If the future belongs to the bold, the Soviet Union seems to have had a head start at the beginning of the 1960s. Unlike Western perspectives, Soviet thinking about the future could claim a clear goal and a plan to attain it: the construction of communism – famously declared by the 1961 programme of the Communist Party of the Soviet Union (CPSU) to be realisable by 1980. It was a promise that at the time sparked considerable enthusiasm at home and also reverberated abroad.¹ But once it had made this commitment, the Soviet leadership found its grip on the future far less secure than it would publicly admit. Not only was the Party’s bid for progress constantly challenged by the country’s scientific-technical elites who, under the banner of the scientific-technical revolution (STR), came to consider themselves – rather than the Party – as the true advocates and legitimate administrators of progress, but even more fundamentally, from the 1970s onwards, the very idea of positivist progressivism was called into question – and with it, eventually, the essence of the Soviet project.

The present contribution sets out to track these competing claims to the Soviet future from the 1960s to the 1980s. In doing so, it focuses on the STR rather than the overarching concept of communism. This choice is motivated by a number of considerations: First, the STR was seen as an indispensable precondition for the construction of communism, and in the Brezhnev era was clearly the preferred term for framing Soviet visions of the future. Second, whereas the Party claimed a virtual monopoly over the definition of communism, the concept of STR – envisioned as a consultative process in which political leadership was to be joined by technocratic expertise – invited discussion by a broad range of actors, and was thus open to negotiation to a completely different degree than the term «communism». Third, the insistence of the CPSU on the all-encompassing nature of the STR effec-

tively dissolved the boundaries of the pertaining discourse, suggesting that alongside technological aspects, broader socioeconomic implications could and would need to be addressed within its framework.

In the following, I argue that what was claimed to be the main strength of Soviet thinking about the future – its holistic character – was also its most serious limiting factor. Unlike Western futures studies, which assumed a plurality of possible futures and stressed the need to strategically choose between them based on preferences and values,² Soviet theoreticians framed the prospective development of mankind in terms of a single future that demanded for an all-encompassing vision.³ Thus the resulting Soviet future discourse was unwieldy and constraining, and left the Soviet Union ill-prepared to deal with the onslaught of «reflexive modernity» that reached the country in the 1970s.⁴ Attempts to account for some of its concerns within the overarching framework of comprehensive progress amounted to squaring the circle and were ultimately futile.

1. Anticipating of the Future: the Party’s Approach

The first mention of the STR on record occurred in a speech by Nikolai A. Bulganin, then chairman of the Council of Ministers, at a plenary session of the Central Committee in July 1955. «We are standing on the threshold of a new scientific-technical and industrial revolution, whose significance far surpasses the industrial revolution», Bulganin said. The new era would rely on the power of the atom, on aviation and space exploration, and make wide use of automation, telematics and electronics. Bulganin was quick to link the STR to the construction of communism, proclaiming that «the battle for the technological progress of our country is synonymous with the battle to build communist society». In the face of rapid, but allegedly inequitable progress in the West, the task was to «use the advantages of our system to overtake the achievements of foreign science and technology».

The STR was hardly Bulganin’s brainchild, although he seems to deserve credit for introducing the somewhat clumsy term, which is now occasionally ascribed to Bertrand Russell, who never actually used it and, more convincingly, to the British Marxist philosopher John D. Bernal (1901–1971), whose Science in History indeed seems to have provided the original inspiration for the Soviet theoreticians – though

³ A leading Soviet futurologist chose to disguise this ideological preference as a cultural given, claiming that in Russian «the word future exists only in the singular.» I. Bestuzhev-Lada, «Futures Research in the Soviet Union», in: Futures 8 (1976) 2, 181–185 (181).
not the term, which Bernal did not adopt until 1957. In his book, first published in 1954, Bernal ascribed the revolutionary novelty of the twentieth century not to scientific progress per se, but to the unprecedented application of scientific knowledge throughout industry and agriculture and the sea-changing socioeconomic consequences that this implied. Both his and Bulganin’s deliberations can be seen as Marxist(-Leninist) replies to Western technocracy – a line of thought that gained political traction in the second and third quarters of the twentieth century, at a time when confidence in the problem-solving capacities of science and technology peaked while trust in ideology-based politics reached a historic low under the impression of a global economic crisis, the rise of totalitarian regimes and the cataclysms of two world wars. In this context, technocracy seemed to provide a rational answer to irrational ideology. I will argue below that the Soviet STR was driven by the same push and pull factors.

Socialist thought, indebted to the contributions of Henri Saint-Simon (1760–1825) and Friedrich Engels, traditionally ascribed technocratic ideas a crucial (though by no means undisputed) role in the progress of humankind towards communism. Marxism-Leninism posited that the universal fulfilment of human needs required the combined effects of both a political and a thoroughgoing economic revolution – the former to end class rule and establish equitable distribution, resulting in socialism; the latter to overcome scarcity and create an economy of plenty, leading to communism. In the same way as the social revolution was to be achieved by heeding immutable historical laws, the economic revolution would follow from leveraging the laws of nature – from science and technology. It was therefore not surprising that the early years of Soviet rule brought forth a wealth of scientifically inspired futurological literature, as well as early proposals for scientific governance. But regardless of the fact that Stalin’s modernising regime subsequently embraced the promise of technology, his charismatic leadership left little room for technocratic governance. The STR discourse, initiated by Bulganin’s 1955 speech, must hence be seen as an important element of de-Stalinisation: as an attempt on the part of the CPSU elite to substitute technocratic for charismatic leadership. «Hard science replaced vague ideology. Technocracy instead of partocracy leads the

6 M. Teich, «J. D. Bernal the Historian and the Scientific-Technical Revolution», in: Interdisciplinary Science Reviews 33 (2008) 2, 135–139 (135). Bernal was a corresponding member of the USSR’s Academy of Sciences and was frequently quoted in the Soviet literature of the time.


10 See for example A. Anekshtein / A. Kol’man (eds.), Zhizni i tehnika budushchego. Social’nye i nauchno-tekhnicheskie utopii, Moskva 1928.
country to utopia» – this was the message the country’s educated elites took when the CPSU enshrined the STR in its new programme in 1961 and assigned it a central role in the rapid transition from capitalism to communism. While not dismissing the need for a strong political leadership, the new programme expressly acknowledged the necessity to base policy-making on broad-based scientific knowledge.¹¹

For all its visionary verve, the Party programme did not immediately kindle concrete planning efforts. Sure enough, Khrushchev repeatedly called for long-term forecasts and some of the high-flying visions of the 1961 programme were in fact based on projections submitted by academic research organisations that had been invited to contribute to a twenty-year scientific and technological forecast.¹² But these ephemeral efforts did not translate into systematic long-term forecasting and planning strategies. Instead, envisioning the specifics of the socioeconomic consequences of the STR was left to academic and popular literature, the latter having a definite flavour of science fiction.¹³ A firm intention to take political control of it and guide it in the desired direction only emerged in the aftermath of Khrushchev’s ouster in 1964, when the Party, in a situation not completely dissimilar to the one after Stalin’s death, again felt pressed to replace «political voluntarism» with «scientific rationalism». The second half of the 1960s and especially the Kosygin reforms thus marked the emergence of a statewide commitment to forecasting in the USSR. At a March 1965 conference of the State Planning Committee (Gosplan), Kosygin declared previous Soviet efforts in this field to be unsatisfactory. At the same meeting, «main directives for developing and using forecasts» in national social and economic planning and management were outlined and subsequently detailed by the State Committee on Science and Technology (GKNT).¹⁴ As one Western observer pointed out, «all forecasts produced in the Soviet Union are seen as parts of a grand system, parts which must be compatible like parts of a machine.»¹⁵ However, this machine was supposed to remain under the Party’s tight control, and not to take on a life of its own – a premise that was highlighted in the fate of OGAS, the project of an «automated, all encompassing control system for the national economy» that was meant to calculate and correct economic plans in real time.¹⁶

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¹¹ Vail’ / Genis, 60–e, 103 (quote); CPSU Programme, 68.
Proposed by leading Soviet mathematicians as early as 1959 and originally backed by Khrushchev and Kosygin, it lost momentum when the political authorities realised it threatened to obliterate rather than enhance their governance over the economy. Tellingly, a government official asked one of OGAS’ developers: «Where is the leading role of the Party in your [computing] machine?» 17 Clearly, neither the scientists nor their abstract tools were to wrest control from the Party. They were, however, expected to inform its decision-making by way of expert forecasts and computer modelling.

It was in this spirit that, in autumn 1968, a decree of the Central Committee and the Council of Ministers recognised «the necessity to develop long-term scientific-technical forecasts (covering ten to fifteen years) for central aspects of the development of the national economy and its individual branches». 18 In a closed meeting, the influential Deputy Chairman of the GKNT, Dzherman Gvishiani, recommended the experience of «serious futurologists» in the West as a methodological example. 19 At the same time, the Politburo considered the creation of a secret advisory board of high-calibre academic specialists that was to counsel the Party leadership on the expected long-term consequences of key political decisions. Feedback from analogous bodies lower down the administrative chain was supposed to increase the accuracy of these forecasts. Despite high hopes, the planned State Service for Prognostics eventually failed in 1971 as a result of political and academic infighting, as well as the Party’s mounting doubts about the political reliability of the scientists in view of developments in Czechoslovakia. 20

Nevertheless, at a time when the «communist perspective» proclaimed so clamorously a decade earlier had clearly lost credibility, the Party leadership saw little other choice than to pursue its course towards scientific governance. At the 24th Party Congress in 1971, Brezhnev expressly reinvigorated the technocratic vision while quietly deemphasising the communist perspective – which was now postponed in favour of «developed socialism». 21 His pledge «to unite [...] the achievements of the scientific and technological revolution with the advantages of the socialist economic system» 22 suggested increased expert participation in political decision-making, but amounted to a suffocating embrace of the

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17 Gerovitch, Newspeak, 267.
18 Decree of the Central Committee of the CPSU and the Council of Ministers of the USSR of September 24, 1968, No. 760.
19 Rocca, «Second Party», 201. Gvishiani had established personal contacts with a number of Western forecasters and future researchers since the early 1960s. See D. Gvishiani, Mosty v budushchee, Moskva 2004, 77.
scientific community by the Party. If Soviet scientific forecasting had enjoyed a certain degree of academic liberty before this congress, it was now submitted to tight Party control. For the preparation of the «Complex Programme of Scientific-Technical Progress and its Socioeconomic Consequences for the Years 1976–1990», an unprecedented number of between 800 and 2000 scientists and scholars was involved in the state planning apparatus. They were coordinated by a special scientific council of the USSR Academy of Sciences under the guidance of V. Kotel’nikov and organised in 27 research groups, sixteen of which were concerned with science and technology and eleven with social and economic aspects. The initial results of their work were presented to the 25th Party Congress and subsequently complemented by a myriad of more specific plans, such as long-term plans for energy and food production. However, the reconciliation of the two main components, the technical and the social, proved exceedingly difficult, and completion of the programme was further delayed by high-level dissatisfaction with the far-reaching scope of the socioeconomic changes set out in early versions of the programme – amongst other things, the suggestion to gradually supersede economic planning by market mechanisms, not unlike the Chinese reforms. In view of these problems, the completion and ratification of the programme was postponed to the 26th Party Congress in 1981 and the forecasting period moved to 1980–2000. Little information was made available to the public, but the fact that there were no fewer than 25 typescript volumes circulating for internal use testifies to the enormous scope of the project. While the programme of technocratic socialism it outlined was decidedly less visionary than the communist project delineated in the 1961 Party programme, it nevertheless asked for substantial adaptations of the Soviet Union’s socioeconomic structure, reflecting the perception that the country was facing serious challenges. Inter alia, the programme demanded that no less than 25 million people be freed from the sphere of manual labour by means of mechanisation to prevent an impending labour shortage. In any event, the programme did little to deter Gosplan from its tried and tested practice of developing Five-Year Plans by means of simple extrapolation from previous developments.

By the time Brezhnev died, it had become something of a habit for new General Secretaries to turn to the STR in an attempt to accelerate socioeconomic develop-
ments. His successors duly planned a Central Committee plenary session devoted to it, but failed to carry it through, much to the frustration of Mikhail Gorbachev, who lamented that the country was already fifteen years behind schedule in implementing STR.\(^{27}\) Accelerated scientific-technical progress was at the core of his initial reform agenda,\(^{28}\) and in the revised Party programme, adopted in 1986, it featured more prominently than ever.\(^{29}\) Two years later, a comprehensive update to the Complex Programme, now covering the period from 1991 to 2000, documented the full scale of the intended reforms and showed that the STR was still considered the principal driving force of all socioeconomic development.\(^{30}\) At the same time, cybernetic governance returned to the agenda of Soviet technopolitics. In 1989, the political leadership reviewed a computerised control system submitted by mathematician and academy member Vladimir Matrosov and code-named «Stability», which was to evaluate variables from a broad spectrum of fields, ranging from military to socioeconomic, ecological and nationality-related parameters so as to ensure the «stable development» of the country in view of numerous crisis factors.\(^{31}\) However, under the impact of the Chernobyl catastrophe, large sections of the Soviet public came to view technoscience as part of the country’s problem rather than its solution, and the subsequent developments brought more democratic than technocratic momentum.\(^{32}\)

2. Forecasting and Future Research: the Scientists’ Perspective

If the CPSU’s large-scale initiative in forecasting and planning the future suggested a process tightly controlled by the political authorities, a closer look reveals that technoscience, once it had joined the effort, developed a considerable momentum of its own that challenged the Party’s self-claimed prerogative over the future in various ways.\(^{33}\) Official STR rhetoric imbued the Soviet technical intelligentsia with the expectation that their expertise would quickly become the key factor in transforming the country, and that consequently, their visions should be given particular weight in defining its future.\(^{34}\) Initial enthusiasm rested on the assumption that


\(^{31}\) Hoover Institution Archive Stanford, Vitalii Kataev papers, Box 14, Folder 10.

\(^{32}\) Technopolitics is the term preferred by a younger generation of historians to refer to «politics conducted through specifically technological means». G. Hecht, The Radiance of France: Nuclear Power and National Identity after World War II, Cambridge, MA 2009, 90.

\(^{33}\) The term technoscience is used here and below as shorthand for science and technology.

technoscience and Party rule would eventually converge into «scientific governance». In hindsight, such hopes can safely be considered unrealistically high.\textsuperscript{35} Obviously, an all-encompassing understanding of scientific governance, as envisioned by the likes of Petr Kapitsa and Andrei Sakharov and shared by many of their colleagues,\textsuperscript{36} left precious little room for political power. Scientists went as far as to demand that science become an independent and impartial judge of political initiatives\textsuperscript{37} – hardly a prospect the Party could be expected to consider any time before the mythical moment when fully-fledged communism was realised and the state withered away. As it was, the gruelling everyday experience of technocratic socialism quickly alienated the scientific-technical intelligentsia from the political leadership.\textsuperscript{38} Subsequently, the scientists challenged the Party’s grip on the future in two significant ways. First, their research increasingly questioned the country’s status quo – the rationality and efficiency of the Soviet administrative and economic system.\textsuperscript{39} Second, and more interesting for our purposes, their anticipations of the future developed a dynamic that was ever more difficult to reconcile with the static prospects envisioned by the Party.

The new discipline of prognostics (prognozirovanie) in particular developed a considerable self-initiative, and before long, the Party found it difficult to command the spirits it had summoned. In the second half of the 1960s, hundreds of research groups on prognostics popped up throughout the Soviet research and development landscape, and with gatherings that attracted hundreds and thousands of enthusiasts, futurology quickly assumed the traits of an intellectual mass movement.\textsuperscript{40} Czech futures studies, flourishing in a more liberal political environment, served as a model for the nascent Soviet forecasting community, while also playing the role of a transmitter for Western future theories to the socialist block.\textsuperscript{41} At Prague University an interdisciplinary research team under the guidance of philosopher Radovan Richta undertook from 1965 to 1968 an in-depth attempt to investigate the STR as a social and historical phenomenon. The resulting book, entitled *Civilization at the Crossroads*, became an immediate bestseller. Its analysis of the social and human

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37 As Kapitsa put it: «To be ruled democratically and lawfully, every state must have independent institutions, serving as arbiters for every issue. [...] It appears that this moral function in the Soviet Union falls to the lot of the Academy of Sciences.» Cited in M. Lipovetsky, «The Poetics of ITR Discourse: in the 1960s and Today», in: *Ab Imperio* 14 (2013) 1, 109–131 (112).


impact of technoscience profoundly challenged the official script of communist transformation, criticising the ways in which Party directives limited individual initiative and expressing the hope that the STR would eventually empower individual citizens to actively co-determine the future development of civilisation. Among the Soviet scientific community, Richta’s project was perceived as «recognition of the fact that science and technology no longer could be equated simply with progress per se, without also addressing the social and political consequences». In June 1968, Bestuzhev-Lada warned that the socialist bloc would eventually need to find Marxist answers to many of the same impending crises in energy, population growth and environmental pollution that dominated the discussions of Western futures research. From their beginning, Soviet future studies were thus profoundly influenced by their Western counterpart. Anticipating the reproach of ideological freethinking, Soviet «futurologists» originally posed as mere analysts of enemy ideology – a strategy that opened the opportunity to relate the Western methods to a broader Soviet scientific public. Inter alia, the Delphi method, operations research, game theory and technology assessment received their fair share of attention. Subsequently, Soviet forecasters developed their own approaches and methods. By the mid-1970s, an American author counted roughly 3000 items of Soviet forecasting literature, and Bestuzhev-Lada claimed that over two hundred approaches were known to Soviet researchers. However, the diversity of methods concealed the fact that most of the literature was still limited to problems of a scientific-technical nature, with social aspects accounting for just a small percentage of the total research.

The unofficial flagship of non-state Soviet futures studies was the Soviet Association of Scientific Prognostics (SANP), established in 1968. Largely bypassing the structures of official academia, it co-opted approximately 3000 scientists and established branches in eleven Union republics as well as scientific contacts in a number of socialist and capitalist countries. It published dozens of monographs and hundreds of articles annually in its own journal, *Questions of Scientific Forecasting*. According to Tardov, one of the Association’s leading figures, the SANP’s mission would ideally have consisted of a twofold effort at developing scientific forecasting

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44 Ibid., 206.


47 Ibid.; G. S. Batygin / S. F. Jarmoliuk (eds.), *Rossiiskaia sotsiologiiia shestidesiatikh godov v vosspomina-
niakh i dokumentakh*, Sankt-Petersburg 1999, 528–530.
methodology while also acting as an independent consultative body to the state planning effort, providing Gosplan with the comprehensive forecasting perspective that in the view of the scientists it was lacking. The SANP’s fourth All-Union Symposium enumerated no less than fifteen areas of forecasting in which the Association might provide advice to Gosplan, including the development of mathematical forecasting methods and automated forecasting systems, as well as the elaboration of actual forecasts of scientific-technical, economic, demographic and environmental developments. Except for Gvishiani’s GKNT, however, these proposals met with limited response on the part of State agencies. Unlike Gosplan’s practice, the scientists involved aimed at prioritising social goals above purely economic and technical decisions, and demanded that greater attention be paid «to the unforeseen or hidden costs of progress» – thus venturing deep into territory the Party considered its exclusive realm.\(^{48}\)

At the same time, developments in Czechoslovakia highlighted the disruptive potential of independent futures studies in a state socialist context. In hindsight, there could be little doubt that STR-thought, condensed in Richta’s project, had constituted an integral part of the intellectual ferment that led to the Prague Spring. In Moscow, the Czech precedent amplified the Party’s distrust of the scientific intelligentsia. Articles in the Soviet press started to warn against the importation of Western futurology, and as the Prague Spring unfolded, the CPSU leadership propagated the dangers of narrow-minded «scientocracy» in increasingly shrill tones. In December 1971, chief ideologue Suslov threatened that the Party would not suffer social scientists installing themselves as some sort of «second party» of social critics.\(^{49}\)

The fate of the Association of Scientific Prognostics aptly reflects the ensuing disciplining of independent-minded scientists. In 1970, Party officials denounced the Association as «a playground for uncontrollable and irresponsible adventurers». Its journal was found to be brimming over with «ideological-theoretical blunders», the most important among them being the assumption that social progress derived directly from technological development rather than class struggle. Consequently, the Association’s activities were brought to a halt by the Committee for Party Control, notwithstanding the fact that an internal Party report admitted its sympathy for the specialists’ impatience in view of the CPSU’s hesitant implementation of future planning.\(^{50}\) Subsequently, academic forecasting was drastically curtailed – ironically around the time of the very 24th Party Congress that pledged to conduct state planning on a scientific basis.\(^{51}\) It would seem that the circumstance that the Party

\(^{49}\) Ibid, 223 and 229 (Suslov’s quote); V. Chkhivadze, «Pravovaia nauka sotsializma», in: Pravda, 10.01.1968, 2–3.  
\(^{50}\) Batygin / Iarmoliuk, Sotsiologiya, 531–535.  
\(^{51}\) Rocca, «Second Party», 227. Disbanded institutions included the Coordinating Committee on Forecasting Scientific and Technical Progress and Its Social Consequences, Bestuzhev-Lada’s Institute for Social Forecasting and the periodical
had done little to claim the future by no means increased its readiness to let others claim it.

Among the technical intelligentsia, the impression that the promise of scientific governance was atrophying into a mere semblance of technocratic socialism met with widespread disappointment. Andrei Sakharov’s famous *Reflections on Progress, Peaceful Coexistence, and Intellectual Freedom* marked the beginning of technocratic dissent. Published internationally in 1968, the pamphlet expressed anxiety at the realisation that for all the opportunities and dangers inherent in the STR, «the scientific method of directing policy, the economy, arts, education and military affairs still has not become a reality».

Scientific governance could hardly prevail as long as the Party’s power was virtually unlimited and often used arbitrarily. Sakharov’s views were shared by many of his colleagues and led a significant number of them to join the ranks of the dissident movement after 1968.

In the past, historians of Soviet science have diagnosed the conflict between political elites and the technical intelligentsia as an inevitable clash of scientific rationality with irrational ideology, scientific freedom with political coercion and technocratic optimisation with the vested interests of apparatchiks. From this point of view, technoscience figured as a progressive counterforce to «partocracy» and was hence identified with liberal democracy. Some contemporary Western observers believed that large parts of the Soviet technical intelligentsia envisioned their country’s path to the future as a trajectory from partocracy via technocracy to democracy. More recently, however, cultural historians have questioned the democratic credentials of the Soviet technical intelligentsia. It has been argued that a majority of Soviet scientists understood scientific-technical progress as an essentialist enlightenment programme that was without alternative and hence inherently anti-pluralist. This made the scientists ill-suited to pioneering pluralist democracy, and instead predisposed them to embrace an authoritarian modernising regime as the most promising option – especially if that regime supported the same ideal of positivist progress. This circumstance, just as much as political coercion, may explain why the bulk of the technical intelligentsia, even after the disillusionment that
brought about 1968, accepted the premise that envisioning the future was viable only in cooperation with the Party, not in confrontation with it. As Amalrik maintained, «the most widespread sentiment in Soviet academic circles is «conformist reformist ideology» – the comforting belief that gradual, piecemeal reforms [...] will eventually create a more humane society».58

3. A Soviet Reflexive Modernity?

If positivist progress was at the heart of the Soviet project and mobilised both the political and the scientific-technical elites of the country, could there be any room for a critical appraisal of modernity – for something akin to what later came to be termed «reflexive modernity» in the West?59 In Soviet discourse, this question finds its earliest and closest approximation in the «physicists versus lyricists» debate that had preoccupied the Soviet intelligentsia since 1959. This discussion has often been summarised as an argument between scientific rationality and literary emotionality, but is perhaps better interpreted as a discussion of the question of whether human progress amounts to the recognition of a single correct course of human development in view of the superiority of natural laws («physicists»), or to a constant series of exploratory and ambiguous choices governed by human will and conscience («lyricists»).60 Obviously, the latter understanding was more conducive to deconstructing the idea of comprehensive progress towards one ideal future, and to imagining a variety of futures based on the primacy of alternative values such as ecology, «national identity», etc. In the Soviet context, it thus fell to the poets to pioneer a sceptical appraisal of modernity. Throughout the 1960s, 1970s and 1980s, criticism of progressivism developed in literature, drama, cinema and chanson culture. Valentin Rasputin’s emblematic Farewell to Matyora (1976) – a literary elaboration on the devastating social and ecological consequences of large-scale hydro-engineering on the Angara river – epitomises the sense of loss that pervaded the genre of village prose from the 1960s to the dissolution of the Soviet Union. Aleksandr Solzhenitsyn went one step further and envisioned the future as a return to an idealised past. Only the rejection of further modernisation and economic growth would allow for moral regeneration, and was best achieved by radical measures, he maintained. A transfer of the country’s centre of population to its underdeveloped and allegedly pristine Northeastern periphery would be the chance to start with a clean slate.61

59 Beck / Giddens / Lash, Modernization.
Clearly, such visions expressed a preference for decelerated – or even reverted – time. At the other end of the literary spectrum, science-fiction offered an opportunity to address the ambiguities of modernity in fictional settings. As a literary scholar has concluded from the analysis of late Soviet literature, «[t]he limitations and possible negative aspects of scientific progress were increasingly recognised» and countered by an emphasis on individual choices based on moral decisions.62

To what extent was the scientific-technical intelligentsia willing to share in the questioning of positivist progress that it had, after all, so prominently helped to shape in the first place? Unquestionably, its opportunities to do so were significantly more limited than those of its Western peers. If Western reflexive modernity was characterised by experts – once seen as above the fray – rejoining to the sphere of adversary politics, then the absence of any such sphere precluded analogous developments in the Soviet case – except for the phenomenon of outright disidence.63 Nevertheless, with sceptical attitudes towards progress spreading among the domestic cultural elites and the international scientific community alike, elements of reflexive modernity entered the mind-set of the Soviet technical intelligentsia from the late 1960s onwards. If, in the early post-Stalinist period, scientists had self-confidently claimed access to objective truth and adhered to the belief that technological progress would take the right course by virtue of its inner logic, they now started to admit that science could not substitute for value-based decisions and moral discussions. In the absence of a democratic sphere, they largely relegated these functions to literature.64 Kapitsa made an especially vigorous case for «spiritual culture» in 1978, maintaining that «the impact of art on the cultural growth of the whole of mankind is at least as great as the impact of science»,65 and it was undoubtedly the resonance that the critically-minded representatives of the literary intelligentsia found among their scientific-technical peers that eventually made their scepticism towards positivist progressivism hard to ignore for the political leadership. Simultaneously, critical reflections on modernity found their way into the reasoning of technoscience proper. Such scepticism was first articulated in connection with an especially ambiguous outgrowth of technological development: the nuclear arms race.66 Subsequently, recognition of the ambiguities of techno-

62 Marsh, Fiction, 10.
64 Vail’ / Genis, 60–6; Marsh, Fiction, 20, and the literature quoted there.
logical progress proliferated throughout the scientific-technical intelligentsia. Tellingly, by the mid-1970s even as staunch a proponent of scientific-technological advancement as Sakharov found it necessary to counter-balance progress with preservation: echoing Solzhenitsyn in an essay published in 1974, he envisioned territorial segregation of the world into a technologically developed and highly productive «work territory» and a pristine «preserve territory» set aside to maintain the earth’s ecological balance.67

By the early 1980s, sceptical views had come to dominate the output of Soviet prognostics. The Soviet forecasting literature produced in those years took as its point of departure the «global problems of the present»68 and looked at «The world in the year 2000» in the light of challenges such as the arms race, ecological problems, overpopulation, and poverty. At that time, Bestuzhev-Lada found it difficult to understand the naive progressivist optimism that his former self had propagated so eagerly two decades earlier.69 It should be noted however that a growing awareness of the concomitant problems of technological progress by no means prevented scientists from believing that eventually technological fixes could be found for all of them. Sakharov called for more, not less technocracy. And while Bestuzhev-Lada would describe the impending problems of mankind in stark terms some fifteen years later, he proposed solving them by means of large-scale technology – namely the reconstruction of the surface of the earth and colonisation of outer space.70 The idea of linear progress remained dominant, even if it was now balanced with preservation considerations. Eventually, hopes of squaring the circle took shape in expectations of a second, ecologically conscious STR that would reconcile progress and preservation by fostering a transition to «technologies permitting the maintenance of a closed circuit between society and nature, the adoption of biological and biochemical processes and the use of «clean» sources of energy».71

4. Society: From Hyper-Industrial to Post-Industrial?
The expected social consequences of the STR merit special attention, as they were prominently described as the key distinguishing feature setting apart the Soviet STR from its Western counterpart. Coincidentally, they were also the aspect subsequently most neglected by the state forecasting and planning apparatus, according to Soviet sociologists engaged in futures studies. For its part, the regime had good reasons to limit such research – for as the STR unfolded, it became increasingly

71 Cooper, «Change», 473.
clear that its actual social consequences often stood in direct contrast to the anticipated outcome. Initial assumptions had envisioned a society in which «one half of mankind engages in scientific research, while the other half supervises automatic factories» and performs social functions. In such a society, class, gender and national differences would finally wither away as blue and white collar workers merged into a uniform group of production engineers, women and men shared the same tasks in the absence of hard physical labour, and the universal spread of knowledge enabled all Soviet nationalities to participate in the process on equal footing. And not only was science expected to occupy the better part of society – it was also assumed to eventually provide the cybernetic principles for its governance. As Kapitsa put it in 1959: «We must learn to build the State apparatus on the basis of the science of society, and it is necessary to learn to analyse it just as engineers now analyse electrical machines; it must be simply constructed and operate with a high efficiency.» In this context, Scientific Management of Society (NUO) became a much-quoted watchword.

Two decades later, the society of scientists and production engineers had not become a reality, nor was it anticipated any longer, as Bestuzhev-Lada clarified in a series of articles entitled Contours of the Future, published between 1983 and 1984. Although he maintained the assumption that agriculture and industry would need fewer and fewer hands as mechanisation and automation progressed, he now deemed it unlikely that the surplus workforce released in these sectors would be funnelled into science, where, he said, an employment ceiling had been reached. Instead, the additional workforce would be needed in education, healthcare, culture, and what he referred to as «the leisure industry». In this updated vision of a service society, technology was relegated to playing a merely instrumental role in providing amenities and had obviously lost its socially transformative power. It was again Kapitsa who got to the heart of the general shift in perception. In the late 1970s, he observed that science had greatly enhanced production, but had failed – mostly due to political constraints, he insinuated – to influence social developments in any meaningful way. In view of this observation, Kapitsa abandoned his earlier pet idea of scientific governance and shifted his hopes for human progress to «spiritual culture». Material wealth, he argued, was being progressively expended.
and had to be renewed; its excessive consumption and production were harmful to humankind and its natural environment. By contrast, spiritual wealth could be continuously accumulated over generations and there were no limits to its growth. In conclusion, Kapitsa suggested that the ultimate measure of progress was not material prosperity, but the «quality of a country’s spiritual culture».

Unspectacular as it seemed, the heightened interest Soviet authors took in the «non-productive» sectors of society towards the end of the 1970s anticipated a potentially much more fundamental transformation of society than the transition from low to high-tech industrial society that had hitherto been associated with STR. What was implied was nothing less than the Soviet Union’s gradual transformation into a post-industrial society – although the term was carefully avoided, as it would have been too much to swallow for the Party with its Marxist-Leninist focus on production. Unquestionably, the technical intelligentsia had come a long way from its initial, rather straightforward visions of the STR society to a much more nuanced appraisal of the consequences of scientific-technical progress.

5. East and West: Competition for the Future or Shared Responsibility?

In its original understanding, the STR epitomised Soviet hopes of outracing the capitalist world in the context of system competition between East and West. The Party programme of 1961 argued that capitalism monopolised the benefits of progress for purposes of profit accumulation and was hence headed for social unrest, whereas socialism would apply the fruits of the STR in the best interests of society to build an ideal communist polity. However, embracing it also launched the Soviet Union on essentially the same path of technological and technocratic progress that the West had embarked on. Describing the sweeping changes the STR was about to bring to all ways of life, Soviet propaganda implicitly conceded that progress in the modern era was conditional to a larger extent upon science and technology than upon a specific social order. Given the ever increasing weight of scientific governance in both the socialist and the capitalist worlds, some Western observers in the 1960s expected the two systems to eventually converge in a common form of technocratic rule. Official Soviet literature fiercely rejected this idea from the outset – and when criticism of progress began to spread throughout the

80 CPSU Programme, 9, 27–28.
Western world around 1970, orthodox Soviet authors took it as proof that the paths of capitalist and socialist STR indeed started to head in opposite directions. Western diffidence concerning progress was countered with ostentatious Soviet confidence, and only dissidents dared to point out an increasingly overlapping set of developmental challenges shared by socialist and capitalist countries.

However, in the course of the decade, the dogma of Soviet exceptionalism began to erode. Whilst Soviet authors fiercely rejected the Malthusian implications of the *Limits of Growth* report (published in 1972) and polemically portrayed it as a reflection of problems specific to capitalism and indicative of its imminent demise, five years later they met the *Global 2000* report with the general acknowledgement that many of the challenges it described were shared, to some degree, by socialist societies. Towards the end of the decade, Kapitsa went as far as to suggest that convergence was a prospect that merited serious consideration in view of the global crises humankind was facing as a result of technological progress. The socialist and the capitalist camps would be well advised, he maintained, to join forces to confront such problems as the imminent depletion of fossil fuel resources and environmental degradation rather than continue their narrow-minded competition. The fact that Kapitsa got away with his bold statement suggests that by the end of the 1970s, the Soviet leadership had tacitly come to accept the shared challenges paradigm. Roughly two decades of international and transnational scientific exchange had prepared the ground for such insights, with peace research playing a pioneering role. From the late 1950s, initiatives such as the Pugwash Conferences had highlighted the dangers of the arms race, and thereby set a precedent for discussing the ambiguous consequences of scientific-technological progress on a global scale. Peace research also provided the starting point for Bestuzhev-Lada’s collaboration in Robert Jungk’s *Mankind 2000* project from the mid-1960s on and the World Futures Studies Federation that emerged from it.

The Soviet leadership’s keen interest in economic modelling opened another door to international future research. From the late 1950s, Dzhermen Gvishiani personally established ties with leading international figures in the field, such as the US econometrist Wassily Leontief and the future founders of the Club of Rome.

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84 Reportedly, it was this aspect of Sakharov’s Reflections that provoked the ire of Party officials. B. Nathans, «Coming to Terms with Late Soviet Liberalism», in: *Ab Imperio* 14 (2013) 1, 175–182 (180, note 7).


Aurelio Peccei and Alexander King. When computer modelling gained momentum in the early 1970s, the Soviet Union was thus already a part of the various networks from which these studies originated. It closely followed the development of the first computerised world model, designed by Forrester and Meadows for the Club of Rome to simulate economic, ecological and demographic processes on a planetary scale, and repeatedly invited its authors to the Soviet Union to promote computer-based global modelling, although it rejected the resulting *Limits of Growth* report. The Soviet Union was also involved in a UN report on *The Future of the World Economy* (1976) edited by Leontief. Thanks to his political circumspection, the Soviet side accepted an analysis that studied socialist alongside capitalist economies under the common denominator of global trade relations and limited planetary resources.

Straddling the bloc divide and de-emphasising ideological divisions, these emerging international scientific networks brought far-reaching initiatives into the realm of the possible. Probably the most important among them was the International Institute of Applied Systems Analysis (IIASA) at Laxenburg in Austria – a think tank jointly created by the two superpowers and aimed at anticipating the global future in a common effort by scientists from both camps. The idea of an «East-West Institute» had been born in 1966 as the brainchild of Lyndon B. Johnson, who proposed a scientific institute that would work on «the shared problems of industrial nations» and in doing so help to bridge the East-West divide. The idea met with a favourable response from the USSR and was subsequently given high priority by both sides. The fact that preparations for founding the institute were not impaired by the deterioration in superpower relations following the Prague Spring indicates that both sides considered technopolitics an alternative field for quasi-diplomatic relations and trust-building measures between the blocs: common attempts at anticipating the future promised to make the competitor more predictable. The founding charter of the Institute in 1972 described the rationale behind the IIASA as developing «methods of investigation and analysis [...] to predict, evaluate and manage the social and other repercussions of scientific and technological development». For this purpose, computer technology and systems analysis methodologies were used extensively. Two years into the institute’s existence, hundreds of scholars had become affiliated with IIASA, working on topics such as automated control of industrial production, urban and regional planning, energy systems, ecological modelling


and control, water resources, artificial intelligence, and long-term global simulation studies.\textsuperscript{91} A fairly typical project illustrating the activities of IIASA (while also highlighting the paradoxes of Cold-War-technopolitics) was the creation of a computer model of the climatic impact to be expected from a nuclear war between the USSR and the USA (1982–1983).\textsuperscript{92} There is probably no better illustration than IIASA for how, within a mere decade, the future transformed in international discourse, from an infinite space of opportunities that needed to be conquered for one’s own system against the claims of a fierce competitor, towards a vulnerable habitat shared by all of mankind which was to be safeguarded in a common effort.

International cooperation drove thoroughgoing epistemological changes in Soviet prognostics. If the term «global» had earlier referred to the whole of the Soviet Union, it now came to designate the planetary scale. Global modelling in the latter sense became an accepted discipline and was officially incorporated into the Academy of Sciences’ Institute for Systems Research (VNIISI), established in 1976 under the auspices of one of Gvishiani’s protégés. Close to the regime and geared towards generating policy-relevant information, VNIISI’s principal task was inspired by the work of the US Commission for the Year 2000, and consisted in forecasting the demographic, economic and environmental development of the world system and the Soviet Union. The resulting global model covered a time horizon of twenty years and was extremely complex, but suffered from a lack of solid input data for the USSR – the result of a culture of secrecy that continued to plague even policy-relevant research. VNIISI’s geopolitical focus was complemented by the Academy’s second node of future modelling – the Computer Centre, headed by mathematician Nikita Moiseev, which specialised in forecasting anthropogenic interference with the bio- and geosphere, including the climate impact of CO2 emissions and a possible nuclear war.\textsuperscript{93}

Acceptance of the shared challenges paradigm unquestionably helped Soviet future studies catch up with international research in the field. But this came at the price of undermining the tenets of Soviet STR theory and, consequently, of communist ideology. Bestuzhev-Lada deserves credit for pointing out the incompatibility with utmost clarity. In the closing chapter of \textit{The World in the Year 2000}, he juxtaposed two fundamental theses: first, that humankind faced large-scale disaster and possible extinction if the negative consequences of scientific-technical progress were not dealt with immediately in a massive concerted effort by the international community, and second, that the triumph of communism on a global scale was an inevitable historical necessity and would provide the key to the expedient solution to

\begin{itemize}
  \item \textsuperscript{91} Rindzeviciute, «History»; A Brief History of IIASA and Schloss Laxenburg, ed. by IIASA, Laxenburg n.d.; Dittmann, «Technik», 103–110.
  \item \textsuperscript{92} Paper given by E. Rindzeviciute at the University of Heidelberg, 27.11.2014.
  \item \textsuperscript{93} Rindzeviciute, «Joint Future», 6, 19–23, 25–30.
\end{itemize}
all of humankind’s problems. Clearly, in Bestuzhev’s plot for the future, communism had been reduced to the status of a highly improbable *deus ex machina.*

6. Conclusion: One Future or No Future

In this article I have argued that the promise of unilinear progress started out as an apparent asset of Soviet thought on the future, but became one of its main liabilities in the period under consideration in this volume. While this peak and subsequent erosion of positivist progressivism was in lockstep with Western developments – if slightly delayed –, it was, I have argued, of a more existential significance for the Soviet Union. Here, the scientific-technical revolution was defined as an inalienable part of the larger Soviet project – deemed not only instrumental in realising its full socioeconomic potential, but also essential in bolstering its scientific credentials as a theory of all-encompassing advancement towards an ideal future. During the heyday of international positivist modernity, the comprehensive Soviet design of the future seemed to place the country at the forefront of progress, but towards the end of the 1960s, when positivist approaches to futures thought in Europe and North America were challenged by critical and normative currents that highlighted the ambiguities of progress and questioned the authority of its administrators, the Soviet Union found itself ill prepared. While the Czechoslovak reform movement provided an entry point for this intellectual ferment into the state socialist context, its suppression and the subsequent disciplining of the Soviet intelligentsia made it clear that the CPSU would not suffer infringements upon what it considered to be its very own prerogative: comprehensive interpretational sovereignty over the future. I have argued that in this light, the limiting implications of the political future discourse became more and more obvious and were increasingly challenged in Soviet expert debates. For one thing, the holistic character of this discourse favoured assumptions that predicted progressive integration of the Soviet polity (most notably, towards classless society), whereas sociologists and economists increasingly observed and forecast processes of differentiation. Second, its palin- genetic quality made optimism compulsory and posited superiority over the capitalist camp, while expert discourses, from the 1970s onwards, expressed a growing sense of impending crisis and a realisation that the socialist camp shared many of the same developmental challenges as its capitalist counterpart. Third, its teleological focus on communism at the end of history limited its horizon to envisioning an equitable and wealthy industrial society at the end of history, whereas scientists eventually started to anticipate a post-industrial world.

95 Seefried, «Steering».
While Soviet scientific thought on the future was thus constantly stifled by ideological constraints, it nevertheless exerted a dynamising effect on the formulation of Party goals and the work of the state forecasting and planning apparatus – initially propagating a programme of positivist progress, but eventually incorporating an increasing number of elements from the agenda of reflexive modernity. Over time these concerns permeated from expert into political discourse. Eventually, they found expression in programmatic documents such as the successive «Complex Programmes», whose focus gradually shifted from managing the opportunities of progress to mitigating its concomitant crises. From about the mid-1970s onwards, the Soviet future discourse can hence be described as an attempt at squaring the circle between positivist and reflexive modernity – usually by proposing technological fixes to problems that had been caused by technopolitics in the first place. However, this approach fell short in two ways: first, blinkered as it was concerning the socioeconomic consequences of scientific-technical progress, Soviet thought on the future found no productive way of dealing with the historical irony that the STR was bound to transcend rather than perfect industrial society – and would hence obliterate rather than complete the Soviet project. With the withering away of industrial society, Marxist-Leninist theory increasingly appeared to have become a narrative not of future transformations but of past attempts to remodel society. Second, while accounting for select gravamina of reflexive modernity, the Soviet future discourse firmly rejected its central axiom – that the development of human affairs inevitably implied ambiguous choices that could not be decided by knowledge alone, but required the articulation of multiple political preferences. Embracing this axiom would have required the acceptance of plurality – a plurality of alternative futures, as well as of political actors to articulate and implement them. It was a step that the CPSU was unwilling to take.

Consequently, at a point when industrial societies both capitalist and socialist faced mounting pressure to adapt to the social, economic and ecological consequences of progress, Western democracies engaged in lively contestations over sharply diverging futures – a process that significantly dynamised their political landscapes and diversified their options of dealing with the developmental challenges at hand. Meanwhile, the Soviet Union, due to its monistic political system, remained locked in its holistic design of the future, which not only started to look out-dated, but also became increasingly complex and unwieldy as it was made to accommodate for ever new developmental options while categorically excluding others. It was a sluggish process of dealing with the challenges at hand that ultimately proved too confining to accommodate the growing doubts about the Soviet developmental path, doubts that in view of numerous crises spread throughout the

97 Herbert, «Europe», 6.
98 Maier, «Sorts».
country’s intellectual elites and, eventually, a wider public. When Gorbachev opened the floodgates to envisioning the future, it was only logical that this spurred more democratic than technocratic momentum.

Is it possible, then, that the Soviet Union had in fact abandoned its future much earlier – some time during the Brezhnev era – and replaced it with a perpetuated present, as has been claimed by analysts of Soviet ideology? The present study suggests another conclusion: that the Soviet Union, in the period under consideration, shifted its efforts at anticipating the future from the ideological to the technocratic sphere – investing considerable energy in the elaboration of ever more complex forecasts and plans of action that remained committed, however, to the idea of unambiguous progress and hence, the one-future-only paradigm. Seen from this perspective, the point is not that the Soviet Union abandoned its future – but that it never owned more than one. And when that single future surrendered to the onslaught of reflexive modernity, it was left without one.

One Future Only. The Soviet Union in the Age of the Scientific-Technical Revolution

The present article focuses on the «Scientific-Technical Revolution» (STR), tracing the Soviet leadership’s bid for the future throughout the post-Stalinist period and examining how it came to be challenged by the scientific-technical and literary intelligentsias of the country. I argue that what was claimed to be the main strength of official Soviet thought on the future – its holistic character – was also its most serious limiting factor. Unlike Western futures studies, which assumed a plurality of possible futures and stressed the need to strategically choose between them on the basis of preferences and values, orthodox Soviet theoreticians framed the prospective development of mankind in terms of a single future that demanded an all-encompassing vision. The resulting Soviet future discourse was unwieldy and restrictive, and left the Soviet Union ill-prepared to deal with the onslaught of «reflexive modernity» that reached the country in the 1970s.

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