Imagining the Cosmos:
Utopians, Mystics, and the Popular Culture of Spaceflight in Revolutionary Russia

By Asif A. Siddiqi*

ABSTRACT

This essay investigates the explosive Soviet interest in space travel during the New Economic Policy (NEP) era of the 1920s, as expressed through amateur societies, the press, literature, painting, film, and other popular culture. In recovering an obscured history of the roots of Russian cosmonautics, it shows how the cause of space exploration in early twentieth-century Russia originally stemmed from two ideological strands: technological utopianism and the mystical occult tradition of Cosmism. The former (seemingly modern, urban, international, materialist) alternately clashed and meshed with the latter (superficially archaic, pastoral, Russian, spiritual), creating an often contradictory but urgent language of space enthusiasm. Cosmic activists, who saw themselves as part of a new Soviet intelligentsia, actively used both ideals to communicate their views directly to the public. The essay argues that despite superficial differences, technological utopianism and Cosmism shared much of the same iconography, language, and goals, particularly the imperative to transform and control the natural world. In other words, the modern rocket with its new Communist cosmonaut was conceived as much in a leap of faith as in a reach for reason.

> By taking a pair of steps, I crossed over the threshold from one epoch to another, into the space [era].[1]
>
> —Mikhail Popov, organizer of the world's first interplanetary exhibition, on what it felt like to step into the display hall, 1927

Space achievements represented an important marker of Soviet claims to global preeminence during the cold war. In books, movies, posters, and songs, Soviet authorities sang the glories of their space program; cosmonauts and artifacts toured the world using rhetoric that conflated mastery of space with mastery of nature. During and after the cold war, both Russian and Western historians underlined the connection between the Soviet space program and Marxist fascinations with technol-

* Dept. of History, Fordham University, 441 E. Fordham Road, Bronx, NY 10458; siddiqi@fordham.edu.

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[1] Sergei Samoilovich, *Grazhdanin vselennoi (Cherty zhizni i deiatel' nosti Konstantina Eduardovicha Tsiolkovskogo)* (Kaluga, 1969), 181.

ogy.[2] These accounts located the social and cultural origins of the Soviet space program as part of the project of modernization, secularism, and "progress." When the first young hero cosmonauts flew into space in the early 1960s, Soviet commentators repeatedly depicted them as emblematic of a modern and technologically sophisticated Russia, overtaking the West. Furthermore, unlike American astronauts who thanked God for their successes, Soviet cosmonauts were explicitly atheistic; one of the first cosmonauts, the young Gherman Titov, famously declared on a visit to the United States that during his seventeen orbits of the Earth, he had seen "no God or angels," adding that "no God helped build our rocket."[3] And in the 1970s, when the Soviets launched their first cargo ship to a space station, they named it simply *Progress*.

Through lenses of modernity, secularism, and progress, historians typically traced back the history of the Soviet space program to the "patriarch" of Soviet cosmonautics, Konstantin Tsiolkovskii, who in 1903 produced the first mathematical substantiations that spaceflight was possible. According to this deeply engrained story, the Bolsheviks recognized the value of his work after the Russian Revolution, honored him with many awards, and made him a national treasure. To the Bolsheviks, Tsiolkovskii's ideas were a perfect vehicle for catapulting Russia into the modern technological age of Ford and Taylor. Soon, inspired by Tsiolkovskii, young men and women joined together to build rockets. The Soviet government supported them and, in 1933, sponsored the creation of a national institute to build rockets. The intellectual and engineering groundwork that they created eventually bore fruit a quarter century later with the launch of *Sputnik*, the world's first artificial satellite.[4] The received story, built on a series of willful distortions, masked a set of complex social and cultural processes, particularly the ways in which social and cultural factors outside state sponsorship—besides popular Marxist rhetoric about the role of technology—enabled the project of space exploration in the Soviet Union.

In the late 1920s and early 1930s, Tsiolkovskii's ideas on space exploration fed enormous popular interest in the cause of cosmic travel in the Soviet Union. With little or no support from the state, amateur and technically minded enthusiasts formed short-lived societies to discuss their interests and exchange information.[5] Some put up impressive exhibitions displaying the visions of the major prognosticators of the day such as Tsiolkovskii, the American Robert Goddard, and the Romanian-German Herman Oberth. In the popular media, advocates wrote about the power of technology to improve and remake Russian society. On the cultural front, the science fiction of Aleksei Tolstoi, the paintings of the Suprematists and the Amaravella collective, and Iakov Protazanov's famous interplanetary movie *Aelita* all engaged mystical and spiritual ideas of the place of humanity in the cosmos. These embryonic artistic,

[2] William Shelton, *Soviet Space Exploration: The First Decade* (New York, 1968); James E. Oberg, *Red Star in Orbit* (New York, 1981); William P. Barry, "The Missile Design Bureaux and Soviet Piloted Space Policy, 1953–1974" (DPhil diss., Univ. of Oxford, 1995); David Easton Potts, "Soviet Man in Space: Politics and Technology from Stalin to Gorbachev (Volumes 1 and 2)" (PhD diss., Georgetown Univ., 1992).

[3] "Titov, Denying God, Puts His Faith in People," *New York Times*, 7 May 1962.

[4] Nicholas Daniloff, *The Kremlin and the Cosmos* (New York, 1972); James Harford, *Korolev: How One Man Masterminded the Soviet Drive to Beat America to the Moon* (New York, 1997).

[5] For an international perspective, see Asif A. Siddiqi, "Nauka za stenami akademii: K. E. Tsiolkovskii i ego al'ternativnaia set' neformal'noi nauchnoi kommunikatsii," *Voprosy istorii estestvoznaniia i tekhniki*, 2005, no. 4:137–54.

philosophical, and cultural explorations were important not only because they underlined an interest in the power of modern science but also because they disseminated ideas about space travel that were not simply about technology or modernization.

In a number of important ways, the space enthusiasts represented a counterexample to the more prominent elements of Soviet scientific and technical intelligentsia of the period. The two groups shared a few common traits. Both possessed a reverence for knowledge about the natural and material world. They exhibited an ambivalence between reason and faith, the former represented by an aspiration for modernization and the latter by a weakness for mysticism. Finally, although few of the space enthusiasts were revolutionary in the way that many Russian intelligentsia self-identified, the space obsessed saw themselves as the vanguard of a new era; the resistance they faced from public quarters for their utopian leanings emboldened their self-image as revolutionary and iconoclastic actors.

Yet two major characteristics distinguished the *kosmopolitov* from the burgeoning Soviet scientific and technical intelligentsia. First, the space obsessed could claim no formal education in the natural sciences; their "higher" knowledge was often the result of informal schooling or, at best, mediocre institutions. Second, they embraced an antielitist stance that led them to actively engage with the popular culture of the day. In fact, their very embrace of more popular and populist forms of communication contributed as much to their estrangement from the orthodox scientific community as their lack of formal educational identifiers, the autodidact Tsiolkovskii being the quintessential embodiment of this alienation. Revisiting the noise that these space enthusiasts generated—which spanned the revolutionary divide of 1917—opens a critical window into the discursive strategies used by marginal scientific actors in revolutionary Russia to advance seemingly outlandish scientific ideas. Theirs was the curious case of a demographic who strongly identified with the mainstream scientific and technical intelligentsia while being almost completely alienated from them.

Their cause, space exploration, was a small but important part of the wild cultural explorations of the New Economic Policy (NEP) era of the 1920s; it stemmed from both ideological oppositions and unions. Two intellectual strands contributed to the birth and sustenance of the 1920s space fad: technological utopianism and the mystical tradition of Cosmism. The former (seemingly modern, urban, international, materialist) clashed and meshed with the latter (superficially archaic, pastoral, Russian, spiritual), creating a complex ideological context for popular interest in spaceflight. If the language of technological utopianism has retained its place in the received history of Russian space travel, the role of Cosmism has been all but obscured. Recovering the "hidden" history of the Cosmist roots of Soviet space travel underscores how advocates of interplanetary flight from the early Bolshevik era navigated the entire spectrum between extreme technology fetishism (such as the amateur student societies) and extreme occult fascinations (the Biocosmists). The most important bridge between these two seemingly contradictory worldviews was Konstantin Tsiolkovskii, the patriarch of Russian space travel.

TECHNOLOGICAL UTOPIANISM

Russian utopian thought, which has a history long predating Bolshevism, Marxism, and indeed the nineteenth century, encompassed everything from overtly secular ideas to explicitly theological conceptions, and from monarchist ideals to anarchist

visions. Already before the revolution of 1917, Russian utopian philosophy incorporated both Marxist notions and twentieth-century modernist ideals of science and technology. The revolution, however, allowed technological utopian visions to move from the wisp of dreams to the arena of *possibility*. After 1917, an ostensibly secular brand of millenarianism entered the picture.

The richest expressions of this meeting of sensibilities between utopia, technology, and possibility occurred during the NEP years, when the country moved through a rapid economic recovery that fostered what Sheila Fitzpatrick called "an upsurge of optimism among the Bolshevik leaders."[6] Notwithstanding harsh conditions in the cities, the urban population continued to grow through the 1920s due to peasant migration into the cities and massive demobilization following the end of the civil war. Despite one million unemployed in 1924, wages finally began to rise the same year, and the standard of living for the average factory worker—someone like the tireless space crusader Fridrikh Tsander—began to improve noticeably. With urban renewal accelerating and the first fruits of the revolution appearing, people conjured up old dreams of utopia in new and experimental ways. In his indispensable study *Revolutionary Dreams: Utopian Vision and Experimental Life in the Russian Revolution*, Richard Stites has described the many ways in which a wide spectrum of actors, from the poorest peasant to the most influential member of the intelligentsia, invoked, debated over, wrote about, and often rejected utopia.[7] From ritual to religion, mannerisms to machines, and art to architecture, utopian thought pervaded Soviet society at all levels. The utopian discussions of the period were not monolithic; in fact, their very contradictions and illogic often gave the social experimentation a rich and expansive tenor.

In the 1920s, technology played a major role in the social conjuring, debating, and enabling of utopias. Prominent voices of the scientific and technical intelligentsia, as well as Bolshevik leaders, engaged in this discourse, and indeed, their pronouncements reflected the same types of tensions between naiveté and pragmatism emblematic of broader NEP culture. Lenin's fascination with the rapid electrification of Russia, industrial Taylorism, and the construction of modernized railroads in Russia were certainly all practical, but they also carried with them an underlying idea that technology itself was a possible panacea.[8] Beyond his oft-quoted phrase "communism equals Soviet power plus the electrification of the entire country," Lenin had an almost evangelical view of the role of electricity, and technology in general, as if it had the power to transform nation and culture. H. G. Wells, after interviewing Lenin in 1920, wrote, "Lenin, [who] like a good orthodox Marxist, denounces all 'Utopians,' has succumbed at last to Utopia, the Utopia of electricians."[9] Even as Lenin underlined "the need to dream," he was also unforgiving of those who shied away from the harsh realities of practical action. In the prerevolutionary days, Lenin

[6] Sheila Fitzpatrick, *The Russian Revolution*, 2nd ed. (Oxford, 1994), 113.

[7] Richard Stites, *Revolutionary Dreams: Utopian Vision and Experimental Life in the Russian Revolution* (New York, 1989). See also Paul Josephson, "'Projects of the Century' in Soviet History: Large-Scale Technologies from Lenin to Gorbachev," *Technology and Culture* 36 (1995): 519–59.

[8] For Lenin's personal role in plans for Soviet electrification, Taylorism, and railroads, see Jonathan Coopersmith, *The Electrification of Russia, 1880–1926* (Ithaca, N.Y., 1992), 153–5; Anthony Heywood, *Modernising Lenin's Russia: Economic Reconstruction, Foreign Trade, and the Railway* (Cambridge, UK, 1999); and Kendall E. Bailes, "Alexei Gastev and the Soviet Controversy over Taylorism, 1918–24," *Soviet Studies* 29 (1977): 373–94.

[9] H. G. Wells, *Russia in the Shadows* (New York, 1921), 158–9.

had been consistently critical of utopian socialists as well as the Populists for their unrealistic goals.[10]

Lev Trotskii (Leon Trotsky), another hardheaded revolutionary few would characterize as being impractical, also spoke rather uncritically of the powers of science and technology. In his 1923 tract *Literature and Revolution*, Trotskii wrote that because of the revolution, "[t]he shell of life will hardly have time to form before it will burst open again under the pressure of new technical and cultural achievements." Under the twin spells of science and utopia, Trotskii conjectured that advances in medicine would create a new "superman," able to "rise to the heights of an Aristotle, a Goethe, or a Marx."[11] Maksim Gor'kii (Gorky), one of the most important cultural commentators of the day, who held Konstantin Tsiolkovskii in very high esteem, frequently spoke of technology as miraculous and a panacea to the world's ills; he coined the phrase "an area of miracles" to speak of the power of science.[12]

Stites and others have pointed to the Russian interest in aviation, which held a much broader fascination for the Soviet populace in the 1920s than did spaceflight, as reflective of "a kinetic metaphor for liberation." Aviation represented a mixture of modernity and liberation that proved irresistible to many leading Bolsheviks. They appropriated its symbolic meanings to encourage and inculcate ideas about a new world and used it to bridge the literal and metaphorical gaps between urban and rural masses.[13] Yet although flight served as a metaphor for liberation, and perhaps even emancipation, it had some basis in the reality of the 1920s; both in Soviet Russia and the rest of the developed world, most urban citizens had seen pictures or drawings of airplanes if not an actual machine flying over their heads.

The dream of spaceflight in the 1920s differed in two significant ways from the concurrent interest in aviation. First, spaceflight, which was also about liberation from the Earth, pushed the physical limits of emancipation beyond conception, past the boundaries of the visible skies. Second, spaceflight was entirely a discourse of fantasy: voyages beyond the atmosphere had no precedent or template. Liberation and fantasy in one shape or other are common to most utopian dreams, but by extending liberation (into space) and pushing utopian speculations beyond reality (into fantasy), the spaceflight discourse was infused with a "universal" (in both senses of the word) appeal that aviation lacked. For a brief period in the 1920s, spaceflight was the most potent manifestation of the "fantasy of liberation" and indeed may be seen as a "liberation of fantasy." The speculations about spaceflight would not have been possible without the promise of new twentieth-century technology that made the utopias of liberation and fantasy attainable. As one single force—a combination of technology, fantasy, and liberation—spaceflight promised what aviation could only offer in

[10] The "need to dream" quotation is from V. I. Lenin, *Polnoe sobranie sochinenii: Izdanie piatoe*, vol. 6 (Moscow, 1959), 171–2. For Lenin and utopianism, see Stites, *Revolutionary Dreams* (cit. n. 7), 41–6; Robert C. Tucker, "Lenin's Bolshevism as a Culture in the Making," in *Bolshevik Culture: Experiment and Order in the Russian Revolution*, ed. Abbott Gleason, Peter Kenez, and Richard Stites (Bloomington, Ind., 1985), 25–38; Rodney Barfield, "Lenin's Utopianism: State and Revolution," *Slavic Review* 21 (March 1971): 45–56.

[11] Leon Trotsky, *Literature and Revolution* (Ann Arbor, Mich., 1975).

[12] Bernice Glatzer Rosenthal, "Political Implications of the Occult Revival," in *The Occult in Russian and Soviet Culture*, ed. Bernice Glatzer Rosenthal (Ithaca, N.Y., 1997), 390.

[13] Richard Stites, "Utopias in the Air and on the Ground: Futuristic Dreaming in the Russian Revolution," *Russian History/Histoire Russe* 11, nos. 2–3 (1984): 236–57.

part: total liberation from the signifiers of the past—social injustice, imperfection, gravity, and ultimately, the Earth.

COSMISM

Technology, fantasy, and liberation also figured prominently in a parallel set of ideas known as Russian Cosmism that has fed into a nationalist discourse in present-day Russia.[14] In the early twentieth century, Cosmism resonated strongly in some Russian intellectual circles as a corpus of philosophical thought about the evolution of both humanity and the universe and the relationship between the two.[15] The philosophy influenced many famous Russian intellectuals in the 1920s. They included Bolshevik ideologues, scientists, writers, philosophers, poets, artists, and architects, who gathered in Moscow and Kaluga, Tsiolkovskii's hometown, to discuss its attributes. Cosmism's intellectual foundations comprised a hodgepodge of Eastern and Western philosophical traditions, theosophy, Pan-Slavism, and Russian Orthodox thinking.[16] The outcome was a nationalist and often reactionary philosophy that continues to attract the attention of many Russian intellectuals.

Tsiolkovskii served as a key contributor to the canon of Cosmism, but the most important worldview that fed into twentieth-century Cosmism stemmed from the writings of Nikolai Fedorovich Fedorov (1828–1903), the eccentric philosopher whose works influenced many, including Dostoevskii (Fyodor Dostoevsky), Gor'kii, and Tolstoi (Leo Tolstoy).[17] While working as a librarian at the Rumiantsev Library in Moscow, Fedorov developed his infamous *Filosofiia obshchego dela* (Philosophy of the common task), the most enduring and notorious of his many works.[18] Described by one Western biographer as "one of the most profound, comprehensive, and original ideas in the history of Russian speculation," Fedorov's doctrine, published after his death in 1906, was about "the common task" of all humanity, to resurrect the dead.[19] Fedorov's mission stemmed from a distinctly theocratic view of the universe in which he saw Christianity as primarily a religion of resurrection, an idea that attracted

[14] For links between modern Russian Cosmism and post-Soviet Russian nationalism, see James P. Scanlan, ed., *Russian Thought after Communism: The Recovery of a Philosophical Heritage* (Armonk, N.Y., 1994), 26–8.

[15] For only a sampling of works on Russian Cosmism since the late 1980s, see L. V. Fesenkova, ed., *Russkii kosmizm i sovremennost'* (Moscow, 1990); Svetlana Semenova, "Russkii kosmizm," *Svobodnaia mysl'*, 1992, no. 17:81–97; Semenova and A. G. Gacheva, eds., *Russkii kosmizm: Antologiia filosofskoi mysli* (Moscow, 1993); O. D. Kurakina, *Russkii kosmizm kak sotsiokul'turnyi fenomenon* (Moscow, 1993).

[16] For the best English-language meditation on Russian Cosmism as a historical process, see Michael Hagemeister, "Russian Cosmism in the 1920s and Today," in Rosenthal, *Occult in Russian and Soviet Culture* (cit. n. 12), 185–202.

[17] Those said to be influenced by Fedorov included writers (Dostoevskii, Gor'kii, Odoevskii, Pasternak, Platonov, Tolstoi), political thinkers (Bogdanov, Lunacharskii), poets (Khlebnikov, Maiakovskii, Zabolotskii), painters (Filonov), architects (Mel'nikov), heliobiologists (Chizhevskii), and scientists (Tsiolkovskii, Vernadskii). For a description of the Moscow-based Fedorovtsy (supporters of N. F. Fedorov) in the 1920s, see Michael Hagemeister, *Nikolaj Fedorov: Studien zu Leben, Werk und Wirkung* (Munich, 1989), 343–62.

[18] Fedorov devotees independently printed and distributed 480 copies of the original in 1906. A second volume was issued in 1913. His writings have been collected in A. G. Gacheva and Svetlana Semenova, eds., *N. F. Fedorov: Sobranie sochinenii v chetyrekh tomakh*, 5 vols. (Vols. 1–4 and supplement) (Moscow, 1995–2000).

[19] George M. Young Jr., *Nikolai F. Fedorov: An Introduction* (Belmont, Mass., 1979), 7.

both Dostoevskii and Tolstoi. He believed that humanity's moral task was to emulate Christ and make bodily resurrection possible. Mass resurrection would finally eliminate the artificial boundaries among the "brotherhood" of humanity, that is, between previous and current generations. In other words, none of the ills of society could be solved without devising a solution to the inevitability of death. He argued that using all of the resources at its disposal, including science and technology, humanity should engage in a quest to reassemble the corporeal particles lost in the "disintegration" of human death. In an ideal utopian setting ("as it ought to be"), Fedorov believed that there would be no birth and no death, only the progressive reanimation of the deceased millions from history.[20]

Two aspects of Fedorov's "philosophy of the common task" related to Cosmism in general and to voyages into space in particular. First, to achieve his ultimate goal of "liberation from death," Fedorov called for restructuring human society and its natural environment, which for him included not only the Earth but the entire universe. In the early postrevolutionary era, the idea of "regulating nature" by taking absolute control over it resonated deeply with the scientific and technical intelligentsia, who, infected by Bolshevik claims of remaking the social universe, were also interested in remaking the natural one.[21] Second, Fedorov believed that humans from Earth would have to travel into the cosmos—to the Moon, the planets, and stars—to recover disintegrated particles of deceased human beings that are spread throughout the universe. Once the bodies of the deceased were reconstituted (in forms that might not resemble humans), the resurrected would then settle throughout the universe. In his *Philosophy of the Common Task*, Fedorov wrote, "[The] conquest of the Path to Space is an absolute imperative, imposed on us as a duty in preparation for the Resurrection. We must take possession of new regions of Space because there is not enough space on Earth to allow the co-existence of all the resurrected generations."[22]

Fedorov's ideas of restructuring humanity and the cosmos, especially the supreme role of science and technology in this transformation, anticipated Tsiolkovskii's writings, which are sprinkled with the Promethean urge to remake everything that surrounds us. Many historians have claimed that Fedorov inculcated Tsiolkovskii with his ideas about space travel. During his brief stay in Moscow as a teen in the 1870s, Tsiolkovskii had indeed met daily with Fedorov, who worked at a Moscow library. Fedorov played a critical role in supporting the young student in his struggle to learn more about the natural sciences. As Tsiolkovskii later remembered, "It is no exaggeration to say that for me he took the place of university professors."[23] Yet, those who suggest that Fedorov may have influenced Tsiolkovskii to take up the cause of spaceflight are certainly mistaken. Throughout his life, Tsiolkovskii himself maintained

[20] Summarized from Fedorov works collected in vols. 1 and 2 of Gacheva and Semenova, *N. F. Fedorov* (cit. n. 18).

[21] The famous Russian geochemist Vladimir Vernadskii, who shared these views (although he probably never heard of Fedorov), headed the Commission for the Study of the Natural Productive Forces (KEPS), a body whose goals encompassed such transformative projects as harnessing solar and electromagnetic forces for the good of Russian society. Kendall E. Bailes, *Science and Russian Culture in an Age of Revolutions: V. I. Vernadsky and His Scientific School, 1863–1945* (Bloomington, Ind., 1990). Remarkably, Bailes never once mentions Vernadskii's interest in Cosmism. For Vernadskii and Cosmism, see G. P. Aksenov, "O nauchnom odinochestve Vernadskogo," *Voprosy filosofii*, 1993, no. 6:74–87.

[22] Jean Clair, "From Humboldt to Hubble," in *Cosmos: From Romanticism to the Avant Garde*, ed. Jean Clair (Munich, 1999), 25; Young, *Nikolai F. Fedorov* (cit. n. 19), 182–3.

[23] Konstantin Altaiskii, "Moskovskaia iunost' Tsiolkovskogo," *Moskva*, 1966, no. 9:176–92, on 181.

that during his tenure of study under Fedorov, the two never discussed space travel although both had independently begun thinking of the possibility by this time.[24]

In parallel with his more technical writings, Tsiolkovskii issued numerous short monographs, beginning in the late nineteenth century, that touched on the philosophy of cosmic travel. These two strands, the technical and the philosophical, intertwined and influenced each other throughout his life, and although his philosophical writings are less well known than his technical ones, they form a corpus of work that exceeds in size his combined works on aeronautics, rocketry, and space travel.[25] Tsiolkovskii brought a messianic and transformative vision to the cause of spaceflight that mimicked some of Fedorov's ideas about immortality and cosmic unity. He also drew upon occult thought rooting back to German philosopher Carl du Prel, who was famous for drawing a link between cosmic and biological evolution, that is, that Darwinian natural selection acted on planetary bodies just as they acted on living organisms.[26] In Tsiolkovskii's worldview, the occult, theories of evolution, and Christianity existed without contradiction. At a fundamental level, Tsiolkovskii was a religious thinker whose life was an attempt to reconcile the scientific views of nature that seemed to contradict his strong faith in Christ. As such, he expended a great deal of energy explaining biblical events with the aid of contemporary science.

Like Fedorov, Tsiolkovskii believed that humanity's place in the universe depended on two related ideas, monism and panpsychism. He described both of these concepts in *Monizm vselennoi* (Monism of the universe), a brochure he self-published in 1925 that would be his most complete statement of cosmic philosophy. According to his version of monism, all matter in the universe, including organic matter, is made out of a single substance, has the same structure, and obeys the same set of laws. He explained panpsychism as the belief that all matter is made up of "atoms of ether," even smaller than "regular" atoms, which are in and of themselves *living organisms* or "happy atoms."[27] When these atoms combine in different ways, they produce different living beings with differing abilities. Because these ether atoms are indestructible,

[24] The legend that Fedorov pointed Tsiolkovskii in the direction of space travel probably originated from scientist Viktor Shlovskii in his "'K' in 'Kosmonavtika ot A do Ia,'" *Literaturnaia gazeta*, 7 April 1971. See also V. E. L'vov, *Zagadochnyi starik: Povesti* (Leningrad, 1977). Many Western and Russian authors, without any evidence, make a direct causal connection between Fedorov and Tsiolkovskii. Michael Holquist, "Konstantin Tsiolkovsky: Science Fiction and Philosophy in the History of Soviet Space Exploration," in *Intersections: Fantasy and Science Fiction*, ed. George E. Slusser and Eric S. Rabkin (Carbondale, Ill., 1987), 74–86; Holquist, "The Philosophical Bases of Soviet Space Exploration," *Key Reporter* 50 (Winter 1985–86): 2–4; and Vladimir V. Lytkin, "Tsiolkovsky's Inspiration," *Ad Astra*, Nov.–Dec. 1998, 34–9.

[25] Especially through the 1920s, during the height of the "space fad," Tsiolkovskii's output on philosophical topics increased dramatically. He self-published such works as *The Wealth of the Universe* (1920), *The Origins of Life on Earth* (1922), *Monism of the Universe* (1925), *Reason for Space* (1925), *The Future of Earth and Humanity* (1928), *The Will of the Universe: Unknown Intelligent Forces* (1928), *Love for Oneself or the Source of Egoism* (1928), *Intellect and Passion* (1928), *The Social Organization of Humanity* (1928), and *The Goal of Stellar Voyages* (1929). All of these works, and others unpublished during his lifetime, have been compiled into one volume: L. V. Golovanov and E. A. Timoshenkova, eds., *K. E. Tsiolkovskii: Genii sredi liudi* (Moscow, 2002). For the best analysis of Tsiolkovskii's philosophical works, see V. S. Avduevskii, ed., *K. E. Tsiolkovskii: Kosmicheskaia filosofiia* (Moscow, 2001), 370–472.

[26] For a sympathetic analysis of the differences between Fedorov and Tsiolkovskii's philosophies, see V. V. Kaziutinskii, "Kosmizm i kosmicheskaia filosofiia," in *Osvoenie aerokosmicheskogo prostranstva: Proshloe, nastoiashchee, budushchee*, ed. B. V. Raushenbakh (Moscow, 1997), 139–44.

[27] K. E. Tsiolkovskii, *Monizm vselennoi* (Kaluga, 1925). Tsiolkovskii's ideas were not original; they were heavily influenced by the ideas of such German thinkers as Gottfried Leibniz and Ernst Haeckel.

there is no such thing as true death as the atoms can be reconstituted in different combinations from the one that gave life to a specific human being.[28]

For all their "progressive" ideas about the role of science and technology and human expansion of space, Fedorov and Tsiolkovskii had a darker side to their vision. Fedorov's "common task" had a distinctly totalitarian tinge as it did not allow choice in the equation, that is, he argued humans would *have* to participate in his project without exception. Tsiolkovskii's view of the search for human perfection also reflected his firm belief in eugenics; he advocated the extermination of imperfect plants and animal life and called for a "battle against the procreation of defective people and animals."[29] In a piece finished in 1918, he wrote:

> I do not desire to live the life of the lowest races [such as] the life of a negro or an Indian. Therefore, the benefit of any atom, even the atom of a Papuan, requires the extinction also of the lowest races of humanity, and in an extreme measure the most imperfect individuals in the races.[30]

This view of space travel, which combined the search for human perfection, racial purity, and occult thinking, provided the fundamental impetus to Tsiolkovskii's more mathematically inclined meditations on rocket flight into outer space. Tsiolkovskii seamlessly combined his fascinations with technology and the occult into a fully formed weltanschauung. Yet to much of his audience in the 1920s—especially those young and technology-minded students who were inspired to dream of space travel—his goal of space travel fit nicely with prevailing Bolshevik rhetoric connecting technology with modernity. The technophiles, in fact, believed that by avoiding Tsiolkovskii's mystical invocations, they could construct a vision of space travel that directly countered antiquated notions of the cosmos as part of an epistemology of superstition and folktales. In forming societies to argue their cause, they saw in space travel a vehicle for creating a new world of machines and men.

TECHNOLOGICAL UTOPIANISM: THE COSMIC SOCIETIES

Most of the men and women who organized cosmic societies in the 1920s did so without any material support or encouragement from the state. They did, however, absorb official discourses on the role of technology as a panacea for all social ills in new, postrevolutionary Russia. Space advocates saw in space exploration (and its corollary, rocketry) a manifestation of the cold hard power of rationality, science, and mathematics to move society ahead on the path of "progress" and "modernization."

Several technology-enraptured (and short-lived) societies coalesced during the period of the space fad. Of these, the most important and influential was the Moscow-based Society for the Study of Interplanetary Communications (Obshchestva Izuche-

[28] In *Volia vselennoi* [Will of the universe], a brochure published in 1928 in Kaluga, Tsiolkovskii wrote, "Death is one of the illusions of a weak human mind. There is no death, for the existence of an atom in inorganic matter is not marked by memory and time—it is as if the latter does not exist at all." K. E. Tsiolkovskii, "Volia vselennoi," in Golovanov and Timoshenkova, *K. E. Tsiolkovskii* (cit. n. 25), 228–9.

[29] K. E. Tsiokovskii, "Liubov' k samomu sebe, ili istinnoe sebialiuboe," in Golovanov and Timoshenkova, *K. E. Tsiolkovskii* (cit. n. 25), 378–402, on 401.

[30] K. Tsiolkovskii, "Etika ili estestvennye osnovy nravstvennosti," in Avduevskii, *K. E. Tsiolkovskii* (cit. n. 25), 82.

niia Mezhplanetnykh Soobshchenii, OIMS), formed in 1924. It was not only the first group in the world to effectively organize for the cause of space exploration but also the first to build a domestic and international network around the idea. The history of the organization, a combination of serendipity, willful devotion, and eventual loss of momentum due to indifference from the state, illustrates the ways in which technological utopianism inspired a few to bring an esoteric idea to many.[31]

The society emerged during the first intense wave of public fascination with spaceflight in the spring of 1924, set off by a story in the newspaper *Izvestiia* under the headline "Is Utopia Really Possible?" about the recently published meditations on spaceflight written by the foreigners Oberth and Goddard.[32] Spurred to promote a Russian source for such ideas, the sixty-six-year-old Tsiolkovskii immediately republished his own prerevolutionary works on spaceflight. Almost overnight the Soviet media began to devote considerable attention to the cosmos. News and rumors of Oberth and Goddard's exploits, the publication of Aleksei Tolstoi's new space fiction novel *Aelita*, and the "Great Mars Opposition" of August 1924—when Mars and Earth were closer to each other than in hundreds of years—fed an explosion of public interest in space. In one lengthy *Pravda* article ("Voyage into Cosmic Space"), the author narrated the new history of space exploration, harking back to Leonardo da Vinci, Cyrano de Bergerac, Jules Verne, and H. G. Wells. The history naturally culminated with the works of Tsiolkovskii, Oberth, and Goddard. Palpably excited by the optimism of the times, the writer concluded, "[W]ithin a few years, hundreds of heavenly ships will push into the starry cosmos."[33]

The media frenzy over space exploration in early 1924 might have faded away had it not been for some resourceful young men and women. In April 1924, about a dozen students at the prestigious Zhukovskii Military Air Engineering Academy's Military-Science Society (VNO) set up a Section on Reactive Motion to exchange ideas about rockets.[34] In compiling a list of goals, the section touched on all the key strategies that would characterize the ensuing space fad, from its technical side (building rockets), to outreach (lectures, publications, and bookstores), to building a community (by interesting others in the same topics), to opening a channel to the West (by collecting media from overseas), to acknowledging the artistic medium as a possible way to educate and popularize (by branching into film).

The section first organized a public lecture. One of the section leaders, Morris Leiteizen, whose father was a famous prerevolutionary Bolshevik, asked a family friend, Mikhail Lapirov-Skoblo, to do the honors. Lapirov-Skoblo, thirty-five years old and a rising member of the reconstituted postrevolutionary technical intelligentsia, had been briefly acquainted with Lenin. After the latter's death, he served as deputy chairman of the Scientific-Technical Department of the Supreme Council of the People's Economy (VSNKh, or Vesenkha), a body tasked with supervisory duties

[31] For a detailed account of the society, see Asif A. Siddiqi, "Making Spaceflight Modern: A Cultural History of the World's First Space Advocacy Group," in *The Societal Impact of Spaceflight*, ed. Steven J. Dick and Roger D. Launius (Washington, D.C., 2007), 513–37.

[32] "Novosti nauki i tekhniki: Neuzheli ne utopiia?" *Izvestiia VTsIK*, 2 Oct. 1923.

[33] M. Ia. Lapirov-Skoblo, "Puteshestviia v mezhplanetnye prostranstva," *Pravda*, 15 April 1924. For Goddard's prominent role in the space fad, see Asif A. Siddiqi, "Deep Impact: Robert Goddard and the Soviet 'Space Fad' of the 1920s," *History and Technology* 20, no. 2 (2004): 97–113.

[34] The leading VNO student members included V. P. Kaperskii, M. G. Leiteizen, A. I. Makarevskii, M. A. Rezunov, and N. A. Sokolov-Sokolenok., r. 4, op. 14, d. 197, ll. 32–3, Archive of the Russian Academy of Sciences (hereafter cited as ARAN), Moscow.

over applied research and development in Soviet industry. He also headed *Pravda*'s department of science and technology.[35] Tsiolkovskii's recently published works so inspired Lapirov-Skoblo that he wrote the first well-researched expositions on space travel in the postrevolutionary era in *Pravda* and other publications.[36]

Lapirov-Skoblo's lecture, held on the evening of Friday, May 30, 1924, was a resounding success. Tickets sold out two days earlier; on the day of the talk, the organizers were forced to call for the police to control the mass of people who wanted to attend. Attendees eagerly bought up all the utopian literature on space travel on display—H. G. Wells's *War of the Worlds*, Russian science fiction from Aleksei Tolstoi and Aleksandr Beliaev, and books by the popular science writer Iakov Perel'man. Lapirov-Skoblo's lecture, titled "Interplanetary Communications (How Modern Science and Technology Solves This Question)," may have been the first exposition on space exploration in Russia open to the general public. His lecture was a typical example of the rhetoric of the technological utopian space advocates; he linked the idea of spaceflight with both modern technology and the future of a new Bolshevik Russia, a nation he believed had left behind its roots in tradition, backwardness, and peasant life. He concluded by calling on the Soviet populace to build rocket engines to "transform into reality the centuries-old dream of flight into space."[37]

Following Lapirov-Skoblo's talk, section members invited the audience to sign up to form the core of a public society, thus opening up membership to laypeople outside the Zhukovskii Academy. While the complete list of 179 names has been lost, the surviving pages give a sense of these people. Of the 121 names preserved, 104 were men. The majority of the members (68) were young, between the ages of twenty and thirty. In terms of professions, a total of 96 members, that is, roughly 80 percent, were evenly split between students and workers. A smaller number identified themselves as "scientific workers," "writers," or "scientists and inventors."[38]

Grigorii Kramarov, elected to chair the new society's "presidium," recalled forty years later that no one had any illusions that the Soviet Union would soon be sending men into space. He remembered that "in the work of the society [we] all saw one more possibility to aid the Motherland, to aid in the building of socialism." Instead of building rockets, the society would bring science and technology to the masses. Its members were "convinced that the society's work would contribute to the preparation of cadres, who in the future would create the economic and scientific and technical base for solving the greatest problems."[39] They paid lip service to the notion that technology would improve social conditions in revolutionary Russia. In a speech to factory workers, Fridrikh Tsander, one of the principal activists in the society, spoke of the many benefits to be gained from space travel: of "senior citizens [who] will

[35] When Lenin supervised the formation of the State Commission for Electrification of Russia (GEOLRO) in 1920, he tapped Lapirov-Skoblo to represent the Vesenkha on GOELRO. For a biography, see r. 14, op. 14, d. 197, ll. 30–30b, ARAN.

[36] For his other articles, both titled "Puteshestviia v mezhplanetnye prostranstva," see *Molodaia gvardiia*, 1924, no. 5, and *Khochu vse znat'*, 1924, no. 3:140.

[37] For the transcript, see r. 4, op. 14, d. 194, ll. 49–62, ARAN. For recollections of attendees, see r. 4, op. 14, d. 197, ll. 35–8, ARAN; G. Kramarov, *Na zare kosmonavtiki: K 40-letiiu osnovaniia pervogo v mire obshchestva mezhplanetnykh soobshchenii* (Moscow, 1965), 25–8.

[38] R. 4, op. 14, d. 196, ll. 6–21, ARAN; V. M. Komarov and I. N. Tarasenko, "20 iunia—50 let so vremeni sozdaniia v moskve obshchestva izucheniia mezhplanetnykh soobshchenii (1924g.)," *Iz istorii aviatsii i kosmonavtiki* 22 (1974): 75–82; Kramarov, *Na zare kosmonavtiki* (cit. n. 37), 28.

[39] Kramarov, *Na zare kosmonavtiki* (cit. n. 37), 50.

find it much easier to maintain health in [space]," of the "inhabitants of Mars . . . [whose] inventions could help us to a great extent to become happy and well off," and of "[a]stronomy, [which] more than the other sciences, calls upon man to unite for a longer and happier life."[40] When critics attacked their views for being utopian, the members responded by calling their opponents "conservative," thus locating supporters and detractors of space exploration within a binary world; one was either modern ("with science and technology") or traditional (against "progress").[41]

Throughout 1924, the society held numerous lectures and debates in Moscow, Leningrad, Kharkov, Ryazan, Tula, Saratov, and elsewhere, introducing the idea of space exploration to a huge audience beyond technology fetishists. But despite their many successes—including one near-riotous event in October 1924, when the Moscow horse militia had to be called out to control unruly crowds interested in rumors of a rocket launch to the Moon that year—lack of state support proved to be the society's undoing. In late 1924, when the society petitioned the administrative department of the Moscow city council to register the organization officially, the city council rejected the application on the grounds that the society had "insufficient scientific strength among its members."[42] The society's members also had to deal with less committed members, who were unable to sustain interest in the face of both the widespread poverty of the times and the possibility that space exploration was decades away. Society head Kramarov remembered that the most common question from the audience after each lecture was "How quickly would flight to the planets be accomplished?"[43] When it became clear that travel into space was years, if not decades, away, the "accidental members" dispersed quickly, leaving only a handful of the truly dedicated to pursue the cause. Eventually, even the faithful had to come down to earth; most, such as Tsander, had little time to devote to activities that did not provide money for living. Valentin Chernov, for example, remembered later that his job as a violinist forced him to abandon the society.[44] Like many utopians, the society was unable to sustain a vision beyond the short term.

TECHNOLOGICAL UTOPIANISM: THE MEDIA

Dissemination of celebratory ideas about space travel during the NEP era depended greatly on the existence of vibrant popular scientific media, which directly equated technology with modernization and societal benefit.[45] The journal *Khochu vse znat'* (I want to know all), published by the Leningrad-based newspaper *Rabochei gazety*

[40] See F. A. Tsander, "Doklad inzhenera F. A. Tsandera a svoem izobretenii," in *Iz nauchnogo naslediia* (Moscow, 1967), 10–4.

[41] V. Chernov, "Raketa na lunu," r. 4, op. 14, d. 194, ll. 1–3, ARAN.

[42] R. 4, op. 14, d. 197, l. 19, ARAN. Tsander later confirmed that the lack of "scientific workers" among members of the "board of directors,"—i.e., Tsander, Leiteizen, Kaperskii, Rezunov, Chernov, Serebrennikov, and Kramarov—was a source of dissension that contributed to the society's dissolution.

[43] Kramarov, *Na zare kosmonavtiki* (cit. n. 37), 56.

[44] Ibid., 51–2. Tsander, in his autobiography, notes that "the lack of published material and of spare time did not permit us to work intensively." "Autobiography of Friedrich Arturovich Tsander, Mechanical Engineer," in N. A. Rynin, *Rockets*, vol. 2, no. 4, of *Interplanetary Flight and Communication*, trans. T. Pelz (Jerusalem, 1971), 187.

[45] For a view on the role of popular science in the postrevolutionary period, see James T. Andrews, *Science for the Masses: The Bolshevik State, Public Science, and the Popular Imagination in Soviet Russia, 1917–1934* (College Station, Tex., 2003).

(Working gazette), for example, set out to "[help] readers in developing a material understanding of the world" and to "familiarize readers with the newest achievements in modern science and technology" that would benefit the revolution.[46] Publishers, both private and public, found that scientific titles were particularly popular among urban masses. Jeffrey Brooks notes that "[p]ublishers had difficulty keeping up with the demand for works in popular science," which "comprised a fifth of [all] titles published from 1921–27."[47] By the mid-1920s, biweekly and monthly journals devoted to popular science were ubiquitous on newsstands and included both new and older publications.[48] The partially independent Leningrad-based publisher P. P. Soikin, which published the journals *Mir prikliuchenii* (World of adventure), *Priroda i liudi* (Nature and people), and *Vestnik znaniia* (Journal of knowledge), played an influential role in the popularization of science through the second and third decades of the twentieth century. Having published Lenin's first legal work in prerevolutionary times, Soikin remained one of the few imperial-era publishing concerns allowed to operate during the NEP years.[49] Although private publishers were producing only about 5 percent of all copies of books in 1925, Soikin carved out a dominating niche in the popular science market that remained unchallenged until complete nationalization of the press in the post-NEP era. Circulation of *Vestnik znaniia*, one of Soikin's most popular monthlies, for example, increased from 25,000 in 1925 to 75,000 by 1931.[50] Such publications were widely available via bookstores such as Leningrad's Nauka i Znanie (Science and Knowledge), one of the largest in the city, which catered exclusively to scientific and applied scientific titles. Its catalog in 1928 boasted around 7,000 titles from "all branches of [scientific and technical] knowledge."[51]

Space and space-related topics constituted a significant, although by no means major, slice of the popular science literature. Based upon an in-depth search through the popular science literature in early twentieth-century Russia, my research suggests that the number of articles on spaceflight published between 1923 and 1932 (inclusive), the key years spanning the space fad, amounted to nearly 250 articles and more than thirty books. Compared with the other pressing topics of the day, this output did not represent a great number, but that so many works on space exploration were published on such an arcane subject is in and of itself a striking result.[52] By comparison, in the United States, only *two* nonfiction monographs on spaceflight appeared in the

[46] Advertisement for *Khochu vse znat'* in inside cover of various issues of *Vestnik znaniia*.

[47] Jeffrey Brooks, "The Breakdown in Production and Distribution of Printed Material, 1917–1927," in Gleason, Kenez, and Stites, *Bolshevik Culture* (cit. n. 10), 159, 168–9.

[48] Popular science journals included *Bor'ba mirov* (The world's struggle), *Khochu vse znat'* (I want to know all), *Krasnaia nov'* (Red virgin soil), *Mir prikliuchenii* (World of adventure), *Nauka i tekhnika* (Science and technology), *Pioner* (Pioneer), *Priroda i liudi* (Nature and people), *Tekhnika i zhizn'* (Technology and life), *Tekhnika-molodezhi* (Technology for youth), *Vestnik znaniia* (Journal of knowledge), *V masterskoi prirodi* (In nature's workshop), *Vsemirnyi sledopyt'* (World pathfinder), and *Znanie-sila* (Knowledge is power).

[49] A. M. Admiral'skii and S. V. Belov, *Rytsar' knigi: Ocherki zhizni i deiatel'nosti P. P. Soikina* (Leningrad, 1970).

[50] Publication runs are from the back pages of *Vestnik znaniia* in 1925 and 1931.

[51] From commercial advertisements in the back covers of various popular science magazines in 1928.

[52] Asif A. Siddiqi, "The Rockets' Red Glare: Spaceflight and the Russian Imagination, 1857–1957" (PhD diss., Carnegie Mellon Univ., 2004).

same period. Only in Germany, the single Western nation with a vocal spaceflight community, were there comparable levels of media attention.[53]

The content of popular science media suggests that readers were not merely passive receptors of information on spaceflight. Brooks has noted that Soviet newspapers during the NEP era contained three spheres of discourse: explanatory, interactive, and informational.[54] The dialogue over spaceflight in popular science journals echoed these divisions. Both *Nauka i tekhnika* (Science and technology) and *Vestnik znaniia* had forums for interacting with readers. The former, under the banner "Correspondence with Readers," published more than two dozen responses to readers' letters per issue. Inquiries and comments came from all over the country: Moscow, Rostov-on-Don, Voronezh, Leningrad, Krasnodar, Voznesensk, Kharkov, Grozny, Kiev, Taganrog, Donbass, and elsewhere. *Vestnik znaniia* had a similar section titled "Living Communication," which published numerous editorial responses to readers' letters on various topics. The transformative, beneficial, and modernizing aspects of space travel were rarely, if ever, questioned in the exchange of ideas.

Many readers asked where to get materials on space, a service that the journals provided repeatedly, pointing out not only articles on space published in the journals' own pages but also those published elsewhere.[55] Some of the responses provided information while others clarified ambiguous topics. To comrade A. Semenov from Leningrad, for example, *Nauka i tekhnika* used a drawing to illustrate the changing distances between the planets. In some cases, the journal editors displayed a distinctly pedantic attitude to its readers, implying that lack of scientific and technical knowledge about space travel was indicative of ignorance about the modern world. For example, *Nauka i tekhnika* chastised comrade Pavliuchenko from Aleksandrovka for his "bewilderment" about movement through space in the absence of matter to push against.[56] On occasion, the journals acknowledged the "many numbers of questions to the Editors" on the topic; *Vestnik znaniia* claimed that numerous readers of the journal were dissatisfied with short articles on space travel and demanded complete books on the topic.[57] Some readers' communications required special attention. *Vestnik znaniia* returned comrade Iosifov's manuscript, "The Importance of the Planet and Its Satellites in the Solar System," with several points explaining why his conclusions were "absolutely incorrect." In the same readers' section, comrade Goldenveizer conjectured about the unpleasant sensations space travelers might experience in a vessel, some of which had been discussed by Tsiolkovskii, Noordung,

[53] For the two American monographs, see Robert H. Goddard, *A Method of Reaching Extreme Altitudes*, Smithsonian Miscellaneous Collections, vol. 71, no. 2 (Washington, D.C., 1919); David Lasser, *The Conquest of Space* (New York, 1931). For the German space fad, see Michael J. Neufeld, "Weimar Culture and Futuristic Technology: The Rocketry and Spaceflight Fad in Germany, 1923–1933," *Tech. Cult.* 31 (Oct. 1992): 725–52.

[54] Jeffrey Brooks, "The Press and Its Message: Images of America in the 1920s and 1930s," in *Russia in the Era of NEP: Explorations in Soviet Society and Culture*, ed. Sheila Fitzpatrick, Alexander Rabinowitch, and Richard Stites (Bloomington, Ind., 1991), 231–52.

[55] "Pred'iaviteliiu bileta avio-loterei ser. 008, no. 10220 (Baku)," *Nauka i tekhnika*, 19 Aug. 1927, no. 34:35; Ia. I. Perel'man, "Mezhplanetnye polety," *Vestnik znaniia*, 1928, no. 4:254; and "Tov. Miklashevskomu (Moskva)," *Nauka i tekhnika*, 9 June 1928, no. 23:31.

[56] "Tov. A. Semenovu (Leningrad)," *Nauka i tekhnika*, 18 Nov. 1927, no. 47:28; "Tov. Pavliuchenko (d. Aleksandrovka)," *Nauka i tekhnika*, 7 April 1928, no. 14:30. For an answer to a similar question, see "L'vovu," *Vestnik znaniia*, 25 Jan. 1931, no. 2:127.

[57] "Ot redkatskii," *Vestnik znaniia*, 1928, no. 11:551.

and others.[58] In one case, when a reader anticipated Fermi's paradox in relation to the possibility of space travel, *Vestnik znaniia* devoted a full article with responses from prominent writers, including Tsiolkovskii and Iakov Perel'man, to the question "Is Interplanetary Communications Possible?"[59] According to the writers, the answer was a resounding "yes," but only because modern science and technology would make it possible.

THE COSMOPOLITANS

Beyond societies and publishing, space advocates of the 1920s also used the medium of the *vystavka*, or "display," to publicize their cause. Through exhibits, enthusiasts were able to let their visions run free in more creative ways than was possible via lectures or publications. By exposing the possibility of space travel for the first time to thousands, they served a very important role during the space fad. Unlike the technological utopians who organized or wrote, exhibition organizers represented a constituency that embraced certain mystical ideas about spaceflight. In their lexicon, Tsiolkovskii assumed near-messianic status in a cause that was equal amounts of fetishizing of technology and speculation about human evolution. Recovering the history of the exhibitions underscores how in the 1920s, the line between lunar aspirations and lunacy was often invisible and that the lexicon of technological utopians was frequently indistinguishable from those who were mystically minded.

In 1925, a group of spaceflight enthusiasts organized a small exhibition of spaceflight-related artifacts in Kiev.[60] Although the exhibit remained open for less than three months, its success prompted one of its organizers, Aleksandr Fedorov, to join with the Moscow-based Association of Inventors (Assotsiatsiia Izobretatelei-Izobretateliam, AIIZ) to open the world's first international exhibition on space travel in 1927.[61] The AIIZ, a forum for amateur enthusiasts to discuss their interests in science and technology, had recently created the Sector for Propaganda and Popularization of Astronautics to promote the cause of spaceflight.[62] The sector's leading members included a motley crew of self-described inventors: a pilot, a former convict, a student, a technician, a librarian, and Fedorov.[63] Obsessed with Tsiolkovskii, the idiosyncratic Fedorov found a shared cause in his fellow exhibition organizers, who, like Fedorov, seemed to see the old man in overtly evangelical terms. In one letter to Tsiolkovskii, Fedorov wrote that he considered himself "fortunate to work under the leadership

[58] "I. T. Iosifovu" and "Podp. Goldenveizeru," in *Vestnik znaniia*, 10 Oct. 1931, no. 19:1004.

[59] "Vozmozhny li mezhplanetnye soobshcheniia?" *Vestnik znaniia*, 1930, no. 4:152–3. Fermi's paradox describes the seeming contradiction of our galaxy being more than a billion years old—and therefore possibly full of alien life—but humanity's having no contact with them.

[60] The only detailed documentary evidence on the exhibition are three letters from Fedorov to Tsiolkovskii describing the works of the Kiev Society, written in August–September 1925. Fedorov to Tsiolkovskii, 16 Aug. 1925, Kiev, r. 4, op. 14, d. 195, ll. 10–2, ARAN.

[61] The literal translation of AIIZ is "Association of Inventor-to-Inventor," but the society was commonly known as the Association of Inventors.

[62] R. 4, op. 14, d. 198, l. 41, ARAN. The precise word they used was *zvezdoplavaniia*, which literally translates as "stellar dynamics" in the same way that *vozdukhoplavaniia* means "aerodynamics." The closest English word is "astronautics," a term that Belgian writer J. J. Rosny invented. Other sections in the AIIZ included one for "culture-propaganda," one for language, and one for developing a universal language.

[63] The "organizational committee" of the AIIZ's astronautics sector included G. A. Polevoi (pilot), I. S. Beliaev (former convict), A. S. Suvorov (student), Z. G. Piatetskii (technician), and O. V. Kholoptseva (librarian). R. 4, op. 14, d. 198, ll. 1–2, ARAN.

of creative great ideas, a thinker of our times and a preacher of great inconceivable truths!"[64]

Having organized the previous exhibition in Kiev, Fedorov suggested to the sector that it host a major exhibition of space artifacts in Moscow. The idea was to construct models of rockets and spacecraft conceived by the leading Soviet and foreign theoreticians of the day and display them with information for curious visitors. The association planned to display many of Tsiolkovskii's publications on spaceflight in one place—a library of sorts that they called the "smithy of all inventors."[65] The exhibition, which would also commemorate the tenth anniversary of the great October Revolution, would be augmented by a publicity blitz on space travel, including lectures in dozens of locales in and around the capital city. The ragtag band of organizers united in their zealous belief in the power of "invention" and "inventors" and held up Tsiolkovskii as some sort of "prophet" of a new era, "superior even to Edison."[66]

Although Soviet-era accounts focused solely on the organizers' fascination with modern technology, Fedorov and his associates were inspired not only by the products of modern engineering but also by a mystic calling. They referred to themselves as "cosmopolitans" (*kosmopolitov*), a word derived from the term *cosmopolite* ("citizen of the world"), and their cause as "cosmopolitanism" (*kosmopolizma*).[67] Unlike many other technically minded popularizers of space exploration in the 1920s who carefully ignored Tsiolkovskii's spiritually oriented works about Cosmism and human destiny, the exhibition organizers embraced them, deifying Tsiolkovskii as a preacher, a visionary, the father of cosmopolitanism. They embraced the "master's" vision of animate matter and monism and believed in the importance of their efforts as part of a big evolutionary leap for all of humanity. In several effusive communications to Tsiolkovskii (the "first honorary captain rocket-mobilist") in late 1927, the organizers referenced Leibniz's worldview on monism and underscored the power of inventors to "find the resources for human immortality"—the foundation of the Cosmist view of the universe.[68] Their rationale for space exploration had as much to do with equating technology with modernization as with a self-important and mystical notion of human destiny that harked back to the nineteenth century.

The exhibition, unimaginatively named the "World's First Exhibition of Models of Interplanetary Apparatus, Mechanisms, Instruments, and Historical Materials," opened on April 24, 1927, not far from what is now Maiakovskii Square at number 68 (now 28) Tverskaia Street, one of Moscow's biggest thoroughfares. Open to the public for two months, the exhibition had an elaborately designed entrance with a huge display of an imagined planetary landscape, designed and built by Arkhipov,

[64] Fedorov to Tsiolkovskii, 7 Sept. 1926, Moscow, f. 555, op. 4, d. 641, ll. 1–5, ARAN.

[65] Efofbi [O. V. Khloptseva, pseud.] and Polevoi to Tsiolkovskii, 5 Feb. 1927, Moscow, f. 555, op. 3, d. 198, ll. 6–8, ARAN.

[66] Efofbi to Tsiolkovskii, 3 Dec. 1928, Moscow, f. 555, op. 3, d. 199, ll. 5–6, ARAN.

[67] AIIZ to Tsiolkovskii, 21 Jan. 1927, Moscow, f. 555, op. 3, d. 198, ll. 1–1ob, ARAN. Although nearly identical, the word *kosmopolizma* differed in meaning and etymology from the pejorative term *kosmopolitizm* that party ideologues used in the late 1940s to describe a "decadent" and "bourgeois" lifestyle during the late Stalin years. The latter word was first introduced into public discourse in January 1949. *Kosmopolitov* was probably derived from the early seventeenth-century French word *cosmopolite*, as in a "citizen of the world."

[68] Efofbi to Tsiolkovskii, 7 Dec. 1927, Moscow, f. 555, op. 3, d. 198, ll. 34–34ob, ARAN; AIIZ to Tsiolkovskii, 18 Dec. 1927, Moscow, f. 555, op. 3, d. 198, ll. 38–38ob, ARAN.

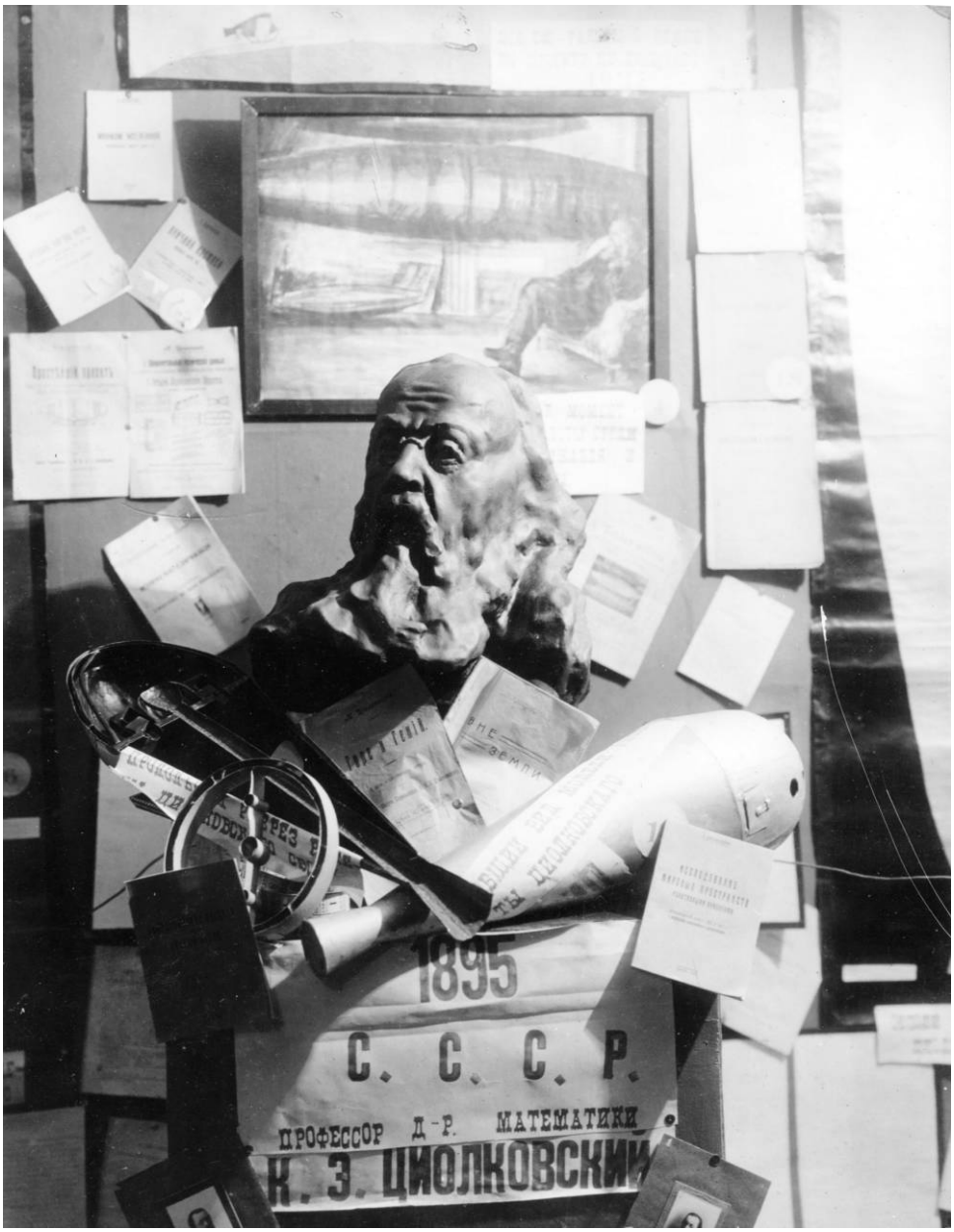

Figure 1. *An image from the "World's First Exhibition of Models of Interplanetary Apparatus, Mechanisms, Instruments and Historical Materials" held in Moscow in 1927 shows the area devoted to the "patriarch" of Soviet space exploration, Konstantin Tsiolkovskii. A bust, specially commissioned for the event, was adorned with Tsiolkovskii's publications and models. The arrangement communicates an obvious conflation between the organizers' feelings about Tsiolkovskii's scientific contributions and their attitude toward the old man as a prophet with almost mystical qualities. (Reprinted with the permission of Ron Miller.)*

placed behind a large pane of glass. Part of the display, somewhat incorrectly called "Lunar Panorama," showed a hypothetical planet with orange soil and blue vegetation crisscrossed by straight canals. A giant silver rocket descended from the starry sky while a voyager in a spacesuit (made of plywood) stood at the edge of a crater. Organizer Mikhail Popov described the feeling of entering the exhibition: "By taking a pair of steps, I crossed over the threshold of one epoch to another, into the space [era]."[69]

Although state organs ignored the show, it succeeded resoundingly with the public. According to the organizers, in two months, between 10,000 and 12,000 people visited the exhibition. Visitors included schoolchildren, workers, service employees, artists, scientists, policemen, and such luminaries as poet Vladimir Maiakovskii.[70] Visitors, who were invited to record their impressions in a book of comments, were both effusive and candid. One person, who signed as "Gorev," wrote, "Our mind is not accustomed to all the 'wonderful and unknown' which literally was [sic] seen and heard, as if in a dream, yet we understand that this is not a fantasy but a completely feasible idea supported by the achievements of science and engineering." Another person, an artist from the Third State Cinematographic Studio, recommended that "[i]t would be desirable that our inventors achieve the first landing on the moon." One of the most captivated visitors was S. G. Vortkin, a reporter from the most important workers' news daily, *Rabochaia moskva*, who wrote, "I am going to accompany you on the first flight. I am quite serious about this. As soon as I heard what you had done, I tried in every way to make certain that you would take me with you. Please do not refuse my request."[71]

SPACEFLIGHT IN ART AND CULTURE

The degree of popular Soviet fascination with space in the 1920s is also underlined by how deeply it resonated in the various art forms of the day. From literature to film to painting to poetry to architecture to language, clusters of artists produced works that reflected their belief that cosmic travel was an inevitable part of their future. A small sampling of this vast output—Tolstoi's novel *Aelita*, Protazanov's movie of the same title, Malevich's Suprematist paintings, and the Amaravella group's artwork—highlights some of the key dimensions of this cultural discourse. On the surface, artists with a spiritual-flavored view of the cosmos may have been disengaged from the modernist technologically minded utopians, but in fact they were linked by a network united in the cause of space exploration. And like their more "scientifically minded" space-enthusiast colleagues, the artists produced their populist work largely isolated from the elite Soviet scientific and technical intelligentsia of the NEP era.

Literature

The most widely disseminated media for communicating ideas about space exploration was *nauchno-fantastika* (literally, "scientific-fantasy"). Although many historians have explored the various dimensions of Soviet science fiction in the early

[69] Samoilovich, *Grazhdanin vselennoi* (cit. n. 1), 181.
[70] "Vospominaniia Z. G. Piatetskogo," r. 4, op. 14, d. 198, l. 38, ARAN; "Vospominaniia O. V. Kholoptsevoi," r. 4, op. 14, d. 198, l. 11, ARAN.
[71] Comments from Rynin, *Rockets* (cit. n. 44), 205–6.

decades of the twentieth century, its use of *space* as a plot or philosophical device has remained largely unscrutinized.[72] Space fiction, which constituted about one-fifth of all Soviet science fiction in the postrevolutionary period to World War II, was remarkable for its disproportionate social resonance given the subgenre's low numbers. To some degree, most of the space-related works reflected the same characteristics of the broader science fiction literature, that is, almost all such works were technologically optimistic and can be divided into adventure stories (*krasnyi pinkerton,* or "red detective") and future utopias. Richard Stites's claim that "[Soviet s]cience fiction was a striking example of revolutionary discourse because of its total vision of communist life and its treatment of 'revolutionary dreams'" was also true for the smaller subset of space fiction.[73] Although the stories were less about social than technological revolution, the prevailing mood of revolution allowed the latter to be conflated with the former.

The most famous Soviet science fiction novel of the 1920s, Aleksei Tolstoi's *Aelita: Zakat Marsa* (Aelita: Sunset of Mars), first published in serialized form in 1922–23, remains the most famous *space* fiction work of the period.[74] It also perfectly encapsulated the contradictory themes of space advocacy in the 1920s. In the story, an engineer and a soldier voyage to Mars, where the latter incites a proletarian revolution among the bourgeois Martians. Aelita is the queen of Mars who falls in love with the Red Army soldier. On one level, the novel incorporates many elements of postrevolutionary utopian science fiction: a bourgeois enemy, a socialist revolution, modern science and technology, adventure and romance borrowed from Edgar Rice Burroughs, and utopian dreaming. Yet *Aelita*'s narrative also has hints of mysticism, especially ideas infused with theosophy and ancient anthroposophic ideas, not dissimilar to Fedorov and Tsiolkovskii's Cosmist views of the universe.[75] Defending his position from critics who blamed him for being too "emotional" in the novel, Tolstoi wrote, "Art—an artistic creation—appears momentarily like a dream. It has no place for logic, because its goal is not to find a cause for some sort of event, but to give in all its fullness a living piece of cosmos."[76] His use of the lexicon of panpsychism suggests a link to the mystical side of Tsiolkovskii and the Cosmists.[77]

Aelita, despite its invocation of space travel, or maybe because of its Cosmist overtones, was a novel less about looking forward than looking to the past. Although regarded as the most important Soviet science fiction novel of the period, *Aelita*, Halina Stephan rightly claims, "concluded rather than inaugurated a literary tradition." Yet, the technologically minded spaceflight enthusiasts of Tolstoi's day avoided the mysticism and found it futuristic since the novel was the first of the period that used a rocket for interplanetary travel. Members of the Moscow Society for the Study of

[72] For general reviews of early Soviet science fiction, see Darko Suvin, "The Utopian Tradition of Russian Science Fiction," *Modern Language Review* 66 (1971): 139–59; A. F. Britikov, *Russkii Sovetskii nauchno-fantasticheskii roman* (Leningrad, 1970); Patrick L. McGuire, *Red Stars: Political Aspects of Soviet Science Fiction* (Ann Arbor, Mich., 1985).

[73] Stites, *Revolutionary Dreams* (cit. n. 7), 167–8.

[74] The novel was originally published in three serialized parts in the journal *Krasnaia nov'*. In 1923, it was published as a stand-alone novel as *Aelita* (*Zakat Marsa*) (Moscow, 1923).

[75] Halina Stephan makes a similar point. Stephan, "Aleksei Tolstoi's *Aelita* and the Inauguration of Soviet Science Fiction," *Canadian-American Slavic Studies* 18 (1984): 63–75.

[76] Tolstoi quoted in ibid., 72–3.

[77] See also Ian Christie, "Down to Earth: *Aelita* Relocated," in *Inside the Film Factory: New Approaches to Russian and Soviet Cinema*, ed. Richard Taylor and Ian Christie (London, 1991), 97–8; Rosenthal, introduction to *Occult in Russian and Soviet Culture* (cit. n. 12), 25.

Interplanetary Communications were so taken by Tolstoi's use of the rocket that they considered using the story to develop a film script—a project that was brought to fruition by others.[78]

Film

The movie version of Tolstoi's *Aelita* appeared soon after publication of the print version and was directed by Iakov Protazanov, the Russian film director of pre-revolutionary fame.[79] Released officially in September 1924 at the peak of the space fad, *Aelita* has since been hailed as the most important Soviet science fiction movie of the interwar era. It also contributed enormously to the popularization of spaceflight in Soviet culture in the 1920s. For example, interest in the movie after its release drove up attendance numbers at interplanetary talks sponsored by space societies such as the OIMS. The film also established a new standard for Soviet cinema, if not in quality, then certainly in popularity and hype. Weeks of intense advertising campaigns in *Pravda* and *Kino-gazeta* (Movie gazette) preceded its release, while airplanes dropped thousands of leaflets announcing the opening over Voronezh.[80] Tickets for the opening shows sold out, and the size of the crowd on opening night prevented even Protazanov from attending.

Protazanov, who, like Tolstoi, had only recently returned to the Soviet Union from exile, engineered a significant transformation in Tolstoi's relatively conventional novel, producing a remarkable movie that not only mirrored and telescoped many prevailing social concerns of the NEP-era in movie form but also critiqued Tolstoi's novel itself. With the help of scriptwriters Aleksei Faiko and Fedor Otsep, Protazanov reimagined Tolstoi's original account of the voyage to Mars as a dream in the mind of the protagonist Los'.[81] The so-called revolution on Mars—which occupies only one-fourth of the film—is riddled with ambiguities that do not demarcate strictly along bipolar lines (capitalist-communist, benevolent-exploitative); nothing is really what it seems. Here, Los' is not simply a one-dimensional caricature of the new Soviet man but rather a man living in and mirroring the contradictory realities of NEP life.

[78] Leiteizen to Tsiolkovskii, 4 May 1924, Moscow, f. 555, op. 4, d. 356, ll. 2–3, ARAN. In addition to *Aelita*, Aleksandr Bogdanov's *Krasnaia zvezda* (Red star) enraptured space enthusiasts of the period. Less about spaceflight than about an idealized Communist utopia on the planet Mars, the novel has also been seen by some scholars as a warning on how socialism might take on distinctly totalitarian tones if sufficiently militarized. The Society for the Study of Interplanetary Communications evidently established communication with Bogdanov in 1924, interested in his idea of using atomic power to propel spaceships. Space enthusiasts were less likely to explore Bogdanov's philosophical arguments than his technological vision; both parties shared a view of technology as autonomous, positive, and liberating. Loren R. Graham, "Bogdanov's Inner Message," in *Red Star: The First Bolshevik Utopia*, ed. Loren R. Graham and Richard Stites (Bloomington, Ind., 1984), 241–53.

[79] M. Aleinikov, *Iakov Protazanov: O tvorcheskom puti rezhisera*, 2nd ed. (Moscow, 1957); Aleinikov, *Iakov Protazanov* (Moscow, 1961); Ian Christie and Julian Graffy, eds., *Protazanov and the Continuity of Russian Cinema* (London, 1993); Denise J. Youngblood, "The Return of the Native: Yakov Protazanov and Soviet Cinema," in Taylor and Christie, *Inside the Film Factory* (cit. n. 77), 103–23.

[80] The movie was produced by a new multinational company, Mezhrabpom-Rus', a joint Russian-German company that combined Mezhrabpom (International Workers' Aid), a Berlin-based relief organization and Rus', a Russian production company formed in 1918. Richard Taylor, *The Politics of the Soviet Cinema, 1917–1929* (Cambridge, UK, 1979), 74.

[81] Faiko and Otsep made changes to the original plot with Tolstoi's agreement. Aleinnikov, *Iakov Protazanov* (cit. n. 79), 32. Most Western sources incorrectly list his name as "Otsen" instead of the correct "Otsep."

In the movie *Aelita*, Protazanov sought to produce an "impartial" work, so the negative response surprised him. By and large, the state media criticized the film. In fact, the movie caused so much controversy that as late as 1928, newspapers and journals were still engaged in attacking the movie for being "alien to the working class," for its "petty bourgeois ending" because Los' returns to the domesticities of marriage, and for being "too Western."[82] Although many critics wrote off *Aelita* as a misstep in Protazanov's long career, it was an incredibly popular film; it did, after all, feature evocative acting, exotic scenes in interplanetary space, a glamorous princess, and women in provocative costumes. Grigorii Kramarov, the head of the OIMS, later underscored how "the book and film played a significant role in strengthening interest towards interplanetary communications and contributed to the development of activities of our Society."[83] Among those deeply affected by the hoopla over *Aelita* was ten-year-old Vladimir Chelomei; forty-five years later, as general designer of the Soviet space program, he named a new project of his, a huge space complex to send the first Soviet cosmonauts to Mars, *Aelita*.[84]

Art

Besides *Aelita*, both the novel and the film, other Russian works of art crossed the lines dividing technology and mysticism. Some scholars have claimed connections between the Russian avant-garde and Cosmism, arguing that the universal views of Nikolai Fedorov deeply influenced artistic personalities such as Vasilii Kandinskii, Kazimir Malevich, and Pavel Filonov.[85] But these connections were neither monolithic nor consistent. No single movement encapsulated the contradictions of the Soviet space fad better than did the Suprematists. Mentored by one of the legendary artists of the Russian avant-garde, Malevich, the Suprematists exemplified the duality and ambiguity of the space fad, cutting across not only mysticism (Cosmism) and science (space technology) but also the time and politics of the imperial and Bolshevik eras.

Suprematism as an organized movement of Russian and Soviet artists developed in the mid-1910s by extending and rejecting many of the foundations of Cubism. It reached its peak right after the October Revolution and then expanded into other media (principally architecture) in the early 1920s before losing direction late in the decade. Malevich had unveiled Suprematism at an exhibition of futurist art in 1915, with works that in their geometric shapes and colors completely dispensed with representations of conventional space and perspective. The paintings acquired a peculiarly compelling nature by the juxtaposition of colors and shapes that conveyed a continuum of space and time rather than self-contained and defined objects or ideas.

[82] Youngblood, "Return of the Native" (cit. n. 79), 111–2; Youngblood, *Soviet Cinema in the Silent Era, 1918–1935* (Ann Arbor, Mich., 1985), 30–2. For a list of reviews, see Aleinikov, *Iakov Protazanov* (cit. n. 79), 408. For Protazanov's comment about being "impartial," see p. 31 of Aleinikov's study.

[83] Kramarov, *Na zare kosmonavtiki* (cit. n. 37), 19–20.

[84] Asif A. Siddiqi, *The Soviet Space Race with Apollo* (Gainesville, Fla., 2003), 745–54.

[85] Iurii Linnik, *Russkii kosmizm i russkii avangard* (Petrozavodsk, 1995); Michael Holquist, "Tsiolkovsky as a Moment in the Prehistory of the Avant-Garde," in *Laboratory of Dreams: The Russian Avant-Garde and Cultural Experiment*, ed. John E. Bowlt and Olga Matich (Stanford, Calif., 1996), 100–17.

Malevich himself called his work the "nonobjective world," that is, a perception of the environment's distilled spaciousness.[86]

Such an approach naturally led many Suprematist artists to eulogize first aviation and then ultimately the cosmos as the ultimate environment of spaciousness. In their paintings, such as Boris Ender's *Cosmic Landscape* (1923), space—both cosmic and otherwise—became an integral part of the composition instead of "filler" in more traditional artistic creations. Malevich expressed interest in the most modern frontiers of art and science and technology, and he spent many years in pursuit of what he called the "science of art." He firmly believed in the power of technological "progress" and, like many other intellectuals of the day, supported the perfection of nature via artificial means. Malevich wrote, "I shall make my whole state comfortable and convenient, and, what is more, I shall convert other states and eventually the whole globe to my comfort and convenience."[87] His writings show an undeniably technologically utopian gloss, sprinkled with flirtations with anarchist ideas. Some scholars have suggested that Malevich, like many other Russian intellectuals, was captivated by mysticism and theosophy. For example, Igor Kazus claimed Malevich was "the first Russian artist to take note of [Fedorov's views of the universe, and] placed [them] at the base of Suprematism." [88] Malevich's many writings and works, however, suggest that his works were attempts to merge some of the disparate ideological underpinnings of modernity and spiritualism, that is, technological utopianism and mysticism.

Malevich's interest in spatial ideas beyond Earth first manifested themselves after 1916. As he wrote to a friend, "Earth has been abandoned like a worm-eaten house. And an aspiration towards space is in fact lodged in man and his consciousness, a longing to break away from the globe of the earth."[89] Paintings at the time show geometric forms (usually squares or rectangles) with hollowed-out spaces and stretched drops of color, drenched in white light that highlighted things unimaginable on Earth, that is, without reference to any form of nature. There was literally no up or down. Malevich's engagement with spatial ideas in the cosmic sense reached a zenith in 1917–18, during the height of the revolutionary years and just after the first major references to space travel appeared in the media. In 1919, he explicitly articulated the notion that Suprematism itself could be part of the project of space exploration:

> Between [Earth and the Moon], a new Suprematist satellite can be constructed, equipped with every component, which will move along an orbit shaping its new track. . . . I have ripped through the blue lampshade of the constraints of color. I have come out into the white. Follow me, comrade aviators! Swim into the abyss. I have set up the semaphores

[86] Larissa A. Zhadova, *Malevich: Suprematism and Revolution in Russian Art, 1910–1930* (London, 1982), 49–50.

[87] Serge Fauchereau, *Malevich* (New York, 1993), 27.

[88] Quotation from Igor A. Kazus, "The Idea of Cosmic Architecture and the Russian Avant-Garde of the Early Twentieth Century," in Clair, *Cosmos* (cit. n. 22), 194. John Golding also notes that "Malevich had . . . fallen under the spell of other occultists and pseudo-scientists fascinated with ideas about the fourth dimension, which had already been disseminated by the turn of the century." Golding, *Paths to the Absolute: Mondrian, Malevich, Kandinsky, Pollock, Newman, Rothko, and Still* (Princeton, N.J., 2000), 62. See also Igor A. Kazus, "Cosmic Architecture and the Russian Avant-Garde," *Project Russia* 15 (undated): 81–8. For a compelling and convincing counterargument, see Zhadova, *Malevich* (cit. n. 86), 59.

[89] Quoted in Zhadova, *Malevich* (cit. n. 86), 124n39.

> of Suprematism. I have overcome the lining of the colored sky. . . . Swim! The white free abyss, infinity is before you.[90]

Some of Malevich's paintings from this period, such as *Suprematism* (1917) and *Drawing* (1918), depict objects not dissimilar to what we might today call space stations or futuristic cities in the cosmos. Malevich, of course, never alluded to them as such, and most certainly would not have known about such things given that few people in the world had yet articulated similar ideas in print. Yet the paintings show a remarkable understanding of the basic concepts of space travel, particularly the idea of space stations, and predate similar artistic visions that were common in Soviet popular science journals and pulp fiction of the 1920s. Malevich's fascination with the cosmos peaked around 1918 with his attempts to achieve an absolute spaciousness with pure whiteness, a white light of infinity that he represented in perhaps his most extreme avant-garde experiment, *White Square on White* (1918).

Like Malevich's works, many of his protégés' works hinted at a Fedorovian or Cosmist view of space. The case of the Society of Easel Painters (OST), which included a number of Malevich protégés, perfectly encapsulated the tensions between technological utopianism and Cosmism in the Soviet space fad of the 1920s. Like many in the Soviet avant-garde, the OST were taken with the wonders of technology and believed that art should mirror and interpret technological advancement in both mechanistic and abstract ways. Artists such as Vladimir Liushin, who produced *Station for Interplanetary Communications* (1922), seemed wholly beholden to the power of the machine to benefit society.[91] Yet Ivan Kudriashev, a Malevich protégé, eventually gravitated to a different view of the cosmos. Unlike other artists, Kudriashev had a direct connection to the space advocacy community: his father, a model builder, had been employed by Tsiolkovskii to build some of his conceptions. The younger Kudriashev accompanied his father on a visit to see the old man and translated Tsiolkovskii's technical terms for the model builder.[92] Kudriashev's philosophy, underlined in messianic essays about the expansion and settlement of humanity throughout the solar system, suggested a closer emotional affinity to Fedorov's mystic ideas than to earlier Suprematist works. Other Malevich followers, Lazar Lisitskii and Georgii Krutikov, explored a new type of architecture designed for "flying cities." These ideas stemmed not only from a fascination with space but also from the utilitarian view that because living space on the Earth was limited, one had to devise other spaces for habitation, a distinctively Fedorovian view of life.[93]

The most striking example of artistic fascination with space resulting from the meeting between the artistic avant-garde and the philosophy of Cosmism was in the work of the informal Soviet artists' group known as Amaravella. The self-contained contradictions characteristic of Russian Cosmist philosophy characterized their work: although they advocated a universal and cosmic consciousness to life and art, their art reflected deeply national influences (such as medieval Russian art), and their philosophy followed the tradition of a nationalist Russian approach to the cosmos, best

[90] Ibid., 57

[91] Vladimir Kostin, *OST* (*Obshchestvo stankovistov*) (Leningrad, 1976); John E. Bowlt, "The Society of Easel Artists (OST)," *Russian History/Histoire Russe* 9, nos. 2–3 (1982): 203–26.

[92] Kostin, *OST* (cit. n. 91), 24–6; Zhadova, *Malevich* (cit. n. 86), 129n19.

[93] S. O. Khan-Magomedov, "Proekt 'letaiushchego goroda,'" *Dekorativnoe iskusstvo*, 1973, no. 1:30–6; Kazus, "Idea of Cosmic Architecture and the Russian Avant-Garde" (cit. n. 88), 196–7.

underscored by many of Fedorov's followers. Superficially, the group aspired to combine the most modern aspects of both science and art, the progenitors of a long tradition during Soviet times, but on a deeper level, theirs was the lexicon of both "rational" and "irrational" science, of both modern and archaic art.[94]

Petr Fateev, a thirty-two-year-old painter, formed and led the original Amaravella around 1922. It reached a stable membership of a few energetic and inspired artists such as Viktor Chernovolenko, Aleksandr Sardan, Sergei Shigolev, and Boris Smirnov-Rusetskii by 1927–28, when the name Amaravella was coined, apparently derived by Sardan from a Sanskrit word meaning "bearing light" or "creative energy." The group, which operated as a commune, explored a remarkably wide range of ideas and approaches to art based on the members' nebulous philosophical ideas about cosmic harmony. Sardan, who was also a professional musician, produced compositions that were combinations of sound, painting, and architecture. His works such as *Sound in Space* (1920), *Lunar Sonata*, and *Cosmic Symphony* (both 1925) tried to represent the "sound" of architecture through vivid colorful hues that aspired toward a cosmic (aural) harmony. Other works such as *Earth, Ocean, Space* (1922) and *Cosmic Motive* (late 1920s) addressed his philosophical views, some of them borrowed from eastern philosophies, while *From the Moon to Space Way* (1930) and *Earthly Beacon and Signals from Space* (1926) elucidated technical ideas. The group exhibited their works several times, including once in New York in 1927, when six of Sardan's paintings were displayed at an exhibition organized by the Russian avant-garde artist Nikolai Rerikh. Rerikh, in turn, served as a link to the "other" space advocate community, centered on Tsiolkovskii: he befriended Aleksandr Gorskii, an influential Cosmist and occultist who himself moved to Kaluga, Tsiolkovskii's adopted hometown, in the 1930s.[95]

LINKING COMMUNITIES: BIOCOSMISTS

At the very extreme of the continuum from technological utopianism to Cosmism were those who were fully engaged in a spiritual and sometimes occultlike interest in space exploration. In the early 1920s, the most explicit mark of Cosmism's imprint emerged through scientific, cultural, and artistic icons such as Vladimir Vernadskii (the geochemist), Vladimir Zabolotskii (the poet), and Maksim Gor'kii (the writer) but also via short-lived groups such as the Anarchist-Biocosmists. The group (also known as the Biocosmist-Immortalists) coalesced in 1921 after the state's crackdown on anarchists following the funeral of famous Russian anarchist Petr Kropotkin. When the authorities arrested an anarchist group named the Universalists, a new collective, the Anarchist-Biocosmists, replaced them; adherents pledged their support to the Bolsheviks but also announced their goal of initiating a social revolution "in interplanetary space."[96] The group, which had factions in both Moscow and Petrograd, briefly published a journal, *Bessmertie* (Immortality), under the banner "Immortalism

[94] For survey of the vast literature on the union of science and art in the Soviet Union, see the special issue of *Leonardo* 27, no. 5 (1994), under the banner "Prometheus: Art, Science, and Technology in the Former Soviet Union."

[95] Iurii Linnik, *Amaravella: Put' k pleiadam; Russkie khodozniki-kosmisty* (Petrozavodsk, 1995), 82–145; Linnik, "Amaravella," *Sever*, 1981, no. 11:108–14.

[96] For the original Biocosmist manifesto, see A. Sviator, "Biokosmicheskaia poetika," in *Literaturnye manifesty ot simvolizma do nashikh dnei*, ed. S. B. Dzhimbinov (Moscow, 2000), 305–14, on 305.

and Interplanetarianism." In their manifesto, issued in 1921, they announced several goals, including victory over space ("not air navigation . . . but cosmic navigation"). They declared the two basic human rights to be the right to exist forever and the right to unimpeded movement in interplanetary space. Inspired by Fedorov's ideas, they wanted to abolish death, colonize the universe, and then resurrect those who had already died.[97] Just after Lenin's death, the Anarchist-Biocosmists published an official statement in *Izvestiia* arguing that all was not lost as the "[workers] and the oppressed all over the world could never be reconciled with the fact of Lenin's death."[98]

Devotees of Cosmism and Fedorov's philosophy were connected to the technological utopian spaceflight community via a network that highlighted the fine line between science and mysticism. Tsiolkovskii, someone who was equally at ease writing about propellant masses as about victory over death, was naturally the most obvious and important link between the two sides.[99] There were other, more famous links. During the 100th anniversary of Fedorov's birthday, Maksim Gor'kii, a devotee of Fedorov's, famously declared in an interview in *Izvestiia* that "freedom without power over nature—that's the same as freeing peasants without land."[100] It is less well known that Gor'kii, who also believed in the search for immortality, considered Tsiolkovskii to be an important scientific and philosophical thinker. During his exile, the writer had heard of Tsiolkovskii via the latter's 1925 work *Prichina kosmosa* (Reason for space), a meditation on humanity's spiritual calling to go into space. Although Gor'kii intended to visit Tsiolkovskii in Kaluga upon his return to the Soviet Union in 1928, the two never met. Tsiolkovskii, however, sent Gor'kii many of his brochures on Cosmist philosophy, and they evidently resonated deeply with the writer; Gor'kii sent a well-publicized congratulatory letter to the "interplanetary old man" (as he liked to call Tsiolkovskii) on his seventy-fifth birthday in 1932.[101]

Even at the extreme of mysticism, people remained connected with the technological utopians. One well-known Biocosmist member, Leonid Vasil'ev, who was also a respected researcher of telepathy, maintained a friendship with Aleksandr Chizhevskii, the young intellectual and well-known Cosmist who wrote extensively on the relationship between cosmic factors (such as sunspots) and social activity on Earth. Chizhevskii lived in Kaluga briefly and later wrote a massive memoir on his relationship with Tsiolkovskii.[102] Chizhevskii also holds a special place in the history of Soviet space exploration: he wrote the famous German-language introduction for the 1924 Tsiolkovskii monograph that effectively set off the Soviet space fad of the

[97] "Deklarativnaia rezoliutsiia," *Izvestiia VTsIK*, 4 Jan. 1922. The Biocosmists unsuccessfully tried to recruit such prominent scientists as Eugen Steinach and Albert Einstein. Michael Hagemeister, "Die 'Biokosmisten'—Anarchismus und Maximalismus in der frühen Sowjetzeit," in *Studia slavica in honorem viri doctissimi Olexa Horbatsch*, ed. Gerd Freidhof, Peter Kosta, and M. Schutrumpf, vol. 1, pt. 1 (Munich, 1983), 61–76; Hagemeister, "Russian Cosmism in the 1920s and Today" (cit. n. 16), 195–6.

[98] A. Sviatogor, N. Lebedev, and V. Zikosi, "Golos anarkhistov," *Izvestiia VTsIK*, 27 Jan. 1924.

[99] Tsiolkovskii also communicated with an international association, devotees of a philosophy similar to Russian Cosmism, known as the Association Internationale de Biocosmique, based in Lyon, France. Ass. Int. Biocosmique to Tsiolkovskii, [illegible but probably 16 April 1934], Lyon, f. 555, op. 3, d. 200, ll. 12–3, ARAN.

[100] A. Gornostaev, "N. F. Fedorov," *Izvestiia*, 29 Dec. 1928.

[101] Gor'kii to Tsiolkovskii, n.d., 1932, n.p., f. 555, op. 4, d. 183, l. 1, ARAN. For Gor'kii and Tsiolkovskii in general, see G. Chernenko, "Sorrento—Kaluga—Moskva," *Nauka i zhizn'*, 1972, no. 6:46–8.

[102] A. L. Chizhevskii, *Na beregu vselennoi: Gody druzhby s Tsiolkovskim; Vospominaniia* (Moscow, 1995).

1920s, enrapturing the technological utopians who wanted to build rockets to bring the Soviet Union into the modern world.[103]

UTOPIA ABANDONED?

The political, social, and cultural climate dramatically changed in the Soviet Union between the early 1920s, when the fad began, and the early 1930s, when the fad ended. The combined repercussions of the Cultural Revolution, the First Five-Year Plan, and nationwide collectivization completely transformed much of Soviet society. For those involved in scientific or technical work, the Shakhty trial and the Industrial Party affair redefined, with tragic consequences, the boundaries of "proper" behavior and expression. Party ideologues purged out of influential positions a huge number of old specialists, especially those with roots in prerevolutionary times.[104] They also removed "old influences" from the editorial boards of several popular science journals. The government absorbed P. P. Soikin's semiprivate publishing company, perhaps the most important promoter of space-related themes, and changed the profiles of several of its former journals. Although science popularization still remained a very important project for Bolsheviks, the tenor of outreach changed. The journal *Priroda i liudi*, for example, changed its name to *Revoliutsiia i priroda* (Revolution and nature) to reflect the explicitly utilitarian, socialist, and applied nature of its message. Its stated goal was now to popularize "technology for the masses." Similarly, the elite Academy of Sciences, although disconnected from the populist space fad, underwent a process of "Bolshevization" that significantly limited its independent voice in matters of science so that it could refocus attention to applied, rather than fundamental, science.[105]

The rise of the state (both government and party) as a ubiquitous and inescapable force in society at the turn of the 1930s profoundly affected the indigenously maintained space fad. In particular, the Bolshevik Party's effort to realign scientific and technical work in the country for socialist reconstruction proved decisive. After an explosion of media attention at the turn of decade, by 1933, the space fad was nearly over. The metamorphosis was striking. In 1931, the press published nearly two dozen articles on spaceflight; in 1932, less than a dozen; the following year—when there were no private popular science journals left—no more than a handful. The same journals that had popularized utopian discussions about space travel now devoted more attention to technical knowledge applicable to workers on the shop floor. Linking science to industrial productivity marginalized many seemingly outlandish ideas such as space exploration. Societies, exhibitions, media, and art on the topic either disappeared or mutated into new forms.

A few spaceflight supporters from the 1920s were casualties of the Great Terror, although it is important to underscore that none suffered *because* of their advocacy of space travel. Cosmist philosopher N. A. Setnitskii lost his life in the late 1930s,

[103] Alexander Tshijewsky, "Anstatt eines Vorworts," preface to K. E. Tsiolkovskii, *Raketa v kosmicheskoe prostranstvo* (Kaluga, 1924), unnumbered preface page.

[104] Kendall E. Bailes, *Technology and Society under Stalin: Origins of the Soviet Technical Intelligentsia, 1917–1941* (Princeton, N.J., 1978).

[105] Michael David-Fox and György Péteri, eds., *Academia in Upheaval: Origins, Transfers, and Transformations of the Communist Academic Regime in Russia and East Central Europe* (Westport, Conn., 2000); Andrews, *Science for the Masses* (cit. n. 45), 130–4.

while Tsiolkovskii's friend Aleksandr Chizhevskii was arrested in 1940 and eventually spent sixteen years in domestic exile. In 1939, the People's Commissariat of Internal Affairs (NKVD) shot Morris Leiteizen, former secretary of the Society for the Study of Interplanetary Communications and the son of an old Bolshevik who had been a friend of Lenin's. Mikhail Lapirov-Skoblo, one of the earliest advocates for spaceflight in the 1920s, also fell to the purges. After a very distinguished career as a vocal spokesperson for the Soviet scientific and technical intelligentsia, he was arrested in 1937, sentenced in 1941, and died in confinement in 1947 while working at a battery factory.[106]

Artists and writers also fell during the upheavals of the Cultural Revolution and the Great Terror. During the former, the Suprematists came under attack from the Association of Russian Revolutionary Painters (AKhRR) as part of a general move to discredit the artistic avant-garde.[107] Similarly, the Proletarian Writers' Association launched a campaign that discredited the genre of science fiction, calling the style a distraction to the problems at hand. By 1936, the government included *Aelita* on its list of banned movies; the NKVD arrested some science fiction writers in the late 1930s while the government removed even Jules Verne from children's literature. Soviet science fiction did not recover from the resultant consequences until the Khrushchev era.[108]

Most space advocates, however, survived. They successfully embraced the discursive shift from indefinite utopia to definite industrialization by changing their strategies. Popularizers and enthusiasts altered their lexicon rather than changing their vision. Many, for example, refocused their attention from rockets flying in space to the purer engineering problem of "reactive motion." Through the 1920s, interplanetary travel had always been connected to the development of reactive motion, that is, with rocket and jet engines. In the early 1930s, however, activists and enthusiasts disconnected reactive motion from interplanetary travel and connected it with more realistic goals that were part of the prevailing state culture of aviation. Although most space advocates never stopped aiming for outer space, they redefined the problem into smaller chunks, the first step being "conquering the stratosphere" using the principle of reactive motion. Stratospheric flight literally and metaphorically lowered the ceiling of ambition while locating the original idea of space exploration within prevailing aviation culture. Reactive motion implied a real engineering problem with real solutions; it also held immediate utility as such a principle could be used to propel airplanes. Many enthusiasts in Europe had already demonstrated the possibility. The limits of possibility moved downward from the cosmos to the clouds.

CONCLUSIONS

From the perspective of the Soviet state, the space fad was of no importance. During its existence, no major party or government official was involved in the activities of

[106] Semenova, "Russkii kosmizm" (cit. n. 15), 96–7; Roy Medvedev, *Let History Judge: The Origins and Consequences of Stalinism*, rev. ed. (New York, 1989), 444; E. N. Shoshkov, "Lapirov-Skoblo Mikhail Iakovlevich," in *Repressirovannoe ostekhbiuro* (St. Petersburg, 1995), 137.

[107] Fauchereau, *Malevich* (cit. n. 87), 31–3.

[108] McGuire, *Red Stars* (cit. n. 72), 13–5; Peter Kenez, *Cinema and Soviet Society, 1917–1953* (Cambridge, UK, 1992), 144; Britikov, *Russkii Sovetskii nauchno-fantasticheskii roman* (cit. n. 72), 137.

either the technological utopians or the mystically minded space advocates. The relatively loose controls over social, cultural, and economic activity during NEP allowed the ideas of space activists to flourish without notice or support from the party and the government. Trotskii's single public comment on the space fad was derisive and cautionary. In a section on proletarian culture and art in *Literature and Revolution*, he argued:

> Cosmism seems, or may seem, extremely bold, vigorous, revolutionary and proletarian. But in reality, Cosmism contains the suggestion of very nearly deserting the complex and difficult problems . . . on earth so as to escape into the interstellar spheres. In this way Cosmism turns out quite suddenly to be akin to mysticism . . . [and may] lead some . . . to the most subtle of matters, namely to the Holy Ghost.[109]

Interest in space, he argued, would lead enthusiasts from the useful to the useless and from science to religion—what Lenin had scorned as the opiate of the masses. Trotskii's comment (disingenuously?) avoided underscoring the connection between science and religion, represented in the space fad by the technological utopians and the mystics, respectively. Both rationales contributed in wholly different ways to the defining of the contours and flavor of the space fad in the 1920s but both also shared many deep-rooted rationales.

The most important contribution of the technological utopians—such as the societies and the popular media—was to link the cause of spaceflight with science and technology. Prior to the 1920s, in the public imagination, space exploration was part of the discourse of fantasy, speculation, and often mysticism. In the 1920s, by linking spaceflight with the sciences and suggesting that space travel was entirely plausible by means familiar to most people, the spaceflight advocacy community brought such ideas into the realm of possibility and the "rational." The link with science, which the Bolsheviks believed provided the way to modernization, also equated spaceflight with "being modern." After the late 1920s, spaceflight became, like aviation, one manifestation of the self-reflexive notion of twentieth-century modernization.

The approach of the technological utopians differed in important ways from that of their fellow Cosmists. Where technology-inspired space advocates looked to a future of many unknown possibilities for humanity, Cosmists looked to the past (the dead) as way station to a singular goal: the reanimation of humanity into a single universal organism. If the former tied their dreams of space exploration (however implausibly) with the modernizing exigencies of the day, the latter were not interested in modernization but the evolution of the species. It is tempting to argue that the tension between these seemingly contradictory ideas provided the charge for the creative outpouring on space exploration in the 1920s; or that both the "old" and the "new" appeal were necessary for mass interest in such an arcane idea as spaceflight. Such assertions would, however, be impossible to test since they raise counterfactual, rather than factual, questions.

A more analytically valuable perspective would be to view the two sensibilities as not altogether incompatible, especially as the boundaries between the two were not always clear. The nearly invisible web of connections via friendship or acquaintance that linked disparate believers in the cause of space travel muddled distinctions

[109] Trotsky, *Literature and Revolution* (cit. n. 11), 211.

between the differing rationales for space travel. Sometimes cold science and ill-defined mysticism existed in the same breath. The artists who emerged from the Suprematist umbrella embodied this duality without contradiction; they worked within the most avant-garde of artistic traditions—materialistic, forward thinking, urban—yet infused their work with Fedorovian views from the late nineteenth century rooted in a pastoral and antimaterialistic aesthetic.

Technological utopianism and Cosmism shared a number of basic elements: both were utopian, both relied on the notion that humanity needed complete control over nature, and both afforded technology a prominent role in the realization of their ultimate goal of transforming society. In their language and iconography, technological utopians spoke with the same evangelical tones as their spiritual compatriots. Like the Cosmists, utopians were obsessed with the future imperatives of humanity and paid fealty to technology, travel, and Tsiolkovskii. In advocating the science of space exploration in the 1920s, "believers" not only used the language of mysticism—the most obvious meeting point between science and religion—but also shared many of the same rationales, goals, and ideologies.

The case of spaceflight culture in the experimental climate of the NEP years provides a striking case in which the demarcations between science and mysticism were at best nebulous. Writing about Bolsheviks' fascination with technology, Anthony J. Vanchu noted that "[w]hile science and technology had the power to demystify religion and magic, they themselves came to be perceived as the locus of magical or occult powers that could transform the material world."[110] In effect, science and technology became a new cosmology in the Marxist-Bolshevik-Leninist context of the interwar years; they were both alternatives to religion and religions themselves. Spaceflight was one vibrant example of this conflation.

Through the decades after the 1930s, Soviet space advocates altered their strategies to fit the needs of practical science and industrialization. Still utopian, they abandoned the mystical for the technological. By the time that cosmonaut Titov declared that he had not found God nor angels in outer space, the religion of space travel could be distilled down to modernity, secularism, and progress. But statements such as Titov's obscured an alternate history of the Soviet space program that harked back to the 1920s, discarded and lost through much of the Soviet era. Titov's willful disengagement of Christ from the cosmos underscored the irony that his achievement had been made possible largely because of people such as Tsiolkovskii who had set out to do the exact opposite, that is, to integrate the mystical and the technological; the modern rocket with its new Communist cosmonaut was conceived as much in a leap of faith as in a reach for reason.

[110] Anthony J. Vanchu, "Technology as Esoteric Cosmology in Early Soviet Literature," in Rosenthal, *Occult in Russian and Soviet Culture* (cit. n. 12), 205–6.