and their representations, ideas, in their essential connection, concatenation, motion, origin, and ending."[188] Engels similarly begins *Dialectics of Nature* by pointing out that hitherto natural scientists, including those materialists

[184] Leszek Kolakowski, *Main Currents of Marxism: Its Origin, Growth and Dissolution*, trans. P.S. Falla, vol. 3 (Oxford: Clarendon Press, 1978), 62, 97-8, quoted in E. Van Ree, "Stalin as a Marxist Philosopher," *Studies in East European Thought* 52, no. 4 (December 2000), 260.
[185] David Bakhurst, "On Lenin's Materialism and Empiriocriticism," *Studies in East European Thought*, no. 70 (2018), 116.
[186] Douglas Weiner, *Models of Nature*, 5.
[187] Frederick Engels, *Anti-Dühring*, trans. Emile Burns (Progress Publishers, 1977), 31.
[188] Ibid., 33.

before him, have mistakenly proceeded from an outlook "in which the central point is the view of the *absolute immutability of nature*."[189] In contrast, an appreciation of the dialectic shows that everything from the sun to the sands, from bacteria to man "has its existence in eternal coming into being and passing away, in ceaseless flux, in un-resting motion and change."[190] Lenin highlights this same element of the dialectic in *Materialism and Empirio-criticism*, when he scolds any who deviate from the orthodoxy of Engels's texts. Dialectical materialism, Lenin writes, "insists on the absence of absolute boundaries in nature, on the transformation of moving matter from one state into another."[191]

Under Stalin, dialectical materialism was increasingly understood in terms of a small number of "dialectical laws" that had been originally enumerated by Engels. [192] The "Law of the Transformation of Quantity into Quality" holds that qualitative change leads to qualitative change. For example, warming liquid water causes it to boil and become a gas. The "Law of the Unity of the Struggle of Opposites," is a basic tenet of Hegelian dialectics according to which all development arises from the struggle of opposites. The "Law of the Negation of the Negation," likewise a cornerstone of dialectical thinking, stipulates that when something new arises out of the struggle between two opposites (negating them), a new form of contradiction emerges, which will, in time, negate that negation. Thus, the dialectic proceeds in a spiral motion. These oblique rules were understandably difficult for writers to use as the basis for accessible descriptions of Soviet science. What mattered more in the popular sphere was keeping observations rooted in physical reality (therefore materialist) while trying to capture matter's "dialectical" movement.

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[189] Frederick Engels, *Dialectics of Nature*, trans. Clemens Dutt (Moscow: Progress Publishers, 1986), 24. Emphasis in original.
[190] Ibid., 30-1.
[191] V. I. Lenin, *Collected Works*, vol. 14 (Moscow: Progress Publishers, 1977), 261.
[192] Ibid., 103.

Science popularizers in the 1920s reiterated contrasts between matter as static and matter in motion to mark the dialectical character of their materialism; however, the primary goal of this first generation of dialectical-materialist popular science writers was to combat religious thinking rather than to drive home any fine distinction between dialectical and non-dialectical materialisms. The Timiryazev Institute, one of the main organizations responsible for promoting dialectical materialism in both the Soviet academy and among the public, provided funding for a hundred or so scientists who gave popular lectures, wrote science columns for newspapers, and published books for a mass audience.[193] The titles of two series of books published by the institute, "On the Path to Materialism" and "Library of the Materialist," foreground their ideological thrust. Those involved espoused a mechanistic materialism that would be routed in favor of Deborinism; still, the books that made up the "On the Path to Materialism" demonstrate an initial attempt to communicate the flexibility of matter.

Many books in the "On the Path to Materialism" series stressed how the ever-changing status of matter softens the boundary between life and death. This focus on the origin of life reflects the overlap between the Timiryazev Institute and the League of Militant Atheists, an organization devoted to fighting religious views with materialist science. In 1925 the press printed a public lecture by A. P. Kizel' under the title *Living Matter* (*Zhivoe veshchestvo*). Kizel', a biochemist who would go on to organize the department of plant biochemistry at Moscow State University, enumerated the physical materials and chemical processes that constitute the living. In *Death and Immortality* (*Smert' i bessmertie*), science popularizer and zoologist Nikolai Plavilchtchikov's 1925 addition to the series, the author encouraged readers to shed their "mystical beliefs" about the boundary between life and death. Plavilchtchikov

[193] James Andrews, *Science for the Masses: The Bolshevik State, Public Science, and the Popular Imagination in Soviet Russia, 1917-1934* (College Station: Texas A&M University Press, 2003), 121-3.

explained that "everything has its end—the sun, the earth, stars, bacteria, and man" (a list of transient objects borrowed nearly verbatim from the introduction to Engels's *Dialectics of Nature*).[194] The only constant was that energy would continually recombine the matter out of which these items were made. That same year, the press published biologist Georgi Bosse's *From the Non-living to the Living* (*Ot nezhivogo k zhivomu*), in which Bosse discussed attempts by French biologist Stéphane Leduc to synthesize life out of non-living matter. The botanist Fyodor Krasheninnikov published *The Sun, the Source of Life* (*Solnt͡se istochnik zhizni*) in 1926. Krasheninnikov began by asking what life is and how to delineate the living from the dead, to which he answered that while the exact boundary is unclear, the sun provides the necessary energy for the transformation of minerals and water into living matter.

How dialectical materialism would be depicted following the Great Break in 1928 can be glimpsed in A. E. Fersman's *Entertaining Minerology* (1929). Fersman played a prominent role in science popularization in early 20th century, serving on the editorial boards of both *Nature*, the popular science journal of the Academy of Sciences, and the publishing house *Vremya*, which was formed in 1922 and specialized in popular science books.[195] In *Entertaining Minerology*, Fersman, like Engels, underscored that modern scientists differed from their predecessors in fully appreciating he plasticity of matter. He took the further step of emphasizing how understanding this dynamic quality aids Soviet industry. "Hard dead rock lives its own, distinct life," Fersman wrote, the dynamism of which can be envied even by those who study living beings.[196] In the chapters that follow, Fersman stressed all of the traits that would become hallmarks of the

[194] N. N. Plavil′shchikov, *Smert' i bessmertie* (Vologda: Severnyĭ pechatnik, 1925), 8-9.
[195] For more on the *Vremya* publishing house, see M. Ė. Malikova, *Shum Vremeni: Istoriia Leningradskogo Kooperativnogo Izdatel'stva 'Vremi͡a' (1922–1934)*, Instituty Kul′tury Leningrada Na Perelome Ot 1920-kh k 1930-m Godam, 2011, http://pushkinskijdom.ru/wp-content/uploads/2018/03/Malikova_Instituty-2011.pdf.
[196] A. E. Fersman, *Zanimatel'nai͡a mineralogii͡a* (Leningrad: Vremi͡a, 1929), 3-4.

Stalinist attitude towards nature, particularly in his accentuating the ever-changing form of rocks (against a previous conception of the earth as fixed and "eternal") and the imperative of man to subdue nature in order to harness its productive powers.

Those writing about science were not content to simply chronicle the practice and priorities of socialist science, however they might be defined. It was important to register a clear *image* of the dialectical materialist world and figure out how such an image could be assembled from the stuff of previous artistic traditions. This issue, which would arise in the speeches of those at the first Soviet Writers' Congress in 1934, was already well articulated by Soviet physicist Sergey Ivanovich Vavilov in his 1927 popular science book *The Eye and the Sun* (*Glaz i solnt͡se*).

Vavilov wondered aloud about how to encode dialectical materialism in literary metaphors. A non-communist member of the Academy of Sciences, Vavilov played a crucial role in promoting dialectical materialism among its members.[197] *The Eye and the Sun* went through six reprintings by the year 1956.[198] Vavilov discussed modern understandings of light, optics, and contemporary developments in florescence for a general audience. His explanation of the wave-particle duality of light offers another early example of what a dialectical materialist popular science might look like.

Vavilov continuously drew parallels between poetic and scientific understandings of light. The verse of Alexander Pushkin and Fyodor Tyutchev and the myths of ancients, he argued, anticipated either the particle or wave-like properties of light, even when their contemporaries had not been able to give scientific explanations for this behavior. In those past times "the dividing line between poetic fantasy and science in many cases was indistinct or did

[197] Vucinich, *Empire of Knowledge*, 157.
[198] Ė. A. Lazarevich, *Iskusstvo populi͡arizat͡sii nauki* (Moscow: Nauka, 1978), 83.

not exist at all. Poetic speculation was transferred to science in an attempt create an unstable unity of poetry and science."[199] Poetry, in this formulation, might provide a useful aid in understanding the natural world but cannot itself do the job of science. Still, poetic intuition and the metaphors contained within poetry are validated; they correctly perceive an attribute of nature.

Dialectical materialism, as articulated by Lenin in *Materialism and Empirio-criticism*, provides a way of holding the contradictory properties of light together. "The main features of the dialectical method of studying nature," Vavilov explained, "are that nature is considered a coherent, unified whole in a state of continuous movement and change."[200] From the point of view supplied by Lenin, "the 'insurmountable' contradiction between wave and corpuscular properties [that is, the contradiction between light as a wave and light as an atom] in light phenomena […] are a new expression of the dialectics of nature, the real unity of opposites."[201] That Vavilov saw no tension between wave-particle duality, a cornerstone of quantum mechanics, and Leninist dialectical materialism is ironic, perhaps, given that quantum theory would later be accused of "idealism."[202]

Before and after Vavilov asserted the correctness of dialectical materialism as articulated by Lenin, he suggested that any stubborn resistance to such understandings arose from the stock images with which one comprehends the world. Past scientists had succumbed to a mechanistic application of Newton's laws because of their "*comprehensibility* (*ponı͡atnost'*), their complete correspondence with our own, ordinary, non-scientific ideas."[203] Vavilov gave the example of

[199] S. I. Vavilov, *Glaz i solnt͡se* (Moscow: Izdatel′stvo akademii nauk SSSR, 1950), 12.
[200] Ibid., 40.
[201] Ibid., 41.
[202] For a summary of this controversy, see Loren Graham, "Quantum Mechanics and Dialectical Materialism," *Slavic Review* 25, no. 3 (1966): 381–410.
[203] Vavilov, *Glaz i solnt͡se*, 39.

comparing the movement of an atom to the movement of a bullet. It is clear "that in reality the bullet is immeasurably more complex than the atom and our 'explanation' reduces the simpler to the more complex, but familiar."[204] He concluded that our attraction to mechanistic explanations "rests, in effect, on the very shaky foundation of 'custom.'"[205] The seeming contradiction of the properties of light "speaks only of the insufficiency and primitiveness of our mechanistic picture (*kartina*). The matter of the real world is infinitely more complex than the simplified metaphysical images (*obrazy*) that come to us due to habit and enduring everyday experience."[206] Here and in his discussion of the latent scientific truth of certain poetic images, there was an implication that the metaphoric molds one's understanding of scientific phenomena. If dialectical materialism was correct, but imagery had not yet caught up to it, a more dialectical materialist imagery was needed.

Such an interest in the correspondence between images and the underlying laws of physics was likely a response to the preoccupation among Marxist theorists of the natural sciences with the relationship between perception and matter. Plekhanov, Mach, Bogdanov, and Lenin, all influential in the debates around a Marxist philosophy of science, each devoted particular attention to the question of whether and how consciousness mediates one's perception of the material world. Though these thinkers did not agree on the process by which material reality was translated into an image, one can see how a narrowly philosophical problem manifested in popular science as a question of metaphor and imagery.

Though Vavilov was not directly involved in the production of science prose, his implied question was one that writers of the next decade had to contest: How can one present the world

[204] Ibid.
[205] Ibid., 40.
[206] Ibid., 41.

dialectically? What images might allow for a "common sense" that would better accommodate dialectical materialism? The metaphoric devices chosen for the task introduced a new set of anxieties. When *skazki* were used to describe the dialectical-materialist world, was this an admission that the epistemology itself was fantastic? Or was something with an aura of the fantastic precisely the thing needed to communicate the immense power of this new worldview? At very least, the fantastic power of *skazki* had to be brought in line with the specific evolutionary teleology of Soviet Marxism.

The *Skazka* Debates

Concerns about the correspondence between fantastic literary language and materialist reality in Soviet popular science writing had their origins in the *skazka* debates. Radical critics had long objected to the influence of *skazki* in children's literature, and these simmering contentions, which could be traced back to pre-revolutionary materialist philosophy, erupted into public controversy from the mid-1920s through the early 1930s.[207] On one side of the debate were Samuil Marshak, Korney Chukovsky, and, following an appeal from Marshak, Maxim Gorky. Based in Leningrad, Marshak and Chukovsky had formed an influential circle of children's writers. Criticizing these writers were Nadezhda Krupskaya, who had long been involved in questions of education and library administration, and hardline RAPP critics, who were narrowly concerned about children's literature carrying the correct ideological line. Marshak and, to a lesser extent, Gorky, innovated in this long-running pedagogical dispute by

[207] For an account of how the *skazka* debates reiterated pre-revolutionary radical critics, see C. Maslinskai͡a, "Neutomimyĭ boret͡s so skazkoĭ (kritika detskoĭ literatury v trudakh N. Krupskoĭ)," *Istoriko-pedagogicheskiĭ zhurnal*, no. 1 (2017): 172–86. For an in-depth telling of the *skazka* controversy, see Ben Hellman, *Fairy Tales and True Stories: The History of Russian Literature for Children and Young People (1574 - 2010)* (Leiden: Brill, 2013), 354-362 and E. O. Putilova, "Nuzhna li proletarskomu rebenku skazka?," in *Ocherki po istorii kritiki sovetskoĭ detskoĭ literatury 1917-1941* (Moscow: Detskai͡a literatura, 1982), 13–23. For a brief bibliography of the central articles that make up the debate, see the notes in M. Gor′kiĭ, "Chelovek, ushi kotorogo zatknuty vatoĭ," in *Sobranie sochineniĭ v tridt͡sati tomakh*, vol. 25 (Moscow: Gosudarstvennoe izdatel′stvo khudozhestvennoĭ literatury, 1949), 494.

positing that *skazochnost'*, once viewed as antithetical to materialist reality, could instead be harnessed to illustrate reality's dialectical character.

Gorky and Marshak were two of the earliest and most influential figures in Soviet children's literature. Gorky's interest in providing children with reading material, especially in the publication of epics and myths for children, began in the pre-revolutionary period. Though he had a hand in shaping publishing efforts immediately following the revolution, that influence waned after his exile in 1921. Upon Gorky's return to the Soviet Union in 1928, children's literature and science popularization became two of his main projects. Marshak began his career writing children's poetry and editing at *Raduga* (Rainbow), a private publishing house. It was there that he formed a life-long friendship with Korney Chukovsky, who would also go on to be a central force in 1920s children's literature and who's whimsical language would eventually spark the *skazka* debates. Ben Hellman characterizes their style as one in which "humor and playfulness were placed ahead of didactic concerns."[208] Marshak, in addition to penning his own work, exerted influence as the editor for a constellation of children's journals: *New Robinson* (*Novyĭ Robinzon*) (1924-5), *The Hedgehog* (*Ëzh*) (1928-35), *The Siskin* (*Chizh*) (1930-41). He also served prominent editorial roles in children's division of The State Publishing House and, upon its formation in 1933, The State Children's Publishing House.

The *skazka*'s incompatibility with materialism was one of an interlinking set of objections to the popular children's genre. Like radical critics before them, those associated with Prolet'cult and its later iteration, RAPP, feared the pernicious effect that *skazki* might have on children. In particular, the anthropomorphism (*antropomorfizm*) of the non-living and the personification (*ochelovechivanie*) of animals threatened to distract from political reality.[209] This

[208] Hellman, *Fairy Tales and True Stories*, 311.
[209] Konstantin A. Bogdanov, *Vox populi: Fol'klornye zhanry sovetskoĭ kul'tury* (Moscow: NLO, 2014), 80.

grievance encompassed both a point about the purpose of children's literature and an idea about how the literary image corresponds to reality: Children's literature ought to be realistic because its sole purpose is to teach young readers about their political reality, and reality is governed by the laws of historical and dialectical materialism.

Criticism of *skazki* shows the centrality of concerns about anthropomorphism. In 1928, the Pedagogic Science department of Narkompros, which was led by Krupskaya, began to publish *Books for Children*, the first Soviet journal dedicated to children's literature. Five of the six issues published in 1928 began with a section titled "Theses on Anthropomorphism" in which critics attacked the figurative device.[210] An article titled "Is the *Skazka* Needed?," published in 1925 by the pedagogue Esfir Yanovskaya, exemplifies the political argument against *skazki*. Yanovskaya continually draws a contrast between the "fantasy" of the *skazka* and "concreteness" (*konkretnost'*), a quality that the *skazka* necessarily lacks. It is only such "concreteness" that gives children the necessary foundation for understanding their political reality.[211] In her choice of terminology, Yanovskaya stresses the link between realism and materialism.

Marshak enlisted Gorky's help in defending against criticism, and it was out of this initial alliance that the two began to develop a program of children's literature and popular science, culminating in their becoming the primary architects of Soviet children's literature in the 1930s.[212] In their initial correspondence in 1927, Marshak gave a concise summary of the traits that attracted ire from Krupskaya and her allies:

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[210] For a succinct historical overview of the journal, which lasted only two years, and a full list of the articles printed therein, see A. Sen′kina, "Rospis′ soderzhaniia zhurnala 'Kniga detiam' (1928-1930)," *Detskie chteniia* 1, no. 1 (2012): 148–61. Similarly, Serguei Oushakine places the *skazka* debates within a pedagogical movement that stretches back to the mid-19th century and examines how the debates were resolved by a shift in terms. See Sergeĭ Ushakin, "Skazka? Lozh′? Namek? Urok? Okololiteraturnye debaty o (bes)poleznosti odnogo zhanra," *Detskie chteniia* 19, no. 1 (2021): 8–43.

[211] Esfir Yanovskaya, "Nuzhna li skazka?," *Detskie chteniia* 19, no. 1 (2021): 77–91.

[212] For an account of the relationship and shared literary philosophy of Gorky and Marshak, see Dzhuliia De Florio, "Maksim Gor′kiĭ i Samuil Marshak na fone ėpokhi," *Detskie chteniia* 12, no. 2 (2018): 184–205.

> Above all, [critics] fear *skazochnost*' and anthropomorphism. In their opinion, fantasy (*fantastika*) (any kind) instills superstitions in children. In our debates it was in vain that we pointed out that every poetic image commits the sin of anthropomorphism — the animation (*ozhivlenie*) and personification of everything around us. In response to this, one of the pedagogues told me: If a poetic comparison uses the word "like" […], then it is allowed; if it is without the word "like," then the comparison will confuse children.[213]

The use of the term *skazochnost'* here and subsequently makes clear its connotation of anthropomorphism, animation and personification, forms of figurative language that blur the boundaries between the animate and the inanimate.

Marshak implied that pedagogues express a philistine attitude in conflating the literary image with what it describes. Gorky and Marshak argued in favor of wordplay, folktales, and *skazki* on the basis that such forms best attract young readers. Later, as the two authors began to suggest that such language might provide an apt illustration of the ever-changing, dialectical-materialist world, this point about figurative language making no claim to correspondence with its object began to slip. *Skazochnost'* would be presented as useful in describing the natural world because it enacts the transformative process of the dialectic.

The most high-profile episode of the *skazka* debates occurred in the pages of *Pravda* and *The Literary Gazette* following an article by Krupskaya that ran on February 1st, 1928, in which she attacked Chukovsky's *The Crocodile*, which had been published many years earlier in 1917. Chukovsky's story was emblematic of the style of Marshak and his circle, for whom the political content of a story was secondary to verbal inventiveness. Krupskaya attacked such verbal play, asking whether Chukovsky's *skazka* had any political meaning or if it was "just a bunch of words."[214] Gorky, in response to the pleas of Marshak, came to Chukovsky's defense. Marshak, whose influence in promoting playful, metaphor-heavy children's literature was well-known,

[213] S. Marshak to A. M. Gor′kiĭ, March 9, 1927, in S. Marshak, *Sobranie sochineniĭ v vos'mi tomakh*, vol. 8 (Khudozhestvennai͡a literatura, 1972), 95.
[214] N. K. Krupskai͡a, "O 'Krokodile' Chukovskogo," *Pravda*, February 1, 1928, 5.

was singled out for ridicule alongside Chukovsky.[215] Though the *skazka* debates continued to simmer into the early 1930s, they reached a kind of apogee with the intervention of Lunacharsky, who gave the keynote address at a 1929 conference of children's writers and pedagogues held in Moscow's Printing House, a hub of literary life.

Lunacharsky's speech reads as an extension of the more moderate cultural line that he had long held as the People's Commissar for Education. While he began by directly addressing the appropriateness of *skazki* for children and eventually mentions the controversy surrounding Chukovsky directly, his speech more generally answered the question of what Soviet children's literature ought to look like and from what sources Soviet authors of children's literature might find inspiration. Against "severe pedants of realism," Lunacharsky argued that authors ought to borrow from the Russian classics and Western genre fiction alike.[216]

Lunacharsky asserted that figurative language should be encouraged because it attracts children, and young readers can easily distinguish between the real and metaphoric. All understand that some stories originate from "animistic myths," but it is silly, Lunacharsky reasoned, to imagine that children might take metaphors literally. Echoing Marshak, Gorky and others who defended figurative language for children, Lunacharsky explained that such language is most effective from a pedagogical perspective, as wordplay both entices children and teaches them a certain felicity with language.

Lunacharsky celebrated the magic power of wordplay, science, and good literature, demonstrating their positive association in the years just before the official adoption of Socialist Realism. Shortly after, authors and critics would endeavor to downplay the "magic" of language as anything with a link to the supernatural gained a negative connotation. Lunacharsky argued

[215] Bogdanov, *Vox Populi*, 85
[216] A. V. Lunacharskiĭ, "Puti detskoĭ knigi," *Kniga detiam*, no. 1 (1930), 4–5.

that, unlike the bourgeois West, the Soviets had made the "magical power (*volshebnai͡a sila*) of science and technology the basis for people's happiness." He anticipated the Socialist Realist dictate not to depict reality as it is but in its "revolutionary development" by observing that writers ought not to "show reality as it really is" but to "show what reality ought to become." In this vein, Lunacharsky praised the utopian novel, a genre in which the Soviets, he reasoned, would soon outpace the rest of the world. Creating a link between magic and figurative language, Lunacharsky repeatedly referred to wordplay by the phrase "tricks with language," (*fokusy s i͡azykom*) with the word "trick" connoting conjuration.

Lunacharsky's speech evinces the influence of "god-building" and an indebtedness to the rich debates around the quality of the poetic image in early 20th century Russia.[217] For Lunacharsky, the "magic" residue of myth carried by *skazki* only made them more attractive. The pedagogical argument, variously articulated by Lunacharsky, Gorky and Marshak, that *skazki* efficiently communicate a greater density of information than prose is reminiscent of (though does not entirely overlap with) Alexander Potebnya's influential theory of the poetic image as an aid for comprehending the signified object.[218] The mythic aura of figurative language also brings to mind Andrei Bely (himself drawing on Potebnya) in his article "The Magic of Words" in which he theorizes the power of naming not only to clarify but alter the world.

A clear tension exists between lauding the power of figurative language and defending the *skazka* as harmless. On the one hand, Lunacharsky saw literature and metaphor alike as able to exert a transformative, magical power that a dry realism could not. On the other hand, such "magic tricks of language" were of no danger, as the reader will never lose grasp of reality,

[217] For more on Lunacharsky's thought, especially how his brand of positivism fit within the landscape of early 20th century thought, see Robert Williams, "From Positivism to Collectivism: Lunacharsky and Proletarian Culture," in *Artists in Revolution: Portraits of the Russian Avant-Garde, 1905-1925* (Indiana University Press, 1977): 23-58.
[218] A. A. Potebni͡a, *Iz zapisok po teorii slovesnosti* (Khar′kov: Izdanie M. V. Potebni, 1905), 314.

which remains distinct and separate from language. Is figurative language useful because it is enchanting, or harmless because it lacks any real force? This unresolved contradiction would carry over into the creation of a popular science vernacular.

Lunacharsky's argument can also be used to mark the distance between those embroiled in the *skazka* debates and the situation of the Russian Formalists, another group who suffered an assault from Marxist critics in the mid to late 1920s. Parallels should not be overemphasized, as Marshak, Gorky, and Lunacharsky championed the *skazka* in a way that departed significantly from Formalist positions. By the time of the *skazka* debates, the Formalist school's influence had declined, and Marxist critics accused Formalism of ahistoricism.[219] Marshak and Gorky would advance *skazki* as useful for imparting a correct attitude towards the natural world. It is Potebnya's similar idea that the poetic image is "simpler than what it clarifies" against which Shklovsky formulated his theory of *ostranenie* in "Art as Technique" in 1917.[220] In Shklovsky's view, the poetic does the opposite of aid understanding; rather, it slows perception precisely by making comprehension more difficult. Vladimir Propp, in *Morphology of the Skazka*, aspires to find in the corpus of *skazki* common laws of formal composition and evolution. Marshak's defense of *skazki* was a proxy defense of lingual play, rather than an argument about how one should study such language or an aspiration to view the form diachronically.

The scorn for anthropomorphism had a dampening effect on children's literature. A majority of popular science titles for young readers in the 1920s were about technology, especially gadgets that children were likely to encounter. Also popular were stories about animals and nature, though, responding to the pressure of critics, there was a turn away from

[219] For a detailed account of the conflict between Marxists and Formalists, see Victor Erlich, *Russian Formalism: History - Doctrine* (Berlin: Walter de Gruyter, 1980), 99-139.
[220] Viktor Shklovskiĭ, "Iskusstvo, kak priem," in *O teorii prozy* (Moscow: Federat͡siia͡, 1929), 7–23.

anthropomorphization, which had earlier been a staple of stories on the topic. Some stories with anthropomorphized characters continued to be published, such as M. Lugansky's "The Match and the Candle" (1924), in which a match, candle, and pair of wick clippers discuss their origins, or A. Zakharova's "In the Recesses of the Human Body" (1927), where a talking leukocyte leads the child heroine on a tour of the human body. Elina Kazakova remarks that, in the context of the *skazka* debates in the late 1920s, such stories featuring inanimate, talking subjects seemed "archaic."[221] Marshak made use of anthropomorphism in "Yesterday and Today" (1925), a short poem in which various outdated, household devices discuss their encounters with those technologies that have rendered them obsolete.

It was into this controversy that Ilya Marshak, who had trained as a chemist, adopted the pen name M. Il'in and launched his writing career in the influential children's journals edited by his brother. In articles and sketches, Il'in drew on his scientific background to describe the production of household items. Representative of these early writings are Il'in's short books *What Time Is It?: Stories about Time* (1927) and *Black on White: Stories about Books* (1928). The two books similarly begin by inviting the young reader to examine an everyday object—a clock and a book, respectively—then point out the many intermediary technologies that have led to that vital yet unassuming household staple. Both stories eschew named characters in favor of a series of vignettes (*rasskazy*) about past inventions: the water clock, papyrus, the printing press. Like other children's stories about technology of the time, such as "The Match and the Candle" and "Yesterday and Today," Il'in's early stories lack a pronounced politics beyond a celebration of the linear advancement of technology. This sense of science as an international endeavor was a commonplace of the 1920s that would be abandoned the following decade in favor of more

[221] Elina Kazakova, "Novai͡a nauchno-populi͡arnai͡a kniga 1920-kh gg.: O chem i kak?," *Detskie chteni͡a*, no. 2 (2021): 281–307.

Russian-centric stories and a stress on how Soviet science differed from that of the West.

The Emergence of Dialectical *Skazochnost'*

Following the Great Break and the launching of the First Five-Year Plan in 1928, officials enlisted cultural institutions to celebrate the Soviet Union's rapid industrialization. The "conquest of nature" appeared as a popular theme to illustrating the scale and scope of Soviet technological accomplishments.[222] Favorite topics were the monumental projects that affirmed this victory, such as Dnieprostroy, a massive dam on the Dnieper River, the Belomor Canal, which cleaved a path between the White Sea and the Baltic, and the construction of Magnitogorsk, a planned steel-smelting city built atop an immense iron deposit in the Ural Mountains. The conquest of nature was central to the Soviet production novel, as exemplified by Leonid Leonov's *Sot* (1929), which describes the construction of a pulp mill along the Sot River, and Marietta Shaginyan's *Hydrocentral* (1931), which recounts the construction of a hydroelectric plant in Armenia. Popular science journals pivoted away from providing general, "disinterested" scientific information towards describing how Soviet technology would serve the industrializing economy.[223] The Central Committee asked that writers provide young readers with texts that "depict the socialist reconstruction of the country."[224] The resulting children's writing of the late 1920s and early 1930s focused on the themes of construction, urban development, and the conquering of nature.[225] Surveying literary depictions of technology in

[222] For a reading of this theme as it appeared in Socialist Realist novels, see Clark, *The Soviet Novel*, 100-106. For an exploration of the arctic exploration theme, see John McCannon, "Tabula Rasa in the North: The Soviet Arctic and Mythic Landscapes in Stalinist Popular Culture," in *The Landscape of Stalinism: The Art and Ideology of Soviet Space* (University of Washington Press, 2003), 241–60.
[223] Andrews, *Science for the Masses*, 121-134
[224] "O meropriiatiiakh po uluchsheniiu iunosheskoĭ i detskoĭ pechati," in *KPSS o sredstvakh massovoĭ informatsii i propagandy* (Politizdat, 1987), 423; "Postanovlenie Sekretariata TSK VKP(b) ob izdatel′stve "Molodaia gvardiia". 29 dekabria 1931 g," in A. Artizov and O. Naumov, eds., *Vlast' i khudozhestvennaia intelligentsiia. Dokumenty TSK RKP(b)-VKP(b), VChK-OGPU-NKVD o kul'turnoĭ politike. 1917-1953* (MFD, 1999), 164-166, quoted in Jacqueline Olich, *Competing Ideologies and Children's Literature in Russia, 1918-1935* (VDM Verlag, 2009), 179, 180.
[225] Olich, *Competing Ideologies and Children's Literature in Russia*, 182-197.

children's writing during the First Five-Year Plan, John McCannon finds "a tremendous occupation with the machine, as well as a corresponding antagonism toward nature and the elements."[226]

Il'in participated in this shift with *The Story of the Great Plan*, published in 1930. Through a series of vignettes, Il'in showcases the various technological innovations, recent and imminent, that will transform the country during the First Five-Year Plan. Science is now political. In addition to exhibiting the coming attractions of Soviet technology, Il'in frequently draws a distinction between inefficient, poorly planned methods of resource extraction carried out by capitalists (most often Americans) in the past and the much greater scale and deliberation with which socialists will carry out those operations henceforth. Crucially, in *The Story of the Great Plan* and the critical commentary that accompanied it, one finds *skazochnost'* explicitly advanced as a way of illustrating the dialectical character of nature's transformation.

The Story of the Great Plan lacks any named, human protagonists; instead, Il'in frequently uses anthropomorphism to animate the machines and natural forces that are his central characters. Drilling towers are "long-legged steel giants," machines are "iron foremen," and those machines that have outlived their usefulness are "little old men."[227] Metaphors often underscore scale, as machines and the mountains against which they square off are similarly called giants. The combative framing of man's relationship to the environment imbues nature with an animacy. In a chapter titled "The War Against the River," Il'in observes that "to conquer the wind is a difficult task. More difficult yet is getting the water to work."[228] These comparisons

[226] John McCannon, "Technological and Scientific Utopias in Soviet Children's Literature, 1921-1932," *Journal of Popular Culture* 34, no. 4 (Spring 2001), 159.
[227] M. Il′in, *Rasskaz o velikom plane,* in *Izbrannye proizvedenii͡a v trekh tomakh*, vol. 1 (Moscow: Khudozhestvennai͡a literatura, 1962), 336, 369, 372.
[228] Ibid., 341.

are not buffered by the use of "like," as, some few years earlier, Marshak had complained to Gorky that critics demanded to avoid confusing young readers. Instead, Il'in uses metaphors that, like the machines he describes, transform the world into a usable product for Soviet industry.

Il'in's use of *skazochnost'* aligns with a broader sentiment that the fantastic had become real. Il'in defends his use of *skazochnost'* by continually pointing out that what is realistic in the present day would have seemed fantastic in the past. He describes the building of the Dnieprostroy, one of the most potent symbols of the young Soviet Union's ability to bend nature to man's will. That workers can stand before the Dnieper and tell the river "stand back" was, until the present time, "something only said in a *skazka*."[229] Only recently, Il'in writes, the power of chemistry to manufacture artificial leather, artificial wool, and rubber galoshes would have seemed "like nonsense, like fiction" but today such things are possible.[230]

The style and the scope of Il'in's book attracted praise from those on both sides of the *skazka* debates, as all agreed that he had captured the distinct essence of Soviet science. *The Story of the Great Plan* was lauded for both displaying material reality's dialectical development and exhibiting a style readily identified with *skazochnost'*. With this, the two concepts began to publicly converge.

In the keynote speech at the First All-Russian Conference on Children's Literature in 1931, Krupskaya singled out *The Story of the Great Plan* as an example of how to show children the dialectical character of Soviet progress. She argued that children must be given books that privilege communist content "without erudite words and verbal flourishes (*slovesnye vykrutasy*)." Krupskaya's word choice can be compared to that of Lunacharsky. "*Vykrutasy*" carries the connotation of deception, while Lunacharsky's term for wordplay, "*fokusy*" suggests a

[229] Ibid., 342.
[230] Ibid., 376.

charming magical conjuration. The implication, especially in the context of the ongoing *skazka* debates, was clear: Authors could not indulge in formal experimentation for its own sake, as Krupskaya had often accused Marshak and Chukovsky of doing.

In her vague prescription for how reality ought to be depicted, Krupskaya drew on the vocabulary with which Engels had described dialectical materialism. Books should show things "in all their concreteness, in all their mediations (*oposredstvovaniia͡*), taken in their development" which would "show their connection with surrounding modernity. In other words, it is just as important to apply the dialectical method to children's literature as it is to all [science] popularization." In such books, "all must be given in motion, in action, in its interconnectedness (*vo vzaimosvi͡azi*)."[231] Among the three titles that Krupskaya felt met these criteria was Il'in's *The Story of the Great Plan*. Krupskaya's latter two selections were stylistically unremarkable. Oleg Shvarts's *The Rally* provides a report of the 1929 All-Union Pioneer Rally. K.F. Piskunov's *The Giant* documents the agricultural accomplishments of the Soviet Union. This suggests that depicting reality "in all its interconnectedness" remained primarily a matter of lavishing praise on Soviet accomplishments. Even if there was no precise connection between a work's style and its depicting reality "dialectically," Krupskaya's speech evinces a discreet set of stylistic descriptors to which authors or critics could (and did) appeal.

Korney Chukovsky, who had been a primary target of Krupskaya for his playful children's stories about talking animals, likewise used Il'in's *The Story of the Great Plan* to advance his position in the *skazka* debates. In an article for *The Literary Gazette*, he presented Il'in's book as proof that there was no contradiction between the *skazka* and educational

[231] N. K. Krupskai͡a, "Detskai͡a kniga--mogushchestvennoe orudie sot͡sialisticheskogo vospitanii͡a," in *Pedagogicheskie Sochenenii͡a v Desi͡ati Tomakh*, vol. 3 (Moscow: Izdatel′stvo akademii pedagogicheskikh nauk, 1959), 439–42.

literature. Best for children, Chukovsky argued, were those texts that could both hold the reader's attention, as fantastic *skazki* did, and teach a lesson. Il'in's *The Story of the Great Plan* "nears the *skazka*" in tone and composition, and it is because of Il'in's great familiarity with the *skazka* that the author has "so succeeded in transferring entirely *skazka* poetics (*skazochna͡ia poėtichnost'*) and allure to our great plan."[232]

Gorky also lavished praise on *The Story of the Great Plan*. Il'in's book was translated and published abroad to great success, a fact that Gorky highlighted in multiple letters to Stalin.[233] Gorky and Il'in met several times in 1931 and 1932. Il'in recalled how Gorky emphasized the necessity books like *The Story of the Great Plan* and offered advice for his forthcoming book, *Men and Mountains,* for which Gorky would write the English-language introduction.[234] Gorky's esteem for Il'in is unsurprising given that, in many ways, the "conquering of nature" theme, so central to Il'in's work, had grown out of Gorky's own thinking. Over the course of the 1920s, nature had become the negative term in Gorky's philosophy of "god-building," his program for man's Promethean self-realization.[235] Nature represented all that was "elemental," a force that would be overcome by human reason (*razum*) in the transformation of the world.[236] Il'in applauded Gorky's articulation of this relationship between humans, science, and nature in an account of their early 1930s meetings: With the aid of science, humans

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[232] K. Chukovskiĭ, "Upravdom ili Darvin. O detskoĭ knige," *Literaturna͡ia gazeta,* September 11, 1932, quoted in Ushakin, "Skazka? Lozh'? Namek? Urok? Okololiteraturnye debaty o (bes)poleznosti odnogo zhanra."
[233] M. Gor'kiĭ to I. V. Stalin, November 12, 1931," in *Polnoe sobranie sochineniĭ. Pis'ma v dvadt͡sati chetyrekh tomakh,* vol. 20 (Nauka, 2018), 349; M. Gor'kiĭ to I. V. Stalin, February 8-9, 1932, in *Polnoe sobranie sochineniĭ. Pis'ma v dvadt͡sati chetyrekh tomakh,* vol. 21 (Nauka, 2019), 69. For an account of the enthusiastic American reception of Il'in's *The Story of the Great Plan*, see Julia Mickenberg, "The New Generation and the New Russia: Modern Childhood as Collective Fantasy," *American Quarterly* 62, no. 1 (March 2012): 103–34.
[234] M. Il'in, "Neskol'ko vstrech s Alekseem Maksimovichem," in *Zhizn' i tvorchestvo M. Il'ina* (Detska͡ia literatura, 1962): 182-86.
[235] Douglas Weiner traces Gorky's attack on nature to a 1926 essay on Mikhail Mikhailovich Prishvin. See Douglas Weiner, "Man of Plastic," 71-72.
[236] See, for example, Gorky's 1931 article, "On the Struggle with Nature": M. Gor'kiĭ, "O bor'be s prirodoĭ," in *Sobranie sochineniĭ v trid͡sati tomakh*, vol. 26 (Khudozhestvenna͡ia literatura, 1953), 186–98.

have already won in the "struggle for power over the elemental forces of nature." Gorky made it clear that "man is the highest form of matter, thinking matter, which not only comprehends (*poznat'*) but reshapes (*pereobrazhat'*) the world."[237] This triumphal story was emphatically materialist while maintaining a clear sense of evolutionary telos which was guided by the *Geist*-like power of human rationality. In this, Gorky echoed both the evolutionary conception of Engels, who likewise maintained a sense of evolutionary teleology, and Russian Cosmists such as Tsiolkovsky and Vernadsky, who similarly celebrated the teleological "development" of nature as guided by rational thought.

Gorky called for the creation of contemporary *skazki* to inspire the conquest of nature in a 1933 article, "On Themes," where he proposed a new genre, "science prose" (*nauchno khudozhestvennai͡a literatura*) which would act as a corrective to current science writing. The term "prose" (*khudozhestvennai͡a literatura*) marked the proposed genre apart from the other two genres to which the term "scientific" was most often appended: science fiction (*nauchnai͡a fantastika*) and popular science (*nauchno-populi͡arnai͡a literatura*). In agreement with the criticism levied against a past generation of science popularizers, Gorky argued that science writing should advertise the Soviet state's application of scientific knowledge. He paid particular attention to the harnessing of natural resources, such as the mining of coal to produce steel and the production of energy from dams.

Gorky saw no contradiction between the *skazka* form and an objective, materialist view of the world. He argued that "children should be given *skazki* based on the demands and hypotheses of modern scientific thought," as "nowadays, fantasy and imagination can rely on real data from scientific experience." How an author might create a *skazka* based on modern

[237] Il′in, "Neskol′ko vstrech s Alekseem Maksimovichem," 185, 186.

scientific thought can be glimpsed in Gorky's suggestion that someone write a story titled "About How Science Made People Giants" to describe how human abilities have been augmented by technologies such as the telescope, radio, and modern transportation. Il'in later realized Gorky's suggestion, at least nominally, and wrote a book titled "How Man Became a Giant" about human evolution. Lastly, Gorky gave the example of two books that were already demonstrating the "possibilities of our construction": Il'in's *The Story of the Great Plan* and Constantine Paustovsky's *Kara-Bugaz.*[238]

Marshak cited Il'in to argue that *skazochnost'* was the best tool for depicting the dialectic at the first Soviet Writers' Congress, held in August 1934. This position was a subtle departure from how he had discussed *skazochnost'* in the past. Before, Marshak had championed *skazochnost'* on formal grounds. Its playfulness and verbal density, he had reasoned, made it the best form for capturing the interest of young readers. Now, to appease his critics who called for children's literature to be realist, he suggested that *skazochnost'* was best for representing dialectical materialism, breaking with an earlier agnosticism towards the relationship between form and content.

Like Gorky, Marshak advocated for the creation of new *skazki*. Though the content of older *skazki* may no longer be relevant, he explained, their form remained useful. Children needed books "based on the real, raw material of life and real ideas." Yet, as Marshak argued throughout his speech, realism alone was not enough. In the best books for children, one found "notwithstanding realism […] unexpected *skazochnost'*." The task for children's books, then, was to wed the *skazka* form with realist content. Dialectical materialism permitted such an alchemy.

[238] M. Gor′kiĭ, "O temakh," in *Sobranie sochineniĭ v tridt͡sati tomakh*, vol. 27 (Moscow: Gosudarstvennoe izdatel′stvo khudozhestvennoĭ literatury, 1953), 97–109.

Following the characterization first made by Engels, Marshak made extensive reference to transformation in distinguishing a dialectical-materialist approach to science from a bourgeois one. The best new books on science were "imbued with an understanding of the 'dialectics of nature'" in that "instead of motionless representations of nature, people, and everyday life" they "[strove] to show readers the changing connection of phenomena (*meni͡aiushchui͡usi͡a svi͡az' i͡avleniĭ*)." Marshak offered Il'in's forthcoming novel *Men and Mountains* as an example of such writing and quoted it extensively. He then repeated his core point: Older books had erroneously presented "science separately from life, life separately from science and impressed in the reader the belief that everything in the world is inalterable: rivers, mountains, borders, thrones, parliaments, nomadism." This older image of science was falsely "unchanging."[239]

In Il'in's own, much briefer speech at the 1934 congress, he used the same vocabulary of dynamism to describe how nature ought to be depicted for young readers, though he never mentioned the dialectic directly. A writer "must show nature in action, in motion, so that [the reader] sees it with new eyes, not the eyes of an observer, but the eyes of a builder."[240] Thus, *skazochnost'* was more than an inviting embellishment, it modeled an active transformation of the natural world necessary for the industrial conquest of nature.

Marshak's argument at the 1934 congress was in keeping with a broader reevaluation of myth and *skazki*. Gorky's speech at the conference defended myth, which he argued represented a primitive, materialist outlook. He called for new, Soviet *skazki*, which, following his intervention, saw a boom in research and publication.[241] Although Gorky was less concerned

[239] S. I͡A. Marshak, "Sodoklad S. I͡A. Marshaka o detskoĭ literature," in *Pervyĭ vsesoi͡uznyĭ s"ezd sovetskikh pisateleĭ, 1934. Stenograficheskiĭ otchët.* (Moscow: Khudozhestvennai͡a literatura, 1934), 30-32.
[240] M. Il′in, [Speech], in *Pervyĭ vsesoi͡uznyĭ s"ezd sovetskikh pisateleĭ, 1934.*, 215.
[241] For more on the production of "contemporary," Stalinist folktales, see Marina Balina, "Introduction," in *Politicizing Magic: An Anthology of Russian and Soviet Fairy Tales* (Evanston: Northwestern University Press, 2005), 105–21.

with the issue of science, his talk rehearsed many of the moves that undergirded the implied correspondence between *skazochnost'* and a dialectical-materialist worldview or the convergence of the fantastic and the realistic in general. Gorky's argued that the myths of primitive peoples were not originally "fantastic," even if they were later perverted into "metaphysics." Rather, myth reflected a primitive, materialist outlook. The uncoupling of myth and folklore from their material basis was the fault of 19th-century idealists.[242] The formally fantastic, Gorky's speech insinuated, could still offer a materialist perspective.

Serguei Oushakine traces the resolution of the *skazka* debates to the differentiation between the "*skazka*" and "*skazochnost'*," a divide on full display in the 1934 speeches. Whereas the *skazka* had been understood as integral to and reflective of a primitive belief system, the ascension of the term "*skazochnost'*" signaled a newfound sense that the formal elements of the *skazka* could be separated from their historical origin. Addressing anthropomorphization, a prime target of the *skazka*'s critics, Oushakine writes that "from a method of *worldview* (*mirovospriiatiia*) anthropomorphism became a method of *plot-construction* (*siuzhetostroeniia*): 'personification' (*ochelovechivanie*) of the non-living and inanimate evolved into 'dramatization.'"[243] Conversations around dialectical *skazochnost'* reveal how, while the elements of the *skazka* could be reappropriated to construct new, Soviet myths, there remained a desire to think through the relationship between form and content. The conquest of nature by Soviet industry provided a general plot for *skazochnost'* to dramatize with the vocabulary of dialectical materialism guiding the depiction of nature's transformation.

[242] For more on how Gorky fit folklore into the emerging ideology of Socialist Realism, see Ursula Iustus, "Vozvrashchenie v raĭ: sotsrealizm i folʹklor," in *Sotsrealisticheskiĭ kanon* (Moscow: Akademicheskiĭ Proekt, 2000), 70–86.
[243] Ushakin, "Skazka? Lozhʹ? Namek? Urok? Okololiteraturnye debaty o (bes)poleznosti odnogo zhanra," 35. Emphasis in original.

In later essays and speeches discussing the necessary path for children's writing, Marshak often dropped his appeal to dialectical materialism, though he remained dedicated to defending lively, *skazka*-inflected prose against those who judged writing solely on the basis of its ideological content. [244] Such a pivot raises the likelihood that Marshak emphasized the link between *skazochnost'* and the dialectic to meet the narrow criteria of his critics. Regardless of his sincerity at the Writers' Congress, his ability to successfully argue that *skazochnost'* illustrates dialectical materialism testifies to the existence of a stable sense of what it meant for figurative language to be "dialectical," and this permitted the rehabilitation of metaphors that had been written off as perniciously metaphysical some few years earlier.

Further Animating and Conquering Nature

In his 1935 book *Men and Mountains*, Il'in provided a complete articulation of dialectical *skazochnost'* and demonstrated how it could be used to wed a Soviet philosophy of natural science to the state's industrial goals. The subject matter of *Men and Mountains* is similar to that of *The Story of the Great Plan*, and Il'in further amplified *skazochnost'* to describe the eminent transformation of nature by Soviet technology. In this, one sees popular science growing *more* fantastic, albeit in a circumscribed way, even as Il'in and others, responding to the demands of the day, began to polemicize about the realism of their work.

Though Il'in does not mention dialectical materialism by name, it informs his story from the outset. In an introductory passage, Il'in draws a contrast between correct and incorrect perceptions of change. He recounts finding a copy of a geography book from his pre-

[244] See, for example, his elaboration of science prose in the forward to Matvei Bronstein's 1935 popular science book: *Solar Matter*: S. I͡A. Marshak, "Povest′ ob odnom otkrytii," in *Sobranie sochineniĭ v 8 tomakh,* vol 6 (Moscow: Khudozhestvennai͡a literatura, 1972). See also his speech, "For a Great Children's Literature," delivered at 1936 meeting on children's literature before the Central Committee of the Komsomol: S. I͡A. Marshak, "Za bol′shui͡u detskui͡u literaturu," *Detskai͡a literatura,* no. 1 (1936): 18–23.

revolutionary childhood. This old geography incorrectly suggests that the world does not change. "It is clear," Il'in explains, "that the world that we once described was not real but imagined. In the real world things do not lie motionless on the shelf but move, collide, grow, are born, die, change themselves and change one another." This passage closely echoes the description of a proper image of science that Il'in's brother, Marshak, had delivered at the Soviet Writers' Congress a year earlier, which, in turn, had drawn on descriptions of the dialectic as they filtered down from Engels.

Il'in's anthropomorphizing metaphors in *Men and Mountains* demonstrate the mutability of nature and the error of the static world depicted in the old geography. Most frequently, nature is compared to a human enemy whom the Soviet Union must subdue. As in *The Story of the Great Plan*, the power of nature is equivalent to that of giants: "For the reconstruction (*perestroika*) of nature," Il'in writes, "we use the materials and energy of nature itself. We make one mountain change (*perestraivat'*) another, one river change another. Our task is to direct the giants. They themselves do all the work for us."[245] Elsewhere, he personifies technology or compares nature to the man-made. A city without electricity is compared to a person without her senses:

> What would happen if a present-day city should suddenly be without electricity […]? All the machines in all the factories would stop. So the city would lack hands. All the streetcars would stop […]. So the city would lack feet. The telephones, the telegraph, radios, and presses would all stop working. The city would lack a tongue and ears.[246]

The ability of Soviet technology to direct the rains is equivalent to man placing trains on the correct track: "Convoys of water, like convoys of train cars, always follow the same route. […] What is man's task? He must direct the movement of the freight cars [of rain], transfer

[245] M. Il′in, *Gory i l͡iudi* (Leningrad: Gosudarstvennoe izdatel′stvo detskoĭ literatury, 1935), 7, 259.
[246] Ibid., 222.

(*perevodit'*) them" between tracks according to his will.[247]

Metaphoric transformation offers an education towards physical alteration. To fail to see mountains as tamable giants and the rains as rail cars is to make the mistake that Il'in outlines in his forward: It is to understand nature as comprised of fixed matter, as past materialists once had, rather than the dynamic arena of dialectical materialism. Even in this small sample, the chosen verbs further emphasize the dialectical character of transformation. The use of the verbal prefix "pere," perhaps best corresponding with the English prefix "re," has the association of re-doing and re-directing. If dialectical thinking is seeing the world as an interconnected whole in which all is in a state of continuous movement, then matter and energy cannot be created from without; rather, pre-existing force can be reoriented, and pre-existing matter reshaped. This refashioning, according to the emerging dictum of Soviet Marxism, trends towards perfection, which is equated with rational (therefore socialist) man.

The use of transformative, anthropomorphizing metaphors had definitively shifted from its earlier context in the *skazka* debates of the mid-1920s, where such language was championed on the grounds that it was simply an enticing way of conveying information. The metaphors that Il'in used may have made his books more attractive to young readers, but the animation of the material world was not solely for entertainment. While young readers knew that rainclouds were not actually train cars and cities not actually human beings, there was an explicit appeal here to an underlying truth: Nature, like the machine, was subject to man's will. *Skazochnost'* was used to construct a popular image of dialectical materialism in which emphasis lay, above all, on Soviet technology's ability to rework the natural world.

In his introduction, Il'in stressed the unification of the sciences, a motif that likewise

[247] Ibid., 63-4.

exemplified how the institutional organization of Soviet science manifested in popular narratives. The sciences had hitherto been fractured into their respective disciplines, Il'in observes. Though he had learned many interesting things over the years, the older he grew, "the harder it became for [him] to create a whole out of the separate things about which [he] knew."[248] His book, in addition to showing how the world was in a state of movement and transformation, demonstrated this unified science.

Such unity generally consisted of emphasizing the complexity of a given scientific task, then enumerating the many scientific disciplines that had to work together to accomplish it. Usually, the Academy of Sciences acted as an institution hub that organized the various specialists. The complex task of building dams along the Volga called for a meeting of "engineers, agriculturalists, geologists, economists, physicists, chemists, zoologists, [and] botanists."[249] Building a single dam might require experts in hydrotechnics, geology, and ichthyology to collaborate. The process of performing such common, utilitarian tasks brought science itself closer to life:

> [Hydrotechnologists, geologists, and ichtyologists] study altogether different things. But when the task is not to study nature, but to remake (*peredelyvat'*) it, all sciences meet, all sciences find a common language and a common task. As it should be. For only in books do things exist separately.[250]

Thus, the anxiety over finding a common language between domains of knowledge, a preoccupation of Marxist philosophers of science, became a readymade trope for boasting about the institutional structure of Soviet science.

Il'in's work demonstrated the larger tension between the realistic and the utopian, as he invoked imagery with a long utopian history but proclaimed it eminently feasible. Il'in spends a

[248] Ibid., 7.
[249] Ibid., 187.
[250] Ibid., 209.

large portion of *Men and Mountains* detailing how the arid steppe would be transformed into fertile farmland through the use of canals. This promised transformation reflected, above all, a contemporary enthusiasm for irrigation and hydroelectric power.[251] The might of dams had long been an object of socialist enthusiasm. Chernyshevsky inaugurated a link between Edenic plenty and technical utopia in Vera Pavlova's fourth dream. After taking in the wonders of the crystal palace, Vera admires the lush countryside, the verdancy of which is ever more impressive given that they are in the middle of the desert. She learns that she is in a territory once called "the land of milk and honey" which has been restored to its prelapsarian condition thanks to a system of canals.[252] In Bogdanov's *Red Star*, a planet-wide canal-building project helps terraform the harsh Martian landscape into usable farmland. Additionally, it is the experience of this collective labor that allows the Martian people to evolve into socialists.

As in *The Story of the Great Plan*, references to the fantastic snuck in, though they are firmly bracketed. For people of the near future looking down at the surface of the earth which had been reconfigured by reservoirs and canals, it would seem that what lay beneath them was "not earth, but some other planet, similar to Mars, with its dark lines and circles."[253] With this comparison, Il'in makes the surface of the Soviet Union equivalent to the fantastic Martian utopias of the previous decade's *fantastika*, though the equivalence is a mistaken conception. Il'in uses similar rhetoric to accentuate the scale of waterways to be constructed around the Volga. "This project," Il'in assures readers, "is no *skazka*."[254] As earlier, the *skazka* is

[251] For more on the extent of canal-building and how canals fit into the Stalinist cultural project, see Paperny, *Architecture in the Age of Stalin*, 134-8; Cynthia Ruder, *Building Stalinism: The Moscow Canal and the Creation of Soviet Space* (London: Tauris, 2018); "Reflections on the Soviet Politics of Water in the 1930s," *EuropeNow*, no. 19 (July 2018), https://www.europenowjournal.org/2018/12/10/reflections-on-the-soviet-politics-of-water-in-the-1930s/.
[252] Nikolaĭ Chernyshevskiĭ, *Chto delat'?*, Biblioteka vsemirnoĭ literatury (Moscow: Khudozhestvennai͡a literatura, 1969), 357.
[253] Il'in, *Gory i li͡udi*, 96.
[254] Ibid., 196.

simultaneously invoked and distanced. Reality has become mythic, and to mistake reality for a *skazka* would be a mistake. Occasionally, an older image of miraculous science is deployed without distance. Il'in writes that if genetic research continues people will "perform miracles (*chudesa*)" by finding agricultural uses for those technologies.[255] In showing how such scientific developments feed Soviet citizens, Il'in continues to separate these scientific "miracles" from a past popular science that paraded the wonders of science divorced from practical application.

Other prominent texts about Soviet industry conquering nature in the early 1930s likewise used *skazochnost'* to exhibit nature's dialectical plasticity. Elsewhere, nature's figurative animation was of secondary concern or the connection between metaphoric and physical transformation was more oblique. Even so, the animation of nature communicated the same message: Nature coming alive illustrated its mutability, and the ability to perceive this animation guided nature's physical "correction" by human logic (*razum*).

Paustovsky's *Kara-Bugaz* (1932), which was often cited, alongside *The Story of the Great Plan*, as a model example of science prose, offers a more subtle demonstration of how a sense of nature's dialectical movement informed its figurative animation. In this book for young readers, Paustovsky describes how humans learned to utilize the salts from the Kara-Bogaz-Gol, a body of water in contemporary Turkmenistan, through a series of vignettes about scientists and explorers.

Of Paustovsky's characters, only those who view nature dialectically can recognize and make use of its hidden bounty. Paustovsky recounts how, during the Russian Civil War, a meteorologist first identifies the yearly cycle by which Kara-Bugaz generates millions of tons of Glauber's salt. The meteorologist relates the cycles of salt accumulation to the revolution of the

[255] Ibid., 159.

seasons and remarks that the adage "everything flows, everything changes" (*vse techet, vse izmenia͡etsia͡*) must have been coined by someone in the desert.[256] This saying, which originates with the Greek philosopher Heraclitus, was shorthand for the dialectic and would have marked it for Paustovsky's readers. For example, Heraclitus's phrase appears in Georgi Plekhanov's *The Development of the Monist View of History* (1895), where the "father of Russian Marxism" repeats it multiple times to explain the core quality of the dialectic.[257]

As in Il'in, discerning that nature can be altered allows for its figurative transformation into a foe. *Kara-Bugaz* ends in the present day (1931) with preparations to conquer the desert. Paustovsky compares a meeting of Moscow scientists to a military council: Though "strictly scientific," the conference "recalled a meeting of officers planning their campaign against the desert [in which] a relentless war had been declared on nature's coarse and intolerable mistakes."[258] Seeing nature as capable of "mistakes" ascribes to it a consciousness and a will capable of redirection, channeling Gorky's conception of nature as the source of "elementality" that human reason must correct. Paustovsky's war analogy, if not explicitly anthropomorphizing the desert into a human personage, is, at very least, an example of the sort of animation which Marshak once complained drew the ire of critics. Paustovsky's story ends with characters celebrating the eminent development of the desert, which will result in the cultural advancement of the local populace, the transformation of the baren sands into abundant gardens, and the availability of salt to Soviet industry, all of which would have been deemed "a fantasy" by past specialists, who were blind to the extent of nature's dynamism.

[256] K. Paustovskiĭ, "Kara-Bugaz," in *Sobranie sochineniĭ v vos'mi tomakh*, vol. 1 (Khudozhestvenna͡ia literatura, 1967), 438.
[257] G. V. Plekhanov, "Idealisticheska͡ia nemet͡ska͡ia filosofii͡a," in *K voprosu o razvitii monisticheskogo vzgli͡ada na istorii͡u* (Gosudarstvennoe izdatel′stvo politicheskoĭ literatury, 1949), 76–123.
[258] Paustovskiĭ, "Kara-Bugaz," 514.

Marshak likewise furnishes an example of how *skazochnost'* communicates the dialectical perception of nature in a 1931 poem titled "War Against the Dnieper."[259] Marshak casts the construction of the Dnieprostroy as a standoff between Soviet workers and a stubborn, anthropomorphized Dnieper River. Attending construction machines come to life. A crane that "comes to the fight," is a "twenty ton/ giant (*velikan*)/ who carries/ in its outstretched hand/ a cast-iron hammer/ on its hook." A driller is "an elephant" who attacks granite with its "iron trunk." The right and left bank of the Dnieper converse about their surprise at the speed and extent of the Soviet project. Accompanying Marshak's poem were illustrations of the cranes and drillers in their real-life, machine forms rather than in their *skazka*-like guises, as if to clarify that Marshak's poetic flight of fancy was not a bid to see the inanimate world as literally having come to life.

In the final section of "War Against the Dnieper," Marshak links the river's figurative anthropomorphization to its physical alteration for human use. He repeats the poem's opening line, "a man told the Dnieper/ 'I will dam you with a wall'," which, in making the river an interlocutor, begins the Dnieper's anthropomorphization into a singular, conscious subject capable of response. Marshak then lists the many tasks that the "defeated water" will carry out as a result of its damming, such as pulling machines, pushing trains and lighting homes. Each action is set off by the conjunction "so that" (*chtoby*), underscoring the causal relationship between the river's metaphoric transformation and its capacity for labor. Both endow the river with a human logic: Just as the river's anthropomorphization causes it to act and express itself in a human manner, so does the river's damming "rationalize" its actions by putting them in service of human needs. At the same time, not all of the figurative language at play in "War Against the

[259] S. I͡a. Marshak, "Voĭna s Dneprom," *Ëzh*, no. 1 (1931): 1–5.

Dnieper" tightly corresponds to the dialectical transformability of nature. Machines appearing as animals do not express the mutability of matter but rather ornament the mythic scale of Soviet industry.

As in the work of Il'in and Paustovsky, to stand up to nature and recognize that it might be transformed permitted apprehending its *skazochnost'*. Marshak's use of anthropomorphization in "War Against the Dnieper" can be contrasted to that in "Yesterday and Today," his poem published six years earlier, in which outdated household objects chat. Before, anthropomorphization was solely a formal device for enlivening Marshak's observation of technological progression. In "War Against the Dnieper," figurative anthropomorphization becomes integral to the technological progress depicted; to reap the rewards of industrial development, one must be able to envision nature as adaptable for human purposes.

How the dialectical-materialist conquering of nature complemented the historical-materialist development of the human subject can be observed in *History of the Construction of the White Sea-Baltic Canal* (1934), a collective volume about the construction of the titular waterway by prison labor. The volume boasted a roster of contributors that included prominent authors, such as Viktor Shklovsky, Mikhail Zoshchenko, Valentin Kataev, and Aleksey Tolstoy. Gorky served as an editor alongside Leopold Averbakh, who had lead RAPP, and Semyon Firin, who had overseen the forced labor camp responsible for the canal's construction. The volume's writers aimed to demonstrate how, in the process of carving the 227-kilometer-long canal, laboring prisoners underwent a "reforging" (*perekovka*) and transformed from criminals into model citizens. While the bulk of the narrative focused on this human conversion (summarized in Gorky's dictum, "man, in changing nature, changes himself"), nature, too, occasionally underwent figurative transformation.

The Vyg river seems to come to life in a passage describing its damming. Again, altering nature revealed a *skazochnost'* undetected by those who did not understand that natural forces could be "corrected." When Soviet shock workers announce their plan to dam the Vyg, local Karelians scoff and respond that "from time immemorial there has been a river, and it will continue to be." These doubters watch in awe as Soviet workers assault the river, which is likened to a conscious animal as it "struggles." The soil dumped into the river to slow its flow is an "earthen noose, tightening around the Vyg's neck." Just when the workers think the river has been "defeated," the Vyg "gathers strength for a blow in the back." Finally, the river is "tamed." "With its final drops, the dying river wept," and locals are shocked by the ensuing silence.[260] Figurative language emphasizes the river's vulnerability to human domestication. While the exact adversary to which the river is compared remains uncertain, the river's precise metaphoric form matters less than the worker's capacity to perceive and activate this latent tamability. This ability, attributable to their ideologically "reforging," sets them apart from the non-proletariat Karelian bystanders.

The imperative to demonstrate nature's subordination to human will and the space that this narrative made for rehabilitating a limited fantastic makes legibility the creative trajectories of other writers who endeavored to depict science in the 1930s. Take, for example the career of Yan Larri, a writer who made the transition from *fantastika* to children's literature. Larri recalled the late 1920s and early 1930s as a period during which the "*fantastika* and *skazki*" that he wrote "were burned with the hot iron of 'orthodox' demagoguery."[261] In 1931, failing to capitulate to the trend of writing about the applications of technology in the immediate future, Larri published

[260] M. Gor′kiĭ, L. Averbakh, and S. Firin, eds., *Belomorsko-Baltiĭskiĭ kanal imeni Stalina: Istoriia͡ stroitel'stva* (Istoriia͡ fabrik i zavodov, 1934), 282-3.
[261] I͡an Larri, "Poiski prozrachnogo slova," in *Redaktor i kniga: Sbornik stateĭ*, vol. 4 (Iskusstvo, 1963), 288.

Land of the Happy, one of the last far-future utopian novels until the genre's revival in the 1950s. In his preface to the novel, N. N. Gleb-Putilovskiĭ displayed the era's waning enthusiasm for the utopian. He at once placed *Land of the Happy* within the utopian tradition while stressing the books departure from it. Larri's book may be utopian but only "to a very limited extent" for what appears in his book can already be glimpsed in the contemporary Soviet Union.[262] *Land of the Happy* was met with a series of blistering reviews that chided Larri for ideological missteps.[263] Larri shrunk from the literary spotlight for the next several years, only reemerging after Marshak asked that he produce a children's book on entomology and aided him in writing the manuscript.[264]

The result, *The Extraordinary Adventures of Karik and Valya*, was published in 1937 and became Larri's most successful book. Larri tells the story of a pair of young siblings who drink an elixir that causes them to shrink to one-hundredth of their original size. Then, thanks to their diminished stature, Karik and Valya find themselves imperiled by everyday insects. The conceit gave Larri the narrative framework to insert drier, educational passages on the habits of various bugs. Because Larri shows the children shrinking to the level of an animal (rather than becoming a giant, as Gorky had advised in "On Themes"), he was scolded for failing to depict man's dominion over nature. An editor at the state publishing house for children's literature wrote that, whether willingly or not, reducing someone to the size of an insect suggested that man is "not the ruler of nature, but a helpless creature." Instead, "we should inspire [young readers] with the potential of impacting nature in the direction needed."[265]

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[262] N. N. Gleb-Putilovskiĭ, "Predislovie," in *Sobranie sochineniĭ I͡ana Larri*, vol. 1 (Prestizh Buk, 2019), 8.
[263] A collection of these reviews can be found in *Sobranie sochineniĭ I͡ana Larri*, vol. 1, 257-263.
[264] For an account of the episode, see Larri, "Poiski prozrachnogo slova."
[265] A. Assovskai͡a, "Kak pisatel′ I͡an Larri Stalina prosveshchal," in *Raspi͡atye: Pisateli — zhertvy politicheskikh repressiĭ, Vypusk 1. Taĭnoe stanovitsi͡a i͡avnym* (Severo-Zapad, 1991), 214–20.

While the theme of conquering nature was widespread, it was not hegemonic. Surveys of environmental themes in children's writing from 1928 through the 1930s note that, despite the prevailing rejection of bucolic depictions of nature in favor of tales about its planned improvement, there persisted apolitical stories about nature and occasional idealized descriptions of the countryside.[266] William Husband also notes examples of anthropomorphism which align with the conquest of nature generally but are not dialectical, such as Sofia Fedorchenko's *How the Machine Alarmed the Wild Animals*, in which forest animals frighten at the great speed of a train that trespasses through their habitat.[267]

Conclusion

The emergence and use of dialectical *skazochnost'* demonstrates how a philosophy of science filtered into literary discourse within the framework of the spontaneity-consciousness dialectic. Ultimately, dialectical *skazochnost'* worked not by coherently elucidating the dialectic but by dramatizing the novel attitude towards nature engendered by Soviet industrialization, which was recast as an act of anthropomorphization. Natural forces formerly thought of as impervious to human intervention were physically and figuratively forced to operate according to human will. An emphasis on movement and transformation provided the guiding parameters to explain the triumph of human reason over "elementality" through a combination of Soviet ideology (discerning how nature ought to be corrected), science (accepting that the physical laws governing nature permitted such corrections), and technology (supplying the strength to execute those corrections).

The accord between fantastic metaphor and scientific realism evinced by dialectical

[266] William Husband, "'Correcting Nature's Mistakes': Transforming the Environment and Soviet Children's Literature, 1928-1941," *Environmental History* 11, no. 2 (April 2006), 300, 307; Olich, *Competing Ideologies and Children's Literature in Russia*, 193-4.
[267] Husband, "'Correcting Nature's Mistakes'," 300, 307.

skazochnost' was significant for the trajectory of Stalinist popular science, even if science prose, the genre in which the figurative device was most frequently used, was not a success. Despite the efforts of many in the establishment, including prominent writers such as Aleksei Tolstoy, Valentin Kataev, and Fyodor Gladkov, science prose failed to gain popularity.[268] Still, the main themes of Il'in's writing, the unification of science and the animation of nature, were widespread and likewise showed the imprint of the dialectic. Il'in continued to write popular science books for the next two decades before his death in 1953, but many of them retreated from the fantastic language on display in *The Story of the Great Plan* and *Men and Mountains*. Marshak exercised great influence as the editor of The State Children's Publishing House, and his particular love of *skazki* meant that its general form continued to be melded with popular depictions of science. Furthermore, Marshak's ideological maneuvering should be considered when assessing how he gave safe haven to those who had come under attack for their lingual play or fantastic stories, including Chukovsky, members of OBERIU such as Daniil Kharms and Alexander Vvedensky, and Aleksei Tolstoy, who had helped define *fantastika* in the previous decade with his novels *Aelita* and *The Garin Death Ray*.[269]

This granular account of dialectical *skazochnost'* complicates perennial questions about the real, the fantastic, and "despiritualization" in Stalinist culture. Editors such as Marshak, who was primarily interested in the aesthetic qualities of children's literature and popular science, learned to adopt the rhetoric of those who were fixated on the philosophical implications of figurative language. For Krupskaya and her camp, re-enchantment was a persistent source of anxiety rather than an aspiration. Ironically, it was this insistence on the correspondence between

[268] Schwartz, "Factory of the Future: On M. Il'in's 'Scientific-Fictional Literature,'" 266-7, 275.
[269] For more on the careers of avant-garde poets under Marshak's editorial tutelage, see Ainsley Morse, *Word Play: Experimental Poetry and Soviet Children's Literature* (Evanston: Northwestern University Press, 2021).

materialism and all literary images that forced metaphor to serve as the handmaiden of dialectic reality rather than sitting benignly atop it. To view the animacy of nature as evidence of "spiritualization" is to ignore these institutional pressures to blur the distinction between the figurative and the real and mistake for animism the Soviet metanarrative about the victory of "consciousness" over "elementality," which has its origins in materialist philosophies that proceed it.

The episode, which played out concurrently with the mounting criticism against Beliaev's *fantastika*, demonstrates the ascendency of a common anthropocentric narrative and the difficulties of accommodating the fantastic to it. Similar to how Beliaev struggled to purge his *fantastika* of the grotesque to bring it in line with new ideas about human evolution, so did those making use of dialectical *skazochnost'* have to disarm the *skazka* of its ability to soften the divide between man and animal. Ultimately, it was just this transformative power that made *skazki* a welcome form in illustrating the transmuting properties of the dialectic. Though both genres were initially seen as threats to an image of Soviet science, the establishment of science prose coincided with a nationalist turn. The *skazka* offered a native source of the fantastic, unlike *fantastika*, which continued to carry with it the taint of its Western origin.

More fundamentally, this episode raises questions about the intractable relationship between science and forms of metaphor that might be construed as fantastic. Perhaps just as surprising as the use of *skazochnost'* to illustrate dialectical materialism was the challenge posed by those who felt that the underlying laws of material reality might ever be described without the mediation of figurative language. As Daniel Tiffany argues in his study of the connection between poetic lyric and materialism, because physics aims to explain facets of the world that is unobservable "the *realism* of modern physics […] relies, by necessity, on a framework of vivid

analogies and tropes."[270] Tiffany's insight repeats Vavilov's observation that dialectical materialism required a new set of "metaphysical images" to communicate the truth of dialectical materialism in 1927. Reframed thus, one can ask not whether a given scientific view is enchanted or not but what sorts of analogies, metaphors and modes of figurative speech are needed to make tangible the intangible. The remarkable aspect of dialectical *skazochnost'* and the corresponding Stalinist attitude towards nature lies in how they reveal the extent and centrality of the conviction that all matter could be recast, redirected, and reforged according to human logics.

When asked to depict the awesome power of science, Soviet writers reached for those analogies available to them. *Skazki* offered ready forms of transformation which both had a long tradition of use within Russian children's writing and allowed for the foregrounding of a new mode of seeing. Myth and *skazki* were ready forms of transformation and enchantment uncontaminated with the cultural baggage of *fantastika*. With the difficult charge of assembling a realistic image of science out of traditions marred by their associations with unreality, the task became to identify which of these past forms of fantasy might be reappropriated into the new cultural paradigm of the real. *Skazki* offered a form that both fit the general mythologization of the Stalinist period and its nationalist turn.

[270] Daniel Tiffany, *Toy Medium: Materialism and Modern Lyric* (Berkeley: University of California Press, 2000), 3. Emphasis in original.

Chapter 3: Escaping the Close Aim

Introduction

In what form did *fantastika* reemerge in the immediate post-Stalinist period? In the 1940s and 1950s, critics and writers devoted particular attention to "*fantastika* of the close aim" (*fantastika blizhnego prit͡sela*), which named what had already been the de facto policy by the mid-1930s. The theory held that *fantastika* ought to depict scientific advances already on the horizon and avoid venturing more than a few years into the future. With the advent of the Thaw following Stalin's death, authors and critics were able to exceed the limit that had been set during the Stalinist period. Ivan Efremov's 1957 novel *Andromeda Nebula*, a story about cosmic exploration set 2,000 years in the future, is canonically hailed as the return of *fantastika* "proper" for exceeding the Stalinist temporal prohibition of the close aim. I argue that Efremov's intervention was partial, and central elements of Stalinist ideology continued to delimit Efremov's fantasy. A closer look at the discourse of *fantastika* up to and immediately preceding the publication of *Andromeda Nebula* (*Tumannost' Andromedy*) reveals which facets of ideology proved pliable and which remained stubbornly in place, allowing for a more nuanced analysis of how *fantastika* and the scientific imagination developed during the Thaw.

Following Efremov's creative development and his critical reception, I chart the trajectory of *fantastika*'s status from the post-war period through the early Thaw. Efremov's first collection of stories, *Five Compass Points* (*P͡iat' rumbov*), was published in 1944 and provides a prime example of *fantastika* of the close aim. His 1947 novella, *Starships* (*Zvëzdnye korabli*), found Efremov asking about evolutionary and social developments over vast expanses of time, though still safely within the bounds of late Stalinist ideology. Finally, the Thaw-era milestone, *Andromeda Nebula*, appeared in 1957. Efremov's novella "The Heart of the Serpent" (*Serdt͡se*

Zmei), a short story published in 1959 and set in the same fictional universe as *Andromeda Nebula*, saw Efremov further articulating ideas about human evolution that he had made central to *Andromeda Nebula*. I place these works within their cultural, scientific, and, above all, critical context, asking how Efremov and his contemporaries responded to shifting prohibitions dictating how science could be depicted.[271] To this end, I devote attention to the Science Literature section of the Writers' Union, a group that met regularly from the mid-1940s through 1951 to discuss *fantastika* and popular science writing. There, during heated debates about *fantastika*, Efremov was held up as one of the few standout practitioners of the genre. The story that emerges is one of writers and critics struggling to determine the extent to which *fantastika* could be a site of imaginative difference in an ideology where all had to reaffirm the triumph of the present.

Discussion of change versus stasis clustered around two main points, the first having primarily to do with temporal difference. Put simply, how far into the future could *fantastika* peer? And, when it looked ahead, how much would the future resemble the present? The taboo against writing about the future is most apparent in the boundary of the close aim and Efremov's leaping beyond it. Yet, in the Thaw era, even after authors were permitted to go beyond that limit and praised for describing the future, critics continued to point out that the seemingly fantastic future was actually close to the present. In this, temporal difference was allowed but still appraised according to its proximity to the ideologically sanctified real, demonstrating a holdout of the Stalinist will towards an infinite present.

The second locus of difference, which might be thought of as a subset of the first, was the relationship between man of the present day and man of the future. For Efremov and others,

[271] I express my deep gratitude to the late Anatoloy Britikov for the exhaustive bibliography of articles on *fantastika* and reviews of Efremov's work: A. F. Britikov, *Russkiĭ covetskiĭ nauchno-fantasticheskiĭ roman* (Nauka, 1970). I also thank the moderators and editors of iae.makorzh.ru, where many of those materials have been digitized and made available.

conversations on the subject arose in relation to evolution and extraterrestrial life. Efremov explored how evolution, especially the question of how and to what extent the man of the past, the man of the present, and the man of the future might be alike. He extended this question to alien life as well, asking how similar life on other planets might be to man. He answered by insisting that all life evolved to greatly resemble the "conscious" New Man of the Soviet present both physically and mentally. Thus, Efremov insisted on human continuity even as he explored temporal difference. This anthropocentrism was not lost on critics, though it occupied a less central part of the larger *fantastika* conversation.

Efremov's evolutionary themes should be understood in the context of the fraught place that human evolution held in the Stalinist scientific imaginary. Critics praised Efremov for his great attention to the psychology of future people, and, in their reviews, frequently labeled his fiction "humanistic." Efremov had revived *fantastika*, but, though he channeled Cosmism in imagining the future, the human at the center of his fiction differed greatly from the more malleable, open-ended subject who had been envisioned by Efremov's intellectual heroes in the first decades of the 20th century. Drawing especially on Vladimir Vernadsky and Konstantin Tsiolkovsky, Efremov theorized an active evolution, that is, an evolution directed by man. Yet there is a sense in Efremov that, despite future man's evolutionary agency, the telos of human development is preordained and uncreative. Efremov's model of tomorrow's human was the New Man, the present-day hero of Stalinist ideology. This limited evolutionary horizon was entirely in keeping with the insistence that the human was the endpoint of all evolutionary development that had been dominant since the early 1930s.

In outlining the theory of the close aim, the place of the fantastic in it, and the attempts of critics and writers to push beyond that limit, one sees a manifestation of the larger Thaw project

of reckoning with the Stalinist era. The process conforms to the characterization provided by Denis Kozlov in *Readers of Novyi Mir: Coming to Terms with the Stalinist Past*, especially his observation that "the mindset of the early Thaw represented a mixture of contradictory values, recipes, and vocabularies."[272] Just as critics applauded how *fantastika* might become more expansive, doing more than simply popularize existing science, as it had under Stalin, so too did they employ the same criteria of evaluation from the Stalinist era that had hindered the genre.

Heeding the sage example of Polly Jones in the introduction to *The Dilemmas of De-Stalinization: Negotiating Cultural and Social Change in the Khrushchev Era*, I will avoid judging the extent to which these changes amounted to a "successful" example of de-Stalinization. "Can we deem a process 'de-Stalinization,'" she asks, "if the desire to break with Stalin(ism) is not explicitly articulated? Or […] if a policy claims to constitute de-Stalinization, do the outcomes, which might well end up still being 'Stalinist', matter?[273]" In keeping with Jones's questions, my goal is not to prove whether *Andromeda Nebula* represents a genuine or false break with past modes of fantasizing but to trace which boundaries could now be crossed and which proved unyielding. Such a study, I hope, will revise the more simplistic, triumphal narrative of the victory of Thaw-era creativity over Stalinist ideology.

Zhdanovshchina

Synonymous with the cultural developments in the post-war period is *Zhdanovshchina*, the term for the conservative cultural turn under the influence of Central Committee secretary Andrei Zhdanov.[274] This new cultural regime prized nationalism and *ideinost'* ("ideology,"

[272] Denis Kozlov, *The Readers of Novyi Mir: Coming to Terms with the Stalinist Past* (Harvard University Press, 2013), 102.
[273] Polly Jones, "Introduction: The Dilemmas of de-Stalinization," in *The Dilemmas of De-Stalinization: Negotiating Cultural and Social Change in the Khrushchev Era* (Routledge, 2009), 3.
[274] Most see the moment beginning with Zhdanov's 1946 decree "On the Journals *Zvezda* and *Leningrad*," in which Zhdanov attacked the journals for publishing "bourgeois," "apolitical" writers Anna Akhmatova and Mikhail

meaning, "having the correct ideological stance," translated literally, "idea-ness") above all else, which resulted in the demand that writers emphatically demonstrate how their work differs from that of the West and reaffirms the ideals of the Party. Any non-Russian influence was labeled an example of "cosmopolitanism" and considered a blight on Soviet culture. *Zhdanovshchina* was not limited to the realm of *belles-lettres*. The change quickly made its way into both the world of children's literature and popular science.

Criticisms against children's writing in the Zhdanov period amplified those difficulties that science writing had encountered since the 1930s. Stories came under attack for looking too far into the future or violating the boundary between man and animal.[275] "Makar Telyatnikov's Amazing Journey" by L. Pantaleev described a young man's trip five years into the future, from the year 1946 to 1951. There, at the end of the current five-year plan, he delights in the spoils of the near future, including double-decker buses and widespread television usage. For this modest fantasy, Pantaleev's story was branded "pure madness."[276] Zoshchenko's 1945 short story "The Adventures of an Ape" told of an ape who is taught good manners by a Soviet child. Once educated, this ape serves as an example for other citizens. Among other reasons, "The Adventures of an Ape" was deemed offensive for suggesting that a creature evolutionary inferior to man had anything to teach Soviet humans. Chukovsky's *The Empire of Dogs*, a pre-

Zoshchenko. Dobrenko has argued that the core elements of this conservative shift were already in effect as early as 1943. See Evgeny Dobrenko, "Literary Criticism and the Institution of Literature in the Era of War and Late Stalinism, 1941-1953," in *A History of Russian Literary Theory and Criticism* (University of Pittsburgh Press, 2011), 169-170.

[275] The examples of Zhdanovite criticism against children's literature in this paragraph are taken from Ben Hellman, *Fairy Tales and True Stories: The History of Russian Literature for Children and Young People (1574 - 2010)* (Leiden: Brill, 2013), 435-6.

[276] V. Emel′ianov, "Iskazhennai͡a deĭstvitel′nost′," *Literaturnai͡a gazeta* 37 (1946): 4, quoted in Hellman, *Fairy Tales and True Stories*, 436.

revolutionary work reissued in 1946, was attacked in *Culture and Life* (*Kul'tura i zhizn'*) for spreading "zoological morality" and offending children's "concept of man."[277]

A nationalistic turn was felt in the Soviet scientific community, which rapidly changed its relationship with the West. Following the war, scientists enjoyed greater institutional autonomy and material compensation for their work.[278] During this time, official language celebrated the victory of the "Big Three" against the forces of fascism, which marked a shift away from an earlier rhetoric of separate Soviet and bourgeois models of science towards one of a "single world science."[279] As the Cold War began to escalate beginning in 1946, there was a dramatic reversal. The Party reinstated control over science and praise of international cooperation was replaced with a Soviet nationalism which differentiated an enlightened, Soviet form of science from its fallen, bourgeois counterpoint in the West.[280]

This patriotic shift influenced how science was taught. In the campaigns against cosmopolitanism, historians of science revised existing accounts to center the contribution of Russian scientists.[281] Educators followed suit, and science education became a matter of learning the principal place of Russian ingenuity in the history of world science. Russians were now the inventors of the light bulb, the airplane, steam engines, and the telegraph. Lomonosov was credited with having discovered the conservation of energy, which, it was pointed out, became a central tenet of dialectical materialism.[282]

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[277] E. Vatova, "Poshl͡iatina pod flagom detskoĭ literatury," *Kul'tura i zhizn'*, December 10, 1964, 4, quoted in Hellman, *Fairy Tales and True Stories*, 436.
[278] Nikolai Krementsov, *Stalinist Science* (Princeton: Princeton University Press, 1997), 95-6.
[279] Werner G. Hahn, *Postwar Soviet Politics: The Fall of Zhdanov and the Defeat of Moderation, 1946-53* (Cornell University Press, 1982), 10; Krementsov, *Stalinist Science*, 116.
[280] Krementsov, *Stalinist Science*, 131.
[281] Alexander Vucinich, *Empire of Knowledge: The Academy of Sciences of the USSR (1917-1970)* (Oakland: University of California Press, 1984), 226.
[282] Michael Froggatt, "Renouncing Dogma, Teaching Utopia: Science in Schools under Khrushchev," in *The Dilemmas of De-Stalinization: Negotiating Cultural and Social Change in the Khrushchev Era* (Routledge, 2009), 251.

These trends informed *fantastika* of the period. There was a sustained push to define the genre in opposition to Western science-fiction and to highlight the accomplishments of Soviet science, which was seen as more consciously directed than the unplanned science of the West. Appeals to *ideinost'* were invoked to rein in anything that strayed too far outside laudations of the present moment.

In the sphere of science writing, the rhetoric of *Zhdanovshchina* was used to argue for and reinforce the policy of the close aim. This policy, never officially codified though extensively discussed in reviews and meetings among writers of *fantastika*, was alternatively referred to as the "theory of the limit" (*teorii predela*), "*fantastika* of the close aim" (*fantastika blizhnego prit͡sela*), and "close *fantastika*" (*blizhni͡aia͡ fantastika*). The theory dictated that *fantastika* ought not to look more than five to ten years into the future. It is difficult to say exactly when or how the theory of the close aim came into active enforcement, as *fantastika* had already been reined in by the early 1930s, but the theory's status as a central subject of debate, especially in the late Stalinist period, demonstrates that it operated as a kind of de facto rule, the terms of which were clear to a general readership.

Irina Kaspi rightly points out that central tenets of the theory of the close aim were already fully present in the first Soviet Writers' Congress in 1934.[283] There, Zhdanov called for fiction to capture real life, in contrast to an older romanticism and utopianism: Fiction, Zhdanov explained, should "be able to look into our tomorrow. It will not be a utopia, because our tomorrow is already today being prepared by our conscious, planned work."[284] Even so, a look at

[283] Irina Kaspė, "Mesto budushchego: Sovetskai͡a nauchnai͡a fantastika mezhdu 'stalinizmom' i 'ottepel'i͡u,' in *Vtoroĭ Vsesoi͡uznyĭ s"ezd sovetskikh pisateleĭ. Ideologii͡a istoricheskogo perekhoda i transformat͡sii͡a sovetskoĭ literatury. 1954: kollektivnai͡a monografii͡a* (Aleteĭi͡a, 2018), 352.
[284] A. A. Zhdanov, "Rech′ sekretari͡a TSK VKP(b) A. A. Zhdanova," in *Pervyĭ vsesoi͡uznyĭ s"ezd sovetskikh pisateleĭ, 1934. Stenograficheskiĭ otchët.* (Moscow: Khudozhestvennai͡a literatura, 1934), 5, quoted in Kaspė, "Mesto budushchego."

fantastika and accompanying discussions of the genre in the post-war period see writers and critics both naming the policy as such and debating its merits, whereas the discourse of *fantastika* on a whole appeared more inchoate in the pre-war 1930s, when conversations around *fantastika* were more often aimed at a broader set of literary questions. Even if an anti-utopianism animated both the foundational debates about Socialist Realism and its more settled form in the 1940s, the near future emerged as a central point of conversation and contention only in the latter period.

How the theory of the close aim was communicated to readers as a corrective against a former version of *fantastika* can be seen in a 1947 collection of short stories by one of the chief practitioners of the close aim, Vadim Okhotnikov, titled "On the Boundary of the Possible" (*Na grani vozmozhnogo*). In addition to announcing the ordinariness of his stories with the book's title, an inscription from Okhotnikov further assures the reader that these are "stories about ordinary (*obyknovennyĭ*) people and their adventures with unusual (*neobyknovennyĭ*) machines."[285] The term "unusual," the negation of the "usual" or "ordinary" (*obyknovennyĭ*), stays within the orbit of the "usual," which set the stories apart from the "fantastic" which had characterized the genre previously.

Boris Lavrenyov provided a forward to the collection titled "Realistic *Fantastika*" (*Realisticheskai͡a fantastika*) which likewise stressed how Okhotnikov's stories stayed close to life. This nearness, according to Lavrenyov, was partially because the stories derived from Okhotnikov's personal experience as a researcher in radio technology and electro acoustics. Lavrenyov defended Okhotnikov against any accusation of fantasy:

[285] Vadim Okhotnikov, *Na grani vozmozhnogo* (Molodai͡a gvardii͡a, 1947), 2.

> In [Okhotnikov's] stories, the concreteness and reality of fantasy are especially attractive. Those "fantastic" devices and mechanisms about which the author writes, are, for the most part, either already on the verge of being implemented or seem entirely feasible from the point of view of the nearest prospects of the development of our technology.[286]

Language of proximity dominates. The fantastic, encased in quotation marks, was "on the verge" (*na grani*) of reality. These things would be implemented in "the nearest" future. *Fantastika* was preserved as a marker of genre, but the author's task was to dramatize incremental rather than revolutionary change. Lavrenyov concludes by saying that such stories, so near to life, will "inspire the reader himself to work on the implementation of these or similar ideas."[287] For the writer of *fantastika* of the close aim, the goal was to create fiction that was minimally fictional, to concoct fantastic scenarios in which there was so little fantasy, that they would not risk spilling over "boundary of the unusual." While the genre continued to be called *fantastika*, its name was a hollow placeholder, a liability that needed explaining away rather than a departure from the probable or rational.

Efremov's Early Fiction and the Influence of Vernadsky

Efremov wrote his earliest fiction, which fell within the confines of the close aim, on the cusp of *Zhadanovshchina*. Born in 1908 in the village of Vyritsa, Efremov held several jobs which would inform his creative output before beginning his career as a writer.[288] After serving as a solider in the Russian Civil War, Efremov found employment in a geological museum. He then began to go on paleontological expeditions in Central Asia and publishing his own scientific work in the fields of paleontology and geology. By 1941, Efremov had completed his doctorate in biological sciences and begun his study of "taphonomy," a field that he pioneered, which

[286] V. Lavrenev, "Realisticheskai͡a fantastika," in *Na grani vozmozhnogo* (Molodai͡a gvardii͡a, 1947), 5-6.
[287] Ibid., 6.
[288] For a biographical account of Efremov's life, see Olʹga Erëmina and Nikolaĭ Smirnov, *Ivan Efremov*, Zhizn′ zamechatelʹnykh li͡udeĭ (Molodai͡a gvardii͡a, 2013).

examined how biological organisms fossilize. Just as he pieced together evolutionary history in his scientific studies, so would Efremov show a great interest in the cultural and physical evolution of humans in his fiction. This fascination would especially inform his post-Stalinist speculative *fantastika* about life in the distant future.

Efremov's concept of human evolution, as appeared in his fiction, combined Vladimir Vernadsky's ideas about the triumph of rationality and Efremov's own, idiosyncratic idea of beauty.[289] Vernadsky had formal training as a mineralogist, and, while he remained anchored in a geologic frame of analysis, he strove to synthesize the broader relationship between biological life and the nonliving environment. Vernadsky founded the discipline "biogeochemistry," a necessary intervention, he argued, against attempts to understand Earth's geochemistry without considering the activity of biological life on its surface. Vernadsky's thinking on the subject popularized the term "biosphere." He adopted the term from Austrian geologist Eduard Suess and expanded it to its contemporary meaning as the dynamic sum of living ecosystems on Earth. The biosphere is distinct from the other "envelopes" that surround the Earth: the atmosphere, the hydrosphere, and the lithosphere.

Vernadsky's idea of the "noösphere" would particularly influence Efremov. The term, first coined by the French theologian and paleontologist Pierre Teilhard de Chardin but elaborated upon extensively by Vernadsky, derives from the Greek "νόος" (nous) meaning "mind" or "reason." Vernadsky argued that the biology and geochemistry of the Earth's surface had been so thoroughly influenced by humans that any explanation of the Earth's contemporary

[289] For a detailed examination of Efremov's aesthetic theory, see A. F. Britikov, "T͡selesoobraznostʹ krasoty v ėstetike Ivana Efremova," in *Otechestvennai͡a nauchno-fantasticheskai͡a literatura (1917-1991 gody). Kniga vtorai͡a. Nekotorye problemy istorii i teorii zhanra* (Saint Petersburg: Tvorcheskiĭ t͡sentr «Boreĭ-Art», 2005), http://publ.lib.ru/ARCHIVES/B/BRITIKOV_Anatoliy_Fedorovich/_Britikov_A.F..html. For more on Vernadsky, see Kendall Bailes, *Science and Russian Culture in an Age of Revolutions: V.I. Vernadsky and His Scientific School, 1863-1945* (Indiana University Press, 1990).

biogeochemistry required taking human activity into account. In Vernadsky's telling, mankind's transformation of the Earth according to human interests constitutes the next step in geologic evolution. He framed this development as the rise of scientific reason, a force similar to Henri Bergson's *élan vital*, which directed the activity of the most evolutionarily advanced species of the day: man. This story of how the arrangement of matter on Earth (or in the universe in general) grew ever more rational resonated with the thinking of fellow Cosmists, such as Konstantin Tsiolkovsky.

Unlike the more recent term, "the Anthropocene," which connotes a rupture with an organic ecological order due to human activity, Vernadsky's declaration of the noösphere, though it similarly identifies departure from an earlier planetary balance, was one of optimism. Echoing Marx's teleological story of communism's inevitable victory over capitalism, Vernadsky saw scientific reason as an independent, naturally occurring force that found its host in human activity, which was reshaping the planet.

Though the idea of the noösphere was clearly important to Vernadsky, he only began to elaborate upon it at the end of his life, leaving the concept a suggestive sketch. Among the work published in his lifetime, Vernadsky outlined the noösphere most fully in a 1944 article published in *The Successes of Contemporary Biology* titled "A Few Words on the Noösphere." Against the backdrop of World War II, the power entrusted to humanity with the arrival of the noösphere took on a moral gravity. Man was now the steward of the planet, and he ought to advocate for Earth's improvement (and his own triumph) against the self-destructive forces of war. The article ended on a note of optimism: "The ideals of our democracy are in tune with the elemental (*stikhiĭnyĭ*) geological processes, with the laws of nature, and correspond to the

noösphere. Thus, we can look at our future with confidence."[290] Vernadsky's celebration of the human mastery of nature aligned with the Stalinist enthusiasm for industrializing and "taming" the natural world. Both drew from an optimism about a uniquely human rationality to transfigure the Earth.[291]

Vernadsky left ambiguous the role of human agency in manifesting this triumph of reason. Vernadsky's full elaboration on the noösphere did not appear in publication until 1991, in a manuscript titled *Scientific Thought as a Planetary Phenomenon* (*Nauchnai͡a mysl' kak planetnoe i͡avlenie*).[292] A partially censored collection of his late manuscripts was published in 1977, though sections remained redacted for their touching on sensitive disputes in the field of biology in the mid-1930s. In *Scientific Thought as a Planetary Phenomenon*, scientific thinking appears as a kind of disembodied phenomenon, arising simultaneously throughout the world, growing in strength as humans advance in their technological thought, and ultimately uniting humankind in the singular task of scientific advancement. But this further, unpublished thinking on the subject would have been of little consequence to Efremov, who would only have had access to Vernadsky's scant published essays on the noösphere.

Vernadsky's ideas clearly resonated with a young Efremov, who was likewise concerned with drawing connections between Earth's geologic history and the evolutionary record. Efremov first contacted Vernadsky in a 1930 letter to ask for the senior scientist's opinion on his hypotheses about human evolution.[293] Efremov speculated about the influence of certain

[290] V. I. Vernadskiĭ, "Neskol′ko slov o nosfere," *Uspekhi sovremennoĭ biologii*, No. 18 (1944): 113–20.
[291] Vernadsky's relationship to Stalin and the regime of science established by the Bolsheviks was complicated. Vernadsky resisted the hostile takeover of the academy. Bailes argues that Vernadsky's faith in science was, at its base, a liberal one, as it celebrated the ability of scientists to debate, disagree and hold tentative truths against the monologic of authoritarianism.
[292] See V. I. Vernadskiĭ, *Nauchnai͡a mysl' kak planetnoe i͡avlenie*, ed. A. L. I͡anshin (Moscow: Nauka, 1991).
[293] I. Efremov to V. I. Vernadskiĭ, November 19, 1930, in *Ivan Antonovich Efremov. Perepiska s uchenymi. Neizdannye raboty.*, vol. 22, Nauchnoe nasledstvo (Nauka, 1994), 36.

minerals and atmospheric CO_2 on the evolution of terrestrial vertebrates. The letter does not contain a full elaboration of Efremov's idea, and further correspondence was lost. However, this letter shows the seed of Efremov's later conviction, articulated in his *fantastika*, that man's physical and mental forms were the necessary evolutionary product of Earth's geological and atmospheric makeup.

Vernadsky argued that human reason would guide evolutionary progress, but he left unspecified how to identify the direction in which that development ought to proceed. Rather, Vernadsky believed that scientific logic had already arisen organically and would continue to accumulate through the rational actions of civilization. Reason's triumph was inevitable, and the place of human agency or the human experience of that accumulating rationality was left unexplored. In his fiction, Efremov often returned to the question of what this rational development felt like and how intelligent species might recognize intelligence in those separated from contemporary humans by the boundary of time, culture, or species. Efremov arrived at an answer by expanding Vernadsky's idea of human evolution into an aesthetic theory in which beauty functions as a sort of instinctual sense of correct evolutionary direction. Efremov's intuitive beauty rests on what Britikov identifies as the classical Greek concept "kalokagathia," the "harmony of physical and spiritual perfection."[294] Under this term, Efremov united good art, scientific intuition and a deterministic account of human evolution. The human form appears beautiful because we possess an inborn ability to recognize its "harmony" with rational thought. Likewise, the human body is the singular physical vessel appropriate for thinking and exploring the universe. Intelligent aliens will likewise develop towards a human form, and all advanced

[294] Britikov, "T͡selesoobraznostʹ krasoty v ėstetike Ivana Efremova."

life, human and alien alike, share an intuitive sense of this form's physical harmony, which is recognizable as such.

Efremov made explicit reference to Vernadsky and the noösphere in his later fiction, and his allusions underscore his aesthetic elaboration of Vernadsky's idea. A character in Efremov's 1968 novel *The Hour of the Bull* (*Chas byka*), speaking in the far future, explains that Vernadsky, one of the great scientists of the past, hypothesized the noösphere, which he explains as containing "all the dreams, speculations, inspired ideals of those who long ago disappeared from the face of the Earth, modes of understanding developed by science, the creative imagination of artists, writers, and poets of all people and ages."[295] Though Vernadsky had mentioned in passing that artistic creation might be considered a feature of the noösphere, Vernadsky's use of the term was most often strictly geologic. For Vernadsky, the noösphere was the material trace of humans domesticating animals, harnessing natural resources, and expanding agriculture. Efremov, however, uses the term to find a common cause between the arts of sciences of all peoples in all times.

In this timeless, self-evident ideal of beauty, Efremov shows his indebtedness to Stalinist aesthetics and endows his works with the accompanying temporal tension between an eternal present and a transfigured future. As scholars have observed, Stalinist neoclassical architecture attempted to articulate the idea that Soviet society had entered into a final, "timeless," utopian stage.[296] This attempt to posit the Soviet present as the inheritor of a self-evident aesthetic

[295] Ivan Efremov, *Chas byka* (Moscow: Druzhba narodov, 1995), 85.
[296] For more on the temporal politics of the "timeless" historicist architectural style of the Stalinist period, see Antony Kalashnikov, "Historicist Architecture and Stalinist Futurity," *Slavic Review* 79, no. 3 (Fall 2020): 591–612. See also Vladimir Paperny, *Architecture in the Age of Stalin: Culture Two* (Cambridge: Cambridge University Press, 2002). Paperny gives an account of how architectural styles reflected a shift from an ethos of iconoclasm in the 1920s to one of timelessness in the 1930s.

harmony first discovered in antiquity appears throughout Efremov's fiction, where the human form's beauty functions as a bridge between human cultures across time and space.

Efremov's earliest writing consisted primarily of adventure stories that conformed to the prohibitions of the close aim. Efremov's first collection, *Five Compass Points* (1944), was published in 1944 and brought together several short stories that Efremov had published in *Novyi mir*. Efremov planned to include seven stories in the collection; however, during editing, he folded one story into another, and the seventh story, "The Hellenic Secret," in which Efremov first elaborated his theme of beauty as a unifying force across time and between cultures, was cut by the editor. When "The Hellenic Secret" was finally published for the first time in 1966, Efremov explained that the story had been deemed unsuitable for print because its premise, the idea of intergenerational, genetic memory, "gave a mystical impression."[297] These stories furnish both a sense of how the politics of the close aim dictated Efremov's depiction of science and how he began to develop his ideas about universal, human beauty.

Five Compass Points opens with a forward from the publisher that distances Efremov's writing from the fantastic and gives a sense of a reservation towards fiction as such. These stories were "not written by a professional literary writer (*literator*)," the publisher announces as a point of pride.[298] The forward goes on to say that Efremov himself had personally worked all those jobs which he assigns to his narrators: a doctor of biological sciences, a mining engineer, a sailor, a surveyor. So, too, had Efremov traveled to those exotic ends of the Soviet Union where his stories take place: Siberia, the Far East, Central Asia. While the topic of Efremov's book was

[297] Ivan Efremov, "Ėllinskiĭ sekret," in *Ėllinskiĭ sekret* (Lenizdat, 1966), 305.
[298] Ivan Efremov, *P͡iat' rumbov: rasskazy o neobyknovennom* (Molodai͡a gvardii͡a, 1944), 2.

"bold fantasy," it was based on "real and scientifically feasible possibility."[299] As in the example of Okhotnikov, the fantastic was useful to the extent that it approximated reality, and the fictional was best when it was as close as possible to real-life experience.

Other organizing features of the stories, including the book's subtitle and the framing narrative, similarly bound the fantastic. The subtitle of the book, "stories about the unusual" (*rasskazy o neobyknovennom*) communicated a movement away from the miraculous world of the fantastic towards that grounded in the world of the everyday. Efremov brought together the five stories of the collection with a short preface describing a group of Soviet soldiers waiting out an air-raid in Moscow. Over the course of the night, those gathered take turns telling of their travels. "Be sure," their host, an old sea captain, assures those assembled, "that in every direction of the compass awaits the extraordinary (*neobychaĭnyĭ*), if one has enough ability and strength for the long journey."[300] These stories were of the immediate past and stayed within the geographic limits of the Soviet Union.

Though Efremov sprinkled his stories with occurrences of the "miraculous" or "fantastic," more often, he followed the lead of his subtitle and cataloged occurrences that were simply "unusual" (*neobychnyĭ* or *neobyknovennyĭ*). Such mildly fantastic events were not even necessarily tied to science, and the demotion from "miraculous" to "unusual" was sometimes cosmetic, as the "unusual" elements might lack any rational explanation. The narrator of "A Meeting Under Tuskarora" (*Vstrecha nad Tuskaroroĭ*) has a premonition that something "unusual" awaits him, remarks on the "unusual" strength of English sailing instruments, then, on the next page, sets out on a sea that is "most unusually" (*neobychaĭno*) tumultuous.[301] Elsewhere

[299] Ibid.
[300] Ibid., 4.
[301] Ibid., 18, 19, 20.

in the same story, when a genuinely miraculous object is encountered, it is relegated to the unusual. Sailors discover "living water," an item drawn from Slavic folklore that resurrects the drinker. After noticing that exposure to a certain water makes a wounded sailor recover "unusually" quickly, another sailor tests the "miraculous (*chudesnyĭ*) water," which the narrator notes has an "unusual" color.[302] The narrator samples the water and experiences "most unusual (*neobychaĭnyĭ*) strength."[303] Efremov gives no rationale for the "unusual" properties of the miraculous drink. The great frequency with which Efremov repeats the word "unusual" persists throughout the collection and fixes the "usual" (*obychnyĭ*) as a central point of reference. Even if Efremov's "unusual" was applied to something beyond natural law, identical to that which would otherwise be called fantastic, there was a desire, if only nominally, to distance oneself from the offending term.

When the miraculous was directly invoked, it was most often applied to the non-fictional elements of the story. For example, in "Allegorkhoi-koroi" (*Allergorkhoĭ-khoroĭ*) (later republished as "Olgoi-Korkoi" [*Olgoĭ-Khorkhoĭ*]), a group of Russian scientists and their Mongolian guides trek into the desert. Existing technology and the natural world are described as fantastic. The team's car can traverse the desert thanks to "miraculous doughnut tires" (*chudodeĭstvennye sverkhballony*).[304] Sun hitting the foothills appears as "an entire fantastic city of flames," which one observer calls a "miracle."[305] The one fictional, supernatural element of the story, a group of aggressive, giant sand worms (called "Allegorkhoi-koroi" by the locals), are "unusual creatures," and those unfortunate enough to die as a result of the encounter suffer

[302] Ibid., 25.
[303] Ibid.
[304] Ibid., 90.
[305] Ibid., 92.

deaths that are "nearly supernatural."[306] The result was a sense of a romantic re-enchantment of the physical expanse of the Soviet Union over and above the thrill of the story's most clearly fictional elements. Mongolia, an actual location, was fantastic, while sand worms are nearly unusual.

Lastly, less educated characters erroneously label fantastic that which had a perfectly scientific explanation. This dynamic plays out, for example, in the story "The Lake of Mountain Spirits" (*Ozero gornykh dukhov*), in which a geologist recounts his exploration of a legendary lake in Central Asia. Locals tell of a lake surrounded by glittering cliffs and filled with water of an "most usual (*neobychaĭnoĭ*) transparency."[307] Many who have explored the lake have perished. A local artist, whose name, "Chorosov," highlights his Oriat heritage, attributes these fatalities to the maleficence of the evil spirits that cause the cliff walls to sparkle. The narrator, his interest piqued, takes it upon himself to find "some sort of explanation for this miraculous phenomenon."[308] Though he has a brush with death, the narrator succeeds in retrieving a sample of the miraculous, sparkling cliffs beyond the lake's edge. With the help of a specialist, he learns that the cliff walls are rich deposits of cinnabar, and the lake's "water" is a massive pool of mercury. The story has a happy ending. This "magic (*volshebnoe*) lake" supplies the Soviet Union with enough mercury to grant it complete autarky, something, "which had particular significance in the days of the Patriotic War."[309] Thus, the falsely "miraculous," labeled such by a more superstitious non-Russian, is given a scientific explanation, and, as a result, can be put to work.

[306] Ibid., 103.
[307] Ibid., 39
[308] Ibid., 47
[309] Ibid., 55.

A key element of Efremov's fiction already palpable in these first stories was communication across time and between cultures. In *Five Compass Points*, one finds enlightened, Soviet protagonists encountering either non-Russians living in a more enchanted, primitive state of development, or old documents, which likewise invite the protagonist to reflect on the distance between his present and the distant past. In these moments Efremov emphasizes an emotional continuity between the Soviet citizen and his less educated foil. Efremov's ideas about continuity and communicability would be further explored and play an even more central role in *Starships*, his next major work, and *Andromeda Nebula*.

This constancy of human experience and Efremov's first attempts at using the beautiful to forge a bridge across time plays a central role in "The Hellenic Secret," the story deemed too "mystical" for inclusion in Efremov's original collection. In his censored story, Efremov recounted how Professor Faintsimmer, a specialist in the physiology of the brain, encounters a patient who works as a sculptor and suffers from visions. These hallucinations, Faintsimmer hypothesizes, furnish proof for his theory that there exists a "genetics of memory" which carries experience from one generation to another. Crucially, this deep-level memory explains why there exists a subconscious, shared sense of beauty. Faintsimmer observes that "the beauty of form, whether it is found in architecture, landscapes, the human body, or elsewhere, is felt and generally appreciated by all people of the most diverse categories, upbringings and educations."[310] Faintsimmer learns that his patient descends from a line of ancient Greek sculptors and correctly surmises that the visions from which his patient suffers are suppressed, long-forgotten sculptural techniques. With Faintsimmer's help, the patient learns to read these visions and regains the skills of his ancestors. At the close of the story, Faintsimmer regards the

[310] Ivan Efremov, "Ėllinskiĭ sekret," (1966), 307.

finished sculpture of his patient, and the artwork's beauty presents "proof of the full power of the Form—the subtle happiness of beauty, common to all people."[311] This idea of universal beauty, especially Greek sculptural beauty, resonated with the Stalinist ideal of "timeless" neoclassicism.

One wonders why "The Hellenistic Secret" was censored while Efremov's other stories not only saw publication but garnered widespread praise. Likely, the problem lay in the central role played by its fictive premise. While many of Efremov's other stories used the "unusual" to dress up real science, "The Hellenistic Secret" revolved entirely around Efremov's riff on epigenetics. The topic of genetic transmission, even before Lysenkoist controversies marred the scientific community late in the 1940s, was already a sensitive topic. In "The Hellenistic Secret," as in Efremov's other stories, science dispels a superstitious account of a phenomenon. Faintsimmer reflects that he "is neither a prophet not a medicine man (*znakhar'*), but a scientist, who, for the solution to a given problem, needs a factual basis."[312] Yet the "scientific explanation," Efremov's invented "genetic memory," was itself fictional. The removal of "The Hellenistic Secret" suggests that, while the real science could be popularized with "the unusual," science itself could not be made "unusual." Science could dissolve the fantastic, but it could not be its source.

Nearly all the reviews of Efremov's *Five Compass Points,* in addition to praising Efremov's strength as a writer, appraised the degree to which Efremov's stories were fantastic, with most seeing the reduced place of the fantastic as a strength of his fiction. In *Technology for the Youth* (*Tekhnika — molodëzhi*), Leah Lozinskaya praised how the fantastic in Efremov's stories was not fantasy for its own sake but a means for the author to "perceive the real world,

[311] This line was cut from the 1966 edition of the story but appears in subsequent editions. See, for example, the collected works of Efremov: Ivan Efremov, "Ėllinskiĭ sekret," in *Sobranie sochineniĭ v shesti tomakh: Rasskazy*, vol. 1, 6 vols. (Moscow: Sovremennyĭ pisatel′, 1993), 62.
[312] Efremov, "Ėllinskiĭ sekret," (1966), 311.

the 'ordinary' reality that surrounds us, in all of its diversity" from an "unusual (*neobychnoĭ*) point of view."[313] Boris Kostelyanets began his review in *The Star* (*Zvezda*) by characterizing Efremov's collection as "about the fantastic and, at the same time, about the real; these are stories about the unusual and, at the same time, about the everyday."[314] Efremov's skill, Kostelyanets went on to explain, was that "with fantastic assumptions" Efremov has "enriched" stories "based on scientifically feasible possibilities."[315] In *The Literary Gazette,* Yakov Rykachev described Efremov as a writer in "a peculiar science-fiction genre where elements of science greatly prevail over those of *fantastika*, which frequently plays only an auxiliary role."[316] A review in *October* likewise noted the ordinariness of Efremov's stories but saw this as a defect rather than a point of praise. "In some of his 'stories about the unusual,'" the unnamed reviewer wrote, "there is not enough of the unusual."[317] In all these reviews the "fantastic" designated something nearly equivalent to the fictional. The implied goal of *fantastika,* in this context, was to keep those fictional elements subdued to the real**.** The fantastic might be employed to attract the reader, but stories are still ultimately good for their ability to popularize actual science.

Starships

Though it received less critical attention, Efremov's novella *Starships*, published over the course of four issues of *Knowledge is Power* (*Znanie — sila*) in 1947, subtly confronted the close aim and anticipated how Efremov would partially overcome it in *Andromeda Nebula*. In his story, Efremov tells the story of two paleontologists, Shartov and Davidov, who discover the fossilized traces of an intelligent, alien lifeform that visited earth some 70-million years ago.

[313] L. Lozinskai͡a, "Chto chitat′," *Tekhnika — molodëzhi*, no. 9 (1945): 29.
[314] B. Kostelī͡anet͡s, review of *Sem' rumbov*, *Zvezda*, no. 1 (1946): 138–39.
[315] Ibid.
[316] Ī͡ak. Rykachev, "Po stranit͡sam zhurnalov 'Novyĭ mir' no. 4," *Literaturnai͡a gazeta*, July 21, 1945, 3.
[317] Review of *Pī͡at' rumbov* and *Vstrecha nad Tuskaroroĭ*, *Oktī͡abr'*, no. 5-6 (1945): 261.

By having this alien visitor arrive in the past rather than the future, Efremov circumvented the prohibition on fantasizing about the world of tomorrow. This accommodated the earlier *fantastika* trope of encountering advanced, alien beings, as popularized by Bogdanov in *Red Star* and Alexei Tolstoy in *Aelita,* to the spirit of the close aim and Vernadskian evolution by positing the present as the horizon of development. In the *fantastika* of the early 20th century, the reader encountered utopian alien communities, and the author explored the remaining distance between the present, a space of revolutionary development, and the future, a place where utopia had been achieved. Efremov placed his alien culture in the past and examined how it advanced towards the reader's present. The extraterrestrial was no longer a vessel for imagining change, whether physical or political; instead, it reaffirmed the certainty of the human's biological form.

In *Starships,* Efremov first fully articulated his ideas about anthropocentric evolution. Shartov and Davidov discuss the theoretical physical build of the ancient extraterrestrials whose remains they have found and agree that it would not make sense for aliens to possess anything other than hominid features. A "thinking being" would require bipedal motion, and both the shape of its extremities and its physical size would be like those of humans. Likewise, the Earth's atmospheric pressure, temperature, and gravity provide the sole preconditions for the development of life.[318]

The physical similarities between alien and human life that Efremov draws offer a fruitful point of comparison to Beliaev's *fantastika,* in which technology often deforms the human body, causing fear. In Efremov's account, the alien's body is explicitly *not* repulsive because the alien it so closely resembles the human. Shatrov and Davidov and hold the skull of a single alien in

[318] Ibid., 344-5.

their hands and marvel at how similar it is to a human skull. In a climactic moment, the scientists discover that a disk found alongside the alien fossil acts as a lens. When illuminated with light, the lens projects the image of the extraterrestrial's face. The image staring back at the scientists is "undoubtedly human" and "unusually (*neobyknovenno*), unbelievably alive."[319] While the alien has larger eyes and smoother skin than that of man, the scientists feel that the alien's face "did not seem ugly or disgusting."[320] With the similarity between man and alien, there is an inversion of Beliaev's depicting bodily deformity to inspire fear. Aesthetic continuity—that the face is "not ugly"—strengthens the shared evolutionary telos of man and alien.

Efremov also upheld the spirit of the close aim *fantastika* more subtle ways. In keeping with the vernacular of the close aim, *Starships* shuns the fantastic in favor of the "unusual." Many of the relics associated with the alien's remains are described as "unusual." The color of the alien's skull is "unusual," as is the hardness of a disk found alongside the alien and the disk's resistance to a polishing powder.[321] The archaeological discovery of the alien's remains is described as "most unusual" (*neobychaĭnyĭ*) more than once. Again, this word choice subtly placed that which might have been categorized as fantastic in the past into the semantic orbit of the quotidian. The fantastic elements of the story, instead of exceeding the bounds of the plausible, are instead something the characters labor to account for with the existing laws of science. Successful scientific work, both this semantic shift and the ark of the story propound, make the "unusual" usual.

Efremov's uses the critical vocabulary of *fantastika* to further equate the "conscious" with the human and beautiful in opposition to the "elemental," which is monstrous. Fantasy is

[319] Ibid., 378.
[320] Ibid., 379.
[321] Ivan Efremov, "Zvezdnye korabli," in *Sobranie sochineniĭ v shesti tomakh*, vol. 3 (Sovremennyĭ pisatel′, 1992), 365, 372, 378.

only mentioned once and in a derisive context. Davidov, one of the two scientist protagonists, dismisses as "fantasizing of the ignorant" all who would discount the certain evolutionary path from simple life to more advanced, thinking forms.[322] Efremov applies the word "monstrous, enormous" (*chudovishchnyĭ*), which derives from the word "miracle" (*chudo*), to natural phenomena of great size: a massive wave, the expanses of space, the number of stars in space.[323] Efremov uses the word "miraculous" one time in his story. As the two scientists make their deductions, one observes that "in such moments, you feel how powerful science is, how miraculous the thinking of man."[324]

Even if Efremov was working well within the norms of 1940s *fantastika*, he chafed at its strictures. A monologue by one of the paleontologists in defense of his profession reads as a plea to expand the scope of *fantastika* beyond depicting the near future and the requirement to be of immediate use. Two graduate students working under Davidov quarrel over whether it would be better to study physics instead of paleontology, because physics has more obvious applications. When Davidov enters, they pose the question to him, and he responds with an impassioned speech. Paleontology's "'tomorrow' is further than other branches of knowledge," but it will be useful in future developments in medicine.[325] Those questions that paleontology can answer are "still far from us, but they are getting nearer every day."[326] Davidov's defense of paleontology need not be read as an allegorical plea for greater creative freedom. His fictional speech echoes those made by scientists amid the Zhdanovite anticosmopolitan campaigns to defend fields like astronomy and cosmology against accusations of being too theoretical.[327]

[322] Ibid., 345.
[323] Ibid., 327, 320, 338.
[324] Ibid., 370.
[325] Ibid., 354
[326] Ibid.
[327] Vucinich, *Empire of Knowledge*, 241.

Efremov also abutted the language that was employed to discuss *fantastika* of the close aim. Davidov concludes that "a scientist cannot be the enemy of the present, but he also cannot be only in the present. He should be ahead, otherwise, he is only a servant. Without the present, he is a fantasizer, without the future, a dullard."[328] Again, "fantasy" identifies that place that lacks a firm enough connection to the present and real, but Efremov defends the necessity of thinking about such hypothetical questions as those that he explores in *Starships*. This same set of questions about social and biological evolution would remain operative for the next 15 years, and it is remarkable that Efremov's public defense of *fantastika* in relation to the reality of science in the early 1960s would so much resemble the one articulated here.

Starships demonstrates how, a decade before Efremov revived far-future *fantastika* in *Andromeda Nebula*, the basic elements of that escape were already available. It is remarkable that Davidov's speech so much resembles the defense of *fantastika* that Efremov and his peers would articulate in the early 1960s. So too was the primary tether that would keep Efremov's fiction linked to the late-Stalinist period apparent with his treatment of evolution, which only became more of a central theme in his later fiction. The "tomorrow" of *fantastika* would be extended, but it would continue to look much like today.

The central, evolutionary theme of *Starships* also stands out given the fact that its publication coincided with the reemergence of debates between Lysenko and his opponents. A closer look at the exact chronology reveals that Efremov's publication lagged slightly behind these events, making it less a response to them than a trace of a pre-Zhdanov scientific culture that was soon to be replaced. Furthermore, Efremov avoided more contentious issues about the exact mechanics of evolution.

[328] Efremov, "Zvezdnye korabli," 354.

Starships was published between July and October of 1947, and Soviet science underwent a dramatic reorientation throughout that summer and fall. In the immediate post-war period, Soviet scientists could collaborate freely with their international counterparts, and the government celebrated such collaborations as a sign that Soviet scientists led the West. This configuration changed with the Kliueva and Roskin affair. Nina Kliueva and Grigorii Roskin, two Soviet scientists researching cancer treatments, drew the interest of their American colleagues after announcing a potential breakthrough "miracle cure." Collaboration between the Soviet and American scientists attracted Zhdanov's attention, and he demanded to know why Soviet scientists were sharing state secrets with the Soviet Union's adversaries. Public trials took place in early June 1947, and the decree "On Responsibility for the Disclosure of State Secrets" soon followed.[329] The event marked the beginning of a scientific patriotism in which paranoia about international collaboration dominated.

Shortly after, Lysenko began an attack on his scientific opponents that would culminate in his domination in the field of evolutionary biology. On October 18th, 1947, Lysenko published an article in *The Literary Gazette* titled "Why Does Bourgeois Science Rise against the Works of Soviet Scientists?" in which he criticized geneticists for the "Malthusian error" of seeing intraspecific competition or the "struggle for existence" as the motor of evolution, a view which was a "bourgeois remnant."[330] Against this, Lysenko argued that direct adaptation was the driver of evolution.[331] This controversy culminated in the 1948 meeting of the Lenin All-Union

[329] For a detailed account of this episode, see Nikolai Krementsov, "The 'KR' Affair': Soviet Science on the Threshold of the Cold War," *History and Philosophy of the Life Sciences* 17, no. 3 (1995): 419–46.
[330] Krementsov, *Stalinist Science*, 150.
[331] For an overview of Lysenko's return during this period, see Svetlana Borinskaya, Andrei Ermolaev, and Eduard Kolchinsky, "Lysenkoism Against Genetics: The Meeting of the Lenin All-Union Academy of Agricultural Sciences of August 1948, Its Background, Causes, and Aftermath," *Genetics* 212 (2019): 1–12.

Academy of Agricultural Sciences, where Lysenkoism was declared the singular ideologically correct account of evolution.

As this timeline makes clear, Efremov's serialized story came out nearly concurrently with major changes in the discourse of evolution and practice of Soviet science. While *Starships* deals extensively with the question of evolution, Efremov never touched on whether such evolution is driven by competition or direct adaptation. If anything, Efremov veered towards Lysenkoist Michurinism, a belief in the inheritance of acquired characteristics (as opposed to a genetic theory of evolution). In the concluding paragraph of *Starships,* Efremov proclaimed that the first step towards conquering the cosmos was unifying the peoples of Earth "into one brotherly family, destroy[ing] inequality, oppression, and racial prejudice."[332] Such a conclusion, while boilerplate, suggests the conscious overcoming of social ills through cooperation. The Malthusian motor of Darwinian evolution had long bothered Marxist.[333] Soviet biologists, defending themselves against Lysenko's accusations of Malthusianism, were quick to point out that while intraspecific competition was an observed biological fact, they did not advocate its application to human social processes.[334]

Efremov's work was an artifact of the immediate post-war in its enthusiastic embracing of international science. The reader meets Davidov as he returns from a scientific conference in San Francisco. Shatrov determines the origins of the ancient cosmic visitors from calculations received from a Chinese scientist.

[332] Efremov, "Zvezdnye korabli," 380.
[333] For more on the complicated reception of Malthus among the radical and liberal intelligentsia in Russia, see Daniel Todes, *Darwin without Malthus: The Struggle for Existence in Russian Evolutionary Thought* (New York: Oxford University Press, 1989).
[334] Krementsov, *Stalinist Science*, 151.

The Science Prose Section

The Science Prose Section, a group of prominent writers and critics within the Writers' Union that met between 1945 and 1951, furnishes a rich example of how the discourse around *fantastika* functioned in the late Stalinist period and gives useful context for Efremov's eventual intervention against *fantastika* of the close aim. Though the group's stated purpose was to examine science writing in all its manifestations, conversations often returned to the central difficulty of defining *fantastika* and asking what sorts of things the genre ought to accomplish. Participants often affirmed that *fantastika* was necessary, important, and popular, then expressed dismay that the genre's current quality was low, and the number of works printed small. Meetings were devoted to resolving these issues, but few concrete plans resulted. The discussions mirrored those going on in the press (and were often undertaken by the same writers and critics), but, with its more direct exchange of ideas and pointed arguments, the Science Prose Section offers a clearer sense of which contentions weighted most heavily on *fantastika*. The two chief, related controversies were how to define and enforce the close aim and how to differentiate Soviet *fantastika* from Western science fiction.

The role of the close aim in *fantastika* was the biggest point of disagreement among those who participated in the Science Prose Section. Opponents of the close aim only dared to suggest that writers be given permission to glimpse an additional decade into the future, whereas the theory's proponents wished to limit *fantastika* and science writing to popularizing science of the present. Some of this confusion stemmed from the discursive snares of Stalinism, which held that, as Soviet citizens already lived "in the future," the present and future were one. Lev Uspensky, a longtime writer of *fantastika* and popular science for young readers, exemplified such confusion in a statement given in a 1949 meeting. He reasoned that *fantastika* is "literature

of the man of tomorrow, of the Soviet man. But the Soviet man's tomorrow is long after tomorrow (*dalekoe poslezavtra*), because today we live in tomorrow."[335] Others, less tripped up by their own rhetoric, still forecast the future as quite close to the present day.

A meeting from 1951 included exchanges that illustrate both the ambiguous bounds of the close aim and confusion about its enforcement. Several members of the meeting spoke out against the close aim, which they ascribed to Victor Sitin, a critic and writer of close aim *fantastika* who participated regularly in the section. One writer, arguing that *fantastika* ought to be permitted to imagine beyond the bounds of the current five-year plan, reasoned that writers should be so bold as to imagine how man might appear not one but two five-year plans ahead. Georgii Tushkan, an author of *fantastika* and adventure fiction, pronounced the theory of the close aim "deeply incorrect" for confining "the flight of fantasy to a five-year plan," then asked, rhetorically, "did not Stalin give us instructions for 15 years ahead?"[336] A representative of Detgiz, the state publishing house of children's literature, also spoke out against the close aim. "*Fantastika* should be winged (*krylatoĭ*) and go not only two years ahead, but 20-30 years."[337] The term "winged" became shorthand for close aim *fantastika*'s opposite. The Detgiz editor wondered why writers treat the tradition of the close aim as law: "The issue is with yourselves [the writers], that you bound your flight, that you are careful and work out for yourselves a program of only the shortest range."[338] This provocation was implicitly answered by the fact of state planning. To humbly venture beyond either the current five-year plan or Stalin's slightly more long-range forecasting, even if not expressly prohibited, would be to risk contradicting the

[335] RGALI, f. 631, op. 9, d. 22, 40.
[336] RGALI, f. 631, op. 22, d. 41, 51.
[337] Ibid., 62.
[338] Ibid., 65.

Party. Writers, especially those operating in the *Zhdanovshchina* period, were circumspect enough to censor themselves, even if this meant not answering the call for better *fantastika*.

This is not to say that a majority were against the close aim. Vladimir Nemtsov and Vadim Okhotnikov, the two most famous practitioners of the close aim and frequent participants in the section, sometimes received explicit criticism for their unambitious *fantastika*. They successfully defended themselves, and their approach remained hegemonic. For example, Okhotnikov, in response to criticisms that *fantastika* ought to educate about the future rather than myopically focus on the present, sidestepped the question by saying that he always disliked the label "science-fantastic" (*nauchno-fantasticheskiĭ*).[339] What matters most, Okhotnikov argued, was that a work help educate the youth towards the end of building communism. Above all, works should be judged for their "ideological (*ideĭnyĭ*) essence."[340] At the same meeting, Nemtsov likewise avoided admitting the heavy toll taken by the close aim. He expressed frustration at the discussion of whether *fantastika* was "winged" or not, an approach that he found "scholastic." The genre, Nemtsov insisted, had room for both the near and far scientific tales, though he followed this by asking why the present was not sufficiently fantastic to serve as creative inspiration.[341] In a meeting a few years earlier, in 1945, Nemtsov had defended the close aim more directly, and clearly stated the equivalency between *fantastika*'s utility and the close aim. *Fantastika* ought to journey only five to ten years into the future and be based on the achievements of the present day so that young readers would feel inspired to accomplish that which the writer depicts.[342]

[339] Ibid., 90.
[340] Ibid., 91.
[341] Ibid., 104.
[342] RGALI, f. 631, op. 22, d. 3, 69.

Such discussions demonstrate that the close aim was recognized as a weight on *fantastika* even in the late Stalinist period, before the limit could be surpassed. Those who argued against the close aim's strictest iteration still supported it to a point, as they also confined their sense of what *fantastika* could do to science popularization. Even its defenders shielded it from criticism somewhat passively. Furthermore, the terms of its discussion, especially the call for a "winged" *fantastika*, were the same that would be used in the post-Stalinist period. In this, Efremov's leap into the future and the responses that *Andromeda Nebula* would elicit mark a continuation of a pre-existing conversation rather than a radical break.

Another one of the central preoccupations of the Science Prose Section was an effort to define what was specifically Soviet about Soviet *fantastika*. Writers recognized that science fiction was popular in the West and that *fantastika* shared with its Western counterpart certain progenitors, namely H. G. Wells and Jules Verne. In general, Jules Verne was talked about favorably because he was focused on popularizing technology, whereas Wells received round condemnation for his "pessimistic" predictions about the future. In the nationalist atmosphere of *Zhdanovshchina*, section participants strained to construct a revisionist history of Soviet *fantastika*'s origins that minimized ties to Western forebearers. In their attempts, critics answered the question of how the aims of Soviet *fantastika* differed from science fiction of the West.

Sometimes, this resulted in arguments that Soviet *fantastika* arose solely out of the Russian classics, unsullied by the influence of Western authors. In a May 1949 meeting, Anatoly Safronov, then secretary of the Writers' Union, emphasized the distance between Soviet science writing and its Western counterpart, a difference that is partially thanks to *fantastika* originating in the Russian classics. Lomonosov, Safronov argued, was the originator of Soviet science prose, and Pushkin's historical novel *The Moor of Peter the Great* was another predecessor of the

genre. Safronov explained that the impulse to include social ideas in *fantastika*, so central to Soviet writing generally, sprung not from Wells but specifically from Chernyshevsky.[343]

A similar example can be found in a December 1949 meeting, in which Sergei Ivanov, a writer and vocal defender of close aim *fantastika*, argued that those who view Francis Bacon's *New Atlantis* as the source of all utopian *fantastika* are mistaken. Tracing the lineage of *fantastika* back to the Russian classics, Ivanov reasoned, one finds a tradition less interested in the cosmos and more focused on the "very close, based on existing scientific research and foundations."[344] The three authors Ivanov saw as forebears of the Soviet *fantastika* tradition were Lomonosov, Chernyshevsky, and, perhaps most bafflingly, Gogol, who was included for his having mentioning windbreaks of trees between farm fields in *Dead Souls*. Ivanov advised contemporary writers to take heed of how these masters wrote about the near future and man's dominion over nature. [345]

As with much revisionist history of the time, Ivanov's argument more highlighted the sorts of traits critics found useful in Stalinist science writing than an original insight into the origins of *fantastika*. Chernyshevsky certainly colored the utopian strand of Soviet *fantastika.* Lomonosov, with his aim of popular science education, can likewise be read as a precursor to Tsiolkovsky and others who wanted *fantastika* to be a vehicle for popular enlightenment. However, the enormous influence and popularity of Western writers was explicitly acknowledged by both the first wave of Soviet *fantastika* writers in the 1920s and those who revitalized the genre during the Thaw.

[343] RGALI, f. 631, op. 22, d. 23, 13-16.
[344] RGALI, f. 631, op. 22, d. 26, 10.
[345] Ibid., 14-15.

In a particularly brazen example of patriotic revisionism, the writer and editor Lev Linkov became incensed at the oft-repeated anecdote that Jules Verne foresaw the invention of the submarine, a foresight that was sometimes brought up as an argument for how thoroughly imaginative *fantastika* might aid scientists by anticipating future inventions. Russians, Linkov interjected, invented the submarine long before Jules Verne, though he does not specify which Russians or when. "Fantastic literature," he continued, "should be party literature."[346] This objection points to the fulcrum on which the primary question of science literature at the time balanced: Whether *fantastika* should follow science or if it could, even to a very limited extent, lead scientific inquiry.

Though it was not as primary a concern of those surveying the state of *fantastika* in the Science Prose Section, the question of how or whether man would differ in the future was occasionally raised. The topic cropped up in discussions of whether everyday people or the more "heroic" ought to populate *fantastika*. A similar criticism held that the characters in *fantastika* of the moment were insufficiently "lively" (*zhivoĭ*), a complaint that was common in literary discussions of the period as half-hearted admission that fiction had been made lifeless by ideological demands. Ivanov, summarizing extant thoughts on *fantastika* in a 1951 meeting, observed that there exists "a sharp distinction between the depiction of technology of the future and man" in that technology changes and improves while "man remains stable."[347] Nemtsov reasoned that those who will exist 10 years in the future "are [already] among us" for they "cannot differ from the most advance of those of the present day. We do not need to fantasize that people will be different (*inye*)."[348] Technology, all could agree, would continue to advance.

[346] RGALI, f. 631, op. 22, d. 22, 67.
[347] RGALI, f. 631, op. 22, d. 41, 99.
[348] Ibid., 107.

To suggest that anything existed beyond the idealized Soviet citizen of the present was a much greater affront to the ideological status quo.

The concerns of the Science Prose Section were voiced in the press as well, though arguments were more oblique when authors were not in direct conversation with one another. One example merits particular attention because it would serve as a reference point for attacks on the concept of the close aim in the immediate post-Stalinist period. Ivanov published an essay titled "Fantasy and Reality" (*Fantastika i deĭstvitel'nost'*) in a 1950 issue of *October*. In the article, Ivanov hammered the same points that he had made in the Science Prose Section a year earlier.

As he had already done in the Writers' Section, Ivanov provided an alternative genealogy of *fantastika*. Lomonosov was lauded as the first writer of Russian *fantastika*, and Ivanov argued that Lomonosov's work demonstrates that trait that divides Soviet from Western *fantastika*—a focus on practical matters. Chernyshevsky received praise as a writer of *fantastika*, as his work predicts such practical scientific accomplishments as new varieties of wheat, the widespread use of aluminum, and greater human lifespans. Ivanov christened Nekrasov the progenitor of the closely related genre, Soviet adventure literature.

In a key passage, Ivanov asked why the massive changes predicted in the current five-year plans were not enough for writers of *fantastika*: "The Party and government bring before us a vision of the future with their practical, daily deeds." Were not the massive changes envisioned by Stalin a fertile enough source of material? "Soviet *nauchno-fantastika* should reflect the coming day (*zavtrashniĭ den'*) of our country, the life of our people."[349] While such a passage did not articulate anything startlingly new, Ivanov here stated outright the relationship between a

[349] S. Ivanov, "Fantastika i deĭstvitel′nost′," *Oktiabr'*, no. 1 (1950), 159.

"patriotic," non-Western *fantastika* and a Soviet alternative that, in its adhering to propagandizing a Party narrative about the immediate future, fulfilled the aim of giving Soviet *fantastika* its utilitarian footing.

Lastly, Ivanov singled out for praise those writers who, in his view, were the shining stars of close aim *fantastika*: Okhotnikov, Nemtsov, and Efremov. Ivanov applauded Efremov's *Five Compass Points* for showing that which was currently unattainable "but will tomorrow be enlisted in the service of the Soviet government." Efremov's work successfully stood on "the 'boundary of the possible.'"[350] Ivanov concluded that Soviet *fantastika* was on a good path. Its only failure was one of scale; there ought to be more *fantastika* and it must enlarge its scope.

Early Post-Stalinism

On March 5th, 1953, Stalin died. Soon after, Efremov began work on *Andromeda Nebula*, which would begin serialization in 1957. With the novel's far-future setting, Efremov emphatically rejected the theory of the close aim, and the novel was immediately hailed as a milestone in the development of *fantastika*. Even before Efremov took this great leap, in the time when Efremov was still composing the novel, there appeared public shifts in the conversation around *fantastika*, as critics and writers of the genre began to state more brazenly that *fantastika* of the close aim lacked something "fantastic."

Just a few days after the death of Stalin, Efremov submitted to *The Literary Gazette* an article titled "On the Broad Popularization of Science" (*O shirokoĭ populi͡arizat͡sii nauki*) that had been met with rejection when he first submitted it in December of the previous year.[351]

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[350] Ibid., 160.

[351] Matthias Schwartz, *Expedition in Andere Welten* (Bohlau Verlag, 2014), 607, quoted in Il′i͡a Kukulin, "Periodika dli͡a ITR: sovetskie nauchno-populi͡arnye zhurnaly i modelirovanie interesov pozdnesovetskoĭ nauchno-tekhnicheskoĭ intelligent͡sii," *Novoe literaturnoe obozrenie*, no. 3 (2017), https://www.nlobooks.ru/magazines/novoe_literaturnoe_obozrenie/145_nlo_3_2017/.

Efremov argued for the publication of more popular science books, especially those that approached their subject "broadly." By this, he meant science writing that accentuates the links between different spheres of science and invites the reader to learn about the controversies on the boundaries of a given discipline. Up until this point, Efremov wrote, those few books of popular science that had been published only recounted the consensuses of yesterday. A "broader" science popularization would grant readers the ability to "look ahead to the future of science."[352] Efremov connected this trend with the problems facing *fantastika*. He observed that a blinkered conception of science "is heavily reflected in our science-fantastic literature," where the reader was likewise prevented from glimpsing what science might bring.[353] Though the close aim was not mentioned directly, it was the clear object of Efremov's criticism.

The following year, in 1954, a series of three articles published in *The Literary Gazette* attested to the newfound ability of authors to say aloud that *fantastika* of the close aim was insufficiently fantastic, inverting some of the core talking points about the genre. The first of these articles was Sergei Poltavsky's "At the Threshold of *Fantastika*" (*U poroga fantastiki*), published on August 7th, 1954. Responding to the *fantastika* of the close aim written by Okhotnikov and Nemtsov, Poltavsky argued that the truly fantastic was that which lay beyond the bounds currently restricting the genre. Poltavsky played on the vocabulary of the "bounded fantastic" as it had been expressed by writers and critics in the previous decades.

Poltavsky surveyed recent works of *fantastika* and pronounces them unworthy of the genre's title. A reader encountering Okhotnikov's 1953 novel *First Thrills* (*Pervye derzaniia͡*) would be prompted to ask, "why is it called *nauchnaya fantastika*?"[354] Poltavsky enumerated

[352] Ivan Efremov, "O shirokoĭ populi͡arizat͡sii nauki," *Literaturnai͡a gazeta*, no. 36 (1953): 3.
[353] Ibid.
[354] Sergeĭ Poltavskiĭ, "U poroga fantastiki," *Literaturnai͡a gazeta*, no. 94 (1954): 3. Emphasis in original.

several other titles from the late 1940s and early 1950s, including Nemtsov's 1948 collection *Three Wishes* (*Tri zhelaniia͡*) and pointed out that in each case the author was afraid of stepping over the "boundary of the possible." "Dreaming within the bounds of the contemporary day and the nearest future" may be necessary, Poltavsky wrote, but this could be accomplished by "*popular science* literature" and not *fantastika*.[355]

Poltavsky even revised the trope, standard from the early Stalinist period, of proclaiming reality more fantastic than *fantastika* itself. In the past, Soviet inventors designed a powerplant that could generate 5,000 kilowatts; now, there existed power stations capable of producing 50,000 to 100,000. This "turning a *skazka* into reality" might be considered fantastic, Poltavsky wrote. But he objects to such a formulation: "This is not *nauchnaya fantastika*, but a scientific *plan*."[356]

Poltavsky also took aim at how the "unusual" had become shorthand for a kind of diminished fantastic. Choosing a topic that evoked the "feeling of the unusual (*neobychnyĭ*)" was insufficient. Fantastika required "not only the most unusual, but the unbelievable (*neveroi͡atnyĭ*)."[357] The "unbelievable" was the closest that Poltavsky came to articulating a *positive* definition of the fantastic beyond pointing out the insufficiency of those currently working in the genre.

While Poltavsky's article surprises in naming the tensions that plagued *fantastika* during the Stalinist period, he also demonstrated the difficulty in charting a clear path away from them. Like those who defended the close aim, he retained a distaste for Western science fiction. The ideas on which bourgeois science-fiction novels were based, he wrote, were "contrived"

[355] Ibid. Emphasis in original.
[356] Ibid.
[357] Ibid.

(*nadumannyĭ*). At the end of his article, Poltavsky offered a solution in the form of a novel with fully developed characters placed in genuinely fantastic situations. The call for more fleshed out heroes aligned with the larger Thaw-era demand for greater psychological realism. Yet Poltavsky continued to assert that fantasy should serve a utilitarian purpose, making it unclear what that fantastic should look like or how the "unbelievable" would align with this usefulness. Restrictive ideas about literature's value made it difficult to expand *fantastika*.

Nemtsov responded to Poltavsky in an article titled "Tradition and Innovation" (*Traditsii i novatorstvo*). Like Poltavsky, Nemtsov lacked a strong critical vocabulary for parsing his subject. The most concrete point of debate remained whether *fantastika* should depict the near or far future. Much of Nemtsov's argument revolved around a policing of the term "*nauchnaya fantastika*." One cannot say that *fantastika* of the close aim strays from the canon, Nemtsov contended, as forerunners of the genre had a looser sense of generic boundaries: Wells did not self-consciously produce genre literature, Verne called his stories "unusual adventures," and Aleksei Tolstoy wrote "science-adventure novels."[358] Thus, there was no canonical text dictating that *fantastika* should explore the future.

Soviet *fantastika* had an affinity for probable subject matter, Nemtsov observed, because many of those writing it had backgrounds in science. Likewise, Soviet readers recognized that dreams, such as the dream of flying to Mars, would first require several preparatory stages. Naturally, the reader would desire stories about those intermediate stages. Fiction ought to show which path "can bring [the reader] closer to that dream."[359] That which has passed for *fantastika*

[358] Vladimir Ivanovich Nemtsov, "Traditsii i novatorstvo," *Literaturnaia gazeta*, no. 129 (1954): 3.
[359] Ibid.

in the proceeding years (of which Nemtsov himself produced much), retained all of the necessary elements of the genre, including the "romance of the unusual" (*romantika neobychnogo*).[360]

Nemtsov repeated standard tropes of the late Stalinist debates around *fantastika*, defining it in opposition to a more far-fetched Western science fiction and appealing to the hazy, Zhdanovite concept of "ideology" (*ideĭnost'*). Even if *fantastika* need not be confined to Earth, Nemtsov argued, it must be different from the science fiction of the West that inflames the reader's imagination with stories of cosmic battles. Soviet *fantastika*, like all Soviet literature, must be oriented towards the goal of "the ideological (*ideĭnyĭ*) education of the new generation."[361] In this, Nemtsov admitted, to an extent, that *fantastika* lacked some speculative element, but he justified this lack by both arguing that such an element was not a requirement of the genre and repeating the Stalinist consensus that a work's fictionality and its educational potential were opposed to one another. Nemtsov's references to the "unusual" show a sustained allegiance to this older conception of the genre.

Lastly, on December 11th of 1954, Efremov joined the conversation with an article titled "On Literature of Winged Dreams" (*O literature krylatoĭ mechty*), which he wrote along with Aleksandr Studitsky, a biologist and fellow writer of *fantastika*, and Lev Djigarev, a writer of popular science and near future science stories. The title of their article picked up the trope of referring to more adventurous *fantastika* as "winged," already in use in the pre-Stalinist Science Writers' Section. The three reiterated Poltavsky's line that *fantastika* of the present day lacked the fantastic. It is fine, they conceded, if Nemtsov wished to write "a fantastic novel without the fantastic." However, to fantasize within the bounds of the current five-year plan is "not to fantasize at all." At the same time, the authors hesitated to go too far. To simply fantasize as far

[360] Ibid.
[361] Ibid.

as possible into the future, to "engage in the fantastic for the sake of the fantastic," they warned, was to "lose the connection with life."[362] Though "fantasizing" retained a sheen of danger, this revision was a departure from just a few years prior, when "fantasizing" and "the fantastic" had an unambiguously negative connotation. In this limited change, it was no longer as important that a work of fiction be correct in its scientific assumptions as long as it captured something essential about human scientific striving.

The conversation carried out through these articles demonstrates that there was a clear sense that *fantastika* of the close aim lacked some vital component of the genre, and the death of Stalin allowed for voicing that lack; however, the vocabulary for revitalizing *fantastika* was still trapped within the lexicon of Stalinist literary criticism. Even the far-future fantastic had to be "tied to life," and critical conversations hinged on the ability to sketch psychologically accurate and inspiring heroes. The blurred place between mimesis and romanticism that had dominated conversations about Socialist Realism for the past two decades remained, and literature was still justified in utilitarian terms. As will be seen, the image of science remained one that was clearly positive and avoided the grotesque. Nonetheless, a call for the unapologetically speculative was now in ascendency. Nemtsov, repeating the dominant talking points of only a few years prior, appeared on the defense. What did it mean to fantasize more freely, if the conception of science to which one remained faithful had been formulated against the fantastic?

Stalin's absence affected the image and practice of science more generally. Khrushchev gave significant funding to the sciences and channeled resources into large-scale projects in physics, chemistry, and agriculture. Scientists regained a level of autonomy, and, while ideological demands on science became less strict, they continued to weigh on the field of

[362] Ivan Efremov, Aleksandr Studitskiĭ, and Lev Zhigaev, "O literature krylatoĭ mechty," *Literaturnai͡a gazeta*, no. 147 (1954): 3.

biology, where Lysenkoism stubbornly persisted.[363] These institutional changes were accompanied by reversals in how science was presented to the public. In 1955, the Ministry of Higher Education called for the history of science to include world science once again. Later that year, the Central Committee reiterated the need for scientists to learn from their capitalist counterparts.[364] "International science," once the boogeyman of late-Stalinist science discourse, had returned.

***Andromeda Nebula* and "The Heart of the Serpent"**

Ivan Efremov's *Andromeda Nebula,* first published serially in *Technology for the Youth* in 1957, marked a turning-point in *fantastika*'s history. With his leap into the future, Efremov violated the most obvious prohibition on *fantastika*. Yet, Efremov broke with the close aim within pre-existing narrative forms and while preserving some of the core Stalinist constraints on the scientific imagination. This baggage is most evident in Efremov's idiosyncratic account of evolution. A more detailed analysis of how Efremov enlarged the possibilities of *fantastika* while respecting certain Stalinist prohibitions allows for a reassessment of the novel's historical significance and informs a reading of the novel itself.

Efremov's prominent themes of communication and heredity revolve around a desire to permit difference while minimizing real change. In this, Efremov's novel is not a radical leap forward but an important step in the direction of greater creative freedom. In both *Andromeda Nebula* and "The Heart of the Serpent," a short story published in 1959 and set in the same fictional universe, he offered a similar account of evolution: Across the universe, all intelligent life would necessarily evolve to appear and act like contemporary man. In describing these

[363] Paul Josephson, "Soviet Scientists and the State: Politics, Ideology, and Fundamental Research from Stalin to Gorbachev," *Social Research* 59, no. 3 (Fall 1992), 605-608.
[364] Michael Froggatt, "Renouncing Dogma, Teaching Utopia: Science in Schools under Khrushchev," 270.

human-like extraterrestrials, the imaginative possibilities of *fantastika* were enlarged while the genre remained adherent to underlying, anthropocentric myths of the Stalinist scientific imaginary.

This reading of *Andromeda Nebula* deepens but does not depart drastically from existing criticism. Scholarship tends to praise the novel for breaking with *fantastika*'s Stalinist iteration and assess the novel's influence on the genre's Thaw-era resurgence. Close attention to debates leading up to the novel's publication allow for a more finetuned reading of how the terms of the *fantastika* debate shifted. Leonid Geller observes that much of the *fantastika* to come out after Efremov into the early 1960s can be taken as an extension of the formula laid out in *Andromeda Nebula*.[365] Anatoly Britikov sees the novel as signaling a decisive break with the close aim and responding to the contradictions of its time, as the Soviet Union began to come to terms with the recent, dark past of Stalinism while looking forward to a period of space optimism.[366] *Andromeda Nebula*, Britikov further observes, grew out of the no-conflict theory in literature, a utilitarian conception of the sciences, and Efremov's polemic with Western science-fiction writers, who's "pessimistic" idea of the future he wished to counter.[367]

These interpretations rest on the issue of how quickly *fantastika* changed during the Thaw and to what effect. George Grebenschikov observes that *Andromeda Nebula* struggled to emerge from the restrictions placed on the genre in the 1930s.[368] Surveying the ideology of Thaw-era *fantastika*, Rafail Nudelman notes that one of the primary changes in *fantastika* after Stalin's death was that it was no longer a "scientific-technological forecaster" and became,

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[365] Leonid Geller, *Vselennai͡a za predelom dogmy: razmyshleni͡a o sovetskoĭ fantastike* (Overseas Publications Interchange Ltd, 1985), 116.
[366] Britikov, *Russkiĭ covetskiĭ nauchno-fantasticheskiĭ roman*, 220.
[367] Ibid., 220, 231-2.
[368] George Grebenschikov, "Efremov's Science Fiction: A Reexamination of His Major Works," *Russian Language Journal* 30, no. 106 (Spring 1976), 111.

instead, "a means of artistic cognition and analysis of reality by way of probable extensions."[369] Ilya Kukulin, surveying the same period, writes that one of the central changes in *fantastika* of the Thaw was the "development of conceptions about the variability of the future."[370] Absent in these analyses is a deeper engagement with Efremov's theory of evolution, which, I argue, was core to assessing how he moved the genre towards a site of imagining alternative futures. Without contesting the core claim that *fantastika* evolved to permit greater creative liberties during the Thaw, the considerable continuity between Efremov's theory of evolutionary change and the Stalinist eternal present, which had constrained *fantastika*, demonstrates the durability of the deeper hurdles to overcoming the Stalinist scientific imagination.

My reading of Efremov aligns most with that of Elana Gomel, who elucidates how Efremov's difficulty depicting difference shows his intellectual debt to Stalinism. In her article "Gods like Men: Soviet Science Fiction and the Utopian Self," Elana Gomel draws on Frederic Jameson to ask how Efremov's utopian subjects re-inscribe the core contradictions of the Stalinist relationship between history and utopia. Ideology holds that Soviet communism is the endpoint of history while playing down the change inherent in historical time. This tendency draws a continuity between the present and the imagined future. Gomel argues that this contradiction plays out in the physical bodies of characters in humanistic Soviet *fantastika* of the late 1950s and 1960s, most chiefly in Efremov's work. Efremov's *idée fixe* about convergent evolution towards man across the universe reiterates a core contradiction of Soviet ideology, which posits utopia as "both the consummation and negation of the historical process."[371] In

[369] Rafail Nudelman, "Soviet Science Fiction and the Ideology of Soviet Society," *Science Fiction Studies* 16, no. 1 (March 1989), 50.
[370] Il′i͡a Kukulin, "Periodika dli͡a ITR: sovetskie nauchno-populi͡arnye zhurnaly i modelirovanie interesov pozdnesovetskoĭ nauchno-tekhnicheskoĭ intelligenti͡sii."
[371] Elana Gomel, "Gods like Men: Soviet Science Fiction and the Utopian Self," *Science Fiction Studies* 31, no. No. 3 (November 2004), 365.

Narrative Space and Time: Representing Impossible Topologies in Literature, Gomel similarly stresses that Efremov's novel fosters a sense of familiarity and sameness rather than difference. As she points out, the neologisms that Efremov coins to give his fictional world flavor are explained away in an appendix, making the "initially strange world of the far future comfortable and acceptable to the Soviet reader."[372] Likewise, difference is reduced within Efremov's fictional world. While Efremov takes the reader to the edges of the universe, "in this breathtaking expanse there is no genuine difference."[373] Both in his imagined world and in his relationship towards readers, Efremov reduces divergence. All evolves to look like man. The language of man of the future can be readily translated into the language of man of the present day.

Building on Gomel's readings of *Andromeda Nebula*, I situate the tension between difference and sameness in *Andromeda Nebula* within ongoing controversies of the Stalinist scientific imagination. Efremov's far-future setting has its roots in his polemic with the close aim, which he was not able to fully supersede. His anthropocentric vision of the future reinstates the eternal present of Stalinism while trying to accommodate the thinking of early 20th-century Cosmist thinkers, chiefly Vernadsky, who themselves posited the present as neither the certain culmination of biological evolution nor the final stage of history. In his treatment of his evolutionary theme, Efremov reiterated both a long-running difficulty of squaring ongoing evolution with historical materialism and the related fixation with reinforcing the boundary between the human and the natural. Efremov's account of universal evolution affirms the narratives that informed this division: consciousness's "conquest of nature" and the working out

[372] Elana Gomel, *Narrative Space and Time: Representing Impossible Topologies in Literature* (Routledge, 2014), 134.
[373] Ibid, 135.

of the spontaneity-consciousness dialectic. Of note is how Efremov amplifies the aesthetic dimension of this tendency towards consciousness. Evolution in Efremov's fiction trends towards the rational and beautiful. The irrational and "elemental," in turn, appear ugly. Thus, *Andromeda Nebula* can be read as an articulation of the science imagination at a crossroads, both trying to allow difference and lacking the resources to fully do so as it retained ideological baggage around the figure of the evolved human, himself an embodiment of the core disputes with Western science and Western science fiction alike.

Efremov wrote *Andromeda Nebula* from 1955 to 1956, and the novel began serialization in *Technology for the Youth* in 1957.[374] In his correspondences, Efremov expressed frustration that the "journal version" had been shortened by half. Editors ran the action-oriented passages of his story while omitting the philosophical digressions in which he expounded his vision of future society.[375] Readers would have to wait until 1958 for the full, unabbreviated book edition of *Andromeda Nebula*.

In a 1961 article titled "On the Path to the Novel *Andromeda Nebula*" (*Na puti k romanu 'Tumannost' Andromedy*), Efremov described how his inspiration for *Andromeda Nebula* arose from a polemic with Western science fiction.[376] In the West, he observed, science fiction was either dominated by plot or engaged in Vernian science popularization. He wished to depart from both of these trends by using *fantastika* to imagine social and philosophical relations of the future. Efremov saw Wells as a starting point for his work, but there, too, there was a contrast.

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[374] Efremov first mentions working on *Andromeda Nebula* in a letter from October 1955, though he completed most of the manuscript during the summer of 1956, which he spent at the dacha of his friend, Ivan Maiskii. See I. A. Efremov to I. I. Puzanov, October 17, 1955, in O. A. Eremina, ed., *Perepiska Ivana Antonovicha Efremova* (Veche, 2016), 265; I. A. Efremov to A. A. and I. M. Maĭskim, September 15, 1956, in *Perepiska Ivana Antonovicha Efremova*, 290.

[375] I. A. Efremov to L. S. Kuchkova, May 29, 1957 in *Perepiska Ivana Antonovicha Efremova*, 311; I. A. Efremov to P. P. Rubt͡sov, August 27, 1957 in *Perepiska Ivana Antonovicha Efremova*, 322; I. A. Efremov to I. I. Puzanov, July 9, 1957 in *Perepiska Ivana Antonovicha Efremova*, 342-3.

[376] Ivan Efremov, "Na puti k romanu 'Tumannost′ Andromedy,'" *Voprosy literatury*, no. 4 (1961): 142–53.

The happy future of *Andromeda Nebula* rejects the "pessimistic" future of Wells's *The Time Machine*, and Efremov found particular artistic inspiration in Wells's *People Like Gods*. Efremov positioned his book as both a continuation of a distaste for Western science fiction that he shared with his Stalinist-era critics and a break with those critics over the central place of the close aim.

As contemporary readers immediately noted, Efremov brazenly jettisoned the notion that *fantastika* ought to peek only a few years into the future with the story of how, 2,000 years from now, Earth has been converted into a communist paradise populated by post-racial, space-faring artists and scientists. In *Andromeda Nebula,* Efremov chronicles the trials and tribulations of those on Earth as they explore the far reaches of the galaxy, reflect on how society has changed since the "Era of Disunity" (their term for the reader's present), and attempt to build relationships with other intelligent life in space.

While Efremov drew from early 20th-century *fantastika* with his setting, he continued to utilize the narrative structures of Socialist Realism. In this, the novel was an updated hybrid of the two, pre-existing Soviet genres. Bogdanov's 1908 novel *Red Star* provided the most obvious prototype for the far-future elements of *Andromeda Nebula*, especially in the societal questions to which Efremov imagined solutions. Like Bogdanov, Efremov wrote of how, in the utopian future, society has solved questions relating to labor, the family and agriculture. All work has become voluntary, and citizens move freely between different jobs. Child-rearing is communal. Massive engineering projects reorganized the surface of the earth, and, thanks to this rationalization of nature's chaos, a band of agricultural zones ring the earth and provide superabundant yields. Their terrestrial needs met, people turn their attention to the stars.

These utopian developments provide atmosphere rather than serving as the engine of the plot, which draws heavily on adventure fiction and the Socialist Realist production novel. Two plot lines propel Efremov's story. A group of explorers land on a foreign planet and narrowly escape the shadowy alien monsters that lurk there. Meanwhile, on Earth, an ambitious scientist debates the merits of a risky experiment that might allow instantaneous communication across the cosmos. The experiment is conducted, fails, in the process killing several brave workers (who had been briefed on the danger of the mission), and the scientist receives punishment for his recklessness. At his trial, he is ultimately celebrated for his initiative. The latter plot rehearses tropes of the production novel in showing how, though it might incense bureaucrats, the daring of the few is sometimes necessary to achieve progress for the many.

Communication across the expanses of time and space is a central theme. Earthlings encounter relics of a past civilization and attempt to understand the psychology of their ancestors. Exploration into the cosmos extends transmissions between Earth and other planets. While, for the most part, these communications are successful, there exists a palpable friction in achieving mutual understanding between humans of the present and humans of the past or extraterrestrials. Efremov uses the imagined trials of cross-historical and interspecies communication to ask how intelligent life evolves over time.

Not all is readily understood in these communications. One character, having discovered the ruins of a museum created by a past society which strongly resembles the Western capitalist countries of Efremov's present, reflects on past man's hubris for imagining that he had arrived at the end of history. How could people long ago think "that their understanding of values and their tastes would continue unchanged through dozens of centuries and be accepted by their

descendants as canon."[377] In a similar passage, a scientist contemplates mysterious transmissions from distant planets. These messages are currently stored in the "Academy of the Bounds of Knowledge," the name of which suggests that human knowledge has room for further advancement. The "strange pictures and symbols" that make up this message have not yet been "decoded" (*rasshifrovannye*). The scientist considers the difference this uncracked language represents while reaffirming that this distance does not violate the telos of evolution: "We try to understand ideas that are a million years apart from us, somewhat different than ours due to the singular path of historical development of life from lower organic forms to higher, thinking beings."[378] In such moments, Efremov inches towards the idea that those of the present moment do well to understand that their seeming "utopia" is but a stage of historical development that will eventually be surpassed, but he shies away from making such a statement outright.

While great temporal and spatial distance allows for the possibility that alien life might be genuinely different from that on Earth, Efremov minimizes difference by emphasizing the singular path of evolutionary development. Efremov's choice to have a distant message "decoded" rather than "translated" (*perevodany*) reinforces the common aim of evolution. Translation suggests the possibility of losing nuance or semantic value between distinct languages. Decoding, conversely, implies a shared signified which can be fully comprehended once one finds equivalences between signifiers. Furthermore, in a universe where all evolves in the same direction, the only message that can be shared consists of platitudes about that singular path. One transmission, sent by a creature "not resembling us [on Earth], but, undoubtedly, a person" contains a message which, after several years, researchers understand to say "We greet

[377] Ivan Efremov, *Tumannost' Andromedy*, in *Sobranie sochineniĭ v 6 tomakh*, vol. 3 (Sovremennyĭ pisatel′, 1992), 288-9.
[378] Ibid, 49.

you, brothers, who have joined our family! Separated by time and space, we are united by reason in a ring of great power."[379] Evolution, this message underscores, follows the triumph of reason and, with it, the attainment of human form. Messages from distant galaxies can only reiterate this fact. If there exist higher levels of development beyond the human form and communist society already on full display by citizens of Efremov's future world, he declines exploring what such developments might look like.

Questioning how utopian citizens might communicate across the bounds of utopia was common in the early Soviet *fantastika* tradition, but, as he had in *Starships*, Efremov updated the formula in a way that expressed the Stalinist paradigm of a utopia of the present. Bogdanov's *Red Star* tells the story of a revolutionary plucked from the 1905 Russian Revolution and transported to Mars, where he struggles to understand and acclimate to the utopian, socialist society there. The theme of a person of the present chafing against utopias of the future continued through the 1920s, before utopian *fantastika* fell out of favor. Efremov's novel casts the reader into the future instead of having a protagonist drawn from the reader's present. Thus, like Efremov's heroes, the reader views utopia from within rather than identifying with the character outside of the utopian future, as had been the norm previously.

Key to understanding Efremov's novel and his engagement with difference are his speculations about evolution, emotion, and race. These preoccupations continue his examination, begun in "The Hellenic Secret," of how the human of the future might relate to man of the past both in the emotional and the evolutionary sense. Efremov clearly restated the temporal tensions of the Stalinist period (that is, that society is contradictorily already utopian and in a state of

[379] Ibid.

transformation) and continued to struggle with the imaginative bounds placed on *fantastika* that he had inherited.

Race, which Efremov imagined through the prism of genetics, plays a significant role in his vision of the future. Despite the society of Earth in *Andromeda Nebula* being superficially post-racial, Efremov racializes his characters and occasionally suggests that race affects their mannerisms and psyche. After informing the reader that Mven Mass, one of the main characters, is of African ancestry, Efremov repeatedly refers to Mven Mass as "the African," and, at one point, describes how Mven Mass walks on the balls of his feet "just as at one time his ancestors had walked in the sunbaked savannas."[380] Lyao Lan, a scientist with "slightly slant eyes," is referred to as "yellowfaced"(*zheltolit͡syĭ*), after a character inquires whether he is "of Chinese origin."[381] The same epithet is given to Aft Noot, another Asian character, later in the novel. Miko, a minor character with a skill for diving, explains that she has inherited her aptitude from her ancestors, who were Japanese pearl divers, though it is "accidental that [this skill] is manifest in me today."[382] The 1959 English translation of *Andromeda Nebula* includes an additional line which tries to divorce Efremov's fictional setting from the specter of race; the reader is assured that, in the future, "there is no longer a separate Japanese people, language or country."[383]

The persistent legibility of race demonstrates the perseverance of traits humanity ought to have left behind. Once again, the future is not radically different and appears in state of analogous development to that of the reader's present. Efremov's celebration of a haltingly post-racial community of scientists echoes the post-Stalinist celebration of "international science." Efremov's depiction of race also mirrors the contradictions of Stalinist attitudes towards

[380] Ibid., 44.
[381] Ibid., 104.
[382] Ibid., 111.
[383] Ivan Yefremov, *Andromeda: A Space-Age Tale*, trans. George Hanna (Progress Publishers, 1980), 148.

ethnicity. According to official pronouncements, ethnic divides had been overcome, though it remained an important to depict ethnic difference in order to communicate of the race-transcending character of Soviet citizenship.[384]

The lingering traces of an evolutionary past are on display when Efremov suggests that certain human emotions arise out of a vestigial connection with our ancient ancestors. For example, two characters gaze at a campfire and feel a calm come over them, as "somewhere deep in the soul of man, from those hundred thousand years during which fire had been his chief refuge and salvation, there remained an ineradicable feeling of comfort and peace."[385] While, in this instance, such an emotional response is presented as neutral, elsewhere such obsolete feelings are more malicious. Darr Veter, a central character, reflects on society's battle against egoism, which is "a natural instinct of primordial man, which played a great role in the wilds and was directed towards his self-preservation."[386] Overcoming such instincts plays out as a kind of evolutionary *fantastika* version of the spontaneity-consciousness dialectic. Efremov again projects into the far future the same psychic transformation that Socialist Realist heroes had been undergoing since Gorky's *Mother*. Whereas the Socialist Realist novel sees the development from "primordial" feelings to enlightened self-discipline take place during a short period of political education, Efremov imagines this same sentimental education playing out over the course of future epochs on the civilizational level.

[384] In his account Soviet ethnics policy, Slezkine describes how a Soviet ethnophilism accompanied the belief that Russian ethnic culture need not be promoted as such, because Russian culture was identified with a universal, Soviet culture. See Yuri Slezkine, "The USSR as a Communal Apartment, or How a Socialist State Promoted Ethnic Particularism," *Slavic Review* 53, no. 2 (1994): 414–52. For an overview of the Soviet social engineering, including how ethnicity was weaponized in the effort to homogenize the Soviet society, see Amir Weiner, "Nature, Nurture, and Memory in a Socialist Utopia: Delineating the Soviet Socio-Ethnic Body in the Age of Socialism," *The American Historical Review* 104, no. 4 (1999): 1114–55.
[385] Ivan Efremov, *Tumannost' Andromedy*, 96.
[386] Ibid., 169.

In *Andromeda Nebula*, Efremov theorizes that human beauty functions as an index of evolution, an idea which had only been implicit in his earlier fiction. The more attractive a human-like species appears, the more it has advanced towards evolutionary perfection. This is first and most clearly stated in an early episode during which the citizens of Earth receive a transmission from Tucana, a distant planet populated by beings who resemble humans but "possessed bodies of refined beauty such as had not by that time been universally achieved on Earth, but which lived in the dreams and creations of artists." Observing such beauty, Darr Veter thinks to himself that evolution trends towards "the thinking being, the more purposeful and developed the higher forms of life, and, consequentially, more beautiful."[387] This beauty is partially the result of man recognizing that cultivating spiritual and physical perfection is just as important as developing technology, in line with the Greek concept of "kalokagathia."

That human beauty indicates "consciousness" allows the communicability of perfection between the present and the future. Such beauty, already latent in humanity, only needs to be further expressed as evolution continues. Though Efremov wrote about the future, his idea of evolutionary perfection did not depart from the conviction of Nemtsov, champion of *fantastika* of the close aim, when, in the Science Prose Section, Nemtsov had hypothesized that the people of the future would resemble the most advanced of the present day. Furthermore, this "advanced-ness," encoded in physical beauty, remains immediately legible to the beholder. There is no need for "decoding;" the language of beauty transcends time and space. Evolution becomes a process of making things ever more familiar rather than stalking into the unknown.

In the inverse of equating the human with the rational and beautiful, the truly alien corresponds with the monstrous, natural world, which must be tamed by human thought. A team

[387] Ibid., 55.

of cosmic explorers encounters a baffling spacecraft on a distant planet and, on it, a group of deadly, jellyfish-like beings. The crew manages to capture samples of the alien lifeform and subjects them to dissection back on earth. The scientists "determined the nature of the monster (*chudovishch*) on a variety of physical, chemical, and biological parameters. The human intellect collected this data of various qualities, mastering the structure of the unknown horror spawn (*porozhdeniĭ uzhasa*) and subjugating it to himself."[388] In "subjugating" this creature to "human intellect" Efremov reiterated the combative Stalinist rhetoric of the war on nature. Additionally, scientific mastery is rendered as a kind of translation. Broken into the discrete sciences, the monstrous is made legible to man's intellect; the elemental is turned into the conscious. This translation can be compared to the "decoding" of messages between evolved, conscious beings on other planets. Whereas intelligent beings can only restate a declaration of their peaceful evolution, the natural world must be violently reconfigured into something useful for conscious beings.

Efremov repeats his vision of anthropocentric evolution and its imaginative limitations in "The Heart of the Serpent," a story first published in the journal *Youth* (*I͡unost'*) in 1959. Set in the same fictional universe as *Andromeda Nebula*, the novella describes a chance meeting in space between humans and extraterrestrials. This event gives Efremov and his heroes an opportunity to pontificate about the singular direction of evolution.

Even before Efremov's characters encounter aliens, they contemplate the necessity of other intelligent life to resemble humans on earth. One character lectures: "The anatomy and physiology of man, the only creature with a brain capable of rational thinking on Earth, were not the result of some accidental caprice of Nature. On the contrary, they represented a maximum

[388] Ibid., 266.

degree of adaptation to the environment […]."[389] As in *Andromeda Nebula,* beauty indexes evolution, and the universal direction of development safeguards against the grotesque. The same character reasons that "there can be no thinking monsters (*chudovishcha*), no mushroom-men, no octopus-men! (*li͡udi-os'minog*)," perhaps alluding, with this last example, to Beliaev's famed amphibian man.[390] One character worries that slight deviations in facial evolution might produce "monstrosities" (*urodstva*) but is assured that the natural harmony of the human face is the singular destination of evolution.[391] The same word had been used by Beliaev in his afterword to *The Amphibian Man* in 1928, where he assured the reader that "freaks" (*urody*) were the organic byproduct of natural evolution.

When Efremov's crew encounters aliens, they are surprised to discover how correct they were in their assumptions about anthropocentric evolution. Only superficial differences separate humans and aliens. The aliens' skin is iron grey, the whites of their eyes and their teeth are turquoise, and their eyes are extraordinarily large. The greatest difference between the aliens and humans is invisible: The other beings breathe Florine rather than Oxygen. One human observes that the aliens have a "exotic beauty of their own" (*svoeobraznai͡a ėkzoticheskai͡a krasota*) and exclaims that "it is easier to become human (*legche stanovit'si͡a li͡ud'mi*) with eyes like those than with ours, though ours are wonderful as well."[392] Like Efremov's beautiful aliens from Tucana in *Andromeda Nebula,* the beauty of these cosmic strangers makes them a more perfect version of the already-human, rather than a deviation from the human biological form.

Efremov seems aware that his own insistent, human-centric vision precludes a certain imagining that was possible in the past. Fantasizing about the supernatural and the grotesque

[389] Ivan Efremov, "Serdt͡se zmei," in *Sobranie sochineniĭ v shesti tomakh*., vol. 3 (Sovremennyĭ pisatel′, 1992), 408.
[390] Ibid.
[391] Ibid., 408-9.
[392] Ibid., 433.

tempts all of Efremov's characters in "The Heart of the Serpent." One character wishes that he could inhabit a world of the distant past, which was more enchanted, yet when he tries to think of what such a world would be like, he admits that his imagination doesn't go any further.[393] Before encountering the aliens, one human crewmember "found it easier to endow the unknown space travelers with the most incredible (*neveroi͡atnye*) characteristics than to subjugate his imagination (*fantazii͡a*) to the rigid laws" that he knows govern evolution.[394] Others are similarly surprised at how much the aliens resemble humans. Efremov writes that "each [crewmember] had expected something most unusual (*neobychaĭnyĭ*), something never before seen," rather than the likeness that they find.[395] The grotesque and fantastic occupy a confused place. They are at once the readiest, though incorrect, sources for imagining difference, and, at the same time, something that cannot be fully imagined.

Efremov's challenge was primarily to Western writers of science fiction who relied upon stale tropes of belligerent, monstrous aliens. In "The Heart of the Serpent," this challenge is made explicit: A character reads a copy of Murray Leinster's 1945 story "First Contact" and scoffs at the suggestion that a meeting between two intelligent beings from different planets must necessarily result in violent conflict. In the process of critiquing the ideological parochialism of Western science fiction authors, Efremov revealed the tropes that hindered his own imagination, as his alternative, peaceable aliens adhered to a philosophy of advancement that he inherited it from the Stalinist period. As in *Andromeda Nebula*, the boundary of the human was coordinate with the limit of the imagination.

[393] Ibid., 395.
[394] Ibid., 418.
[395] Ibid., 429.

The discourse on *fantastika* proceeding *Andromeda Nebula* makes clear Efremov's innovation in making *fantastika* more than solely a tool for science popularization. The genre had returned to its early 20th-century roots of being a place to imagine the future, and Efremov added to that tradition a particular focus on the philosophy and emotional workings of future people. Yet, in *Andromeda Nebula*, what changes might accompany the passage of time were limited. Nudelman observes that in *fantastika* of the early 1930s "differences between utopias disappear, supplanted by the one-dimensional approach of the official utopia," whereas variation returned in the Thaw.[396] The degree of variation should be derived from the extent to which alternative utopias depart from the official. Efremov's evolutionary vision, though novel, followed the core ideological constraints of *fantastika* and science of the late Stalinist period in which the future is a more perfect restatement of the present. The victory of the conscious over the elemental, core to both the Socialist Realist novel and the Stalinist story of man's relationship to nature, forms the backbone of Efremov's evolutionary narrative. Efremov's theme of translatability, in which the messages received have nothing new to say, encompasses the frustration of his ideological moment. Discourse in the early Thaw was in an interregnum; Stalinist prohibitions were dying away, but both a new language and something new to say had not yet been born.

The Critical Response to *Andromeda Nebula*

Andromeda Nebula was a critical and commercial success. A spike in the volume of *fantastika* published in the years following Efremov's novel's publication shows the extent of the renewed interest in the genre. Until the appearance of *Andromeda Nebula*, no more than ten books of *fantastika* had been published every year. Between 1959 and 1965, 1,266 works of

[396] Nudelman, "Soviet Science Fiction and the Ideology of Soviet Society," 44.

fantastika were published with a total print-run of approximately 140 million. More *fantastika* was published in that six year period than in the proceeding 30 years combined.[397] New, influential journals and collections dedicated to *fantastika* were founded. *Fantastika*, a yearly collection put out by *Molodaya gvarda*, was first published in 1962 and continued to come out until the fall of the Soviet Union.[398] In 1964 *Library of Modern Fantastika* (*Biblioteka sovremennoĭ fantastiki*) appeared, followed closely by *An Almanac of Nauchnaya Fantastika* (*Almanakh nauchnoĭ fantastiki*) in 1965.[399] Existing publishing houses opened divisions devoted to publishing *fantastika*.[400]

Critics quickly recognized Efremov's daringness in shattering the boundary of close aim that had contained *fantastika* for nearly three decades. Yet, just as Efremov's polemic with Western science fiction and the internal workings of his leap into the future preserved the scientific imaginary that had proceeded them, so too did the critical vocabulary of the past endure, as critics praised the novelty of *Andromeda Nebula* in familiar terms. While applauding Efremov's leap into the future, critics continued to view the seeming closeness and "realism" of Efremov's future as its greatest merit. This is not to say that critics and readers misread Efremov's text. Efremov himself reiterated the importance of the "nearness" of his fiction to life, though he wished to expand the bounds of what sorts of questions *fantastika* could investigate.

Efremov himself praised *Andromeda Nebula* for its nearness to life in his preface to the book edition, published in 1958. He acknowledged that before he had finished serializing *Andromeda Nebula* in *Technology for the Youth*, Sputnik had successfully orbited Earth, bringing his far-future fantasy closer to life. Efremov admitted that he did not properly consider

[397] Britikov, *Russkiĭ covetskiĭ nauchno-fantasticheskiĭ roman*, 268.
[398] Geller, *Vselennai͡a za predelom dogmy*, 120
[399] Hellman, *Fairy Tales and True Stories*, 532
[400] Nudelman, "Soviet Science Fiction and the Ideology of Soviet Society," 49

"the accelerating pace of technological progress." As a result, in reworking the serialized story into book form, he shortened the distance between the time when his novel takes place and that of the reader's present by 1,000 years. *Andromeda Nebula* was now set 2,000 years in the future rather than 3,000.[401]

While most reviews appeared in 1959, following *Andromeda Nebula*'s full book-length publication, the great popularity of the story was immediately noted by *Technology for the Youth* in a regular column dedicated to responses from readers. Most reader reviews were positive. A writer from England noted that his native (that is, Western) writers of *fantastika* wrote stories "with the addition of very little real science," in contrast to *Andromeda Nebula*, which had a "strong scientific basis."[402] Another reader disagreed, calling the story "groundless *fantastika*." The journal responded that similar criticisms had been levied by critics against those who envisioned exploring the cosmos in the past; however, all could now agree that "the rapid progress of life has made a real correction to such categorical judgments."[403]

In their praise for *Andromeda Nebula*'s vision, many repeated the stock line that the might of the Soviet Union resolved any friction between the real and the fantastic, as reality itself had become fantastic. This dismissal shows a confusion over the underlying idea of the fantastic, which remained caught between this muted, rhetorical usage, which denied the fantastic any power, and its earlier, more transgressive meaning. Even as critics praised *Andromeda Nebula* for recovering the fantastic, they employed the formulation with which it had been dismissed. Vladimir Dimitrevsky, writing for the official paper of the Leningrad Writers' Union, *Neva*, in 1958, titled his review "The Right to Winged Dreams" (*Pravo na krylatui͡u mechtu*), which, at

[401] Efremov, *Tumannost' Andromedy*, 6.
[402] "Nam Pishut," *Tekhnika — molodëzhi*, no. 12 (1957), 25.
[403] Ibid.

first glance, appears like an endorsement of the author's right to boundless imagination; however, Dimitrevsky reaffirmed the connection between dreams and reality. Authors can dream, he wrote, because "every year the existence of the socialist state expands the scope of human dreams ever wider, making them, in essence, limitless."[404] In an article for *Novi mir*, Kirill Andreev remarked that the book takes place "far from us, in a very fantastic, but not entirely fictional (*vymyshlennom*) world, which is the logical continuation of our world."[405] Gurevich opened his review in *Knowledge is Power* with the observation that "fantasy is invading life."[406] The author of an anonymous article in *The Literary Gazette*, responding to one of the few negative reviews of *Andromeda Nebula*, chided the disapproving critic who claimed not to be "against fantasy and dreams." Such a defense does not hold up, the *Literary Gazette* writer maintained, as the negative critic "denie[d] even that fantasy which ha[d] already become reality."[407] Others reiterated Efremov's excitement that Sputnik's success had narrowed the gap between *Andromeda Nebula*'s fantasy and the actual achievements of Soviet space exploration.

Critics also picked up on Efremov's intervention against a Western tradition of science fiction that was sullied by both its disconnect from real science and its heavy borrowings from mass genres. Efremov's "optimism" was contrasted to the persistent "pessimism" of Western science fiction, from its inception with Wells to its most recent standout iteration, Ray Bradbury's *Fahrenheit 451*.

While central talking points of Stalinist *fantastika* discourse persisted, critics were also more outspoken in acknowledging that *Andromeda Nebula*'s brazen fictionality had returned to the genre something that had been lacking. In a 1958 review of *Andromeda Nebula* for *The*

[404] Vl. Dmitrevskiĭ, "Pravo na krylatuiu͡ mechtu," *Neva*, no. 7 (1958), 202.
[405] Kirill Andreev, "Mir zavtrashnego dnia͡," *Novyĭ mir*, no. 6 (1959), 247.
[406] G. Gurevich, "Pisatel′ nachinaet razgovor," *Znanie — sila*, no. 7 (1959), 22.
[407] "Gde zhe verbliu͡d?," *Literaturnaia͡ gazeta*, no. 82 (1959): 3.

Literary Gazette, an unnamed critic observed that the first half of *nauchnaya fantastika*'s name, "scientific," had for too long overshadowed the latter half, *fantastika*. The scientific "had become a kind of fetish." The purpose of *fantastika* is not science popularization, the critic continued. "Let not all of the writer's assumptions come true in the future, it is important that his book excites and inspires today's reader with the lofty flight of dreams."[408]

Approval for Efremov's focus on his characters' interior lives resonated with larger Thaw-era literary conversations. Many praised Efremov for finally having given *fantastika* "living characters," echoing the era's fixation on breathing psychological depth into the more wooden characters who had peopled Stalinist fiction. There was a refrain of calling Efremov's *fantastika* "humanist," with which critics highlighted Efremov's interest in his characters' emotional lives. The crux of the tension between *fantastika* as a means of reaffirming the present or imagining some sort of changed future could be found in discussions of the human at the center of Efremov's fiction. Three reviewers noted Efremov's depiction of human evolution and alien lifeforms who greatly resembled humans to reflect on the necessity of imagining difference.

Efremov's particular skill at picturing what man might look like in the future was the focus of a lengthy 1959 article in *Novi mir* titled "In 100 and 1,000 Years" (*Cherez sto i tysi͡achu let*) by the critic Yuri Ryurikov. He criticized writers of the close aim for their "machine studies" (*mashinovedenie*), which eclipsed a more needed "human studies" (*chelovekovedenie*).[409] The main question of the communist future, Ryurikov insisted, was the study of how man will change, and it was Efremov alone who had established a path for *fantastika* to explore this vital question. *Andromeda Nebula* was surely *fantastika,* he wrote, but it was not *fantastika* "for its own sake;" instead Efremov used the genre to "show the changes which he suggests will happen

[408] "Vospityvat′, zvat′ k podvigu! Chitatel′ prodolzhaet razgovor," *Literaturnai͡a gazeta*, January 30, 1958.
[409] I͡urii͡ Ri͡urikov, "Cherez sto i tysi͡achu let," *Novyĭ mir*, no. 12 (1959), 231.

to man."[410] Good literature, like Efremov's, "expands the horizons of every person, [*fantastika*] helps a person become more human than he is (*stat' bolee chelovechnym, chem on est'*)."[411] This final line encapsulates the sense of trending towards a perfection of what already was, rather than reaching towards any form of alterity.

Others correctly identified Efremov's vision of beneficent human evolution as a polemic with Western writers of science fiction, who depicted aliens as ugly and belligerent. In another article for *Novi mir*, Kirill Andreev, an editor and critic who specialized in *fantastika*, reaffirmed the underlying ideological dogma that equated the human, the conscious, and the beautiful. He wrote that in Western science fiction foreign lifeforms are "monstrous" and "can only cause horror and disgust in readers."[412] Efremov provided a needed intervention in showing that "the form of man, his appearance as a thinking being, is not accidental." There is a "great humanism" in Efremov's depicting this universal, convergent evolution into humanoid, peaceful communists.[413]

In his 1960 article "Without Allowances (On the Contemporary *Nauchnaya Fantastika* Novel)" (*Bez skidok [O sovremennom nauchno-fantasticheskom romane]*) Andrei Sinyavsky, though he likewise lavished praise on Efremov for his creative striving, broke with other critics in suggesting that Efremov's anthropocentrism represents a creative blind spot. Sinyavsky focused on the relationship between the real and the fantastic, similar to his celebrated, 1957 essay "What is Socialist Realism?" (*Chto takoe so͡tsialisticheskiĭ realizm?*), which was written as *samizdat* under his pseudonym Abram Tertz. In "What is Socialist Realism?" Sinyavsky asserted that a grotesque, non-realism is necessary to be truthful, an approach which he dubbed "fantastic

[410] Ibid, 241.
[411] Ibid., 245.
[412] Andreev, "Mir zavtrashnego dni͡a," *Novyĭ mir*, 244.
[413] Ibid.

realism." Similarly, in "Without Allowances," he argued that the inhuman must be permitted to faithfully imagine cosmic difference and chart a third path beyond the binary of the monstrous Western alien and the human-like Soviet extraterrestrial. The ongoing debates around Efremov's novel provided the framing for Sinyavsky's larger examination of the recent break with the theory of the close aim and desire for greater creativity in *fantastika*. Sinyavsky's central contention lay with the way that the line between "realism" and "fantasy" had been drawn. Often, "realism" functioned as a synonym with continuity with the present and sameness. Yet would it not be "realistic," Sinyavsky argued, for creatures inhabiting distant galaxies to not resemble us, to be strange? In this, one should see "realism" more wholistically and not as "some kind of appendage added to *fantastika*."[414]

Sinyavsky criticized the tendency of Soviet writers of *fantastika* to make those on alien planets too closely resemble inhabitants of Earth. He noted the Wellsian tradition of making the alien monstrous and pointed out that recent Soviet authors may have over-corrected in making all alien life so closely resemble man. Efremov was singled out as guilty of this in *Andromeda Nebula* and "The Heart of the Serpent." Sinyavsky praised *Starships*, for, there, the "thinking being from another world" was "not beautiful and not ugly to our eyes, but simply different, in many ways similar to the human, but, at the same time, dissimilar, peculiar."[415] As he neared his conclusion, Sinyavsky praised Beliaev's amphibian man and Wells's invisible man because, even if they are "impossible from a scientific point of view," they are "richer in their content than this or that forerunner of technical innovation."[416] Sinyavsky concluded that for *fantastika*

[414] Andreĭ Sini͡avskiĭ, "Bez skidok (O sovremennom nauchno-fantasticheskom romane)," *Voprosy literatury*, no. 1 (1960), 53.
[415] Ibid., 56.
[416] Ibid., 59.

to rightly take its place as one of the best literary phenomena of the moment, authors must be given the right to make such daring fiction.

Taken as a response to Ryurikov and Andreev, Sinyavsky's diagnosis underscores both the local ideological taboo against physical alterity in the early Thaw and gestures towards the larger imaginative blind spot created by adhering to such a human-centered vision. It should be noted that Sinyavsky's desired use of the alien trope (and *fantastika* in general) differed significantly from Efremov's: Sinyavsky was primarily concerned with staking out creative freedom, and he was entirely unconcerned with the scientific feasibility of a fictional conceit. Efremov, in contrast, emphatically did wish for his *fantastika* to be perceived as "near to life," for this appeal allowed it to function as a medium of scientific prognostication. Nevertheless, Sinyavsky's comments demonstrate the ideological charge of anthropocentrism.

Sinyavsky showcased the creative potential of inverting Efremov's alien tropes in a short story titled "Pkhentz," which was written in 1957 but did not find publication until it appeared in English translation under Sinyavsky's pseudonym Abram Tertz in 1966. Sinyavsky chronicles the tribulations of an alien marooned in Moscow and uses his alien visitor's estranged viewpoint as a means of defamiliarizing his terrestrial setting. The alien is repulsed by Earthlings' habits and the general sensory environment they create, from the barbarism of human dining customs to the smells and sounds of urban life. He perceives humans as grotesque and recognizes that they would view him as hideous as well. Sinyavsky's alien explains that he is more closely related to a cactus than a human, and he makes use of a hunched back to disguise his true many-limbed, many-eyed physical appearance.

Scholars have read the alienation at the heart of Sinyavsky's story as an allegory for a variety of social differences. Sinyavsky's frustrated protagonist can be understood as a

meditation on the author's own double life or a stand-in for the dispirited intellectual more generally.[417] This interpretation is bolstered by Sinyavsky's having read a line of the story aloud at his 1966 trial, where he asked jurors: "Just because I'm different must you immediately curse me?" The story's title, "Pkhentz," sounds similar to Sinyavsky's pseudonym, "Tertz," and the alien's assumed half-Polish identity suggests Sinyavsky's own.[418] Comic romantic (or near-romantic) interactions invite a queer reading.[419] A smitten female neighbor, in a last-ditch effort to court the alien narrator, reveals her naked body to him, and he recoils at her appearance. He shows more platonic interest in a hunchbacked man, Leopold Sergeevich, whom he mistakes for a fellow alien making use of a hunchback as a disguise. The alien's mistaken attraction to one hidden identity uncovers another: Leopold Sergeevich reveals that he is secretly Jewish.[420] In suggesting racial, religious, cultural and sexual forms of difference, Sinyavsky's extraterrestrial functions as an avatar of otherness.

These analyses recognize that "Pkhentz" fulfills the criteria of "fantastic realism" as Sinyavsky had laid them out in "What is Socialist Realism?" but do not consider the story as a part of Sinyavsky's parallel engagement with the tradition of Soviet *fantastika*. "Pkhentz" should also be understood as Sinyavsky's initial attempt to find an alternative to both the Wellsian tradition of ugly, belligerent aliens and Efremov's too human, too attractive overcorrection, as he would identify them in "Without Allowances." The alien in "Pkhentz" mentions that he is not

[417] Catharine Theimer Nepomnyashchy, "The Writer as Criminal: 'Pkhents' and 'At the Circus,'" in *Abram Tertz and the Poetics of Crime* (New Haven: Yale University Press, 1995), 64–82.
[418] Jane Grayson, "Pkhentz: Overview," in *Reference Guide to Short Fiction*, ed. Noelle Watson (St. James Press, 1994), 849–50.
[419] Anastasia Kayiatos, "Silence and Alterity in Russia after Stalin, 1955-1975" (University of California-Berkeley, 2012), quoted in Eliot Borenstein, "A Hothouse Flower in a Communal Apartment," 2019, https://www.eliotborenstein.net/soviet-self-hatred/a9szd5212pib5qvc6b9lvcf21ygkwo.
[420] Grayson, "Pkhentz: Overview."

part of a "war of the worlds," broadcasting his distance from Wells, but Sinyavsky's engagement with Efremov is less explicitly announced.

The vocabulary surrounding physical beauty in "Pkhentz" greatly resembles Efremov's. The alien bemoans that he is "the only example of that lost harmony and beauty which [he calls his] homeland," and he explains that he is still "proportionate" and "elegant" despite having had to contort his body into its disguised form for so long.[421] These terms resonate with the harmony and proportionality that Efremov made the backbone to his theory of a universal beauty. Similarly, from the transhistorical beauty hypothesized in "The Hellenic Secret" to the intergalactic beauties of *Andromeda Nebula*, Efremov had posited universal, self-evident allure of the nude female form as evidence that there existed a universal evolutionary logic. The alien's disgust before his female neighbor evinces his culturally relative beauty standards and subverts Efremov's aesthetic universalism.

Sinyavsky likewise upends Efremov's ideas about seamless communications between extraterrestrials and humans. The story's title, "Pkhentz," is a "sacred" word in the narrator's extraterrestrial language and defies translation. The narrator whispers "pkhentz" to Leopold Sergeevich like a codeword to affirm their common alien origin, but Leopold Sergeevich responds with confusion. The alien-narrator imagines what it would be like if his body was found by those on Earth. They would put him on display in a museum but understand nothing of what they saw:

> How could they understand me, when I myself am quite unable to express my inhuman nature in their language. I beat about the bush and try to make some headway with metaphors, but when it comes to the point I can find nothing to say. I can only see a short, solid GOGRY, hear a rapid VZGLYAGU, and an indescribably beautiful PKHENTZ beams down upon my trunk.[422]

[421] Andrei Sinyavsky, "Pkhentz," in *The Portable Twentieth-Century Russian Reader*, trans. Manya Harari (Penguin Books, 1985), 502.
[422] Ibid., 506.

The alterity of the narrator's body is equivalent to the inaccessibility of his language. Not even metaphor can help explain why he finds his own body beautiful. This is a complete contradiction of *Andromeda Nebula*, where a shared aesthetic sense across the bounds of time, space and culture provides the basis for their ability to communicate with one another. "Pkhentz" ends with the alien visitor sulking into the wilderness, where he plans to self-immolate in hopes that nobody recovers his baffling corpse. A string of words in the alien's inaccessible language concludes the story.

With "Pkhentz," Sinyavsky demonstrates how an anthropocentric, realist hemming in of the fantastic greatly limited the creative possibilities of *fantastika*, even if certain prohibitions had been lifted. Sinyavsky's use of the alien theme differed greatly from Efremov's. Efremov wished to imagine what the future would look like based on his interpretation of evolutionary and social development. These predictions rested on laws of development that did not depart wildly from extant ideology. Efremov's work was a plea that the author be granted the freedom to extrapolate beyond the close bounds enforced by the Soviet government. Sinyavsky wanted to grant the alien theme and *fantastika* freedom from the requirement to predict the future at all. In this contrast, Sinyavsky highlights the extent to which Efremov not only continued a Stalinist scientific imaginary but how that thinking aligned with a similarly constrained idea of what fiction could do.

Conclusion

The publication of *Andromeda Nebula* sparked a renewed interest in making *fantastika* live up to its name; however, conversations about what it meant to reinvigorate *fantastika* demonstrate how greatly the imaginary of science had shifted since Soviet critics had first problematized the genre in the late 1920s and early 1930s. Earlier controversies about the place

of the fantastic had revolved around fundamental questions about the role of science in the nascent Soviet state. To its critics, *fantastika* so extended the vista of scientific possibility that it not only failed to distinguish between realistic and impossible goals, but it also disregarded the emerging, official story about the relationship between the human subject, technology, history, and the material world. Science writers, whether of *fantastika* or popular science, curtailed the fantastic as they brought depictions Soviet science in line with the state's priorities, particularly the "conquest of nature" and science's related utilitarian orientation. This thematic direction reinforced the overarching narrative of consciousness prevailing over the elemental. The meaning of the fantastic appears significantly narrowed in critical discussions of the 1940s and 1950s. Efremov and his critics contended that while depictions of science could deviate from what was immediate possible, they should remain within the orbit of plausibility, and plausibility required adhering to the underling metanarrative of Stalinist science. In effect, the scope of *fantastika* was enlarged without fundamentally challenging the root cause of its initial diminishment.

This is most clearly illustrated by Efremov's exploration of the theme of evolution, which had been a sensitive topic since the late 1920s. Efremov inherited a prevailing narrative about anthropocentric evolution in which humans are separate from and dominant over the natural world. This conception of evolution had a central place in shaping earlier iterations of popular science: Beliaev had been censored for suggesting that science might blur the boundary between man and animal. Il'in and other writers of popular science literature had crafted *skazki* about the natural world bending to appear more like conscious man. Drawing on Vernadsky, Efremov extrapolated that evolutionary trajectory across the distances of time and space.

Roman Arbitman, observing the changes in *fantastika* between Beliaev's generation and Efremov's, characterizes the shift as one from "adventures of the body" to "adventures of thought."[423] *Andromeda Nebula* shows the internal logic of that development. It was because questions about the body were so resolved that *fantastika* could explore the future of consciousness. Furthermore, depictions of the body and depictions of the mind in *fantastika* were not entirely separable: The stability of the human body across the cosmos reflected a shared evolutionary course towards a human form of consciousness.

This is not to discount the real creative renaissance that Efremov sparked in *fantastika*. Once again, authors were invited to ask about the future and imagine the expanses of the universe. Rather, the boundaries still present in *Andromeda Nebula* provide benchmarks for analyzing how subsequent works of *fantastika* confronted or continued to shy away from totems of Soviet scientific and cultural ideology. Those who reinfused *fantastika* with its more transgressive power did so in response to the thematic preoccupations on display in *Andromeda Nebula*. In "The Heart of the Serpent," Efremov himself demonstrated that when all that is non-human becomes an affront to the human, something to "subject," it becomes ever more difficult to imagine difference, whether physical, ideological, or otherwise. Sinyavsky responded by advocating for and exploring the creative possibilities of the grotesque.

Most of all, these polarities provided a blueprint for the leading writers of philosophical *fantastika* who came after Efremov to use the themes of evolution and interspecies communication to critique the triumphal narrative of Soviet progress. For example, Stanisław Lem's 1961 novel *Solaris* responds to Efremov's anthropocentric iteration of the first encounter story and presents the reader with an alien lifeform that is both physically incomprehensible to

[423] Roman Arbitman, "Back in the 1960s: Notes by a Man Who Wasn't There," *Science Fiction Studies* 31, no. 3 (2004), 409.

man and whose language escapes his grasp. Lem's researchers must finally admit the hubris of their project to understand alien life. Similarly, in the Strugatsky brothers' 1972 novel *Roadside Picknick* (*Piknik na obochine*), humans and aliens fail to understand one another. Aliens from an advanced civilization have visited Earth and left behind mysterious artifacts, which are collected and coveted by people. Humans confront that there may not be any intentionality behind the "gift" of this extraterrestrial detritus. Both novels complicate the Soviet metanarrative of the victory of human "consciousness" over "elementality" by positing an alien intelligence that cannot be understood by humans. The possibility that evolution might take multiple paths or, worse, that there might be no telos to development at all upset the Soviet Marxist ideal of a singular, linear progress.

Efremov continued to write. Of his later work, his 1968 novel *The Hour of the Bull* (*Chas byka*) stands out. *The Hour of the Bull* found Efremov less optimistic about the assured advancement of human society. He imagined a planet where Chinese-style socialism and capitalism have developed rather than a utopian, Soviet communism. Taken with other chief *fantastika* writers of the Thaw, one can see how *fantastika* became a place of imagining multiple possible futures, though some of these differences feel more like expressions of doubt in response to the certainty of a Soviet story of history—of continual progress, of the anthropomorphic character of intelligence—rather than alternatives.

Lastly, Efremov's space-age *fantastika* provides a rich case study of the Soviet scientific imaginary against which to parse the optimism engendered by the space race. Matthais Schwartz examines depictions of space travel in popular science publications following the launch of Sputnik and concludes that there was not a great break between this "cosmic enthusiasm" and

popular science of the Stalin period.[424] He differentiates between stories of cosmic colonization and first encounter stories, with the latter taking *Andromeda Nebula* as a model for staging "heterotopias" in which humans are forced to recognize that "there exist other, more powerful supernatural or extraterrestrial forces, ones on which they are probably dependent."[425] Again, the anthropocentric domination of nature distinguishes the Stalinist imaginary of science, allowing one to see how Efremov both contributed to the continuation of this Stalinist mode while offering a model for critiquing it.

The somewhat confused return of the fantastic speaks to the larger process of de-Stalinization. Writers and critics tried to reverse the damage done to *fantastika* while remaining unsure of how far such a recuperation might go before conflicting with foundational Soviet narratives. Breaking from the shackles of the close aim was a relatively simple operation, but it would take time to develop a more supple critical language with which to chart the bounds of this new "humanistic" *fantastika*. Just a few short years after Stalin's death, Efremov had travelled 2,000 years into the future. Efremov's successors followed that same path into uncharted territory, and it is only by reference to Efremov's maiden voyage that their creative journeys can be measured.

[424] Matthias Schwartz, "A Dream Come True: Close Encounters with Outer Space in Soviet Popular Scientific Journals of the 1950s and 1960s," in *Soviet Space Culture: Cosmic Enthusiasm in Socialist Societies* (Palgrave Macmillan, 2011), 236.
[425] Ibid., 245.

Conclusion

The Earth is the cradle of reason (*razum*), but one cannot live in a cradle forever.
--Konstantin Tsiolkovsky, 1911

We take off into the cosmos, ready for anything: for solitude, for hardship, for exhaustion, death. Modesty forbids us to say so, but there are times when we think pretty well of ourselves. And yet, if we examine it more closely, our enthusiasm turns out to be all a sham. We don't want to conquer the cosmos, we simply want to extend the boundaries of Earth to the frontiers of the cosmos. [...] We are only seeking Man. We have no need of other worlds.
--Stanisław Lem, *Solaris*, 1961

The present study has traced the place of the fantastic within the Stalinist scientific imaginary to explore how it demarcated between plausible and irrational change. Immediately after the Russian Revolution, many asked how the power of rational thought might reconfigure the world. Science and technology were seen as tools for smashing bourgeois ideology and outdated religious superstition. The ambiguous line between rational science and wild fantasy was a sign of the former's power, an indication that the old world had been done away with, but the limits of the new world had yet to come into view. This dynamic reversed with the Great Break in 1928: Institutional forces began to consolidate a Soviet philosophy of science and a corresponding practice of science based upon it. The fantastic took on a negative connotation and could only be deployed to contrast the new Soviet reality and the beliefs of the old world. This bounded fantastic registered the new limits of how society, the environment, and the human body might be transformed.

Reason, beauty, and science became synonymous within the narrative of Soviet Marxist development, and the suggestion that science might produce something grotesque was particularly offensive. The charged status of the grotesque was partially the result of a combination of Stalinist science and literature alike defining themselves against their Western counterparts. In contrast to H. G. Wells's "pessimistic" science fiction, Soviet *fantastika* and

popular science had to be positive and unfrightening. Bodies deformed in the name of scientific advancement, like those depicted in Beliaev's fiction, violated both the imperative to show science as useful and the Stalinist fixation on the "timeless," neoclassical body. Efremov's fiction upheld this binary between rational beauty and irrational monstrosities, and his critics strained to ask whether more expansive imaginings of the non-human were possible within the existing scientific imaginary.

These aesthetic and ideological positions coalesced with epistemological claims in the great scrutiny devoted to human evolution. A transhumanist enthusiasm about directed evolution had flourished in the 1920s, as Bolshevik thinkers, visionary scientists, and writers of *fantastika* alike had delighted in asking how man might appear different in the future and potentially evolve into something physically *beyond* the human. The Stalinist turn redirected these visions of physical change into a program of eternal sameness. Venturing that humans would be different in the future was tantamount to admitting that either there existed something "elemental" and animal in man worth correcting or that there existed some more advanced evolutionary stage, unaccounted for by the tradition of Soviet Marxism. Instead, all non-human matter had to be shown growing more rational and morphing to more resemble the human in thought and appearance.

This study revises more simplistic explanations of *fantastika*'s decline. The withering of *fantastika* has often been interpreted as a result of diminished creative freedoms and utopian energies under Stalin. While true, such an explanation sidesteps the specific ideological demands that made the production of *fantastika* difficult. Furthermore, previous accounts of Soviet *fantastika*, especially those from Western scholars, frequently assess the genre according to its ability to depict political difference or dissidence. This narrow understanding of the genre as a

tool for political allegory ignores the complicated ways that writers and critics conceived of it as a space for reflecting on scientific and existential questions, even if these latter uses were intimately tied up in contemporary politics. Additionally, the more allegorical *fantastika* that appeared during Thaw was written using a scientific vocabulary which is most legible when considering how science had been politicized under Stalin. In other words, *fantastika* served as a ledger for the various ways science was utilized in the Soviet political narrative, utopian or otherwise.

Under Stalinism a certain configuration of the utopian, the human, and a will towards the eternal present consolidated, and it is against this formation that subsequent cultures of science, both official and unofficial, must be understood. Space exploration became a central topic in popular science journals in the years leading up to and following the launch of Sputnik. This excitement drew on the cosmic utopianism of the 1920s but differed from its antecedent in more aligning with the "realistic fantastic" of the Stalinist period. Gone was the millenarian component of 1920s science enthusiasm, and, in its place, was a sense of technology as a value-neutral force that could be used to tame the expanses of the universe, just as it had done on Earth.[426] Space colonization was exciting because it was possible (rather than because it seemed so beyond the realm of plausibility), and, as in Efremov's fiction, even if one could now imagine into the future and beyond Earth, that conquest often appeared as an enlargement of the present rather than its qualitative transformation.

One of the other central trends in popular science of the post-Stalinist 1950s and 1960s, alongside the growing interest in space exploration, was a fascination with pseudoscience. In the same popular science journals where stories about the possibilities of space flight were

[426] Asif Siddiqi, *The Red Rockets' Glare: Spaceflight and the Russian Imagination, 1857-1957* (Cambridge University Press, 2010), 290-331.

published, there also appeared articles about telepathy, hypnosis, parapsychology, and ufology. Once the bastions of the state campaign against irrationalism, these publications became sites for exploring the esoteric and occult.[427] Here, too, one can see a refraction of the 1920s science culture in which the division between the fantastic and scientific rationalism had been less distinct. Ideas about telepathy and hypnosis upset the strong dichotomy between "consciousness" and "spontaneity," as they embraced the shadowy unconscious and the immaterial, "elemental" potentials of the mind. In this way, a turn towards the stars and a turn towards the esoteric can be seen as similar ways of expanding the terrain of science from how it had been restricted; space exploration invited an investigation of the heavens, and the paranormal pointed inwardly towards the self.

Most immediately, the particular nexus outlined in this study between technology, progress, and physical beauty that was embodied in the New Man raises questions about how to interpret the theme of intelligent non-human life that became prominent in *fantastika* following Stalin's rule. Efremov's staunch anthropocentrism reflected his faith in the Soviet project, especially its central narrative of the victory of conscious reason over the elemental forces of nature. Efremov's most immediate literary successors, the Strugatsky brothers and Stanisław Lem, similarly described extraterrestrial life, but they imagined non-humans as a locus of alterity and unbridgeable difference, unlike Efremov, who stressed the continuity and communicability between human and intelligent other. Such stories self-consciously respond to the central place of the human subject in Soviet conceptions of evolution and "conquering" nature to lay bare the

[427] For an account of how popular science journals started to run stories about pseudoscience, see Il′i͡a Kukulin, "Periodika dli͡a ITR: sovetskie nauchno-populi͡arnye zhurnaly i modelirovanie interesov pozdnesovetskoĭ nauchno-tekhnicheskoĭ intelligent͡sii," *Novoe literaturnoe obozrenie*, no. 3 (2017), https://www.nlobooks.ru/magazines/novoe_literaturnoe_obozrenie/145_nlo_3_2017/. For a collection of perspectives on functioning of the esoteric in Soviet Russia, see Birgit Menzel, Michael Hagemeister, and Bernice Glatzer Rosenthal, eds., *The New Age of Russia: Occult and Esoteric Dimensions* (Verlag Otto Sagner, 2012).

hubris of anthropocentric thought. In envisioning a truly alien other, as Sinyavsky had done in his fiction and criticism, these authors both advocated for an expansion of *fantastika*'s creative use and occasionally cast doubt on the certitude of the Soviet project's triumph. This was not the return to a pre-Stalinist sense that man had further distance to evolve or the universe might contain beings more conscious than man, as Tsiolkovsky had hypothesized; instead, it was a growing skepticism towards a story about the inevitable victory of rationality.

Lastly, the subdued place of the grotesque in the Stalinist scientific imagination offers a starting point in reading grotesque themes in late and post-Soviet media, which might be taken as the further aesthetic manifestations of Lem and the Strugatskys' pessimistic skepticism. For example, the Stalinist emphasis on the linear evolution from animal to human as a subtext of Soviet Marxist development informs an understanding of the Necrorealists, a school of underground filmmakers led by Yevgeny Yufit that was most active in the late 1980s and early 1990s. Yufit and his colleagues drew inspiration from macabre medical textbook illustrations and populated their films with scientists concocting grotesque semi-humans befit of Moreau.[428] In their delight for porous, decayed bodies, the Necrorealists expressed a deep nihilism and reflected the zombified ideological atmosphere of the late Soviet Union. The same science-fictive atmosphere and thematic equivalence between the breakdown of the human and the disintegration of Soviet temporal order can be found in the work of the underground filmmaker Vladimir Kobrin. Kobrin began his career in the 1970s directing at the Central Studio of Popular Science and Educational Films but gradually transitioned to producing experimental films about alternative temporalities, the alien, the non-human, and the spiritual. In the collected volume

[428] For an overview of the Necrorealists and a preliminary reading of their work as a kind of rejection of politics as such, see Alexei Yurchak, "Necro-Utopia: The Politics of Indistinction and the Aesthetics of the Non-Soviet," *Current Anthropology* 49, no. 2 (April 2008): 199–224.

Other Animals: Beyond the Human in Russian Culture and History, editors Jane Costlow and Amy Nelson point out the rise of "humanimals" in post-Soviet Russian literature, such as Tatyana Tolstaya's *The Slynx*, as Russia faced the traumatic dissolution of the Soviet Union and its accompanying scientific optimism. Stalinist anthropocentrism offers a symbolic medium for examining the wreckage of the failed Soviet project. The politics surrounding depictions of the human, especially the staunch division of the human from the animal, begin to answer the open question posed by Costlow and Nelson of how "in the post-utopian context of contemporary Russia" the animal might become political.[429]

This study is primarily a cultural and scientific historical one and does not purport to draw connections between the Stalinist period and our own. Certainly, the diminished place of *fantastika* was a minor tragedy among the great horrors of Stalinist rule. Still, as we in the present confront racism, ecological crisis, and political formations that fantasize about returning to an elusive, "timeless" beauty of the past, we might heed the warning of how an anthropocentric fixation during the Stalinist period was integral to a greater imaginative impoverishment. As we labor to enlarge our sympathies, live more sustainably, and imagine brighter tomorrows, we must recognize that these tasks require expansive thinking. To do otherwise is to find that the most radical futures imaginable are simply a larger scale reinstatement of the present.

[429] Jane Costlow and Amy Nelson, "Boundary Work: Late-Soviet and Post-Soviet 'Humanimals,'" in *Other Animals: Beyond the Human in Russian Culture and History* (University of Pittsburgh Press, 2010), 197.

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