

From *Inzhener* to ITR:
Russian Engineers and the First Five-Year Plan

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ABSTRACT

The Russian engineering corps was almost completely transformed during the first five-year plan, which ran from 1928-1932. The purpose of this thesis is to examine the nature of that change, and the forces that drove it. In this paper, I will argue that the corps was transformed in four fundamental ways: class composition, skill level, role in production, and political orientation.

This paper begins by examining the old engineering corps on the eve of the first five year plan. Specifically, it examines Russian engineers as a subgroup of the intelligentsia, and how that problematized their relationship with power. I next examine how the Soviet government forcibly reshaped the engineering corps by pressure from above, specifically by a combination of state terror and worker-promotion campaigns. These two phenomena were closely intertwined. Along with collectivization and crash industrialization, they were part of the “Cultural Revolution” that reshaped Russian society in this period. I next examine how the campaign of terror against engineers was used by Stalin and his camp for political gain on a variety of fronts. Lastly, I will examine how engineers became part of the Soviet elite after 1931.

For sources, I rely especially on the correspondence between Stalin, Kaganovich, and Molotov, which was published in the Yale University *Annals of Communism* series. I also draw heavily on The Harvard Refugee Interview Project, memoirs, and the collected works of Joseph Stalin.

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CHAPTER 1

SETTING THE STAGE

INTRODUCTION

In 1928, a very strange thing took place in the dusty, North-Caucasus mining town of Shakhty. The quota for strangeness was high that year, because the Soviet Union was in the throws of yet another revolution. Driven by Joseph Stalin, the country was industrializing at a frantic pace. The USSR, Stalin claimed, was building the society of the future, a utopia of fire and steel where the workers would control the wealth they create. The old certainties of life were being swept away, and new ones established. It was a social upheaval as cataclysmic as the revolutions of 1917 and the Civil War of 1918-21.

In the midst of this upheaval, the Shakhty trial took place in 1928. Fifty-three mining engineers were arrested and charged with industrial sabotage. A photograph from the trial reveals to us a row of defense lawyers at the front of the courtroom, fidgeting nervously.¹ The defendants are seated behind them. They are closely packed together, like cattle penned for the slaughter. Their faces are indistinct, blurred by motion. They look like little white brushstrokes floating above a murky black sea of suits. The expressions we can pick out are blank, or vaguely inquisitive as they peer up at the camera. In the end, five engineers would be executed, and hundreds more arrested in the years that followed. To this day it is unknown how many engineers were arrested

¹See Hiroaki Kuromiya, *Stalin's Industrial Revolution-Politics and Workers 1928-1932* (Cambridge, MA: Cambridge University Press, 1988), 16.

between 1928 and 1932. The lowest estimate is 2000, the number given by the official Soviet sources. The higher estimates range up to 7000.² The fate of these men was ghastly. Some of them were executed, others were thrown in prison. Still others used as forced labor by OGPU, the secret police. This wave of terror reached a new peak in the Industrial Party Trial of 1930.

All of this took place against the backdrop of a crippling shortage of engineers. To build the new industries, the state needed thousands of engineers, scientists and technicians. Why would the state defame, arrest and even execute the very people it needed most? What was happening there, in that little mining town? Contained in this problem is a critical thread in the story of Stalin's industrial revolution. If we can understand the fate of Stalin's engineers, it can tell us a great deal about the nature of the Stalinist era. It can tell us the goals of Stalinist repression as well as its consequences, intended and unintended.

The goal of this thesis is to tell the story of what happened to the Russian engineering corps during the first five-year plan. The five-year plan, or *pyatiletka*, lasted from 1928-1932. In this thesis I will argue that the Russian engineering corps was radically transformed during the course of the first *pyatiletka*. It changed in four fundamental ways: class background, skill level, role in production and political alignment.

²Kendall E. Bailes, "The politics of Technology: Stalin and Technocratic Thinking Among Soviet Engineers," *The American Historical Review* 79, no. 2 (1974), 446.

It's unclear if the Soviet leadership really planned every detail of the process ahead of time. As we will see, the process had a number of unintended consequences. It is clear, however, that pressures from the Soviet leadership played a decisive role. The “reforging” of the engineering corps was one of many sweeping changes to society that were driven by the government in this period. Robert C. Tucker has called this upheaval the “Revolution from Above.”³ It is also clear that the transformation of the engineering corps was both fundamental and lasting.

The first change was demographic. Before the first *pyatiletka*, or five-year plan, most engineers came from middle or upper-class families. After 1928, the state deliberately set out to change the class background of the engineering corps. They instituted a form of affirmative action, promoting working-class people into positions of authority, and recruiting workers for technical education. This policy was called *Выдвижение* (*vydvizhenie*). By 1933, the engineering corps had grown enormously, and was now almost entirely of working-class background. Around 60,000 new engineers graduated during the first *pyatiletka*.⁴ This completely swamped the old specialists, who had numbered only 15,000 before the arrests began.⁵

The second fundamental change was in the skill level of the engineering corps. The rapid expansion of the engineering corps was accompanied by a drop in its overall skill level. Most of the new engineers were trained in great haste, and many were very highly specialized. They often lacked training in the broader principles of science, and

³ See *Stalin in Power: The Revolution from Above 1928-1941*. (New York: W. W. Norton and Co, 1990.)

⁴ Kendall E. Bailes, *Technology and Society Under Lenin and Stalin: Origins of the Soviet Technical Intelligentsia, 1917-1941*. (Princeton, N J: Princeton University Press, 1978), 221.

⁵*Ibid*, 4.

lacked the expertise to do any kind of work outside of their narrow specialization. They also lacked the broad background in humanities that pre-revolutionary engineers had possessed. Not all engineers trained in this period were so narrow, but the vast majority of them were.

This led to a third fundamental change: the role that engineers played in production, and in the economy at large. In the western designation, an engineer is defined as an applied scientist. The Engineer's Council for Professional Development defines engineering in this way:

“The creative application of scientific principles to design or develop structures, machines, apparatus, or manufacturing processes, or works utilizing them singly or in combination; or to construct or operate the same with full cognizance of their design; or to forecast their behavior under specific operating conditions; all as respects an intended function, economics of operation and safety to life and property.”⁶

As defined above, the job of an engineer involves both technical and economic considerations. An engineer must not only solve a problem, but find the most cost-effective solution. By the end of the first five-year plan, very few of the people who were called engineers really fit this description. The narrow education of the new engineers and the emergence of the planned economy both served to narrow and redefine the role of an engineer.

There was a change in terminology that took place at this time as well. The pre-revolution инженер (Inzhener) or “engineer” was officially relabeled as an *ITR*. ITR is short for Инженерно-Технический Работник (Inzhenerno-Technichesky Rabotnik,) or

⁶Quoted in Ralph J. Smith, “Engineering,” *Encyclopedia Britannica Online*, (2010)
<http://www.britannica.com/EBchecked/topic/187549/engineering>

“Engineering-Technical Worker.” This was not simply a change of labels, however. It indicated a profoundly different job description. Specifically, it blurred the line between an engineer and a technician. In fact, the term ITR could refer to either one.⁷

Between 1928 and 1932, the role of an engineer was redefined as an “Organizer of Production.” This may sound like an exalted position, but the reality was that engineers had less authority than they had before 1928. In practice, an “Organizer of Production” was someone who carried out the technical aspects of decisions made by the economic planners. This entailed subordination to the command economy, and the loss of most authority for independent problem-solving. Even minor innovations required the approval of the planning apparatus. In the command economy, engineers were expected to work on the production line, or built plants and other infrastructure at places chosen by their superiors. They were no longer expected to evaluate different solutions to a technical problem, or to assess their costs. Both of these tasks are critical to the role of an engineer in the capitalist world.

There was one further change that accompanied the previous three. There was also a shift in the political orientation of the engineering corps during this period. It went from a group that was primarily *liberal* and *Russian nationalist* to one that was primarily *socialist* and *Party-minded*. As Stalin had hoped, the new “red engineers” were generally loyal to the state and the communist cause. Many of them even joined the Communist Party. But what of the older generation? The older engineers who had begun their

⁷ Nicholas Lampert, *The Technical Intelligentsia and the Soviet State*. (New York: Homes & Meier, 1979), 8.

careers before the revolution of 1917 were known as “bourgeois specialists,” or “spetsy” for short. Most of these men did not actually come from the bourgeois, the property owning-class. They were so called because they had worked under the “bourgeois” social order of capitalism.⁸

In response to the terror against their profession, the remaining spetsy seem to have "changed camps" to survive. This entailed two things: First, they embraced Bolshevik socialism. That is, the Communist Party and its vision of socialism. Whatever their private misgivings, the spetsy began to voice support for the party line in public. Second, they submitted to the command economy, with its strict hierarchy of planning and decision-making. This meant, above all, that they no longer criticized the party line or its social consequences. They gave up the old intelligentsia role as "conscience of the state." In return for this, they received good pay and privileges as full members of the Soviet elite. In any case, their numbers had become insignificant in comparison to the vast numbers of working class “red engineers.” Between these two things the engineering corps became, on the whole, a solid support base for the regime.

Chapter 1 examines the historiography of the topic. It also outlines my research methods and the position of the engineering corps on the eve of the first five-year plan. Chapter 2 examines the intertwined phenomena of proletarianization and the terror. In addition to the changes in education and job description, this chapter also examines the wave of arrests that broke over the engineering corps in this period. My discussion of the terror focuses on two famous show trials in which engineers were the main defendants.

⁸ Lampert, *The Technical Intelligentsia and the Soviet State*, 14.

These were the Shakhty Trial of 1928 and the Industrial Party Trial of 1930. This chapter also examines how the arrests were used by Stalin and his camp for a variety of political goals. Chapter 3, “Carrot and Stick” examines the change that took place in the state’s policy toward engineers after 1931. The arrests were scaled back, and a number of “carrots,” or incentives, were offered to engineers if they cooperated. These included higher pay, social prestige, and a higher standard of living. In the conclusion, I examine some of the long-term consequences of the transformation described in this thesis.

HISTORIOGRAPHY

On the whole, the historiography of engineers in this period is underdeveloped. This points to an important but neglected problem in Soviet history. The Russian engineering corps is an important subject of study for three reasons. The first reason, as Loren Graham has suggested, is that the disempowerment of engineers could have been a contributing factor to the stagnation of the later Soviet economy.⁹ Second, the subject is important because it provides a window into the sweeping changes that took place during the revolution from above. Engineers feature prominently in the economic and social history of the era. Neither story can be told without them. Third, they are interesting as case study of social engineering. Even as engineers labored on the state’s massive construction projects, the state sought to “engineer” them into more pliable instruments.

⁹ Lauren Graham, *The Ghost of the Executed Engineer, Technology and the Fall of the Soviet Union* (Cambridge, Harvard University Press, 1993), 81.

The engineering corps was another project of the state, as important as the giant new dams and factories.

One of the first historians to examine the story of the engineers was Sheila Fitzpatrick. In 1974 she published an article called *Cultural Revolution in Russia, 1928-1931*.¹⁰ This article introduced two critical concepts. The first was *Cultural Revolution*. Fitzpatrick defines the Cultural Revolution as the period between 1928 and 1931. It was an era in which the Soviet state sought to destroy all the remnants of capitalism in culture and in the economy. Soviet leaders hoped to create a truly socialist society with a socialist economy. In order to do this, Fitzpatrick argues, the state tried to create an atmosphere of class warfare, pitting the “awakened” working class against the remnants of the bourgeois. The party encouraged young communists to attack traditional authority figures, be they priests or professors. The state also denounced the “former classes” as traitors in their midst, seeking to discredit them. The arrest of the “bourgeois specialist” engineers was part of this movement.

The second concept that Fitzpatrick introduced was Вывдвижение,¹¹ (*Vydvizhenie*.) This was an “affirmative action” policy that favored workers and their children. Fitzpatrick argues that the regime actively recruited working class people into higher education, and promoted them from the factory floor into positions of authority. This created a vast new management class that was both technically skilled and politically

¹⁰ Sheila Fitzpatrick, “Cultural Revolution in Russia, 1928-1932.” *Journal of Contemporary History* 9, no. 1 (1974.) Republished in 1978 (Bloomington, Ind.), and then 1992 as *Cultural Revolution as Class War*. The citations in this thesis refer to the 1992 version, which can be found in a compilation of her essays called *The Cultural Front: Power and Culture in Revolutionary Russia*. (Cornell University Press, 1992.)

¹¹ Fitzpatrick, *The Cultural Front*, 115.

loyal, as it owed everything to Stalin. Fitzpatrick argues that *vydvizhenie* was an integral part of the Cultural Revolution, because the new communist elite took the place of the old bourgeois authorities.

This article is also important because it was the first to systematically examine the campaign of terror against the engineers. Fitzpatrick was the first to argue that Stalin's motivation for the two show trials was to create an atmosphere of class warfare. She was also one of the first to argue that Stalin used the show trials as a political weapon against his opponents in the party.¹² Stalin's principle opponents at this time were known as the right opposition. The right opposition was a more moderate school of thought within the Communist party. Led by Andrei Rykov and Nikolai Bukharin,¹³ the "rightists" had opposed crucial aspects of Stalin's program, such as forcible collectivization of agriculture. Many, like Rykov, also opposed the arrest of the spetsy. Fitzpatrick argues that Stalin used the show trials to discredit his opponents.

Fitzpatrick expanded on these themes in *Education and Social Mobility in the Soviet Union, 1921-1934*, published 1979. The book is most useful in providing details about the reforms of technical education that took place during this period. It also provides more detail about the political wrangling that surrounded *vydvizhenie*, and also its social consequences. This book is important because it illustrates the commonalities between the experiences of engineers and technicians, the "technical intelligentsia" and

¹² Fitzpatrick, *The Cultural Front*, 118.

¹³ Alexei Rykov was an old Bolshevik. Though Stalin held all the real power, Rykov had been the nominal head of government since Lenin's death. Nikolai Bukharin was another old Bolshevik. He was a member of the Politburo, the highest circle of the Communist Party, from 1924-1929.

other intelligentsia groups. It remains one of the most important to the historiography of the engineers.

Kendall E. Bailes is another important historian of the engineering corps. Whereas Fitzpatrick emphasized mass mobilization as the cause of the two show trials, Bailes emphasizes high politics. He seeks the background of the trials in the factional struggles within the party leadership. Bailes first probed this question in 1974 by publishing *The Politics of Technology: Stalin and Technocratic Thinking Among Soviet Engineers*. In this article, he argues that that the Industrial Party Trial was collateral damage from power struggles within the party. The prosecution of the spetsy, he argues, was primarily a power play by the Stalinist camp to discredit Stalin's political opponents. If the right opposition could be linked with this conspiracy of bourgeois "class enemies," it would damage their credibility, and increase that of the Stalinist camp. This article was published a few months after Fitzpatrick's *Cultural Revolution in Russia*, and it's unclear whether they influenced one another.

Bailes also argues in this article that the terror was intended to discourage engineers from their technocratic views.¹⁴ Among other things, the defendants in the Industrial Party Trial were accused by Stalin's camp of trying to seize power and make the USSR into a technocracy. That is, a country governed by engineers and scientists, not workers. Bailes fails to make the case that Stalin considered technocracy a serious threat, but later historians have confirmed that the terror encouraged ideological conformity.

¹⁴ Bailes, "The Politics of Technology," 448.

The Politics of Technology later became chapter four of *Technology and Society under Lenin and Stalin*. In this 1978 book, Bailes argues that the engineers were not simply the passive victims of Stalin's wrath. Instead, they exercised agency by finding ways to adapt and survive in the chaos of the Cultural Revolution. It is also worth noting for terminological reasons. Bailes introduced a new term, *proletarianization*.¹⁵ Proletarianization was Stalin's long-term priority to create a working-class management elite. The policy of *Vydvizhenie*, as identified by Fitzpatrick was a means to this end. To avoid confusion, I will use the word *proletarianization* almost exclusively for the rest of this thesis.

Another crucial book is Nicholas Lampert's *The Technical Intelligentsia and the Soviet State*. Lampert's goal in this book is to examine how engineers and technicians (the "technical intelligentsia") interacted with the Soviet power structure. The book has no clearly defined thesis, but it provides a wealth of detail on the basic outline drawn by Fitzpatrick. In addition to the "Cultural Revolution" explanation that Fitzpatrick espouses, Lampert also suggested that the terror was also intended to browbeat the engineers into political compliance. This book is most valuable in that it provides a lot of new details on the campaign of terror against engineers.

The best work to date on the technical intelligentsia is *Stalin's Industrial Revolution: Politics and Workers 1928-1932*, by Hiroaki Kuromiya. Published in 1988, the book has two main arguments. The first is that while the Cultural Revolution of 1928 was triggered from above, it resonated with popular enthusiasm among the working class.

¹⁵ Bailes, *Technology and Society* 74.

The second argument is that the show trials of 1928 and 1930 were motivated mostly by the goal of mass mobilization. That is, of building popular support for the regime and its programs. It did this by presenting the industrialization drive as a class war. Whereas Fitzpatrick sees the class war concept mostly at work in the realm of culture, Kuromiya argues that the entire industrialization drive was presented in this light. It was the concept of class warfare, Kuromiya argues, that made industrialization politically possible. He spends much of the book examining how the concept was disseminated by the regime and used to whip up popular enthusiasm. While Kuromiya does not deny that the class war concept was useful in Stalin's political ploys, he argues that mass mobilization was far more important.

The most recent major work on the engineering corps is *The Soviet Economy in Turmoil, 1929-1930*.¹⁶ This book is primarily an economic history, with little attention to the social conditions of the time. The engineers nevertheless feature prominently in this story, as they had to bridge the gap between the ambitions of the regime and the realities on the ground. Published in 1989, this book was part of a massive multi-volume study by R. W. Davies on the industrialization of Soviet Russia. The main argument of this book is that despite its massive failures, the first five-year plan laid the groundwork for future growth. Davies argues that because of this, it was an overall success. Like many of the previous historians, he makes lengthy and sometimes confusing forays into the high politics of the era. While providing some useful background, Davies does not

¹⁶ R. W. Davies, *The Soviet Economy in turmoil, 1929-1930*. (Cambridge, MA: Harvard University Press, 1989)

clarify the relationship between developments in high politics and their actual impact on the engineering corps.

RESEARCH METHODS

The overarching method of this paper is to synthesize the previous historiography, and combine it with some new primary source research. In particular, I have attempted to incorporate new primary sources that have been published since the previous works. The most important of these are the collections of correspondence published in Yale's *Annals of Communism* series. Particularly revealing is Stalin's correspondence with his two chief lieutenants, Viacheslav Molotov and Lazar Kaganovich. This correspondence is especially important in elucidating Stalin's involvement in the Industrial Party Trial, and how he used it for political gain. This correspondence was not yet published when the previous authors were writing about the subject.

The public statements of Stalin can also shed some light on what he hoped to gain from the show trials. While we certainly shouldn't take Stalin at his word, his rhetoric can reveal the way he wanted other people to interpret what he was doing. In other words, it can reveal the message he intended the terror to convey. It is primarily in terms of rhetoric that I examine Stalin's words, both public and private. I rely especially of Stalin's speech to the April 13th 1928 Joint Plenum of the Central Committee and the Central Control Commission. A good summary of Stalin's publicly stated opinion can be found in an interview that Stalin granted to H. G. Wells in 1934. The author of "War of the Worlds" had come to the Soviet Union for a writer's conference, and to tour the

country that seemed to be inspired by science fiction. This interview is useful because Stalin explained in detail his conception of the technical intelligentsia and its role in a socialist society.

Another important primary source for this thesis is memoirs. I employ memoirs primarily to reveal the results of government policy on the ground. The memoirs of Zara Witkin are a good example of this. Born in America of Russian Jewish émigrés, he was a construction engineer by training. In 1932 he went to Russia, fired by a belief that he could make a real contribution to the building of Stalin's utopia. Two years later, he returned home, disillusioned and disgusted. The memoirs he left behind describe his struggles and adventures with surprising eloquence. His account is important because he describes the chaos, incompetence and fear that dominated the Russian engineering corps by the end of the first pyatiletka. He clearly has a grudge against the Soviet leadership, but other observers in this era support his observations.

The memoirs of John Scott are another window into the results of Stalin's policies. Scott was an American welder, also motivated by a belief in communism. He worked in the city of Magnitogorsk from 1932 to 1938. The unflinching way in which Scott describes the squalor, chaos and repression of the era makes his account highly credible, despite his communist convictions. This account is especially useful in illustrating the role of the OGPU and forced labor in the building of socialism.

Last but not least, I also make use of the memoirs of Eugene Lyons. Lyons was an American reporter who traveled extensively throughout the Soviet Union in the years 1928-1934. Originally a communist, Lyons became increasingly disillusioned as he saw

the horrors of the Stalinist period with his own eyes. He provides an eyewitness account of the two show trials, and how ordinary people reacted to them.

Another crucial source is The Harvard Project on the Soviet Social System. It was also known as the Harvard Refugee Interview Project. This is a series of interviews that were conducted by the Russian Research Center at Harvard between 1949 and 1954. The subjects are Soviet citizens who had escaped or defected from the USSR after WWII. For the safety of the interviewees, they were identified only by a number. Among the ranks of these refugees were a number of engineers. The majority of them were educated in the first half of the 1930s, and then worked in production in Russia during the later 1930s. As such, they provide a wealth of detail on the conditions an engineer faced in production. Most of the engineers interviewed were “red engineers,” of the younger generation. There are four, however, who belong to the old pre-revolutionary cadres. Their stories illustrate how some old specialists were able to survive under the new regime.

THE OLD SPECIALISTS

In order to understand the magnitude of the transformation of Russian engineers, we must briefly sketch their position on the eve of the Shakhty Trial. In the Bolshevik view of the world, engineers were part of a social group called the *Intelligentsia*. Intelligentsia is a word that has no direct translation in English. The intelligentsia was a group of highly educated people who convened in the literary salons of St. Petersburg

and Moscow. This group emerged in Russian society in the late nineteenth century. Its members tended to be politically liberal, feeling that it was their duty to drive social progress. They were highly critical of the elites, feeling it was their duty to “speak truth to power,” as the Quakers put it. They were also frustrated with the “backward” social and political conditions, and felt a moral obligation to change them. Because of this, they were often in conflict with the Tsarist government.¹⁷

The members of the intelligentsia were usually involved in the production of culture, but the term could include anyone with higher education who shared their views. Specialists, like engineers, were an important contingent of the intelligentsia.¹⁸

According to Kendall Bailes, the engineers belonged to a subset of this group called the *Technical Intelligentsia*. Bailes defines the technical intelligentsia as the segment of the population whose profession involves science and technology. This group included engineers, agronomists, and other scientists. In Soviet times, technicians without university training were also considered part of this group.¹⁹ For the remainder of this paper, I shall use the Soviet meaning, and include technicians under this term.

Engineering was considered to be the most prestigious profession within the technical intelligentsia.²⁰ At the time of the revolution, the engineering corps numbered only about 15,000.²¹ For a country the size of Russia, that is a staggeringly small number. By

¹⁷ Jochen Hellbeck, *Revolution On My Mind: Writing a Diary Under Stalin*. (Cambridge, MA: Harvard University Press), 351.

¹⁸ Fitzpatrick, *Education and Social Mobility*, 240.

¹⁹ Bailes, *Technology and Society*, 4.

²⁰ Lubrano and Solomon, eds. *The Social Context of Soviet Science*. (Boulder: Westview Press, 1980), 137.

²¹ Bailes, *Technology and Society*, 4.

comparison, the British engineering corps numbered about 40,000 in this same period.²² The Russian engineering corps grew slowly during the first ten years of Soviet power. By 1928, they numbered only about 18,000.²³

The early Bolsheviks were deeply divided among themselves about the role that the old engineers should play.²⁴ In Marxist terminology, the intelligentsia lies between the proletariat and the bourgeoisie.²⁵ The old engineering corps's position was therefore ambiguous. They were neither friend nor foe. This was problematic because the state needed the services of these "class aliens" to run the economy. There were not enough Bolsheviks with technical knowledge to run the newly nationalized industries. The proletarian revolution depended on non-proletarians to survive. This put the Bolsheviks in an awkward position: If the spetsy were to continue running the factories, it would require workers to be subordinate to non-workers on the job.²⁶ This seemed anathema to the goal of a worker's revolution. On the other hand, there was nobody competent to take their place. Firing the old specialists would mean the total collapse of the economy. This issue deeply divided the party leadership in the first decade after the revolution.²⁷

In the 1920s, the Bolsheviks perused a policy of harmony and cooperation with "class-alien elements" in their midst. This was part of a general "tactical retreat" from the press for socialism. The Russian economy was devastated after three years of civil

²² R. A. Buchanan, "The Diaspora of British Engineering," *Technology and Culture* 21, no. 3. (July 1986), 503.

²³ Fitzpatrick, *The Cultural Front*, 141.

²⁴ Lampert, *The Technical Intelligentsia and the Soviet State*, 19-20.

²⁵ Ibid, 14.

²⁶ Ibid, 20

²⁷ Ibid, 21.

war. In order to rebuild it the Bolsheviks instituted the New Economic Policy, or NEP, in 1921. Under NEP, the Bolsheviks followed a mixed economic model called “State Capitalism.” This meant that small-scale private enterprise was legalized, while the government maintained centralized control over the “commanding heights” of the economy, such as heavy industry and transportation.²⁸

The biggest beneficiaries of this policy were the peasants.²⁹ In the Civil War, the Bolsheviks had taken grain from them by force. Under NEP, the Bolsheviks abolished this forced requisitioning, requiring only that the peasants pay a modest tax in grain. Peasants could also now legally sell their excess grain on the market, though most wholesale trade was controlled by the government.³⁰ Many peasants prospered in this era, and by 1924 agricultural production had been restored to the pre-WWI level.³¹ The other main beneficiaries of “class conciliation” were the intelligentsia, especially the engineers. Lenin and other Bolsheviks courted the service of the spetsy with high salaries. Lenin also intervened to spare the lives of spetsy who were arrested by the secret police. He once explained, “One must spare a good scientist or major specialist in whatever sphere, even if he is reactionary to the n-th degree.”³² After Lenin, the cause of the bourgeois specialists was championed by Alexei Rykov, the head of state.³³ Starting in 1930, Sergo Ordzhonikidze, then head of Vesenkha, would become their main advocate.³⁴ Another

²⁸ Ibid, 13.

²⁹ Ronald Grigory Suny, *The Soviet Experiment: Russia, the USSR, and the Successor States*. (New York: Oxford University Press, 1998), 137.

³⁰ Ibid, 138.

³¹ Ibid, 157.

³² Bailes, *Technology and Society*, 48.

³³ Ibid, 141.

³⁴ Ibid, 144.

way in which the early Bolsheviks tried to win the support of the spetsy was to grant them as much independence as possible. Engineers were allowed to form their own professional organization, the VAI, or All-Russian Association of Engineers.³⁵ Unlike other trade unions in this period, the VAI was not sponsored or controlled by the Communist Party.

Engineers were not granted total independence, however. After 1923, the party began taking control of factories by putting loyal party apparatchiks in charge of them. An *apparatchik* is a professional functionary or bureaucrat of the Communist Party. This was part and parcel of the NEP policy to control the “commanding heights” of the economy.³⁶ The process was controlled by the Communist Party’s Assignments Committee, which was chaired by Joseph Stalin from 1923 onwards.

These apparatchiks in industry were called “Red Directors.” Most had no knowledge of the technology they were to supervise. According to one survey from October 1929, about 80% of the red directors did not even have even an elementary education.³⁷ What they had, in the party’s eyes, was a solid proletarian background and an unswerving loyalty to the government.³⁸ Special schools were set up in the factories to bring the managers up to grade. By 1928, only 20% of factory directors were bourgeois specialists. In practice, however, not a lot had changed in the day-to-day management of the factories. The imposition of a red director resulted in a system of “dual control” which was codified into law in 1926. The red director would act as the factory’s

³⁵ Lampert, *The Technical Intelligentsia and the Soviet State*, 25.

³⁶ *Ibid*, 22.

³⁷ Kuromiya, *Stalin’s Industrial Revolution*, 52.

³⁸ Bailes, “The Politics of Technology,” 457.

commissar, handling personnel and ideological issues. The old bourgeois director remained in charge of all the technical aspects of running the factory.³⁹ In practice, this meant that the spetsy had a great deal of independence during the NEP period.⁴⁰

Many Bolsheviks were unhappy with this arrangement. Because the old engineers were believed to be “class aliens,” some communist organizers mistrusted them. The fact that most engineers had recently worked for the Tsar made their loyalty doubly suspect. This was not the only source of tension. Many common workers resented the high salaries and privileges of the specialists.⁴¹ Lower-level party functionaries often shared this view.⁴² The party seemed to be treating the bourgeois specialists better than its own apparatchiks. The chronic shortage of food and other basic goods fed this resentment. The term “intelligentsia” was a pejorative one for many Bolsheviks of the late 20s and early 30s.⁴³

The mistrust (and distaste) cut both ways. One thing we can say for certain is that most of the spetsy did not work for the Bolsheviks out of ideological conviction. The educated classes had been almost universally hostile to the Bolshevik takeover. Many of the old specialists had belonged to the liberal Kadet Party.⁴⁴ The Kadets, (or Constitutional Democratic Party) wanted a strongly centralized, though democratic, government that could raise the living standard of the masses. The Kadets had enjoyed widespread support among the intelligentsia. Many of the old engineers were

³⁹ Bailes, *Technology and Society*, 23.

⁴⁰ Lampert, *The Technical Intelligentsia and the Soviet State*, 25.

⁴¹ Bailes, *Technology and Society*, 73.

⁴² *Ibid*, 73.

⁴³ Fitzpatrick, *The Cultural Front*, 127.

⁴⁴ Fitzpatrick, *Education and Social Mobility*, 64.

nationalistic, but otherwise apolitical. They wanted to build a strong Russia, regardless of what kind of regime was in power. As the VAI Stated in 1922, the purpose of the organization was to “Struggle for the development of the productive forces of Russia, and their restoration independently of any transient political situations...According to our view, the engineer is a citizen of the highest qualifications, boldly and honestly fulfilling his duties as a technical person and a citizen.”⁴⁵ Spetsy with a military background were especially well represented in the apolitical camp.⁴⁶

A few engineers had fled with the white armies during the civil war. Most, however, went with the current and took the well-paid jobs that the state offered them. Why did so many engineers participate in the programs of a regime that they did not support? This can partly be explained by the commonalities between the intelligentsia and Bolshevik worldviews. Most of the early leaders of the Bolsheviks had in fact come from the intelligentsia. Both camps had a long radical and revolutionary tradition. Both groups believed that they had a historical mission to uplift the masses and lead them into a perfect social order. Both had a sense of moral superiority, believing that they knew the laws of history.⁴⁷

Finally, both the old specialists and the Bolsheviks were influenced by a school of thought in the US and Europe called technocracy. In its broadest sense, technocracy means wider social responsibility for technical people, especially in the formation of

⁴⁵ Lampert, *The Technical Intelligentsia and the Soviet State*, 26.

⁴⁶ Bailes, *Technology and Society*, 23.

⁴⁷ Fitzpatrick, *The Cultural Front*, 4.

government policy.⁴⁸ It usually also means the scientific management of the economy. Technocracy appealed across class lines and across the political spectrum in the early 20th century. Though most engineers were not socialists, many of them supported the idea of rationally restructuring society and the economy.

The participation of the old specialists can also be explained partly by the Russian conception of engineering. The Tsarist engineering corps was closely tied to the Russian government. They had even worn military-style uniforms, suggesting the primacy of their service to the state. The symbol of the Tsarist engineer was a crossed wrench and hammer, worn on a military-style forage cap.⁴⁹ Catherine the Great had founded the first Russian engineering schools, in the 18th century, to manage the government's mines and smelters. Even before the revolution, almost all Russian engineers worked for the state. Service to the government was part of their conception of an engineer's role.⁵⁰ This is in marked contrast to the west, where most engineers work for private corporations.

Peter Palchinsky was one example an apolitical engineer who worked for the Bolsheviks. He was a mining engineer who had worked for the Tsarist government before the First World War. In 1915, he had helped to found KEPS, or the Council on the Study of Productive Forces. The purpose of KEPS was to increase industrial output for the Russian war effort. It was at this time that Palchinsky came to see the utility of centralized planning. After the February Revolution, he continued to work there for the provisional government. When the October Revolution came, he continued to work at

⁴⁸ Bailes, "The politics of Technology," 449.

⁴⁹ Bailes, *Technology and Society*, 136.

⁵⁰ *Ibid*, 25.

the same job. Under Bolshevik control, KEPS gradually evolved into VESENKHA, or the Supreme Council of the National Economy.⁵¹ The task of Vesenkha was to administer all the industrial plants in the USSR. Palchinsky was also an advocate for the professional independence of engineers. He was a founding member of the VAI, and even composed poetry to be read at its meetings.⁵²

While Palchinsky was not a socialist, he did share their enthusiasm for rationally restructuring society. Throughout his life, Palchinsky was committed to the idea that an enterprise was a social and economic problem, as well as a technical problem. He argued that to maximize productivity, living conditions and health of the workers needed to be guaranteed. Like the rest of the intelligentsia, he shared a concern for advancing the living standard of the Russian people. The Bolsheviks, too, were committed to this ideal, so Palchinsky continued to work for the government.⁵³ Most of his old colleagues from KEPS did the same. Palchinsky would be arrested in April 1928.⁵⁴

While the alliance of spets and red was never a warm one, the two camps were at least willing to work together on the common goal of economic development. During the NEP, there was a delicate balance of power between engineers and the party. When the Shakhty Trial was announced in March of 1928, this balance was upended for good. The lives of Russian engineers would never be the same again.

⁵¹ Bailes, "The politics of Technology," 451.

⁵² Graham, *The Ghost of the Executed Engineer*, 31.

⁵³ Graham, *The Ghost of the Executed Engineer*, 35.

⁵⁴ *Ibid*, 44.

CHAPTER 2

THE “REFORGING” OF RUSSIAN ENGINEERS

THE SHAKHTY TRIALS

On May 18th of 1928, fifty-three mining engineers from the town of Shakhty were tried for sabotage.⁵⁵ All were bourgeois specialists. Among the accused was the national head of the coal industry.⁵⁶ The methods of these supposed saboteurs included driving up production costs, disorganizing the mine, neglecting the staff, and misusing foreign equipment. The sabotage had supposedly been carried out in conjunction with foreign governments, to facilitate an invasion of the USSR.⁵⁷

The term of invective hurled at the accused was *vrediteli* (вредители). This word is usually translated as “wreckers” or “saboteurs.” It has a second meaning, however. It can also mean “vermin.” In the usage of the Russian villages, *vrediteli* were animals that spoiled grain, like rats. In a nation that was mostly peasant, or recently peasant, the word would have carried a powerful negative connotation. By calling the accused “vermin,” the prosecution could both dehumanize them and present their “crimes” in the most heinous possible light.

There is no direct evidence that Stalin framed these men, but there is strong circumstantial evidence. For one thing, it was Stalin and his henchmen who promoted

⁵⁵ Bailes, *Technology and Society*, 89.

⁵⁶ *ibid*, 89.

⁵⁷ Kuromiya, *Stalin's Industrial Revolution*, 15.

and ran the event.⁵⁸ The trial was run by Andrei Vyshinsky and Nikolai Krylenko, both close associates of Stalin. Krylenko was the state's prosecutor, while Vyshinsky served as judge. What's more, it was Stalin and his camp that benefited most from the trial. Their rhetoric determined how the public came to see the event. They also used it to successfully push their agenda.

The trial was held in Moscow, at a former nobleman's club. The event had been publicized two months beforehand, and the hall was packed with spectators. Eugene Lyons, an American reporter, recalls an almost carnival atmosphere.

“Sputtering Jupiter lights played on the scene, photographers and cinema cameramen maneuvered their equipment into position, nearly a hundred foreign and Soviet reporters settled down at the foot of the high rostrum. Only a row of trimly uniformed GPU soldiers at rigid attention in front of the prisoner's box, their fixed bayonets glinting in the floodlights, added a note of grimness to the carnival.”⁵⁹

Krylenko, the prosecutor, played his part with a sinister flare and gusto. He was dressed in old-fashioned hunting clothes, like a game warden from some nobleman's estate. Perhaps this was to celebrate the trapping of so many “vermin.” To add to the drama of his appearance, he had also shaved his head, which shone iridescently under the spotlights.⁶⁰ The guilt of the accused was taken for granted, as it had supposedly been established by the OGPU investigation beforehand. The point of the trial was for the accused to confess in public their crimes against the state. According to Lyons, ten of the

⁵⁸ Ibid., 15. See also Bailes, *Technology and society*, p. 70 and Robert C. Tucker, *Stalin in Power*, p. 77.

⁵⁹ Eugene Lyons, *Assignment in Utopia*, (New York: Twin Circle publishing), 42.

⁶⁰ Ibid, 44.

accused had confessed their “crimes” before the trial and denounced the others. Six more had merely confessed their own guilt.⁶¹

There is evidence that these “confessions” were wrung out of them by duress or by torture. One of the defendants had a mental breakdown during the trial, which resulted in him missing one day in court. As his lawyers explained, he “was suffering from hallucinations and had been placed in a padded cell, where he screamed about rifles pointing at his heart and suffered paroxysms.”⁶² One of the prisoners tried to renounce his confession at the trial, crying out, “I scarcely know what I signed...I was driven to distraction by threats, so I signed...”⁶³

In any event, almost all played the role assigned to them, and confessed their “guilt” before the world. According to Lyons, “The Shakhty men were pilloried not merely for their own alleged misdeeds, but for the whole embittered, rebellious intelligentsia.”⁶⁴ He went on, “It was the indubitable guilt of their class that was being demonstrated...they were merely a batch of exhibits, the best that could be gathered at the moment, to impress the populace with the fact that the revolution was still honeycombed with dangerous enemies.” In the end, thirty-eight of the defendants were sentenced to prison, in terms ranging from one to ten years. Four were completely acquitted. Eleven of the defendants were sentenced to death. Of those eleven, six had their sentences commuted to life in prison. Only five of the fifty-three original

⁶¹ Ibid, 46.

⁶² Ibid, 45

⁶³ Ibid, 51

⁶⁴ Ibid, 43

defendants were actually executed.⁶⁵

These are the basic facts of the trial. Why would engineers be targeted for persecution? They were not the only “class alien elements” in Soviet society. As mentioned above, the spetsy were widely disliked by ordinary workers and apparatchiks. Stalin probably calculated that he could gain their support by attacking the old specialists. Another possible reason is that the old engineers tended to oppose rapid industrialization, one of Stalin’s most important policy goals.⁶⁶ By painting them as wreckers, Stalin could discredit their position and built support for his own policies.

At the April 13th 1928 Joint Plenum of the Central Committee and the Central Control Commission, Stalin spoke at length on the Shakhty Affair. The trial itself would not begin for another month, but the “guilt” of the defendants had already been decided by the secret police. It was Stalin who set the tone, and determined the long-term significance of the Trial before it even opened.

The importance of the Shakhty Trial is not the arrests themselves, but the fiction these arrests created. The “unveiling” of the Shakhty conspiracy created a fiction of enemies within the borders of the USSR. What’s more, these enemies were working with the very real enemies outside the USSR. It was part of the international class struggle. As Stalin put it, “We have internal enemies. We have external enemies. This, comrades, must not be forgotten for a single moment...It need scarcely be said that these and similar attacks, both internal and external, may be repeated and in all likelihood will be repeated.

⁶⁵Kuromiya, *Stalin’s Industrial Revolution*, 15.

⁶⁶Lampert, *The Technical Intelligentsia and the Soviet State*, 48.

Our task is to exercise the maximum vigilance and to be on the alert.”⁶⁷

Having convinced the delegates of this threat, he then used it to justify his agenda. Though he didn't state it in these terms, Stalin pushed for the end of class conciliation, characteristic of the NEP, and the beginning of proletarianization. As mentioned above, on the eve of the Shakhty Trial there was an uneasy division of authority in production between the red director and the chief engineer. To Stalin, the power of the bourgeois specialists in industry was a dangerous liability. “What was the class background of the Shakhty affair?” he asked. “The facts show that the Shakhty affair was an economic counter-revolution, plotted by a section of the bourgeois experts, former coal owners...”⁶⁸

The solution, said Stalin, was to create a new intelligentsia, one that was working class in its background and working class in its loyalty. To implement this plan, Stalin proposed four measures. The first was to place all power in the hands of the red directors. This became known as “One Man Management.” The engineer was deprived in one stroke of much of the decision-making power he had held before. All technical decisions now needed to be ratified by the red director. Stalin justified this disempowerment of spetsy by stating that it would force the red directors to master new technology.⁶⁹

His second proposal was to improve the quality of technical education. Third, he proposed to recruit more managers from among the working class. Lastly, he proposed to increase “checking up on fulfillment.” By this he meant sending members of the top party

⁶⁷ Stalin, *Works*, (Moscow: Foreign Languages Publishing House, 1954), 11:67-68.

⁶⁸ *ibid*, 57.

⁶⁹ *ibid*, 62.

leadership to ensure that directives and quotas were being fulfilled.⁷⁰ This job would soon come to be carried out by the OGPU and by RABKRIN. Rabkrin was another Soviet acronym. It stood for “Workers’ and Peasants’ Inspectorate.” Rabkrin’s job was to inspect the industrial management and ensure that they were meeting their production quotas. In practice, the OGPU would often handle this duty as well.

The “proletarianization” of the engineering corps can be dated from the April plenum. The state set out to reconstitute an entire class, to “reforge” it into something that was loyal and committed to the cause of socialism. Stalin put it even more stridently in a speech to the July plenum of the Central Committee:

...Old experts who are prepared to work hand in hand with the Soviet government are becoming relatively fewer and fewer. The point is that it is absolutely necessary to have a new force of young experts to succeed them. Well, the Party considers that the new replacements must be brought into being at an accelerated rate if we do now want to be faced with new surprises, and that they must come from the working class, from among the working people. That means creating a new technical intelligentsia capable of satisfying the needs of our industry.”⁷¹

Stalin’s proposals were duly approved, and began to take effect in 1929.⁷² The “sabotage” at Shakhty had made proletarianization seem necessary. Now, the reform of technical education would make it possible.

⁷⁰Ibid, 61-66.

⁷¹Ibid, 225.

⁷² Loren Graham, ed., *Science and the Soviet Social Order*. (Cambridge, MA: Harvard University Press, 1990), 151.

THE REFORM OF TECHNICAL EDUCATION

The pyatiletka was a vast project, almost unimaginable in scale. To build the new economic system would require the service of thousands of technical personnel. The shortage of such personnel was one of the biggest obstacles to the development of the new economy. Once built, the new plants would require still more experts to run them. This required a fast and streamlined “production process” in technical education.

All across the union, the industrial commissariats set up technical schools to train engineers for their particular needs. These institutes were known as VUZy. Engineering was usually a five-year program, but in times of desperate need, this course was shortened.⁷³ The expansion and “proletarianization” of technical education was one of the biggest factors in transforming the Russian engineering corps. It enormously expanded the size of the corps, and also changed its composition.

The working class was targeted for recruitment to the new engineering corps. This began with a decree passed by the party in July 1928, which ordered a special mobilization of one thousand party members for study in engineering schools. Further, it decreed that every recruit in this pool must have four or five years experience as a party or trade union organizer.⁷⁴ The same decree also required that 65% of all students at the new engineering schools should be workers or children of workers. In the end, the

⁷³ Stephen J. Duskin, *Stalinist Reconstruction and the Confirmation of a New Elite* (New York, Palgrave McMillan, 2001), 42.

⁷⁴ Fitzpatrick, *Education and Social Mobility*, 184.

percentage was closer to 79%⁷⁵. By the end of the first pyatiletka, there were over 151,000 proletarian students in higher education.⁷⁶

Soviet sources disagree over how large these first levies were. According to one source, over the course of the first pyatiletka, over 110,000 party members, about one out of every ten, entered higher education. Two thirds of these went into engineering schools.⁷⁷ Another source puts the number at a mere 10,000.⁷⁸ The party didn't simply recruit these people. It also provided stipends, so that they could study full time. Meager though these stipends usually were, in aggregate they represented a huge investment on the part of the state. This demonstrates how seriously the leadership took proletarianization. The “production” of new specialists was even budgeted into the pyatiletkas as a form of “output.”⁷⁹ The trade unions also raised “levies” of engineering students. By the end of the pyatiletka, the trade unions had recruited around 10,000 party members to higher education, and almost 4000 non-communist workers.⁸⁰ Others joined of their own accord.

A huge new management class emerged. The newly educated worker was called a *выдвиженец*, (*vidvizhenets*) which means “promote.” The term was also used in reference to uneducated workers who had been promoted to management positions. These “new people” were generally very loyal to the Soviet state, and enthusiastic about

⁷⁵ Ibid, 184.

⁷⁶ Ibid, 187

⁷⁷ Fitzpatrick, *Education and Social Mobility*, 187.

⁷⁸ Fitzpatrick, *The Cultural Front*, 159.

⁷⁹ Duskin, *Stalinist Reconstruction*, 55.

⁸⁰ Fitzpatrick, *The Cultural Front*, 159.

its goals.⁸¹ By 1933, there were around 60,000 new engineers who had graduated during the first pyatiletka.⁸² They vastly outnumbered the old engineers, and made them aware that they could be replaced by someone else at a moment's notice. The Tsarist engineering corps had been only about 15,000 strong. During the first pyatiletka alone, the number of engineers employed in industry rose from 18,000 to 74,000. Overall, the number of professionals employed by the state rose from 63,000 to 119,000.⁸³ This means that the number of engineers in industry almost quadrupled. By comparison, the total number of professionals was a little less than doubled. This indicates that the engineering corps was growing faster than any other professional group. By the late 1930s, the corps had grown to over 250,000.⁸⁴ In other words, this group grew by *16 times* in the course of only twenty years. The most astounding thing about these new student bodies is that 60% of them were over thirty when they entered higher education.⁸⁵ People who thought that they would die as simple workers suddenly had a chance to become educated.

The vast majority of the state's need for technical expertise was met by less skilled personnel. Besides engineers, there were two other categories of ITRs recognized by the state. Those who had learned their skills on the job were called *praktiki* ("practitioners"). They were the lowest rung of the technical intelligentsia. The *praktik* worked in production or construction. He would learn to do a specific job, like surveying,

⁸¹ Ibid, 12.

⁸² Bailes, *Technology and Society*, 221.

⁸³ Fitzpatrick, *The Cultural Front*, 141.

⁸⁴ Bailes, *Technology and Society*, 4.

⁸⁵ Ibid, 184.

for example. During the first pyatiletka, over half of need for new technicians was filled by praktiki with no formal qualifications.⁸⁶ Huge numbers of Praktiki were also promoted “from the bench” to be foremen. In the first pyatiletka, praktiki could even be promoted to white-collar management.

Above the praktiki in this hierarchy were personnel called “Technicians of Intermediate Grade.” These were as narrowly specialized as the praktiki, but had graduated from a trade school called a *tecnicum*. The vast majority of the state’s need for technical knowledge was filled by tecnicums, which offered three to four year programs in a very specific task. Tecnicums straddled the line between secondary and higher education. In the American system, a tecnicum would cover the last two years of secondary school, and the first two years of university. The graduate would receive a certificate as a specialist, and would go to work as a junior manager or a foreman in production.⁸⁷

In total, the state boasted that 170,000 specialists graduated from VUZy during the first pyatiletka.⁸⁸ This number includes both engineers and technicians. Given that these are official Soviet sources, all of the recruitment figures above are probably inflated. The important thing is that large numbers of people were upwardly mobile during this period, and this built support for the state.

⁸⁶ Ibid, 202

⁸⁷ Stephen Lament, “A Survey of the Soviet Engineering Industries,” *Soviet Studies* 5:4 (1954) 341.

⁸⁸ Fitzpatrick, *Education and Social Mobility*, 245.

The influx of new engineering students was not enough in itself to change the character of the engineering corps. A second, and more important, factor was the change in curriculum that took place beginning in 1929. It was here that Soviet engineering began to diverge from that of the west. Red engineers were as narrowly specialized as the technicians they worked with.⁸⁹ What made the new curriculum different was the incredible degree of specialization. Prior to 1929, there had been little to no specialization in the Russian engineering profession.⁹⁰ In the era of the pyatiletkas, specialized subfields multiplied exponentially. Between 1928 and 1931, there was constant pressure from above for shorter training times and greater specialization.⁹¹ By 1936, there were about 900 different specialties.⁹² Over 111 of these revolved around designing machines. For example, an engineering student in this period could receive a degree in locomotive design. A different degree was needed to design railcars.⁹³

This crash-education was greatly inferior to that which the old specialists had received. In the context of the pyatiletka, however, better training was probably impossible. The hyperspecialization of Soviet engineering was largely caused by the relationship of each VUZ to a particular industrial commissariat.⁹⁴ A VUZ was established to provide a commissariat certain kinds of specialists. There seemed no reason to invest scarce resources on theory that was not immediately needed. Not only that, the commissariat needed its specialists yesterday. The breakneck speed of

⁸⁹ Duskin, *Stalinist Reconstruction*, 46.

⁹⁰ Lament, "A Survey," 336.

⁹¹ Fitzpatrick, *Education and Social Mobility*, 189.

⁹² Graham, ed., *Science and the Soviet Social Order*, 154.

⁹³ Duskin, *Stalinist Reconstruction*, 47.

⁹⁴ *Ibid*, 47.

industrialization was another reason for the narrow focus of Soviet engineers.⁹⁵ It takes less time to train a recruit for a specific task than it does to instill the broader principles of science and problem-solving.

Broader education was available at universities, but these were the most exclusive of all the institutes.⁹⁶ University training emphasized the study of theory, and maintained the same high standards of training that the old engineering corps had possessed. These programs were oriented more towards research than production, however. They were also intended to staff the economic planning organs.⁹⁷ For most production engineers, hyperspecialization was order of the day.

This was not the only reason for the inferiority of the new education. Standards for admission and graduation at VUZy were very low in the first half of the 1930s. This was consistent with the regime's goals of including as many proletarians in the new management cadres as possible. The poor conditions in the student barracks and the need to engage in party work also detracted from the quality of education at the new VUZy. As a result, incompetence was rampant at all levels of industry in this period.⁹⁸ Factory managers complained that these new engineers were often ill-educated, "on the level of technicians."⁹⁹ While the overall number of engineers on the ground expanded enormously, the overall quality level dropped. Like other Soviet products in this period, many of the new engineers were shoddy and hastily made.

⁹⁵ Graham, ed. *Science and the Soviet Social Order*, 152.

⁹⁶ Duskin, *Stalinist Reconstruction*, 48.

⁹⁷ *Ibid*, 48.

⁹⁸ Graham, ed. *Science and the Soviet Social Order*, 156.

⁹⁹ *Ibid*, 151.

Zara Witkin noted a similar degree of incompetence. In his memoirs he describes a technical council he attended in 1932. Witkin was horrified to discover that none of the ‘engineers’ could do a cost analysis, or calculate how much of any given material was needed to build a structure.¹⁰⁰ John Scott described in detail one such incompetent, his boss Syemichkin. (Scott does not give Syemichkin’s first name or patronymic.) Syemichkin graduated in 1932, after a “superficial” course in engineering. Scott describes him as “ill-educated,” but adds that he worked hard and gained experience and confidence on the job. He would become assistant chief engineer of Magnitogorsk after the purges of 1936.¹⁰¹ This illustrates an important point: the new engineers learned as much by experience as by bookwork. Those that survived often learned to do their narrow jobs well.

Theory was not the only weakness of the new engineering programs. They were also devoid of any training in business management or business economics.¹⁰² This is strange, considering that the engineer was often thrust into the role of a managing a plant, or even an entire kombinat.¹⁰³ It was in this aspect in particular that the education of Soviet engineers differed from their American counterparts. As mentioned above, Western engineers are trained not only to solve technical problems but to evaluate the cost-effectiveness of various solutions. This is fundamental to an engineer’s task in the west. Before 1929, Russian engineering students received the same training as engineers

¹⁰⁰ Zara Witkin, *An American Engineer in Stalin’s Russia: The Memoirs of Zara Witkin, 1932-1934*. (Los Angeles: University of California Press, 1991), 75.

¹⁰¹ John Scott *Behind the Urals: An American Worker In Stalin’s City of Steel*. (Bloomington, IN: Indiana University Press, 1942) 161.

¹⁰² Graham, *The Ghost of the Executed Engineer*, 72.

¹⁰³ A *kombinat*, or combine, is a large industrial enterprise that incorporates several smaller enterprises.

in America or in Germany. The new cadres who entered VUZy in 1929 were not trained to compare multiple solutions to a given problem, nor were they expected to. In the Stalinist command economy, the economic planners decided what technology to use, and in what context.

IN THE GLOVES OF YEZHOV¹⁰⁴

Just as broader thinking was removed from the curriculum, it was largely removed from the role that engineers were expected to play. The biggest difference was that the new role had none of the planning or budgeting responsibilities once carried by the old specialists.¹⁰⁵ The role of planner and the role of technical worker were increasingly separated.

Meanwhile, the roles of an engineer and a technician were becoming closer and closer. The “technician of intermediate grade” would not be considered an engineer, but he filled an almost identical role, as a “production specialist” managing a factory or a mine.¹⁰⁶ The red engineers often complained that they were ordered to do a technician’s work. The near-interchangeability of these roles illustrates the narrow limit of action expected of the production engineer. By 1932, the word “engineer” had become an all-inclusive term for anyone with technical knowledge.¹⁰⁷ For example, a young geologist,

¹⁰⁴ Nikolai Yezhov was an officer of the OGPU, who would become head of that organization in 1936. “In the gloves of Yezhov” is a Russian colloquial expression meaning complete control or domination of someone.

¹⁰⁵ Duskin, *Stalinist Reconstruction*, 46.

¹⁰⁶ *Ibid*, 44-45.

¹⁰⁷ Lyons, *Assignment in Utopia*, 205.

Leonid Potemkin, often referred to himself as an “engineer” in his memoirs.¹⁰⁸

In production, an engineer would be assigned a very narrowly defined role, for which for which his narrow education had prepared him.¹⁰⁹ For example, he might be ordered to build a hydroelectric dam at a specific place determined by the economic planners. He would not be consulted as to whether the location was suitable for a hydroelectric dam, or even on whether a hydroelectric dam was the best choice for the economic goals of the region.

Stalin explained his view of the proper place of technical people in an interview with H. G. Wells in 1934. Wells began the interview by noting the similarities between the management philosophy of the New Deal in America and that of the Pyatiletka. He even suggested that America was heading down a socialist path itself. “The introduction of planned economy depends,” Wells said,

“To a large degree, upon the organizers of economy, upon the skilled technical intelligentsia, who, step by step, can be converted to the socialist principles of organization. And this is the most important thing. Because organization comes before socialism. It is the more important fact. Without organization, the socialist idea is a mere idea.”¹¹⁰

Karl Marx could not have said it better. Stalin, however, dismisses the idea that the technical intelligentsia could, by itself, make a difference in the struggle for socialism. The reason for this, Stalin explains, is that they are not a real class, but merely a stratum

¹⁰⁸ Hellbeck, *Revolution On My Mind*, 272.

¹⁰⁹ Duskin, *Stalinist Reconstruction*, 44.

¹¹⁰ Constantine Oumansky, ed. *Joseph Stalin and H. G. Wells, Marxism VS. Liberalism: An Interview*. (New York, New Century Publishers, September 1937; reprinted October 1950), 291.

of the bourgeois. “Capitalism will be abolished, not, by ‘organizers of production,’ not by the technical intelligentsia,” said Stalin, “but by the working class, because the aforementioned strata do not play an independent role.”¹¹¹ Stalin is referring to the Marxist concept that only classes as a whole can be historical actors.

What then, is the role, of the engineer? Stalin continues, “*The engineer, the organizer of production, does not work as he would like to, but as he is ordered, in such a way as to serve the interests of his employers.*”¹¹² (My emphasis) This sentence seems to sum up Stalin’s attitude towards the technical intelligentsia in one stroke. While Stalin is the last person on earth who should be taken at his word, the actual practices of Soviet industry suggest that this is what Stalin really thought.

This philosophy was reflected in the narrow sphere of influence granted to engineer-managers on the factory floor. As the command economy grew in complexity and centralization, the sphere of influence for each engineer shrank. The most startling example of this is that most engineers in this period did not have the authority to implement improvements to the production process. For example, an engineer would be expected to manage a blast furnace in exactly the same way as his predecessor. A hydroelectric engineer would be expected to build dams according to designs that were already proven. Any change production technique, even one that would save considerable time and resources, required approval from above.

¹¹¹ *Ibid*, 291.

¹¹² *Ibid*, 292.

As one spets put it, “The Chief engineer of a large factory is not a “chief” in the sense that he is in the rest of the world. He cannot do what he wants, what is best for his factory. He must go through many different channels to get anything done... There is so much red tape and restrictions. It goes around and around you.”¹¹³ To make any change in production technique, one had to appeal very high up. For much of the 1930s, Soviet industry was organized into ministries, or *commissariats*. The head of each commissariat sat in a governing body called the *Council of People’s Commissars*. This was one of the highest non-party governing bodies in Soviet Russia. If a manager wanted to change anything, he had to apply to the office of the Commissariat responsible for his factory.¹¹⁴ This would be equivalent to an American factory manager needing to appeal to his congressman every time he wanted to improve something. “Only the least important things in the factory could be changed without having that permission,”¹¹⁵ said the spets.

These approvals were often excruciatingly slow in coming. Sometimes, the applications were not processed at all. Avoidance of responsibility was endemic in management during this period. Zara Witkin’s first encounter with industrial bureaucracy came in May of 1932, when he completed his first project in Russia: the design for a lumber storage depot. It was not a particularly complicated or risky design. Nevertheless, he spent three days trekking from office to office, searching in vain for

¹¹³ Harvard Project, Case 338, A Schedule, vol. 17, p. 8.

¹¹⁴ *Ibid*, 10.

¹¹⁵ *Ibid*, 38.

someone who would take responsibility for approving his plans.¹¹⁶ After struggling with the morass of red tape for two years, Witkin left Russia in disgust in 1934. At the conclusion of his memoirs, Witkin wrote,

“The creative engineering mind, accustomed to pitting imagination, skill and initiative against the difficulties of great constructive tasks, cannot function against the devious and stifling Soviet bureaucratic control... The attrition of the bureaucracy wore down the strongest among them and reduced their great potential contributions to tragic collections of vanished hopes.”¹¹⁷

Is this characterization of Soviet industry credible? Witkin summarizes the situation in a fairly melodramatic way. As it turns out, official sources back his observations. A 1931 report from the Donbas region of Ukraine put it this way:

“They don’t like taking risks in production in the Donbas. It has become a rarity, and many specialists *avoid* it with the greatest care. Even in those cases where a quite responsible specialist introduces a valuable suggestion... he waits until *somebody* takes the initiative in implementing the suggestion or measure. The only form of initiative that is permissible in the mine is action “on orders from above.”¹¹⁸

It seems that Stalin’s vision of the engineer as someone who “worked not as he liked, but as he was ordered” had come true. In fact, it exceeded his expectations. Engineers had reached a level of paralysis beyond his wildest dreams. We should not be surprised to hear that no one was willing to make a decision or take responsibility for its consequences. In Stalin’s factories, the stench of fear mingled with that of the blast furnace and the foundry. For all engineers, regardless of their political background,

¹¹⁶ Witkin, *An American Engineer in Stalin’s Russia*, 75.

¹¹⁷ *Ibid*, 312.

¹¹⁸ Quoted in Fitzpatrick, *Education and Social Mobility*, 215.

industrial management was a career fraught with danger. Once the concept of wrecking had entered the public consciousness, the authorities seemed to see it everywhere.

As John Scott put it, “The fact is that all actions which the Soviet authorities consider detrimental to the national economy constitute wrecking.”¹¹⁹ Wrecking was defined so broadly that any kind of failure could lead to a charge of wrecking. Even being “indifferent” to party directives could count.¹²⁰ The state did not clearly distinguish between incompetence, negligence, and sabotage. Scott reports that after 1931 any fatal accident was treated as wrecking. The penalty, according to article 58-7 of the Soviet criminal code, “involves the supreme measure of social protection-shooting.”¹²¹ There were a lot of breakdowns and disruptions of production in this period, so there was a lot of blame to go around. The director, especially the technical director, would often be made a scapegoat for these failures.¹²²

The job of an engineer in production was accompanied by incredible pressure to produce. Given that managers were dependant on a sluggish bureaucracy to get the raw materials they needed, this was a recipe for severe stress and worry. One red engineer reported being forced to leave engineering because the stress was too much for him. He was a construction engineer who worked for a coal mining kombinat in Siberia. He was also a member of the Communist Party. “When I came to production, I gave all I could,” he said.

¹¹⁹ Scott, *Behind the Urals*, 290.

¹²⁰ Lampert, *The Technical Intelligentsia and the Soviet State*, 95.

¹²¹ Quoted in Scott, *Behind the Urals*, 192.

¹²² Lampert, *The Technical Intelligentsia and the Soviet State*, 91.

“I made the greatest efforts to fulfill my duties. I did it as a party member and a chief. However, as much as I tried to fulfill what I was asked...I never could do it. I worked fourteen, sixteen eighteen hours a day. I sometimes slept in the mine...I saw that we engineers are blamed for non-fulfillment...With personnel and machines as low as 50% of that foreseen by the plan, I still fulfilled 60, 70, sometimes 100%. Yet my supervisors were never satisfied...If you can't fulfill, they don't care. The party says 'You are a Bolshevik, the party has put its confidence in you.' They do not take into account that you cannot do it. This is especially true in the party organs.”¹²³

This engineer was lucky in that he was never arrested. If an engineer-manager did not fulfill his quota, the consequences could be deadly. Another engineer said, “If the plan is not fulfilled and production is disrupted, the director is 80% sure to be removed and tried.”¹²⁴ A geodesic (surveying) engineer concurred with this statement when describing why he would never want to work in a factory. Any flaw in the work, he said, was politically dangerous. “For a plant engineer, if a turbine is wrongly made, he may be arrested.”¹²⁵ Still another stated, “In any position in the Soviet Union there is a fear that at some time you will be called a saboteur. That something dark will be found in your past and that this will be the end of your career. These people feel that they do not know whether they are under observation or not.”¹²⁶

By 1930 both generations of engineers had been placed under supervision by control aparaty on the job. This gave rise to a factory proverb: “While one man works, five investigate.”¹²⁷ In factories, engineers were watched by both Rabkrin and the OGPU. The OGPU was the more feared of the two watchdogs. By 1930, the chaos and collapse of industry forced the OGPU to directly supervise production. Every factory had an

¹²³ Harvard Project, Case 470, B Schedule, vol. 5, p. 1-2.

¹²⁴ Harvard Project, Case 427, B Schedule, vol. 19, p. 2.

¹²⁵ Harvard Project, Case 430, B Schedule, vol. 5, p. 2.

¹²⁶ Harvard Project, Case 144, B Schedule, vol. 21, p. 7.

¹²⁷ Bailes, *Technology and Society*, 122.

OGPU cell in residence.¹²⁸ In their trench coats and blue caps, they prowled the factories for signs of wrecking. They hovered over every aspect of production, like working-class angels of death. The effect of their presence on the nerves and concentration of the workers can only be imagined.

CRIME AND PUNISHMENT

As proletarianization progressed, so too did the campaign of terror against engineers. Suspicion of them as a class was widespread after Shakhty. An OGPU report from June 1928 states that twenty out of the forty engineers in Smolensk were suspected of subversive activities. However, it requested that “The specialists not be pulled out in bunches, but gradually, so as not to denude industry.”¹²⁹ By mid-1931, about half of all ITRs in the Donbas region were in prison.¹³⁰ On orders from the center, each region conducted its own investigations and arrests. They were expected to uncover more conspiracies like the one that was “unveiled” at Shakhty. A soap factory in Kazan was even rebuked by the center for failing to make arrests.¹³¹

In 1931, in the Moscow region alone there were 2,520 specialists charged in 1,620 cases.¹³² In 1929 and 1930, the OGPU made arrests in every branch of industry. In February 1930, Kuibyshev, head of Rabkrin, declared that “There is not one branch of

¹²⁸ Kuromiya, *Stalin's industrial Revolution*, 170.

¹²⁹ Fitzpatrick, *The Cultural Front*, 129.

¹³⁰ Bailes, *Technology and Society*, 150.

¹³¹ Fitzpatrick, *The Cultural Front*, 130.

¹³² *Ibid*, 101.

industry where wrecking organizations have not been created with quite definite directives from abroad.”¹³³ Higher-level spetsy were disproportionately targeted, but a number of red engineers were arrested as well.¹³⁴

Over the course of the first pyatiletka, somewhere between 2000 and 7000 engineers were arrested. The lower number is the one stated by Soviet sources. The higher number comes from a Menshevik party newspaper that had sources inside Russia. Both of these sources agree that the majority of those arrested were university-trained engineers working in heavy industry. According to Kendal Bailes, this group numbered only a little over 10,000 to begin with.¹³⁵ If the higher number is correct, it would mean that about 70% of the spetsy in factories were arrested during this time. Lacking more documents from the OGPU, it is impossible to know the real number. It is also impossible to know how many of these were acquitted, and how many of the “guilty” were shot or imprisoned.

One common fate of those arrested was to be used as forced labor by the OGPU. They became “prisoner specialists” in the gulag system. Many of the engineers imprisoned after the Shakty trial returned to production shortly afterwards as forced labor. Precise numbers are unavailable, but it appears that the use of prisoner specialists was a very widespread phenomenon. The White Sea (Belomor) Canal, for example, was built entirely by forced labor, from the engineers to the common laborers. Even the project’s

¹³³ *Ibid*, 41.

¹³⁴ Davies, *The Soviet Economy in Turmoil*, 117.

¹³⁵ Bailes, “The Politics of Technology,” 446.

chief engineer, N. I. Khrustalev, was a prisoner. He had been convicted of wrecking, and now found himself in charge of the largest canal project in Russia.¹³⁶

One red engineer reported that prisoner specialists were sometimes brought in by the OGPU/NKVD as industrial consultants, even in the late 1930s. “They could use the services of the NKVD, who had engineers among its prisoners,” he reported.¹³⁷ Even in the gulag, engineers had a semi-elite status, and were given a ration that was better than that of the other prisoners. This extra ration, of course, could be taken away if they did not do what they were told. In some places, they seem to have lived rather well.

John Scott describes the lives of several prisoner specialists that he worked with on the construction of Magnitogorsk. He records that they worked side by side with the free labor, though always under the watchful eye of an OGPU agent. According to Scott, forced labor made up about 30% of the labor force that built Magnitogorsk.¹³⁸ There were 20-30 prisoner specialists working at Magnitogorsk in 1932, when Scott arrived. Most had been swept up the wake of the Industrial party trial, and many had held high positions in government before the trial.¹³⁹ They were given the best apartments available, automobiles or carts for their personal use, and high salaries. One prisoner specialist whom Scott knew well was Ilya Gavrilovich, the chief electrician of the construction site. He made 3000 rubles a month, and had a horse and cart for his

¹³⁶See Graham, *The Ghost of the Executed Engineer: Technology and the Fall of the Soviet Union*.

¹³⁷ Harvard Project, Case 480, B Schedule, p. 7.

¹³⁸ Scott, *Behind the Urals*, 289.

¹³⁹ *Ibid*, 288.

personal use. Another prisoner specialist, Georgy I. Bulgakov, was allowed to keep a wife, and even to go hunting.¹⁴⁰

Scott claims that all of the prisoner specialists were fed reasonably well, on black bread, cabbage, potatoes, and a little meat. This may sound like a lean diet, but it was much better than that of the common workers at Magnitogorsk. When one considers that literally millions of people were starving at this time, it even seems luxurious. The typical sentence for a prisoner specialist in Scott's time was six months to five years. They were told they could redeem themselves by hard work.¹⁴¹ Even so, Scott reports that ten of the prisoner specialists received new sentences during the Great Terror, and were shipped off to new construction projects in the east.

It's impossible to know, at present, how many people were arrested and what happened to them. The important thing is that it was a widespread phenomenon, and the spetsy began to fear for their lives. According to Lyons some people even kept a suitcase packed, expecting to be arrested any minute.¹⁴² This wave of terror against the engineers would reach its peak in the Industrial Party Trial of 1930.

¹⁴⁰ *Ibid*, 296.

¹⁴¹ *Ibid*, 285.

¹⁴² Lyons, *Assignment in Utopia*, 141.

THE INDUSTRIAL PARTY TRIAL

We will begin with “Just the facts.” Between November 25th December 7th, the Industrial Party Trial captivated the nation. No trial would be so heavily publicized, until the great purge of the late 30s.¹⁴³ Eight engineers were the main defendants. Again, all of these men were “bourgeois specialists.” The supposed conspiracy was remarkably similar to that of the Shakhty Trial. Along with 2000 other engineers (who were not named at the trial) these eight were charged with conspiring to sabotage industry, take over the government and allow foreign armies to invade the USSR. This conspiracy was known as “The Industrial Party,” or *Prompartiya*. Foreign corporations and governments were said to be plotting the invasion, along with an émigré group called Torgprom. Even Lawrence of Arabia was implicated in the plot.¹⁴⁴

The defendants were almost certainly innocent. The only evidence presented was the men’s own confessions, or the testimony of other engineers who had been in prison for some time before the trial.¹⁴⁵ As we will see, many of these testimonies were obtained through torture. One of the central figures of the trial was Peter Palchinsky. He was listed as “an early leader of the plotter’s organization.”¹⁴⁶ While this is almost certainly false, he had known all of the main defendants socially. Like many of the defendants, he had been in KEPS. He was also a founder of the VAI, or All-Union Association of Engineers. Palchinsky was well connected, but there is no real evidence that he was forming a conspiracy against the government. Palchinsky, however, was not

¹⁴³ Bailes, “The Politics of Technology,” 446.

¹⁴⁴ Tucker, *Stalin in Power*, 99.

¹⁴⁵ Bailes, “The Politics of Technology,” 447.

¹⁴⁶ Tucker, *Stalin in Power*, 99.

present in the courtroom. He had been arrested before the trial, in April 1928. For some reason he was not part of the Shakhty Trial, perhaps because he refused to cooperate. In 1929, he had been shot at the Butyrka prison in Moscow. None of this had been public knowledge until it was published in the newspapers during the Industrial Party Trial. It was in this way that Palchinsky's wife, Nina, learned that her husband was dead.¹⁴⁷

Public opinion was at a fever pitch, fueled by the crippling shortages of food and fuel.¹⁴⁸ On November 25th, huge crowds of workers had marched past the courthouse, under banners that read "Kill the Wreckers!" They chanted "Death! Death! Death!" their voices loud enough to be heard inside.¹⁴⁹ In the end, all eight were convicted of industrial sabotage, though none were sentenced to death. One of the Defendants, Leonid K. Ramzin, would later be released and rehabilitated.

This was probably due to his lavish cooperation. On the opening day of the trial, Ramzin had testified to his political sins for three hours. He outlined the main points of the plot, and denounced his colleagues as co-conspirators.¹⁵⁰ In closing, he said "We came to court not to defend ourselves but to capitulate. I am happy I confessed. My soul is quieter."¹⁵¹ Ramzin was allowed to continue his experiments in prison. In 1943, he was awarded the Stalin Prize for one of his inventions, and was allowed to return to his old job as a professor. He died a natural death in 1947.¹⁵² The rest of the defendants

¹⁴⁷ Bailes, "The Politics of Technology," 452.

¹⁴⁸ Ibid, 166.

¹⁴⁹ Lyons, *Assignment in Utopia*, 166.

¹⁵⁰ Ibid, 167.

¹⁵¹ Ibid, 172.

¹⁵² Bailes, "The Politics of Technology," 460.

were given prison sentences of various lengths. The trial marked the high-water mark of the regime's "class struggle" against the bourgeois specialists.

TERROR AS AN OBJECT LESSON

Why would such a brutal campaign of terror and intimidation take place? What was the state thinking when it unleashed its fury on the very people it needed most? As noted in the historiography section, there is a plethora of opinions among historians as to why the terror took place. Most historians agree that Stalin was the driving force behind the terror. Most also agree that he had multiple motives, disagreeing only on what was most important in Stalin's mind. In sifting through this discussion, there are a few common themes that emerge.

The first is that Stalin used the trials to gain support for his agenda. We've already discussed how Stalin used the fiction of internal enemies to justify his agenda of proletarianization. The massive media coverage at the show trials ensured that the masses got the same message. As Hiroaki Kuromiya demonstrated, the masses seem to have accepted this "class war" ideology and rallied around the state.

The second common theme is that Stalin used it to discredit his opponents, or anyone else who opposed his line. Sheila Fitzpatrick was the first, in 1974, to examine how Stalin used the show trials, and the fictitious enemies they created, as a political weapon. There is strong evidence that this was an important priority of Stalin's. For one thing, it's clear that Stalin was running the show in the Industrial Party Trial. It was he

who ordered the arrest of Leonid K. Ramzin, the chief defendant of the trial. In late August 1930, Stalin wrote that “Sukhanov, Bazarov and Ramzin must definitely be arrested...**All** testimonies without exception must be distributed to Central Committee members.”

Stalin then went on to discuss the best way to publicize these testimonies. He ordered that they be published with an introduction from the OGPU, with an official interpretation. He wanted to make sure that everyone got the same message. Stalin writes, “The leitmotif of this interpretation should be: *We have revealed everything, we know everything about the intrigues of the bourgeois and its robber-arsonists and wreckers, and we plan to rake them over the coals.*”¹⁵³ (my emphasis.)

What this means is that before Ramzin had even been arrested, Stalin had determined that Ramzin would be a target. He also had decided ahead of time on the message that the trial would convey. On October second, Stalin received a copy of Ramzin’s testimony from Viacheslav Menzhinskii, chief of the OGPU. In his reply, Stalin wrote, “Ramzin’s testimonies are very interesting. I think the most interesting thing in his testimonies is the question of intervention in general and the question about the timing of the intervention in particular.” Stalin then went on to recommend who to arrest and interrogate next, and on which topics to concentrate when interrogating them.

“Bring charges against Larichev and other member of the “Prompartiya Central Committee.” Interrogate them as strictly as possible after giving them Ramzin’s testimony to read. Interrogate Groman as strictly as possible, according to Ramzin’s

¹⁵³Lars T. Lih, Oleg V. Naumov and Oleg V. Khlevniuk, eds. *Stalin's Letters to Molotov, 1925-1936*. (New Haven: Yale University Press, 1995), 203.

testimony...Run Messrs. Kondratiev, Yurovskii, Chaianov through the mill...interrogate them as strictly as possible on the timing...*We'll make the materials available in some form to the Comintern sections and workers of the world*¹⁵⁴ (my emphasis)

We can only imagine what was entailed in being “run through the mill.” As we can see from this letter, Stalin intended the “proof” of these plots to be distributed as widely as possible. They provided “proof” of the existence of wrecking conspiracies, which justified Stalin’s line of class warfare.

As mentioned before, Stalin’s main opponents at this time were a moderate group of Bolsheviks called the right opposition. The Stalinist camp expended a lot of energy linking the right opposition to the wreckers.¹⁵⁵ In April 1929, Stalin gave a speech condemning the right opposition. In particular, he condemned them for criticizing the campaign of “class struggle” against the old specialists.

“The intensification of the class struggle and the increase in the resistance of the capitalist elements of town and country are taking place. Their (the rightists’) mistake lies in approaching the matter not as a Marxist, but in a philistine way, and trying to explain the intensification of the class struggle by all kinds of accidental causes: the “incompetence” of the Soviet apparatus, the “imprudent” policy of local comrades, the “absence” of flexibility, “excesses, etc., etc.”¹⁵⁶

In other words, Stalin is condemning the notion that human error, not wrecking, could be the cause of failures in industry. Given that wrecking is a real threat, Stalin argued, any reduction of the class war would aid the enemies of the USSR. The danger

¹⁵⁴ Letter reproduced in *Stalin’s Letters to Molotov*, 195-196.

¹⁵⁵ Fitzpatrick, *The Cultural Front*, 119.

¹⁵⁶ Stalin, *Works*, 12:38.

of the rightist position, said Stalin, “Lies in the fact that it lulls the working class to sleep, undermines the mobilized preparedness of the revolutionary forces of our country, demobilizes the working class and facilitates the attack of the capitalist elements against the Soviet regime.”¹⁵⁷

The message that Stalin and his camp hoped to convey was that any opposition to his line aided the enemies of the union. Therefore, dissent was equal to treason. This was reinforced by a new slogan that was introduced that year: “Who is not with us is against us.”¹⁵⁸ The plenum duly condemned Bukharin, Rykov, and other leaders of the right opposition. Bukharin was expelled from the politburo, but not the party. The plenum also approved a purge of the party, which would remove most of the rightists over the next two years.¹⁵⁹

At the December 1930 plenum of the Central Committee, Rykov and the remaining rightists were attacked of supporting the wreckers, at least ideologically. As Valerian Kuybyshev put it, “The wreckers from the Prompartiya, the Chaianov-Kondratiev wing, and the Groman wing are all hoping for the victory of the right opportunists.” The plenum decided to remove Rykov and replace him with Molotov, Stalin’s right-hand man.¹⁶⁰

Anyone who opposed Stalin’s line could be accused of being a right deviationist, and thus a traitor. Anatoly Lunacharsky, head of the Commissariat of Enlightenment,

¹⁵⁷ Ibid, 41.

¹⁵⁸ Davies, *The Soviet Economy in turmoil*, 114.

¹⁵⁹ Kuromiya, *Stalin’s Industrial Revolution*, 38.

¹⁶⁰ Lih et al., eds. *Stalin’s Letters to Molotov*, 198.

was accused of being a rightist after he opposed the reforms of technical education. A. Y. Vyshinsky claimed that it “sabotaged” the reorganization of the VUZy that Stalin and his camp believed was necessary to industrialize.¹⁶¹

The “dissent=treason” message was also repeated at the Industrial Party Trial itself. Many of the defendants had criticized Stalin’s line, and this fact was trotted out at the Industrial Party as evidence of their hostility to Soviet power. Ramzin, for example, had argued that a series of small coal-burning power plants was more economical for industrializing the Dnepr region than the giant dam, Dniprostroy.¹⁶² Peter Palchinsky, too, had admonished the government not to build giant hydroelectric dams without examining the costs of power transmission or making detailed hydrological surveys. But that was not Palchinsky’s only sin. He had also criticized the social costs of the pyatiletka, such as high accident rates, shoddy housing, and famine.¹⁶³ The defendants were also accused of condemning the reforms of technical education that had so debased their profession.¹⁶⁴

This dissent was far from unusual. Before the show trials, the old specialists had often frankly expressed their skepticism at the plan or the party line. This was part of the old intelligentsia’s conception of themselves as critics of power. After the Industrial Party Trial, this largely ceased.¹⁶⁵ Intended or not, the effect of the terror was to

¹⁶¹ Fitzpatrick, *Education and Social Mobility*, 135.

¹⁶² Bailes, “The politics of Technology,” 461.

¹⁶³ Graham, *The Ghost of the Executed Engineer*, 53.

¹⁶⁴ Fitzpatrick, *Education and Social Mobility*, 143.

See also Bailes, “The Politics of Technology,” 448.

¹⁶⁵ Davies, *The Soviet Economy in Turmoil*, 119.

browbeat the engineering corps into silence. The engineers essentially gave up the old intelligentsia role of “speaking truth to power.”

So what was Stalin’s real motive in unleashing the campaign of terror against engineers? One thing is clear: it was an elaborate and bloody political ploy. The fiction of an enemy within was used to silence criticism, to discredit opponents and to build support for Stalin’s agenda and the projects of the state. Stalin was, among many other things, a very clever politician. He used the same bloody political circus for all three of these ends at the same time. As to which of these three things was *most* important to Stalin, that is beyond the scope of this paper. The terror was unquestionably the lowest point in the history of the Russian engineering corps. It is not, however, the end of our story. The state was about to take another sharp turn in policy, as abrupt as the Cultural Revolution of 1928.

CHAPTER 3

CARROT AND STICK

THE GREAT BREAKDOWN

In late 1930, it looked like things couldn't get any worse for the engineers. But even as the crowds at the Industrial Party Trial roared for blood, great changes were underway that would improve their situation. Starting in 1931, the government scaled back its campaign of terror began to solicit the support of the old specialists. This was not an act of kindness or magnanimity. It was because the state desperately needed their help.

By mid-1930, the project of 'building socialism' was in chaos. The most serious problem was that the food supply was rapidly running out.¹⁶⁶ In 1929-30, collectivization had been completed, amidst widespread violence. In March of 1930 alone, the OGPU recorded 6,528 peasant uprisings across the country. A total of 13,754 would be recorded by the end of the year.¹⁶⁷ To make matters worse, Stalin pushed the export of grain furiously to pay for the cost of industrialization. Combined with general mismanagement of the collective farms, this created widespread famine.

Besides the distribution of food, the center had also tried to control the transportation of all raw materials from one factory to the next. In conjunction with this

¹⁶⁶ Kuromiya, *Stalin's Industrial Revolution*, 155.

¹⁶⁷ R. W. Davies, O. V. Khlevniuk, E. A. Rees, L. P. Kosheleva and L. A. Rogovaya, eds. *The Stalin-Kaganovich Correspondence, 1931-36*. (New Haven and London: Yale University Press, 2003), 5.

measure the government had abolished legally binding contracts, by which factories had previously negotiated the intake of raw materials and food for the workers. Combined with the adjustments Moscow was constantly making to the plan targets, it was impossible to plan how much of any raw material would be needed.

As if that wasn't bad enough, the state's tinkering with the currency had caused massive inflation. Between all of these things, the economic system had completely collapsed by the summer of 1930.¹⁶⁸ Stalin sounds almost embarrassed as he writes to Molotov, "For God's sake, stop the press's squawking about "breakdowns right and left" "endless failures," "disruptions" and other such nonsense. This hysterical Trotskyist-right-deviationist tone is *not justified* by the facts and is *unbecoming to Bolsheviks*."¹⁶⁹

The scale of the catastrophe was almost unimaginable. Desperate to restore order, Stalin turned to the OGPU and Rabkrin. The OGPU took direct control of factory management and imposed order by raw force. Rabkrin took over Vesenkha, sacking its top administrators. Grigory "Sergo" Ordzhonikidze, formerly head of Rabkrin, took over the leadership of Vesenkha personally in November 1930.¹⁷⁰ All levels of government, industry and party were being purged of "unreliable elements" in 1930.¹⁷¹ This event was called the "chistka," or "cleaning." It was in this atmosphere of chaos and violent struggle for control that the Industrial Party Trial was held.

¹⁶⁸ Kuromiya, *Stalin's Industrial Revolution*, 154.

¹⁶⁹ Lih et al., eds. *Stalin's Letters to Molotov*, 215.

¹⁷⁰ Kuromiya, *Stalin's Industrial Revolution*, 275.

¹⁷¹ *Ibid*, 145.

Sometime in 1930, however, the leadership must have realized that force alone was not going to solve the problems of the state. In 1931, they made an abrupt “right turn” that undid many of the reforms of the Cultural Revolution. This right turn reached its apogee in 1934, with the restoration of traditional cultural forms in art and literature. Pushkin, for example, was rehabilitated and held up as a model for Soviet writers to follow. Nicholas Timasheff would famously call this reversal “The Great Retreat.”¹⁷² Why would Soviet leaders abruptly change their policy towards the engineers? Given the utter collapse of the economy in 1931, the most likely explanation is desperation to get the wheels turning again.

This change of policy had two main ramifications for the engineering corps. The first was that the rhetoric of class war in industry was quietly dropped. Starting in 1931, the state began to value training and production experience over political fervor.¹⁷³ The first sign of this was that the state cut back on the number of arrests. In some places this happened very abruptly. In the Moscow region, there had been 1,620 criminal cases for wrecking in January-September 1931. In October-December, that number was cut to 56. In the Urals there had been 54 cases in June 1931 alone. In December 1931, there were only 13.¹⁷⁴ Starting in January 1931, Vesenkha was reviewing applications for readmission and clemency from the imprisoned specialists. A great number of them were released from prison and returned to their old positions.¹⁷⁵

¹⁷² Nicholas S. Timasheff, *The Great Retreat: The Growth and Decline of Communism in Russia*. (New York: E. P. Dutton and Co., 1946.)

¹⁷³ Fitzpatrick, *The Cultural Front*, 146.

¹⁷⁴ Lampert, *The Technical Intelligentsia and the Soviet State*, 101.

¹⁷⁵ Fitzpatrick, *The Cultural Front*, 147.

Measures were also taken to restore the prestige of the old specialists. In April, the *Vesenkha* newspaper began publishing a series of articles denouncing the indiscriminate accusation and arrest of specialists.¹⁷⁶ One of the articles told the story of four engineers in the gulag, who had built a working blooming mill with their own hands. This piece of equipment shaped hot steel into ingots, and previously had been imported from abroad at great expense. Though their original guilt was never questioned, these prisoner specialists were described as having been won over to the Soviet system by the reformatory power of socialist labor.¹⁷⁷

Stalin officially rehabilitated the old specialists in a June 1931 speech called “New Conditions, New Tasks.” He first repeated his old description of the Industrial Party Trial as a hard-fought victory over the “foreign interventionists.” He goes on, “Naturally, under such circumstances, the Soviet government could pursue only one policy towards the old technical intelligentsia—the policy of *smashing* the active wreckers, *differentiating* the neutrals and *enlisting* those who were loyal.” Now, he argues, things are different. “The new situation had to create, and did create, new attitudes among the technical intelligentsia. This explains the definite signs we have that a portion of this intelligentsia which earlier sympathized with the wreckers have now come over to the side of the Soviet power.”¹⁷⁸

¹⁷⁶ Bailes, *Technology and Society*, 273.

¹⁷⁷ *Ibid*, 154.

¹⁷⁸ Stalin, *Works*, 13:70-72.

It seems unlikely that Stalin actually believed this shift in loyalties had taken place. Engineers would continue to be arrested for many years to come, most notably in the great purge of the later 1930s. But the assertion that most spetsy were no longer working for the enemy was an important step to end the persecution of the old specialists and restore their authority in the workplace. The language of official publications changed as well. After 1931, the pejorative terms “bourgeois specialist” and “bourgeois intelligentsia” largely disappeared.¹⁷⁹

The second consequence of the great retreat was the stratification of incomes. The leadership had recognized that coercion and propaganda were not enough to motivate people. They began providing material incentives for elite workers. Starting in 1931, wage differentials were officially restored all across the economy. The salaries of red engineers rose in comparison with those of other workers.¹⁸⁰ In some places this stratification was quite steep. Engineers and technicians at Magnitogorsk, for example, made about three times what an average worker did. In 1935, for example, a typical laborer at Magnitogorsk made 407 rubles per month. An average technician, by contrast, made 1,527 rubles per month.¹⁸¹ Stratification was important, Stalin stressed, to encourage upward mobility. “In order to build up cadres of skilled workers, we must provide an incentive for the unskilled workers, provide for them a prospect of advancement, of rising to a higher position.”¹⁸²

¹⁷⁹ Fitzpatrick, *The Cultural Front*, 14.

¹⁸⁰ Fitzpatrick, *Education and Social Mobility*, 216.

¹⁸¹ Scott, *Behind the Urals*, 277.

¹⁸² *Ibid*, 60.

Along with the stratification of incomes, all engineers were entitled to purchase better quality food at stores that were otherwise open only to managers.¹⁸³ They were also given special privileges in housing. The old specialists had often been discriminated against by the housing authorities. By 1931, equal rights in housing were formally guaranteed to them.¹⁸⁴ In some places, like Magnitogorsk, superior housing was even built for them.¹⁸⁵ Between all these things, the standard of living for all engineers was much higher than that of their coworkers. Even if they did not live in luxury, they were not overcrowded in communal apartments, nor did they starve. In an age when most Soviet citizens endured both of these things, the status of the engineering corps was all the more visible.

Overall, the old specialists who survived to 1931 found their privileged position reaffirmed and even strengthened.¹⁸⁶ For the red engineers, they found that they were now part of the new Soviet elite. This bestowal of prestige and privilege can only have deepened their commitment to the state and its projects.

THE LIFE OF THE PARTY

This brings us to the final change that took place in the engineering corps during the first five-year plan: political alignment. We have already discussed how most of the old engineers were not sympathetic to communism. As the corps became swollen with

¹⁸³ Bailes, *Technology and Society*, 152.

¹⁸⁴ Fitzpatrick, *Education and Social Mobility*, 216.

¹⁸⁵ *Ibid*, 217.

¹⁸⁶ Fitzpatrick, *The Cultural Front*, 146.

thousands of working-class recruits, that began to change. Overwhelmingly, the engineering corps came to identify with the party, the state and the cause of socialism.

We have several reasons to believe this. First, as we have already discussed, the first waves of engineering recruits, the “thousanders” of 1928, had been party members or communist agitators. They were selected on the basis of their party loyalty. Second, the state provided upward mobility for thousands of non-communists. This entailed not only greater prestige, but a substantial rise in standard of living. It offered an escape from the starvation that was gripping the USSR at the time. It would be strange indeed if these men did not to feel a certain degree of gratitude. As Jochen Hellbeck discovered, many of the newly-educated, the “new soviet people,” did in fact come to strongly identify with the regime that had lifted them up out of poverty.¹⁸⁷ Hellbeck analyzed dozens of journals from the 1930s, and found that education did in fact, win people over to the side of communism. Many people did come to identify with the communist cause, and its worldwide mission. They seemed to be living proof of the party’s commitment to the advancement of ordinary people.

Another way of charting the change in political alignment is to look at party membership. Another way that the engineers were incorporated into the elite after 1931 was to join the communist party. Even as managerial control was imposed from the outside, many engineers willingly accepted party discipline by joining the Communist Party or the one of the ITR trade unions. Membership in the party and its sponsored organizations granted significant privileges. The most important of these was a measure

¹⁸⁷ See Jochen Hellbeck, *Revolution on My Mind*.

of security. One party engineer described the protection this way: “If a non-party man does not fulfill, he will get a reprimand or will be removed. A party member will not be removed until the party does something.”¹⁸⁸ Given the glacial pace of party bureaucracy, this would have granted considerable protection.

Terrified by the purges around them, many engineers took refuge in the very party that was killing their colleagues. In the course of 1930, about 3,500 engineers and technicians joined the Communist Party. In 1928, fewer than a thousand of the technical intelligentsia had been party members.¹⁸⁹ The party had always been open to red engineers, but before 1930 very few of them seem to have joined. The party’s ITR professional association, VARNITSO, explicitly granted its members immunity from OGPU prosecution. In return for this, they had to submit to party discipline. Varnitso grew from 1000 in 1929 to 3000 in 1930. By 1932, it would have 11,000 members.¹⁹⁰

Other perks of party membership included higher salaries and priority in housing assignments. As one former engineer put it, “The state looked after them much better.” They also had access to special stores with rare goods.¹⁹¹ Membership in the party, moreover, was helpful in getting a promotion. As one engineer put it, “Party membership was important only for appointments to positions such as chief of some department or

¹⁸⁸ Harvard Project, Case 470, B Scheduling, vol. 5, p. 5.

¹⁸⁹ Bailes, *Technology and Society*, 138.

¹⁹⁰ *Ibid*, 139.

¹⁹¹ Harvard Project, Case 25, B Schedule, vol. 19, p. 7.

sector... It is true that at equal knowledge a party member has more possibilities... Only careerists were interested in the party. You can make a career only in the party.”¹⁹²

One could argue that with all the benefits of party membership, these numbers can be explained away as careerism. The engineer quoted above, a non-party member, certainly believed so. Undoubtedly, this played a role in the decision of some ITRs. It doesn't explain everything, however. In addition to privileges, there were significant hardships involved in party membership. This suggests that at least some engineers must have joined the party out of real conviction.

These hardships stemmed mostly from the restrictions on personal freedom that came with party membership. The party had a centralized “command and control” ethos, with each level of the party (theoretically, at least) subordinate to the one above it. This hierarchical, centralized control was called “democratic centralism.”¹⁹³ This applied especially to party members in production. “More is asked from party members,” said one engineer who was a member of the Communist Party. “Party organs are worse than economic officials. Then, if it is a non-party man, they think ‘you cannot tear two skins from him.’...A party member, true, will not be removed until the party does something. But he will be questioned and investigated until he is exhausted.”

This hapless engineer reported that he was investigated by 29 different commissions in two months. “I could not run the enterprise, I was too busy answering commissions.” When asked about the role of the party, he replied, “It was very great.

¹⁹²Harvard Project, Case 480, B Schedule, vol. 5, p. 5-7.

¹⁹³ Matthew J. Payne, *Stalin's Railroad: Turksib and the building of Socialism*, (Pittsburg, University of Pittsburg Press, 2001), 13.

The party interfered in everything.”¹⁹⁴ This control even extended into the personal lives of party members. One younger engineer, who was not in the party, described the hardships of his party colleagues:

“A party member is subject to very strict discipline, and he usually has no free choice of his job. Usually he is transferred by the party from one job to another. That is a very difficult side of party membership. You may be a party member and living in a nice apartment with your family in Moscow, and tomorrow you will get an order to a village in Siberia, where a new factory is being built...*But you cannot refuse a party order. If you do you will be expelled and severely punished.*”¹⁹⁵ (my emphasis.)

Like the prisoner specialists, party engineers had to go where they were bidden by the command economy. The engineer continued,

“Non-party people come under Soviet law and regulations, while party members are under both party and Soviet regulations...Their personal freedom, especially in the expression of their thought, was much more restricted. It was for that reason that I felt that I could express myself much more freely among my friends. Of course, I did not say anything that was openly anti-Soviet. But I could talk about events in my life more freely. Party members only have certain lines of conversation open to them.”

These topics included party life and economic questions, which had to follow the official line in the newspapers exactly. Nothing controversial could be discussed.

“Conversation among party members is usually very tiresome,” he continued. “It is hard for them to find things to talk about.”¹⁹⁶ The party even allowed the old specialists to join at this time.¹⁹⁷ It was a smart move on the party’s part. Accepting the older

¹⁹⁴ Harvard Project, Case 470, B Schedule, vol. 5, p. 5.

¹⁹⁵ Harvard Project, Case 25, B Schedule, vol. 19, p. 10.

¹⁹⁶ Ibid, 40.

¹⁹⁷ Lampert, *The Technical Intelligentsia and the Soviet State*, 55.

generation of engineers both lured them in into the system with incentives, and solidified that system's control over them.

This begs the question: does the rise in party membership among the spetsy indicated that some of them had converted to the cause of socialism? This seems highly unlikely. The historian Jochen Hellbeck has argued that a number of the old intelligentsia did sincerely “convert” to the Bolshevik cause.¹⁹⁸ There is little evidence that anyone in the old engineering corps had truly converted, however. On a purely intuitive level, it seems unlikely that anyone could genuinely feel loyalty to a cause that had murdered vast numbers of his colleagues, and accused him of treachery. If anything, it would do the opposite. Eugene Lyons, John Scott and Zara Witkin were all disillusioned by the OGPU's arbitrary violence. Why, then, would a spetsy join the party? Self-preservation provides a likely answer. We know that this was the case for at least a few individuals. The newspaper *Za Industrializatsiyu*¹⁹⁹ published a story about one spetsy who applied to join the party “direct from prison,” and another who applied after the OGPU had searched his flat.²⁰⁰

For the old specialists, freedom from prosecution alone was worth the price of admission. Even more than their younger colleagues, they needed protection. This is the great irony of the terror: it actually facilitated the incorporation of engineers into the command economy. Driven by fear, the spetsy stopped criticizing Stalin's line, and

¹⁹⁸ Hellbeck, *Revolution on My Mind*, 287.

¹⁹⁹ This roughly translates as “For Industrialization!”

²⁰⁰ Quoted in Lampert, *The Technical Intelligentsia and the Soviet State*, 55.

sought protection by integration with the power structure.²⁰¹ Undoubtedly, it must have rankled to swear allegiance to the party that had killed their friends and colleagues, but there was no one else who could protect them. Like a chess player who has lost all his pieces, a spets in the 1930s found himself with very few moves to make. Professing loyalty to the state and its ideals was a means to escape arrest.

Joining the party and its organizations was not the only way that the spetsy attempted to show their loyalty. The ITR journal “Front Nauk y Techniki” (The Science and Technology Front) declared in 1930 that it was “a militant organ of the progressive Soviet intelligentsia.” It, and its publisher Varnitso, tirelessly proclaimed the loyalty of its members to the Soviet cause.²⁰² In early 1930, Varnitso organized a public demonstration of engineers and technicians in support of industrialization. Thirty thousand ITRs supposedly took part, shouting slogans like “Down with the political neutrality of engineers!”²⁰³ Some old specialists also tried to save themselves by publicly renouncing their previous criticism of the regime in the press.²⁰⁴

While it’s doubtful that the spetsy were ever enthusiastic about the Soviet dream, they were completely neutralized as a source of political criticism. Those that survived to 1932 seem to have accepted their reduced sphere of authority. They bore the yoke of the command economy without any outward complaint. The closest thing to rebellion that we know of is the handful of engineers who defected to America after WWII. If the spetsy resented their new circumstances, they kept their grumbling to themselves.

²⁰¹ Fitzpatrick, *The Cultural Front*, 7.

²⁰² Fitzpatrick, *Education and Social Mobility*, 218.

²⁰³ Bailes, *Technology and Society*, 140.

²⁰⁴ Davies, *the Soviet Economy in Turmoil*, 121.

The state, for its part, seems to have largely left the spetsy alone after 1931. Engineers would be swept up in the Great Purge of the late 1930s, but there were no more campaigns of terror that targeted them specifically. In the 1936 constitution, the USSR no longer listed the “bourgeois specialists” as a separate social group. By this time, the term *intelligentsia* meant something different than it had in 1928. As defined by the 1936 constitution, it included both generations of engineers, as well as the communist management cadres. “Intelligentsia” had become synonymous with “elite.”²⁰⁵ A great number of the spetsy seem to have lived out their careers as privileged and productive members of the Soviet power structure.

We’ve already discussed how L. K. Ramzin survived by cooperating with the authorities. He was not the only old specialist to take this route. One Ukrainian spets was imprisoned for two years, and then released. After this, he made a comfortable living in Kiev, giving private lessons on technical matters to the red directors. He reports that he was always on good terms with them, and sometimes even drank with them before lessons.²⁰⁶ Ilya Tikhominov, a prisoner specialist whom John Scott had known at Magnitogorsk, was another survivor. He had received a ten-year sentence in the industrial party trial, but did not serve all of it. In 1936, when other managers were being arrested, he was reinstated as a Soviet citizen. He nevertheless remained very bitter towards the Soviet authorities, insisting to the end that he had never committed any crime. Tikhominov’s colleague, Georgy Bulgakov, was not as lucky. He was swept up in the great terror in 1937 and sent to the camps. Scott reports that Bulgakov’s wife was

²⁰⁵ Fitzpatrick, *The Cultural Front*, 15.

²⁰⁶ Harvard Project, Case 408, B Schedule, vol. 20, p 22.

instantly turned out of their apartment, and all their money and clothes were confiscated. Like Tikhominov, Bulgakov protested his innocence to the end.²⁰⁷ Peter Palchinsky was another victim. More than anyone else, Palchinsky exemplified the old engineering corps. He was highly skilled, humane, and critical of the regime. In contrast to Ramzin, Palchinsky stayed true to his old ideals. He paid for it with his life.

A red engineer who defected during WWII described the place of the surviving spetsy by the 1940s: “The highest position a non-party engineer could occupy would be that of a consultant.” “Chief engineer?” his interviewer had asked him. “Not necessary for that.” The red engineer replied. “I even think that there were more non-party men among chief engineers, because they were mostly old specialists...If an old specialist was already holding a leading post, they left him there if there is nothing against him. But if he is removed he will be replaced with a party member.”²⁰⁸

What can we say, in summary, about the political realignment of the engineering corps? By 1932, every engineer you asked would probably have declared his loyalty to the state and the cause of socialism. Four years previously, this would not have been the case. At least on the surface, support for the party line was unanimous. For the red engineers, the “new Soviet people,” this statement was probably true. For the old specialists, it probably was not. They resented their constrained position, but they kept their mouths shut. They were well aware that their lives depended on it.

²⁰⁷ Scott, *Behind the Urals*, 287.

²⁰⁸ Harvard Project, Case 480, B Schedule, vol. 5, p. 7-8.

CONCLUSION

THE MARCH OF DROZDOV

By a combination of threats and incentives, the Russian engineering corps was transformed over the course of the first five-year plan. From an outspoken, critical intelligentsia group, it was reshaped into the management elite of the command economy. In the process, almost everything about the corps was transformed. From a group that was primarily middle class, it became a group that was overwhelmingly working class. Liberal nationalism was replaced by socialism. From a group that was world class in its training and education, it became one of very mixed quality. Along with this, the very role that most engineers performed had changed. Engineers continued to do their traditional jobs, managing factories, mines, and so on, but with much less freedom of action. The old independence, to solve problems creatively and on their own authority, had been usurped by the planning apparatus.

What is the long-term relevance of this story? There is evidence to suggest that the changes to Soviet engineering that took place during the Stalinist era persisted long after Stalin was dead. The Russian engineering corps had suffered a severe trauma during this period. This trauma left a distinctive scar on its institutional structures for decades afterwards.

One lasting legacy of the Stalinist era was the stifling of innovation. In most sectors of the economy, the Stalinist-era “trust the party” mentality had become ingrained in the management culture. Outside the flashy military and aerospace industries, there

were very few monetary incentives offered for inventing new production techniques, or for improving the efficiency of old ones.²⁰⁹ This complacency among the managers was an open secret in Soviet society by the 1950s. It is most famously depicted in Dudintsev's 1954 novel *Not by Bread Alone*.²¹⁰ The book chronicles the struggles of an inventor-engineer named Lopatkin against a stifling bureaucrat named Drozdov. Lopatkin has designed a machine for making drainpipes that promises to greatly boost their production. Time and again, however, Lopatkin is frustrated by his manager Drozdov.

Drozdov is not portrayed as being evil or corrupt. He is simply indifferent to innovations, especially those that are pushed quixotically by an individual genius. In one such confrontation, Drozdov says to Lopatkin,

“We can see through you as though you were made of glass, but you cannot understand us. For instance, you do not understand that we can do without your invention, even if it is a genuine, a great discovery. We can do without it and, just imagine, without even suffering any loss! Yes, Comrade Lopatkin, without suffering any loss, because of our accurate calculations and the planning which insures us a steady advance.”²¹¹

Drozdov values only the maintenance of the status quo, complacent that the higher wisdom of the party will provide a slow but inevitable progress. The widespread acclaim Dudintsev received from the Soviet public suggests that frustration with the

²⁰⁹ Lubrano, *The Social Context*, 157.

²¹⁰ Vladimir Dudintsev, *Not by bread alone* (New York: E. P. Dutton and Co, 1957).

²¹¹ *Ibid*, 173.

Drozdovs of the system was widespread in the 1950s. It is difficult to prove a causal connection between discourse and actual events. It is tempting, however, to trace the later stagnation of Soviet industry back to the disempowerment and demoralization of engineers under Stalin. The fear that stifled innovation in Stalin's time left a scar of apathy.

The long shadow of Stalinism that hung over the engineering corps was not immediately apparent. During the 1950s and 60s, the technological achievements of the USSR gave scientists and engineers an enormous amount of prestige. This was the golden age of Soviet science. The USSR became the second nuclear power. It appeared to be far ahead of the west in its technology, especially in the space race. It launched the first dog, man and woman into space. Using the same rockets, it also built the first nuclear-armed ICBMs. The Soviet public responded with an enormous enthusiasm for science and technology.²¹²

The military and aerospace sectors of the economy had outperformed almost all other sectors. They were more innovative and in many ways more efficient. How can we explain this if the overall quality of the engineering corps decreased? Part of the reason for this is that there was a system of incentives and bonuses to encourage new ideas. By and large, this was not true in other sectors of the economy. The military and aerospace sectors were also assigned the best personnel the system could produce.²¹³ Still another

²¹² Loren R Graham, ed., *Science and the Soviet Social Order*. (Cambridge, MA: Harvard University Press, 1990), 172.

²¹³ Lubrano, *The Social Context*, 157.

factor is that they received a lot of funding and personal attention from Stalin, and later Khrushchev.²¹⁴

Conditions were not as good for the engineering corps in other sectors of the economy. From the late 1960s onward, the dissatisfaction of technology workers grew. Soviet sociological studies from this era indicate that engineers were widely dissatisfied. One source of dissatisfaction was that the wage gap between engineers and workers steadily shrank after the Khrushchev years.²¹⁵ After investing years in a demanding course of study, newly minted engineers found that their efforts had bought them little in the way of social advancement. By the 1970s, the wages of a construction engineer were actually *lower* than those of the laborers he directed. This was partly due to official wage policies, and also due to the labor market. The engineering corps had continued to expand steadily, and by the 1970s there were too many engineering graduates for the labor market to absorb.²¹⁶

This was not their only complaint, however. Hyperspecialization in engineering education was another lasting legacy of the Stalinist era. A 1971 study called “Young Engineers” suggests that it was a serious source of dissatisfaction.²¹⁷ As in the 1930s, engineers were often put in charge of a narrowly circumscribed part of the production process, with little room for creativity.²¹⁸ If hired as a manager, one study suggests that they found the training received to be lacking. The technical education system had

²¹⁴ Slava Gerovich, “Stalin’s Rocket Designers Leap Into Space: The Technical Intelligentsia Faces the Thaw.” *Osiris* 23 (2008) 193.

²¹⁵ Lubrano, *The Social Context*, 137.

²¹⁶ *Ibid*, 161.

²¹⁷ Quoted in Lubrano, *The Social Context*, 138.

²¹⁸ *Ibid*, 149.

improved a great deal since Stalin's time, but some of the same weaknesses remained. For example, the weakness in general theory that had plagued the early red engineers was still present in the later Soviet Union. Many new graduates complained that their training was weak in science and mathematics. The same study found that plant managers were often dissatisfied with the preparation of their newly hired engineers. They were particularly dissatisfied with the preparation the VUZy had provided in management, financial and organizational skills.²¹⁹ As in the 1930s, new graduates were forced to learn these skills on the job.

Hyperspecialization and apathy would continue to plague Soviet engineers up until the glasnost period. Both of these can be traced back to the fundamental transformation of the corps that took place during the first pyatiletka. An old specialist lucky enough to be alive in 1954 would probably have empathized with Lopatkin when reading *Not by Bread Alone*. He might just as easily have empathized with Drozdov, however. He had made a bargain with the state, accepting the limitations of the system in return for his life. Like Winston Smith at the close of Orwell's *1984*, the surviving spetsy mouthed litanies to the powers-that-be. Failing that, they kept their mouths shut. They may not have genuinely loved their "big brother," as Smith did, but they played the role of the loyal subordinate. Bound to the system by a combination of fear and complicity, Russian engineering would never be the same again. Launched by a small cadre of Lopatkins, Soviet industry would slowly sink under the weight of its Drozdovs.

²¹⁹ *Ibid*, 147.

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APENDIXES

APPENDIX A: ACRONYMS

GOSPLAN-State Committee for Planning. Founded in 1921, Gosplan was responsible for all economic planning in the USSR. One of its most important jobs was to create the five-year plans.

ITR-Engineering-Technical Worker. A Soviet term for engineers and technicians, especially those who worked in production.

KEPS-Commission for the Study of Scientific-Productive Forces. Founded in 1915, the purpose of KEPS was to increase the productivity of Russian industry during WWI. It eventually evolved into VESENKHA.

OGPU-(Also called GPU)-State Political Directorate. The OGPU was the secret police of the Soviet Union. It changed names a number of times, eventually becoming the KGB, or Committee of State Security. The OGPU also ran the Gulag system.

RABKRIN-Workers' and Peasants' Inspectorate. Founded in 1920, Rabkrin's job was to root out corruption, inefficiency and red tape in the state and economic agencies.

VAI-All-Russian Association of Engineers. A professional society for Russian engineers that was founded in 1919. Unlike VARNITSO, the VAI was not affiliated with the Communist Party. Because of this, many of the old specialists were members. The VAI would eventually be dissolved in 1929.

VARNITSO: All-Union Association of Scientific and Technical Workers for Active Participation in Socialist Construction in the USSR. Varnitso was a Marxist professional organization for scientists and technical workers. Founded in 1927, its purpose was to recruit the technical intelligentsia to the cause of socialism. Its members were required to adopt the same strict discipline as the Communist Party.

VESENKHA-*Supreme Council of the National Economy*. Vesenkha was the highest organ of economic management in the USSR. It administered all the factories in Russia and the union republics.

VUZ-*Higher Educational Institution*. The term refers to both technical schools and universities.

GULAG- *Chief Administration of Corrective Labor Camps and Colonies*. The Gulag was a massive system of forced-labor camps. Run by the OGPU, it housed both political prisoners and petty criminals.