

**Loren Graham: *Lonely Ideas - Can Russia Compete?*, Cambridge, Massachusetts: The MIT Press 2013**

Russia traditionally has had a rich scientific talent pool, which, according to the leading scholar on Russian science and technology outside Russia, Loren Graham, it has failed to capitalize on to become a leading scientific and technical power. Interesting historical account, “Lonely Ideas: Can Russia Compete?” explores the reasons behind Russia’s continuous failure. Given that the Russians built the first steam locomotive in continental Europe, the first operational diesel-powered locomotive in the world, illuminations for large cities with electric lights, and the first multiengine passenger planes, Graham’s main question is why Russia is a weak player in world technology today. By analyzing the development of Russia’s industries over the last three centuries and by comparing it with the development of the US and other Western countries’ industries in the same time periods, Graham solves this puzzle and suggests that technology is most successful in a democratic and law-governed society.

Graham’s analysis of Russian “lonely ideas” consists of twenty chapters and is divided into three parts. In the first part Graham explores why Russia has failed to modernize over more than three centuries. Each of the ten chapters of the most successfully written first part focuses on the development of one particular industry and explains how they failed to become the engines of Russia’s economic growth.

The first chapter starts by analyzing the rise of the first arms factory in the Russian town of Tula between 1632 and 1826, when it became one of the best armories in the world. However, as Graham points out, only twenty-nine years later Russian small-arms production was among the least developed in Europe. Graham acknowledges that both autocratic rule and the failure of Russian diplomats to report on progress made in armament manufacturing abroad might have contributed to Russia’s defeat in Crimean war. Simultaneously, he points out that in fact Russia’s social and economic milieu was the most important factor that hindered the early development of Russia’s armament industry. In order to support his argument, Graham brings the only successful example of Russia’s armament manufacturing, the Kalashnikov rifle, as the most famous, reliable, simple and inexpensive rifle in history. Nevertheless, as Graham points out, the inventor of the rifle, Mikhail Kalashnikov, never earned any money from his invention.

The following eight chapters of the first part follow the same structure as the first chapter, exploring in a wealth of detail the rise and failure of Russian inventions in other industries. Chapter two analyzes Russian inventions in railroads. Chapter three focuses on electric industry by exploring not only inventions, but also the fates of the three Russian nineteenth century inventors Aleksandr Lodygin, Pavel Yablochkov, and Aleksandr Popov. Chapter four is devoted to

the Russian aviation industry, focusing on Igor Sikorsky's invention of a four-engine passenger plane, which he could not commercialize in Russia due to political impediments, and insufficient opportunities to develop his invention in other countries, but later succeeded in building a successful aviation corporation in the US. Chapter five explores Soviet industrialization. Although it turned an agrarian country into an industrialized one, according to Graham, Soviet industrialization was overburdened with ideological and political considerations, which trumped commercial and engineering issues. As a result, for post-Soviet Russia its industrial system is simultaneously an impediment and an advantage. Chapters six to ten analyze the rise and fall of the Russian semiconductor industry, genetics and biotechnology, computers, and lasers, coming to similar conclusions: Russia's failure to modernize is rooted in Russia's mentality.

The second part of the book represents well-illustrated causes of Russia's failure to modernize, devoting each of seven chapters to one of them. Chapter eleven reconstructs the attitudinal cause of Russia's failure to modernize, by demonstrating that Russian scientists and broader society look upon science as a means to bring good to humankind, as opposed to entrepreneurship, which, in the understanding of most Russians, brings good only to a few. In chapter twelve Graham demonstrates that, in contrast to 'state control', which is able to promote technological development, political authoritarianism has been one of the main obstacles to Russia's modernization. Through history, Russian scientists have often been punished for their inventions as national traitors if their inventions were financed from abroad. Chapter thirteen examines social barriers, such as social and geographical mobility, which is highly controlled in Russia ever since tsarist times. In Chapter fourteen, Graham demonstrates that traditional Russia autocracy produced an absence of property rights, including patents. In turn, Russian scientists have been demotivated from developing their inventions and applying them in Russia. Chapter fifteen explains that one of the main reasons for Russia's failure to modernize over three centuries has been due to the lack of interest and support for investors in their inventions, and the lack of investors as a class. Chapter sixteen demonstrates that innovation in Russia is hindered by wide spread corruption: Graham explains that licenses for launching entrepreneurial ventures and even entrance into higher education institutions are almost impossible without bribes. The last chapter of the second part demonstrates that the research system in Russia followed similar trends as those in the West, however, without economic rewards.

The shortest, but also very informative third part of the book aims to examine Russia's contemporary capabilities to overcome its backwardness. Chapter eighteen reviews recent initiatives by the Russian government and oligarchs to establish and support research through foundations and universities, which Graham sees as a promising start for the development of technological innovations in Russia. Chapter nineteen analyzes the two relatively recent Russian-

government-led projects, nanotechnology organization RUSNANO, and a new technology city, Skolkovo. Graham's doubts the success of the two projects, regarding them as attempts to improve technology without changing Russian society, which proved to be counter-productive. The last chapter provides a clear answer to the question posed in the title of the book: Graham points out that Russia can modernize and become economically and technologically competent only if it establishes true democracy, protects human rights, and creates a legal system capable of protecting both intellectual property and entrepreneurs.

Graham's argument is masterly elaborated and supported by rich empirical evidence. Given that the author is of American origin, his knowledge of Russia, its history, economy, society, and customs is impressive. Graham skillfully established the linkages between many different types of research, including the literature on invention and innovation, Russian history, and Russian domestic policy. These linkages constitute the book's main strength. At the same time, to a Russian, or other non-Western readership, Graham's argument, if not the whole empirics presented in the book, seem common knowledge. The same argument – that the development and success of technology is not a matter of mere talent, but even more of societal and political environment – would hold if similar research were conducted in most of Central and Eastern, and South and Eastern European countries, and, probably, far beyond Europe too.

As a proof to this, in "Lonely Ideas" Graham also mentions a number of the world's famous inventors, who emigrated to the US as their home countries provided no better conditions for the development of their inventions than Russia. One of the striking examples is the Austro-Hungarian-born Croatian Serb, Nikola Tesla, mentioned in Chapter 3, as one of the possible first inventors of radio. His fate, as, for instance, nicely demonstrated in Margaret Cheney's book "Tesla. A Man out of Time", was very similar to the fates of Igor Sikorsky and other prominent Russian inventors. Similarly, discussing the rise, and failure thereof, of Russian aviation using the example of Igor Sikorsky's attempts to develop a commercial aircraft, in Chapter 4 Graham admits that "[e]ven in France, where democratic government and freedom were basic principles, Sikorsky could not obtain the support he needed" (p.44). Graham also quotes Sikorsky, who wrote that his success would not have happened anywhere else, than in the United States. Thus, "Lonely Ideas" to a large extent is a book about the United States as a country, where technological innovations are helped to succeed, as much as about Russia, where they are hindered.

Overall, Loren Graham's "Lonely Ideas" represents a liberal account on the possible solution to Russia's centuries-long failure to modernize. It is undoubtedly engaging reading, which provides an accessible explanation to the complex question of Russia's failure to modernize. "Lonely Ideas" also masterly summarizes the history of Russian inventions, and interesting biographies of its inventors. In conclusion, despite the fact that it is based on almost common

knowledge for Russian scholars and Russians in general, this book is recommended to both a general and academic readership in the West and beyond.

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