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Socialist Science Cities: from Utopia to Urban Life

Abstract

This article serves as an introduction to the journal's section entitled "Focal Point," which in this issue is devoted to the topic of science cities in socialist societies.

Science cities, also known as technopoles, emerged in both capitalist and socialist societies after World War II. This phenomenon resulted in futuristic images of Silicon Valley and Novosibirsk's Akademgorodok that spread worldwide.

This topic is addressed in more detail in the following three articles of this section focused on models of science cities in state socialist systems, particularly in the Soviet Union and Hungary.

The introduction discusses historiographical patterns in the science cities/technopoles field and contextualizes the three papers

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of this issue. The authors assume that the scholarly interest in science cities and science spaces has shifted from viewing them as extraordinary to recognizing them as part of modern urban life. The purpose of the articles in this section is to inspire researchers to conduct additional analyses of the transnational history of science.

Keywords: *socialist science cities, technopoles, urban history, socialism, science and technology, Akademgorodok*

Socjalistyczne miasta nauki: od utopii do życia miejskiego

Abstrakt

Niniejszy artykuł stanowi wprowadzenie do działu czasopisma zatytułowanego „W centrum uwagi", który w tym numerze poświęcony jest tematyce miast naukowych w społeczeństwach socjalistycznych.

Miasta nauki, znane również jako technopolie, pojawiły się zarówno w społeczeństwach kapitalistycznych, jak i socjalistycznych po II wojnie światowej. Zjawisko to zaowocowało futurystycznymi obrazami Doliny Krzemowej i Nowosybirskiego Akademgorodoka, które rozprzestrzeniły się na cały świat.

Temat ten jest omawiany bardziej szczegółowo w trzech kolejnych artykułach. Artykuły tego działu koncentrują się na modelach miast nauki w systemach socjalistycznych, szczególnie w Związku Radzieckim i na Węgrzech.

Wprowadzenie omawia wzorce historiograficzne w dziedzinie miast nauki/technopolii i odpowiednio kontekstualizuje trzy kolejne artykuły tego tomu. Autorzy zakładają, że zainteresowanie naukowców miastami nauki i przestrzeniami nauki zmieniło się z postrzegania ich jako czegoś niezwykłego na uznawanie ich za część współczesnego życia miejskiego. Celem artykułów tego działu jest zachęcenie badaczy do podjęcia dalszych analiz transnarodowej historii przestrzeni nauki.

Słowa kluczowe*: socjalistyczne miasta nauki, technopolia, historia miejska, socjalizm, nauka i technologia, Akademgorodok*

During World War II, modern science entered a new phase known as Big Science.[1] This term reflects the significant financial, labor and spatial expansion experienced by the academia. The Cold War and the scientific and technological rivalry of the superpowers further fueled global science with large government grants and ambitious goals. The migration of scientists from traditional campuses in the 1960s and 1970s resulted in the emergence of science, education, and knowledge-intensive industry clusters. Geographer Allen Scott accurately used the term 'technopoles' in 1990 to characterize the concentration and spatial specificity of high technology in Southern California.[2] At that time, numerous science cities or technopoles emerged in various countries, including the USA (Silicon Valley, Boston Route 128), the USSR (Novosibirsk's Akademgorodok), the UK (Cambridge Park), France (Grenoble, Sophia-Antipolis), and Japan (Tsukuba), through market processes and state cultivation. This issue focuses on the spatial and memorial heritage of these communities in the socialist East. In the introduction, we discuss some historiographical tendencies in this field and place the following articles in their intellectual context. We think the academic interest in science cities and science spaces, in general, is moving away from seeing them as something extraordinary to the spectrum of modern urban life, and underlines their global impact.

Economists and sociologists have paid considerable attention to technopoles. One of the most influential interpretations of this phenomenon was presented by sociologist Manuel Castells and political scientist Peter Hall in the early 1990s.[3] They studied around 20 urban technopoles and connected them to the worldwide expansion of the information economy. Castells and Hall highlighted the political roots of these spatial development projects. They argue that expressing the synergistic effect of technopoles in a formal model is nearly impossible, and planning for it is difficult. This effect goes beyond the socio-economic structural organization that is individually formed or not in such cities. Their approach raises a core question for social scientists in technopoles: what is the corporate/

[1] De Solla Price was one of the first scholars to use the concept in his work describing nuclear physics and aerospace programs (1963). See Vermeulen (2016) for further developments of the big science framework in other fields, particularly biology.

[2] Scott 1990.

[3] Castells, Hall 1994.

state policy to ensure the successful birth of the science city and its role as a driver of spatial development?[4]

In the early 2000s, some researchers became disillusioned with the idea of technopoles. They argued that a conscious concentration of science, industry, and entrepreneurs in one place could also occur in old urban centers. These scholars suggested that modern telecommunications facilities provide the benefits without the social and transport isolation that is characteristic of science cities.[5] However, in 2003, Henry Etzkowitz formulated the triple helix of innovation concept, inspired by the knowledge economy discourse.[6] This innovative development cycle requires autonomous and cross-funding involvement from universities, industrial companies, and governments to result in a new cluster quality of interaction. Over the last decade, there have been hundreds of technopole attempts worldwide.[7]

This approach focuses on technocracy and development and is inspired by the extending field of innovation studies.[8] Although it has received little attention from historians, the concept of the spatial, institutional, and political complexity of modern science is valuable for historical analysis. Historians typically concentrate on scientific communities, institutions, and the broader social and intellectual context. In their sophisticated review of key academic concepts of scientific work, Hackett and colleagues noted that since the 17th century, there have been three major trends: aggregation of the scale of work, specialization of research fields, and simultaneous synthesis of the latter.[9] In this issue we are the most interested in the aggregation tendency.

In 2005, Margaret O'Mara published a pioneering study on the history of urban knowledge-based clusters in San Francisco, Philadelphia, and Atlanta.[10] O'Mara refers to these cities as 'cities of knowledge' and argues that they emerged simultaneously in historical and spatial dimensions. O'Mara also discusses the long-term trend of suburbanization in American

[4] For example, Benko 2000; Chordá 1996; Forsyth, Crewe 2010; Ferrara, Lamperti, Mavilia 2014.
[5] Komninos 1997.
[6] Etzkowitz 2003.
[7] Miao, Benneworth, Phelps 2015.
[8] Fagerberg 2013.
[9] Hackett, Parker, Vermeulen, Penders 2017.
[10] O'Mara 2005.

cities after World War II, as well as the relocation of industry from city centers to suburbs or rural areas. Furthermore, the author emphasizes the government's Cold War policy of supporting research in knowledge-intensive industries. This policy was embraced by universities, corporations, and individual research teams, creating a new culture in suburban American cities of knowledge. This revitalized the American dream, making Silicon Valley a role model for governments worldwide. This section is inspired by the idea that the spatial organization of the scientific community influences the internal social contexts of science. It enables us to perceive science cities not only as autonomous utopian communities or simply as engines of economic growth.

Socialist science cities emerged under similar circumstances but in a different context. However, they require comments on both parts of this title. On the one hand, the Soviet approach to science, which was later transferred to the Soviet allies, was born in the forge of the First World War, when warring states put scientists at the service of their ambitions and began experimenting with forms that would become Big Science. At the same time, it reflects the peculiarities of the political path opened by the 1917 revolution. As the historian of science Alexey Kozhevnikov notes, the combined experience of the First World War and the Marxist views of the Bolshevik leadership (science as a productive force and an instrument for the construction of socialism) led to the fact that Soviet scientists became close to political power and the socio-economic problems associated with it.[11] The direction of scientific research was no longer set so much from within the academy as from outside, within the spectrum of economic tasks set by communist politicians who shared money and prestige with scientists. The entire tragic history of socialist science in the twentieth century is explained by this duality: scientists, especially academic leaders, in Soviet-style countries lost their autonomy from society but gained an almost boundless ambition to pursue their ideas.

The large industrial city under state socialism was the synonym for development and the place where the proletariat lived and worked. From this perspective, the science city was the synonym of a communist utopia. Although the first experiments with socialist secret nuclear technopoles occurred in the 1940s, the true image of late socialist urban utopia is Novosibirsk's Akademgorodok. A scientific greenfield built in the Siberian

[11] Kojevnikov 2008.

taiga, it was simultaneously a symbol of Soviet regional and scientific frontier development during the Thaw. One of the first studies of socialist science cities was Paul Josephson's work on Novosibirsk Akademgorodok. Josephson highlighted numerous contexts in which Akademgorodok was seen by its inhabitants and contemporaries as a pioneering project and an ideal scientific community.[12] One could say that Josephson's book overstates its utopian content, following the Thaw-era historical narratives of author's local informants interviewed almost forty years after the foundation of Akademgorodok. We think a similar idea (but a different political attitude) of united community is expressed by Maria Rogacheva in her recent book on physicists from Chernogolovka, a science city near Moscow.[13] Rogacheva wonders how Soviet scientists, having embraced Khrushchev's thaw program, were then forced into a pact of silence with the Brezhnev leadership. The point of the pact was that the scientists would do their work for the Soviet military-industrial complex and not get involved in the dissident movement, while the authorities provided them with interesting jobs and higher consumption standards. Based on oral histories, Rogacheva paints a picture of a small community that is not entirely happy with the established system, but understands its own privileged position and is willing to welcome, but not force, change.

The next move to show these academic communities as less cohesive was made by Kate Brown in her work on Richland and Ozersk, the plutonium producing cities in the US and USSR.[14] She coined the term 'plutopia' to describe these cities, associating plutonium with utopian visions. Brown points out that both cities were the products of similar superpower scientific, technological, and spatial policies. She demonstrates how the atmosphere of secrecy in Richland and Ozersk combined with progressive projects in housing, social infrastructure, and job security. The plutopian working class, which made up the majority of the population of both cities, quickly adopted the views of their technocratic supervisors and their scientific staff, seeing their place of living and working as the realization of a middle-class consumer's dream. On the contrary, the temporary personnel of the nuclear facilities (soldiers, construction workers) or the inhabitants of the surrounding villages received much less attention from the leaders of Richland and Ozersk. Anna Veronika Wendland, another

[12] Josephson 1997.
[13] Rogacheva 2017.
[14] Brown 2013.

prominent researcher on nuclear urban culture and politics, in her study of Ukrainian 'atomgrads,' or nuclear cities, shows how, since the 1970s, national tensions and complex relationships have emerged between the (mostly) Russian-speaking technical specialists of the power plants and the (mostly) Ukrainian-speaking rural populations of their sites.[15] This intellectual move allows us to look beyond the utopian image of science and technology of socialist modernity and to see them as instruments of modern politics, working with such large social concepts as nation, class, and economic development.

The Obninsk Digital Project continued this deconstruction of the Thaw-era ideological and memorial images of idyllic communities in Soviet science cities. Galina Orlova shows that administrative and departmental barriers in the world of Obninsk research institutes were porous in Soviet times, with communication between scientists and engineers, but this ability, and the memory of it, disappeared after 1991.[16] Nowadays there is only one dominant narrative in the representations of the collective memory of the city, that of the Institute of Physics and Power Engineering. Despite the real complexity of the Obninsk scientific landscape, where nuclear physicists coexist with radiologists and meteorologists, local historians and authorities tend to imagine their city as a place of pure nuclear energy research. Similarly, the authors of this text have written a paper on how different groups of locals in Novosibirsk's Akademgorodok try to define in their interests and use in city politics the concept of the 'forest city' mentioned by Akademgorodok founder Mikhail Lavrentyev.[17] Finally, one of the most recent publications on socialist science cities is the work of a collective of architects and architectural historians on the Soviet Ukrainian nuclear science city of Pyatihatky near Kharkiv.[18] Lubov Kachemtseva and others focus their attention only on the architectural projects of Soviet science cities, and this approach also prevents them from utopian narratives or images.

To sum up, in addition to innovation cycles and knowledge-based economic development, scholars have focused on complex scientific urban communities and their (re)production, as well as architectural and spatial projects of urban life. We could say that these are the classical topics of

[15] Wendland 2019.
[16] Orlova 2017.
[17] Bugaev, Piskunov, Rakov 2021.
[18] Kachemtseva, Khoroian, Didenko, Antonenko 2022.

urban studies, studied in unclassical urban objects. The interests of this section authors follow these patterns – from architectural and urban design to memory politics and centre-periphery relationships.

Melinda Harlov-Csortán and Máté Tamáska work (2025) less with memory than with materiality – architecture and the embodiment of ideology in stone and concrete. The author compares two exemplary Hungarian socialist cities, Dunaújváros and Paks. The former emerged as a steel center and is associated with the Stalinist proletarian culture of the 1930s–50s. Paks, on the other hand, built a decade later as a city of nuclear power plant workers, was to embody both the post-modernist and technocratic aspirations of late socialism and the national specificity of Kádár's regime. The comparison between these two cities, their functional connections with dominant technologies, the architectural style of buildings, and the urban models led the authors to pose the key questions: what are the urban specifics of science cities in socialist countries, and where they the last ones in Hungary?

Madina Kalashnikova's article (2025) on the opposite is based on interviews with residents of Akademgorodok in Novosibirsk, Dubna and Chernogolovka near Moscow. She focuses on different models of structuring scientific space in people's memories. Her analyses reveal common patterns of retrospective place attachments of scientists, how they (re)produce specific relationships with specific territories and how they label them. Kalashnikova observes a strong class ressentiment among the inhabitants of these privileged scientific cities. For her protagonists, being part of Soviet big science meant privileged access to interesting work, leisure time, and scenic nature. The author reflects on the class category in her interviews and finds her academic informants oppose themselves to working class families. This class tensions reveal a dark side of (post)socialist science utopias where benefits and scientific commitment of some coexist with hard and poorly paid work of others.

Vera Kliueva's text (2025) partly overlaps with this theme, but the author does not focus on the northern Akademgorodok communities in Apatity themselves, but on their significance for the city and region. Kliueva sees this Akademgorodok as a tool for Arctic urbanization and discusses how the changing models of scientific institutions from the 1930s to the 1990s can be seen in this place. Located above the Arctic Circle, Apatity never had the glory or utopian projection that Novosibirsk's Akademgorodok could boast. As an outpost of the Soviet development of the European

North, scientists of Apatity's Akademgorodok worked on the problems of applying science to productive technologies and knowledge. Nevertheless, their culture and education, and their ability to connect the place of their life and work with the national cult of the academician Vladimir Fersman, allow them to give the small town of Apatity an extra significance not only on the map of the Russian North, but also on a country scale.

We think that these papers develop two fields of knowledge. First, they continue the very long academic tendency to see state socialism from an alternative perspective to that of the monolithic state or the Communist Party. There were numerous actors within the party-state machine of the planned economy, some of whom survived the collapse of the 1980–90s and are trying to adapt to or resist market conditions.

Second, the authors show the complex relationship between the state, the economy, and the scientific community in situations of socialist modernities. In a sense, this issue continues the project of the historians of science Agustí Nieto-Galana and Oliver Hochadel on 'emerging cities.'[19] Sharing a similar interest in cities and science as our authors, they used this concept to distinguish the technologically peripheral cities of the late nineteenth century - such as Naples, Barcelona, or Athens – from the knowledge metropolises of London, Paris, or Berlin. From their perspective, science and technology – as practices, policies, or even specific institutions – were not something that could simply be transferred from the capital to the periphery in a finished form. Adopting and adapting the practices of modernity beyond the global cities also changed these practices and created a new quality.[20]

We also look beyond the socialist metropolises of Moscow, Berlin, or Budapest to trace the mastering of science for urban life in socialist modernity. Socialist scientists, architects, and intellectuals worked under the conditions of numerous state ideological or developmental projects of modernity. Even when science cities were seen as a utopian example, urban life continued to disrupt this image with its conflicts over work, housing, social justice, and commemoration. We believe that this issue will stimulate other colleagues around the world to explore their cities and the space of science to achieve more and more fruitful results. As a social behavior

[19] Hochadel, Nieto-Galana 2016.
[20] Hochadel, Nieto-Galana 2019.

and social institute, the Academy is constantly evolving, and as part of that, we are most interested in tracking these changes.

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