

DOSTOEVSKY IN CONTEXT

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Science, technology, and medicine

Michael D. Gordin

We live in a world where science, technology, and medicine are omnipresent – screaming from the headlines, embodied in mobile phones, and consolidated into therapies for a wide variety of ailments. At the same time, many modern intellectuals seem to have little curiosity about the knowledge behind the scientific enterprise; their computers are indispensable, but they would not be able to explain how they work, nor would they see this as a significant omission. Dostoevsky's world resembled ours in the former respect, but not the latter. The middle of the nineteenth century in Europe seemed to the thin stratum of educated inhabitants to be at the very peak of science and technology, a cornucopia of inventions on the cusp of accelerating communication to lightning speed, curing all ailments, and revealing the very fabric of the Creator's construction in all its glory – much as our world seems to many today – but they did not accept these miracles with a shrug. Science, technology, and medicine were not matters for cloistered specialists to ponder but were the province of all writers and thinkers confronted with their modernizing continent. They were intensely curious about how it was all happening and what it all meant. Dostoevsky was no exception.

Over the course of the nineteenth century, a barrier began to emerge between “literary” intellectuals and “scientists” – a term coined in English only in 1833 to signify someone working in the natural sciences alone, a distinction not captured in the Russian *uchenyi*, applicable to both sides of the cultural divide – but that barrier did not go up at the same time everywhere across the continent. Britain and France experienced it first, then the German states (busy unifying themselves in the period between 1848 and 1871); it only appeared in the Habsburg lands and the Romanov Empire toward the end of the century. This means that Dostoevsky lived in a St. Petersburg where what it meant to be educated was to have some views about the sweep of scientific development. Both his life and his works reflect this context at every level.

“Science” (in Russian, *nauka*, sometimes used with the broader meaning conveying any form of systematic knowledge) often refers to three related but analytically distinct domains: medicine; technology; and science proper, understood as more abstract domains such as biology, physics, geology, and chemistry. (The social sciences – economics, sociology, anthropology, and so on – are excluded for the purposes of this essay.) What follows will outline some of the very dynamic context of these fields in Dostoevsky's Russia, especially in the intellectual milieu of Petersburg, his home for almost his entire adult life. Each section is devoted to one of these domains, and each begins with a passage from Dostoevsky's *Notes from Underground* (1864) that demonstrates how embedded Dostoevsky's life, society, and literature were in the bustling expansion of knowledge that characterized the nineteenth century.

Medicine

The narrator's opening words of *Notes from Underground* still hit the reader with a punch: “I am a sick man . . . I am a bad man. I am an unattractive man. I think my liver is ailing. On the other hand, I don't give a damn about my illness and I don't truly know what ails me. I am not in treatment and never have been, although I respect medicine and doctors” (5:99; Pt. 1, Ch. 1). These words aptly introduce the history of medicine in Dostoevsky's Russia. Medicine was very much on people's minds, a means by which people came to define and understand their own selves – or, in the case of Dostoevsky's contemporary Leo Tolstoy, a sinister and suspicious force to be attacked in works like *The Death of Ivan Ilych* (1886). Dostoevsky, like all of us, interacted with medicine in two ways: through his own body, and through the public conversation about the status of medicine.

Dostoevsky was a sick man. He suffered from epilepsy; in fact, after Julius Caesar, he is one of the most famous epileptics in history. The evidence of his attacks, his interactions with Petersburg physicians, and the role of the disease in his work – as a theme in his narratives and as a possible fount for his creativity – has been extensively discussed (including a notorious treatment by Sigmund Freud).¹ The fits that would descend upon Dostoevsky structured his life, demanding supervision by his family and constant communication with physicians, and this dialectic between the self and body of an individual manifests itself in many of his works, including, most notably, Prince Myshkin's epileptic seizure in *The Idiot* (1868).

But this was not the only way medicine manifested itself to Dostoevsky. In mid-nineteenth-century Petersburg, medicine was a topic that occupied the halls of power and spilled over onto the pages of newspapers, journals, and books with striking regularity. The touchstone for many of these developments, as with so much else in imperial Russia, was the military. With the westernizing reforms of Peter the Great (1682–1725) in the early eighteenth century, the medical profession had become a way for commoners to improve their social position, and medical education was revamped once again in the second quarter of the nineteenth century by the imperial decree of Nicholas I (1825–55). Reacting to the high casualty rates of both the Napoleonic Wars of his brother and predecessor, Alexander I (1801–25), his own forays against Turkey in 1827–8, and the devastating cholera epidemic of 1828–32 (the first of many in the century), in 1838 Nicholas ordered a standardization of medical education, sponsored by both the Ministry of Education and the Ministry of War. (Throughout the century, the Ministry of War led the reforms in medical education.) With intensified recruitment and more rigorous training, the number of physicians ballooned, from 2,000 in 1803 to 6,879 in 1840, to 8,605 in 1854 (a greater than four-fold increase, far ahead of population growth).² The year 1854 serves as a convenient watershed. The Crimean War (1853–6) erupted in October of the year before, and the following year Nicholas I died, preparing the way for his son, the reformist Alexander II (1855–81).

The war raised both the visibility and importance of medicine for all European observers, while demonstrating its continued shortcomings to Russian ones. Renowned for his pioneering advances in field surgery, Nikolai Pirogov (1810–81) emerged as the medical hero of the war on the Russian side – complementing Florence Nightingale on the British. Pirogov spearheaded another overhaul in medical education, as the Great Reforms of Alexander II opened up more opportunities for professionalization in different realms. Enrollments in medical school had collapsed after the emancipation of the serfs in 1861, marking the declining value of a medical diploma, and Pirogov pushed through a reform in 1876 that effectively reversed the trend.³ Alexander's introduction of rural councils, *zemstva**, in 1864 – which were responsible for coordinating the local health system, among a host of other tasks – also provided job opportunities for budding physicians across the country, including the young Anton Chekhov (1860–1904), who worked as a medical doctor both before and during his career as Russia's most famous short-story writer and playwright. The conquest of Central Asia by the Russian empire – Tashkent fell in 1865 – provided a further surprising boost to medical education:

the Ministry of War introduced medical education for women, at least partially because Russia's new female Muslim subjects refused to be treated by male physicians.

Dostoevsky's Russia was constantly tinkering with its medical system, a process that left numerous traces across all of his writings, noticeable at first glance through his repeated invocation of nineteenth-century ailments, such as brain fever, apoplexy, and consumption. Although we can identify the latter two with contemporary diseases (stroke and tuberculosis, respectively), one has to be careful in making exact identifications, since the moral valences of having these diseases were different in different eras, and their etiologies – such as bacterial infection in the case of tuberculosis – were unknown to Dostoevsky. When Ivan Karamazov is struck with brain fever at the end of *The Brothers Karamazov* (1879–80), for example, the disease both functions as a realistic description of nineteenth-century understandings of the course of encephalitis, and also marks for Dostoevsky a pathology located in the tormented Ivan's *brain*. Medicine in his works functions as more than metaphor, offering valuable indications as to how Dostoevsky's contemporaries understood disease.

Technology

Of all three domains discussed in this essay, technology leaves the lightest impression on *Notes from Underground*. In describing his habit of stalking an opponent and brushing beside him in the street, the narrator digresses slightly about the nature of roads “so that a well-brought-up child, by disregarding the art of engineering, not contract harmful idleness, which, as is well known, is the mother of all vices. Man loves to create and to build roads, that's indisputable” (5:118; Pt. 1, Ch. 9). While this is a passing reference, it is not incidental. In *Winter Notes on Summer Impressions*, published just the year before (1863), Dostoevsky expressed great admiration for the “excellent” and “wondrous” bridge in Cologne (5:48; Ch. 1) in the midst of peevish complaints about his interactions with Germans. This was a writer who paid attention to bridges and knew something about them. If Dostoevsky felt the grip of medicine both in his own person and his milieu, his connection to technology and engineering was equally robust.

Dostoevsky trained as an engineer, a fact only lightly remarked upon in most commentaries. In 1838, he enrolled at the Academy of Engineers, then the finest engineering establishment in Russia, and in 1842 took his first paid employment as a military draftsman. (That career path did not

last long; he found it painfully boring.) Dostoevsky's father had chosen the profession for his sons Fyodor and Mikhail because it had become a well-trodden path for advancement ever since native-born Russians began to displace imported engineers in the mid-eighteenth century. Nicholas I was also educated as an engineer, and the military of Dostoevsky's day was centrally involved in the monumental efforts of state building. The professionalization of engineering, no less than medicine, was tied to Russia's disastrous engagement in the Crimean War. The slow pace of railroad construction, failures of fortification, and inadequate supply lines during the war all convinced leading bureaucrats that reform was required, and the ensuing epoch of Great Reforms brought substantial changes to the profession. Before the restructuring, an engineer would typically work his entire career within the ministry where he obtained his first job (usually War, Navy, or Communications); engineering did not constitute a free profession until the 1860s, by which time Dostoevsky had long moved on to literary pursuits.⁴

Yet there was no escaping the technological modernization that gripped Russia in mid-century, and many of these developments crop up in Dostoevsky's writing as a matter of course. The railroads are perhaps the most salient example. *The Idiot* begins on a train journey from Warsaw toward Petersburg; the history of Russian railroads during Dostoevsky's life took the reverse path, beginning in Petersburg and heading outward. In March 1833, Nicholas I introduced a law for rebuilding the major roads in Russia – echoed in the earlier cited passage from *Notes from Underground* – but only in January 1835 did extensive discussion of railroad construction grip the empire's higher echelons. The first significant line, between Petersburg and Tsarskoe Selo (a summer residence for the tsars located 24 km south of the city), was constructed between May 1836 and October 1837, dominating the news of the day. In 1842 a Department of Railways was established and construction of the grand, ruler-straight railway line between Petersburg and Moscow began (it was completed in 1851). The department was subsequently absorbed by the Ministry of Communications in 1865. In 1855, when Alexander II ascended to the throne, there were just 917 km of track in the empire; in 1880, the year before Alexander's and Dostoevsky's deaths, there were almost 23,000 km.⁵

The railroads began to knit Europe together, rapidly bringing news from distant regions to the imperial nerve-center in Petersburg, a process only accelerated by the introduction of telegraphy. In many instances, the wires followed the train tracks, and vice versa. The telegraph was rapidly adopted by the growing numbers of newspapers, and the journalist

Dostoevsky avidly devoured the reports that poured into the capital. Like so much else, the telegraph boom was spurred by the Crimean War, which stimulated a flurry of cable-laying to link Moscow, Petersburg, Warsaw, Kiev, Odessa, and Sevastopol (the latter two representing central theaters in the conflict) by 1855. As Russia joined Europe-wide telegraph unions, newspapers blossomed, especially in the capital, which brought stock prices and international news along the wires.⁶ Dostoevsky's Russia was an empire beginning to be integrated through steam and electricity.

Science

The great intellectual debates of Dostoevsky's Russia were often about politics and peasants, but they just as frequently engaged the natural sciences. The changing view of nature and mankind's place in it left traces upon almost everything Dostoevsky wrote, not least *Notes from Underground*. In one of the novella's most striking passages, the Underground Man explains that he will not consent to being persuaded that he cannot break through a stone wall or that twice two is four even though these are hard and fast rules dictated by science. Recognizing the irrationality of this position, he revels in it, all the while sneering at the commonsense understanding of middlebrow Petersburg: "Well, it stands to reason, the laws of nature, the results of the natural sciences, mathematics. They've proven to you, for example, that you descended from a monkey, then there's no need to make a face about it, just accept it as it is" (5:105; Pt. 1, Ch. 3). Without leaving his apartment, the Underground Man kept up on the latest intellectual fashions, and a major fashion of the 1860s and 1870s was conversing about science.

Dostoevsky participated enthusiastically in this conversation, even though he often remained skeptical of the rationalizing and modernizing intellectual trends of the day. Some of the most evocative passages of his novels – such as the discourse between Ivan Karamazov and the devil about the nature of non-Euclidean geometry – concern current topics in the natural sciences.⁷ As the passage cited earlier suggests, one of the most active debates at the time focused on Charles Darwin's argument in *The Origin of Species* (1859) about evolution by natural selection. *The Origin of Species* was translated into Russian in 1864 by Sergei Rachinsky, professor at Moscow University, with a second edition in 1865; noted physiologist Ivan Sechenov translated *The Descent of Man* in 1871, the same year as the English edition; *Variation of Animals and Plants*, *The Expression of Emotions*, and *The Voyage of the Beagle* all appeared in

the 1870s. Dostoevsky, an avid journal reader, was unquestionably exposed to discussions of these texts.

Darwin attracted a great deal of attention from the Russian *intelligentsia**, and with the attention came heated criticism. Conservative intellectuals, such as Nikolai Danilevsky (who, like Dostoevsky, belonged to the Petrashevsky circle* in his youth) and Nikolai Strakhov (a long-time friend who later quarreled with Dostoevsky), attacked the theory for being irreligious, materialist, and corrosive of morals. On the other hand, Russian naturalists objected to Darwin's reliance on Thomas Robert Malthus's theory that exponential population growth necessarily generated a climate of scarcity and competition. Based on their field studies in the sparsely populated steppes, they inclined toward a more cooperative model of evolution than the hostile competition trumpeted by Darwin's English apostles.⁸ Much as it had in Britain, the United States, Western Europe, and just about everywhere else, Darwinian ideas sparked intense reflection about humans' relationship to "lower" animals, and what that might have to say about the existence and characteristics of the soul.

The concern about the implications of the natural sciences for the existence of the soul extended beyond the debates over Darwin. For example, in the 1870s Petersburg was taken by a craze for Spiritualism – table-rapping, levitation, automatic writing, and the like – and Dostoevsky attended a few séances himself (he remained skeptical). He was very much amused both by the endorsement of this practice by certain scientists as well as the efforts by naturalists such as Dmitry Mendeleev (1834–1907) – famous for his 1869 formulation of the periodic system of chemical elements – to debunk them, a controversy discussed repeatedly in installments of his 1876 *Diary of a Writer*. (Tolstoy did the same in his contemporary novel *Anna Karenina* [1875–8].)

For Russian writers in the mid-nineteenth century, the barriers between cultural conversation and scientific conversation were not yet fully in place, and Dostoevsky trafficked across that emerging divide no less than his peers. This is not to say, of course, that Dostoevsky was engaged in science in the same way as his contemporaries Mendeleev and Ivan Pavlov (1849–1936), both of whom he met briefly. Science was, after all, a profession, and Dostoevsky had long set his technical training aside. Nonetheless, he lived surrounded by the achievements and controversies of medicine, technology, and science, all of which inform the intellectual production of the period: atomism, thermodynamics, entropy, evolution, germ theory, psychopathology (including sexual pathologies), telegraphs, trains, logarithms, non-Euclidean geometry, comets, phrenology,

mesmerism, modern beekeeping – and on and on. The list is chaotic, and that is how it appeared to Russian thinkers of the period. They dipped into this morass and attempted to turn it into some kind of sense. We cannot understand Dostoevsky in context without it.

Notes

- 1 James L. Rice, *Dostoevsky and the Healing Art: An Essay in Literary and Medical History* (Ann Arbor, MI: Ardis, 1985).
- 2 Nancy Mandelker Frieden, *Russian Physicians in an Era of Reform and Revolution, 1856–1905* (Princeton, NJ: Princeton University Press, 1981): 28.
- 3 Frieden, *Russian Physicians*, 45 and chapter 4.
- 4 Harley Balzer, "The Engineering Profession in Tsarist Russia," in Harley Balzer (ed.), *Russia's Missing Middle Class* (Armonk, NY: M. E. Sharpe, 1996): 55–88.
- 5 J. N. Westwood, *A History of Russian Railways* (London: G. Allen and Unwin, 1964).
- 6 Marsha Siefert, "'Chingis-Khan with a Telegraph': Communications in the Russian and Ottoman Empires," in Jörn Leonhard and Ulrike von Hirschhausen (eds.), *Comparing Empires: Encounters and Transfers in the Long Nineteenth Century* (Göttingen: Vandenhoeck & Ruprecht, 2011): 78–108.
- 7 Liza Knapp, *The Annihilation of Inertia: Dostoevsky and Metaphysics* (Evanston, IL: Northwestern University Press, 1996).
- 8 Daniel P. Todes, *Darwin without Malthus: The Struggle for Existence in Russian Evolutionary Thought* (New York: Oxford University Press, 1989).