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The politics and contexts of Soviet science studies (*Naukovedenie*): Soviet philosophy of science at the crossroads

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Abstract *Naukovedenie* (literarily meaning 'science studies'), was first institutionalized in the Soviet Union in the twenties, then resurfaced and was widely publicized in the sixties, as a new mode of reflection on science, its history, its intellectual foundations, and its management, after which it dominated Soviet historiography of science until *perestroika*. Tracing the history of meta-studies of science in the USSR from its early institutionalization in the twenties when various political, theoretical and institutional struggles set the stage for the development of the field, to the sixties when the field resurfaced within the particular political context of the Cold War, and using the history of Moscow Institute for the History of Science and Technology as a case-study, I situate Soviet *naukovedenie* project within the culture of late-socialism in the Soviet Union during the Cold War, asking what this discourse meant for its creators and practitioners, as well as for the high-ranked Soviet officials who provided the authoritative support for this field.

Keywords *Naukovedenie* · Soviet philosophy · Scientific-technological revolution · Bonifatij Kedrov · Moscow Institute for the History of Science and Technology

In the sixties and the seventies the new field called *naukovedenie* (literarily meaning 'science of science' or 'science studies') was widely publicized in the Soviet Union. The promoters of the new discipline claimed that *naukovedenie*, in the words of the Minister of Higher Education of the Russian Federation Vsevolod N. Stoletov, as he put it in 1966,

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> …is a domain of scholarship which is situated on the borderline between the natural sciences and philosophy. Hence, in our country, where scientists are constantly improving their philosophical competence, we have the optimal conditions for the development of the science of science.[1]

The emergence of this new field in the Soviet Union occurred simultaneously with the dramatic reconfiguration of the studies of science in the Anglophone West, where it was associated with the proliferation of the sociology of knowledge and the extension of cultural anthropology, critical theory, and literary studies into the studies of science. Soviet *naukovedenie*, not surprisingly, almost immediately attracted the attention of Western science studies scholars.[2] However, seen against the backdrop of what came to be known as *science studies* in the Anglophone West, the Soviet project appeared as a rather bleak version of its Anglo-American counterpart.

Thus, in 1984 the leading journal in science studies, *Social Studies of Science*, published a review entitled "Soviet Science Studies: A Dissident View," written by Alexey Levin and introduced by Steven Shapin, who was in contact with the Soviet dissident philosopher, by that time fired from his position at the Moscow Institute of Philosophy. The publication reproduced the extracts from the correspondence between Shapin and Levin, which included the following dialogue:

Shapin Could you comment on the general state of history of science and science studies in the Soviet Union?

Levin This is a poorly developed field in the Soviet Union. To begin with, it is under-developed institutionally: there is at present not a single department, unit, faculty, or the like, which could provide an appropriate training in any branch of science studies. … The only university departments that are able to offer at least some formal training suitable for science studies are departments of philosophy, with the result that the field is overcrowded with philosophers. You have, I know, your philosophical rationalists in the West, but you could hardly imagine a typical Soviet philosopher [Levin goes on to describe ideological constraints on Soviet philosophy—S.S.]. On the other hand, the education furnished by even the best philosophical faculties can hardly be regarded as adequate: too much classical philosophy, too much … Marxist disciplines…., too much formal logic, and too little general history…⟨…⟩

Shapin In the West, the most recent empirical Marxist study from the Soviet Union with which many historians are familiar is Boris Hessen's 1931 'Social and Economic Roots of Newton's *Principia*.' What, if anything, has become of that tradition of work?

Levin Work in Hessen's style is now very rare…

Shapin What, then, is the official line in Soviet science studies?

[1] Stoletov (1966: 422). The quote is from Stoletov's afterword to the translation of the collection of essays in honor of John D. Bernal, *The Science of Science: Society in a Technological Age*, originally published in 1964.

[2] See the useful review of the field of *naukovedenie* in the Soviet Union: Rabkin (1976).

> *Levin* … Soviet history and philosophy of science … has never produced its own special models of scientific change or practice other than abstract and over-universalized pictures constructed in the framework of dialectical and historical materialism. … I cannot name any sound, middle-level methodological, sociological, or historical conception of science developed by Soviet scholars.[3]

As Levin further attested, "the approaches which dominate Soviet historiography are traditional and intellectualist. Little attention is paid to modern Western perspectives in the social study of science. … the references to modern Western authors … are ritualistic … ⟨and⟩ there is no significant orientation to what is occurring in the West" (Levin 1984: 462).

Several years later, in the late eighties, an anthropologist visited the Moscow Institute for the History of Science and Technology (Institut istorii estestvoznanija i tekhniki, thereafter IHST), the country's leading center of *naukovedenie*. Alessandro Mongili used Bruno Latour and Steve Woolgar's classic *Laboratory Life: The Construction of Scientific Facts*—the core work in the laboratory studies tradition within the field of science studies—as a model for his own anthropological study of Moscow Institute (Mongili 1998a). What resulted was a fascinating account of the daily activities and routine practices of the researchers of this Institute, and the ways in which Soviet *naukovedy* constructed their "scientific facts." Mongili suggested that Soviet *naukovedenie* was "a phantom science" ("une science fantôme"), as a nod to Latour's point on the significance of paper documents and texts—literary inscriptions—in the "normal" operation of science (220). As Mongili described this phantom, or fictional, character of Soviet *naukovedenie,*

> The research units were far from being the real teams of research. More often than not it was a matter of a fictional collective: each individual researcher tended to be occupied with his own personal research or did no research whatsoever. … Other structural conditions, such as control structures that [reduced the possibilities to publish] and… the difficulties and dangers for publishing outside the USSR … reduced the importance of publications. … Publication was transformed into a gadget for those researchers who already enjoyed high-level careers. … The publications were [obsolete] and were not read, at least not by the professional public.… In the climate of control, censorship and self-censorship, texts tended to become more and more irrelevant, little more than conveyers of cryptic messages… Science therefore found itself in a situation where publication played only a marginal role: it lived in an almost *pre-gutenbergian world*."[4]

Both Levin and Mongili compared and contrasted Soviet science studies with what is called "science studies" in the Anglophone tradition, and found it wanting. In this paper I attempt to understand *naukovedenie* in its own terms and situate it within its own local context—the culture of late-socialism in the Soviet Union

[3] Levin (1984: 464).

[4] Mongili (1998b: 170–180, emphasis added—EA).

during the Cold War—asking how this discourse functioned and what it meant for its creators and practitioners. As historian Slava Gerovitch pointed out, Soviet historiography of science followed closely the political and social evolution of Soviet society, changing its thematic and methodological outlook according to the changing political demands of the time (Gerovitch 1996, 1998). I seek to extend Gerovitch's account, focusing on one aspect of Soviet science studies—the role of philosophers and philosophy in Soviet science studies project.

In contrast to what came to be known as *science studies* in the US and the UK, with its explicit juxtaposition of the new approaches in the studies of science to traditional philosophy of science dominated by logical positivism, and the ambition to replace philosophy of science by sociology of knowledge (the credo of the so-called Strong Programme and the Edinburgh school),[5] in the Soviet Union *naukovedenie* was a preeminently philosophical project. As Levin lamented, the field of *naukovedenie* was "overcrowded with philosophers" (Levin 1984: 464). Who were these philosophers who came to occupy this discursive space in the sixties? What discourse on science did they produce and why? The mainstream Soviet philosophers, to whom Levin's referred to as "typical Soviet philosophers," wrote lots of undeniably boring and uninspiring pages, as Levin's comments vividly testified. However, making these "typical" philosophers and their discursive strategies the focus of analysis is revealing, as it allows us to see to what they were responding. What these non-dissident adaptors and survivors produced reflected the relationship between science, society, and the state.

In this account of Soviet *naukovedenie* I use the history of IHST as a case-study. Since its inception in the twenties, the Institute became a prototype of a country-wide "model" institution in historiography of science, conceived as part of the bigger ambition to develop and institutionalize meta-studies of science, under the names of "studies of methodology of science," "general studies of science," or *naukovedenie*. The case of this single institute allows me to trace the history of meta-studies of science in the Soviet Union from its early institutionalization in the twenties, when various political, theoretical and institutional struggles set the stage for the development of the new field in the new Soviet republic, to the sixties when the field resurfaced within the particular political context of the Cold War. I argue that rather than being a "fictional" or "phantom" discipline existing in an entirely different world of Soviet socialism incommensurable with Western democracies ("pre-gutenbergian world," in Mongili's words), the story of Soviet science studies is both comprehensible and intriguing in the same terms in which historians have come to understand how the political concerns of the Cold War formed the backdrop of "the science studies renaissance" in the US and the UK in the sixties and seventies.[6]

[5] As John Zammito noted, "this disputation of the authority of philosophy of science emanated most forcefully from David Bloor. Bloor's book *Knowledge and Social Imagery* was aptly characterized as 'a sustained tirade against philosophers.' Bloor 'sets out to redefine the disciplinary boundaries for the study of science, giving sociology pride of place … and dealing philosophers … largely out of the game" (Zammito 2004: 137).

[6] Recent studies highlighted the political context of the emergence and institutionalization of science studies as an academic discipline during the Cold War. Thus, as Steven Fuller argued, Thomas Kuhn's

Soviet philosophy and the studies of science in the twenties and thirties

Philosophy always had a special status in the Soviet Union. Marxist philosophy provided explicit legitimation of Soviet system of the party-state. Moreover, Soviet Marxism was proclaimed to be a truly "*scientific* philosophy," in the sense that both science and philosophy were seen as the foundations of the Soviet system. By the same token, Marxism was also proclaimed to be distinct from all former socialist theories, as it was perceived neither as "utopian socialism" nor as "ethical socialism" but as *scientific socialism*. As Lenin famously stated in his 1902 *What is to be Done*?, one of the central tasks of the workers' party was to educate the working class in the *science of socialism*.

The relation between Marxist philosophy and science, i.e. the question of whether and in what sense Marxism was a science, was the subject of major debates in Soviet philosophy since its inception.[7] The special relation, however understood, between Marxist philosophy and science also authorized the expansion of Marxism into the natural sciences, both theoretically and institutionally. Studies of science as a social institution and the basis for a "knowledge society" attained high visibility within educational curricula of the newly formed educational institutions. Moreover, meta-studies of science were promoted as a special discipline throughout the twenties and thirties in the Soviet Union. A special term for such a discipline—"*naukovedenie*" (a term which resurfaced in the sixties)—was suggested by philosopher I. A. Boričevskij in 1926 (Boričevskij 1926).[8]

The major institutional niche for the development of the meta-studies of science was provided by the Communist Academy, which was established in 1918 as the center for the education of the new, Communist, intelligentsia—educated, dedicated, and disciplined professional revolutionaries who should combine the

Footnote 6 continued
account of science fitted the demands of the time in successfully promoting the conservative cause of maintaining science's status quo in the hostile political environment of the Cold War, forging the "conservative agenda" and a "neutral," apolitical stance of science studies (Fuller 2000). Similar argument was made by David Hollinger (Hollinger 1995). On the ways the Cold War anxieties and concerns affected the intellectual agendas of historians and philosophers of science in the US see Reisch (2005); Solovey (2001).

[7] These debates came to partition the opposing groups of leading Bolshevik theoreticians in the twenties. The group of scientifically inclined Marxists (the so-called "mechanists," most prominently Aleksandr Bogdanov-Malinovskij and Nikolaj Bukharin) argued that the methodologies of natural sciences required no "working over" by Marxism, because Marxism was compatible and indeed continuous with all genuine science. The other, more defined group lead by Abram Deborin ("Deborinists"), prompted in part by the publication, in 1925, of Engels' *Dialectics of Nature* by the Institute of Marxism-Leninism, called for systematic application of "dialectical method" to natural sciences, denouncing the "mechanists" for their alleged failure to appreciate the importance of Hegelian dialectics. In 1931, however, the dispute was terminated by the resolution of the Party's Central Committee and both positions were officially condemned as "right" and "left deviations" respectively. Nevertheless, the same discussion, with the same positions, resurfaced in the sixties, although without the old labels (on the debate between "mechanists" and "Deborinists" see Joravsky (1961); Scanlan (1985).

[8] Boričevskij's visionary proposal was materialized, at least to some extent, in the establishment of the Institute for the History of Science, headed by Nikolaj Bukharin, with which Boričevskij was affiliated from its inception in 1927.

attributes of both revolutionaries and scholars.[9] The Communist Academy was founded with the aspiration of becoming the Party's "theoretical center" as well as the country's premier center of Marxist research and study. Initially formed as the Socialist Academy of Social Sciences (Socialističeskaja Akademija Obščestvennykh Nauk), in the first years of its existence the Academy focused on the social sciences. During the twenties "the social sciences" (obščestvennye nauki) were re-defined in the Soviet Union in relation to the component parts of Marxism. Thus, for example, sociology was redefined as being identical with historical materialism, that is, the study of the general laws of development of human history and the specific laws of socio-economic formations. The authoritative text for Marxist sociology was Nikolaj Bukharin's *Teorija istoričeskogo materializma—populjarnyj učebnik marksistskoj sociologii*.[10] According to Bukharin, because Marxist sociology is equated with historical materialism and is thus a component of Marxist theory, there is no need for sociology as an independent science.[11]

By the mid-twenties the Communist Academy expanded to include the natural sciences, being transformed from an exclusively educational institution into what was conceived as a "scientific-methodological center." History and philosophy of science as well as studies of science "as a whole" (*naukovedenie*) were promoted by leading Bolshevik theoreticians who became the major patrons of this new offshoot of Marxist philosophy. In 1920 the first institute focusing entirely and exclusively on meta-scientific issues—the Institute of Scientific Methodology—was established on the basis of the Communist Academy's Section of methodology of science. The Institute of Scientific Methodology affiliated many prominent Russian scientists—mathematicians N. N. Luzin and O. Ju. Šmidt, physicists A. K. Timirjazev, V. K. Arkad'ev, and Ju. V. Vul'f, economists E. S. Varga and S. G. Strumilin, among others—many of whom were not Marxists, let alone Party members.[12] As such, the formation of this Institute within the Communist Academy signaled that the Academy was moving beyond the boundaries of social sciences, "… gradually turning into a scientific-methodological center …," as the resolution of the 12th Party Congress stated in 1923 (David-Fox 1997: 211). During the twenties, several specialized research institutes devoted to meta-studies of science were established under the auspices of the Communist Academy, supplementing teaching curricula in history and philosophy of science, which became a prominent part of the

[9] On the history of the Communist Academy see David-Fox (1997); Krementsov (1997).

[10] Published in English translation as *Historical Materialism: A System of Sociology* (Bukharin 1925).

[11] The institutional consequence of these discussions was the elimination of the Department of Social Sciences at Moscow University that included the chair of sociology, which was disbanded in 1924, after five years of existence. For an overview of the history of sociology in the Soviet Union see Weinberg (1974).

[12] The research themes listed in the institute's research agenda ranged from "mathematical method in biology" and "the application of quantum theory to the theory of chemical reactions" to "the disciplinary structure of biology" and "the role of statistics and abstract analysis in scientific research." Although the Institute never became an influential center of theoretical coordination, as initially envisioned, it was, in words of one of the Institute's members, "the first attempt at collective meta-scientific study" (cit. in Bastrakova 1978: 37).

educational programs at the Communist Academy's institutions, notably its Institute of Red Professors and Sverdlov University, with the research component.[13]

In 1927 the Communist Academy's Section of the Natural Sciences petitioned for the establishment of the Institute for the History of Science, affiliated with the Communist Academy. The program of the Institute included the studies of the relations between science, on the one hand, and technology, art and literature, on the other, as well as studies of the social organization of science—institutional history of science, history of education, and the "… governmental politics of science in different countries at different times."[14] As the 1927 program further suggested, the research at the new institute would focus on the "history of science and specifically the use of science as a tool in the class struggle of the exploiters against the exploited (the cases of racial hygiene, chauvinistic anthropology, pseudo-Darwinian eugenics, etc.); … the phylogeny of scientific ideas and discoveries; study of the conditions and impact of different factors on the growth of scientific thought and scientific discoveries; …study of individual, social and genealogical backgrounds of scientists (as exemplified by de Candolle, but revised according to Marxist theory); … a systematic registration and analysis of scientists' genealogies and social status, as well as statistical study of data on scientific discoveries in different countries; and the development of methods and ways of popularization of science."[15]

The plan of the Institute was adopted by the Presidium of the Communist Academy, and what was initially called The Cabinet of History of Science of the Communist Academy was established in December 1927 under the directorship of Nikolaj Bukharin.[16] Its first research topics included Boris Hessen's "social and

[13] On the institutionalization of meta-studies of science in the Soviet Union in the twenties and thirties see Bastrakova (1978), Ilizarov (1993), Dmitriev (2002), Gindilis (2009), David-Fox (1997).

[14] *Programma kabineta po istorii estestvoznanija*, on p. 4.

[15] *Programma kabineta po istorii estestvoznanija*, on pp. 4–5. The reference to Alphonse de Candolle (whose *Histoire des Sciences et des Savants* (1873) drew on genealogical and statistical data to explore how various variables influenced the rates at which different European countries produced eminent scientists) concealed a peculiar appropriation by the new Institute of the studies of the social composition of Russian scientific and intellectual elites, conducted in the twenties by geneticist Jurij Filipčenko as part of the work of his Bureau of Eugenics in Petrograd. Filipčenko and his students collected and statistically analyzed data on the genealogies, demographic composition, sex ratio, etc., of the co-opted Russian Academy of Sciences for more than 80 years, the time span that covered both the Academy's pre-revolutionary and post-revolutionary periods. At the time when the future of the Russian Academy of Sciences was undecided, Filipčenko highlighted the "essentially democratic" composition of the Russian Academy, stressing its difference in this regard from foreign Academies of sciences: "in comparison with de Candolle's statistical data on foreign members of Parisian Academy of Sciences, our data … [show] that our outstanding scientists descend from much more democratic background than the members of the Parisian Academy of Science…" (Filipčenko 1922). On Filipčenko's eugenics program see Adams (1990).

[16] In 1932 The Cabinet for the History of Science was merged with the Commission for the History of Knowledge, created in 1921 by the initiative of Vladimir I. Vernadskij under the auspices of the All-Union Academy of Sciences, to form the single Institute for the History of Science and Technology (IINT). The creation of IINT was preceded by the replacement in 1930 of Vernadskij, in his role of the head of the Academy of Sciences' Commission for the History of Knowledge, by Bukharin, as a consequence of 1929 "cleaning" of the Academy of Sciences from "bourgeois" elements (the so-called "1929 affair of the Academy of Sciences"—"delo Akademii Nauk"). IINT was established under the directorship of Bukharin, and now was formally affiliated with the All-Union Academy of Sciences, ceasing its earlier affiliation with the Communist Academy. This reorganization signified the major trend

economic roots of Newton's mechanics," which would make such a lasting impact at the 1931 International Congress for the History in Science in London; "Haeckel and monism"; "the history of geology in its relation to natural philosophy in the first half of the nineteenth century"; along with more abstract and theoretical topics, such as "the general history of the methodology of science," "the history of historiography of science," as well as several projects to elucidate and develop the views of the founders of Marxism on the history of science and technology.[17]

With the consolidation of Soviet system of the party-state Marxist philosophy, once a productive field of scholarship, was turned into an official canon and became gradually dogmatized. During the thirties, which were marked by ideological battles and "public debates" on science, Soviet philosophers actively participated in the ideological surveillance and policing of the scientific community, "translating scientific theories into ideological language for the politicians and transforming political slogans into research agendas for the scientists" (Gerovitch 2002: 26).[18] Slava Gerovitch has noted that under Stalin the relations between philosophy and science were turned around: while in the early Soviet period the Bolshevik party-state drew its legitimacy in part from its claim to be *scientific,* thus putting science "on the top" (that is, higher than or equal to philosophy), by the time the Soviet party-state was finally firmly established under Stalin, science had to base its legitimacy on its declared compliance with Marxist philosophy (Gerovitch 2002: 29).

The terror of the 1937–1938 turned out to be detrimental for the nascent field of the meta-studies of science in the Soviet Union. Almost all leading Bolshevik theoreticians who became the major targets of Stalinist purges were affiliated with the Communist Academy. Many members and all the heads of the centers for the meta-studies of science created within the Communist Academy during the twenties and early thirties were arrested during the purges, and their institutes were disbanded by 1938, thus ending this first stage of the institutionalization of the studies of science as an independent discipline in the Soviet Union. Bukharin's Institute for the History of Science was disbanded in 1938, following his arrest in 1937 which was followed a few months later by the arrest of the Institute's second director, academician V. V. Ossinskij. The remnants of the Institute's staff and facilities were reorganized in the same year of 1938 to form the Commission on the history of the Academy of Sciences, which was structurally subordinated to the Academy of Sciences' Archives. The Commission was staffed by illustrious members of the Academy of Sciences, such as V. I. Vernadskij, A. N. Krylov, O. Ju.

Footnote 16 continued
started in 1932 (the beginning of the Second Five-Year Plan) towards the centralization of Soviet scientific and educational institutions. By the mid-thirties, the parallel existence of the two academies, All-Union Academy of Sciences and the Communist Academy, ceased to exist, and in 1936 two academies were merged into one, centralized system—the Soviet Academy of Sciences.

[17] Bastrakova (1978), esp. on p. 44. On Boris Hessen see Graham (1985).

[18] Most infamously, Soviet philosophers attacked the theory of relativity, quantum mechanics and genetics, during the "public debates" on science, in search of various "philosophical deviations" of scientific theories (Krementsov 1997).

Šmidt, L. S. Berg, among the others, but it functioned more as an administrative unit rather than an intellectual or research center (Ilizarov 1993: 17–19).

The Cold War and Soviet philosophy

The Cold War gave the major incentives for the re-emergence of *naukovedenie* in the Soviet Union. The Cold War had a profound effect on the status of Soviet philosophy. While WWII was instrumental for the rise of the status of natural scientists, the beginning of the Cold War was crucial for the re-definition of the social sciences in the Soviet Union as disciplines independent of philosophy. Within months after Winston Churchill's "iron curtain" speech in November 1946 several new journals and institutes were established "… to enlarge and improve the personnel in the social science disciplines."[19] The institutional measures to strengthen the "ideological front" included the establishment, in November 1946, of the Academy of Social Sciences under the Party's Committee for Agitation and Propaganda (Agitprop). The creation of the Academy of Social Sciences indicated that with the beginning of the Cold War the USSR was in need of highly qualified social analysts who could provide tools and categories for defining and interpreting the new postwar situation, and who could develop the framework for understanding the basic notions of the Cold War.[20] Soviet scholars—philosophers in the first place—were assigned the key roles in the battle on the "ideological front" of the Cold War: on the one hand, their function was to criticize Western ideas, on the other, they were expected to come up with compelling visions of Soviet modernity that can be exported to Eastern Europe and Third World countries.[21]

In the early years of the Cold War the emphasis was on criticism. In the wake of the patriotic campaign started during the war, patriotism and its opposite, "servility to the West," became the main notions that framed the thematic profile of Soviet historians and philosophers of science. In the late forties and fifties, Russian history, in particular the history of Russian science, became the important element of the new doctrine of Soviet patriotism, which portrayed "Soviet culture" as advanced, modern, progressive, and European, but at the same time based on and continuous with Russian culture.[22] The Cold War rhetoric emphasized the strict dichotomy between East and West. Scholars from different disciplines were busy at juxtaposing

[19] As proclaimed by Andrej Ždanov in 1946, cit. in Krementsov (1997), on p. 130.

[20] During the following decade, various departments and "laboratories" for training and research in sociology, social planning, and "concrete social research" (konkretnye social'nye issledovanija) were opened in several universities and research institutes. Sociology as an independent field with its discrete functions was legitimized officially in 1966 at the Twenty Third Party Congress, and 2 years later the separation of sociology from philosophy was institutionalized in 1968 with the transformation of the Division of Social Research of the Institute of Philosophy in Moscow into a separate Institute of Concrete Social Research (see Weinberg (1974), Greenfeld (1988).

[21] See discussion in Pollock (2006).

[22] See discussion of the strategies of Soviet historians of science and technology during the rise of Russian nationalism in the forties and fifties in Gerovitch (1996). On the politics of historical profession in the Soviet Union and the appropriation of historical memory under different Soviet rulers over the course of the twentieth century see Koposov (2011).

the "two camps" with their incommensurable sets of values—"Soviet values" versus "Western values." The notion of "world science" came under attack and became the common accusation in the public debates on science that erupted in the forties and fifties. As one of the speakers at the 1950 Academy of Sciences meeting exclaimed, "There is no place in Soviet science for those who, under the slogan of 'a single world science', openly or secretly try to hamper the development of our science. … They are unworthy to bear the exalted title of Soviet scientist."[23]

Following the death of Stalin in 1953, and during Khrushchev's Thaw, however, the emphases changed. After Stalin's death in 1953 and the successful testing of the Soviet hydrogen bomb in the same year, scientists, especially those associated with the atomic bomb project, used their new prestige to renegotiate the power relationships within the Soviet academic community. Philosophers (or, rather, 'a philosopher'), in the words of Gerovitch, were targeted by leading Soviet scientists as the "major evil" for Soviet science. As Gerovitch put it, "liberal intellectuals personified the enemy in the figure of a 'philosopher'," when in the fifties and sixties the leading Soviet scientists called into question the dominant status of philosophers in Soviet scientific community (Gerovitch 2002: 163). As David Holloway has observed, however, "…the term 'philosopher' was used to describe not only professional philosophers and officials in the ideological apparatus, but also those who employed the Stalinist 'techniques of persuasive argumentation' in natural scientific debate" (Holloway 1974). "Philosophy" thus came to signify the entire Stalinist political and ideological discourse with its "ideologisation" of Soviet science. Historian David Gillispie put it succinctly when he noted that "to some extent, Soviet philosophers were made the scapegoats for various lags in science and technology."[24]

Philosophers responded to this legitimation crisis and reorganized themselves in various ways.[25] During the sixties and seventies many philosophers turned to the in-depth studies of science, changing their disciplinary identities and affiliations.[26] Others, on the other hand, turned their efforts to the need to project a positive image of the socialist modernity, by developing a new philosophical discourse on science, which was now informed and shaped by the new political realities of the Cold War.

[23] G. K. Khrushchov, cit. in Krementsov (1997), on p. 219.

[24] Cit. in Gerovitch (2002), on p. 166.

[25] For a discussion of the strategies used by scientists to unsure a greater autonomy and independence from the control of the party ideologists, see Gerovitch (2002).

[26] For example, as historian Douglas Weiner has observed, philosophers became a distinct subgroup of the "environmentalist community" in the sixties and seventies. Environmentalism came in a variety of flavors in the Soviet Union. For Soviet philosophers, however, the engagement with environmentalist issues was mostly rhetorical. As Weiner noted, "social scientists could not engage in Marxist analysis of the political economy of their own society," which made nature protection a purely rhetorical exercise for them. Even 'unmasking' the "myths" of inexhaustibility of nature or the desirability, let alone possibility of "man's domination of nature," philosophers could not expose the structural or socio-economic causes that led enterprises and ministry officials to externalize environmental costs. As Weiner pointed out, "nature protection-as-rhetoric" led to the promotion of "picaresque new careers" of these new men of environmentalism, at the same time making environmentalism safe for the Soviet regime (Weiner 1999: 399–401).

The Cold War was, among many things, about different visions of how to organize science. The basic premise of Soviet Marxism was that in the socialist system scientific rationality is perfectly matched by the rationality of social and economic planning. This acclaimed congruence between scientific and socialist rationalities acquired renewed significance in the context of the Cold War confrontation. Social scientists were expected to provide an intellectual coherence to the *a priori* premise that communism or socialism was the best way to organize society as well as science rationally and efficiently.[27] This role of philosophers and social scientists grew even more important in the sixties and seventies, when the arms and space race heated up.

In the late fifties and during the sixties, in the wake of the sensational achievements of Soviet science in nuclear physics, the pioneering construction of the first nuclear power station and nuclear ice-breaker in the Soviet Union, and, above all, the Soviet exploration of space, a new term entered the Soviet political and philosophical discourse—the "Scientific-Technological Revolution" (Naučno-Tekhničeskaja Revoljucija, thereafter STR). The notion of STR came to denote these recent scientific achievements and technological innovations that had taken place since the WWII, and which had such a critical impact on the arms and space race, promising crucial changes to the socioeconomic conditions in the USSR, and globally.[28]

A comprehensive theory of STR was introduced in the Soviet bloc in the sixties by philosophers and social theorists in Eastern Germany and Czechoslovakia—technologically the most advanced countries in the Soviet bloc. In Czechoslovakia, the theory of STR, developed by Czechoslovak philosophers, provided the reform movement led by Alexander Dubček with its philosophical agenda. The program of Czechoslovak economic reforms ("socialism with a human face") was the result of the team work of philosophers, economists, sociologists, psychologists, engineers, and natural scientists, commissioned by Dubček's government and led by philosopher Radovan Richta, who assumed the directorship of the Institute of Philosophy in Prague in 1968.[29] The programmatic collective monograph that resulted from this team work, *Civilization at the Crossroads: Social and Human Implications of the Scientific and Technological Revolution*, was published in Czech in 1966, followed by an English translation in 1969.[30] The central argument of Czechoslovak reformers was that the modern STR delimited a new epoch "in the evolution of productive forces" and required the adaptation of the socialist economic system to the demands of modern industrialization and scientific-technological

[27] See discussion in Pollock (2006).

[28] In the seventies and eighties the literature on STR was thoroughly reviewed by American and Western European Sovietologists and political analysts. The most important overviews of the literature include: Hoffmann and Laird (1982a, b, 1985), Black (1979), Buchholz (1979, 1985), Hoffmann (1978), Rapp (1985).

[29] As historian of Czechoslovak reform movement has noted, "The Dubček leadership could, from the very beginning, count on unprecedented expertise of a kind that the previous regime was in part denied and in part refused to accept. … Few regimes had ever been able to rely on such formidable theoretical support" (Kusin 1971), see also Kusin (1977).

[30] Richta (1966), published in English as Richta (1969).

development. As Czechoslovak reformers argued, however, while the newest STR was critically different from the "first industrial revolution" in many important aspects, in the socialist countries the qualitatively new possibilities of the STR were still combined with an economic system that had traits of the first industrial revolution. As the Richta report stressed, "these considerations underscore the vital need for radical economic reforms now being introduced in the socialist countries" (Richta 1969: 19). In practice, such an adaptation would mean a more flexible and transparent economic system, and openness to the world-wide exchange of information and ideas.

The Soviet invasion in Czechoslovakia in August 1968 and the end of Dubček's "new way toward socialism" had immediate consequences for the philosophical discussion of STR. The specialists in Czechoslovakia who played leading roles in the debates of the sixties and those who were active in the reform movement per se were removed from their positions and posts, although most if not all continued to work in visible positions (Kusin 1971). Some theoretical innovations of Czechoslovak reformers, particularly those concerning the role of social groups and the nature of social relations under socialism, were explicitly criticized and rejected both in Czechoslovakia and in the Soviet Union. However, the criticism did not include the theories of STR developed by Richta and his team (Kusin 1971, 1977). Rather, the major effect of the events of 1968 on the theories of STR was a shift of focus from the discussion of the reformist cause and the need to adjust socialist societies to the requirements of the STR to the discussion and evaluation of anticipated (or unanticipated) social and political consequences of STR.[31]

The seventies marked the beginning of what might be called the "era of STR" in Soviet political discourse, when the STR became a central notion in the official statements of Soviet leaders. The greatly increased official commentary on the STR was part of the campaign to formulate more effective national policies and to mobilize bureaucratic support for the major economic and political decisions of the time: to pursue the politics of détente, which marked a new phase of the Cold War, accompanied by increased economic cooperation and West-East trade. The economic situation was a crucial factor in these political moves. The oil crisis of 1973 created new opportunities for the export of Soviet oil and opened new conditions for the integration of the USSR into the world economy. However, although the oil windfall was keeping the Soviet economy running, the seventies were marked by the beginning of a slow economic decline, which became only more obvious in the course of the next decade.[32] By the mid-seventies the Soviet industrial economy largely ceased to grow, causing Brezhnev's government to adopt

[31] In the Soviet Union, in the economic sphere, the mid-sixties was a period of innovative thought and experimentation. New institutes created at this time, such as the Central Economic and Mathematical Institute and the Institute for Concrete Social Research, along with the Institute of Economics in Novosibirsk, formulated ideas and proposals calling into question many established Soviet economic principles (see Josephson (1997)). Numerous debates and positions were adopted on such issues as pricing, value, the plan and the market. The broad conclusions which slowly filtered out of these discussions—the emphasis on efficiency, intensification and productivity, need for greater autonomy for the lower levels of the system, more scope for individual initiative and incentives—formed the core of the Kosygin economic reforms of 1965, adopted soon after Brzezhnev replaced Khrushchev.

[32] See Boyd and Caporale (1992), Reinsh et al. (1992)

the policy of technology-transfer from the highly industrialized capitalist West to the socialist East, as the way to promote economic growth and productivity.[33]

In this new political climate of détente, the official STR discourse offered different images of the future socialist utopia.[34] Soviet philosophers and social scientists were in a unique position to interpret and to give meaning to the official pronouncements on STR on the part of Soviet party leaders. Thus, for example, almost every account of the STR referenced or quoted Brezhnev's speech at the Party's 24th Central Committee Congress in 1971. The line from the speech where Brezhnev referred to the STR literally stated: "The task we have, comrades, is one of the greatest historical importance: *to fuse the achievements of the scientific-technological revolution with the advantages of the socialist economic system*."[35] This wording, however, left ample room for interpretation of what exactly this unity of STR with the socialist system would mean. The job of philosophers and social theorists was to give a concrete meaning to this proclaimed "fusion," and to develop fresh ideas about a possible and desirable synthesis between modern scientific and technological advances (often imported from the capitalist West) and the socialist principles of centralized economics and social planning, without challenging the system too far.

The emphasis of Brezhnev's government on the importation of entire systems of technology from the West made theories of STR the key element in the evaluation of the effects (especially the undesired and unanticipated ones) of the infusion of foreign technology into socially and politically different societies. In this context, Soviet theorists of STR developed a comprehensive discussion of the relations between technology and society, postulating analytical distinctions between the form and the content of modern technologies, between "technique" (gadgets and machines) and "technology" (social and economic relationships embedded in apparently value-free machines), and between direct and indirect effects of technology on society. For example, philosopher Genrikh Volkov contended in 1972 that some technological innovations, like computer technologies, increase labor productivity indirectly through changes in production relations, while other technologies have a direct effect on labor process "relatively independently of socio-economic operations" (Volkov 1972: 7). Alluding to the very real and present day situation of technology transfer from West to East he concluded that such technological systems as "an assembly line would require the same type of highly specialized, mechanical operations, no matter whether it is installed in a Detroit plant or in a plant in Sverdlovsk" (Volkov 1972: 38).

The postulated distinctions reflected deeper disagreements on the social and political implications of technology transfer from the West. As the authors of the

[33] The technology transfer involved the importation of entire factories. Thus, during 1965–1972, two giant vehicle manufacturing plants, one for cars (Tolyatti) the other for trucks (Kama River plant), were constructed by purchasing the equipment and general technical services from Italian and American companies. On the cultural history of cars manufacturing in the Soviet Union see Siegelbaum (2008).

[34] For Western contemporaneous perspectives on Soviet forecasting of the future see Bell and Mau (1971), Gilison (1975). For the discussion of Soviet views of future and Soviet utopian theorizing during the Khrushchev years, see Vail' and Genis (1989).

[35] *Materialy* (1971), on p. 57, emphasis in the original.

1972 volume *Naučno-tekhničeskaja revoljucija i social'nyj progress* contended, new technical hardware cannot simply be grafted onto existing processes of labor, production and management. Rather, these processes themselves needed to undergo considerable change in order to generate and accommodate new machines. Hence, technical breakthrough can be effectively utilized only if adjustments are made in the larger social systems of which the new techniques are a part. Thus, for example, the installation of computers would not produce "revolutionary" changes in the forms and organization of production, or decision-making practices, unless they would be accompanied by changes in the organization of the flow and content of technical and social information (Kedrov et al. 1972). The underlying argument was that scientific and technical advances are not value-free, since they are embedded in the value-laden technologies that enabled them to perform social and political functions.

Ideas about STR served various ends. On the political level, theories of STR were deployed by both the conservative Party leaders to justify and rationalize the preservation of the status quo, as well as those Party officials who sought ways to reduce organizational "irrationality" and to "optimize" economic decision-making. Thus, some Soviet leaders, like Mikhail Suslov, who was especially apprehensive about the undesirable consequences of the infusion of Western technology, were less than enthusiastic about the growing interdependence between capitalist and socialist states. Others, like Alexej Kosygin (as well as Leonid Brezhnev himself), believed that capitalist technical advances could be effectively adapted without compromising socialist values, and seriously attempted to anticipate and to take advantage of opportunities the STR presented, and to fuse the achievements of predominantly Western scientific and technological advances with the social and economic structures of the USSR.[36]

On the theoretical level, the discourse of STR was not merely a post-facto justification of certain economic decisions nor utopian forecasting. Theories of STR offered a general theory of social change, and hence represented an important modernization of Soviet Marxism.[37] In contrast to classic Marxist-Leninist theory of the thirties, which emphasized class conflict as the motor of social change, the basic premise of the STR theory was that the advancement of science and technology had become the principal source of societal transformation. Unlike standard Soviet Marxism, this new outlook didn't take for granted that socialist society was the most advanced simply because of the public ownership of the means of production. Instead, STR promoted a new image of competition between the two world systems based not on class conflict or military victory, but rather on the superior ability to develop, manage and apply advances of science and technology.

The theories of STR thus extended the meaning of Soviet Marxism. As the major evolving part of official Marxist-Leninist theory in post-Stalinist Soviet Union, STR discourse also restored to a certain degree the political function to Soviet philosophy, in the sense that political struggles were not solely about positions and personal power but also about ideas and the meaning of Marxism-Leninism.

[36] See discussion in Hoffmann and Laird (1985).

[37] This point was made in Black (1979).

The theories of STR gave the major incentive and the legitimation for the re-emergence of *naukovedenie* in the Soviet Union.

Local contexts and politics of *naukovedenie*: Bonifatij Kedrov and the "philosophical turn" of the Institute for the History of Science and Technology (IHST)

IHST was the major producer of literature on the STR. During the seventies, the Institute produced or supervised a large number of collectively authored book-length accounts of STR, which played the key role in generating philosophical reflection on the STR.[38] The history of this Institute provides a vantage point from which to look at the local politics and contexts of Soviet studies of science. Framed as a direct response to the growing importance ascribed to the STR, the project of "Soviet science studies"—*naukovedenie*, which resurfaced in the Soviet Union in the sixties—was aimed at providing a comprehensive expertise about Scientific-Technological Revolution.

The Institute's history mirrored the life trajectory of *naukovedenie* project. The Institute for the History of Science (IHS), founded by Bukharin in 1927 and disbanded in 1938, was founded anew in 1945. The main incentive for the re-establishment of the Institute was to provide historical depth to the new doctrine of Soviet patriotism, which had emerged during the WWII. As the resolution of the Scientific Council of IHS adopted in 1949 stressed, "nowadays …at the time of the fierce and violent struggle between the two worlds, the history of science has acquired critical significance" (Ilizarov 1993: 27). Indeed, already in 1943, in the wake of the patriotic and nationalistic campaign, various commissions of the studies of Russian science were organized under the auspices of Soviet Academy of Sciences.[39] In 1949 the Scientific Council of IHS adopted the program of the preparation of a multivolume series (more than 20 volumes) ambitiously entitled "History of Science and Technology in the USSR, From Antiquity until Today," which was approved as the main research project of the Institute (Ilizarov 1993: 27). The mammoth project was never implemented as conceived, but during the fifties numerous works were produced by the researchers of the IHS, asserting the

[38] The "collective volumes" on STR published by IHST researchers or under the supervision of IHST included: Stokova et al. (1967), *Naučno-tekhničeskaja revolucija i social'nyj progress* (1972); *Čelovek—Nauka—Tekhnika* (1973); *Naučno-tekhničeskaja revolucija i izmenenie struktury naučnykh kadrov* (1973); *Naučno-tekhničeskaja revolucija i obščestvo* (1973); *Partija i sovremennaja naučno-tekhničeskaja revolucija v SSSR* (1974). Only few names of these volumes' authors, however, appeared on the title pages, usually the supervisors, but sometimes collective monographs were published without any names of the authors listed. In the case of the 1973 volume *Čelovek—Nauka—Tekhnika* the omission of the names concealed the collaboration with Czechoslovak philosophers who were involved in the Czechoslovak reform movement and were displaced (and in some cases disgraced) after the crushing of the Prague Spring.

[39] Commissions established at the end of the war at the Academy of Sciences included the "Commission on the study of scientific legacy of D. I. Mendeleev," the "Commission on the study of scientific legacy of A. M. Butlerov," and the "Commission on scientific legacy of M. V. Lomonosov," among many others that were focused on the study of scientific heritage and publication of the works of prominent Russian scientists.

superiority of Soviet science, and supplying the official discourse of the opposition between two "camps" with historical "evidence"—the function that the Institute dutifully performed starting in the late forties and throughout most of the fifties.

Following the death of Stalin in 1953, the Institute was reorganized. The first reorganization, in 1953, merged all the Academy's Commissions on the history of Russian science, along with the Commission on the history of technology formed during and immediately after the war, with IHS, to form the single Institute (IHST), located in Moscow, with the "branch" of the Institute in Leningrad. This reorganization signified the centralization and consolidation of the field of history of science, as IHST became the country's premier center in history of science.[40] During the sixties, the Institute was reorganized again. While the reorganization of 1953 mostly invoked structural changes, only slightly affecting researchers' individual agendas, the reorganization of the sixties was primarily aimed at framing the new agenda for the Institute that would respond to the new political situation. This new phase in the history of IHST was marked by the appointment, in 1962, of the new director of IHST, philosopher Bonifatij Kedrov.

Bonifatij Mikhajlovič Kedrov (1903–1985) was a controversial figure in the history of Soviet philosophy.[41] A philosopher and an "old Bolshevik," with background in chemistry, Kedrov had been involved in major political debates over science since the twenties. His early career was in many ways similar to that of Boris Hessen.[42] Like Hessen, Kedrov represented the type of a 'sophisticated Marxist', knowledgeable both in Marxism and in science, and with strong ties to the scientific community. Kedrov saw the studies of science as a philosophical project, and as a program of de-Stalinization of Soviet philosophy.

Son of a distinguished Old Bolshevik and professional revolutionary Mikhail Kedrov, Bonifatij Kedrov was 14 when his family returned to Petrograd from Switzerland soon after the October revolution (Kedrov 1986). In 1918, Kedrov began his studies at the newly opened Communist University (so-called "Sverdlov University")—the first center of Marxist education for the future generation of Party elite. He interrupted his education volunteering to the Red Army during the civil war, after which he decided to turn to natural science. In 1922 Kedrov entered Chemistry Department of Moscow University from which he graduated in 1930. After his graduation Kedrov became a deputy director of the "Chemical Institute" at the Moscow University[43]—the position similar to that of Boris Hessen, who was a deputy director of the "Physical Institute" of Moscow University (Graham 1985). During the thirties Kedrov gradually gave up chemical lab work and focused instead on theoretical and historical research in chemistry. Simultaneously, in 1931–1932 he was studying at the Institute of Red Professors of the Communist Academy. In

[40] During this reorganization the first director of the institute after WWII, physiologist and the corresponding member of the Academy of Sciences, Kh. S. Koštojanc, was replaced by the vice-minister of education, A. M. Samarin.

[41] See useful sketch on Kedrov and his career path in Hahn (1982). For the analysis of Kedrov's philosophical views see Blakeley (1966).

[42] On Hessen's background see Graham (1985).

[43] Kedrov's autobiography (Kedrov 1949), reprinted in Lektorskij (2005), on pp. 699–701.

1935 Kedrov earned his Ph.D. degree in chemistry for the dissertation on the history and his original solution of the Gibbs Paradox, which he defended at the Institute of General and Inorganic Chemistry. The same year he received the position of instructor at the Science Section of the Communist Party's Central Committee (Lektorskij 2005).

By the mid-thirties Kedrov was firmly established in the burgeoning field of meta-studies of science, both within the Communist Academy and at Moscow University. Along with Hessen, Kedrov taught at the Institute of Red Professors and Moscow University: in both institutions Hessen lectured on the history of physics while Kedrov covered history of chemistry.[44] Kedrov's major works in the history of science were focused on the history of atomic theory in chemistry. Kedrov saw his project as bridging history, philosophy and theory of chemistry, holding that through the reconstruction of the historical development of the categories of [chemical] composition, structure and function one would progress eventually from history of chemistry to theory of chemistry.[45]

The terror of 1937–1938 impacted Kedrov's immediate milieu. The majority of the first graduates and professors teaching at the Institute of Red Professors were arrested and disappeared during the purges, including Kedrov's colleague and comrade Boris Hessen.[46] At the same time, those who survived—mostly younger graduates of the IRP—constituted in later years the elite of the party-state nomenklatura and headed many of the Central Committee's Departments.[47] As Sheila Fitzpatrick has observed, the massive and rapid social promotion of proletarian cadres begun during the Great Break (the shift from the NEP to the Stalin era), followed by the Great Terror, gave rise to a single "cohort" of party leaders who came to power as the "Brezhnev generation."[48] Kedrov's own career

[44] In 1938 the program of lectures on the history of physics of the Institute of Red Professors in Philosophy, taught by Hessen, included following topics: (1) the law of conservation and transformation of energy; (2) the problem of determinism in classical physics; (3) second law of thermodynamics; (4) the problem of matter in classical physics; (5) time and space in contemporary physics. The readings included texts by Engels, Lenin, Einstein, and Rosenberger. Kedrov's program on the history of chemistry highlighted the following topics: (1) The metaphysical period in chemistry; (2) Atomic theory in the first half of nineteenth century; (3) Atomic theory in mid-nineteenth century; (4) Periodic law; (5) The development of physical chemistry and the crisis of chemistry in the twentieth century. The readings included texts by Engels, Lenin, Boyle, Lavoisier, Mendeleev, Ostwald (Gosudarstvennyj Arkhiv Rossijskoj Federacii (GARF), fond R-5205: Institut Krasnoj Professury—Filosofija, opis' 1, delo 511).

[45] Kedrov (1940, 1948, 1949, 1956, 1969a, b).

[46] On the former graduates of the Institute of Red Professors see Berendt (2002).

[47] Former "ikapists" (graduate of IRP), such as Suslov, Pospelov, Il'ičev, Pelše, made astonishingly rapid and successful careers, since the very terror made many vacancies available and facilitated the rapid promotion of those who escaped the purges. The surviving graduates of the IRP became the politicians who shaped the politics of the Soviet Union after Stalin. From 1927 to 1989 at least one former graduate of the IRP was in the Central Committee. The Party's main organ supervising science policy, Agitprop (Committee for Agitation and Propaganda), was headed by the former graduates of the Institute of Red Professors throughout its history: A. I. Steckij (1930–1938), M. A. Suslov (1947), D. T. Šepilov (1948–1952), F.V. Konstantinov (1955–1958), and L. F. Iličev (1958–1965). Many of the foreign graduates of IRP (which was truly an international institution admitting students from all over the world) later played an important role in shaping the political agenda of East Germany, Bulgaria, Hungary, and Poland (Berendt 2002).

[48] Fitzpatrick (1974).

well illustrates this rapid social promotion during the time of terror. Despite the fact that his father and younger brother were executed as "the enemies of the people" during the Stalin's purges,[49] Kedrov was appointed in 1939 as a senior researcher at the Institute of Philosophy, the Party's elite institution, which was formed on the basis of the Institute of Philosophy of the Communist Academy after the Academy's dissolution in 1936.[50] He left the Institute of Philosophy in 1941 to join the Red Army, and upon his demobilization in 1945 he received the prestigious position of deputy Director of the Institute of Philosophy.

Kedrov survived the Stalinist purges, but he figured prominently in what was called the "anti-cosmopolitan" campaign in the late forties, coinciding with the beginning of the Cold War and which targeted scientists who maintained ties with foreign colleagues and promoted the ideals of international, universal and "world science." Kedrov was in the center of this patriotic "anti-cosmopolitan" campaign of the late forties. He endorsed the notion of "world science" and even made it the title of his new book, *World Science and Mendeleev: On the History of the International Collaboration of Physicists and Chemists of Russia (USSR), Great Britain and USA*, scheduled for publication in 1949.[51] In the wake of the anti-cosmopolitan campaign the publication of Kedrov's book with such an unfortunate title was cancelled and Kedrov became the target of violent attacks. He ritualistically admitted all his "ideological errors," but was forced to resign from the position of deputy director of the Institute of Philosophy and was dismissed from his position of editor-in-chief of the journal *Voprosy Filosofii* he had helped to create.[52]

Kedrov's defeat didn't lead to his complete removal from the scene, though. He remained on the editorial board of *Voprosy Filosofii*, and retained his professorship at the Department of dialectical and historical materialism within the newly created Academy of the Social Sciences.[53] Moreover, Kedrov actively participated in major

[49] Kedrov's father, Mikhail Kedrov, was one of the founders of the CheKa (later NKVD), who, along with his youngest son Igor was arrested and executed following their alleged attempt to reveal the compromising facts about Beria (Hahn 1982). The fate and terrible torture of Mikhail Kedrov during the purges figured prominently in Khrushchev's "secret speech" of 1956. As Loren Graham recounts, the fate of his father was something that Bonifatij Kedrov never forgot (personal communication).

[50] The Communist Academy's Institute of Philosophy was organized in 1923 initially as a section headed by G. G. Špet. In the twenties and thirties the members of the Institute included A. M. Deborin, Bukharin, Ja, E. Sten, L. A. Akselrod. In the thirties a Hungarian Marxist philosopher and one of the founders of Western Marxism, György Lukács was affiliated with the Communist Academy's Institute of Philosophy during his time in the Soviet Union, working on his doctoral dissertation on young Hegel, which he defended at the Institute (Gusejnov and Lektorskij 2009).

[51] Kedrov's book, *Mirovaja nauka i Mendeleev: k istorii sotrudničestva fizikov i khimikov Rossii (SSSR), Velikobritanii I SŠA,* was not published until 1983.

[52] "Stenogramma zasedanja 23 i 28 fevralja 1949 g.," Archives of the Russian Academy of Sciences (ARAN), Papers of the Institute of Philosophy (Thereafter **IP Papers**), fond 1922, opis' 1, delo 286.

[53] Kedrov also found a refuge at the *Great Soviet Encyclopedia* where he held a modest position of a researcher, simultaneously being affiliated with the Academy's "Commission for the study of Mendeleev's scientific legacy." Work in this Commission led to Kedrov's perhaps most original work in the history of science—a meticulous hour-to-hour reconstruction of Mendeleev's discovery of the periodic law (Kedrov called his method "the *microanatomy* of scientific discovery"), in which he pointed out to the role of textbooks in the construction of the periodic system—a line of reasoning quite resonant with the present day science studies approaches: see Kedrov (1958, 1970), discussed in Gordin (2002).

ideological campaigns of the time.[54] In 1949, at the meeting of the Academy of Sciences convened to frame new directions in the history of science, Kedrov delivered a speech arguing that Marxist history of science should be written in the spirit of "Soviet patriotism." Only such history, Kedrov explained, can "claim to be a truly scientific and at the same time truly partisan approach to the explication of the events of the past. Only such [patriotic] history can help our Party and our people in their struggle with hostile forces that try to humiliate, blacken and defame our Soviet people and its great past, and only such history can help Soviet people win new victories on their path to communism."[55]

After Stalin's death Kedrov gradually regained his former stature. He rejoined the Institute of Philosophy in 1958 as head of the prestigious department of dialectical materialism. In 1960 he was elected to the Academy of Sciences. In 1962 the Presidium of the Academy of Sciences nominated Kedrov the director of the newly reorganized IHST and approved Kedrov's program for that Institute.

Kedrov's appointment marked the major change in the profile of IHST. His program included a strong philosophical component and established strong connections between two Moscow Institutes, IHST and the Institute of Philosophy. One of the newly formed departments of the Institute, with the somewhat cryptic name "sector of the general problems of the history of science," which was renamed in the late sixties as the "sector of the logic of the development of science" and then transformed into the huge "department of *naukovedenie*," was staffed by philosophers from the Institute of Philosophy, who were expected to provide the direction and theoretical framework to historians of specialized branches of science.[56]

The "philosophical turn" of the Institute troubled many IHST researchers. In 1965, a historian of chemistry and a researcher at IHST Georgij V. Bykov wrote in a letter he sent to the directorate of the Institute: "Who are we now? According to the formal stratification of specialties we are historians. By our training, past work, and our diplomas most of us are natural scientists. However, recently our Institute became affiliated with the Division of Philosophical Sciences ⟨of the Academy of Sciences⟩ and hence now we are philosophers. What does this mean? … From our Director we have heard only confusing answers to this question…"[57]

[54] Most infamously, Kedrov wrote several pro-Lysenko articles and contributed to the so-called "anti-resonance campaign" in chemistry in 1951. On the controversy over resonance theory see Graham (1987), on pp. 294–319. On Kedrov's infamous involvement in anti-resonance campaign see Sonin (1991).

[55] *Voprosy Istorii Otečestvennoj Nauki* (1949), on p. 662.

[56] During his time at the Institute (from 1962 to 1973 as a director, and from 1974 until his death in 1985 as the head of the "section of the logic of science") Kedrov cultivated close connections between the Institute for the History of Science and Technology and the Institute of Philosophy. From the sixties through to the eighties the Institute served as an alternative institutional affiliation for leading Muscovite philosophers from the Institute of Philosophy.

[57] G. V. Bykov, "Ob osnovnom napravlenii v dejatel'nosti našego instituta," 22 janvarja 1965, Archive of the Institute for the History of Science and Technology (thereafter **IHST Papers**). Before joining IHST Bykov was the Scientific Secretary of the Academy of Sciences' Commission on the scientific heritage of A. M. Butlerov, and became the researcher at IHST after the Commission was merged with IHST in 1953 (Ilizarov 1993: 48).

The philosophical turn of the historians' Institute served several goals. One concerned the new role for the history of science, as it was redefined in the sixties. During the 'anti-cosmopolitan' campaigns of the forties and fifties, the Institute dutifully produced or supervised numerous works that claimed the priority of Russian science in almost any significant scientific discovery and declared the superiority of Soviet science. At the same time, as a result of these militant nationalistic campaigns many historians retreated to descriptive and antiquarian modes of scholarship, or to exotic fields like Arabic mathematics, or ancient science, as a way to continue their careers without contributing to what they considered false scholarship.[58] In the sixties, neither of these strategies suited the new political goals. The rhetoric on STR, placed the emphasis on the analysis of recent science, and encouraged the study of major Western industrial nations and their scientific and technologic achievements, rationalizing in this way the new emphasis of Soviet economics on the transfer of Western technology and know-how.

Kedrov's 1962 program emphasized that the Institute's structure and research focus had to be changed in order "to correspond to the present day situation" and to ensure the production of up-to date "synthesizing and analytical work on the development of recent science and present-day science."[59] The new departments—"the department of the scientific-technological revolution" and the department "of general problems of the history of science"—were created to ensure the implementation of these changes.[60]

Although the intellectual production of the Institute was by no means confined to the accounts of STR, the discourse of the STR legitimized the re-emergence of the field of *naukovedenie*, now conceived as the investigation of recent science, with the emphasis placed on Western scientific and technological developments. At the same time, Western works on scientific and technological developments were read by Soviet scholars against the background of their own local cultural wars. The reading and "staging" of the works by Thomas Kuhn and Karl Popper in the Soviet Union is especially illustrative of the ways in which the local contexts and politics of *naukovedenie* set the stage for the "geography of reading" of these two towering figures in Western science studies, as Kuhn and Popper came to signify the radically different images of science, almost opposite in their epistemological premises and practical as well as political, implications.

[58] The retreat to descriptive and factological style, or to "textology" (the publication of original texts with only minimal commentary and with no interpretation) was widely employed by historians and literary critics (*literaturovedy*) in general (see discussion of the strategies of Puškin scholars during Puškin Centennials in the late thirties when Puškin was redefined and mythologized as a Soviet hero: Petrone (2000), on pp. 113–149).

[59] Priloženie "O napravlenii naučnykh issledovanij i strukture Instituta istorii estestvoznanija i tekhniki AN SSSR" k postanovleniju Prezidiuma AN SSSR ot 12 oktjabrja 1962, IHST Papers).

[60] Priloženie "O napravlenii naučnykh issledovanij i strukture Instituta istorii estestvoznanija i tekhniki AN SSSR" k postanovleniju Prezidiuma AN SSSR ot 12 oktjabrja 1962, IHST Papers).

Staging the scientific revolutions: Kuhn versus Popper in the Soviet Union

Kuhn's seminal book, *The Structure of Scientific Revolutions* (1962), is usually highlighted in historical accounts of science studies as having challenged the received view of science and triggering the professionalization of science studies as an academic field in the following decades, particularly in the US.[61] In the Soviet Union Kuhn's *Structure* was discussed and sympathetically reviewed by IHST researchers almost immediately following its publication.[62] Despite that, Soviet reaction to Kuhn's book gained momentum only a decade later, in the mid-seventies. The Russian translation of Kuhn's *Structure* by IHST researchers Markova and Mikulinskij appeared in 1975, and this publication stimulated the response and vivid discussion of Kuhn's model of science.[63]

In many respects Soviet discussion and criticism of Kuhn's work resembled Western criticisms. Soviet philosophers and scientists were troubled, just as their Western counterparts were, by the "incommensurability" thesis and argued that scientific change is a rational and logical choice, not a somewhat mysterious and irrational "gestalt switch."[64] Another common facet of Soviet critics was Kuhn's failure to discuss the sources of the new knowledge. From the perspective of Soviet critics, Kuhn's concept plausibly accounted for the survival of paradigms but didn't provide a sufficient explanation for the arrival of new paradigms.

Many Soviet reviewers pointed out that Kuhn's model of scientific change through periodic radical transformations was not new. They argued that Marx, Engels and Lenin had recognized the phenomenon of revolutions in science, and the view that the development of science occurs through leaps can be found in Engel's law of the transformation of quantitative changes into qualitative changes. As Kedrov put it bluntly, "Kuhn put forth a view, long established in Marxism, that the progress in science occurs through periodic shifts from the evolutionary to the

[61] On the reception and the responses to Kuhn's *Structure* in the United States see Zammito (2004).

[62] In 1963 American historian of science from Cornell University, Henry Guerlac, visited IHST and gave a lecture on "The development of the history of science in the USA" ("Otčet o rabote Leningradskogo otdelenija Instituta istorii estestvoznanija i tekhniki AN SSSR v 1963 g." IHST Papers, Protokoly zasedanij direkcii). The first Soviet review of Kuhn's *Structure* was published in 1965 by a researcher of IHST L. Markova and offered a sympathetic summary of Kuhn's book, stressing its significance as a turning point for the history of science (Markova 1965).

[63] The postscript to Russian translation of Kuhn's *Structure* by the researchers of IHST highlighted the significance of Kuhn's book pointing to the "antipositivistic bent" of the Kuhnian account and emphasizing its proximity to Marxist thought through its dialectical interpretation of the revolutions in science (Mikulinskij and Markova 1977). See summary of many positions presented by Russian readers of Kuhn's *Structure* in Josephson (1985).

[64] As John Zammito has noticed, Kuhn primarily sought to reach philosophers of science as his major audience. Their reaction (at least in the US and Britain) was rather hostile and largely dismissive. As Zammito put it, "The philosophical community Kuhn sought to join continually rejected his ideas. By contrast, the discipline he invoked somewhat cavalierly to illustrate his views, sociology, took his ideas up in their most drastic formulations and launched a research program in his name, a 'Kuhnian' sociology of scientific knowledge" (Zammito 2004: 123). Contrary to the Anglo-American response to Kuhn's work, the philosophical reception of Kuhn in the Soviet Union was far from being hostile. One of the reasons was that while in the United States Kuhn emerged in the context of a philosophy of science with a strong logical empiricist tradition, this tradition was largely absent in the Soviet Union and the countries of Soviet bloc (with the exception of Poland) until the sixties.

revolutionary periods of ⟨scientific⟩ development, through the constant transition from one step to the next one, in the infinite progressive path to the absolute truth" (Kedrov 1969a). At the same time, Soviet critics stressed that the apparent proximity of Kuhn's concept of 'paradigm shifts' to the laws of dialectics was deceptive, since Kuhn's concept was largely concerned with how scientists come to *agreement* on what is true, rather than with how science produces objective knowledge about reality.[65]

The most prominent criticism, however, concerned Kuhn's focus on the universal features (structures) of scientific revolutions. As Kedrov argued, Kuhn's analysis, seeking for universal patterns, does not account for the unique features of individual revolutions. As Kedrov argued, "Each scientific revolution must be studied separately as a unique and non-repetitive phenomenon" (Kedrov 1976). By the late seventies, directly responding to Kuhn, Kedrov developed an entire "typology" of scientific revolutions in his several books, one of which was characteristically entitled *Scientific Revolution: Substance. Typology. Structure. Mechanism. Criteria* (1980).[66] As Kedrov concluded, "Although we could say, following Kuhn, that in each case there was a radical breaking of the interconnected system of concepts and views (what Kuhn calls "paradigms"), such a generalized (and hence abstract) approach can hardly be fruitful for the study of the revolutionary development of science" (Kedrov 1976: 71).

Overall, Kuhn's work was received in the Soviet Union with sympathetic interest but without any particular enthusiasm. One of the reasons that made Kuhn's work to some degree irrelevant for the Soviet *naukovedy* was the competing discourse of scientific revolutions—the theories of STR. The STR theorists, many of whom were affiliated with IHST, were focused almost exclusively on the period since WWII. History for them was happening here and now, in the post-atomic age, and promised the revolutionary transformation of the world, qualitatively different from the effect of the previous revolutions in science. Politically primitive and counter-revolutionary, Kuhn, with his focus on normal science as a stabilizing social practice, was largely irrelevant for the theorists of the STR.

In his book *Kuhn versus Popper* Steve Fuller reflected on the history of the famous debate between Kuhn and Popper organized by Imre Lakatos in London in

[65] As one of Kuhn's critics put it, "It is not difficult to find certain points where Kuhn's concept comes into a contact with dialectical materialist theory of knowledge. These points of apparent proximity between the two include the implied interconnection and interdependence of theoretical and experimental practices in science, the protest against the absolutisation of logical methods of studies of science, the assertion of the social conditioning of scientific research, etc. However, it would be a mistake to talk about any proximity of Kuhn's views to the basic tenets of the Marxist theory of knowledge. One of these major tenets lies in the answer to question, what is the relation between science and ⟨objective⟩ truth. This question is out of the scope of Kuhn's analysis, as the notion of "truth" does not play any role in his concept" (Legostaev 1972: 136).

[66] Kedrov had characterized four "types" of revolutions: the first type was the Copernican revolution characterized by Kuhn. Then there was the "Kantian Revolution" that forged the ideas of evolution. In the late nineteenth early twentieth centuries, the "New Revolution in the natural sciences" consolidated representations of nature based on mathematical abstractions and probability. Finally, there was the Scientific-Technological Revolution, a new phenomenon, which, as Kedrov argued, could not be understood by reducing causes, effects and outcomes to the previous revolutions in science (Kedrov 1980).

1965. As Fuller argues, this event played an important role in the creation of Popper's reputation as a conservative and authoritarian proponent of an out-dated positivism, at the same time helping frame Kuhn as a "scientific radical," an intellectual rebel and critic of the scientific establishment of his time, and a precursor of the contemporary post-modern social studies of science. The truth, however, as Fuller provocatively tells us, could be read as the exact reverse, at least with regard to the issue of science, democracy, and radicalism. Contrary to their respective reputations, Fuller argues, "Popper was a democrat concerned with science as a form of dynamic inquiry and Kuhn an elitist focused on science as a stabilizing social practice" (Fuller 2005: 68).

The Soviet reading and staging of Kuhn *versus* Popper created reputations of Popper and Kuhn in the Soviet Union which were almost the reverse of those that they, somewhat unwillingly, acquired in the Anglophone West. For Kedrov, as well as for philosophers from the Institute of Philosophy who moved to staff Kedrov's Institute, philosophy of science had a special significance; it was seen as a vehicle for de-Stalinization (in some cases even de-Marxification) of Soviet philosophy in the wake of the legitimation crisis of Soviet philosophy in the fifties. It is against this background that formal logic and its applications to the analysis of the language of science became an especially attractive field among philosophers who tried to avoid issues of Marxist dialectical materialism altogether. During the sixties many philosophers retreated to philosophical logic and, along with mathematicians, were actively extending formal methods to various "special sciences."[67]

At IHST the logical studies of science became one of the prominent areas.[68] In this logicians' milieu, the works of Karl Popper were wildly popular. In the sixties IHST became a formidable center of "Popperian studies" in the Soviet Union. Popper's works in philosophy of science were closely read, reviewed and even made into the subject of doctoral dissertations.[69] The prominence of "Popperian studies" in Soviet philosophy of science made it possible to selectively introduce Popper's social philosophy to the general Soviet reader. Popper's *Open society and Its Enemies* (1945) and his *Poverty of Historicism (*1944–1945), which presented a sharp critique of Marxism, were not translated into Russian until after *perestroika*. In the seventies the Soviet general public could learn about Popper's social and political philosophy only from the publications of British Marxist philosopher

[67] The integration of logic with general philosophy through the analysis of language, in the manner of Western analytical philosophy, was not developed in the USSR until the sixties. The logical positivist perspective was officially rejected in Soviet philosophy since the thirties, because this approach was deemed idealistic and not compatible with the materialist focus of Marxism, as being focused on the analysis of language rather than on material entities.

[68] Logical studies of science were on the agenda of the "sector" (department) of the "general problems of history of science," which was renamed in the late sixties to become the "sector" of the "logic of the development of science" (headed from 1972 by Boris Grjaznov and from 1974 by Kedrov) (IHST Papers, Otčety o rabote sektorov, individual'nye plany raboty, 1965–1973).

[69] Thus, in the late sixties a graduate student at IHST T. N. Khabarova defended a dissertation on Popper's philosophy (summarized in Khabarova (1968)). The philosopher Boris Grjaznov, a researcher and for a short period head of the IHST sector of the "general problems of history of science," published prolifically on Popper throughout his career [see for example, Gorskij and Grjaznov (1975), Grjaznov (1976a, b), Grjaznov (1978), Grjaznov (1982)].

Maurice Cornforth, whose defense of Marxism against Popper's criticisms was widely publicized and made Popper the official "anticommunist theoretician number 1" in the Soviet Union (Sadovskij 2002: 181–189). The occasional expositions of Popper's *Open Society* by philosophers of science were also accompanied by standard critiques (Mongili 1998a: 198). Yet, Popper's writings in philosophy of science had contributed to the very possibility of these expositions.[70]

Thus, somewhat ironically, the Soviet staging of Kuhn and Popper produced reputations very close to the de-mythologized picture that Fuller has presented. The efforts of Soviet philosophers to rehabilitate the "anti-communist number 1" made Popper's *Logic of Scientific Discovery* and his other writings on science sound much more unorthodox, radical and appealing in the Soviet Union than they appeared to his American audience in the seventies and eighties.

Conclusion

Was Soviet *naukovedenie* a "phantom science"?

As I have argued in this paper, the Soviet science studies project was articulated in response to the local economic and political situation and the needs of the Soviet state during the Cold War. Science studies (*naukovedenie*) as a specialized discipline were promoted and used as a vehicle for changing the role of philosophers in the post-Stalinist Soviet Union. Scientists' harsh attacks on "philosophy" targeted the Stalinist order of things rather than philosophy or philosophical theory per se. A popular Soviet joke from the sixties attributed to the physicist Lev Landau captured this perfectly, stating: "There are only three types of science: natural science, unnatural science (i.e. social sciences), and anti-natural science (i.e. philosophy)." Philosophers-turned-*naukovedy* did not succeed in challenging the hierarchy that privileged natural sciences over social sciences and the humanities in the Soviet Union, but they did succeed in reestablishing connections with the scientific community and the state.

A creature of late socialism, *naukovedenie* was neither a form of resistance nor conformism with the state. Such a binary representation was itself the creature of the Cold War mentality that many recent works of historians of the Soviet Union have convincingly questioned.[71] The Cold War-inspired accounts that made Soviet experience appear incommensurable with the world of Western democracies are now giving way to more nuanced and complex readings showing various forms of ideological accommodation as well aspragmatic and institutional cooperation between different groups of scientists and politicians (a picture not that different

[70] The first Russian translation of Popper's works on scientific method appeared in 1978 thanks to Grjaznov of IHST and V. N. Sadovskij of the Institute of Philosophy. The translation was the compilation of Popper's articles published in Boston Studies in the Philosophy of Science in 1963–1971 (Grjaznov and Sadovskij (1978)). Popper's *Logic of Scientific Discovery* appeared in Russian translation in 1983 (translated by Sadovskij). See the history of publication of Popper's works in Russian in Sadovskij (2002), on pp. 186–189.

[71] See discussion in Yurchak (2006). On the problem of resistance in Stalinist Russia see the special issue of *Kritika* (David-Fox et al. 2003). See also Adams (2001), Kotkin (1998).

from "Western science"). The story of "Soviet science studies" project demonstrates that Soviet *naukovedy* responded to the same anxieties and concerns of the Cold War as their Western counterparts, while adapting and transforming them in highly specific and often peculiar ways.

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