

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)

[1]

The Soviet Armed Forces in the Interwar Period

Earl F. Ziemke

Introduction

In Soviet terminology, the interwar period, elsewhere regarded as comprising the roughly two decades between the world wars, is the interval between the Russian Civil War and the German invasion. While the distinction, like that between the Second World War and the Great Patriotic War, is, no doubt, as much mythological as actual, it bears significantly on all aspects of the Soviet armed forces' effectiveness. How to make the transition from the war of 1914–18 to that of 1939–45 concerned the Soviet military and political authorities as much as it did those of any of the other major powers, but the Soviet perceptions and responses were conditioned by special circumstances. One was the technological and industrial backwardness of the Russian nation. The other was the radical discontinuity the communist system had imposed on the Russian state. As a consequence, the interwar period was substantially different for the Soviet armed forces, and it consisted of several distinct phases.

The first of those, the Civil War, is considered to have begun in late May 1918, when a Czechoslovakian corps composed of former prisoners of war seized control of the Trans-Siberian Railroad, and to have ended in November 1920 with the defeat of the White general Baron Peter Wrangel and the conclusion of the Polish War. Leon Trotsky had become People's Commissar of War (war minister) in March 1918 and had begun organizing the Workers' and Peasants' Red Army. The Workers' and Peasants' Red Navy, the renamed ex-imperial Baltic Fleet, existed already, and the Red Army had established an air contingent comprised of aircraft and personnel taken over from the imperial forces. The so-called old army, not the least as a result of Bolshevik (communist) subversion, had become totally useless and what was left of it had to be disbanded. The Red Army regarded itself not only as a replacement but as an 'army of a wholly new type,' which it and the other

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*Military Effectiveness*

Soviet armed forces would subsequently always claim to be. The primary characteristics of the 'new type' are said to be dedication to the service of the working class and reliance on class spirit and on the guidance of the Communist Party.

Trotsky was as good a Marxist as any but also a pragmatist, and he undertook to build the Red Army to conform as closely as the circumstances would allow to the European standard of the First World War era. The result was a conscript army – of 3 million in 1919 and 5.5 million by mid-1920 – officered, although that term was prohibited during the Civil War and for a long time thereafter, by politically acceptable commanders and 'military specialists.' Party members with a taste or talent for military affairs, old army enlisted men who supported the Bolsheviks, and workers trained in commanders' schools comprised the politically acceptable contingent. The military specialists were former imperial army officers who volunteered for or were drafted into the Red Army. By the end of the Civil War, the politically acceptable groups accounted for 66 per cent of the command personnel, but then still mostly in the company grades. As they had throughout the war, the military specialists held by far the larger part of the intermediate and higher level appointments.¹ The need to employ military specialists whose commitment to the revolution was often doubtful, to say the least, perpetuated the practice (begun while the old army still existed) of appointing political commissars. That developed during the war into a dual command system in which the military commander could neither issue nor enforce orders without the concurrence of his commissar.

The first phase in the interwar period (in the Soviet view) was that of the 'economic reconstruction' and the 'military reforms.' The two began simultaneously in March 1921 with the Kronstadt naval mutiny and the Tenth Party Congress. The mutiny was taken, probably correctly, as a sign that the party was on the verge of alienating its staunchest support; and the congress undertook to repair the damage by approving the New Economic Policy (NEP), which sanctioned a relatively free economy, and the conversion of the Red Army to a militia system, which would reduce the strain the 5.5 million-man regular army was putting on the economy. By the fall of 1923, the Red Army converted to a cadre (regular) force of 516,000 troops in 26 divisions and a part-time territorial militia of 26 divisions.² The navy brought the armed forces' total to 562,000.³

The second phase of the interwar period is said to have started in 1929 with the first of the five-year plans for industrialization; however, its military aspect, the 'technological reconstruction of the armed forces,' did not begin to take definite shape until June 1931 when Mikhail Tukhachevskiy, a former Tsarist lieutenant who had held army and army group commands in the Civil War and had been Chief of the Red Army Staff, became Deputy People's Commissar for Military and Naval Affairs and chief of armaments for the armed forces.⁴ In 1932 and after, the armed forces acquired new, Soviet-made weapons and equipment of all kinds in great quantities, and Tukhachevskiy undertook to incorporate them into the military organizations and doctrine. The army had received 15,000 tanks by 1938, and aircraft production of all types was running at over 5,000 planes per year.⁵ The navy reportedly

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*The Soviet Armed Forces in the Interwar Period*

increased its tonnage 130 per cent by 1939, but that apparently was from a small base by world standards and included rebuilding.⁶

The technological reconstruction also brought structural changes, the most notable of which was a shift away from the militia system. The militia, which had done no more than provide basic infantry training, could not effectively absorb and operate the new weapons and equipment. The quantities of the latter becoming available also made a personnel expansion necessary.⁷

Although the Soviet literature generally treats the technological reconstruction as the last phase in the interwar period, it is evident that the armed forces' experience was sufficiently discontinuous in the four years preceding the German invasion to have constituted two additional phases. The first began with Tukhachevskiy's arrest and execution in June 1937. The purge that followed brought about the deaths of three of the five marshals of the Soviet Union and, according to one of the few Soviet accounts to be specific on the matter, all of the military district commanders and corps commanders, 'almost all' division and brigade commanders, and 'about half' of the commanders of regiments.⁸ The purge continued up to and beyond the outbreak of war in western Europe on 1 September 1939, coinciding also with the Soviet involvement in the Spanish Civil War and an undeclared war in the Far East with Japan.

By the spring of 1940, however, the war in Europe was profoundly affecting the Soviet armed forces. The Winter War against Finland, which ended in March 1940, and the fall of France in June left the Soviet Union in the distinctly unpleasant position of having to face Germany alone with forces that the Finnish war had shown to have deep-seated deficiencies. Consequently, the last peacetime year was given over to massive new preparedness programs in command, training, and equipment of the armed forces that, together with modernization already begun, constituted a second technological reconstruction.⁹

Political Effectiveness

From their inception, the armed forces 'of a new type' were held to have eliminated the need for political-military accommodation. The Communist Party, the 'leading, guiding and organizing force,' as Marshal A. A. Grechko has put it, 'always found the most advisable structure and flexible forms and methods of political and military leadership.'¹⁰ The political and the military leadership could rely on the infallible guidance of Marxist-Leninist doctrine. Furthermore, as a one-class organization of workers and peasants, the armed forces 'of a new type' were regarded as having erased the social distinctions that had previously existed between the officers and the other ranks and the differences in outlook that had frequently divided the officers and the political authorities. The armed forces 'of a new type' were – and are – therefore presumed to have rendered traditional military professionalism, which was *a priori* inimical to the interests of the working class, obsolete.

In practice, the political-military relationship was one of the first major

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*Military Effectiveness*

problems of the Soviet state. The armed forces came into being under communist political control, but the party possessed no military expertise. The ex-imperial officers had a monopoly on that, and party doctrine held them to be a class hostile to the revolution. During the years 1918–24, Lenin delegated the actual control of the armed forces to Trotsky, who, although he was as faithful a Marxist as anyone, rejected the idea that war could be conducted on the basis of a political doctrine alone. War, he insisted, was ‘an art,’ a ‘trade,’ ‘a skill with certain habits which are elaborated by experience and correctly assimilated,’ a skill that could be transformed into a ‘high art.’¹¹ As long as he was the main link between the political leadership and the armed forces, military professionalism in the conventional sense was esteemed more highly than it would be during the remainder of the interwar period. He recruited and drafted thousands of former imperial officers as military specialists (48,000 by mid-1920), and he reinstated the post of Supreme Commander in Chief. The latter, a military specialist, was ‘entirely independent on matters of strategy and operations,’ but his orders had to be countersigned by a political member of the Revolutionary Military Council, of which Trotsky was the chairman.¹²

Trotsky’s reliance on the military specialists, however, aroused instant resentment among the party members with little or no military experience who had established themselves as field commanders and saw their way to the top being blocked by the preference given to the former officers. By March 1919, this hostility had coalesced into near dissidence, and its spokesmen in the upper reaches of the party, chief among them Mikhail Frunze and Kliment Voroshilov, had become known as the ‘military opposition.’ Frunze, Voroshilov and their adherents contended that the Marxist state ought to do away with regular, centralized military organization and rely on the spirit of the working class and the initiative and leadership of party men such as themselves, essentially on what Trotsky scornfully characterized as ‘guerrillaism.’ In 1921, Frunze published a theory of a unified military doctrine in which he implied that military doctrine could be derived from Marxist principles.¹³

Trotsky kept the upper hand over the military opposition in the party throughout the Civil War and into the period of the military reforms, but after Frunze supplanted him as People’s Commissar for Military and Naval Affairs in January 1925, the political–military relationship changed. The post of Supreme Commander in Chief, which had been held by military specialists, had been abolished in 1924 on the grounds that it was unnecessary in peacetime, and after Frunze took office the people’s commissar became the military as well as the political chief of the armed forces. Frunze would possibly have been suited to the dual role. He was a political figure of some consequence, and had successfully held several important military commands during the Civil War, but he died before he had been in office a full year. His successor, Voroshilov, also a party man with Civil War military experience but undistinguished in both, owed his tenure as people’s commissar, which ran until 1940, entirely to a subservient relationship with Josef Stalin.

After 1925, the leaders of what had been the military opposition held the

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*The Soviet Armed Forces in the Interwar Period*

top military posts, and they removed the military specialists from the key command and staff positions. Most were discharged, and some were appointed to teach at the military schools. The former members of the military opposition lost the desire to promote decentralization of command once they reached the top, but their competence to function professionally at the levels they had attained was manifestly questionable. Tukhachevskiy was the only one who impressed foreign military observers. In 1928, a German officer with access to the Soviet high command, Colonel Hilmar Ritter von Mittelberger, described Tukhachevskiy as 'the most significant military figure in the Red Army.'¹⁴ The future German field marshal, Erich von Manstein, who visited the Soviet Union in 1931, dismissed Voroshilov as 'a politician' but found Tukhachevskiy 'from the military point of view an undoubtedly interesting personality . . . ruthless and intelligent.'¹⁵ In 1936, D. Fedotoff White regarded Tukhachevskiy as 'the present actual head of the Soviet Army.'¹⁶

Tukhachevskiy was never the 'actual head of the Soviet Army,' nor was anyone else other than Josef Stalin after 1925. At the height of his career between 1931 and 1937, Tukhachevskiy was a technician managing a program.¹⁷ Stalin regarded the military profession as distinct but not as autonomous. He saw to it that his own military reputation was elevated to match his political stature; and during the 1930s, after the top appointments in the armed forces had mostly been given to men whose qualifications derived from the Civil War, his experience in the field could be stretched to nearly equal theirs in all but a few instances. Moreover, he had sat, along with Lenin and Trotsky, on the Defense Council, the all-powerful strategy and policy-making organ for the armed forces in the Civil War.

Throughout the interwar period the Soviet principle of collegiality in the decision-making process provided a permanent point of contact between the professional military and the political leadership in the form of the Revolutionary Military Council of the Republic (1918–34) and its successors, the Military Council (1934–38) and the Main Military and Main Naval Councils (1938–41). The people's commissar chaired the councils, and the membership consisted of his deputies, one of whom was chief of the General Staff, and of Politburo members, most notably Stalin, who was a permanent member after 1938. The late Marshal Kirill Meretskov, who was the secretary of the Main Military Council in 1938, said in his memoirs that Stalin attended the meetings frequently and received reports on all of them.¹⁸ On the other hand, Admiral N. G. Kuznetsov, who became People's Commissar of the Navy in 1938, maintained that while the system provided a direct channel from the armed forces through the people's commissar to the Council of People's Commissars (cabinet) in the early years, later 'in actual fact it was Stalin who began to decide military matters with the Council of People's Commissars rubberstamping his decisions.'¹⁹ According to Kuznetsov, consultation with the military consisted in the main of meetings in Stalin's office at which the people's commissar and the chief of the General Staff 'received' Stalin's decisions.²⁰

Although the navy and the air force possessed nominally separate status from 1918 on as the Workers' and Peasants' Red Navy and the Workers' and

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*Military Effectiveness*

Peasants' Red Air Fleet, they did not have direct access to the highest political authorities during the interwar period. Because command in both required certain technical knowledge, they also did not acquire political-military hybrids like Frunze and Voroshilov, and it was well into the 1930s before officers trained under the Soviet regime had sufficient experience to take over the most responsible posts. The navy had the additional political liability of the Kronshtadt mutiny. The air force chief ranked as a corps commander, and after general-officer ranks were reintroduced in the late 1930s, was the equivalent of a US major general. The navy acquired its own people's commissariat and main council in 1938, but did not thereby achieve coequal status with the army. In fact, according to Kuznetsov, it had less access to the highest political authority (namely, Stalin) after 1938 than before, since Stalin was not a member of the Main Naval Council.²¹

Esteem for the military profession during the interwar period cannot be correlated either positively or negatively with the armed forces' successes in securing shares in the budget, industrial resources, technology, and manpower of the Soviet state. Those were determined by other considerations, the most pervasive of which was the conviction that the Soviet Union was alone in a hostile world. The political authorities never doubted that the armed forces deserved the maximum feasible support and only once (during the economic reconstruction) permitted another requirement to take precedence over military preparedness. Consequently, how much the armed forces received, individually or collectively, depended less on their ability to promote their concerns than on the nation's capacity to generate support in the various categories. The army, for instance, was consistently the most favored service. It also had the best political contacts, but its industrial, technological, and manpower needs happened as well to be less difficult to meet than those of the other two services; and Russia was historically a land power. Paradoxically, the political authorities always operated under a dual compulsion: to make the armed forces strong and to keep their leadership from accumulating power that could possibly rival that of the Communist Party or produce a Bonaparte.

The most readily quantifiable measure of armed forces' political effectiveness, the budget share, has always been difficult to apply to the Soviet armed forces, and that was never more the case than during the interwar period. In the years of the Civil War the budget was almost only a figure of speech; the money was virtually worthless, and the deficit in the 1919 budget was close to 80 per cent.²² On the other hand, the armed forces' claim on the resources of the state received the absolute highest priority. As Trotsky put it, 'The War Department determined the government work of the entire country. All the other government activity was subsidiary to it.'²³ In September 1918, the All-Russian Central Executive Committee declared the entire country to be 'a single armed camp' and instituted the system of 'war communism,' which nationalized industry and required the peasants to turn over to the government all the grain they grew.²⁴ The Council of Workers' and Peasants' Defense, charged with mobilizing all of the country's resources, gave the armed forces absolute first claim on the output of industry and agriculture, but that amounted in effect to a lesser share in the shortfalls of both. In 1920,

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*The Soviet Armed Forces in the Interwar Period*

industrial production stood at about 15 per cent and agricultural output at about 65 per cent of the 1913 levels.²⁵

The Civil War established a permanent political commitment to maximum support of the armed forces that never wavered during the interwar period. The economic reconstruction imposed a certain stringency on the armed forces in 1921 and for some years thereafter; but the demobilization was phased over three years, and the army reduction to 516,000 men appears to have constituted a relatively small cut in real terms since the effective fighting strength had not at any time been more than 600,000 to 700,000 troops.²⁶ The navy had already declined from a strength of 180,000 men in 1917 to 56,000 in 1921 as a result of attrition, some of which resulted from the Kronshtadt mutiny.²⁷ Actually, by the time the demobilization ended, in 1924, a buildup was in progress. Expansion in the navy and air force raised the armed forces' cadre (regular) strength from 562,000 men in 1924 to 617,000 in 1928.²⁸ The army's cadre strength did not increase, but the militia system was giving basic infantry training to 1.8 million men on a two-year cycle.²⁹ The air force went from a total 228 aircraft in 1921 to 1,400 in 1928; the navy from an aggregate 82,000 tons in 1923 to 139,000 tons in 1926.³⁰ The air force and the navy also improved their relative positions within the armed forces. In 1921, the army's share was 98.6 per cent, the air force's 0.4 per cent and the navy's 1 per cent; by 1928, the army had declined to 92.6 per cent and the air force and navy had risen to 2 and 5.4 per cent.³¹

The Fifteenth Party Congress, held in December 1927, established the basis for the support of the armed forces throughout the rest of the interwar period: a resolution specifying that the five-year plan then being developed (the first) should 'give maximum attention to development of sectors of the economy in general and industry in particular which would play leading parts in strengthening the defense and the economic foundations of the country in case of war.'³² Consequently, during the five-year plans, the armed forces received (in addition to whatever part of the budget was assigned directly to them) a very large share of the amounts invested in the plans, which in the first two years (1928–9 and 1929–30) comprised two-thirds of the budget.³³ According to one source, the Soviet Union devoted 9 per cent of its 1934 total national income to defense, three times as much as Great Britain, and two and a quarter times as much as Germany. The same source gives the value of armament production for the years 1935–9 (in 1944 dollars) as having been \$1.5 billion for the United States, \$2.5 billion for Great Britain, \$8 billion for the Soviet Union, and \$12 billion for Germany. In the year 1939 alone German production was \$3.4 billion and Soviet production was \$3.4 billion, and by 1941 the Soviet Union had gone ahead at \$8.5 billion to the German \$6 billion.³⁴

By 1936, the midpoint in the second five-year plan, industry was getting into full swing, and in that year the defense expenditures constituted about a third of the total budgetary financing for the national economy. In 1937, the directive for drafting the third five-year plan established a requirement to 'guarantee . . . a general strengthening of the defense capacities of the country,' and in 1938 the investment in arms industries increased by 70 per cent. The 1939 budget allotted another 70 per cent increase to defense, and that was

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*Military Effectiveness*

doubled at mid-year.³⁵ Altogether the amounts budgeted for defense rose 235 per cent in the years 1938 through 1940.³⁶

The Soviet armed forces were different from most others during the interwar period in that their access to industry and technology was less a matter of money than of development. Imperial Russia had been the least technologically and industrially advanced of the major powers, and the base the Bolsheviks took over in 1917 was then already collapsing under the effects of war and political and economic turmoil. Their inability to get more than six or seven hundred thousand actual troops out of the millions of men they conscripted, although an exceedingly high desertion rate had much to do with it, resulted in the main from lack of arms and equipment. New production was not enough to compensate for ordinary wastage.³⁷ Except for some hand-crafted airplanes and light tanks, the aircraft, armored vehicles, and naval vessels employed in the Civil War were either inherited from the imperial forces or acquired by capture from one opponent or another.

The Soviet technological and industrial bases remained weak throughout the 1920s, although a limited capacity to design and build aircraft and tanks developed after 1925 and the navy began a small building program in submarines and escort vessels. The army had 92 tanks in 1929, mostly Soviet-designed light (3,000 pound) T-18s.³⁸ Of the 1,400 aircraft the air force had in 1928, apparently at least 800 were bought abroad and a good many of the rest came from a German Junkers aircraft factory established near Moscow.³⁹ In the main, the navy achieved its increase in tonnage by rehabilitating ex-imperial ships.⁴⁰ After the Soviet-German Rapallo agreements of 1922 and until Adolf Hitler came to power in 1933, the army and air force did have access to German programs in what were then considered to be the three main military technologies, aircraft, tanks, and war gases. In 1924, the Soviet and German armies jointly set up an air test and training facility at Lipetsk, near Voronezh. Later, they established similar installations for tanks (in 1927 at Saratov) and for chemical warfare (in 1930 at Kazan).⁴¹ Considering the state of Soviet technology at the time, the profit must have been considerable on the Soviet side even though the collaboration seems not to have fulfilled the expectations of either partner.

The relationship with the German Army was the closest the Soviet military came during the interwar period to working in the setting of an alliance. According to German accounts, which are the only ones existing, nothing like mutual trust and confidence ever developed. The Second World War German Air Force general, Helm Speidel, who like many of his contemporaries participated in the exchanges with the Soviet Union in the 1920s, said the Germans learned early that the Russians avoided breaking agreements *de jure* but evaded their obligations *de facto* while always insisting on full compliance from their partners.⁴² Manstein, who in the early 1930s was concerned with the state of the potential Soviet alliance as chief of the German General Staff's war plans section, characterized Tukhachevskiy as being 'energetically devoted to technological cooperation with the Reichswehr' – and at the same time prepared to take as much and give as little as possible.⁴³ On the other hand, the military association lasted nearly a decade and would very likely have continued longer had Hitler not disregarded military advice

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*The Soviet Armed Forces in the Interwar Period*

to the contrary and ordered it terminated in the late summer of 1933.⁴⁴ In Speidel's view, the projected German rearmament was then making the operation of the bases in Russia 'more urgent than ever.'⁴⁵ The technological reconstruction was almost certainly doing the same on the Soviet side.

The five-year plans of the 1930s brought industrial development, and the technological reconstruction of the Soviet armed forces was indeed a remarkable accomplishment, but neither clearly showed the military to be highly effective at devising plans and programs and getting them adopted. Tukhachevskiy is said to have campaigned for modernization of the armed forces during his term as Chief of the Red Army Staff (1925–8) and to have had Stalin turn his proposals down as 'harebrained schemes' so often that he finally asked to be transferred to other duty.⁴⁶ By his own account, Tukhachevskiy also did not have the support of his military colleagues, many of whom preferred to believe in the so-called theory of the special mobility of the Red Army. This theory held that the Soviet cavalry armies of the Civil War had solved the problem of mobility that had confounded all of the forces in the First World War.⁴⁷

While the technological reconstruction of the armed forces could later be regarded as Tukhachevskiy's vindication, it certainly did not appear to be that at the time. Shortly before the first five-year plan began, Tukhachevskiy was dropped out of the army staff and relegated to command of the Leningrad Military District. He had not succeeded in having his program adopted but had had it co-opted.⁴⁸ His recall to be armed forces' armaments chief in 1931 and subsequent advancement to Marshal of the Soviet Union in 1935 and First Deputy Commissar of Defense in 1936 seemed to have established him as the country's leading military professional. Yet less than a year later, in short order, he lost his high appointments and his life.

The air force and navy leadership fared no better. The air force benefited enormously from the technological reconstruction. By 1935, it had 6,672 combat aircraft. Between 1930 and 1940, it received almost 25,000 aircraft of all kinds.⁴⁹ The commander-in-chief of the air force, Ya. I. Alksnis, achieved the status of Deputy People's Commissar of Defense in January 1937 and eighteen months later disappeared in the purge along with a good half of the air force's top commanders.⁵⁰

The navy did not benefit as much from the first two five-year plans as the army and air force did. Its program although much enlarged, was restricted to building submarines and light surface ships and modernizing some First World War battleships and cruisers. The technological reconstruction was a race to catch up with the outside world, one that could be more swiftly and, in terms of the national interest, effectively run for the army and air force than for the navy (which would have required a heavy preliminary building of yards and docks).

The navy's progress was also more erratic than that of its sister services. In the early 1930s, the emerging communist naval leadership propounded a 'new school' doctrine oriented toward coast defense. Suddenly, in 1939, the navy found itself elevated, on Stalin's orders to (almost) coequal status with the army and air force, in possession of its own people's commissariat and charged under the third five-year plan with launching a high seas fleet of

Cambridge University Press

978-0-521-73750-0 - Military Effectiveness, Volume 2

Edited by Allan R. Millett and Williamson Murray

Excerpt

[More information](#)*Military Effectiveness*

battleships and aircraft carriers.⁵¹ Just as suddenly, the originators of the 'new school' disappeared in the purge, and the more junior officers who replaced them were left to struggle until the war intervened with the impossible task of building 'the most powerful navy in the world.'⁵²

Technology, much less responsive to state coercion than basic industrialization, was a special problem throughout the interwar period. The solution adopted, which was to acquire, adapt, and, if possible, improve upon foreign inventions, fostered rapid advancement and some notable successes but not fully reliable depth and breadth. (It also generated an openness to developments that were being slighted in their countries of origin, for instance, the American J. Walter Christie's tank designs.)⁵³ The most spectacular early achievement was a cantilevered-wing monoplane fighter, the I-16, which was the fastest military aircraft in the world in the mid-1930s and incorporated an American engine and design features of American 'Gee Bee' racers.⁵⁴ On the other hand, the compulsion to catch up impelled the Soviet armed forces to go into large-scale production several years before other nations including Germany, had fully reoriented their technology and industry. Consequently, by 1938 the Soviet plants were turning out large quantities of mostly obsolescent equipment and a second technological reconstruction had to be initiated.⁵⁵

The second technological reconstruction brought out (in 1939) the best medium tank of the Second World War, the T-34, which was the culmination of earlier work on Christie types. In 1940, several new high-performance fighter aircraft comparable to those already in service with foreign air forces began to go into production. However, a habit of valuing quantity more than quality made it difficult for the new tanks and aircraft to compete for factory space and materials with the older models.⁵⁶ The aircraft also fell somewhat short of the current state of the art because foreign governments, the United States included, had restricted exports of military technology.⁵⁷ The navy's program to acquire a high seas fleet was severely hampered by the inability to buy a nucleus of battleships abroad.⁵⁸ The second technological reconstruction also did not keep abreast of developments in communications. Like the first, it concentrated on weaponry. Tanks and aircraft, even the newest, did not usually carry radios. In the air force, squadron commanders' airplanes had radios, but it is said that because of their poor quality 'flight personnel made little use of them while in the air.' The ground forces' radio networks were thin.⁵⁹

Manpower as such was not a problem for the Soviet military. The communist regime was always more than willing to recreate the human steamroller of 1914 if need be. Field service regulations published in 1936 at the height of the technological reconstruction stated that 'the infantry . . . by decisive action in attack and by maintaining positions in defense, decides the outcome of battle.'⁶⁰ There is no evidence that the Soviet government or military were concerned, as others were after the First World War, with the possibility of not again being able to muster a mass army. The reduction after the Civil War was actually an effort to maintain the largest possible armed forces in the midst of a crippling economic crisis. By 1929 the cadre and