

# Introduction:

## Intelligentsia Science Inside and Outside Russia

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### ABSTRACT

The concept of “intelligentsia” has had a long life both as an actors’ category and as a tool of historical analysis to understand the role of the educated elite in Russia and the Soviet Union. For a variety of reasons, this term has not achieved much prominence in exploring the assimilation of science and technology into Russian culture. This essay examines the term’s convoluted historiography and makes a case for the utility of its revival—understanding “intelligentsia” not as a single concept or group but as a heterogeneous and evolving social institution. The entire volume is then introduced with these features in mind.

### INTRODUCTION

Andrei Sakharov was no sport of nature. The moral authority that he had acquired by the time of his death in December 1989 was the product of more than his extraordinary scientific aptitude and a rare willingness to speak truth to power. Since the demise of Communism, he has rightly been claimed as a paragon of the Russian intelligentsia tradition stretching back to the nineteenth century. His scientific biographer has demonstrated Sakharov’s clear filiations with the laboratory milieu cultivated by the Moscow University physicist P. N. Lebedev (1866–1912), whose career had likewise fallen victim to overweening government authority.<sup>1</sup> The widespread post-Soviet eagerness to recover a usable historical continuity with a more distant Russian past is in no small part a symptom of the often tragic fortunes of the “intelligentsia”—a term whose meaning has long been contested—under Soviet power.

Yet Sakharov’s colleagues’ invocations of a uniquely heroic figure for his era elide the social institutions and traditions that are indispensable to any historical appeal to the intelligentsia legacy. An invaluable collection of reminiscences titled *He Lived among Us . . .* handily illustrates the multilayered nature of the problem in

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We would like to thank Alexei Kojevnikov for his initiative in proposing this volume, his organizational acumen in coordinating the initial conference from which these papers were drawn in fall 2004 in Athens, Georgia, and his contributions to and suggestions on the first version of this introduction. We also greatly appreciate the support of the University of Georgia and Princeton University in making this volume possible. Comments from an anonymous referee and especially the judicious interventions of Kathryn Olesko have made this introduction—and this volume—substantially better.

<sup>1</sup> Gennady E. Gorelik, with Antonina W. Bouis, *The World of Andrei Sakharov: A Russian Physicist’s Path to Freedom* (New York, 2005).

capturing this seemingly singular *intelligent* (i.e., a member of the intelligentsia; pl. *intelligenty*) against a larger historical backdrop.<sup>2</sup> Despite the vaguely messianic connotations, the title actually refers to a poem by Aleksandr S. Pushkin, a touchstone reference for every incarnation of the Russian intelligentsia and a particular favorite of Sakharov's. In 1937, at the centenary of Pushkin's death, a young Andrei Sakharov had witnessed the lavish state-sponsored celebrations of the national poet and even then had been quite conscious of the irony, amid the Great Purges, of officially praising the poet's disdain for an oppressive tsarist regime. And that is the historical parallel his colleagues sought to emphasize—artist and scientist each resisting arbitrary state power. However, the poem has more than that to say about the scientist in Russian culture.

Pushkin's "He Lived among Us" does not celebrate political nonconformity or moral uprightness but rather dresses down the Polish national poet Adam Mickiewicz for his manifest ingratitude in supporting the Polish rebellion against the Russian empire of 1830–1831. The Polish exile had enjoyed extended hospitality in both Moscow and St. Petersburg only a few years previously, and Pushkin himself had translated several of Mickiewicz's poems into Russian. But after Mickiewicz's passage to sedition, wrote Pushkin, "our peaceable guest has become an enemy to us—and poison." The tone is not angry—simply wounded. Among those colleagues invoking Sakharov's Pushkin, however, only one pointed to the contents of the poem itself. He recalled that Sakharov had explicitly drawn an analogy between Pushkin's altered relationship with Mickiewicz and his own with a fellow dissident who had strayed into the thickets of anti-Semitic Russian nationalism.<sup>3</sup> Identifying with Pushkin, Sakharov somewhat ruefully recognized the righteous impulse to banish the wayward scholars from their midst, yet he seemed insensible to a reading of the poem in which the rebellious Pole is the protodissident and Pushkin the unself-conscious proponent of an imperial Great Russian state. That is to say, Sakharov's status as a scientist did not exempt him from participating in a lengthy tradition of competing universalisms in Russia. Scientists were part and parcel of the agonistic strain in the intelligentsia tradition. One of the tasks of this volume is not only to highlight the role the intelligentsia played in the formation of professional identities and even research agendas in the Russian empire and the Soviet Union but also to recover some of the international context of this distinctive Russian phenomenon: the intelligentsia scientist.

Yet Sakharov was just as much a weapons scientist, a father of the Soviet hydrogen bomb, as he was a dissident intelligent dipping into the well of intellectual as oppositionist. Making sense of science in the Russian context requires considering both aspects as part of a single milieu. Western eyes might detect a contradiction here, and one way of addressing it, attractive to both physicists and historians, is to treat Sakharov's career as a *quid pro quo*: the delivery of technical expertise in return for the toleration of limited intelligentsia values inside a physics microcosm. This should be the starting point for historical explanation, not its conclusion.<sup>4</sup> A

<sup>2</sup>B. L. Al'tshuler et al., eds., *On mezhdru nami zhil . . . : Vospominaniia o Sakharove* (Moscow, 1996).

<sup>3</sup>The colleague was the mathematician I. R. Shafarevich. M. L. Levin, "Progulki s Pushkinym," in *ibid.*, 330–75, on 346; cf. Andrei Sakharov, *Memoirs*, trans. Richard Lourie (London, 1990), 327.

<sup>4</sup>To give a prominent example, émigré cosmologist Andrei Linde claimed that the atomic bomb was the reason "the scientific culture associated with the Soviet school of physics became a culture of free political thought." See his letter to the editor, *Physics Today* 45 (June 1992): 13. This view is affirmed by David Holloway, who argues that the bomb saved "a small island of intellectual autonomy in a so-

functional trade-off between knowledge and power will not suffice to explain “intelligentsia science.” Drawing back from the iconic Sakharov to focus on a wider field of scientific endeavor, we see a long line of intelligentsia “descent with modification” that suggests more contextual hybridity than singular mutation. We argue for the study of Russian *culture* as a fruitful incubator for metaphorical models in the history of science. The structure of Russian cultural institutions, and more specifically the hallmark institution of the intelligentsia, both before and after the revolution of 1917, offers a deep study of how elites organize themselves around the themes of knowledge and political action. By repeatedly using this institution as the structural level of their investigations, the authors here push for a new scale of understanding the microcomposition of what have traditionally been painted in broader strokes. We wish to do more than just revive the now-unfashionable category of “intelligentsia” to demonstrate its centrality for specific questions in Russian history. We hope to show precisely how the analysis of these kinds of institutions can offer a model for not merely bringing the history of science closer to mainstream political, social, and economic history but placing science and technology right at the heart of national and international developments.

#### THE RUSSIAN INTELLIGENTSIA AS CATEGORY AND CRITIQUE

Andrew Dickson White is best known to historians of science as the author of *History of the Warfare of Science with Theology in Christendom*, which he completed in 1895 while posted to St. Petersburg as the American ambassador to the Romanov court. He had first served in Russia in the 1850s as a young man, before going on to a distinguished career that included a stint as the first president of Cornell University. It is only in recent decades that his influential account of “the great, sacred struggle for the liberty of science” against the (autocratic) forces of religious dogmatism has been displaced by more nuanced views of the multivalent relations between scientific thought and Christian culture.<sup>5</sup> For White, this vaunted scientific autonomy was achieved through the exceptional agency of great men striving against deeply pernicious character traits instilled by theological training. Although his writings on science and on Russia scarcely intersected, White objected to the “barbarism” of the Russian tsars and similarly ascribed deep-rooted character traits (some positive, most negative) to Russians as products of this autocratic setting. This dynamic extended to intellectuals as well, with White asserting that “the evolution of Tolstoi’s ideas has evidently been mainly determined by his environment.” Only two scientists warranted mention in White’s account of Russia. In the case of D. I. Mendeleev, with his “epoch-making discovery” of the periodic system of elements, White regarded this achievement as made possible because the scientist “[gave] himself wholly to some well-defined purpose” and was not distracted by that same Russian milieu. By contrast, in the case of geographer and biologist Prince Peter Kropotkin, that environment could not provide the necessary intellectual discipline, and he gave himself over

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ciety where the state claimed control of all intellectual life.” See his *Stalin and the Bomb* (New Haven, Conn., 1994), 213; Holloway, “Physics, the State, and Civil Society in the Soviet Union,” *Historical Studies in the Physical and Biological Sciences* 30 (1999): 173–93.

<sup>5</sup> See, in particular, John Hedley Brooke, Margaret J. Osler, and Jitse M. van der Meer, eds., *Science in Theistic Contexts*, *Osiris* 16 (2001); Andrew D. White, *History of the Warfare of Science with Theology in Christendom* (New York, 1896).

to “speculations of an abstract sort, with no chance of discussing his theories until they are full-grown and have taken fast hold upon him.”<sup>6</sup> Kropotkin’s long career abroad went unmentioned, in the presumption that these weaknesses had been indelibly inscribed while he was still in Russia.

White’s protostructuralist and dualist mode of interpretation has proven surprisingly durable (if unacknowledged among historians of Russian science), as evidenced by Loren Graham’s plea in 1998 for historians of science to treat Russia in symmetrical terms and renounce the “deviationist” model once and for all.<sup>7</sup> The fact that Graham even needed to raise this point after more than a century indicates that something is indeed amiss in the framework through which most historians have tended to view Russian scientific activity. We believe that closer study of the evolving identities of the (scientific and technical) intelligentsia—including Russian scientists abroad—can do a good deal more than transcend tired realist/constructivist or internalist/externalist dichotomies in the field.

By the time anglophone historians of science first adopted the term “intelligentsia” in the mid-1930s, it had already been suitably deracinated and was used to describe the sort of men who congregated at the London coffeehouse frequented by Benjamin Franklin and Joseph Priestley in the late eighteenth century.<sup>8</sup> Occasionally, even the political overtones were stripped away to render the term nearly synonymous with what social scientists would call a “cohort.”<sup>9</sup> Yet the original usage a century earlier connoted anything but quietism. Its very coinage is emblematic of the boundary problems we seek to address in this volume, for while it entered English directly from Russian in the 1920s, it was originally appropriated into Russian much earlier from Polish, which was itself a mediator for analogous terms in France, Germany, and Italy in the 1830s and 1840s. This cluster of parallel terms was initially used rather broadly in Europe to designate educated and “progressive” individuals, but the various Western European analogues gradually fell out of use. The Polish and Russian usage of “intelligentsia,” by contrast, continued to accrete complex associations with word and deed in the tsarist context.<sup>10</sup>

The men discussing the term were largely from the Western-oriented minor service nobility. The small size and privileged location of these early discussions was in part

<sup>6</sup> Andrew D. White, *Autobiography of Andrew Dickson White*, vol. 2 (New York, 1905), 494–5, 498–9. On White as one of the first American experts on Russia, see David C. Engerman, *Modernization from the Other Shore: American Intellectuals and the Romance of Russian Development* (Cambridge, Mass., 2003), 43–5.

<sup>7</sup> Loren R. Graham, *What Have We Learned about Science and Technology from the Russian Experience?* (Stanford, Calif., 1998).

<sup>8</sup> W. Cameron Walker, “The Beginnings of the Scientific Career of Joseph Priestley,” *Isis* 21 (1934): 81–97, 84.

<sup>9</sup> The Invisible College “was merely a club of young men, some of the intelligentsia of that day, brought together by common college backgrounds and many common interests for rest and refreshment from the political, theological and military turmoil of the times.” Dorothy Stimson, “Comenius and the Invisible College,” *Isis* 23 (1935): 373–88, on 374.

<sup>10</sup> For the *Begriffsgeschichte*, see Otto Wilh. Müller, *Intelligencija: Untersuchungen eines politischen Schlagwortes* (Frankfurt am Main, 1971); S. O. Shmidt, “K istorii slova ‘intelligentsii,’” in *Rossiiia, zapad, vostok: Vstrechnye techeniia; K 100-letiiu so dnia rozhdeniia akademika M. P. Alekseeva*, ed. V. E. Bagno et al. (St. Petersburg, 1996), 409–17. The most ambitious recent treatment is the collection of essays T. B. Kniazevskaia, ed., *Russkaia intelligentsiia: Istoriia i sud’ba* (Moscow, 2000); see, especially, the contribution of Iu. S. Stepanov. The late eighteenth-century sources of the “service to the people” mentality are best chronicled by Marc Raeff in *Origins of the Russian Intelligentsia: The Eighteenth-Century Nobility* (New York, 1966); for the nineteenth century and beyond, see Richard Pipes, ed., *The Russian Intelligentsia* (New York, 1961).

a function of the repressive political circumstances—larger gatherings and men of lesser social station would have been much more vulnerable to the political police. It was in these small circles (*kruzhki*) that discontent with the regime of Tsar Nicholas I (r. 1825–1855) mixed with discussions of class identity and *Bildung*, incorporating the normative element of the participants' moral behavior vis-à-vis enserfed peasant Russia. What began as salon politics quickly underwent an astonishing intellectual ferment that for practical (read: censorship) as much as aesthetic reasons was manifested mostly in literary forms, whether as Aesopian criticism or as *belles lettres*. In this first generation of nascent intelligenty, only Prince Vladimir F. Odoevskii demonstrated any active interest in natural philosophy (though many members of the intelligentsia embraced some variant of Comtean positivism), and his scientific pursuits found few outlets outside Russia.<sup>11</sup>

The generation of the 1860s transformed “intelligentsia” into a central notion of Russian popular discourse, cementing its association with revolutionary politics—and with natural science.<sup>12</sup> Science became the cornerstone of the intelligentsia's ideological and political projects, either as an alternative to socialism or, more often, as its nominal *raison d'être*. During the Great Reforms of the 1860s, with their modest abatement of censorship, figures such as Petr Lavrov strove to articulate a role for “critically thinking individuals” in Russian society, sparking myriad debates about who counted as an intelligent. Although the roles of bureaucrat or writer or officer remained compatible with a primary identity as a nobleman, the normative intelligentsia role soon became militantly *déclassé* in the very period when more finely differentiated social roles, including that of the scientist, were becoming possible.<sup>13</sup> The intelligentsia nonetheless maintained its embattled self-conception and oppositional ethic through the end of the century, even as it fractured into liberal, radical, Marxist, and even reactionary groupings and subgroupings. Liberal geochemist Vladimir Vernadskii, for example, took a decidedly evolutionary view of scientific discovery; yet in a course offered at Moscow University, he also comfortably associated receptivity to new scientific truths with a heretical mindset.<sup>14</sup> The comparative “respectability” of scientists in social terms has tended to obscure the complexity of their roles in this period's confrontation between a suspicious state and those intellectual “subversives” claiming to represent the greater public good. The oppositional boundaries

<sup>11</sup> Dimitri Bayuk, “Literature, Music, and Science in Nineteenth Century Russian Culture: Prince Odoevskii's Quest for a Natural Enharmonic Scale,” *Science in Context* 15 (2002): 183–207. We are not making a claim about the place of *Naturphilosophie* in Russia more generally, and its importance for nurturing a culture of science in Russia under Nicholas I should be acknowledged. But its most accomplished adepts had little direct influence on subsequent arguments about “Russian science” and should not be regarded as intelligentsia scientists *avant la lettre*.

<sup>12</sup> For the classic set of Slavophiles, Westernizers, and other representatives of the politically oriented intelligentsia in this period, see the essays gathered in Isaiah Berlin, *Russian Thinkers*, ed. Henry Hardy and Aileen Kelly (London, 1978). Berlin's rather sanguine interpretation of the Russian intelligentsia, especially the central figure of Aleksandr Herzen, has recently received rather wide exposure through the popular success of Tom Stoppard's dramatic trilogy, *The Coast of Utopia* (London, 2002).

<sup>13</sup> On the transformations in the estate social structure of this period, see Elise Kimerling Wirtschafter, *Social Identity in Imperial Russia* (DeKalb, Ill., 1997); Edith W. Clowes, Samuel D. Kassow, and James L. West, eds., *Between Tsar and People: Educated Society and the Quest for Public Identity in Late Imperial Russia* (Princeton, N.J., 1991); and Harley D. Balzer, ed., *Russia's Missing Middle Class: The Professions in Russian History* (Armonk, N.Y., 1996).

<sup>14</sup> V. I. Vernadskii, “O nauchnom mirovozzrenii,” in *Sbornik po filosofii estestvoznaniia* (Moscow, 1906), 104–57, 145.

proved porous over time, and it was plausible for participants in prominent state and industrial initiatives in oil exploration, university education, and industrialization to engage simultaneously in the philosophical and political debates about science then raging in intelligentsia circles.

The Russian intelligentsia at the fin de siècle was relentlessly self-critical, and the marginal figures of the scientific intelligentsia found themselves shunted aside both at that time and in later histories of the period. Indeed, the critics of the intelligentsia have defined it as much as its members, most famously evidenced by the *Signposts* volume of 1909.<sup>15</sup> While idealist philosophers N. A. Berdiaev, S. N. Bulgakov, and S. L. Frank dominated this polemic, P. B. Struve's critique was most effective in ensuring that "intelligentsia" would be bound to "revolution" in subsequent Western historiography. For Struve, the intelligentsia was not simply the educated class (with ready analogues in other European countries), but "the offspring of the interaction of Western socialism with the particular conditions of our cultural, economic, and political development." Moreover, it was *defined* by its hostile relation to the state, an oppositional stance that Struve labeled "renegadism" (*otshchepenstvo*).<sup>16</sup> That oppositional stance did not seek to replace the "mystery" of the state with another Hegelian foundation but rather to deny the state entirely in favor of a rational and empirical foundationalism with no spiritual component whatsoever. The main thrust of this critique helped cement the conviction among subsequent observers that the Russian intelligentsia necessarily shared a particular political and philosophical stance toward the state. That view produced one of two possible consequences for the historical treatment of scientists, depending on which strategy one followed.

The first strand of argument drew upon broader debates about modernization theory in the social sciences and treated the apparent fading of the (oppositional) intelligentsia in the Soviet era as a symptom of universal processes of industrialization. If there was no more "renegadism" under the Soviets, it was because intellectuals globally were increasingly subject to professionalization and standardization of social roles—not least among them, Soviet scientists.<sup>17</sup> This then licensed a dual terminology that mirrored actual Soviet usage, following Stalin's redefinition of the term "intelligentsia" to refer to what in the West would later be termed "white-collar workers": clerks, bureaucrats, and the like. These interpretations split the intelligentsia into two groups: the fading prerevolutionary remnants that had slid into irrelevance to the extent that they did not identify completely with Soviet power (a "quasi-intelligentsia"), and a modernizing technical elite without explicit political aspirations (i.e., "technocrats"—Stalin's newly redefined "intelligentsia"). In more optimistic readings, professionalization would even slowly overtake the party appa-

<sup>15</sup>N. A. Berdiaev et al., *Vekhi* (Moscow, 1909; repr., Sverdlovsk, 1991). On literary critics of the intelligentsia, cf. Gary Saul Morson, "What Is the Intelligentsia? Once More, an Old Russian Question," *Academic Questions* 6 (Summer 1993): 20–38.

<sup>16</sup>P. B. Struve, "Intelligentsiia i revoliutsiia," in Berdiaev et al., *Vekhi* (cit. n. 15), 148–65, on 164, 151. On the significance of Struve as a marker for countercurrents in Russian culture, see Richard Pipes, *Struve: Liberal on the Left, 1870–1905* (Cambridge, Mass., 1970); and Pipes, *Struve: Liberal on the Right, 1905–1944* (Cambridge, Mass., 1980).

<sup>17</sup>"Alienation has been dethroned . . . from its position as the dominant trait of the old intelligentsia of a century ago. The singularly modernizing USSR has gone far in incorporating the new intelligentsia," which for Fischer unproblematically includes scientists and engineers. George Fischer, "The Intelligentsia and Russia," in *The Transformation of Russian Society: Aspects of Social Change since 1861*, ed. Cyril E. Black (Cambridge, Mass., 1960), 253–74, on 273–4.

ratus.<sup>18</sup> Within such frameworks, scientists and engineers, being the standard-bearers of modernization, became the least likely objects for study with respect to the Soviet intelligentsia, understood in the pre-Stalinist sense. For it was science and technology that would eventually return Russia from its Communist detour back on to the historical trajectory of Western modernity.<sup>19</sup>

The second and more influential strand of argument within Russian studies emphasized the longer-term historical specificity of the Russian intelligentsia but was no less universalist in explaining its ultimate fate. Following Struve, these scholars emphasized the essential Europeaness of the Russian intelligentsia, and then portrayed the revolution as either apotheosis or apocalypse (usually the latter), but effectively as an end point for the conditions that had made the intelligentsia possible in the first place: the intelligentsia made the revolution, which then swallowed its parents. The earliest Western students of the Bolshevik regime thought the revolution had destroyed the intelligentsia a decade later—yet did not seem to notice the simultaneous explosive growth in the ranks of scientists alongside the supposed death of the intelligentsia.<sup>20</sup> If the intelligentsia had been destroyed by the revolution, the rise of science and technology after the Bolshevik victory was a priori irrelevant to any intelligentsia tradition. Martin Malia was especially eloquent in extending the *Signposts* position that the intelligentsia was by definition alienated and, after 1917, marginalized and virtually nonexistent.<sup>21</sup> Malia's magisterial synthesis of Western views of Russia remains exemplary in demonstrating that the history of the Russian intelligentsia must be told in pan-European (if not global) terms, and several of the essays in this volume consciously heed that injunction. We differ from Malia in two important respects, however. First, the grand temporal arc of intellectual legacies that he traces needs to be complemented by accounts of medium-scale conjunctural effects (e.g., scientists at war; scientists as bearers of national/patriotic aspirations) and of small-scale interactions at the personal and institutional level. These levels of analysis comprise the specifically Russian and Soviet contexts in which intelligentsia social identities were formed. Second, when these effects are taken into account, we believe that 1917 will

<sup>18</sup> Robert V. Daniels, "Intellectuals and the Russian Revolution," *American Slavic and East European Review* 20 (1961): 270–8, on 277. More pessimistic readings, following Leon Trotsky (Lev Trotskii), saw this development as a new Thermidor and a prelude to Soviet Bonapartism: Leon Trotsky, *The Revolution Betrayed: What Is the Soviet Union and Where Is It Going?* trans. Max Eastman (Garden City, N.Y., 1937).

<sup>19</sup> Albert Parry, *The New Class Divided: Science and Technology Versus Communism* (New York, 1966). Although political scientists showed no interest in the internal structure of the scientific community, they were quick to criticize the purported "cleavage" between technically trained managers and party apparatchiki. Cf. Stephen White, "Contradiction and Change in State Socialism," *Soviet Studies* 26 (1974): 41–55.

<sup>20</sup> René Fülöp-Miller, *Geist und Gesicht des Bolschewismus: Darstellung und Kritik des kulturellen Lebens in Sowjet-Russland* (Zurich, 1926), 19, 327–9; Friedrich Braun, "Über die russische 'Intelligenz,'" in *Kultur- und Universalgeschichte: Walter Goetz zu seinem 60. Geburtstage*, ed. colleagues et al. (Leipzig, 1927), 362–75; David Joravsky, "Soviet Scientists and the Great Break," in Pipes, *Russian Intelligentsia* (cit. n. 10), 122–40; Joravsky, *Soviet Marxism and Natural Science, 1917–1932* (New York, 1961). We owe the Braun reference to Jutta Scherrer.

<sup>21</sup> Martin Malia, "What Is the Intelligentsia?" in Pipes, *Russian Intelligentsia* (cit. n. 10), 1–18; Malia, *Russia under Western Eyes: From the Bronze Horseman to the Lenin Mausoleum* (Cambridge, Mass., 1999). Cf. James H. Billington, "The Renaissance of the Russian Intelligentsia," *Foreign Affairs* 35 (1957): 525–30, in which Khrushchev's "liberalizing" measures are seen as a (still premature) opportunity for the revival of a (by definition) oppositional intelligentsia. See also Billington, *The Icon and the Axe: An Interpretive History of Russian Culture* (New York, 1966).

cease to loom so large and that subtler enduring continuities between imperial and Soviet phenomena will become apparent.<sup>22</sup>

Others have demanded thoroughgoing social histories of the Russian intelligentsia that encompass more than socialist revolutionaries, but their calls seem to exclude natural scientists and engineers.<sup>23</sup> Jutta Scherrer has rightly called for more explicit historical connections between proclaimed self-identity and actual socialization, for studying lifestyles in order to get at questions of corporate identity among the intelligentsia. But we can go beyond the officers, civil servants, and upper levels of the clergy she identifies as illuminating boundary test cases for such research.<sup>24</sup> Scientists also offer abundant possibilities for testing hypotheses about Russia, and this most international of social identities should surely play a role in further comparative studies of European intellectuals in the spirit of ambitious synthetic works such as those of Christophe Charle or Denis Sdvizhkov.<sup>25</sup>

So why have the scientists been left out of this history? For a variety of reasons, both scientists themselves and Soviet historians of intelligentsia found it useful to employ the term in ways that obscured or effaced its historical specificity vis-à-vis science in Russia. Lenin himself underwrote the misleading dichotomy between “re-educating old specialists” and “training new cadres” to make a new socialist intelligentsia, and Soviet historians duly followed suit, making the new “technical intelligentsia” into something socially and politically distinct from its prerevolutionary avatars. In the rush to bleed “intelligentsia” of its specificity, Soviet historians advanced the notion of a complementary “nonprofessional intelligentsia” composed of a broad variety of “proletarian” pursuits not necessarily captured by the labels “engineer” and “technician.”<sup>26</sup> This expansive category surely helped swell the ranks of the Soviet-educated elites for bookkeeping purposes, but was this really the most appropriate term for operators of high-speed excavators?<sup>27</sup> Even when the focus was on natural scientists, there was every motivation to restrict oneself to cautious demographic analyses demonstrating the social breadth, rather than the historical depth, of the scientific intelligentsia.<sup>28</sup> The intelligentsia, it seemed, had lost its taste for

<sup>22</sup> For continuities in the exceptional cases of Bogdanov, Lunacharskii, Bukharin, and Gastev, see Jutta Scherrer, “Die sozialistische Intelligenzija: Ihre Rolle in der russischen Kulturrevolution vor und nach 1917,” *Comparativ* 6 (1995): 94–119.

<sup>23</sup> Daniel R. Brower, “The Problem of the Russian Intelligentsia,” *Slavic Review* 26 (1967): 638–47; Michael Confino, “On Intellectuals and Intellectual Traditions in Eighteenth- and Nineteenth-Century Russia,” *Daedalus* 101, no. 2 (1972): 117–49; Alexander Gella, ed., *The Intelligentsia and the Intellectuals: Theory, Method, and Case Study* (Beverly Hills, Calif., 1976).

<sup>24</sup> Jutta Scherrer, “Russkaia dorevoliutsionnaia intelligentsiia v zapadnoi istoriografii,” in *Intelligentsiia v istorii: Obrazovannyi chelovek v predstavleniakh i sotsial'noi deistvitel'nosti*, ed. D. A. Sdvizhkov (Moscow, 2001), 9–30.

<sup>25</sup> Christophe Charle, *Les intellectuels en Europe au XIX<sup>e</sup> siècle: Essai d'histoire comparée* (Paris, 1996); Denis Sdvizhkov, *Das Zeitalter der Intelligenz: Zur vergleichenden Geschichte der Gebildeten in Europa bis zum Ersten Weltkrieg* (Göttingen, 2006).

<sup>26</sup> Western journalists could help reinforce this usage of intelligentsia; see, e.g., “Soviet Now Seeks Aid of the Intelligentsia: Need of Engineers and Technical Experts in Industry Brings Offer of Reconciliation,” *New York Times*, 13 Dec. 1924.

<sup>27</sup> M. P. Kim, ed., *Sovetskaia intelligentsiia (Istoriia formirovaniia i rosta 1917–1965 gg.)* (Moscow, 1965), 418; S. A. Fediukin, *Velikii oktiabr' i intelligentsiia* (Moscow, 1972); P. V. Alekseev, *Revoliutsiia i nauchnaia intelligentsiia* (Moscow, 1987).

<sup>28</sup> D. M. Gvishiani et al., *The Scientific Intelligentsia in the USSR: Structure and Dynamics of Personnel*, trans. Jane Sayers (Moscow, 1976).

ideology.<sup>29</sup> Old Regime scientists sympathetic to the Soviets were also inclined toward inclusive definitions, but they were not necessarily being disingenuous when they celebrated the vast qualitative increase since 1917, or the increasing diversity of the scientific community.<sup>30</sup> Indeed, the point is not to claim that all scientists and engineers under state socialism were “genuine” intelligentsia—whatever that would mean—but rather to show concretely how such social and ideological distinctions were scrambled over time among scientists themselves. The term “intelligentsia” may have lost its specificity, or its corporate identity, but that does not mean that we as historians cannot locate traditions, institutions, and ideologies that bear more than family resemblances to the classic conception of the term.

This introduction began with Sakharov and the intelligentsia, so it is only fair that the other great anti-Soviet dissident—and fierce critic of the intelligentsia—should have his say, in passing. Aleksandr Solzhenitsyn has been instrumental in hardening the 1917 divide regarding the composition of the intelligentsia, although his identifying criteria were neither intellectual nor political but profoundly moral. The ability to function successfully under Soviet power was, in Solzhenitsyn’s scheme of things, evidence of collaboration and compromise and thus barred one from membership in the true “intelligentsia,” the exemplars of which were drawn in his case from the Slavophiles of the 1840s and their ilk.<sup>31</sup> Soviet scientists were especially vulnerable to this charge, given how closely they were tied to the state as civil servants and technical experts—and despite his sharp differences with Solzhenitsyn, Andrei Sakharov shared some of the same sense of disappointment in his peers. In Solzhenitsyn’s eyes, the Soviet successors of the Russian intelligentsia had sold out their ideas for material comforts. This polemic carried a great deal of truth, but Sakharov’s own experience already suggests that it was overstated.<sup>32</sup>

Scientists outside Russia have themselves contributed to the marginalization of the term, tending toward usages that imply the least politically problematic relation between science and power. The earliest usages of the term among Western scientists sometimes made it even more inclusive than “intellectuals,” without attributing anything particularly Russian to the meaning.<sup>33</sup> Émigré Russian scientists were likewise naturally uninterested in fostering any historical distinctions in social roles between

<sup>29</sup> An American Sovietologist in the age of *The Organization Man* described an “ersatz intelligentsia” that wants “simply to describe life as they see it without constant reference to ideology.” L., “The Soviet Intelligentsia,” *Foreign Affairs* 36 (1957): 122–30.

<sup>30</sup> B. Keller, “Proletarskaia revoliutsiia i sovetskaia intelligentsiia,” *Front nauki i tekhniki*, 1937, no. 11:49–58.

<sup>31</sup> A. I. Solzhenitsyn, “Obrazovanshchina” (1974), reprinted in *Kniazevskaia, Russkaia intelligentsiia* (cit. n. 10), 125–49; cf. M. L. Gasparov, “Intellektualy, intelligenty, intelligentnost’,” in *ibid.*, 5–14, on 7. On the Slavophiles, see Andrzej Walicki, *The Slavophile Controversy: History of a Conservative Utopia in Nineteenth-Century Russian Thought*, trans. Hilda Andrews-Rusiecka (Oxford, 1975).

<sup>32</sup> Sakharov’s post-Soviet canonization was thus not simply evidence of bad conscience among his scientific peers (by Solzhenitsyn’s lights) but also a sign of some more durable social processes peculiar to the Soviet era.

<sup>33</sup> For U.S. National Research Council representative Vernon Kellogg, the “intelligentsia” (his scare quotes, marking the contemporary novelty of the term) was “the university faculties and the Russian professional and scientific men in general.” Kellogg, “The Present Status of University Men in Russia,” *Science* 54 (25 Nov. 1921): 510–1. This tendency to conflate intelligentsia with intellectuals may also be found in the important early study by Karl Nötzel, *Die Grundlagen des geistigen Russlands: Versuch einer Psychologie des russischen Geisteslebens* (Leipzig, 1923; repr., New York, 1970), e.g., 260.

them and their Western counterparts. Yet while condemning the Soviet system, they invariably insisted that “Russia has always generously contributed her share to the science of the world.”<sup>34</sup> Eager to catalog Russian achievements, they were loath to evaluate the scientist in Soviet context. The left-leaning P. M. S. Blackett adopted a Soviet-style “service intellectuals and technicians” definition that made (scientific) intelligentsia into a source of (political) progress, again without any historical differentiation of social roles—every scientist became an intelligent willy-nilly in the modern era.<sup>35</sup> The Marxist Léon Rosenfeld, by contrast, took intelligentsia to have a political bent everywhere, not just in Russia, and he did not shy away from anachronistic usage.<sup>36</sup>

Perhaps more representative in the postwar era was the experience of the biologist Conway Zirkle, an early visitor to the Soviet Union who became sharply critical of it at the height of the cold war during the depredations of Lysenkoists. Reviewing James Bryant Conant’s *Science and Common Sense*, Zirkle happily agreed with its premise that education in science builds good liberal-democratic citizens but worried that it was not enough to persuade laypeople that science is “organized knowledge,” when they still might fail to appreciate its “conceptual schemes” properly. Witness the Marxist dupes of the 1930s in Great Britain, inveighed Zirkle. “In the intellectual climate of the nineteen-thirties and early forties, becoming a sucker was almost an occupational hazard of the intelligentsia.”<sup>37</sup> Not surprisingly, accusations of Western co-optation did not lend themselves to further analysis of the original Russian problem. Other, less politically engaged, scientists with extensive knowledge of the Soviet setting preferred a definition of “producers of high culture,” thereby distancing scientists from the discussion.<sup>38</sup> A dissident scientist such as Zhores Medvedev might hedge the matter by placing scientists among the intelligentsia but still distinguishing them from the “culturally creative intelligentsia.”<sup>39</sup> More conservative and elitist appropriations of the term by anglophone scientists have been ignored by historians of science, notwithstanding the awkward parallels with Leninist practice.<sup>40</sup> In short, the anglophone meanings of intelligentsia among scientists have been so promiscuous as to discourage reflection about its relevance in historical perspective.

<sup>34</sup> V. N. Ipatieff, “Modern Science in Russia,” *Russian Review* 2, no. 2 (1943): 68–80, on 68. Cf. George Vernadsky, “Rise of Science in Russia, 1700–1917,” *Russian Review* 28, no. 1 (1969): 37–52. Although George was a historian by training, his father, Vladimir, was an eminent geochemist and liberal who remained in the Soviet Union and wrote regularly to his son. This article was already quite dated at the moment of publication but very much in keeping with the style of Ipatieff’s earlier essay.

<sup>35</sup> P. M. S. Blackett, “Science, Technology, and World Advancement,” *Nature* 193 (3 Feb. 1962): 416–20.

<sup>36</sup> Léon Rosenfeld, “Voltaire on Newton,” *Nature* 218 (11 May 1968): 607.

<sup>37</sup> Conway Zirkle, “Science and Common Sense,” *Isis* 42 (1951): 269–71, on 270.

<sup>38</sup> E.g., Cambridge physicist David Shoenberg wrote that Kapitza had “a wide circle of friends among the ‘intelligentsia’: artists, sculptors, writers, musicians, actors, film directors and so on.” Shoenberg, “Piotr Leonidovich Kapitza,” *Biographical Memoirs of the Fellows of the Royal Society* 31 (1985): 326–74, on 364.

<sup>39</sup> Zhores Medvedev, *The Medvedev Papers* (London, 1971), 170–1.

<sup>40</sup> A favorite example comes, appropriately enough, from an Anglophile Canadian witness to the demise of the British Empire: “Always a firm believer in an oligarchy of the intelligentsia, Rowan looked upon the events following the Second World War as conclusive evidence of the depravity of democracy. He was convinced that mankind is heading toward total self-destruction and that it can be saved only by placing itself under the guidance of an intellectual few.” W. Ray Salt, “Prof. William Rowan,” *Nature* 180 (7 Sept. 1957): 463.

## “SCIENCE IN RUSSIA” VERSUS “RUSSIAN SCIENCE”

Yet “intelligentsia,” precisely because it is an international category closely identified with educated elites that simultaneously carries a strong Russian contextual specificity, offers the potential to recast a typically thorny way of carving up the history of the sciences. Of all the ways to divide up the history of modern science, nation-states offer perhaps the most common, yet the least defended, variant. One is accustomed to perusing histories of American biology, Brazilian physics, French chemistry, and so on—but often without any explicit attempt to argue why this is a fruitful way to analyze each of those different fields.<sup>41</sup> After all, modern science bears the distinctive character of international communication (whether in the traditional forms of publication or travel or the relatively more recent innovation of postdoctoral exchanges and conferences). Even the linguistic bounds usually used to parcel off various sciences in academic studies seem beside the point: Russians often published in French, Britons in German, and almost everyone now publishes in English. Why, then, does one continually find the history of science carved into segments whose traditional boundary lines have been set by the vagaries of nineteenth- and twentieth-century politics?

This volume offers both a reasoned instantiation of such nation-state studies—paired with an implicit defense of their utility—and a critique of their unavoidable limitations. The series of essays presented here derive from recent research on the history of science in the Russian empire and its successor, the Soviet Union, from 1860 to 1960. The essays suggest ways in which it is still valuable to examine modern science using this particular unit of analysis, even (or especially) when the science in question crosses international and cultural borders.

The crux of the transition that took place in this period was the transformation of what one might call “science in Russia” (that is, science that happened in the geopolitical space defined by Russia, which had been taking place at the very least since the early eighteenth century) into “Russian science”—the assimilation and adaptation of scientific traditions and institutions into Russian culture so that they became an integral part of Russian culture. The peculiar features of both science in Russia and Russian science have provoked persistent study at a moderate level since at least the end of the Second World War. The boom of interest at that time was, of course, no accident and proved intimately linked to three specific developments of the late 1940s. One was the onset of the cold war between the United States and the Soviet Union, which led to the academic institutionalization of Russian/Soviet studies within universities in the West. Another was the proliferation of nuclear weapons (the first Soviet atomic test took place at the end of August 1949) and the consequent recognition of the growing importance of science and technology as modes of competition in the cold war, highlighted most dramatically by the October 4, 1957, launch of *Sputnik*. Third was the abolition of genetics in the Soviet Union in 1948 under the auspices of both Joseph Stalin and Trofim D. Lysenko, which added an ideological aspect to the superpower conflict specifically in the area of science.

As a consequence of these three undeniably important developments, early studies

<sup>41</sup> Even raising the issue may strike the contemporary reader as a bit old-fashioned. Defenses of national categories in the science do, in fact, tend to be rather dated. For one of the more persuasive efforts, see Maurice Crosland, “History of Science in a National Context,” *British Journal for the History of Science* 10 (1977): 95–113.

of science in Russia acquired certain features that still dominate the views of its past among historians and political scientists who do not specialize in the area. The first, almost so obvious as to be unstated, is that the history of science in Russia was completely absorbed within a history of the Soviet Union. It was the Soviet Union that interested historians and political scientists, and the history of Soviet science was a subset of that interest. The necessary consequence of this was that the trends, methodologies, and vicissitudes of Sovietology proved dominant in this field—insulating it until very recently from some of the leading methodologies in history of science as a profession.<sup>42</sup> This attention to the Soviet experience to the exclusion of almost all else meant that—with a few exceptions—most of the research done exhibited a staggering indifference to the “background” of prerevolutionary Russia or interpreted it mainly as “prehistory” to the relevant Soviet developments.<sup>43</sup> If, until the last decade or so, the history of imperial Russia was centered (as it was) around finding precursors for the success of Vladimir Lenin’s Bolshevik Party in 1917, the history of science in the Soviet Union implicitly accepted some of the regime’s propaganda at face value and understood that most of the developments of Soviet science emerged without significant continuities to the almost desolate prerevolutionary intellectual landscape.<sup>44</sup>

A second feature of the cold war historiography of science in the Soviet Union was an overemphasis on *ideological interference* or distortion of the “normal” course of science—“normal” being defined as the development of modern science in Western Europe and North America. According to the internal logic of this argument, Lysenko represented a feature of the Soviet system repressing the ordinary course of normal science, so our attention should be focused on understanding such features of the Soviet system and the repressive aspects of ideology. Borrowing an age-old template

<sup>42</sup> Alexei Kojevnikov, “A New History of Russian Science,” *Science in Context* 15 (2002): 177–82; Engerman, *Modernization from the Other Shore* (cit. n. 6); and Jonathan Coopersmith, “The Dog That Did Not Bark in the Night: The ‘Normalcy’ of Russian, Soviet, and Post-Soviet Science and Technology Studies,” *Technology and Culture* 47 (2006): 623–37.

<sup>43</sup> The pattern was already set before the cold war, when one of the earliest students (and celebrants) of Soviet science, J. D. Bernal, claimed in 1939, “the great Russian scientists, such as Lomonosov, Mendeleev, Kovalevsky or Pavlov, managed to do their work rather in spite of than because of the official organization [the state-sponsored Academy of Sciences].” The Soviet Union thus had to “build up a new and greater science” after the revolution. Bernal’s examples are taken over wholesale from the Soviet physicist A. F. Joffe, who maintained that “Russian physics was, until the Revolution, one of the most backward and weakest branches of world science.” J. D. Bernal, *The Social Function of Science* (London, 1939), 222–3, 236; cf. A. F. Joffe, “O nedostatkh i nekotorykh problemakh razvitiia sovetskoi fiziki,” *Front nauki i tekhniki*, 1934, no. 4:32–6. Another physicist, P. P. Lazarev, made similar assertions in “O mezhdunarodnykh nauchnykh snosheniakh,” *Nauchnyi rabotnik*, 1926, no. 3:3–10, 4.

<sup>44</sup> Important exceptions in English include Daniel Todes, *Darwin without Malthus: The Struggle for Existence in Russian Evolutionary Thought* (New York, 1989); Daniel Todes, *Pavlov’s Physiology Factory: Experiment, Interpretation, Laboratory Enterprise* (Baltimore, 2002); Alexander Vucinich, *Science in Russian Culture*, 2 vols. (Stanford, Calif., 1963–70); and Michael D. Gordin, *A Well-Ordered Thing: Dmitrii Mendeleev and the Shadow of the Periodic Table* (New York, 2004). To be sure, Loren R. Graham, who is almost single-handedly responsible for the maintenance of a community of Western historians concerned with Russian science, offers considerable attention to the eighteenth- and nineteenth-century peaks of science in Russia in his survey history *Science in Russia and the Soviet Union: A Short History* (New York, 1993), but even his level of analysis acquires greater depth when it comes to the Soviet period. For a more typical example of Soviet-centric studies, see Alexander Vucinich’s history of the Soviet Academy of Sciences, *Empire of Knowledge: The Academy of Sciences of the USSR (1917–1970)* (Berkeley, Calif., 1984), which in a few pages dispenses with the 200 years of institutional momentum that preceded the sovietization of the academy in the early 1930s.

from scientists' understanding of their own history, the conventional understanding of the Galileo Affair (righteousness under the heel of dogmatic orthodoxy) was literally resurrected as the Lysenko Affair.<sup>45</sup> The history of genetics and biology served as a model for other fields (e.g., psychology, chemistry), and where it failed to destroy a field—as in theoretical physics—it was necessary to explain the case in terms of a *deviation* from the supposed Soviet norm.<sup>46</sup>

These specific features are far from adequate for a comprehensive understanding of the nuanced development of science in Russia and the Soviet Union, and have been either substantially modified or abandoned by specialists on this region. It is the manifest goal of this volume not only to fracture some of the old preconceptions about this field among the uninitiated but also to offer new frameworks for how studying this specific region of the world can illuminate a broad swath of central historical and historiographical questions.

It stands to reason that historians of science in Russia have been arguing for alternative justifications for the study of this area and conclusions that differ from the Sovietological model outlined above. All of the essays in this volume draw from this tradition of alternative explications but seek to recast them in the light of new empirical evidence from Russian archives and intellectual developments within historical studies generally. The eventual result of an active engagement with these emerging frameworks may be a reinvigoration of how we should understand the advantages and drawbacks of reliance on concepts such as the nation-state, ideology, and militarization in our understanding of the place of science in modernity. We believe one concept that can help effect this reorientation is the “intelligentsia.”

#### INTELLIGENTSIA SCIENCE IN THE RUSSIAN CENTURY

Several themes run through the various essays in this volume, which we can parse in one way in terms of time and space. First, the issue of chronology. The start and end years of this volume are somewhat unusual in the historiography of Russian science (and in Russian history more generally). Typically, Russian history is presented as beginning or ending with the Bolshevik Revolution of October 1917, or the end of World War II in 1945, or the death of Stalin in 1953. We have eschewed all of these periodizations. Instead, the essays in this volume begin just before the emancipation of the serfs in 1861, the conventional beginning date for the last great effort of modernization of the Russian empire, although those efforts famously failed to preserve tsarism. Beginning here, and ending a century later, we focus—with one exception—

<sup>45</sup>The classic instances of this presentation of Lysenkoism are: David Joravsky, *The Lysenko Affair* (Cambridge, Mass., 1970); Valery N. Soyfer, *Lysenko and the Tragedy of Soviet Science*, trans. Leo Gruliow and Rebecca Gruliow (New Brunswick, N.J., 1994); and Zhores A. Medvedev, *The Rise and Fall of T. D. Lysenko*, trans. I. Michael Lerner (New York, 1969). For more recent and sophisticated efforts that still place the bulk of their attention on the ideology of either the macropolitical or microbureaucratic varieties, see Nikolai Kremontsov, *Stalinist Science* (Princeton, N.J., 1997); and Ethan Pollock, *Stalin and the Soviet Science Wars* (Princeton, N.J., 2006). For further discussion of this specific Lysenko emphasis, see Michael D. Gordin, “Was There Ever a ‘Stalinist Science’?” *Kritika* (forthcoming).

<sup>46</sup>Loren R. Graham, *Science, Philosophy, and Human Behavior in the Soviet Union* (New York, 1987); David Joravsky, *Russian Psychology: A Critical History* (Oxford, 1989); M. G. Iaroshevskii, *Repressirovannaia nauka*, 2 vols. (Leningrad, 1991–94); David Holloway, “How the Bomb Saved Soviet Physics,” *Bulletin of the Atomic Scientists* 50 (Nov. 1994): 46–55; and Nikolai Kremontsov, *The Cure: A Story of Cancer and Politics from the Annals of the Cold War* (Chicago, 2002).

on hallmark episodes of the development of science in Russia: from the moment of its dramatic takeoff to just before the cold war “stagnation” (*zastoi*) of the Brezhnev years when several factors altered the configuration of Soviet science. This periodization also places the Bolshevik Revolution firmly in the center of our span, so we can openly explore the extent to which it was, in fact, a discontinuity in the history of science in Russia, rather than taking such a break for granted.

Place is a closely related reformulation. One of the supposedly distinctive features of the Stalinist Soviet Union was its autarky—its disconnect from the developments in Western Europe and North America. (The Lysenko Affair as modern Galileo Affair fits neatly into this narrative.) The essays in this volume, by contrast, constantly move between the physical space of Russia and the Soviet Union to the West—Paris, Zurich, Heidelberg, London, Houston—to show how the borders between Russian developments and those worldwide were more porous than has typically been realized. The history of science in Russia is thus an essential component of the history of science around the world and not just a cutoff boutique interest. To fully understand the impact of the autarkic periods (which certainly existed), one needs to explore how significant the interactions were at other times.

Our volume is divided into three sections, each of which explores a different traditional function of the various “intelligentsias” in Russian history through the lens of science and reformulates the traditional concepts in the process. The first section, “Intelligentsia as Social Organization,” examines the institutions of the intelligentsia as forms of social cohesion and differentiation and how patterns that were characteristic of the more “mainstream” intelligentsia were both appropriated and adapted for the particular needs of science and technology.

Our story opens around 1860, when the intelligentsia found its obsession with science. Both science and the intelligentsia would change as a result of that relationship. A few years after 1855, when Tsar Alexander II assumed the throne, the greatly expanded universities filled with a cohort of students coming from the much wider, predominantly lower, ranks of gentry, clergy, and state officials, often poor and needing to work for material survival. The intelligentsia began to fragment into various strata, characterized by different tones: the younger set were typically more uncompromising and demanding, while the older generations—who continued to see themselves as intelligent—characteristically combined free thinking with a confidence and leniency of aristocratic privilege. The new, more democratic radicalism demanded changes that even a reformist government was not able to satisfy, which quickly turned universities into an arena of chronic political protest.<sup>47</sup> The intelligentsia’s generation of the 1860s added natural science as another major component to more traditional preoccupations with literature and social criticism. The transition was well marked by the arrival of the Russian translation of Darwin’s *Origin of Species* (published 1859 in English; translated into Russian in 1864), which sparked multiple reactions—anticlerical, antihierarchical, anticapitalist, anticompetition, anti-Malthusian—and defies simple characterization.<sup>48</sup>

<sup>47</sup> On universities in this period, see Samuel D. Kassow, *Students, Professors, and the State in Tsarist Russia* (Berkeley, Calif., 1989); Susan K. Morrissey, *Heralds of Revolution: Russian Students and the Mythologies of Radicalism* (New York, 1998); and Allen Sinel, *The Classroom and the Chancellery: State Educational Reform in Russia under Count Dmitry Tolstoi* (Cambridge, Mass., 1973).

<sup>48</sup> On these various debates, see Todes, *Darwin without Malthus* (cit. n. 44); and Alexander Vucinich, *Darwin in Russian Thought* (Berkeley, Calif., 1988).

In time, there were tensions and competition between various activities that had previously been more or less unproblematically supported by the intelligentsia's commonly shared values. Many radical students struggled over the personal choice between literary and scholarly pursuits, involvement in social activism, and mainstream careers within the establishment. This volume's articles concentrate on those for whom science became a major preoccupation in life—the subspecies of scientific intelligentsia. Using as an example the case of chemistry, the leading science of the period, Michael Gordin's contribution analyzes the first major consequence of the shift: the training and professionalization of the Russian research community. For perhaps the first time, the intelligentsia's aspirations overlapped with the interests of the Russian state. Embarking upon a renewed effort of modernization “from above” (and later also as a conscious attempt to distract students from radical politics), the government supported research aspirations of able students with a program of state fellowships for study abroad. Gordin shows how this initiative eventually (and in this case unintentionally) enabled the organization of the professional Russian Chemical Society, which came about via a combination of various models of contemporary scientific research—largely taken in this case from the southern German states, in particular from the University of Heidelberg—and the native cultural model of *kruzhok*, or closely knit discussion circle, that had previously provided the basic structural social unit for the Russian intelligentsia.

The cult of science stood high enough for many other professional groups to long for the status of a scientific discipline. Andy Byford describes a revealing, if ultimately unsuccessful, attempt to establish a new science of pedology, or child studies, in the border area between academic psychology and high school teacher training. For experts in pedagogy, the creation of their own branch of science would have considerably raised the social prestige of the profession—and simultaneously enabled specialists in education to rightfully call themselves intelligentsia. The first decade of the twentieth century opened an opportunity to achieve the goal of “scientific pedagogy” through nongovernmental academic and educational institutions, including professional training courses for teachers. Bypassing the state and establishing private and community-based institutions allowed a novel (for Russia) approach to the realization of these goals, as well as for many other controversial intelligentsia initiatives. Although the pedology movement lost much of its civil base after the 1917 revolution, its activists established themselves within the new organs of the Bolshevik state and carried the project further with intensified vigor, though only for the time being. In the 1930s, the changed political realities reversed the trend and delivered final victory to their opponents and to “practical” pedagogy.

One finds interesting parallels to this case from the end of our period, at the height of the Soviet Union's technological development. The Soviet nuclear power industry was born of twin origins: nuclear expertise, drawn from military research that had produced the first Soviet atomic bomb in 1949; and the experience of electrical engineers, who had occupied central positions in the technocratic intelligentsia since Lenin's massive electrification effort of the 1920s (GOELRO). Sonja Schmid explores the tension between these two groups of experts as the “designers” (*atomshchiki*) cast themselves as heirs of an older elite intelligentsia tradition, while the “operators” (*energetiki*) of the nuclear power plants continued as Stalinist technocrats. Taking this story of professional differentiation through to the 1986 Chernobyl reactor catastrophe, Schmid demonstrates how this long-standing competition of intelligentsia

identities ran continuously through major transformations in the post-Stalin Soviet Union.

Indeed, throughout this volume, one can trace the constant tension between the Stalinist identification of “intelligentsia” with white-collar workers (such as scientists), and a protodissident identification of science as a radical democratic force analogous to the nineteenth-century traditions. Our second section, “Intelligentsia as Political Agent,” explores the implications of this tension when the intelligently sought to actively take part in statecraft and science policy.

Such political action, especially in the Soviet period, relied on an inflated notion of the power of science, shared by the Communist Party and the scientific intelligentsia, or “bourgeois experts” in Bolshevik parlance of the 1920s. The prominent role of nonparty experts in the creation of the new society and its institutions made the Soviet state in this period of transition from the October Revolution to Stalinism the closest real-life approximation of Plato’s imaginary *Republic*. It also enabled a far-reaching transformation of science itself in an attempt to reach the impossible ideal. As Alexei Kojevnikov argues in his essay, the intelligentsia in power pioneered a series of important innovations that would change the social role of science in the course of the twentieth century. Those included a large-scale government involvement in supporting and directing research and development; recognition of science as a separate branch of civil service and its transformation into a mass profession; a broadening of the demographic base of science by a system of measures similar to those currently known as “affirmative action” in the American context; and last but not least, constructivist theoretical ideas about science in its relation to society.

Building a scientific state required cadres to work it, and building significant resources took a long time. Olga Valkova’s contribution discusses the emergence of an important group of intelligentsia scientists—women scientists—from its origins in the 1860s until the onset of the Second World War. This *longue durée* approach emphasizes the continuities for which the intelligentsia category is so useful. For intelligentsia women in the nineteenth century, becoming professional scientists was extremely difficult, as in their case the government had long maintained legal barriers to university matriculation, the sine qua non for a scientific career. The feminist movement arose in the 1860s from young women’s (and men’s) struggle for access to higher education, which they attempted to achieve, at first, in Russia—and when that failed, abroad, by enrolling in western European universities.<sup>49</sup> But formal higher education was not the only possible route toward scientific activities—Valkova uncovers a variety of different cases and strategies employed by women in their quest to engage in scientific research. Even the removal of formal barriers by the Bolshevik government immediately after the revolution of 1917 and the establishment of legal equality in scientific education did not fully resolve the problem, as women continued to fight against more subtle forms of discrimination throughout their research careers. In this final period, women scientists occupied an interesting blend of contrary intelligentsia traditions: reformist technocratic politics from within, and oppositional resistance from a position of exclusion.

<sup>49</sup>In autocratic Russia, the demand for gender equality in educational opportunities remained much more important for feminism than the issue of voting rights, as men could not vote either. On the course of Russian feminism, see the classic but still useful Richard Stites, *The Women’s Liberation Movement in Russia: Feminism, Nihilism, and Bolshevism, 1860–1930* (Princeton, N.J., 1978).

The most famous (and infamous) incident where this intelligentsia tension came to the fore was the well-known Lysenko case of 1948, or the decision to abandon Mendelian genetics in favor of a supposedly homegrown, neo-Lamarckian version of agricultural science, “Michurinist biology.” Instead of primarily ideological or institutional explanations, Nils Roll-Hansen sees the root possibility of this move in a real and basic dilemma of science policy, which can be expressed by the famous Marxist dictum as “the unity of theory and practice.” This postulate allowed the state to play the role of ultimate arbiter between the two competing approaches in science and also allowed rival communities of scientists to use and abuse the apparatus of the state for settling their own academic and institutional conflicts. Although the Lysenko case represents a somewhat extreme example, the underlying science policy dilemma is not unique to the Soviet Union and remains valid and meaningful today.

In the final essay in this section, Slava Gerovitch explores the specific identity of Soviet technical intelligentsia in his analysis of the rocketry and space programs in the 1950s and the 1960s. The chief designers of the Soviet space probes, Sergei Korolev and Valentin Glushko, survived arrests in the 1930s, worked their way into classified military research, and ultimately learned how to manipulate the system to win reluctant permission for the launch of *Sputnik* in 1957. All the while they remained loyal to the regime, yet also critical to a degree, lobbying for their own understanding of a space policy that might deviate considerably from the official one. The dual nature of this project—both classified military and openly propagandistic—relied on dual-use rocket technologies and developed dual identities and dual agendas within the space program, signifying the parting of ways between the Soviet state and its scientific elite.<sup>50</sup>

One of the consistent themes in this collection is that although the intelligentsia (or intelligentsias) consisted of real social structures and engaged in real politics, it also represented an ideal, an imaginary on which Russian scientists could project their aspirations. This is the central concern of our third section, “Intelligentsia as Utopia,” borrowing the term from one of the classic historical surveys of the Soviet period, *Utopia in Power*.<sup>51</sup> Of course, this interest in the utopian was not confined to the Soviet period. In the first essay of this section, Kirill Rossiianov presents a novel analysis of Elie Metchnikov’s landmark discovery of immune cells and the founding of immunology. As earlier research in the history of Russian science has established, many Russian authors tended to accept Darwinism without its Malthusian component, stressing as the chief mechanism of evolution the struggle of organisms with the forces of environment rather than against the members of the same species. It is also well known that Western scientific racism generally found little appeal and circulation in the nineteenth-century Russian empire, whose authors could view themselves (as Russians) simultaneously or interchangeably as both colonizers and colonized, privileged and oppressed, compared with other nations. Yet Metchnikov, one of the most distinguished Russian scientists of his era, did engage in a borrowed discourse about “primitive races.” He managed, however, to combine it—in a counterintuitive and paradoxical way—with the Russian Populist (*narodnik*) moral and political ideal

<sup>50</sup> This terminology borrows from one of the classic studies of the formation of the Russian intelligentsia as an “unofficial opposition”: Nicholas V. Riasanovsky, *A Parting of Ways: Government and the Educated Public in Russia, 1801–1855* (Oxford, 1976).

<sup>51</sup> Mikhail Heller and Aleksandr Nekrich, *Utopia in Power: The History of the Soviet Union from 1917 to the Present*, trans. Phyllis B. Carlos (New York, 1986).

of human equality, and to find a resolution to the inherent contradiction between the two, and a realization of his hopes for a harmonious society in his model of immunity in higher organisms.

In 1917, theoretical physics was still a fairly young subdiscipline even in central Europe, and few Russian physicists had embraced this ill-defined professional identity. Yet within the space of a few decades sizable cohorts of Soviet theorists had won worldwide acclaim, primarily for developing distinctive professional practices in quantum field theory and condensed matter theory. Along with mathematicians, however, these theorists were also seen by many as the natural scientists who had best managed to escape Lysenkoist politicization. Karl Hall describes the search for collective identity among theorists in this dystopian setting, focusing on the “school” as an important means for advancing the discipline in the Soviet period. The best-known school among theorists was that led by Lev Landau. Yet his peculiar brilliance has obscured the broader professional context for pursuing this mode of scientific community in the early decades of Soviet power. Hall locates some of these aspirations in the generational disruptions under the Bolsheviks but also finds many unacknowledged echoes of prerevolutionary intelligentsia concerns among Russian physicists. The article further demonstrates the international context for understanding these generational and disciplinary tensions within the young Soviet physics “community.” Whereas the older generation could use its westward travels to establish its Soviet credentials under the new regime, the younger generation—often initially sympathetic to Bolshevik scorn for the classical intelligentsia—could, in turn, employ their Western exploits to fashion distinctive Soviet identities at the expense of their elders.

With the young supplanting the old, the primitive taming the civilized, and the quantum providing stability, it seems safe to claim that there was indeed something utopian going on in the Soviet Union. A revolution had unexpectedly overthrown a large and powerful empire. A small and marginal segment of the intelligentsia—the Bolsheviks, a socialist conspiracy in a predominantly peasant country—achieved supreme political power and embarked upon building a society of universal equality and prosperity. Asif Siddiqi looks at the postrevolutionary fate of a non-Bolshevik but equally utopian project, Russian Cosmism. Despite its deep roots in mysticism and religion, Cosmism had one aspect in common with the Bolshevik program: belief in the unlimited potential and transformative power of technology. Because of this, some of its representatives, in particular Konstantin Tsiolkovskii, received encouragement from the state, if not exactly munificent support. Though meant primarily as a public-relations campaign to inspire impressionable youth into the study of engineering, Cosmism’s utopian project—or rather its technological component cut off from the mystical goal—also turned real forty years later, with the Soviet breakthrough into the cosmos.

What became of all these traditions—technocratic, oppositional, reformist, revolutionary, utopian—in the decades after *Sputnik*? While open dissidents were rare, the growing alienation from the regime eventually created a whole new generation of the oppositional-minded Soviet intelligentsia by the 1980s. Their renewed revolt during Gorbachev’s perestroika against the system that was ultimately responsible for their privileged status in society would result in the third Russian revolution of the twentieth century, this time anticommunist as a successor to the liberal (1905) and Bolshevik (1917) revolutions. This time, some argued, the revolution also de-

stroyed the very conditions that allowed intelligentsia to exert such influence in the first place, considerably undermining the group's prestige and making it disoriented and marginalized. Whether this is a terminal case or only a temporary development remains to be seen. The essays in this volume should add some perspective on the place of science in the developments that led to the rise of Russia's prominence in the intellectual sphere in the 1860s, and its possible—but debatable—decline since the 1960s. The Russian century may in fact be over, but the interrelation of the intelligentsia and science to form “intelligentsia science” proves enduring.