

PETER N. STEARNS

The Industrial Revolution Outside the West¹

Stearns, a modern historian, discusses the export of industrial machinery and techniques outside the West (Europe and North America) in the nineteenth century. Again and again, he finds that initial attempts at industrialization — in Russia, India, Egypt, and South America — led to increased production of export crops and resources but failed to stimulate true industrial revolutions. Consequently, as producers of raw materials, these countries became more deeply dependent on Western markets for their products, while at the same time importing from the West more valuable manufactured products like machinery. What common reasons can you find for these failures?

Before the 1870s no industrial revolution occurred outside Western society. The spread of industrialization within Western Europe, while by no means automatic, followed from a host of shared economic, cultural, and political features. The quick ascension of the United States was somewhat more surprising — the area was not European and had been far less developed economically during the eighteenth century. Nevertheless, extensive commercial experience in the northern states and the close mercantile and cultural ties with Britain gave the new nation advantages for its rapid imitation of the British lead. Abundant natural resources and extensive investments from Europe kept the process going, joining the United States to the wider dynamic of industrialization in the nineteenth-century West.

Elsewhere, conditions did not permit an industrial revolution, an issue that must be explored in dealing with the international context for this first phase of the world's industrial experience. Yet the West's industrial revolution did have substantial impact. It led to a number of pilot projects whereby initial machinery and factories were established under Western guidance. More important, it led to new Western demands on the world's economies that instigated significant change without industrialization; indeed, these demands in several cases made industrialization more difficult.

Pilot Projects

Russia's contact with the West's industrial revolution before the 1870s offers an important case study that explains why many societies could not follow the lead of nations like France or the United States in imitating Britain. Yet Russia did introduce some new equipment for economic and military-political reasons, and these initiatives did generate change — they were not mere window dressing.

More than most societies not directly part of Western civilization, Russia had special advantages in reacting to the West's industrial lead and special motivation for paying attention to this lead. Russia had been part of Europe's diplomatic network since about 1700. It saw itself as one of Europe's great powers, a participant in international conferences and military alliances. The country also had close cultural ties with Western Europe, sharing in artistic styles and scientific developments— though Russian leadership had stepped back from cultural alignment because of the shock of the French Revolution in

¹ Peter N. Stearns, *The Industrial Revolution in World History* (Boulder, Colo.: Westview Press, 1993), 71-79.

1789 and subsequent political disorders in the West. Russian aristocrats and intellectuals routinely visited western Europe. Finally, Russia had prior experience in imitating Western technology and manufacturing: importation of Western metallurgy and shipbuilding had formed a major part of Peter the Great's reform program in the early eighteenth century.

Contacts of this sort explain why Russia began to receive an industrial outreach from the West within a few decades of the advent of the industrial revolution. British textile machinery was imported beginning in 1843. Ernst Knoop, a German immigrant to Britain who had clerked in a Manchester cotton factory, set himself up as export agent to the Russians. He also sponsored British workers who installed the machinery in Russia and told any Russian entrepreneur brash enough to ask not simply for British models but for alterations or adaptations: "That is not your affair; in England they know better than you." Despite the snobbism, a number of Russian entrepreneurs set up small factories to produce cotton, aware that even in Russia's small urban market they could make a substantial profit by underselling traditional manufactured cloth. Other factories were established directly by Britons.

Europeans and Americans were particularly active in responding to calls by the tsar's government for assistance in establishing railway and steamship lines. The first steamship appeared in Russia in 1815, and by 1820 a regular service ran on the Volga River. The first public railroad, joining St. Petersburg to the imperial residence in the suburbs, opened in 1837. In 1851 the first major line connected St. Petersburg and Moscow, along a remarkably straight route desired by Tsar Nicholas I himself. American engineers were brought in, again by the government, to set up a railroad industry so that Russians could build their own locomotives and cars. George Whistler, the father of the painter James McNeill Whistler (and thus husband of Whistler's mother), played an important role in the effort. He and some American workers helped train Russians in the needed crafts, frequently complaining about their slovenly habits but appreciating their willingness to learn.

Russian imports of machinery increased rapidly; they were over thirty times as great in 1860 as they had been in 1825. While in 1851 the nation manufactured only about half as many machines as it imported, by 1860 the equation was reversed, and the number of machine-building factories had quintupled (from nineteen to ninety-nine). The new cotton industry surged forward with most production organized in factories using wage labor.

These were important changes. They revealed that some Russians were alert to the business advantages of Western methods and that some Westerners saw the great profits to be made by setting up shop in a huge but largely agricultural country. The role of the government was vital: The tsars used tax money to offer substantial premiums to Western entrepreneurs, who liked the adventure of dealing with the Russians but liked their superior profit margins even more.

But Russia did not then industrialize. Modern industrial operations did not sufficiently dent established economic practices. The nation remained overwhelmingly agricultural. High percentage increases in manufacturing proceeded from such a low base that they had little general impact. Several structural barriers impeded a genuine industrial revolution. Russia's cities had never boasted a manufacturing tradition; there were few artisans skilled even in preindustrial methods. Only by the 1860s and 1870s had cities grown enough for an artisan core to take shape — in printing, for example — and even then

large numbers of foreigners (particularly Germans) had to be imported. Even more serious was the system of serfdom that kept most Russians bound to agricultural estates. While some free laborers could be found, most rural Russians could not legally leave their land, and their obligation to devote extensive work service to their lords' estates reduced their incentive even for agricultural production. Peter the Great had managed to adapt serfdom to a preindustrial metallurgical industry by allowing landlords to sell villages and the labor therein for expansion of ironworks. But this mongrel system was not suitable for change on a grander scale, which is precisely what the industrial revolution entailed.

Furthermore, the West's industrial revolution, while it provided tangible examples for Russia to imitate, also produced pressures to develop more traditional sectors in lieu of structural change. The West's growing cities and rising prosperity claimed rising levels of Russian timber, hemp, tallow, and, increasingly, grain. These were export goods that could be produced without new technology and without altering the existing labor system. Indeed, many landlords boosted the work-service obligations of the serfs in order to generate more grain production for sale to the West. The obvious temptation was to lock in an older economy — to respond to new opportunity by incremental changes within the traditional system and to maintain serfdom and the rural preponderance rather than to risk fundamental internal transformation.

The proof of Russia's lag showed in foreign trade. It rose but rather modestly, posting a threefold increase between 1800 and 1860. Exports of raw materials approximately paid for the imports of some machinery, factory-made goods from abroad, and a substantial volume of luxury products for the aristocracy. And the regions that participated most in the growing trade were not the tiny industrial enclaves (in St. Petersburg, Moscow, and the iron-rich Urals) but the wheat-growing areas of southern Russia where even industrial pilot projects had yet to surface. Russian manufacturing exported nothing at all to the West, though it did find a few customers in Turkey, central Asia, and China.

The proof of Russia's lag showed even more dramatically in Russia's new military disadvantage. Peter the Great's main goal had been to keep Russian military production near enough to Western levels to remain competitive, with the huge Russian population added into the equation. This strategy now failed, for the West's industrial revolution changed the rules of the game. A war in 1854 pitting Russia against Britain and France led to Russia's defeat in its own backyard. The British and French objected to new Russian territorial gains (won at the expense of Turkey's Ottoman Empire) that brought Russia greater access to the Black Sea. The battleground was the Crimea. Yet British and French steamships connected their armies more reliably with supplies and reinforcements from home than did Russia's ground transportation system with its few railroads and mere three thousand miles of first-class roads. And British and French industry could pour out more and higher-quality uniforms, guns, and munitions than traditional Russian manufacturing could hope to match. The Russians lost the Crimean War, surrendering their gains and swallowing their pride in 1856. Patchwork change had clearly proved insufficient to match the military, much less the economic, power the industrial revolution had generated in the West.

After a brief interlude, the Russians digested the implications of their defeat and launched a period of basic structural reforms. The linchpin was the abolition of serfdom in 1861. Peasants were not entirely freed, and rural

discontent persisted, but many workers could now leave the land; the basis for a wage labor force was established. Other reforms focused on improving basic education and health, and while change in these areas was slow, it too set the basis for a genuine commitment to industrialization. A real industrial revolution lay in the future, however. By the 1870s Russia's contact with industrialization had deepened its economic gap vis-a-vis the West but had yielded a few interesting experiments with new methods and a growing realization of the need for further change.

Societies elsewhere in the world — those more removed from traditional ties to the West or more severely disadvantaged in the ties that did exist — saw even more tentative industrial pilot projects during the West's industrialization period. The Middle East and India tried some industrial imitation early on but largely failed — though not without generating some important economic change. Latin America also launched some revealingly limited technological change. Only eastern Asia and sub-Saharan Africa were largely untouched by any explicit industrial imitations until the late 1860s or beyond; they were too distant from European culture to venture a response so quickly.

Prior links with the West formed the key variable, as Russia's experience abundantly demonstrated. Societies that had some familiarity with Western merchants and some preindustrial awareness of the West's steady commercial gains mounted some early experiments in industrialization. Whether they benefited as a result compared with areas that did nothing before the late nineteenth century might be debated.

One industrial initiative in India developed around Calcutta, where British colonial rule had centered since the East India Company founded the city in 1690. A Hindu Brahman family, the Tagores, established close ties with many British administrators. Without becoming British, they sponsored a number of efforts to revivify India, including new colleges and research centers. Dwarkanath Tagore controlled tax collection in part of Bengal, and early in the nineteenth century he used part of his profit to found a bank. He also bought up a variety of commercial landholdings and traditional manufacturing operations. In 1834 he joined with British capitalists to establish a diversified company that boasted holdings in mines (including the first Indian coal mine), sugar refineries, and some new textile factories; the equipment was imported from Britain. Tagore's dominant idea was a British-Indian economic and cultural collaboration that would revitalize his country. He enjoyed a high reputation in Europe and for a short time made a success of his economic initiatives. Tagore died on a trip abroad, and his financial empire declined soon after.

This first taste of Indian industrialization was significant, but it brought few immediate results. The big news in India, even as Tagore launched his companies, was the rapid decline of traditional textiles under the bombardment of British factory competition; millions of Indian villagers were thrown out of work. Furthermore, relations between Britain and the Indian elite worsened after the mid-1830s as British officials sought a more active economic role and became more intolerant of Indian culture. One British official, admitting no knowledge of Indian scholarship, wrote that "all the historical information" and science available in Sanskrit was "less valuable than what may be found in the most paltry abridgements used at preparatory schools in England." With these attitudes, the kind of collaboration that might have aided Indian appropriation of British industry became impossible.

The next step in India's contact with the industrial revolution did not occur

until the 1850s when the colonial government began to build a significant railroad network. The first passenger line opened in 1853. Some officials feared that Hindus might object to traveling on such smoke-filled monsters, but trains proved very popular and there ensued a period of rapid economic and social change. The principal result, however, was not industrial development but further extension of commercial agriculture (production of cotton and other goods for export) and intensification of British sales to India's interior. Coal mining did expand, but manufacturing continued to shrink. There was no hint of an industrial revolution in India.

Imitation in the Middle East was somewhat more elaborate, in part because most of this region, including parts of North Africa, retained independence from European colonialism. Muslims had long disdained Western culture and Christianity, and Muslim leaders, including the rulers of the great Ottoman Empire, had been very slow to recognize the West's growing dynamism after the fifteenth century. Some Western medicine was imported, but technology was ignored. Only in the eighteenth century did this attitude begin, haltingly, to change. The Ottoman government imported a printing press from Europe and began discussing Western-style technical training, primarily in relationship to the military.

In 1798 a French force briefly seized Egypt, providing a vivid symbol of Europe's growing technical superiority. Later an Ottoman governor, Muhammed Ali, seized Egypt from the imperial government and pursued an ambitious agenda of expansionism and modernization. Muhammed Ali sponsored many changes in Egyptian society in imitation of Western patterns, including a new tax system and new kinds of schooling. He also destroyed the traditional Egyptian elite. The government encouraged agricultural production by sponsoring major irrigation projects and began to import elements of the industrial revolution from the West in the 1830s. English machinery and technicians were brought in to build textile factories, sugar refineries, paper mills, and weapons shops. Muhammed Ali clearly contemplated a sweeping reform program in which industrialization would play a central role in making Egypt a powerhouse in the Middle East and an equal to the European powers. Many of his plans worked well, but the industrialization effort failed. Egyptian factories could not in the main compete with European imports, and the initial experiments either failed or stagnated. More durable changes involved the encouragement to the production of cash crops like sugar and cotton, which the government required in order to earn tax revenues to support its armies and its industrial imports. Growing concentration on cash crops also enriched a new group of Egyptian landlords and merchants. But the shift actually formalized Egypt's dependent position in the world economy, as European businesses and governments increasingly interfered with the internal economy. The Egyptian reaction to the West's industrial revolution, even more than the Russian response, was to generate massive economic redefinition without industrialization, a strategy that locked peasants into landlord control and made a manufacturing transformation at best a remote prospect.

Spurred by the West's example and by Muhammed Ali, the Ottoman government itself set up some factories after 1839, importing equipment from Europe to manufacture textiles, paper, and guns. Coal and iron mining were encouraged. The government established a postal system in 1834, a telegraph system in 1855, and steamships and the beginning of railway construction from 1866 onward. These changes increased the role of European traders and investors in the Ottoman economy and produced no overall industrial

revolution. Again, the clearest result of improved transport and communication was a growing emphasis on the export of cash crops and minerals to pay for necessary manufactured imports from Europe. An industrial example had been set, and, as in Egypt, a growing though still tiny minority of Middle Easterners gained some factory experience, but no fundamental transformation occurred....

Developments of preliminary industrial trappings — a few factories, a few railroads — nowhere outside Europe converted whole economies to an industrialization process until late in the nineteenth century, though they provided some relevant experience on which later (mainly after 1870) and more intensive efforts could build. A few workers became factory hands and experienced some of the same upheaval as their Western counterparts in terms of new routines and pressures on work pace. Many sought to limit their factory experience, leaving for other work or for the countryside after a short time; transience was a problem for much the same reasons as in the West: the clash with traditional work and leisure values. Some technical and business expertise also developed. Governments took the lead in most attempts to imitate the West, which was another portent for the future; with some exceptions, local merchant groups had neither the capital nor the motivation to undertake such ambitious and uncertain projects. By the 1850s a number of governments were clearly beginning to realize that some policy response to the industrial revolution was absolutely essential, lest Western influence become still more overwhelming. On balance, however, the principal results of very limited imitation tended to heighten the economic imbalance with western Europe, a disparity that made it easier to focus on nonindustrial exports. This too was a heritage for the future. . . .

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1. *Did nineteenth-century efforts to ignite industrial revolutions outside the West fail because these societies neglected to develop capitalism, or did they fail because their local needs were subordinated to those of Western capitalists?*
 2. *Explain.*