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26 March 1981

... FBIS 40TH YEAR 1941-81 ...

USSR Report

MILITARY AFFAIRS

(FOUO 1/81)

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26 February 1981

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On behalf of all of us in FBIS I wish to express appreciation to our readers who have guided our efforts throughout the years.

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USSR REPORT
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MILITARY SCIENCE, THEORY, STRATEGY

FORECASTING IN MILITARY AFFAIRS

Moscow SOVETSKAYA VOYENNAYA ENTSIKLOPEDIYA in Russian Vol 6, 1978 pp 558-560

[Encyclopedia entry]

[Text] Forecasting in military affairs [Prognozirovaniye v voyennom dele]. The determination of future probabilities for possible directions and trends in the development of armed forces, military technology and military art, both in one's own nation (or coalition of nations) and that of a likely or real enemy, and for the course and outcome of an armed conflict or an entire war. Forecasting deals with more narrow tasks of a theoretical military and practical nature than does foresight, of which it is a component. The term "forecasting" came into broad usage in the 1950's when large advances were made in the development of mathematics, cybernetics and computer technology, making it possible to model more accurately future events in the organizational development of armies and innovations in methods and forms of combat operations and in troop management. Certain forecasting methods were actually employed considerably earlier.

The methodology used for forecasting in the Armed Forces of the USSR and the armies of other socialist nations is Marxism-Leninism, which provides a truly scientific ideological basis for determining general prospects for the development of military affairs and for modeling this process.

The main areas of forecasting in military affairs are the strategic military, operational, tactical, military-economic and technical military fields, which are interrelated and mutually conditioned.

Strategic military forecasting is used as the basis for determining the possible nature of a future war, the degree to which nuclear weapons and other means of mass destruction will be employed, and by what methods; the characteristics of a war involving the use of conventional means of destruction and the possibility that it will develop into a nuclear war; the nature of local wars; the quantitative makeup and qualitative state of a likely enemy's armed forces, as well as strategic variants (or plans) for their employment at the outset and during the course of a war. On the basis of the forecast information obtained, requirements and recommendations are worked out for the future development of the armed forces, the development of new armaments, military equipment and transport; the stockpiling of supply reserves needed to conduct a war; and the training of the armed forces and preparation of the nation as a whole.

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Operational and tactical forecasting are used for revealing the nature of future operations and battles and methods of conducting them with prospective new means of armed conflict; for determining the possible effects of massive employment of nuclear weapons and other means of mass destruction; and for developing ways of counteracting an enemy's employment of nuclear and other weapons and of protecting troops and rear service installations, as well as ways of restoring their fighting efficiency. The forecasting of probable enemy operations during a war reveals the enemy's possible concept for the use of troops (or forces), nuclear and other weapons.

This is used as the basis for developing the concept for upcoming operations, making the decision for achieving the enemy's defeat in impending operations, creating the appropriate groupings of troops and resources for its implementation and the necessary reserves of materials and equipment, for organizing troop control and for carrying out other measures. While combat operations are under way, a determination is made as to how the situation will be changed by the use of nuclear weapons and by troop operations, the creation of areas of radioactive contamination and areas which would be flooded by the destruction of hydraulic works, and measures to facilitate the timely removal of troops to safe areas. Forecasting is also performed with respect to water conditions, the ice situation in bodies of water, the condition of seas, oceans and straits, weather conditions for selecting the time for the beginning and the conduct of active combat operations, missile launchings, plane and helicopter flights, for conducting artillery fire, and so forth.

Military-economic forecasting makes it possible to reveal the future development of the military-economic capabilities of one's own nation and those of a likely enemy with respect to outfitting the armed forces with everything necessary for conducting combat operations in the future; to provide one's state and military leadership with data for achieving the best possible quantitative and qualitative composition of armed forces, their services and branches of troops, and the most practical organization of operational field forces, formations and units; to ascertain the budgetary allocations necessary to maintain them, and to estimate outlays of economic resources in peacetime and after the war has begun.

Technical military forecasting provides information on possible tactical and technical characteristics of weapons and military equipment models and prospects for their future development and improvement, and on the development of new weapons.

Forecasting is usually broken down into short-term forecasting, which determines the prospects for the development of events in the immediate future, a period of up to five years; medium-range forecasting, which covers a period of 5 to 10 years; and long-range forecasting, for a period of more than 10 years. Short-term forecasts are the most detailed and precise. Long-range forecasts indicate only the general trend in the development of military affairs or of the constituents thereof, and a general concept of a possible war. Forecasting in military affairs is handled by the general staffs and the staffs of services of the armed forces, main and central directorates of ministries of defense, scientific research and

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military educational institutions, special troop formations (or units) and other military organizations. Mathematical, heuristic and combined research methods are used in forecasting.

Mathematic forecasting methods are arbitrarily broken down into two groups: mathematical modeling and extrapolation (statistical methods). Mathematical modeling consists in transferring summarized data obtained from modeling to a future situation. This method involves the determination of quantitative characteristics of the processes involved in an armed conflict by means of mathematical modeling of the battle and the operation. It is used with good results for forecasting the characteristics of weapons models. Various data describing the battle and the operation are subjected to mathematical processing, which establishes their quantitative relationship. Mathematical models are then built, and the values are calculated for the relevant characteristics of the processes being studied. Statistical forecasting consists in using statistical methods for processing existing data on the target process of the forecasting, deriving the dependencies linking these data to time, and calculating its anticipated (probable) properties. Mathematical methods make it possible to achieve good operativeness by means of modern computer equipment and eliminate or significantly limit the subjective factor. Errors are possible even with the use of these methods, however, caused by incorrect selection of the mathematical model, changes occurring in the nature of the process since it began, the presence of indeterminate forms ("obstacles"), and so forth. Not are such qualities of commanders (or military chiefs) as experience and intuition properly manifested in this process. For this reason other forecasting methods, particularly heuristic and expert appraisal methods, are not ruled out in the modern situation. They make it possible to draw upon a large team of specialists (or experts) for the forecasting. They base their conclusions primarily upon experience and intuition, which makes it possible to derive more correct conclusions from the data obtained by mathematical methods. Logical analysis, which makes it possible to cut forecasting errors, is extensively employed for revealing and eliminating contradictions arising in the forecasting process. Logical analysis plays an especially great role in the forecasting of irregular processes. Combined forecasting methods should be used to supplement each other (with mathematical methods as the decisive factor) for deriving the most reliable data on stochastic processes in the development of military affairs.

Forecast data obtained by specific state agencies and institutions are used for forecasting in military affairs. Unlike forecasting in many natural sciences, in which case the objective is to adapt activities to an anticipated condition, the significance of forecasting in military affairs is determined by the degree to which the data obtained can be used for altering the situation. The complexity of forecasting in military affairs lies in the fact that it is necessary to appraise the capabilities and the nature of two opposing sides, which closely guard their concepts and designs. All of the data must be reliable, and in a combat situation it must be obtained as rapidly as possible for purposes of adopting a timely and correct decision on the operations of one's own armed forces, one which conforms to the current situation.

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The inability correctly to evaluate all of the factors affecting changes in the situation can result in irreparable errors. In the second half of November, 1941, for example, the strategic situation in the Moscow sector was developing in favor of the Soviet forces. It was this fact which led the German fascist command to conclude that they could take Moscow within a very short period of time. This forecast turned out to be wrong, of course. The fascist military leadership was not able to objectively evaluate the entire situation. Among other things, it ignored information on the concentration of Soviet reserves near Moscow, the high morale of the Soviet people and of army personnel, the growing military strength of the Soviet Nation and the improved combat skill of its fighting men. Another forecast was made at Headquarters, Soviet Supreme Command. Headquarters took all the factors into account, defined the capabilities of the Soviet state, its people and its army, correctly identified the noticeable weakening of the enemy offensive and made the correct decision to wear down the attacking enemy in defensive battles, switch to a counteroffensive with the commitment of large reserves to the engagement, rout the German fascist forces and drive them back from Moscow (see "The Battle of Moscow, 1941-1942"). By thoroughly considering all of the factors influencing the situation and capable of altering it by the summer of 1943, Headquarters was able correctly to determine the axis of the main thrust by the German fascist forces and to take steps in advance to rout a large enemy grouping on the Kursk sector (see "The Battle of Kursk, 1943"). A tendentious assessment of possible development of the military-political situation on the eve of World War II by the Western nations, on the other hand, caused the war to begin and be conducted in a manner not consistent with the desires of the imperialists.

Forecasting has become considerably more complicated in a modern war: The volume of information necessary for forecasting has increased greatly, and the substance of the information has changed; and the enemy has greater possibilities for rapid maneuvering and for taking various camouflage steps to conceal preparations for an operation and to mislead its adversary as to its concepts. At the same time, the exceptional power of weapons of mass destruction and the adoption of other new weapons have increased the need for military forecasting. It has taken on an extremely great role as a result of the accelerated rates of development of weapons and military equipment and the increased cost of their production. The need for scientific forecasting has naturally increased today as a result of the increased danger posed by the ruinous effects of powerful new weapons and their increased cost. Special institutions--corporations, commissions, institutes, societies and centers--were created for this kind of forecasting in the 1960's and 1970's in the developed nations. Numerous kinds of computer equipment were created for forecasting the developing situation in operations, which make it possible rapidly to "run through" various alternate plans, taking into account possible changes in the situation, in order to adopt the most expedient (optimal) one. Despite the adoption of the most advanced computer equipment, however, man's role in forecasting has not only not decreased but has actually increased. Heuristic forecasts are still a product of man's creativity, while mathematical forecasts require participation by man as an element essential for the scientific preparation and analysis of the data. A large number of people directed by a commander (komandir, komanduyushchiy) take part in the forecasting of processes involved in combat operations, and his decision provides the basis for the

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employment of all personnel and equipment participating in the battle and the operation. All of this places extremely great demands upon commanders at all levels and requires that they possess in-depth professional knowledge and the ability rapidly to grasp and analyze a drastically changing situation and to derive the proper conclusions therefrom. As they perform these tasks they must make skillful use of the various kinds of computer equipment available in the forces to determine with great accuracy possible changes in the situation and the effects of their decisions.

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M. M. Kir'yan, N. I. Reut

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HISTORY OF SOVIET MILITARY THOUGHT

Moscow ISTORIYA SOVETSKOY VOYENNOY MYSLI. KRATKIY OCHERK. 1917-IYUN' 1941
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[Text]

Chapter 6. Theory of Military Economics: The Nation's Material-Technological
Foundation

Theory of Military Economics

Expenditures for combat equipment have increased drastically in the 20th century.
They accounted for 50 percent of all military outlays in World War I and 70 per-
cent in World War II.¹ Despite an increase in the size of armies the proportion
of expenditures for personal supplies and clothing has been reduced.

A drastic increase in the role of the economy as the main source of military
strength for nations and coalitions of nations has made the economic aspects of
war one of the prime problems. The branch of economic science known as the theory
of military economics has begun handling the theoretical resolution of these
problems. A part of political economics, it is directly involved with military
science in the estimation and forecasting of the probable material needs in a war.
The theory of military economics is therefore regarded as a component of economic
science as a whole and an important part of military science. The Soviet military
press now sometimes refers to the theory of military economics as military economic
science.

Of the many problems of military economic theory of the 1920's and 1930's we have
to single out certain problems of current importance today. These are general
problems of military economic and rearmament matters.

Soviet military theoreticians have been guided by the Leninist principle that
economics are of crucial importance in any war. As early as 1917 V. I. Lenin
stated the matter with absolute frankness: "...Either perish or catch the advanced

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nations and surpass them economically as well."² With respect to the nation's preparation for defense, he stated at the third All-Russian Congress of Councils of National Economy in 1920: "War includes all types and all areas of construction and development."³ This was to say that war embraces all aspects of the functioning of the state. It was also pointed out that the nation's preparation for defense demands "prolonged, intense... and disciplined work on a massive scale."⁴

Lenin's statement about the crucial importance of economics in the strengthening of the nation's defense and subsequent decisions adopted at congresses and by the Communist Party Central Committee on this matter set the general trend for the development of military economic theory.

As it implemented the party's decisions the military leadership took the position that any future war would be conducted by the entire nation. This brought out new tasks and advanced new methods for preparing the nation for defense, and a "new role for rear services themselves as direct participants in the struggle."⁵

Soviet economists and military theoreticians pointed out that World War I had produced a new method of overt warfare--economic strangulation of the enemy--which could render one of the participants incapable of fighting,⁶ that the army was not the single, the all-important force determining the outcome of the campaign. New factors affecting chances for victory were brought out: The "rear," that is, the sum total of the nation's economic and human resources, had assumed crucial importance.⁷ They therefore saw the certainty of victory not alone as a matter of maintaining a powerful army, but also in the nation's ability to support combat operations up to the final minute of the war.⁸

The military press discussed a broad range of questions pertaining to economic support for the socialist state's defense. M. V. Frunze believed that the nation's defense tasks would not fit within the framework of a single war department. He proposed that the same sort of operational plan be created for setting up the nation's economy during a war as that worked out at the General Staff for the forces.⁹ In the article "The Front and the Rear in a Future War" written in 1924 he described a defense preparation plan, which included beefing up the armed forces (creating officer reserves, making the aviation a crucial branch of troops, converting the artillery from horse-drawn to tractor-mounted transport, and so forth) and making decisions on defense matters under the jurisdiction of the nation's civilian administration (mobilizing industry, communication and transport facilities and the national economy in general, teaching military subjects in schools and VUZ's, and so forth).¹⁰

B. M. Shaposhnikov shared the opinion that there had to be a plan of economic preparation for the nation's defense: "The economic plan for war," he wrote, "should not only cover preparation of the army and the theater of military operations for war and should not just include the 'military aspect' in the sense of providing the army with everything it needs but should also deal in general with the economic policy to be followed by the nation in time of war."¹¹

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This broad understanding of the nation's defense tasks meant that the command and political staff of the armed forces would have to study not only military affairs but also the material foundation for the nation's defense. The idea was expressed that all the work of preparing the armed forces and all defense matters for the USSR as a whole should be combined under a war department.¹² Headquarters, RKKA [Workers and Peasants Red Army], began carrying this out.

A special course, "The Economics of War," was instituted at academies.¹³ A two-year course for the training of leading personnel for the defense agencies of civilian people's commissariats began functioning at the Military Academy imeni M. V. Frunze in February of 1931.¹⁴ Publication of a special scientific and theoretical symposium was initiated for purposes of achieving a broad exchange of military economic expertise, working out common views on defense matters and developing the theoretical perspective of military economists at Headquarters, RKKA.¹⁵

Many military and civilian economists, including N. Vasil'yev, S. Volkov, V. Dyagilev, Ya. Ioffe, A. Manikovskiy, N. Movchin, S. Shapurin, G. Shigalin, Ya. Shlyakhter and others, studied specific areas of the nation's economy and their role in a possible war: material resources, the financing of war, the role of industry, agriculture and transport in war, and how a blockade would affect the course of a war. A central military journal raised for discussion the matter of the economy's role in the overall system of defense preparations.¹⁶

As part of this multifaceted problem the theoreticians were interested in the matter of achieving mobilizational readiness for the armed forces and the nation as a whole. Various theoretical approaches were brought out in the investigation. Some theoreticians were for permanent economic mobilization. In their scheme the material supplies stockpiled by the beginning of the war were regarded as the first echelon of supply, intended to meet the needs of the front during the period of development of military operations. A special wartime industry was considered as the second echelon, which would make it possible for the front to hold out until final mobilization of the rest of the nation's industry had been achieved. And finally, the third echelon--activation of civilian industry--which was to provide the army and the nation with material supplies after the mobilization stockpiles had been exhausted. The decision to increase military production to the maximum was only to be made at an indication of a munitions crisis at the front.¹⁷ Such views objectively oriented conversion of the economy to a wartime footing on a long-term basis as had been the case in World War I. The advantages of the Soviet economic system were not taken into account in preparing the nation for defense.

Other theoreticians offered specific recommendations for keeping a record of stockpiles of raw materials and food for the front and the rear and for improving transport operations. It was also proposed that provisions be made for providing industry with a skilled work force and production with complete blueprints, patterns and so forth for new models of equipment.¹⁸

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Soviet economists felt that it was necessary before the beginning of a war to involve most of the plants engaged in peacetime production in the production of goods to meet defense needs. "The imperialists' strategy requires that we build up large resources and achieve all-round economic, mobilizational readiness to actively inflict a counterblow during the initial period of intervention. The specific situation of intervention makes the initial period of the war tremendously important. Before this period begins we must prepare enormous quantities of all types of combat supplies for the army, making it possible to satisfy fully all the needs of the front."¹⁹

Mainly experience in World War I was taken into account for analyzing the economic conditions of a possible war. The imperialist nations had begun preparing for war militarily and economically long before the beginning of military operations. For example, Germany had created a system for mobilizing the economy to meet wartime needs while there was still peace. The functioning of this system made it possible to replace imports of strategic raw materials from other nations with the production of synthetic gasoline, synthetic rubber and ferrous-metal substitutes, and to procure the raw materials of war (metals, oil and so forth) in advance.

In view of the increased size of the armies and their increased mobility it was assumed that the strength of the armed forces would have to be increased considerably in order to load the front with equipment. The difficulty of this task lay in the fact that the rear also required a large number of workers to manufacture and repair the combat equipment. It was believed that 6 workers would be required in the rear to produce and repair a single machine gun, 76 workers for a tank and 125 for a single aircraft.²⁰

Certain writers advanced unfounded suppositions about the mobilizational capabilities of the imperialists, who, they maintained, would find themselves facing unsolvable conflicts in matters of mobilizing the broad masses of workers to meet the needs of the front.²¹ Such assertions were convincingly refuted. It was pointed out that the imperialists tried to prepare themselves politically and economically for war while there was still peace.²² This was confirmed by substantial studies made of the economic foundation of modern war.²³ Reality bore out the fact that prior to the beginning of a war the aggressive nations would destroy democratic institutions, intimidate the people with acts of repression and create armies with a strength of millions.

Soviet economists and military theoreticians were highly interested in the development of new, technical means of conducting warfare. The operational success of the armed forces began to depend greatly upon a powerful new factor--technological initiative in the development of new combat vehicles and the achievement of qualitative and quantitative superiority in military technology. It was therefore important to foresee means of warfare which might be used by the enemy, but most importantly--to achieve the rapid introduction of means of opposition or more powerful offensive weapons.

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Questions pertaining to the technological initiative and to frequency and scope with respect to the updating of weaponry in a probable war became enormously important in national defense preparations. The national economy and military economic theory were faced with problems of accomplishing this.²⁴ In view of the fact that weapons and other military equipment were becoming obsolete more and more rapidly, M. V. Frunze was convinced that it was unfeasible or actually dangerous "to spend enormous amounts of money to procure stockpiles of mobilization materiel."²⁵

Many Soviet military economists felt that it would be impossible to procure munitions and equipment in peacetime for an entire war, mainly because of their rapid obsolescence. The mass production of new models would have meant falling behind new technology or endless work on new models, for which no budget, no matter how large, would have been adequate. Consequently, the building up of large stockpiles of technical war materiel could have found the army with obsolete equipment at the beginning of the war. It was therefore recommended that means of combat be stockpiled only for the initial period of the war,²⁶ or that the forces be outfitted with the basic models, while keeping a close eye on the development of new equipment, improving the old equipment and providing mass-production capabilities. The moment a war became inevitable would be the time to switch to mass production of the latest models of weapons and other combat equipment.²⁷

A study published by S. M. Vishnev, "Problems of Updating Weaponry in Foreign Armies," is of interest in this respect.²⁸ He proposed a number of well-supported theoretical tenets pertaining to the updating of weaponry in peacetime, based on an analysis of the postwar experience of foreign armies. The author concentrated mainly on the time factor in the updating of weaponry. Since this matter is of prime importance to a nation's military preparedness for defense, it must be discussed in somewhat greater detail.

S. M. Vishnev's study confirms certain important principles, which have not lost their validity today. No matter how good new weapons are, they do not produce the proper result when used initially in insignificant quantities in a war. Furthermore, using new means of warfare in this manner has a reverse effect: It tips one's hand prematurely to the enemy, and one's own forces are demoralized by failure. This was true, as an example, of the use of super-long-range guns by the Germans against Paris in 1918, the use of tanks by the British and so forth. On the other hand, the old and well-known means of combat--machine guns and artillery--employed in unexpectedly large quantities (concentrations) had an incomparably greater qualitative effect.

Important economic and financial difficulties stand in the way of the massive updating of the army with new weaponry. At the increased rate of development of military technology weapons become obsolete considerably faster than they were out. That is, their design becomes outmoded sooner, as a result of which they are unsuitable for use after lengthy storage. Consequently, the expenditure of enormous amounts of money on the updating of weaponry may prove to have been a waste after a short period of time. What is the solution to this problem?

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S. M. Vishnev disagreed with the suggestion that the massive updating of weaponry not be carried out in peacetime but that only experimental models be developed. If a nation puts off their production until a war begins it runs the risk of finding itself with inadequate and obsolete armaments when the aggressor begins an invasion. In his opinion the conversion to new weapons will sharply affect the rate of development of mass production (or large-scale series production), which will require considerable time (new materials, different processing methods, new machine-tool attachments, inspection gages and so forth will be needed).

The arrival of new models of equipment in the forces during a war entails a number of difficult organizational steps: the training of the personnel, the development of new tactical procedures, the issuing of new manuals and so forth. The author recommended that the renewal of military equipment be accomplished in peacetime. He essentially proposed the stockpiling of new equipment with simultaneous "rejuvenation" of the materiel. The modernization would result in the forces receiving what are actually new models with improved tactical and technical features.

S. M. Vishnev designated the prewar period as the main phase in the updating of weaponry when the imperialist nations look for all sorts of loopholes for setting out on a path of massive updating of weaponry, in order to complete the final stage during the period immediately prior to the beginning of war. The aggressor wants to create a prolonged period of political tensions with a slow "sliding into war," in order to force the mass production of those models which have already undergone the preliminary stages of preparation and are only waiting to be placed into series production.

It was not the author's purpose in writing the article to describe the difference between preparations for war by aggressive nations, which plan in advance the beginning of the war and the completion of large-scale rearmament with the latest models of equipment, and those of the peace-loving states, which have not always been able to detect the beginning of aggression promptly and accurately, in order to establish for themselves the period of political tensions.

It must be borne in mind that this was one of the difficult theoretical and practical problems of national defense in the 1920's and 1930's. The problem was essentially one of determining when to begin updating the army and navy with the latest in weapons and other combat equipment, in order to complete the process and make it possible for army and navy personnel to master the new equipment before the aggressor attacked. It was not a matter of replacing a few models of weapons and other equipment, but a large-scale updating. The question can only be answered by carefully analyzing the international situation and the state of the economy and the armed forces of likely enemies.

After analyzing the events of World War I, Soviet theoreticians considered it unfeasible to procure munitions and equipment for an entire war far in advance, because of their rapid obsolescence. The stockpiling of large quantities of technical means of combat could result in a situation in which an army would find itself outfitted with obsolete equipment when the war begins.

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Any premature, large-scale manufacture of weapons and other equipment places an enormous burden upon a nation's budget, without achieving the needed effect. The wrong decision in this matter can result in large, unjustified outlays.

The large-scale manufacture of new models of aircraft, tanks and other equipment far in advance of the aggressor's invasion may result in the spending of enormous sums without proper justification, the equipment becoming obsolete within a short time and having to be replaced.

On the other hand, delaying the large-scale production of new military equipment and the training of groups of men mustered from the reserves in its operation and maintenance was dangerous because it meant that the army might not be fully prepared to repel the enemy's attack.

Objectively, the aggressor was in an advantageous position at that time. It had made precise calculations for reoutfitting the army and navy by the time it planned to begin military operations.

This matter requires constant attention. Information provided by long-range reconnaissance and the scientific forecasting of the possible time of the enemy's attack were exceptionally important in this respect. They could make it possible to reoutfit the army and navy, train the forces on the new equipment and create essential mobilization stockpiles and state reserves in good time.

To sum up this brief survey of views on the most important aspects of military economic theory, we might say that Soviet military leaders, economists and theoreticians took a broad approach in working out problems pertaining to the nation's economic strength in case of war. The CPSU Central Committee and the Soviet government endeavored to prevent the possibility of a war.

The Struggle for Peace and to Build Up the Defense Strength of the USSR

While pursuing the Leninist policy of peaceful coexistence with the capitalist nations, the political leadership of the socialist nations saw the ruinous policy of the aggressive nations' governments and produced specific disarmament proposals. The Soviet government was the first to suggest discussing the issue of universal arms reductions and the banning of the destructive means of warfare, including toxic substances (gas), aircraft and others. This was at the 1922 Genoa Conference. In November, 1927, the Soviet government submitted to the Disarmament Conference Preparatory Committee for consideration a proposal calling for the total disarmament of all nations. The proposal was rejected, however. In 1928 the imperialists rejected another Soviet proposal calling for partial disarmament. They began arranging armed conflicts along Soviet borders. With their agreement and encouragement, Chinese militarists in 1929 seized the KVZhD [Chinese Eastern Railway], which belonged to the USSR at that time and invaded Soviet territory. It was not possible to settle the conflict by peaceful means. The forces of the Chinese militarists were defeated by the Special Far East Army, created in August of 1929.

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The economic crisis which began in the capitalist world in 1929 caused reactionary capitalist circles to step up their efforts to prevent the building of socialism in the USSR and to frustrate fulfillment of the first five-year plan. The imperialist forces saw a way out of the crisis through a new war against the socialist nation.

The establishment of a fascist dictatorship in Germany in 1933 and the initiation of Japanese aggression in the Far East in 1931 created new and difficult problems in Soviet foreign policy.

The Soviet government's call for the creation of a collective security system and for the rallying of all anti-war forces against the aggressive nations was consistent with the new conditions for the struggle against imperialist aggression. At the Geneva Disarmament Conference held in February of 1938 the Soviet Union proposed that the participants conclude a convention, which included the definition of an aggressor.²⁹ Representatives of the capitalist nations did not support the Soviet draft convention, since it conflicted with their policy of encouraging aggression against the USSR.

At the London Economic Conference held in June of 1938 the Soviet Union submitted for consideration a protocol calling for economic nonaggression and the rejection of all forms of economic discrimination, which was based upon the principle of peaceful coexistence among nations, regardless of their social system. The conference ended without taking action.

The struggle for collective security in Europe became one of the central issues in the Soviet Union's foreign policy. Security would be based on the principle that each nation would receive equal and mutually effective guarantees of assistance from all the other member-nations of the collective security system. Such a system would have protected the national independence, sovereignty and territorial integrity of all peoples, given them complete equality and insured noninterference in their internal affairs. It would have ruled out military conflicts as a means of resolving disputes. At the end of 1933 the Soviet government proposed the conclusion of an Eastern Pact, which could become the foundation for collective security in Europe if it were signed by the USSR, France, Poland, Finland, Czechoslovakia, the Baltic countries and Germany.

However, the signing of the pact was not in the interest of the governments of England and the United States, which were counting on a military confrontation between Germany and the USSR. Germany and the bourgeois government of Poland also refused to sign the Eastern Pact. The Soviet Union concluded a mutual assistance pact with France on 2 May 1935. Under the pact, should one of the parties involved be attacked, the other would immediately come to its assistance. A similar agreement was signed by the USSR and Czechoslovakia at the insistence of Czechoslovakia's government, however, the record of signing included the stipulation that, "mutual aid commitments will be in effect between them only so long... France also aids the party which is the victim of aggression."³⁰ The governing circles in bourgeois Czechoslovakia had provided in advance for refusing assistance from the USSR.

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And so, the Soviet government's efforts to create a collective security system in Europe were frustrated by the imperialist powers. The Far East Pact was not concluded for the same reasons.

Encouraged by the governments of the Western nations the aggressive countries continued their actions. In March of 1936 fascist Germany took its troops into the demilitarized Rhineland. That summer the governments of Germany and Italy interfered in the internal affairs of Spain, supporting Franco's fascist insurgency against the republican government of the Popular Front.

Because of the "noninterference" and "neutrality" of the governments of England, France and the United States the Spanish Republic found itself solidly ringed by an economic blockade, which was extremely advantageous to Franco and his supporters, the fascist governments of Italy and Germany.

The situation of encouraging the aggressor gave new life to the process of uniting imperialism's reactionary forces. A military and political alliance was concluded between Germany and Italy (the "Berlin-Rome Axis") in Berlin on 25 October 1936. A month later German and Japanese militarists signed the "Anti-Comintern Pact." World war was drawing near.

The USSR took new steps to prevent the fascists from unleashing a war in Europe. The Soviet government proposed that France and Czechoslovakia begin talks on the general staff level. It simultaneously advanced the idea of a "General Mutual Assistance Pact among the USSR, France, Czechoslovakia, Romania, Yugoslavia and Turkey." The Soviet initiative was not supported by the capitalist powers.

When, at the end of 1937 and the beginning of 1938, Daladier and Chamberlain--advocates of a direct agreement with the fascist powers--came to power in France and England, anti-Sovietism became the dominant trend in the policy of "nonintervention." Capitulatory circles in England and France were ready to make a deal with the aggressors at the expense of the USSR.

Events did not develop in the way governing circles in England and France would have liked, however. Germany and Italy continued to occupy small European nations. Even then, however, it would not have been too late to halt fascist aggression, had the governments of England and France given effective aid to Romania, Poland, Greece and other nations in their struggle against fascist aggression.

The governments of England and France engaged in talks with the Soviet Union in the spring of 1939 and then in August of that year about concluding a collective security pact against the fascist states, and attempted to get our government to make unilateral commitments which could not be fulfilled. All of this was an indication of their desire to isolate our country and not create any obstacles to fascist Germany's aggression.

There was also a policy of encouraging the aggressor in the case of Japan. The 1937 Brussels Conference, which was convened for purposes of halting Japanese aggression in China, did not achieve positive results. The representatives of

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the United States, England and France did no more than state their desire for the Japanese government to review its position and move toward a peaceful settlement of the conflict. The proposal put forth by the Chinese government for the application of economic sanctions against Japan, which was supported by the delegation from the USSR was not accepted by the other delegations.

In the summer of 1937 the Japanese command renewed military operations in the North and in Central China, capturing Shanghai and Nanking, and by the end of October 1938 Japanese forces occupied an enormous territory in the south of China, cutting it off from the outside world.

Hoping for a confrontation between Japan and the USSR, governing circles of the imperialist powers did not undertake effective steps against the aggressor in the Far East. In the summer of 1939 the U.S. Congress reconfirmed the 1935-37 neutrality laws. In 1939 the American monopolies were continuing to supply Japan with war materials and strategic raw materials.³¹

The Soviet Union faced the danger of being drawn into an armed struggle on two fronts at once--in the West and the East--at a time when governing reactionary circles in England, France and the United States were hostile toward it. In order to change a situation unfavorable to the Soviet Union and to delay the aggressor's attack, the Communist Party and the Soviet government in August of 1939 accepted Germany's proposal of a nonaggression pact. This was a forced move, but it was the only correct one, predetermining to an enormous degree the outcome of World War II, which was favorable for the Soviet Union and for all other freedom-loving peoples.

Following the defeat of Poland the British and French government could see that their hopes for directing fascist aggression against the USSR were baseless, and they advanced the idea of a joint military campaign by all the imperialist powers against the Soviet state.

The "Munich" strategy consisted in turning World War II from armed antagonism among the capitalist powers into a united campaign against the Soviet Union. Intensive, anti-Soviet diplomatic and propaganda activities were initiated in October of 1939. The military staffs of England and France were working along the same line.³²

Despite the enormous effort put forth by the Communist Party and the Soviet government in the 1930's, war could not be avoided because of the balance of power in the world at that time and the anti-Soviet policy of the Western powers.

The Party and the Soviet government assessed the adverse international situation and took the steps necessary to further strengthen the nation's defense capability. This was not contrary to the party's foreign policy line of peaceful coexistence. I. I. Brezhnev stated at the 25th party congress that the CPSU "relies upon the nation's economic and defense strength" in its international activities.^{32a}

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The Soviet Republic was in a difficult economic situation following the civil war. "We had to begin our peacetime development at a level so low that large industry's output was only one-seventh and smelted metal production less than five percent of the prewar figure. Agricultural output had dropped almost to half the prewar production."³³ The situation was unique, as V. I. Lenin pointed out in 1918, in that our economic strength did not measure up to our political strength. With respect to our political structure, he stated, and the political power of the workers, the Soviet Republic is "ahead of any England... and at the same time behind the most backward of the Western European states... with respect to cultural level and degree of preparedness for the material-production 'establishment' of socialism."³⁴ We had the enormous revolutionary enthusiasm of the masses, however, and this made it possible for the Soviet Union to accomplish what appeared to be the impossible. By the end of the reconstruction period (1925) large industry's gross output was 75.5 percent of the prewar figure.³⁵ However, there was a shortage of iron and steel and especially of the nonferrous metals so essential to the defense industry. K. Ye. Voroshilov, who attached great importance to the nation's defense strength, expressed concern about the fact that in 1927 the nation was forced to import 50 percent of the copper it needed and 70 percent of certain nonferrous metals. The Soviet Union was in last place in the world in the production of nitrogen, the basic material in all explosives. We were behind the advanced capitalist nations in machine-building. That same year, for example, our nation had a total of only 22,000 passenger cars and trucks, including those in operating condition and those in disrepair, while the United States had 23.45 million motor vehicles.³⁶ Our lack of a developed automobile industry made the manufacture of tanks difficult.

Restoration of rail transport involved great difficulties. More than 1,000 steam locomotives were inoperable. There were very few surfaced roads: We had only 0.5 kilometer of surfaced road to 100 square kilometers of territory, while the United States of America had 54 kilometers.³⁷

At the beginning of the 1920's the Red Army was outfitted with obsolete small arms left over from World War I and the Civil War. Industry had a minimal capacity for providing the army with the most essential supplies: It could supply only 8 percent of the rifle shells the army needed, 30 percent of the rifles, 14 percent of the submachine guns and 1.5 percent of the binoculars.³⁸ M. V. Frunze had every basis for stating "that in all areas of technology we lagged behind the armies of the largest bourgeois nations."³⁹ The updating of the Red Army's weaponry was further complicated by a shortage of means. For this reason we did not take on the task of achieving any kind of technological progress immediately.⁴⁰ Even after the reconstruction of industry the Soviet Union still did not have the necessary material resources or the production-technology capabilities to overcome the backwardness in military technology which we had inherited from the old army after two devastating wars.

In order to replace the obsolete armaments we had to spend enormous amounts of material means and time to reconstruct and develop our own defense industry. This was not a rapid process. By the end of the reconstruction period the state of our war materiel industry was considered the weakest spot in the state's defense.⁴¹

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The difficulties involved in reconstructing and developing the defense industry were for the most part objective ones--a shortage of means and material resources, our inability to obtain foreign loans and a shortage of skilled workers, engineers and technicians. Other difficulties were caused by acts of sabotage and by harmful anti-Soviet elements, negligence toward the machines and tools and violations of labor discipline.

The difficulty of the military theoreticians' work lay in the fact that they had to consider the nation's temporary economic and technological backwardness, on the one hand, and the general state of military affairs abroad and the future level of technological development, on the other. That is, they had to deal with the current situation while at the same time looking to the future.⁴² The resolution of many matters pertaining to military theory and to the practical organizational development of the armed forces was difficult under those circumstances. The replacement of old weapons and combat equipment, as an example was accomplished in stages. In 1922 each rifle regiment, for example, had only one model company armed with light machine guns and trained in group tactics. The other eight companies lacked light machine guns, since it was not until the end of 1924 that we were able to organize the production of automatic weapons and train the necessary cadres of junior commanders for all the infantry companies. This accounted for the fact that in the early 1920's "we did not have and could not have had either common organization or identical tactics throughout."⁴³

The first updating of the Red Army's small arms took place in the early 1930's. The artillery had not yet been upgraded, however, since the Red Army had inherited from the old army an artillery which included a small quantity of howitzers and an insignificant number of heavy artillery pieces.⁴⁴ There were absolutely no antiaircraft or antitank guns. Our artillery was not only obsolete. It had also been subjected to great wear and tear in two wars. Restoration and modernization of the materiel was therefore carried out between 1921 and 1932, and 1933 was the beginning of a period of complete updating of the artillery with new materiel.⁴⁵

The outfitting of the Red Army with different means of combat also depended upon the rate of restoration and development of industry, the training of cadres of designers and the availability of skilled workers, engineers and technicians. The armored forces, for example, were represented by separate heavy and light tank battalions outfitted mainly with foreign military equipment. Our industry was able to begin production of the MS-1 (T-18) light tank series in 1928. During the first five-year plan the tank industry produced 3,949 tanks and tankettes, 3,099 of which were produced in 1932.⁴⁶ These formed the basis for our first experimental tank and mechanized units.⁴⁷ Foreign tanks were removed from the forces in 1931.

The aviation was being outfitted with new equipment at a faster rate. In 1922 90 percent of the aircraft were purchased abroad, while three years later foreign aircraft purchases were halted.⁴⁸ The aircraft plants were just getting on their feet and, naturally, were not providing the armed forces with an adequate number of quality aircraft. The air fleet received 13 combat aircraft from Soviet industry during the 1923/24 fiscal year, and 264 in 1924/25. It took longer to

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increase the number of aircraft produced and improve their quality because of a lack of Soviet engines. Imported engines made up 70 percent of the engine pool in 1928.⁴⁹

In 1929 the CPSU Central Committee defined as the most important task for the years immediately ahead that of rapidly bringing the quality of Soviet aircraft up to the level of the advanced bourgeois nations, and recommended that we train our own, Soviet, military designers as rapidly as possible, especially for engine building. In 1930 the Soviet aircraft industry mastered the mass production of Soviet aircraft, which made it possible to update the Air Forces with new models, including the I-5, the TB-3 and others. As of 1 January 1933 the number of aircraft in the Air Forces had increased 2.7-fold, compared with the end of 1928.⁵¹

The Navy was being rebuilt relatively slowly. The decision to rebuild it had been adopted at the 10th Congress of RKP (b) [Russian Communist Party (Bolsheviks)] in 1921, but economic difficulties prevented us from fully accomplishing the plans outlined. "The Navy," M. V. Frunze stated, "is a very expensive weapon."⁵³ While advocating the strengthening of the fleet in the Black and Baltic Seas, he saw it as realistically possible only to restore the ships left over from the old navy and then, as these vessels became obsolete, to replace them with new ones.⁵⁴

The six-year program of military ship-building (1926-1932) called for completing major repairs on the fleet and its motorization first of all, and this was basically completed by 1928.

Circumstances conducive to the completion of the restoration and modernization of Soviet naval ships were created in the early 1930's. A considerable portion of the military vessels were repaired, the battleships were partially modernized, the submarine fleet was beefed up and coastal defenses were strengthened during the first five-year plan.⁵⁵

Circumstances in the 1920's and early 1930's prevented our nation from allocating extensive resources to outfit the Red Army. "Our resources," K. Ye. Voroshilov said in December of 1926, "place certain limitations upon the development of technology."⁵⁶ We therefore lagged behind the Western armies in the outfitting of our army with technical means of warfare.⁵⁷

In the difficult situation existing during the period under discussion Soviet military theoreticians accurately determined the general trend in the development of means of warfare and the correct sequence for updating the arms and equipment of the army and navy. In 1924 M. V. Frunze called for establishment of the very closest of ties between science and military affairs. He believed that any important invention or discovery in the area of military technology could immediately create superiority for one of the sides. In this respect Frunze advocated the most rapid possible development of tank building, "even at the expense and to the detriment of the other kinds of weaponry."⁵⁸ He pointed out that aviation would have an enormous role in any future war. A nation lacking a powerful, well organized, trained and prepared air force would inevitably be doomed to defeat.⁵⁹

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Soviet military thought assigned an important place in a likely world war to radio technology, which would not only be a means of communication but would also have its own importance as a means of remote control. Enormous prospects were foreseen for radio technology in the national defense.⁶⁰

Military theoreticians pointed out that the development of aircraft and tanks would lead to changes in the weapons used by the ground forces. Plans were made to replace existing infantry and artillery weapons with automatic guns, which would operate against aircraft. Medium and large-caliber machine guns needed to be developed for antitank and antiaircraft warfare.⁶¹

According to Soviet military theoreticians two trends had taken shape in the post-war development of technology. In the past there had been no drastic technological changes in military affairs for decades at a time, whereas at the beginning of the 20th century improvements or discoveries were occurring every year in military technology.⁶² Special attention was therefore given to the need to draw upon workers in science and technology for strengthening the nation's defense capability.⁶³

The other trend was a significant growth in the number of technical personnel servicing the new means of warfare. A total of 4,000 pilots and 66,000 engine mechanics and technicians were required to operate and service 3,000 combat aircraft, for example.⁶⁴

Both of these trends detected by Soviet theoreticians in the 1920's have developed rapidly and now play a large role in the resolution of problems pertaining to the nation's defense capability.

The detection of general, objective trends in the development of military affairs was highly important to the development of Soviet military thought and the accomplishment of specific practical tasks involved in military organizational development, based upon the nation's realistic capabilities. With this in mind the matter of building up the Red Army's technological strength began to be discussed at the end of the 1920's at the initiative of the central theoretical military magazine VOYNA I REVOLYUTSIYA. The editors appealed to military scientists to explain their views, in order to plan the proper policy, "in order to avoid costly errors." An editorial pointed out the need to provide "tactically sound proposals, which can be achieved in our actual circumstances."⁶⁵ One could see a conflict between this requirement and the title of the article--"Tactics and Weapons of the Future"--which indicated that we had to deal not only with the actual circumstances existing at that time, but also with the future.

Many theoreticians and practical experts were active in working out this matter.⁶⁶ The discussion contributed to the adoption of more thoroughly substantiated scientific recommendations for the development of military technology. It brought out erroneous opinions standing in the way of proper resolution of the problem and essentially diverting attention away from its discussion. Certain analysts did not believe that it would be possible rapidly to overcome our lag in military technology. This point of view was exemplified by an article published in the

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journal of the Academy of the RKKA (now the Academy imeni M. V. Frunze). The article stated that we were not in a position to outfit the Red Army with equipment equalling that of the enemy. It maintained that we would not even be able to achieve technological superiority in the future.⁶⁷ It therefore recommended only those methods of conducting military operations, which would make the enemy's technology less effective and also make it possible to employ existing means and methods of warfare--partisan actions, the extensive employment of bodies of mounted soldiers, taking skillful advantage of the terrain, and so forth. With respect to aircraft and tanks, the article suggested that it would be better to master methods of combating them than to learn how to employ them in combat.⁶⁸

The search for methods for contending with a technologically powerful enemy in the situation of our nation's temporary technological backwardness brought out views inconsistent with the objective development of military affairs. It was asserted, as an example, that equipment was of less importance than the proper training of commanders and troops and their superior morale.⁶⁹ This point of view was widely held in the 1920's and in our opinion it reflected incorrect appraisal of the Red Army's experience in the civil war. Proponents of such theories were making an invalid comparison between an army's morale and its technological equipage.

V. I. Lenin taught us to regard people and combat equipment, man and weapon, their role and place in warfare in the light of their interdependency, in dialectical unity. No matter how sophisticated the combat equipment and no matter what sort of destructive powers the weapons possess, in the final analysis it is only people, people with good morale and a high level of military skill, who can use those weapons to gain victory in a war.⁷⁰ V. I. Lenin also stressed the following fact, however: "The very best army and people with the greatest of devotion to the revolution will be immediately destroyed by the enemy if they are not adequately armed, supplied with food and trained."⁷¹ War has taught us, V. I. Lenin stated, "that he who has the greatest technology, the best organization and discipline and the best machines gains the upper hand...."⁷²

And so the dialectical unity of man and technology has two sides: a military-technical side, which reflects the interaction between technology and the physical, biological and intellectual qualities of man, and the class-political side, which defines the political objectives of a war and determines the use of military technology in the war.

During that difficult period in the making of Soviet military thought, however, a time when scientific cadres were at the stage of mastering Marxism as applicable to analysis of military problems, views were expressed which were not consistent with prospects for the development of armed forces. For example, a number of military scientists called for us "to counter the enemy's technology with everything within the capability of a republic technologically poor but rich in the great morale and iron will of its people." In a commentary on this article the central military journal noted that certain authors have a tendency to draw a line between the army's "morale" and the "material aspect" of military affairs, traditional of the old school of military thought. The editors were supported by

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writers who maintained that there is no basis for separating man from technology, from the weapons, which are produced by man. "The development of new weapons is not a basis for formulating the question as one of man or machine."⁷⁴

Certain theoreticians rejected the process of contrasting man with technology and formulated the matter in a different light: Man and machine compliment each other and cannot be separated. Man remains the prime source of strength, intelligence and will, but man cannot exist without weapons in modern warfare.⁷⁵

In the polemics on the role of technology in warfare attempts were made "to justify" the existing lack of technology. Well-known military theoretician A. A. Neznamov acknowledged infantry's crucial role in combat and called for an expedient limit to the army's mechanization, "so that technology does not overshadow man in the army."⁷⁶ A number of critical articles were written to counter this erroneous point of view. One of them contained the statement: "Perhaps much of the technology is presently not within Russia's means--this is true, but this is an entirely different aspect of the matter. We must not be lulled by this situation into believing that we do not need technology."⁷⁷ It was recommended that a careful study be made to determine what was essential at that time and what could be put off until the future.

Proceeding from the Marxist-Leninist position on the role of man and technology and cognizant of the great revolutionary enthusiasm of the fighting men and their commanders, the military leaders warned us not to permit the Red Army's good morale to blind us to the need constantly to improve and outfit it technologically. They recommended thoroughly studying all means of warfare and establishing patterns and their interrelationships, and pointed out technology's crucial role in war.⁷⁸

In their search for a solution to the Red Army's temporary technological backwardness, certain theoreticians appealed for a return to the Dragomir indoctrinational methods, in which the training of the soldiers is oriented toward hand-to-hand combat.⁷⁹ Arguing against their views, M. V. Frunze wrote in 1921: "You will not get very far with 'savagery' alone."⁸⁰ Suvorov's opinion that "a bullet is a fool, a bayonet the valiant one," progressive for its time and taught by Dragomirov, was already outdated at the end of the 19th century. Theoretically, such views were due to a lack of understanding of the objective development of military affairs.

The Commission for writing the RKKA Field Service Regulations frankly discussed the underestimation of technology in an explanatory statement: "In the Red Army the theory has acquired currency that we will wage a future war not so much with technology as with the supremacy of our revolutionary activeness and class self-awareness. While there was some basis for this opinion during the period of devastation, now that our industry is returning to the prewar level, it is an extremely harmful and dangerous evil."⁸¹

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The commission discredited the idea that we would have to reconcile ourselves to the Red Army's technological backwardness, thereby affirming its respect for material strength in combat and material resources in war. This in particular distinguished the 1925 Field Service Regulations from our previous ones. Technology's role was underestimated even after that, however. Certain delegates to the Conference of Chiefs of District and Fleet Political Directorates, held in January of 1927, did not agree with the explanatory statement at the beginning of the 1925 Field Service Regulations. R. A. Muklevich, for example, stated that "in a future war our supremacy over the enemy will by no means lie in the area of mechanization, machinization, electrification or technology in general... our supremacy will be provided by nothing other than our social nature, our ideals and our political work."⁸² Responding to such statements, M. N. Tukhachevskiy, while acknowledging the extremely powerful influence of political indoctrination in combat, stated that "one does not repel a machine gun either with morale alone or with one's cap."⁸³

At the same time the most prominent Soviet theoreticians were warning us not to make a sacred thing of technology. "It is extremely dangerous to underestimate the role of technology, of course, but we can also not afford to be hypnotized by it."⁸⁴ This warning was especially needed in the 1920's, due to attempts by bourgeois military theoreticians to intimidate the Soviet Union with their technological superiority. This is why M. V. Frunze saw the task of party organizations with respect to disseminating the correct views on the problem of man and technology in a future war as one of insuring that every Red Army man understood what might be used against him. In this way, "we will achieve much in the sense of combat indoctrination and combat conditioning for the personnel of our Red Army."⁸⁵ It was Frunze's opinion that we should give extensive publicity to questions surrounding the improvement of technology and to its tactical and technical possibilities, and should demonstrate the strong and the weak points of new weapons. He requested that this matter be brought to the attention of all civilian institutions and organizations. "That side," M. V. Frunze wrote, "which has personnel well trained in all respects and which has a proper concept of the role of technology, of its true importance and power, will never be crushed by an enemy's technological superiority."⁸⁶

Fundamental economic and social reforms took place as a result of our successful fulfillment of the first five-year plan. Far-reaching changes occurred in the class composition of the Soviet society: The working class increased numerically and grew stronger organizationally, and its leading role in Soviet society increased. Socialist production relations became predominant in the rural area, and the roots of capitalism were stamped out in agriculture.

A qualitatively new class, the kolkhoz peasantry, took shape in the rural area in the process of mass collectivization. The alliance of the working class and the peasantry gained strength on its new, socialist, foundation. Former workers and peasants made up a considerable portion of the Soviet intelligentsia.

All of this strengthened Soviet society, increased the nation's defense capability and created new conditions conducive to the training of scientific cadres and the development of Soviet military theory.

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The successes achieved in the socialist economy had a beneficial effect upon the development of weapons and military technology, and through these, upon the development of Soviet military theory.

Production of the means of production increased from 39.5 percent of the gross industrial output in 1928 to 53.4 percent in 1932. The Soviet Union changed from an agrarian to an industrial nation and advanced to the front ranks of nations with the highest level of technological and economic development.⁸⁷

The rapid growth of machine building was enormously important for the technological retooling of the national economy and especially for strengthening the nation's defense. The gross output of the machine-building and metal-working industries increased 4-fold during the five-year period, reaching a level seven times that of 1913.⁸⁸

The development of automotive, tractor and tank industries during the first five-year plan created the material foundation for motorization of the army and for the creation of armored and mechanized troops. Motor transport, for example, grew from 23,000 motor vehicles in 1928 to 73,000 as of 1 January 1933 (not including the Gor'kiy Automobile Plant).⁸⁹

Rail transport and the level of agriculture's technical equipment has an important function in the nation's defense capability. The total length of the railways was increased by almost 5,000 kilometers,⁹⁰ during the five-year plan, and agriculture received more than 120,000 new tractors and other machines, which doubled its machine equipment level, compared with 1928.⁹¹

Our nation's economic geography changed during the first five-year plan. The Ural metallurgical base, the Magnitogorsk and Kuznetsk industrial giants and a fuel base in the Far East and Eastern Siberia were created during those years, and industrial centers were laid out in Central Asia. All of this made it easier economically to accomplish the nation's defense tasks.

And so, the foundation for a socialist economy was created as a result of the successful implementation of the first five-year plan. The Soviet people, led by the Communist Party, proved that it was possible to build the foundations of socialism in a situation of capitalist encirclement. Formerly an economically and technically weak nation, the Soviet Union became an industrial nation.

The technical outfitting of the Red Army, accomplished as a result of fulfillment of the first five-year plan, had a beneficial affect upon the development of military theory. Matters pertaining to the employment of the technical branches of troops--aviation, tanks and artillery--became increasingly important in research studies, and the publication of technical military literature was expanded.

The party and government devoted special attention to strengthening the nation's military and economic might in the second half of the 1930's. When it reviewed the Third Five-Year Plan of National Economic Development (1938-1942) the 18th party congress, held in 1939, noted the importance of continuing to raise the

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degree of technical equipment for all branches of the national economy, especially the defense industry, and indicated the need for proper distribution of new plants in the nation's eastern regions, taking into account the most important types of raw materials, and the need to create duplicate enterprises for a number of machine-building and petroleum-refining branches, in order to eliminate uncertainties in supply.⁹² This decision was highly important for the nation's defense, since many enterprises were out of reach of enemy aircraft. Prior to this a considerable number of plants had been located in the European part of the nation, and the bulk of the Red Army's bases and depots were located in the western districts.⁹³ By the summer of 1941, however, almost one-fifth of all the nation's munitions plants were located in the eastern regions.⁹⁴

The Soviet government increased the defense industry's output, compared with other branches. Industrial output for the USSR increased by 120 percent during the second five-year plan (1933-1937), for example, while the defense industry's output increased by 286 percent.⁹⁵ The annual increase in output for all of industry averaged 13 percent for the first three years of the third five-year plan, while the average for the defense industry was 39 percent.⁹⁶

Machine building, which was being developed more rapidly than the other branches, was a crucial factor in the technical updating of the entire economy, especially the military. In 1940 gross industrial output exceeded the 1913 level by 7.7-fold. This included increases of 13.4-fold for group "A," 4.6-fold for group "B" and 30-fold for machine building and metal processing.⁹⁷ Due to the increased threat of war, the creation of large state reserves was given special importance in the third five-year plan. Between January 1939 and January 1941 state reserves and mobilization stockpiles of iron were increased 5-fold, rolled metal 2-fold, copper more than 2-fold, zinc 2.2-fold and lead 1.6-fold.⁹⁸

By 1 January 1941 the state had stockpiled 6.162 million tons of rye, wheat, oats, flour and groats, and had stockpiled enough food and fodder to meet the needs of the armed forces for four to six months in case of war.⁹⁹

During the one and a half year preceding fascist Germany's attack upon the USSR, the nation's state material reserves almost doubled in terms of value. At the beginning of the war they were transferred to the eastern regions of the nation.^{99a}

In view of the need for additional measures to raise the mobilizational readiness of the national economy, the Presidium of the USSR Supreme Soviet on 26 June 1940 at the initiative of the trade unions, passed the Ukase "On Converting to the Eight-Hour Workday and the Seven-Day Workweek and On the Prohibiting of Unauthorized Departure of Blue- and White-Collar Workers From Enterprises and Establishments." Lengthening the workday was highly beneficial for strengthening the nation's defense. However, the party and government regarded this as a temporary measure resulting from the increased threat of war.¹⁰⁰ The training of worker cadres was an important factor in the strengthening of the nation's defense capability. Courses for masters of socialist labor and workers' groups for meeting the minimal technical standards were created at enterprises.

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A state system for the vocational training of the youth was created in the nation. An ukase passed by the Presidium of the USSR Supreme Soviet on 2 October 1940, "On the State Labor Reserves of the USSR," established three types of training institutions--trade and railroad schools and factory training schools (FZO). An annual training goal of up to 1 million workers was set.¹⁰¹ In 1940, 3,078,000 workers were trained or retrained in the labor reserve system and the vocational and technical education system.¹⁰²

The 18th All-Union Conference of the VKP (b), held from 15 to 20 February 1941, reviewed matters pertaining to the improvement of industry and transport operations. Specifically, it pointed out the need for strict observance of discipline in the production process, the need to master production of new machines, materials and manufactured articles, and so forth. It stressed the fact that industry remained the foundation for the nation's defense strength.¹⁰³ The conference worked up political and organizational and management measures, which essentially prepared the way for placing industry and transport onto a military footing.¹⁰⁴

And so, the Soviet people, led by the Communist Party and utilizing the advantages of the socialist system, were able to resolve the basic problems involved in the nation's industrialization within a span of less than three five-year periods. "A multi-branch industry had been created in the nation by the beginning of the 1940's.

"The Soviet Union had reached the level of Europe's developed capitalist nations with respect to volume of industrial output and industry's level of technical equipment."¹⁰⁵ A solid material foundation had been laid for increasing the nation's defense capability.

In the area of the military the party concentrated upon the technical rebuilding of the armed forces and on the improvement and development of the material-technological foundation for the nation's defense strength. The possibility of aggression forced the party and the Soviet government to allocate considerable funds to strengthen defense. Defense outlays had increased to 56 billion rubles in 1940, compared with 23 billion rubles in 1938.¹⁰⁶⁻¹⁰⁷

Specialized construction organizations were created under the People's Commissariat of Construction (Narkomstroy). They performed state and defense tasks, including the construction of large industrial enterprises, roads, canals, bridges, airfields, ports, and so forth.

The industrializing of construction created conditions conducive to the rapid development of war materiel production and defense facilities.

Railroads were being successfully constructed in the nation, especially in the western regions. Powerful new steam locomotives and heavy rail cars were built, and track facilities, steam locomotive and rail car depots were remodeled.

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The construction of roads was expanded. Work was begun on the Moscow-Minsk Highway.

New towed and self-propelled vessels were added to the river fleet, and ports on the Dnepr, Sozh, Pripyat', Berezina and Zapadnaya Dvina were mechanized.

The government took steps to create an extensive network of postal, telegraph, telephone and radio communications. A high-speed teleprinter was being placed into operation just before the war began.

The Soviet political and military leadership was forced to review defense measures on the nation's eastern and western borders. In the early 1930's the threat of Japanese aggression made it necessary to reinforce our defenses on the Far East borders. The military leadership recommended that we have two mechanized corps in that area and that we build up the air forces there to a strength of 2,000 aircraft.

The January 1936 session of the TsIK [Central Executive Committee] of the USSR, seventh Convocation, raised the issue of the nation's preparedness to defend itself simultaneously on two fronts separated from each other by 10,000 kilometers.¹⁰⁸

It became necessary to increase the constant combat readiness of all the armed forces to repel a surprise attack. This was done by converting to a system of regular rifle formations. It was pointed out that this line of organizational development for the armed forces would be very expensive but that there was no alternative.¹⁰⁹

Final rejection of the combined territorial and regular system and the switch entirely to the regular system for the organizational development of the armed forces in 1939 were necessitated by the tasks involved in strengthening the nation's defense, since the old system had fallen behind the increase in the quantity of weapons and combat equipment and the need to assimilate them. "As the foundation of our forces," K. Ye. Voroshilov, people's commissar of defense, stated at the 18th party congress, "the territorial system began to conflict with the state's defense needs as soon as the armies of the main imperialist nations began to be increased and brought up to fighting condition while there was still peace."¹¹⁰

At the session of the TsIK of the USSR, seventh convocation, military leaders raised for discussion the matter of accelerating development of the aviation, the most powerful means of national defense, and focusing our effort upon the development of the submarine fleet and subsequently, the surface fleet.

The numerical strength of the armed forces almost doubled between 1936 and 1939 as a result of adopting the regular system for manning the army. It increased from 1.1 million in 1936 to more than 2 million as of 31 August 1939.¹¹¹

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The increase in the numerical strength of the armed forces and the amount of military equipment in the army and the navy fundamentally altered the internal structure and the organizational setup of our defense: Large numbers of new military agencies and formations, and new military specialties came into being, and service conditions became more complicated for the rank and file, and especially for those in charge. This fact was reflected in the 1939 Compulsory Military Duty Law. The term of service was extended from two to three years in the Ground Forces and the air forces and to four years for service at sea. In order to increase total numbers of trained military personnel the draft age for active military service was lowered by two years, from 21 to 19 years.¹¹²

In view of the fact that our likely enemies--Germany and Japan--had large land armies and that military operations would be launched on land fronts, we set out to increase the Ground Forces, which accounted for four-fifths of the total strength of the army and navy by the beginning of the Great Patriotic War (see Table).

Correlation of Branches of Armed Forces from 1939 to 1941 (In Percentages)*

Branches of armed forces	September 1939	May 1940	June 1941
Ground forces	74.5	84.2	79.3
Air forces	10.9	5.8	11.5
Navy	10.7	7.5	5.8
National air defense forces	3.9	2.5	3.4

* "Istoriya vtoroy mirovoy voyny" [History of World War II], vol 3, p 418.

External conditions forced the Soviet government to continuously build up the armed forces, review our defense measures, recalculate forces and facilities, work out new strategic deployment plans, and so forth.

A significant advance was made in the strengthening of the Soviet Armed Forces following the Politburo's meeting in March of 1940, which reviewed the results of the war with Finland and the lessons derived therefrom and discussed the combat training and indoctrination of the troops and the matter of increasing the combat capability of the army and navy.¹¹³

An order "On the Combat and Political Training of the Troops for the 1940 Summer Training Period" was issued in accordance with instructions from the VKP (b) Central Committee and recommendations made by the Main Military Council. This document indicated the changes made in the training of the troops and staffs and the new, technical reorganization achieved for all services of the armed forces and troop arms and their technological updating, a result of the party's consistent course toward industrialization of the nation.

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The Soviet state was faced with difficult tasks of introducing the new models of weapons and other combat equipment in the army and navy within the limited time available. The activation of 20 mechanized corps was begun in February and March of 1941. A total of 32,000 tanks, including 16,600 of the new models, had to be manufactured in order to fully outfit these corps.¹¹⁴

We still lacked a considerable quantity of this equipment in mid-1941, however. We also lacked cadres of technical specialists and commanders. For this reason the tank and mechanized formations were not fully manned. The bulk of the personnel joining the forces at the end of 1940 and during the first half of 1941 could not receive special training.¹¹⁵ The armament industry was also unable to provide the equipment for the activation of 10 antitank artillery brigades begun in April of 1941.

Between 1 January 1931 and 22 June 1941 our aircraft industry produced around 18,000 combat aircraft, around 4,000 of them new models. On the eve of the war most of the aircraft were therefore of the old designs. We were able to update no more than 21 percent of the air units with new aircraft.¹¹⁶

Not only did the realization of industrial plans hinge upon extremely short time periods: The armed forces were growing at a rate exceeding our capability for producing certain types of weapons and combat equipment.

This chapter has shown the vigorous steps taken by the Communist Party and the Soviet government to prevent the imperialists from involving the Soviet Union in international conflicts. World War II could not be prevented, however.

The program for strengthening the nation economically ended with the creation of a powerful military and economic potential. It was now possible for the nation to provide its armed forces with everything they needed in case of war.

History attests the fact that the Communist Party and the Soviet government took emergency steps to build up the Soviet Union's defense strength. And although it was not possible to resolve all the problems pertaining to defense during those years, the socialist state had a powerful economy overall. Fascist Germany had fully updated its forces and was mobilized to conduct the great predatory war in August of 1939, while the Soviet Union had not completed the updating of its army and navy by June of 1941. And so, the malicious fabrication about Russian aggression, concocted for the purpose of justifying as preventive fascist Germany's actions against the Soviet Union, contradicts the historical facts.

Military economic theory, as well as the postwar experience in updating the armed forces, have demonstrated the fact that the transition to series production of new types of aircraft, tanks and other equipment entailed a vast restructuring of the production process, a fact which has not always been taken into proper, accurate account. "Errors made in appraising the possibility of an attack against us by Hitler's Germany and the resulting omissions in preparing to repel the first strikes" were also important factors.¹¹⁷

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As a result of the delays in the updating of the armed forces the new materiel basically did not begin reaching the western military districts until April or May of 1941. For this reason the air regiments had few crews trained to operate the new combat equipment. Consequently, the border districts had a certain number of aircraft and crews which were not ready for combat, and this gave the enemy a 1.5-fold superiority in crews and aircraft in the western sector.¹¹⁸

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