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Outer space technopolitics and postcolonial modernity in Kazakhstan

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ABSTRACT

This article examines the role of outer space technopolitics in post-Soviet Kazakhstan. It explores how outer space, the technological artefact of global relevance, works as a postcolonial fetish of modernity that is called upon to produce what it represents, that is, the reality of a technologically advanced Kazakh nation. The article shows that in its project of becoming a spacefaring nation the country reiterates major incentives that have motivated nuclear and space programme development in the postcolonial context of the Global South. It explores how collaboration with Russia allows Kazakhstan to claim its share in the Soviet space legacy rather than to distance itself from it. The study then traces the rise of a new internationalism in the Kazakhstani space programme outside the post-Soviet context. The article contributes to the debate on postcolonial technopolitics and shows how outer space has been used to enhance the conventional domain of postcolonial national ideologies – nativism and tradition – with technology and science. Finally, it depicts how the growing resistance to the space programme among Kazakh civil society groups reveals a close association of the environmental agenda with an 'eco-nationalism' permeated by a profoundly anti-imperial and, ultimately, anti-authoritarian political discourse.

Introduction

On the 10 February 2021, the President of Kazakhstan, Kassym Zhomart Tokayev, congratulated Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi, on behalf of the people of Kazakhstan on the magnificent accomplishment of the United Arab Emirates (UAE): the entry of the Al-Amal satellite into the orbit of Mars. In his address, President Tokayev not only acclaimed the achievement of the UAE in having joined the ranks of space powers, but also expressed his confidence in the future joint space programme of Kazakhstan and the UAE at the world famous Baikonur Cosmodrome (*Inform.kz* 2021). This article examines how the space technopolitics of Kazakhstan, which began as a story of forced, if not reluctant, dealing with the legacy of Soviet space infrastructure – Baikonur – inherited by the country in 1991, was transformed into an important instrument for the shaping of the image of Kazakhstan as a

technologically advanced nation, building its alliances in the international arena and mobilizing its scientific and technological resources for envisioning the new global identity of the country.

A burgeoning literature on the symptoms of postcolonial politics and identity in post-Soviet space and postcolonial writing *in* and *about* various regions of the former Soviet Union has asserted the potential benefits of a productive engagement with the theoretical framework of postcolonialism (Beissinger and Young 2002; Kandiyoti 2002; Adams 2005; Chari and Verdery 2009; Abashin 2015). This article sets out to examine the ambiguity of the Kazakhstani project of becoming modern through the lens of the concept of 'postcolonial modern', deploying for this purpose the example of Kazakhstani outer space technopolitics. It shows how the pragmatic assertion of the legacy of the Soviet space exploration programme, rather than the dismissing of it as an imposed colonial venture, has facilitated the development of a specifically future-oriented Kazakhstani techno-nationalism. The Kazakhstani strategy of reappropriating the socialist modernization experience, embodied in Soviet space technology in the guise of a narrative of national development, provides an example of a pragmatic state technopolitics. It recycles the legacy of the Soviet outer space programme in order to produce an image of a global, prosperous and technologically advanced independent nation-state.

Advances in the use of space and their growing impact on most aspects of everyday life have not only served to connect the whole world, but have also entrenched divisions between those who have access to technology and those who do not (Kellner 2001). The spacefaring ambitions of semi-peripheral postcolonial nations in this context emerge as a response to this new form of inequality, driven as they are by a desire to escape their underdeveloped status, reinvent their national identity and reassert their position on the global modernity map. 'Postcolonial' in this context refers not to a chronological horizon (the period after being a colony) but to a specific moment in modernity that features a need to come to terms with a global condition where the rules of political subjectivity and of statehood, and the criteria of modernity have been defined in advance by other agencies (Abraham 1998).

Technopolitics provides a valuable resource for uncovering this complex dynamic in post-Soviet space, one still largely neglected in postcolonial studies of the region, which continue to be dominated by studies of culture, memory and nationalism (Bissenova and Medeuova 2016; Tlostanova 2017; Shelekpayev and Chokobaeva 2020) or, indeed, authoritarianism (Schatz 2008; Heathershaw 2010). Some important aspects of the technopolitics of the former Soviet countries have recently been explored in the literature, however, with the major focus being on environmental policies (Josephson 2006; Koch 2015; Peterson 2019), on the impact of the nuclear programme or radiation (Petryna 2002; Josephson 2005; Stawkowski 2016; Brown 2017) or on social studies of programming and cybernetics (Gerowich 2002; Biagioli and Lépinay 2019). The article introduces into this debate the technopolitics of outer space by taking a closer look at how the legacy of Soviet space policy has been recast through state technopolitics in Kazakhstan becoming an element of the nationalizing strategies endorsed by governing elites. The paper also contributes to the field of science and technology studies by examining how the necessity for the development of space technology has been articulated and legitimized in the political and social conditions prevailing

in a postcolonial and semi-peripheral state. Studies of space development have traditionally been dominated by issues of geopolitics being projected on to the cosmos, with an emphasis on security and the military use of space (Dolman 2002; Bormann and Sheehan 2009; Moltz 2012; Pfaltzgraff 2013). The emerging field of the social study of outer space (Dunnett et al. 2019) has opened new perspectives on outer space technology and science by examining their political, social and cultural implications (Andrews and Siddiqi 2011; Geppert 2012; Dick 2015). The majority of these studies explore the wider social impact of space programmes within the current context of the Global North, which continues to be understood as the sole source of advances in space technology (Sage 2014). Through an examination of the growing significance of outer space technology and science both in national identity management and the self-assertion of the image of a developed Kazakhstani nation on the global stage, this article emphasizes the need to engage with technopolitics as an important dimension of post-Soviet nation- and statecraft. In order to analyse the manner in which outer space operates socially and politically, the article employs the concept of a postcolonial 'fetish' of modernity (Pietz 1993), so as to demonstrate how cosmic technological advancement serves as a proxy for development, being both an embodiment of the desire to become modern and an affirmation of this desired status.

Drawing on the analysis of official documents, public discourses and media accounts, the paper examines how in the context of Kazakhstan's newly acquired independence outer space has been used to develop the future-oriented temporality of its national ideologies. It explores how space-related high-technology and science here complement and enhance the conventional retrospective temporality of a postcolonial nation, one that focuses on cultural tradition. To achieve this goal, the article first examines new aspects in the studies of technopolitics emerging with the shift of focus beyond the Cold War superpowers. It then proceeds to map Kazakhstani development in the context of postcolonial and semi-peripheral countries in order to reveal the link between future-oriented space technology and the strategic refashioning of the national self both on the global stage and in the domestic arena. In the following sections the article depicts the Soviet and post-Soviet status of Baikonur as an epitome of Soviet space modernity and its legacy – as inherited by Kazakhstan. It deploys the case of the post-Soviet history of Baikonur to demonstrate how a nationalizing discourse developed by the country's elites incorporates the history of the Soviet space programme into the national narrative of Kazakh scientific and technological development while at the same time reappropriating the Soviet technological legacy for the sake of a Kazakhstani technological future. The analysis then proceeds to develop a conceptualized depiction of outer space technology seen as a 'fetish' of modernity that 'stands in' for the nation's development, providing the means required for fulfilling its aspirations and future achievements. In the final section, the article addresses the critique of the official space policy voiced by Kazakhstani civil society groups, such as Anti-Heptyl, which view the space programme as a neo-colonial enterprise and a destructive force that inflicts harm on both Kazakh nature and Kazakh society. The article explores these protests as linked to a global environmentalist agenda framed in terms of universalist categories, while at the same time maintaining a close association with an 'eco-nationalism' imbued with an anti-Soviet and anti-Russian and, ultimately, anti-authoritarian political discourse.

Technopolitics beyond the Cold War superpowers

The term 'technopolitics' was coined in order to account for 'the ability of competing actors to envision and enact political goals through the support of technical artefacts' (Gagliardone 2014, 3). During the Cold War, spectacular scientific and technological achievements served to manifest geopolitical status, and to demonstrate the success of the modernization and development model. Initially, the question regarding the political use of technologies was dominated by studies in technopolitics from the perspective of the major geopolitical actors, namely the United States, Europe and the Soviet Union (Bills 1990; Leslie 1993; Cathcart 1994; Nardon 2007; Mieczkowski 2013). Nuclear power, computer science and space represented the three main technological systems where the competition between two ideological blocs was played out. These technologies have not been *in* and *of* themselves technopolitical, as Edward and Hecht (2010, 256–7) acknowledge, but the practice of using them in political processes and/or with political aims in mind constitutes technopolitics.

Examining the social and political working of technologies in contexts situated outside the sphere of superpower competition allows us to see how a wider spectrum of meanings is attributed to technopolitics. From the 1950s to the 1970s, in countries such as India, China, South Africa or Israel, technopolitics offered an answer to multiple concerns, such as anxieties about global status, decolonization, the prestige of scientists and engineers, and a strong desire to develop modern scientific and technological infrastructures (Gagliardone 2014). This wider transregional perspective on technopolitics reveals how the symbolic and material apparatuses of technological systems have become intertwined with nations' search for a coherent and convincing self-image at various stages of consolidating their nation-state profiles in the global arena.

For some countries, postcolonial India in the 1950s and 1960s among them, technological achievements were seen as a means that could be used to bolster a newly emancipated national identity by indicating progress, modernity, independence and national rebirth. Indian scientists and technologists believed in technology as a way to advance their nation's postcolonial emergence. The primary goal of the Indian nuclear programme, in spite of all the controversies and moral dilemmas, was to put India on the international scientific and technological map (Perkovich 1999, 282). A similar drive for the affirmative avowal of a nation's prestige and the obtaining of the status of a technological power in the international arena underpinned the Israeli space programme. In 1961, when the official announcement of the country's first rocket launch was made, prime Minister David Ben Gurion declared that this launch 'proved the ability of Israeli scientists. The entire rocket is made in Israel' (*Haaretz* 2010). On the website of the Israeli Space Agency (established in 1983), the history of 'Blue and White space' is depicted as the story of the remarkable technological achievements of the Israeli nation, which had become the eighth in the world to launch satellites into space. It also reaffirms that involvement in space has served to ensure Israel's prominent place in the world.

According to Moltz (2012), with the end of the Cold War the world entered 'the second space age', which featured new geopolitical taxonomies of space exploration programmes. The international system of the new era is constituted by a multiplicity of greater and smaller actors involved in space exploration, rather than bipolarity. It is

also characterized by increased interdependencies and exchange, as the typical space corporations are nowadays multinational, relying on the use of technologies from more than one country, and marketing their products and services worldwide (14). What is also emblematic of the second space age is the fact that a new epicentre of space activity is now situated in Asia: besides the United States, Russia and the countries that make up the European Space Agency (ESA), multiple rapidly developing space programmes are located in this region. Alongside China, India, Japan and South Korea, countries that have traditionally taken the lead in Asia where space is concerned, such as Australia, Indonesia, Malaysia, North Korea, Pakistan, Singapore, Taiwan, Thailand and Vietnam, all now have significant space plans of their own. The countries of Central and South America as well as those in the Arab world have also engaged in the development of space science, which has been reinvented as new ground upon which national and regional interests intersect with international effects and cosmopolitan thinking about the globe (Determann 2018; Johnson 2020).

Kazakhstan with its aspiration to join the club of spacefaring countries shares many of the same motives as the other semi-peripheral countries for developing space programmes, including scientific–technological progress, national security and status within the global arena. Essentially, where semi-peripheral or postcolonial states that have recently gained independence are concerned, 'internationalization' is not simply a condition, but a cherished value that helps to boost their symbolic standing both on the global stage and in the domestic arena (Bekus 2021). Involvement in the development of space technology that relies on international cooperation in this context emerges as one of the constitutive elements of the desired international perceptions of the country.

Affirmative modernity of outer space

Much like nuclear technologies in the 1970s and 1980s, space has come to represent 'modernity' and the promise of gaining new economic and social benefits from the application of advanced space technologies to current problems. Spacefaring capabilities have long been associated with progressive nationhood, providing spectacular evidence of a nation's technological prowess and standing on the world stage (Mieczkowski 2013). As in the case of many postcolonial states, the space programme in Kazakhstan initiated by elites embodies complex dilemmas regarding the country's development and its place on the global map.

Official Kazakhstani technopolitics has met with resistance from those who define the realm of Kazakh culture, tradition and science as lying outside the Soviet modernization project, which they deem external and anti-Kazakh by definition due to its intrusive and transformative nature. This confrontation reproduces the postcolonial process of creative tension between 'modern' science and technology and vital elements of a socio-cultural heritage that can be observed in many countries of South Asia (Arnold 2000). The Kazakhstani state seeks to equip the retrospective national idea with a technological aspiration – the space programme – which is meant to elevate the landscape of history and tradition and to embody its future. The outer space programme in Kazakhstan emerges as the privileged instrument of identity management and state advancement.

In a bid to demonstrate involvement in a scientifically advanced space programme, which can *stand in* for development, the state seeks to produce a modern fetish. The link between space technology and a refashioning of national selfhood invokes the capacity of the artefact to signal a complex, polyvalent message, what Appadurai (1986) has called the 'semiotic virtuosity' of the object. The transformative power characteristic of the fetish is associated with the belief held by ruling elites that becoming a spacefaring nation would bring about affluence, recognition and a respected status on the global stage. The mere possession of something owned by the West, namely, 'rich world technology' (Edgerton 2006), is seen as 'synonymous with the re-creation of the structures of "advanced" production, lifestyles, histories, and societal context within domestic space' (Krishna 2009, 72). A technologically advanced artefact, such as the space programme in Kazakhstan, is expected to be both integrated into the narrative of national identity and to describe the trajectory of its future development. Space technology and promises of the nation's bright future thus function as methods to secure this same future (Brown, Rappert, and Webster 2000, 10).

The perception of the Soviet space legacy in Kazakhstan differs essentially from that of its nuclear weapons facilities, which the country had inherited from the USSR and gave up in 1993.[1] This decision on the part of Kazakhstan's leadership could be seen as a form of de-Sovietization and the assertion of a new state sovereignty by virtue of its entering the global community with the status of a non-nuclear state (Abshaparova 2011, 1541–2). The space legacy of the Soviet Union, on the contrary, became effectively recycled in the creation of a new image of the Kazakh nation.

The concept of recycling implies both 'change and continuity' and invokes structural endurance within the newly emerging configuration (Bekus 2017). It reveals a paradoxical strategy of investing in development and progress that negates the idea of significant loss (Kendall and Koster 2007). Space infrastructural legacy in Kazakhstan has been developed, refined and reframed so as to be integrated within the new project of identity, while the Sovietness of the space technologies inherited by the country has been relegated to the margins, becoming merely one of the bricks used in the foundation of ambitious Kazakhstan's technological future. Such a form of ideological recycling is in stark contrast to the strategy of 'postcolonial estrangement' (Oushakine 2013) of the socialist legacy, which for its part is driven by the desire to distance the new national project from the Soviet past. This strategy is at the heart of many post-Soviet national ideologies and can likewise be detected in the discourse of Kazakhstani elites. Being a product of the overdetermination of subjectivity by the trauma of colonial violence (Biehl, Good, and Kleinman 2007; Browne 2017), postcolonial estrangement in Kazakhstan has been reinforced by the memory of the victims of Stalinist repression and of the 1932–33 famine.

Focusing on the technological aspects of socialist modernization and its transformative effect limits the power of this trauma-driven postcolonial framework and opens up the possibility of a variable reading of the Soviet past. Some scholars view this stance as a symptom of Kazakhstan's postcolonial ambiguity (Kudaibergenova 2016). This article contends, however, that it can also be interpreted as an intricate way of becoming 'postcolonial modern', one that allows for the mobilizing of technological resources and the Soviet infrastructural legacy for constructing the technopolitical identity of independent Kazakhstan.

The space race on the Kazakh steppe

Kazakhstani soil was chosen to host one of the key sites of Soviet technopolitics, the space port Baikonur Cosmodrome, established in 1955.[2] The orbital efficiency ensured by its proximity to the equator, low population density and clear horizons rendered the Kazakh steppe attractive to the Soviet space policymakers. The location of a major launching facility of the Soviet space programme in Kazakhstan, however, did not guarantee any privileges for the republic within the all-Union technological space hierarchy. Unlike other pieces of grand infrastructure built in Central Asia, which had served to accelerate the development of the region (Kalinovsky 2018) as well as to facilitate its hidden integration (Högselius 2021), space infrastructure initially remained unembedded within the Kazakhstani technological landscape. Due to the extreme sensitivity of space technology in the context of the Cold War and its military significance, Baikonur remained a Soviet technological and infrastructural enclave with little connection to its 'host', Kazakhstan.

The idea of sending a Kazakh astronaut into space arose only in the early 1980s. The First Secretary of the Central Committee of the Communist Party of Kazakhstan Dinmukhammed Kunayev oversaw the search for potential astronaut candidates among the republic's military pilots. The launch of the space mission with a Kazakh astronaut was planned to coincide with the celebration of the 30th anniversary of Baikonur, in 1985. None of the candidates selected, however, passed the medical examination (Nurgaliev and Kangozhin n.d.). In 1986, Talgat Musabaev joined the astronaut training programme, but due to the political unrest in Almaty that same year, his space flight would never take place. In 1989, the discussion of Kazakh participation in the space programme was resumed by Nursultan Nazarbayev, who had replaced Kunayev.[3] In his book *Kazakhstan's Way* Nazarbayev (2006, 307) emphasized the symbolism of Kazakhstan's sovereignty, which started 'from space itself':

> In anticipation of the collapse of the Soviet Union, in August 1991, the Baikonur Cosmodrome was declared the property of the Republic, while in October that same year the first Kazakh cosmonaut was sent into space, and the Declaration of Kazakhstan's independence was adopted in December. In this way, our intention to become a national state was, it turns out, started earlier in space than on earth!

Describing the complex negotiations with the Soviet political, military and space agency authorities, including President of the USSR Mikhail Gorbachev and Minister of Defence Dmitry Yazov, Nazarbayev underlined the political meaning of the decision to send a Kazakh astronaut into space. It was intended to be a form of recognition of the Kazakh people as partners in space exploration and of their signal contribution to Soviet technological achievements (310–312).

The formal status of the Baikonur space port or 'residual assets' (Cooley 2001) became an important issue after the dissolution of the USSR. It became the property of Kazakhstan on 31 August 1991, but in the conditions of economic crisis of the early 1990s, as Nazarbayev admitted, maintenance of Baikonur had become a heavy burden that Kazakhstan could not shoulder on its own. At that time, the major institutional infrastructure of the Kazakhstani space programme was created. The Agency of Space Research of the Kazakh Soviet Socialist Republic was established in 1991, renamed the National Air and Space Agency of Kazakhstan in 1993 and transformed into a National Space Agency Kazkosmos in 2007.[4]

During the first years of independence Nazarbayev made frequent visits to Baikonur, and his perception of this grand technological artefact reflected the way in which the entirety of the Soviet legacy would be dealt with throughout his rule. Baikonur embodied a scientific asset of the Soviet space programme that could be deployed to shape and legitimate the technopolitical future of an independent Kazakhstan. In the early 1990s, after the Soviet Union had fallen behind in the technological and scientific competition with the West (Chan 2015), the space exploration programme appeared to be the only surviving artefact of globally recognized 'prime quality' and both Russia and Kazakhstan remained committed to the preservation of Baikonur, obliged therefore to find a way to share their interest in it.

The story told by Nazarbayev of the survival, and of the fashioning of a new status for Baikonur as the property of Kazakhstan, does not mention his idea of creating an International Consortium that would offer access to Baikonur not only to former Soviet republics but also to other foreign states, including the United States. A National Aeronautics and Space Administration (NASA) delegation visited Baikonur in January 1994 and expressed interest in direct cooperation with Kazakhstan and access to Baikonur without Russian interference (Tsekhmisternko 1994). This plan would never be realized, but the very idea of such a development signalled the emergence of alternative scenarios for Kazakhstan, cooperation with the Russians being just one of many. In 2009, the Kazakhstani analyst Berkimbayev returned with an ambitious project to transform Baikonur into a 'global space hub' which would consist of four autonomous segments, each providing space launching services to different regions: (1) Russia; (2) Arab states (Saudi Arabia, UAE, Egypt, Jordan); (3) European states; and (4) East Asian states (including Japan, South Korea, Thailand and Singapore) (Berkimbayev 2009). The realization of this plan would bring about the reorientation of the Kazakhstani economic system from one that was raw material export oriented to one that was technologically advanced. Being publicly expressed by an independent expert, the project could not be seen as a reflection of an official stance. It nonetheless articulated the ultimate aspirations of Kazakhstani technopolitics as they have gradually taken shape over the three decades of independence.

Baikonur and national space independence

In 1994, Boris Yeltsin and Nazarbayev signed a lease transferring the management responsibilities for, and rights over, Baikonur to the Roscosmos State Corporation and Russian aerospace forces. Not only was it an unprecedented agreement between two sovereign states but also it was highly problematic for Kazakhstan. For the agreement regulated the status of technological objects and land, as well as that of Leninsk town (renamed Baikonyr in 1995) with its resident population, which consisted of Kazakhstani nationals. The agreement was criticized in Kazakhstan for being arrived at under the coercive pressure of economic and geopolitical circumstances and is described by scholars as a manifestation of Kazakhstan's 'sporadic sovereignty' (Kopack 2019). Nazarbayev described the concession as a sacrifice made for the sake of the 'preservation of the scientific–technological and intellectual resources of the space complex and a global heritage of [the] human space mission' (Nazarbayev 2006, 317). From his perspective, it was also a strategic decision with a bearing upon the future technopolitics of independent Kazakhstan.

By emphasizing the global significance of Baikonur, Nazarbayev had restructured the hierarchy of the scientific space legacy, embedding Kazakh within Soviet national scientific development and Soviet within global scientific development, thereby leaving behind the historical context of Cold War. By stressing the shared legacy of Soviet space exploration embodied in Baikonur ('common child of the Soviet people'), this narrative asserts the participation and the active agency of the Kazakh, as well as of the other Soviet nations, in the full gamut of Soviet technological ventures. This strategic move has enabled Kazakhstani elites to harness the power of science and the legacy of the Soviet space technologies for national developmental projects.

Following the agreement with Russia, Kazakhstan signed several international treaties and agreements, thus becoming subject to international space law. In 1995, the country became a member of the United Nations Committee on the Peaceful Uses of Outer Space. In 1997, Kazakhstan signed up to five major international agreements in the sphere of space exploration.[5]

Since 1991, three Kazakh astronauts have participated in space missions: Toktar Aubakirov in 1991, Talgat Musabayev in 1994, 1998, and 2001, and Aidyn Aimbetov in 2015. The 'degree of Kazakhness' attributed to their missions and the extent to which these latter were championed as national space missions, however, remains contested.

Aubakirov, who became the first Kazakh in space and, ironically, the last Soviet astronaut, travelled to space under the Soviet flag and as a Soviet citizen. Yet, it was he who spoke Kazakh from space for the first time during a space communication session and it was he who made Kazakh a language of the space universe (Nazarbayev 2006, 315). The first astronaut of independent Kazakhstan was Musabayev. On his first spaceflight he took to the space station a Kazakhstani flag, a capsule containing some Kazakhstani soil and the Koran, all of which were later given as space souvenirs to President Nazarbayev. On his second spaceflight Musabayev also became the first Kazakh commander of an international space crew. To be able to go on a mission in this role, however, he had perforce to become a citizen of the Russian Federation in accordance with the Law of Space Activities of the Russian Federation. This move was accepted on the Kazakhstani side as a necessary compromise for the sake of the space programme of Kazakhstan (Nazarbayev 2006, 319). These formal complications as regards citizenship did not preclude Musabayev from performing patriotism on the flight itself: along with the state symbol traditionally carried when travelling into space, the flag of Kazakhstan, he also took into space the Constitution of RK and the flag of Kazakhstan's leading political party Nur Atan. During the mission, Musabayev took part in the international music festival 'Voice of Asia' where he performed a song by the Kazakh poet Abai and participated in the inaugural ceremony for the new capital of Kazakhstan, Astana, on 10 June 1998 (Kabikizy 2017).

This series of symbolic gestures served to convey something more than a patriotic message communicated from space: they displayed the close entanglement of technology with narratives of national and social identity in which space had become a new venue for nation-building. In this endeavour, Kazakhstan's technopolitics of outer space recapitulates all the accoutrements of the postcolonial state's desire to combine 'science, modernity, indigeneity' (Abraham 1998, 156). The creation of chevrons for Kazakh astronauts reveals how blending tradition with modernity can be achieved not only through the modernization of the former, but also through the nativization of the latter. Musabayev's personal chevrons were designed by Shote Valikhanov, who was

also responsible for devising the national emblem of Kazakhstan. One of his first chevrons depicted swan's wings with a *shanyrak*, a wooden rim that forms the arch of the traditional Kazakh yurt, inscribed between them. The second chevron, entitled 'Nomad of the Universe', portrays a rider in traditional Kazakh costume galloping on a horse against the background of outer space and planet Earth (Nurgaliev and Kangozhin n.d.).

This type of imagery bridges outer space with a conventional repertoire drawn from an ethnic identity toolkit in order to heighten the 'acquired indigeneity' (Dubow 2006) of the Kazakh nation. Outer space in this context is intended to serve as a technological artefact of global relevance that might allow Kazakhstani elites to equate technological achievement and sophistication with national development, and so to imagine their nation in a dialectic of science and technology with tradition. Kazakhstani elites use the symbolic and material apparatus of their space programme to perform new conceptions of national identity vested with the attributes associated with outer space – in other words, the fact of their being advanced and technologically sophisticated. This discourse of collective identity vested in space technology allows Kazakhstan to obtain domestic endorsement and win acclaim for costly ethnopolitical projects.

The postcolonial fetish and affirmative modernity

On 3 July 2010, on the eve of the Day of Astana in Kazakhstan, a symbolic plaque was unveiled in the city to mark the start of construction of the National Space Centre (NFC) of the Republic of Kazakhstan. The plan was for the centre to become the largest facility within the country's space infrastructure. Notably, among the official guests at the ceremony were the Prime Minister of the Republic of Kazakhstan Karim Masimov, Kazkosmos Chairman Talgat Musabayev, French Secretary of State to the Ministry of Economy, Industry and Employment Anne-Marie Idrac, and the Chairman of the French company EADS Astrium SAS François Auque. The event was envisaged as a new development in the discourse of Kazakhstani national identity and statehood. The presentation of the future NFC metonymically promised to place the country at the forefront of technologically advanced states by virtue of the association of space with science and modernity. The presence of French partners was highly important as it offered reassurance regarding the Kazakh state's prominent position within the global context of space exploration outside and beyond post-Soviet collaboration, the latter being characterized by continuing, even if gradually diminishing dependency on Russia. Finally, the building of a large material object of space infrastructure in the capital city served to merge, as it were, two deeply significant representations, each of which manifested the specificity of the Kazakhstani path to becoming a modern and prosperous nation.

Science and technology are both desired forms of modern practice and privileged instruments ensuring fundamental change, and are central, therefore, to an understanding of the postcolonial condition (Abraham 1998, 20). To facilitate this process of becoming truly modern, Kazakhstan has embarked on the idea of creating a mise-en-scène of architectural and technological artefacts that embodies the new rationality of the modern and is vested with the capacity to transform the traditional landscapes of nations. So positive a perception of the potency of technological artefacts in relation to society causes them to operate as a 'modern fetish'. The idea of nation and the fact of material objects – space infrastructure – interpenetrate in the guise of what Durkheim

(2001, 269) once described as a 'common sentiment'. The special, even sanctified, aura of a space programme seen as the state fetish produced through the difference it embodied, avowed through its particular rituals of achievement and status becomes a demonstration and, by displacement, a proof of modernity in its postcolonial mode (Abraham 1998, 156). Due to a 'fundamental fetishised inversion' the object that had been merely the means to achieving some desired end becomes a fixed necessity, the very embodiment of desire, and something imbued with the effective, exclusive power for gratifying it (Pietz 1993, 147).

Since 1998, a central role in building a representational image of Kazakhstan as an open, modern and global-minded country has been given to the capital, Astana (Nur-Sultan). By creating a remarkable cityscape, with multiple architectural masterpieces produced by world-leading 'starchitects', Kazakhstani elites produced a site for the 'consecration of an effort', of 'a stress for achievements' (Baudrillard 1981, 33). The phenomenon of Nur-Sultan has been analysed by scholars from various different perspectives: as the instrument of legitimization of authoritarian rule (Koch 2010; Fauve 2015), as an expression of the government's determination to obtain greater international recognition (Schatz 2008), and as a way to utilize its imagery for nation-branding (Marat 2009; Bekus and Medeuova 2017). Much as in the case of Brasilia in the 1950s, conceived as a 'pole of development' and a source of progress to be spread throughout Brazil's territory (Holston 1989, 18), Nur-Sultan became a central site for projecting desired images of the future of Kazakhstan (Laszczkowski 2011).

The shortcomings of a city intended to serve as a fetish of modernization did nonetheless perpetuate its ostensible merits, namely, the pre-eminence of exterior forms of material representation that begin to work once they have been completed. The space programme, in contrast, has been used by the Kazakhstani state as a 'spectacular science', deployed for the production of a modern fetish through a demonstration of *ongoing involvement i*n a technologically advanced programme, called upon to serve as a proxy for development. These two aspects of postcolonial modernity in Kazakhstan not only complement each other by bridging the material representation of the future (the capital city) with a praxis of innovation (outer space), but also become closely intertwined through a net of multiple symbolic references. First Kazakhstani Space Complex with launch pad (construction started in 2004) was named after the central elements of the capital cityscape, observation tower and cultural monument 'Bayterek' (2002). Shaped in the form of a tree with reference to the legend of the 'Tree of Life', a central symbol of Turkic mythology, Bayterek represents not only a notable symbolic intervention in the new state ideology, but also serves as one of the main icons of the capital city. In 2018, to mirror the connections between the capital and the space programme, the Republican Onomastic Commission named the fourth administrative district of the city of Nur-Sultan 'Baikonur' (*Kazakhstanskaya Pravda* 2018). Construction of the NFC facilities and the Spacecraft Assembly and Testing Complex in Nur-Sultan became a manifestation of a further entanglement between the two major fetishes of Kazakh postcolonial modernity.

Outer space infrastructure and artefacts emerge in this context as material evidence of the efforts of the country's elites to transform the nation's future by means of the hidden temporality of infrastructure – namely, the desired future it prefigures (Appel, Anand, and Gupta 2018). Outer space artefacts – including the launch pad, satellites, and Spacecraft

Assembly and Testing Complex – operate as emblems of a postcolonial affirmative modernity whose transformative power is associated with the realization of material projects and also with the emotional and affective investments that unfold over time and can alter from enthusiastic and positive to negative and critical over time (Stoler 2013).

In 2018, to celebrate the 20th anniversary of Nur-Sultan and the 10th anniversary of the first intergovernmental agreement on space cooperation signed with France, Nazarbayev visited the new edifices of the NFC. On this occasion, French company Airbus Defence & Space staged a presentation of the 'Between Heaven and Earth' exhibition pavilion of the space city theme park in Toulouse. Nazarbayev also visited the open-air exhibition of the Museum of Rockets and Space Technology, located on the 'representative' left bank of Nur-Sultan, occupying a 1.4 ha site on the premises of the NFC complex. The full-size models of Soyuz, Proton, Zenith rockets and Buran spacecraft were exhibited as part of the display created in the Kyzylorda region, under the aegis of a project known as 'Regions Give Gifts to Astana'.[6] These material objects link the city and the outer space programme as well as also embroiling further the process of becoming modern in a fetishized materialization. Arising as the real representations of material social relations these physical objects are fetishes insofar as they become necessary functional parts that privilege the command-and-control points of a working social system (Pietz 1993, 147). Both capital city and outer space representations form the reality of a materialized imagination that has acquired the status of a new social fact central to all forms of agency (Appadurai 1996, 31). In his speech at the Spacecraft Assembly and Testing Complex in 2018, Nazarbayev confirmed the vital role of space facilities in embodying the future that they helped the Kazakhstani public to imagine and, thus, to create:

> Together with our French partners, in the near future, we will assemble our own satellites. We have our own launch system, and the rocket Zenith will be ready by 2022. Thus, our space industry attains a new technological level, and Kazakhstan is becoming a fully fledged space power. (Beisembayev 2018)

Binding together the new technological fetish of Kazakh identity – space technology – with the capital city serves to create a new reality in which material objects fluctuate between 'thingness and spirit' (Taussig 1993, 217), between their physical form and an imagined future. Space technology in this context is endowed with the role of a crucial agent that has been woven into the social fabric of the nation (Latour 1991, 103) by providing the means for realizing its aspirations and future achievements. This technology thus offers a strategy for holding society together as an enduring whole.

As in the case of other postcolonial modern states, this future can only be achieved through the displacement of its origins (Abraham 1998, 156). The Sovietness, so to speak, of the space technologies inherited by Kazakhstan and expressly embodied in the models of the Soviet rockets exhibited in the open-air museum has been relegated to the margins. Its materiality, mimicked in rocket models, has been placed in the alternative context of the nation's fetishized material objects, the capital's numerous architectural masterworks, so as to create the new face of Kazakhstan. One of the attributes of the postcolonial desire to become modern is the recognition that modernity itself is absent (Abraham 1998). The preservation of the Soviet space legacy in Kazakhstan, however, works as an important marker of the nation as not only 'becoming' but also 'being' modern. In contrast to the subaltern subject located at the centre of the 'classical'

postcolonial project and 'lacking modernity', independent Kazakhstan emerges as an offspring of Soviet modernization.

Space, sovereignty and eco-nationalism

The entanglement of technology with politics never produces one single response but invariably presumes a multiplicity of positions (Kurban, Peña-López, and Haberer 2017). The space technopolitics of the Kazakhstani elites has also been continuously challenged by various civil society groups and independent activists. The discourse of these actors combines elements of environmental activism with a new form of 'eco-nationalism' (Dawson 1996) permeated by a profoundly anti-imperial discourse. This combination forms a strong ideological opposition not only to the project of Kazakh 'space modernity' with its heavy reliance upon the Soviet legacy but also to the system of power that seeks to endorse it.

Organized resistance to the outer space programme pursued by the authorities emerged in Kazakhstan in 2012 when the group of activists known as *Anty-Heptyl* was established. The name of the group indicates their determination to bring about the banning of a fuel used in Russian rockets that contains the highly toxic component heptyl. The group deploys their protest against the harmful impact of the rocket launches both on the natural environment and on those resident in the regions in such a way as to articulate wider environmental and political ideas. Rather than voicing their demands in the categories of liberal environmental justice, with its inherent stress on the global aim of environmentalism (Malloy 2010), they equate the protection of the environment with the fight to establish the 'complete' national sovereignty of Kazakhstan. The latter is linked in their agenda both with the struggle against the 'exploitation' of the Kazakhstani steppe by a foreign state, that is, Russia, as a form of enduring, even if camouflaged, 'colonization' and the ruling authoritarian regime that disregards the interests of the Kazakh people, their land and the natural environment. Such openly oppositional political demands established the reputation of the movement as 'a school of Kazakh democracy' (*Analytical Information Portal Almakz.info* 2018).

Environmental activism in Kazakhstan has had a history of successful cooperation with the authorities, in that ecological campaigners have sometimes forged mutually beneficial alliances with the titular elites (Weinthal and Watters 2010). In the late 1980s and at the beginning of the 1990s, Kazakhstan witnessed the rise of protests against the testing of nuclear weapons in Semipalatinsk. The Nevada–Semipalatinsk movement, which was formed in 1989, united prominent Kazakh cultural elites with local and international environmental activists. Their campaign for a nuclear test ban and the shutting down of the nuclear weapon testing site in Semipalatinsk proved highly effective. The nuclear test site has since been closed and turned into the International Research Centre, while the Nevada–Semipalatinsk movement has been hailed as a story of successful cooperation between domestic activists, international environmental organizations and the national government. In Kazakhstani anti-nuclear activism, two separate strands of environmental engagement, identified by Cederlöf and Sivaramakrishnan (2006) as the cosmopolitan and the nativist, have been combined by the state and appropriated as a source of national pride, thereby consolidating and legitimizing the nation-state. Moreover, in 2005, the Kazakhstani government initiated the process of inscribing

the Nevada–Semipalatinsk on the United Nations Educational, Scientific and Cultural Organization (UNESCO) list 'Memory of the World',[7] thereby stressing the global significance of effective partnerships under the auspices of the government.

The public set-up for Anti-Heptyl activities, however, differs sharply from the favourable context in which Nevada–Semipalatinsk operated. Most of the group's street rallies combine environmental claims with strong anti-government slogans and they often culminate in arrests and criminal or civil penalties for the organizers. It is worth noting that the founding of Anti-Heptyl indicated not so much the appearance of new attitudes to the space programme in Kazakhstani society, but rather a shift from what Scott (1990, 207) designates as a 'hidden transcript' of dissatisfaction shared by society and elites alike to its open articulation and the consolidation of a new agency of active resistance. The Kazakhstani authorities were indeed alarmed by the explosion of two Russian Proton rockets in 1999. They introduced a temporary ban on Proton launches from Baikonur, which was lifted after the soil pollutant at the accident site was detoxified and compensation for environmental damage was paid (Sabitov 2016). A series of similar crashes and launch accidents at the space port in 2007, 2010 and 2013 generated serious tensions between Roscosmos and the government of Kazakhstan. They caused the Kazakhstani elites to question further use of Proton rockets at Baikonur, and to discuss new forms of compensation. Furthermore, they intensified the process of regaining control over the space complex and the city of Baikonyr as a strategic part of Kazakhstan's own technopolitics.[8] The avowed openness to space cooperation with Russia and the simultaneous resistance to it has become a form of Kazakhstani governmental infra-politics that avoids the open declaration of real intentions.

This veiled discontent on the part of state elites was transformed by Anti-Heptyl into a fully fledged political opposition to the government itself. The protests in Almaty and Nur-Sultan have been organized under the anti-governmental banner as well as under anti-Russian slogans such as 'No to Eurasian Union' or 'Long Live Crimea'. Activists accuse Russia of perpetrating a 'Heptyl-genocide' of the Kazakh nation and demand that all Russian launch sites on the territory of Kazakhstan be closed forthwith. In 2013, the Anti-Heptyl activists transformed the movement into a coalition that included over 80 members of the Nevada–Semipalatinsk group, human rights campaigners, independent trade unionists and Islamic religious activists. The declared goal of the coalition became the closure of Baikonur spaceport as well as all military polygons used by Russian Federation on the territory of Kazakhstan, and arrangement of compensation for the damage incurred by Kazakhstani residents due to space and missile launches.

In 2015, the mass deaths of saiga antelope that occurred in Kazakhstan were linked by Anti-Heptyl to the harmful effect of Russian rockets launched at Baikonur (Sharipzhanov and Sharogradkii 2015), even though the official governmental investigation, backed by independent international enquiries, did not find any evidence for such a connection.[9] A second key player in the sphere of environmental activism emerged in the guise of non-governmental organization Baikonur for Human Rights and environmental organization Baikonur Eco Monitoring (2015), both led by Marat Dauletbayev. Their major demands relate to the restoration of the disturbed state of the environment at the expense of the Russian Federation and payment of moral damages. Furthermore, in the context of the 2016 events in Kazakhstan, when mass protests took place in Kazakhstan against the land code changes that would allow foreigners to rent land for 25 years, Baikonur

for Human Rights launched a court case to challenge the legal validity of the agreement between Russia and Kazakhstan regarding the lease of Baikonur. Both Baikonur for Human Rights and Anti-Heptyl activity remained, however, confined to the capital city Nur-Sultan, Almata and the Kyzylorda region, sites directly affected by launches (Chernykh and Fominykh 2017).

Being similar to anti-nuclear activism under late socialism, described by Dawson (1996) as a political effort that channelled anti-Soviet sentiment and resentment at Moscow's domination over the different nations, the anti-Baikonur campaigns are also unique in many respects. Unlike the Ukrainian Chernobyl and Kazakhstani Semipalatinsk environmental struggles, Baikonur represents not only the legacy of a collapsed system but also a still operative technological and commercial asset, which continues to play a key role in the global space industry. Furthermore, both Baikonur for Human Rights and the Anti-Heptyl movement effectively combine geopolitical demands with resistance to the space technopolitics pursued by their own state. The use of traditional folk costumes, and of images of wild nature (including dead saiga antelope), in Anti-Heptyl street actions translates the protection of the environment into an ethnic identity discourse, which is combined with, and mediated by, nature and landscape. This nativist approach to national identity shapes their nationalism as a form of reaction against elites (Castells 1997, 30), with their ideological concept of a science- and technology-centred nation inscribed within the discourse of postcolonial modernity. Notably, Kazakh activists link their discourse of ecological nationalism to concerns for the environment in times of rising global ecological insecurity, thus acquiring an image as a sort of 'Kazakh Greenpeace'.

At the 2015 meeting of Anti-Heptyl activists with the United Nations Special Rapporteur on hazardous substances, Baskut Tuncak, they accused the Kazakhstani leadership of posing a major ecological threat not only to the Kazakh people but also to the global community (Shamshet 2015). The way in which Kazakh activists globalize their local environmental struggles by outlining a new space of globalization within their pro-native ecological campaign validates Latour's (1993) remark that a clear distinction between the global and the local is increasingly questionable, since 'almost everything is at least a little of both'.

The conflict we have scrutinized here reveals complex relationships between a modern technopolitics preoccupied with technological advancement as necessitated by global conditions, an authoritarian socio-politics that seeks to centre the idea of nation on science and technology, and an ecological nationalism that amalgamates the discourse of 'native identity' with wild nature, landscape and ecosystem.

Conclusions

The article has discussed the distinct role of space technopolitics in nation- and state-building in Kazakhstan as a symptom of the country's postcolonial modernity. Specific conditions of newly established state sovereignty reinvigorate the processes of becoming a nation, which entail extensive work on forging and managing identity processes accompanied by lavish symbolic investment in representations of national culture, indigeneity and tradition. Outer space technopolitics, in this context, features a future-oriented vector of temporality that works to secure a future development and employs

this 'envisioning of something desired' in order to build the international capital of the country in the present.

The space ambitions of semi-peripheral nations can be seen as a response to new global conditions, in which participating in space development and gaining access to space technology become an indicator of a country's development status. Engagement in space activities – from building space infrastructure to sending astronauts into space – emerges as a desired form of modern practice and a privileged instrument of development. As this research demonstrates, in the context of semi-peripheral states the pursuit of national interests and identity management through space closely intersects with strategic concerns about their global or international perception.

Drawing on the theorization of postcolonial techno-science (Abraham 1998; Anderson 2002; Gagliardone 2014), the article develops the idea of outer space development as a postcolonial fetish of modernity. It features a significant symbolic investment that seeks to fuse identity with science and technology and to construct what it embodies, namely, the reality of a hyper-modern, technologically advanced nation. The article shows that in its project of becoming a spacefaring nation Kazakhstan reiterates major incentives that have motivated nuclear and space programme developments in the semi-peripheral nations of Asia, Latin America or the Arab world.

The historical role of Kazakhstan in the Cold War space race and Soviet space infrastructure inherited by the country – with Baikonur as the most emblematic heirloom – is an essential factor shaping the technopolitical agenda of the Kazakh ruling elites in the era of independence. The stance adopted with regard to the Soviet space legacy reiterates the general Kazakhstani strategy of becoming modern without disparaging or laying waste to the Soviet space legacy. This strategy has enabled Kazakhstan to maintain a selective reappropriation of the socialist scientific and technological legacy as a part of a national modernization narrative, thereby avoiding the degrading status of pre-modern nation. The space technology of socialism has thus been upheld as evidence of Kazakhs both being and becoming modern. Collaboration with Russia allows Kazakhstan to claim its share in the Soviet space legacy rather than to distance itself from it. This partnership, however, needs to be seen as an element in a wider transregional dynamics, whereby Kazakhstani elites seek to engage with multiple actors across the globe.

The article also contributes to the literature on science and technology studies by bringing into focus the role of social, political and cultural conditioning in the production of cosmic scientific and technological advances in semi-peripheral settings. With the continuing rise of new outer space initiatives and projects in Central Asian countries and across post-Soviet space, the article also provides a starting point for further exploration of what this region contributes to the heterogeneous dynamics regarding the global development of outer space.

Notes

1. Kazakhstan was one of four post-Soviet states that inherited nuclear weapon facilities after the dissolution of the USSR, alongside Russia, Ukraine and Belarus.
2. Initially, for security reasons, the name Baikonur was used as a decoy orientation for the spaceport (Gruntman 2019).

3. Interview with the head of the National Space Agency of the Republic of Kazakhstan (Kazkosmos 2014).
4. Presidential Decree No. 441, 11 September 1991. https://tengrinews.kz/zakon/prezident_respubliki_kazakhstan/nauka/id-U910000441_/.
5. The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies; The 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space; The 1972 Convention on International Liability for Damage Caused by Space Objects; The 1975 Convention on Registration of Objects Launched into Outer Space; and The 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Kazkosmos. n.d.).
6. The project 'Regions Give Gifts to Astana' (now Nur-Sultan) was officially launched in 2018 on the 20th anniversary of the capital. It formalized the tradition, established in 1998, the year in which Astana was founded, whereby the various regions contributed to the development of the capital city. The main gifts to the capital city are given by the various regions, and the idea behind this ritual is to create an image of the capital city as a common achievement of the people throughout the country. In 2018, among the gifts from the regions to Astana were a kindergarten, the redevelopment of a public park, the reconstruction of the building known as the 'House of Friendship', the monument known as 'The Wall of Peace', the light and music fountain, a sports, and entertainment city park. "Astane podaryat 10 novykh obiektov sotsialnogo znacheniya" (*Zakon.kz* 2018).
7. The Nevada Semipalatinsk Movement received international recognition, and in 2005 was inscribed on the UNESCO list 'Memory of the World'.
8. The name 'Baikonyr' appears as a more authentic spelling in the Kazakh language as opposed to a Russified version Baikonur used historically since the Soviet period.
9. International investigation later confirmed that the saigas were killed by fatal blood poisoning, which was caused by *Pasteurella multocida* type B bacteria not in any way linked to rocket launches (Kock et al. 2018).

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Disclosure statement

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