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TRANSLATIONS FROM "VOYENNAYA MYSL'," No. 11, NOVEMBER 1971

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WAR AND THE SOCIALIST REVOLUTION

(Military Problems in Theory of Scientific Communism)

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The present era of transition from capitalism to socialism, which was ushered in by the Great October Socialist Revolution, has placed mankind face to face with an abrupt break with the old principles of societal affairs. Under conditions of rapid development of the world revolutionary process, when socialism has become firmly established in the world and has become a powerful international force, under conditions of growing aggressiveness on the part of imperialism and increased potential for utilization of the achievements of scientific and technological progress in war, the problem of war and the socialist revolution has become particularly acute.

The present situation is both complex and conflictive. It demands dialectical flexibility in analyzing and solving specific problems; a scientifically substantiated conclusion on the fact that the road to socialism passes through revolution, however, is mandatory and indisputable for the peoples of all the nations of the world. "...Socialism," wrote Karl Marx, "cannot be achieved without revolutions" (K. Marks and F. Engel's: Soch. [Works], Volume 1, page 448).

The fundamental conflict of the present era -- the antagonistic conflict between two opposed social systems -- can be resolved only by means of a world socialist revolution -- this is the logical path of social development of the modern world.

The militarists grossly falsify Marxist-Leninist doctrine on the socialist revolution and declare it to be a special expansionist program. Equating the terms war and revolution, they cynically ascribe to the Communists aggressiveness and an attempt to resolve social conflicts with the aid of war, while they describe Leninism as the product of "military thinking," of a unique military doctrine oriented toward "baptizing its revolution in blood."

Marxism-Leninism has provided a precise definition of war and the socialist revolution and has revealed the dialectical interrelationship between them. Its doctrine on the socialist revolution, on war and peace enables revolutionary parties to elaborate a scientifically substantiated strategy and tactics and to wage an implacable struggle against the lie of anticommunism, a struggle both against rightist opportunists, who fear the revolution, and against the adventuristic course of "leftist" elements.

War and Revolution -- Social Phenomena of a Differing Character

War and revolution possess certain common traits. They are engendered by the conditions of an exploiter society and constitute forms of political struggle, a continuation of the policies of specific classes. Exploitation of the toiler masses and predatory wars are two aspects of one and the same bourgeois policy. At the same time war and revolution are radically different as social phenomena.

War and revolution possess different sources. The socialist revolution possesses first and foremost an internal source. It matures within the capitalist society as a result of the objective laws of its development. All economic development of the capitalist system leads to a termination of the dominance of capitalism. "No force would destroy capitalism," wrote Lenin, "if it were not undermined by history" (Poln. Sobr. Soch. [Complete Works], Volume 32, page 99). The socialist revolution involves the effect of the law of conformity between production relations and the character and level of development of productive forces. Its economic basis is the conflict between the new productive forces and capitalist production relations, which have become an inhibiting factor in their development. The conflict is expressed in a sharp aggravation of the antagonistic conflict between labor and capital.

The socialist revolution is the result of the development both of objective and subjective preconditions for social revolution in a given country. The material, sociopolitical preconditions presume the existence of a political army of the revolution -- class forces which are politically, ideologically and organizationally prepared to storm the bastions of the old society. A war engendered by the domination of capitalism and the policies of the bourgeoisie is not always necessarily linked with an acute conflict between productive forces and production relations.

The founders of scientific communism came out vigorously against the theory of export, of the urging of revolution from without, and particularly with the aid of war.

Marx and Engels subjected to withering criticism those Blanquists and anarchists who claimed that it was sufficient to have an organized group of conspirators in order to produce a revolution at any given time. At the time of the negotiation of the Treaty of Brest-Litovsk Lenin sternly branded the "leftist Communists" as adventurers and pseudorevolutionaries who were calling for the spread of socialist revolution in Western Europe even at the cost of the collapse of the Soviet government. War would constitute such an urging of revolution. These views are incompatible with the theory of Marxism, which has always denied the "pushing" of revolutions. Lenin angrily branded the idea of "revolutionary war" for the purpose of priming the pump of the revolutionary process, as advanced by

the Trotskyites, as a "mangy revolutionary phrase," and people who think that revolution can arise in any country on order as fools or provocateurs.

Adventurist theory is oriented toward passivity of revolutionary class forces within a given country. The danger of such an approach to the problem under present-day conditions was emphasized by Le Duan, First Secretary of the Central Committee of the Vietnam Workers' Party. "...One cannot conclude," he wrote, "that war is an essential source of and condition for the outbreak of revolution and that therefore one can sit idle and wait for war to come, only then waging revolution."¹

War and revolution differ in motive forces. Wars are waged both by reactionary and progressive classes. A revolution is waged only by progressive forces.

Preparations for unjust wars are kept completely secret from peoples, are waged under false banners specially prepared by the military organization -- the army -- and express the selfish, narrow class interests of the bourgeoisie.

Progressive social forces capable of pronouncing a judgment of history rise up in revolution. The socialist revolution is based on the political activeness of the broad toiler masses, particularly the worker class, guided by Marxist-Leninist parties. The revolution is prepared not by machinations behind the scenes but rather by means of open and frank mobilization of the masses. Without their sympathy and active participation a victorious revolution is impossible. Of unfading significance is the Russian experience, about which Lenin wrote. "We were a small party in Russia, but we had as allies the majority of soviets of worker and peasant deputies throughout the country... Almost one half of the army was with us, an army which at the time totaled at least 10 million men" (Poln. Sobr. Soch., Volume 44, page 26).

Bolshevism united around itself the entire revolutionary vanguard and the great majority of toilers. Lenin's thesis is extremely pertinent today, when the opportunity has arisen to expand the social base of the revolution, when the problem of winning over the bulk of the masses, the problem of creating a broad front of antiimperialist forces has become one of the most important problems in the strategy and tactics of Communist and worker parties. Their struggle for implementation of general democratic slogans and for peace is helping to create a mass political army of socialist revolution. The general democratic struggle does not further postpone the socialist revolution but rather draws it closer.

Falsifying Marxism-Leninism, the Maoists place the struggle for democratic reforms in opposition to the cause of the socialist revolution. In their opinion, the less developed democracy in capitalist countries is, the

greater the chances for socialist revolution. This primitive, metaphysical appraisal is incompatible with the dialectical Leninist idea of rapprochement of the struggle for democracy with the struggle for socialism.

In the period of transition from capitalism to socialism it is not essential in each and every country, at each and every stage of its development, to proclaim the slogans of socialist revolution. Whatever stages the revolutionary masses must pass through, whatever intermediate programs and slogans the Communists may advance in consolidating and rallying the masses, they always remember that there lies ahead a struggle for the overthrow of capitalism and the establishment of socialism. Under present-day conditions of the development of mankind, national, anticolonial and liberation revolutions, independent nations constitute tributaries which flow into the general stream of the antiimperialist and anticapitalist world revolution.

Propaganda and agitation alone are insufficient to bring the masses to support the position of the proletariat; the masses themselves must gain political experience for this. It would be not only unintelligent but criminal to throw the vanguard alone into decisive combat before the masses have been drawn into the struggle. Our party led the masses in the assault on capitalism when suitable objective and subjective conditions had been created for this, "when the consciousness, will and passion of tens of millions of persons had been prepared for this by the entire course of the struggle," state the Central Committee CPSU Theses "On the Vladimir Il'ich Lenin Birth Centennial."

The fundamental law of revolution thus presupposes the presence of the vanguard of a revolutionary class, as well as political experience of the masses.

War and the socialist revolution differ in political content, end goals and social consequences. In contrast to wars, which can be progressive or reactionary, revolutions pursue just goals, which prompted Karl Marx to call them the "locomotives of history." While an imperialist war serves the aims of plundering the peoples of other countries, the seizure of territories, markets, spheres of influence and the aims of destroying revolutionary forces, the socialist revolution encompasses the entire aggregate of economic, political and spiritual transformations which lead to the total destruction of capitalism, to the building of socialism and consequently to elimination of the source of all wars.

War and the socialist revolution, societal phenomena which are profoundly different in content, frequently lead to diametrically opposite socioeconomic consequences. Imperialist wars have brought mankind incalculable loss and suffering. Productive forces are savagely crushed and millions of

human lives destroyed. Lenin sharply censured those who described wars as an accelerator of development of productive forces. The arguments of German professor Heniger in favor of an arms race as a stimulus of economic progress were called by Lenin the babblings of a "nasty little man dedicated to militarism" (Leninskiy Sbornik [Lenin Collection], XXVII, page 17).

Lenin's assessment of this ideologue of militarism has a direct relationship to the present-day apologists of aggression, who have fabricated a special theory of the benefits of civilian utilization of the results of research conducted on the basis of contracts with the military, on the beneficent influence of the development of military technology for improving the health of science.

Social revolution means a transition to new, more progressive forms of societal affairs. The Great October Socialist Revolution is the best evidence of this. Those 10 days in October "shook the world," while the 54 years which have passed since then have changed it. The ideas and legacy of the October Revolution consist in the total and ultimate victory of socialism in the USSR, in the establishment and consolidation of the world socialist system, in the burgeoning of the present-day labor, communist and national liberation movement, in the profound change in the spiritual life of mankind. The triumph of the Great October Revolution signifies a new chapter in world history -- an era of unprecedented revolutionary accomplishments.

The essence of the revolution consequently lies not so much in compulsion, which is characteristic of war, as in the creative establishment of a new society.

War and socialist revolution do not coincide in methods and forms of achieving political goals. In contrast to war, for which employment of means of armed violence and mass armed struggle is a specific, determining indicator from the standpoint of form of implementation of political goals, the socialist revolution presupposes, depending on specific historical conditions of place and time, a variety of ways, methods and means of achieving common goals. Marxists have never claimed that the conquest of power must be achieved everywhere and in all cases with identical means. Lenin warned against stereotype in determining the forms of transition to socialism and criticized attempts to shift the center of gravity from the content of the term revolution to the forms of its manifestation. Without predetermining in advance the method of gaining political power, without absolutizing any given variant of implementing the socialist revolution, he considered it essential to master all, without the slightest exception, forms of struggle, to be prepared for a rapid shift from one form to another. "...Marxism definitely does not renounce any forms of struggle,"

wrote Lenin (Foln. Sobr. Soch., Volume 14, page 1). The ruling classes do not voluntarily yield power, and therefore revolution is always social coercion, but it does not always constitute physical, armed violence.

The methods and forms of gaining political power depend on the general conditions of the era, the specific situation in each country and its national features, the acuteness of class conflicts, the correlation of class forces, the degree of organization and political maturity of the worker class and its allies, skilled party guidance, as well as on the strength or weakness of resistance by the bourgeoisie. Consequently, selection of forms of struggle is based not on subjective desires but rather on the objective logic of historical development. Each party elaborates its own policy, specifies areas, forms and methods of struggle and selects, depending on circumstances, a peaceful or nonpeaceful path of transition to socialism.

The Chinese schismatics have placed their dogmatic and adventurist position in opposition to the scientific conclusions of the Leninist parties, which have been confirmed by practical experience. A Marxist-Leninist concept of the socialist revolution is alien to the Maoists. They reduce the revolutionary process to extreme forms of armed activity, justify the correctness of Blanquist insurrections, etc. They replace the decisive role of the class struggle with the determining significance of war, absolutize armed violence as the highest form of class struggle, as the main front of struggle, and have declared war to be an ideal toward which one must strive.

In actual fact the highest form of class struggle is the socialist revolution proper. Armed violence cannot be called the highest form of class struggle. It is the most acute but not the highest and not an absolutely mandatory form.

Utilizing the ultrarevolutionary phrase for purposes of obfuscation, the Maoists are playing into the hands of capitalism. Denying the possibility of employing peaceful means, they express thereby a lack of faith in the power of the worker class and its allies, in the strength of the socialist community. Orienting themselves totally toward the achievement of results on the basis of war and assessing the "cultural revolution" as a great military exercise "with the goal of preparing to wage a popular war," the Maoists in fact are joining the general chant of the American "superhawks" with their militarist slogan "Victory, Not Peace." Thus by the very logic of things leftist slogans converge with the slogans of the extreme rightist supporters of ultramilitarism, who openly state that they are constrained by no caution in selection of the means of struggle.

For justification of this petit-bourgeois, anarchist element, the Peking propagandists have replaced materialist dialectics with sophistry and eclecticism. They translate Marxist-Leninist dialectics into the language of demagoguery and a subjectivist fast shuffle. They seek to make capital on the element of authenticity, absolutizing it, removing it from the general context. It is a well-known fact that a strategy of protracted guerrilla warfare was implemented in China when an offensive was being mounted on the cities from the rural areas. This strategy, failing to take the concrete situation into account and hypertrophied to a global scale, is expressed in the absurd theory of revolutionary war of the "world village" (the entire nonindustrial world of Asia, Africa, and Latin America) with the "world city" (the industrially developed regions of Europe and North America), which includes the Soviet Union. Thus the specific knowledge of tactics of guerrilla warfare in an agrarian country is sophisticatedly universalized and transferred to the world arena.

History indeed knows of many instances of temporary coincidence of war and revolution, revolution and civil war, but this is not a natural law.

Maoist claims are rejected by Marxist-Leninist theory of socialist revolution and by the very experience of the world revolutionary process. A revolutionary situation does not necessarily become transformed into a revolution as a result of war. The experience of the 1919 Hungarian revolution is of interest. The bourgeois dictatorship collapsed under the pressure of a powerful worldwide wave of revolution, as it was unable to cope with the growing revolutionary crisis in Hungary. The Hungarian Communist leader Bela Kun, who enjoyed solid support by the masses, took over as head of government. As Lenin stated, the transition to a Soviet system, to dictatorship of the proletariat was incomparably easier and more peaceful in Hungary (Poln. Sobr. Soch., Volume 38, page 260).

The young Hungarian revolution was crushed by the forces of domestic and external counterrevolution. Soviet Russia, whose every effort was committed to the struggle against foreign intervention and domestic counterrevolution, was unable to lend that assistance which would have been possible under different circumstances. In the People's Democracies of Central and South-eastern Europe the worker class, under the leadership of Marxist-Leninist parties, ensured an essentially peaceful transition from democratic to socialist revolution, under different historical conditions, with a more favorable balance of revolutionary and counterrevolutionary forces in the international arena.

It is characteristic that a revolution is not always accomplished in that country which has participated in war. The revolution is victorious wherever a revolutionary situation has been established. Sixty-one nations were drawn into World War II, while a socialist revolution took place in 11 countries, where internal preconditions existed.

Nor is civil war a mandatory form of class political struggle. Lenin spoke of the necessity of the most acute class struggle under certain historical conditions of civil war. One must bear in mind the fact that "the world bourgeoisie is organizing and waging civil war against the revolutionary proletariat..." (Poln. Sobr. Soch., Volume 39, page 187). The Bolsheviks demonstrated an example of combination of peaceful and non-peaceful means of struggle and flexibly utilized them, depending on the prevailing situation.

Specific patterns and relationships are inherent both in war and socialist revolution. The course and outcome of an armed conflict depends on the correlation of economic, moral-political and military forces of the belligerent states. This is the most general law of war, and war is not at all mandatory for the transition from capitalism to socialism.

Revolution as a mandatory and inevitable condition for transition by any capitalist country to socialism, with all the unique features and diversity of the individual countries, develops on the basis of the same common patterns of collapse of the exploiter edifice of state and the establishment in one form or another of a dictatorship of the proletariat, which has entered into an alliance with other toiler strata, liquidation of exploiter classes, nationalization of the means of production and establishment of socialist production and other societal relations in city and village, and acquisition of cultural treasures by the broad toiler masses.

Although the genesis of an imperialist war is determined by laws inherent in imperialism, it can be prevented, since a new world balance of forces has been created. Nothing can prevent a socialist revolution, however, since there are no other means than socialist revolution to resolve the increasingly-acute conflict between labor and capital.

Thus war and the socialist revolution, constituting societal phenomena engendered by the exploiter capitalist system, are not mandatorily linked by cause and effect relations. They have fundamentally different sources of origination, motive forces, methods and forms of implementing political goals. The attitude of the masses toward them is fundamentally different. The laws of war and revolution are specific.

Features of difference between war and socialist revolution do not exclude but rather presume a dialectical interrelationship, flexible, mobile, multifaceted and profoundly contradictory interlinks between them.

Correlation Between War and Socialist Revolution

Revolutionary processes cannot be viewed in an isolated fashion, abstracting from other social phenomena, including wars between nations and civil

wars. Wars between nations have a definite effect on development of the class struggle and maturation of the revolutionary situation; the socialist revolution in turn influences the origination of a war, its course and outcome.

Wars between nations, particularly world wars, exert a dual influence on the socialist revolution: on the one hand they speed up the ripening of a revolutionary situation and on the other hand inhibit and complicate achievement of the goals of revolution.

In many cases an aggressive, unjust war functions as a catalyst of revolutionary processes. It leads to an excessive strain on all socioeconomic contradictions of capitalism and creates a dynamic situation as regards the political interrelationships between classes. World War I generated in Russia profound revolutionary moods among the masses and placed them before a dilemma: to perish or to overthrow the yoke of capital by revolutionary means, to pass final judgment on social institutions which had lost their viability.

Under certain conditions war is capable of accelerating the maturation of objective and subjective preconditions for a socialist revolution.

In the first place, an unjust war exposes the policy of the ruling classes, unmasks its class, antipopular character and promotes a deepening of the "summit" crisis. The conflict between people and government is manifested particularly acutely when a war fails to bring victory to the aggressor. Under these conditions the government is unable to pull the nation out of crisis, writhes in agony, going from one extremity to the other, displaying nervousness and confusion. Political improvisations may assume the character of governmental desperation. The "summit" loses the ability to administer and govern.

Secondly, during the course of an aggressive war the government is more dependent on the people than during peacetime. The masses are drawn into the war by the millions. The times are long since past when, for example, it sufficed Nicholas I to give the command: "Gentlemen, mount up! France has become a republic!" to strangle with impunity a revolutionary war by means of intervention. Today the militarists are compelled to adapt themselves and adjust, but opportunities for maneuver are narrowing. During war it is more difficult to play at democracy. Militarist propaganda loses its force, since it contradicts the experience of the masses. In addition, the highly-trained, militaristic officer caste dwindles away in numbers as casualties rise. The toiler masses, now dressed in uniforms, possess in their hands weapons which they can turn against their oppressors.

Thirdly, war aggravates social antagonisms, brings even greater suffering to the toilers and deepens the discrepancy between the rising level of greedy demands of the bourgeoisie and toiler living standards.

Today this tendency is showing up increasingly clearly in the world's richest capitalist nation, which is staggering under the burden of war in Vietnam, Laos, and Cambodia. In the United States the mad rampage of militarization, whipped to a fever pitch by the war, is devouring the lion's share of the gross national product. The arms race and related climb in military expenditures constitutes the main reason for a growing burden of taxation. The monetary crisis, which is leading to inflation -- rising prices, stagnation or decline in real wages -- is becoming a real calamity to the toilers. The monetary crisis which broke out in the United States has led to confusion throughout the capitalist world.

Crisis phenomena, which are aggravated in the course of an unjust war, impart greater dynamism to the historical process. "...It is precisely the 'instability' of capitalism," wrote Lenin, "which is that enormous progressive factor which is accelerating societal development, drawing the masses to an increasing degree into the mainstream of societal life, compelling them to think about its structure, compelling them to 'forge out their own prosperity'" (Poln. Sobr. Soch., Volume 2, page 208).

Fourthly, war exerts influence on a regrouping of class forces and promotes changes in the sociopolitical situation which creates an objective possibility for a decisive onslaught on capitalism. The popular masses openly engage in sociopolitical affairs. Indignation breaks through to the surface. There occur active mass demonstrations by the worker class and progressive forces, which escalate into decisive, revolutionary actions. The masses acquire their own political experience and rally around their political vanguard, the worker class.

Symptomatic phenomena are occurring today in the United States, to a substantial degree under the influence of the war. Animosity and hostility toward the military-industrial complex is being aroused; there is a lack of confidence in both the Democratic and Republican parties. Confusion and dissatisfaction are being manifested even among those elements friendly toward the regime; more and more social groups are escaping from the influence of the ruling class.

In the recent past the leaders of the military-industrial complex spoke much about the stability of capitalism, counting on the political indifference of large segments of the population, on the "silent majority." The process of activation of the masses in a country whose rulers are waging bloody aggression is becoming increasingly apparent. Broad segments of the population are being drawn into the struggle, including those which prior to the dirty war in Vietnam maintained a state of political lethargy.

This awakening frequently channels into various streams of a spontaneous antimonopoly, antimilitarist, national-democratic movement. One must bear in mind, however, that it can also be utilized by reactionary forces. It is extremely important to bring the nonproletarian masses into the world revolutionary liberation movement headed by the worker class and Marxist-Leninist parties.

Fifthly, war speeds up the process of delimitation of class elements in the imperialist army. During World War I favorable conditions developed in Russia for movement by soldiers and sailors to the side of the revolution, for development of the class struggle among the troops. The prediction of Friedrich Engels that the day would come when soldiers under arms would refuse to kill their brothers and fathers had come true.

Under present-day conditions increased social unreliability of military personnel, particularly under the influence of the dirty and unsuccessful war which is being waged in Indochina, is characteristic even of the army of the citadel of modern capitalism, the United States. It is true that this army still constitutes a powerful war machine capable of carrying out inhuman orders but, to quote the magazine Newsweek, the war in Vietnam has become "poison in the veins of the American army."

We are all familiar with the fact that military personnel transferred from Vietnam to other units, including in Western Europe, carry with them a spirit of distrust and rebelliousness. Upon arriving home they frequently become antiwar activists. In the spring of 1971 Washington was stunned by a demonstration by Vietnam veterans, which took place in conjunction with widespread strikes by American toilers, a stepped-up movement against racial oppression and increasing public protest against the domination of the military-industrial complex and the bureaucratic police edifice.

In order to achieve development of the revolutionary situation it is essential that people, accumulating political experience under the influence of Marxist-Leninist ideology, reach an awareness of their class missions, that a substantial increase in mass political awareness and activeness take place on the basis of increased organization, conscious discipline and expansion of the influence and leadership role of the Communist Party. International solidarity of the worker class, international solidarity in the revolutionary struggle, and unification of various currents of the revolutionary process into a single mainstream capable of crushing the exploiter system, acquires particular importance.

An unjust war contains negative aspects from the standpoint of prospects for development of the socialist revolution. Accelerating its advance in certain cases, wars can have a negative effect. Under conditions of a

war situation, a reactionary government endeavors to establish a rigid dictatorship, strengthens the military-bureaucratic edifice, encourages terrorist actions against the toilers and the liberation movement, and organizes reprisals against revolutionary and democratic elements.

During the period of preparing for and in the course of waging war the imperialists, as is the case, for example, in the United States, endeavor to chain society with despotic military rule. All aspects of activity are permeated with bureaucracy and militarization. Factory, office, city, and the state as a whole are transformed into a barracks. Liberal American journalist Fred Cook had reason to call the United States a symbolic juggernaut -- a garrison state, a being of ruthless force demanding of its subjects blind faith and a willingness for self-destruction.

Political repression, military despotism, lawlessness and the employment of cruel, punitive actions complicate revolutionary activities and make the establishment of links between the worker class and the masses more difficult.

In the course of war, under conditions of intensified political reaction, favorable soil is created for deformation of revolutionaries and the burgeoning of opportunism. Great numbers of petit-bourgeois elements, infected with opportunism, elements who have evaded mobilization, replace cadre workers who have been cast into the field of battle. Savage acts of repression against the most conscious members of the worker class and their leaders can revive conciliatory, compromise-prone parties and trade unions, which make political deals with the bourgeoisie, making capital on the nationalist-chauvinist attitudes of ideologically immature individuals.

There also exists a danger of another kind. An imitation of revolutionary nature, leftist adventurism may arise in an atmosphere of unrest, dissatisfaction and growing anger against militarism.

The strategy and tactics of the Communist and worker parties rigorously take into account all the plus and minus points of the effect of a war in a given specific historical situation.

Positive prospects are borne in mind under conditions of any and all difficulties. The exploiter classes, initiating aggression, have the goal of diverting the attention of the toiler masses from internal political crises, of disuniting and fooling the masses, of destroying the vanguard, of weakening the revolutionary movement of the proletariat. Their calculations, however, ultimately fail. A general tendency of development of the class-antagonistic society is specifically revealed in this area -- the law of discrepancy between the content of the objective and the practical results of the activities of the ruling class.

The influence of war on development of the class struggle and maturation of the revolutionary situation is not one-sided. A process of inverse influence is extremely important. The effect of a victorious socialist revolution is particularly powerful. It creates a new, unprecedented opportunity to eliminate war from the experience of society. Only a socialist revolution can liquidate the exploiter classes and do away with the conditions which produce wars. The Great October Socialist Revolution plucked our nation from the maw of a bloody imperialist war. Popular democratic followed by socialist revolutions in many European and Asian nations helped bring World War II to a speedy end. When we, wrote Lenin, "overthrow, ultimately defeat and expropriate the bourgeoisie throughout the world, not only in one country, wars will become impossible" (Poln. Sobr. Soch., Volume 30, pp 133-134). Complete accomplishment of this task is a thing of the future, although even now, where victorious socialist revolutions have taken place in many countries, with the ensuing creation of a mighty community of socialist states, which enjoy vast international prestige and authority, a formidable obstacle has been placed in the path of the aggressive policies of imperialism. The era of imperialism has been correctly defined as an era of wars and revolutions. It is now possible to prevent or even exclude world wars from society even prior to the complete victory of socialism throughout the world. The victory of socialist revolutions in a number of countries has given particular importance to external, international conditions of maturation of preconditions for a socialist revolution in other countries. Socialism is receiving the opportunity to dictate to the world bourgeoisie both the forms of struggle and the battlefield as well.

The ratio between peaceful and nonpeaceful forms of socialist revolution has changed substantially. Under conditions of total hegemony of imperialism the peaceful path of revolution was improbable, an extremely rare historical possibility, although extremely desirable. Since the war a socialist revolution without war has become increasingly probable, a fact which of course does not remove from the agenda or diminish the role of the nonpeaceful course of revolution.

Economic development of socialist nations constitutes a powerful and revolutionizing factor in the world.

Lenin appraised economic success as a force and factor of revolution. One can hardly exaggerate the effect on the masses elsewhere in the world produced by successful development of a new society in a number of countries in various parts of the globe. The very fact of existence of a socialist world constitutes enormous assistance to the toilers in the capitalist nations in their struggle for their rights.

The Comprehensive Program of Further Deepening and Improvement of Cooperation in Development of Socialist Economic Integration of the CEMA Member Nations, passed at the 25th Session of the Council for Economic Mutual Assistance (1971), attests to the political solidarity of the nations of the socialist community, to the indisputable advantages of socialism over capitalism and the attractive force of the positive example of socialism.

Under peacetime conditions one observes enormous changes in development of the world revolutionary process. Imperialism is receiving increasingly telling blows both in the central areas of its domination and on the flanks -- delivered by the peoples of colonial and dependent countries. Everywhere, in all capitalist nations, the bourgeoisie is experiencing an intensifying onslaught by the labor movement. Militant demonstrations by tens of millions of proletarians constitute the best response to the fabrications of the enemies of Leninism, who are spreading a lie about the alleged loss of revolutionary spirit by the worker class.

The founders of scientific communism have emphasized time and again that, utilizing the entire arsenal of means of revolutionary overthrow, it is essential to seek ways toward less painful forms of revolutionary transformations. Marx and Engels stated that it was desirable for the proletariat to take over power by peaceful means, without armed violence, with a minimum of lives lost and detriment to productive resources, in order to speed up the building of socialism.

Taking into account the experience of the Great October Socialist Revolution, Lenin stated that although the socialist revolution connected with the world war led to the collapse of capitalism, "one could not conceive of a more painful, more difficult transition, more acute need and a more acute crisis, undermining all productive forces" (Poln. Sobr. Soch., Volume 36, page 397). Revolution breaking out during war "is a particularly difficult case of birth" of a new social system. Lenin's idea was reflected in the Manifesto of the Communist International, adopted at the First Comintern Congress: "Never artificially inciting civil war, Communist parties endeavor to make it as brief as possible when a civil war of necessity occurs, to reduce the number of victims and particularly to ensure the victory of the proletariat."

In the eighties of the last century the founders of Marxism approached the prospects of a temporary convergence of the socialist revolution with a general European war "with redoubled caution." Under the new conditions, Lenin emphasized, particular prudence is necessary, since war "will result in unprecedented brutalization and backwardness of all Europe..." (Poln. Sobr. Soch., Volume 36, page 397).

A nuclear missile war would lead to even more devastating consequences than the two world wars. Such a war could destroy a large part of the world's productive resources, is capable of inflicting ill-afforded losses on the worker class and retarding the movement toward communism, since it would take a long time to rebuild the economy, culture, and local resources.

The end objective of the socialist revolution is not simply the overthrow of capitalism at any price but rather the building of communism.

The Leninist policy of peaceful coexistence is consequently not a temporary slogan but rather a realistic, scientifically-substantiated political course. It most fully reflects the interests of the toilers of the entire world and the interests of development of the world revolutionary process.

The Chinese dissenters scoff at the Leninist idea of peaceful coexistence. They portray Marxist-Leninists in the caricature of toothless pacifists who are counting on "the love of peace and humanitarian nature of the imperialists"; at every opportunity they raise a cry about an alleged deal between the USSR and the United States. They cynically ignore the genuine dialectic of Marxist-Leninist foreign policy, characteristic of which are purposefulness, consistency, boldness and decisiveness, refusal to compromise in the struggle against imperialist aggression, and at the same time composure, caution, and precise calculation. The dialectics of the Leninist foreign policy course are consequently such that "the love of peace and willingness to offer suitable resistance to aggression are totally merged and coalesced in our policy."²

The 24th CPSU Congress, in its "Freedom and Peace for the Peoples of Indochina!" appeal and its "For a Just and Solid Peace in the Near East" declaration, confirmed a readiness and willingness to continue resolute support of the just cause of the peoples of Indochina and the Near East, which have been made the victims of imperialist aggression.

A revolutionary course without war is not reformism, it is not a negation of the revolution, nor does it constitute social partnership between the proletariat and the bourgeoisie; it is a savage battle which demands of Marxist-Leninist parties flexibility, firmness and resoluteness. It is not demobilization but rather mobilization of the masses, isolation of both rightist opportunists and "leftist" sectarians and schismatics.

Peaceful coexistence between nations of differing social systems does not mean absolutization of peaceful forms of socialist revolution in a given country, nor does it exclude the employment of armed forms of revolution in certain areas of the class struggle. "The policy of peaceful coexistence is not in contradiction to the right of oppressed peoples to utilize in the

struggle for their liberation that path which they consider necessary -- military or nonmilitary..."³

The struggle between socialism and capitalism is a class struggle in all areas of societal affairs and activities, including military. Under conditions of increased aggressiveness on the part of imperialism, the greatest vigilance is necessary. Our Communist Party is rigidly guided by Lenin's instructions that "we must accompany our steps toward peace by stepping up our military preparedness..." (Poln. Sobr. Soch., Volume 40, page 248). Minister of Defense A. A. Grechko declared at the 24th CPSU Congress that the Soviet Union is prepared, together with the other socialist nations, to respond to force with superior force.

FOOTNOTES

1. Le Duan: "Under the Glorious Party Banner," Pravda, 24 March 1970.
2. L. I. Brezhnev: Speech delivered at a meeting of constituents on 12 June 1970.
3. Mezhdunarodnoye Soveshchaniye kommunisticheskikh i rabochikh partiy (International Conference of Communist and Worker Parties), Politizdat, 1970, page 317.

ON THE QUESTION OF PROGRAMMED LEARNING

Col Gen I. Shkadov, Chief, Main Directorate of Military Educational Institutions of the Ministry of Defense USSR

The principal task in the area of training officer cadres consists in implementing the resolutions of the 24th CPSU Congress on further development of higher and secondary specialized education in conformity with the demands of scientific and technological progress, improvement in the quality of training and ideological-political indoctrination of future specialists.

In accomplishing this task military educational institutions not only equip students with the requisite volume of knowledge and practical skills, a volume rapidly growing under present-day conditions, which constitutes an objective pattern; they also form in students a scientific philosophical outlook and creative thinking, indoctrinate Communist conviction, party-mindedness, moral-psychological and professional qualities. Therefore implementation of party demands is inconceivable without seeking new and improving existing forms of organization of the curricular process and methods of training and indoctrination.

Collective study efforts by military educational institutions in this area have enriched our educational science with effective methods of working with students, have created the opportunity to improve organization of the curricular process and have made it possible to incorporate modern technical devices the employment of which within the framework of traditional forms has promoted intensification of the learning process and improved control and management of this process.

An article by Lt Gen P. Vashurin entitled "More Widely Adopting Programmed Learning"¹ and responses to this article² reflect an endeavor on the part of military higher educational institutions faculty to achieve further improvement of the curricular process as well as their interest in this problem, to which more than 5000 publications have been dedicated in the last 10 years in the Soviet Union alone.

During this same period effective studies of the problems of programmed learning have been conducted at military educational institutions. In 1967 a special scientific theory conference was held; on the basis of the results in this conference clear-cut guidelines were presented for the conduct of scientific investigation in the area of improving the curricular process and one of its elements, programmed learning. In conformity with these guidelines, a comprehensive scientific research effort is being conducted under the general supervision of the Main Directorate of Military

Educational Institutions of the Ministry of Defense USSR at service academies, schools and in other bodies. It is planned to complete this program by the end of this year. A number of conclusions based on this program are already being implemented in the schooling process.

We should note that matters pertaining to programmed learning which are discussed in the journal Voyennaya Mysl' reflect the results of these studies.

The conclusions of scientific investigations and experience in utilizing programmed learning methods at military educational institutions and at higher educational institutions of the Ministry of Higher and Secondary Specialized Education USSR indicate that they produce positive results, which are influencing the rate of learning, quality, depth and firmness of assimilation of knowledge by students and attest to its effectiveness. But in order to utilize this method with maximum effect for accomplishing the overall task, it is essential clearly to see its advantages and drawbacks and to determine the role and place of programmed learning in instructional procedure.

In the initial period of elaboration of this problem, when there was lacking a clear-cut definition of the essence of programmed learning, its content, as well as its role and place in the instructional process, some specialists excessively enlarged the area of application of programmed learning. The author of the article "More Widely Adopting Programmed Learning" as well as the authors of several replies to this article also failed to avoid this error. They continue to assign it the function of determining demands on future specialists, determination of an optimal volume of knowledge and skills, elaboration of scientifically-substantiated curriculum plans and programs, organization of the instructional procedure, lecture methods, employment of technical devices in teaching, etc. This is evidently due to an insufficiently clear idea on the differences between programmed learning, the programming of instruction, scientific organization of the instruction process, curriculum and instruction programs.

As early as 1967 an editorial in the journal Sovetskaya Pedagogika (No 7, page 41) stated: "At the same time one cannot help but comment that the noted tendency toward an excessively broad definition of programmed learning, right up to equating it with the concept of scientific organization of labor (meaning scientific organization of the instructional process -- ed. note) or the scientific foundation of the planning of cadre training is incorrect on the whole, since these problems go beyond the framework not only of programmed learning but of formal instruction in general."

Today the range of central and specific problems in the area of programmed learning has been essentially defined. Illusions about the limitless

possibilities of formalization of the learning process have been dissipated. A practical result of the studies has been, in the first place, the development of special types of textbook aids which have received the designation "study programs" or "programmed self-instructors" for independent study of a specific area of knowledge. Secondly, special teaching devices and adaptive simulators have been developed, which make it possible to utilize instruction programs for differentiated individual learning and drill.

These results are of great importance for effective independent study and more efficient organization of courses of instruction with the aid of modern technical devices.

Research results have also made it possible to determine the essence of programmed learning, which today is viewed as one possible form of organizing instruction in a specific discipline (subdivision or topic), constituting a totality of psychological-pedagogic, organizational and technical principles of program control of the learning process and providing individualized, independent work by the students with the instructional materials, with the aid of specially-elaborated instruction programs.

Programmed learning as a form of organization of instruction is based on the general principles of educational science and psychology, which were formulated long before the development of programmed learning. The most important are those principles which can be implemented most successfully with its assistance: optimal breakdown of information into sections, the establishment of feedback on the assimilation of each information segment, control of the student's mental activity on the basis of feedback information, and individualization of the student's work with the course material under mass instruction conditions.

Of fundamental importance for elaboration of instruction programs and the development of teaching machines are three psychological aspects: activation of the assimilation process, individualization of learning, and feedback which constitutes not only a monitoring function but also an instrument of routine intervention during the learning process. They find expression in the creation of conditions in the instruction program which ensure intellectual activity on the part of the students in assimilating each unit of information and sequence of corresponding steps in the assimilation process on the basis of individual capabilities, as well as by means of monitoring and self-monitoring at each step in the assimilation process.

Advances in cybernetics, electronics, psychology and education science have made it possible in recent years to develop technical devices which implement certain principles of programmed learning, which has made it possible to apply programmed learning not only for instruction in practical actions but also in studying a number of theoretical disciplines.

The experience of our higher educational institutions indicates that technical devices are employed by the teacher to increase the volume of transmitted information and to increase the effectiveness of its assimilation by students and mechanization of the collection and processing of feedback information. Students utilize technical devices primarily to obtain consultation and for objective self-verification. Thus at the present time technical devices do not supplant the teacher but assist both the instructor and student, increasing the productivity of their labor.

Programmed learning, as is correctly noted by B. Strel'chenko and P. Smirnov, enables the instructor to transfer some teaching functions to his assistants -- various technical devices and programmed textbooks. As a result he obtains considerable opportunity to solve the most complex pedagogic problems. His function is strengthened as organizer of the teaching process and management of student cognitive activity.

An instruction program, depending on the instruction aims, can include course information broken down into optimal doses and presented in a strict logical sequence, can specify the character of student activity during the process of working with the program, possible difficulties and appropriate assistance, verification operations and assimilation criteria, etc.

Higher educational institution facilities and economic capabilities make it possible today extensively to utilize automatic monitoring devices which, in combination with the instruction program, special textbook or conventional textbooks makes it possible to individualize learning to a greater degree, to establish feedback, objectively to evaluate a student's knowledge and to activate student cognitive activity as a whole.

Various types of simulators with program peripheral devices are extremely valuable in the instruction process. Thanks to simulators, students quickly acquire primary practical skills in operating combat equipment.

But must and can everything be programmed? The answer is no. The experience of Soviet and foreign educational institutions convincingly corroborates this. Sometimes the employment of programmed learning is economically disadvantageous, and sometimes it is technically impracticable. As is indicated by the experience of military educational institutions and has been noted in the Soviet literature and in the proceedings of

scientific methods conferences, possibilities for employing programmed learning in the study of the social sciences, tactics, operational art and a number of other sciences are still fairly limited.

This does not mean, however, that elements of programmed learning are generally inapplicable for the study of separate topics and areas of these sciences which do not easily lend themselves to programming. The responses to the Vashurin article contain many examples, from which it is evident that the extensive utilization of teaching machines, testing devices, special programmed textbooks and problem texts would be quite useful in developing the skills required to solve brief practical problems, as well as in the assimilation of factual course material.

The experience of a number of military educational institutions persuasively confirms the effectiveness of employing programmed learning for the study of general scientific, general engineering, general military disciplines and combat equipment.

At the present level of development of education science and from the standpoint of technical and economic capabilities, we can speak in realistic terms of the extensive utilization of monitoring devices, small cybernetic machines, simulators with program-operated peripheral devices, as well as programmed learning without hardware. The combined method is the most widespread both at military and civilian higher educational institutions, that is, utilization of special instructional programs in combination with manuals and testing devices.

To an increasing extent computers are being introduced into the learning process as a computing tool for student performance of assignments and projects, as well as for simulating real processes taking place in technical systems. In recent years computers have also been used for optimizing planning of instruction procedure and as a control element in the teaching process.

A machine, however, will never acquire those qualities possessed by man the instructor and indoctrinator. A machine is indifferent to human emotions, to one's feelings, variations of psychological makeup, and yet these factors play an important role in training and indoctrination. Therefore a leading role in training and indoctrination will still be played by man, the teacher.

Whether or not learning is programmed or conveyed by traditional teaching methods, it is a process during which instruction plans and programs are carried out which contain demands on the students, on the extent of their knowledge, abilities and skills. Their implementation definitely should be effected on a scientific basis, with maximum productivity of the labor of instructors and students.

Under present-day conditions, when demands on the graduates of military educational institutions are increasing year by year and the volume of information to be learned is rapidly growing, improvement of the learning process on a scientific basis is becoming a most important problem, the solution to which determines the quality of cadre training. Programmed learning is one of many methodological solutions to this problem. Its place in the study of each curricular discipline should be specified in particular methodologies of teaching, which define the tasks, content, methods and organizational forms of teaching a given concrete subject. They should specify what methods and elements of programmed learning can be utilized in a given course activity in order to increase its effectiveness.

In one case it will be independent study of new material with the aid of a programmed textbook, in another case testing progress with the aid of automatic testing machines, in a third case work on a program-operated simulator, etc.

That drop in interest toward programmed learning which Strel'chenko and Smirnov point out is due to the fact that in some places programmed learning has been employed without proper thought or planning, hastily, viewed isolated, detached from other forms of organizing the training and indoctrination process. This of course failed to produce good results, and this fact discredited it in the eyes of some teachers. Growing research in the area of programmed learning, however, has served as an impetus for the development of other methods of intensifying the learning effort as well.

Today work in the area of programmed learning at military educational institutions is conducted together with improvement of all forms of organizing the instruction process and, as a part of the overall task, its problems are solved within the framework of studies on scientific organization of the learning process.

Theory of programmed learning is in a process of development; it contains to date little which no longer is subject to debate and which has assumed final form. All the literature on this problem -- both scientific and training -- at present constitutes essentially the result of studies and experiments.

Solution to some problems of programmed learning has been found on the basis of utilization of the laws of psychology. The further process of its development will depend substantially on the success of psychology in studying those processes which we are endeavoring to control with the aid of instruction programs, for optimal learning control models and systems can be constructed only when the basic laws and parameters of the processes being controlled are known.

Programmed learning as one of the means of promoting independent effort by students and improving control of their cognitive activity merits expanded scientific investigation in this area. But this effort should be conducted not in an isolated manner but rather together with solving psychological and scientific-pedagogic problems pertaining to improving cadre training.

* * *

From the editors. With publication of this article by Col Gen I. Shkadov, this journal ends the discussion of the article "More Widely Adopting Programmed Learning." The editors would like to express their gratitude to all officers and general officers who took active part in discussing this problem.

FOOTNOTES

1. Voyennaya Mysl', No 12, 1970.
2. Voyennaya Mysl', No 4, 6, 1971.

IDEOLOGICAL-POLITICAL TRAINING OF YOUNG OFFICERS OF THE CZECHOSLOVAK
PEOPLE'S ARMY

Maj Gen Vaclav Matička, Candidate of Military Science, Docent

During the current training year the Czechoslovak People's Army was faced with extremely complex tasks in the area of combat and political training. The principal task assigned by the Minister of National Defense for 1971 demanded that we focus the efforts of all army personnel on "comprehensive strengthening of the CzPA as an inseparable component of the Warsaw Pact armies, trained and prepared for the joint repulsion of any aggression and total destruction of the enemy."

In order to accomplish this task it was necessary first of all comprehensively to utilize the party-elaborated system of ideological indoctrination, which would act with maximum effectiveness, in a spirit of Marxism-Leninism and in combination with political organizational effort, on the CzPA soldier masses and on command personnel.

The CzPA proceeded to carry out the assigned tasks under conditions whereby the Czechoslovak Communist Party had achieved substantial success in the struggle against revisionism and rightist opportunism, had taken a major step forward toward the consolidation of society as a whole and had strengthened the economy. The party's leadership role in the ideological, political, and economic areas has been reestablished in this country. The party purge, involving an exchange of party cards, the resolutions of the December Plenum of the Central Committee of the Czechoslovak Communist Party, and publication of the document "The Lessons of Crisis Development in the Party and Society Following the 13th Congress of the Czechoslovak Communist Party" decisively promoted increased confidence on the part of Communists and the party-unaffiliated in party policy and the labor activeness of the toilers of the Czechoslovak Socialist Republic.

The army party organization has also strengthened its ideological-political unity. The entire CzPA has become consolidated on the positions of Czechoslovak Communist Party policy and has again become a reliable governmental-political instrument of the Czechoslovak socialist state and a strong element in the Warsaw Pact defense community.

All these positive factors and favorable conditions, however, are unable of and by themselves to ensure accomplishment of the difficult tasks assigned, if the ideological indoctrination of all military personnel, and command personnel in particular, is not systematically improved. Therefore the special Directive of the Minister of National Defense and Chief of the Main Political Directorate of the Czechoslovak People's Army for 1971

stresses the importance of ideological indoctrination effort, thus creating favorable conditions for party guidance of this effort from the position of Marxism-Leninism.

Particular importance is acquired by the ideological-political indoctrination of young officers, who are making a weighty contribution toward the attainment of positive results in the area of combat and political training of active military personnel, are exerting the greatest influence on their activeness in implementing the military policy of the Czechoslovak Communist Party and are promoting the achievement of high troop morale and political state, for it is they who are with subunit personnel on a daily basis, and many of them are political instruction group leaders. Consequently their knowledge, dedication to Marxism-Leninism and methodological preparedness determine to a substantial degree the quality of political instruction classes and instillment in the rank and file of a sense of military duty and an effort to achieve vigorous and conscientious fulfillment of their obligations.

Frequently young officers are called upon to perform responsible tasks in the newly reestablished organizations of the Union of Socialist Youth. They must also be well prepared for this effort, since their activities will frequently determine the extent to which we shall succeed in increasing the membership and how soon these organizations proceed with effective and active political effort among youth.

Commanders and party officials devote constant attention to the ideological-political indoctrination of young officers. It is borne in mind thereby that the thinking of many young people in our society, not excluding the army, was in the recent past subjected to powerful negative influences. We must not forget that we are dealing with a generation which does not know what unemployment is, has not experienced the bitter struggle of the worker class for its rights and the persecution of Communists in the pre-Munich republic and did not experience the horrors of Nazi occupation.

The postwar generation, to which our young officers belong, does not remember May 1945, when the troops of the valiant Soviet Army finally liberated Czechoslovakia and Gottwald's appeal "With the Soviet Union Forever!" became an expression of the sincere sentiments of all honest Czechs and Slovaks toward the Soviet Union. Our youth was not always correctly informed about the role of the Soviet Union and its assistance in the period of building the popular democratic and later socialist republic.

The political inexperience was aggravated by a neglect of political indoctrination or mere lip-service indoctrination prior to induction into the army. All this enabled rightist opportunist elements to disorient the

younger generation with slogans about "humane socialism," "pure democracy," the necessity of introducing a "pluralist system," to deceive our youth, claiming that the character of imperialism has changed and that it has become transformed practically into a peaceful lamb.

It is not surprising that under the influence of this propaganda some young officers began to underestimate the class enemy, the aggressive aspirations of imperialism, the policies and military preparations of the NATO nations. Under these conditions it was difficult for young people to understand what was going on and to approach an assessment of societal phenomena from a class standpoint, for any such attempt in the recent past was frequently subjected to sharp criticism. On the other hand, life in the Western capitalist nations was idealized, and this exerted an attraction on young people. The thinking of a substantial portion of the younger generation was adversely influenced by nationalistic demagoguery and a failure to appreciate the necessity of reliably defending our socialist homeland in an international alliance with the armies of the Warsaw Pact nations, headed by the Soviet Army.

This is why in working with young people we emphasize first and foremost class-political indoctrination, stressing the necessity of Marxist-Leninist right-mindedness and active participation in implementing the policies of the Czechoslovak Communist Party.

Particular importance in ideological work with young officers is attached to eliminating formalism of every kind, since in the past this frequently led to disruption of party efforts to indoctrinate the younger generation. Therefore commanders and political workers, in the effort at ideological-political indoctrination of young officers, systematically concretize its content depending on present conditions and tasks facing the given subunit and unit. Exceptional attention thereby is focused on Marxist-Leninist training of young officers, constituting the foundation of their ideological indoctrination.

A total of 124 hours is scheduled for Marxist-Leninist training during the calendar year. Of this total, approximately 80 hours are assigned for the study of basic topics specified by the program of the Main Political Directorate of the Czechoslovak People's Army, 20 hours are devoted to the study of party materials, and 24 hours to the study of matters pertaining to current policy. Each Marxist-Leninist training group contains no more than 25 men. The respective commanders make up the groups, taking into account the level of training and preparedness of individual officers, receiving approval for class assignments from the primary party organization committee or the deputy commander for political affairs. The best and most experienced commanders and political workers, who are able to explain to young officers current problems in a clear manner and from a

Marxist-Leninist position, and on the basis of facts to convince them of the correctness of party policy, are assigned as group leaders. This task is of course very complex and demands of the group leader not only a knowledge of Marxism-Leninism but political and life experience as well, plus careful preparation for political instruction classes.

Proceeding from the tasks facing the Czechoslovak People's Army in the present international situation, and taking into consideration the negative influences to which young people were subjected in the recent past, principal attention in the area of ideological-political indoctrination of young officers is focused on mastery of Marxist-Leninist doctrine on defense of the socialist homeland and doctrine on war and army, on Leninist theses on the essence of imperialism and its contemporary forms as well as exposure of imperialism's preparations for an aggressive war against the socialist nations. At the same time the revanchist character of the policies of influential reactionary circles in the Federal Republic of Germany is revealed.

Special attention is focused on indoctrinating officers in a spirit of socialist patriotism and proletarian internationalism, as well as profound clarification of the necessity of reliable defense of socialism under conditions of a class-divided world.

The festivities in connection with the 50th anniversary of the Czechoslovak Communist Party are being utilized in order to demonstrate convincingly and to emphasize the historic role of Vladimir Il'ich Lenin and the significance of the Third Communist International and the Communist Party of the Soviet Union in the founding and Bolshevization of the Czechoslovak Communist Party, as well as the role of the Soviet Union and its valiant army in World War II and the liberation of Czechoslovakia, as well as in the period of building socialism in this country.

An important role in the system of ideological-political indoctrination of young officers being carried out by commanders, political workers and primary organizations of the Czechoslovak Communist Party and Union of Youth, in addition to Marxist-Leninist training, is played by cultural-indoctrinational effort, including numerous forms of propaganda and agitation. We should note that much remains to be done in this area in order to ensure that political agitation, cultural indoctrination and mass-political effort in combination with Marxist-Leninist training constitute a definite system of daily and comprehensive ideological influence on young officers.

Numerous examples can be cited to show how systematic and purposeful ideological indoctrination carried out following the principles of Marxism-Leninism and the policy of the Czechoslovak Communist Party is helping

overcome the negative influence of opportunistic and revisionist elements which rose up in 1968-1969, on people's thinking and consciousness. This is attested by the great degree of activeness displayed by young officers in studying the document "Lessons of the Crisis Development in the Party and Society Following the 13th Congress of the Czechoslovak Communist Party" and other published materials. At party meetings and conferences of the Union of Socialist Youth these officers present numerous proposals aimed at improving indoctrination of CzPA personnel in a spirit of proletarian internationalism. More and more frequently interest is being shown in the establishment of direct personal contacts with the young people of the armies of the socialist nations, particularly the Soviet Union, for the purpose of exchange of experience and know-how in combat and political training, as well as for the purpose of broadening ties in the area of culture and sports.

Young officers, in the course of instruction classes within the system of Marxist-Leninist training, study very conscientiously and with great interest the revolutionary traditions of our labor movement, the history of the Czechoslovak Communist Party and the revolutionary fighting traditions of the Czechoslovak People's Army. They seek out veteran party members, combat veterans of the worker class and Czechoslovak Communist Party from the time of the bourgeois republic, Red Armymen-internationalists, and partisans and enlist their assistance in indoctrinating military personnel in a spirit of socialist patriotism and internationalism.

Of great interest to young officers are articles on party activities, personnel indoctrination, political and combat training written by Soviet officers and general officers and published in the army press, particularly in Obrana Lidu and Lidova Armada. The wealth of experience in ideological-indoctrination work by the commanders and political workers of the Soviet Army, particularly in the Central Group of Forces, is becoming an extremely effective contribution toward forming a Communist ideological outlook in young Czechoslovak officers. Another effective means of internationalist indoctrination is the steadily expanding fighting friendship with the armies of the Warsaw Pact member nations, and particularly specific collaboration at exercises with the Soviet Army Central Group of Forces.

CzPA military educational institutions play an extremely important role in the political indoctrination of young officers. At these establishments they acquire not only profound knowledge on the theory of Marxism-Leninism but also learn to be an example in political work, convinced followers of the teachings of Lenin and skilled organizers of implementation in the military of the resolutions of the Czechoslovak Communist Party. Service schools and academies have been purged of carriers of rightist opportunist ideas, and study of the social sciences at these schools has been freed of the distortions of past years and has become an organic part of the

class-crystallized system of political indoctrination in the CzPA. We greatly appreciate the assistance of Soviet military educational institutions, particularly the Military Political Academy imeni V. I. Lenin, in this area. Guideline documents of the Czechoslovak Communist Party, the Communist Party of the Soviet Union and the international labor movement constitute an important part of the study of the social sciences at our military educational institutions. All this creates the requisite conditions for young officers, upon assignment to line units, to become genuine political mentors for their men.

Indoctrination of young CzPA officers is now and will continue to be in the future one of the most important tasks of the CzPA command and of the entire army party organization, for today young officers, who sometimes possess relatively little life and command experience, are assigned to responsible leadership posts. Therefore it is particularly essential to organize and conduct their ideological-political indoctrination in such a manner as to help them become vigorous followers of Marxist-Leninist teachings, tireless implementers of Communist Party military policy and active fighters to build the Czechoslovak People's Army on class-crystallized communist principles.

EVOLUTION IN THE CORRELATION OF STRATEGY, OPERATIONAL ART AND TACTICS

Lt Gen I. Zav'yalov, Candidate of Military Science

Statement of a correct solution to the problem of the correlation of strategy, operational art and tactics, a solution in consonance with reality, is of great importance for military theory and practice. From the standpoint of theory, investigation of this correlation offers the opportunity to study more deeply the action of the objective laws of war in the engagement, the operation, and in a war as a whole, to reveal the dialectical interlink between various means and methods of waging war, objective and subjective factors, and to determine that principal element which has played or in the future will play a decisive role in achieving war aims. This enables military science to predict possible paths of development of military affairs and to elaborate practical recommendations for the most expedient solution to problems of armed forces organizational development and preparation to repel aggression.

The practical significance of a correct understanding of the correlation of strategy, operational art and tactics lies in the fact that it enables command cadres more deeply to evaluate and more clearly to see the role of each element of the complex military organism, each unit, large unit and formation in the multifaceted process of military operations, in the execution of their assigned combat missions and in achievement of the general aims of war, to make purposeful and expedient decisions on the engagement or operation and to plan the combat utilization of manpower and hardware with greater confidence.

What is the correlation of strategy, operational art and tactics, and how has this correlation changed in the process of their historical development?

In this question Soviet military science proceeds from the standpoint that strategy, operational art and tactics comprise three inseparable components of military theory and practice. One cannot exist without the others, and they influence one another. There exists among them a close dialectical interrelationship as between separate parts of a unified whole -- the art of war. Strategy, operational art and tactics cannot develop and move forward without relying on the development of the art of war as a whole, just as the latter cannot be manifested and developed exclusive of each of its parts. This means that any appreciable change in any one of the components of the art of war, produced, for example, by the development of a new weapon or other military equipment, will receive adequate development only when it promotes the progressive forward movement of its other components and the art of warfare as a whole.

Let us cite an example. The increased tactical mobility and maneuverability of Soviet Army units and large units in the second and particularly the third phase of the Great Patriotic War, as a result of intensified motorization and mechanization, began to produce maximum effect and exert positive influence on the course of combat operations only when these factors, along with tactics, began to be correctly taken into account and utilized in operational art and strategy, that is when they acquired the significance of major factors of the art of warfare as a whole and began to be manifested in the engagement, operation, and in operations of a strategic scale.

All of this promoted on the one hand further increase in troop tactical mobility and maneuverability, and on the other hand -- an increase in rate of advance, depth of offensive operations, reduction in length of operations and the achievement of stated objectives. In other words the art of warfare took another large step forward in its development as a result of correct utilization of increased troop mobility and maneuverability.

Here is another example. Employment of pocket defense by Soviet troops at the beginning of the Great Patriotic War as a necessary method of operation did not receive further development, since it was supported neither by operational art nor by strategy. Nor did this type of defense meet the demands of the art of warfare as a whole. It became obsolete and disappeared as the Soviet Army became better equipped and acquired greater firepower.

Strategy, operational art and tactics, as component parts of the art of warfare, possessed their own peculiar features, the capability of independent development, and yet at the same time certain common traits characteristic of the art of warfare as a whole are inherent in them.

Such common traits include, for example, the relationship between strategy, operational art and tactics on political factors, the combat capabilities of armed forces, their quantitative and qualitative composition, level of development of weapons and military equipment, personnel morale and fighting ability. This relationship is traced to a differing degree in all three components and in the art of warfare as a whole. At the same time this relationship has its own specific features for each of the components. Let us take, for example, the relationship between the art of warfare on the one hand and weapons and military equipment on the other. Characteristic of each of these parts is development of weapons which are capable of accomplishing tactical, operational and strategic missions respectively. Tactics, for example, requires weapons which are essential for conducting combat at relatively shallow depth, while operational art requires longer-range and more powerful weapons. Range and power of weapons are practically unlimited as far as strategy is concerned. But each weapon is developed

not in an isolated fashion but in relation to the combat capabilities of all other weapon types, in close coordination with them and in such a direction that the weak points of one are compensated for by the stronger points of another. Methods of military operations change in conformity with this.

But the correlation of strategy, operational art and tactics is determined not only by the fact that they possess both common and their own characteristic traits and features of development. Also inherent in them is a certain interrelationship which proceeds from the dominant or subordinate position of one part in respect to the other. This interrelationship proceeds both downward and upward. In a downward direction it is expressed in the fact that methods of warfare, strategic objectives and actions are determined by the political aims of the war and the combat capabilities of the armed forces. From this proceed the operational objectives, missions and methods of operation of fronts, armies and fleets, in conformity with which missions of large units and units as well as methods of tactical operations of troops, forces and weapons are specified, distribution of armed forces among theaters, strategic and operational axes is effected, and a certain influence is exerted on the decisions of subordinates and on the character of troop operations.

Prior to the appearance of operations, strategy coordinated directly with tactics, exerting a determining influence on troop tactical activities. The direct influence of strategy on tactics diminished with the development of operational art. Operational art began to play the role of intermediary between strategy and tactics.

Strategy proved unable to achieve stated war aims in one or two battles. In the era of imperialism, in connection with the increased economic potential of belligerent states, the achievement of victory demanded not only that the armed forces of the enemy be crushed but also that the enemy's important economic regions be captured and that the enemy be deprived of the capability of rebuilding his defeated armies. No army was capable of accomplishing this task in one fell swoop. On the way to achieving the overall war objective it was necessary to accomplish a number of intermediate strategic missions, which constitutes the prerogative of operational art. Thus strategy began influencing tactics through operational art. Tactics was now directly dependent on operational art. Now not the strategic but rather the operational command echelon determined the missions of units and large units, reinforcements, methods of conducting combat operations and organization of coordination. Of course the operational command echelon in turn proceeded from the aims and capabilities of strategy in handling these matters.

The interrelationship between strategy, operational art and tactics in an upward direction proceeds along the line of executing combat missions and achieving stated objectives. Prior to the development of operational art, strategic success was achieved by accomplishing tactical missions, defeat of the adversary on the battlefield. The interrelationship in an upward direction also became more complex with the development of operational art. Tactical success on the battlefield as a rule began to determine the success of an operation, while the latter determined accomplishment of strategic missions and achievement of the objectives of the war or of individual stages.

Essentially the conduct, for example, of a deep offensive operation consists in the conduct of continuous engagements of various character during the course of several days. Included are the assault on the enemy's forward defensive positions, repulsion of enemy counterattacks, penetration of hastily occupied defensive positions without halting in attack position, river-crossing operations, pursuit and meeting engagement, shift from attack to defense, and vice versa. In other words the entire arsenal of the art of warfare is employed in conducting an operation, where each particular success is subordinated to the common objective and leads to its attainment. Therefore it is natural that the principles of tactics must correspond to the aims of operational art, which in turn proceed from the objectives of strategy.

These two lines of interrelationship between the individual parts of the art of warfare -- a line proceeding upward and a line proceeding downward -- are not separated by an insurmountable wall. There are no clearly-defined boundaries between them. Both operate simultaneously in a varying ratio. The role of the downward line increases in proportion to the scale of military operations. The direct influence of higher command echelons on subordinate echelons has assumed increasing importance for the success of the operation and engagement. But potential for this on the part of the strategic and operational command echelon was relatively limited by the limited performance capabilities of the weapons at their disposal. Therefore all their efforts were aimed primarily at achieving troop tactical success directly on the battlefield.

Wherein is expressed the influence of strategy on operational art and the latter on tactics, and how is it specifically manifested? First of all we should state that this influence is determined not by random factors. It proceeds from a well-known thesis of military science on the relationship between methods of military operations on the one hand and weapons and military equipment on the other. Influence on the course of combat operations will be determined by the means at the disposal of the higher command echelon and the performance capabilities of these weapons.

In past wars the strategic command echelon established large forces, which always included tank armies, for the attainment of important strategic objectives and the conduct of corresponding operations. But this command echelon had for all practical purposes nothing other than long-range bombers to attack deep enemy targets. But there were too few strategic bombers, and they were incapable of accomplishing strategic missions due to their relatively poor combat performance characteristics. It is true that the strategic command echelon did have various reserves at its disposal, but the effective range of their weapons did not extend beyond the tactical zone. Therefore they were able to influence the course of combat operations only after their commitment and engagement, being transferred to the operational or tactical command echelon.

The operational command echelon was in approximately the same boat. It had at its disposal tactical or front-controlled aviation, long-range artillery, tank armies and divisions, support echelons, combined-arms and special reserves, antitank and antiaircraft defense weapons, and could mount both airborne and amphibious assaults.

But the effective range of weapons at the disposal of the operational command echelon, other than aviation, did not extend beyond the tactical zone. Weapons were employed as a rule for close support and reinforcement purposes, that is in the interests of tactics, attached to commanders of large units and units, or utilized by the commanders of operational formations for the accomplishment of coordinated tactical missions.

Thus the effective range and capabilities of weapons of the strategic and operational command echelon, other than aircraft, did not extend beyond the tactical zone, and their efforts were logically directed toward ensuring tactical success and, through accomplishment of an entire complex of tactical missions, at achieving operational and strategic objectives.

It is true that mobile forces -- tank armies -- were employed in the operations of the second and particularly the third phases of the Great Patriotic War, for development of tactical into operational success. Even these forces, however, which were under the strategic or operational command echelon and which operated at depth, nevertheless accomplished their assigned operational missions through the tactical operations of their subunits, units, and large units. At that time there were no weapons possessing adequate combat capabilities for the direct accomplishment of operational and strategic missions, other than bombers. But even aircraft as a rule operated in the tactical zone and only in certain cases attacked targets at operational depth. The results of these air strikes almost never assumed a strategic scale and only in a few cases acquired operational significance.

All this of course in no way minimizes the role and significance of operational and strategic reserves in the performance of operational and strategic missions. One must bear in mind that fresh forces capable of performing tactical missions at depth are necessary for developing tactical success into operational. Therefore no operation would be possible without operational and strategic reserves. In addition, utilization of the resources of the operational and strategic command echelons on the battlefield exerted decisive influence on troop methods of tactical operations and their accomplishment of combat missions. In particular, this made it possible to increase the depth of the combat formation of units and large units as well as to increase their offensive strength and defensive stability, freed tactical reserves from the performance of certain missions and created conditions for their more extensive maneuver. This accelerated and ensured successful accomplishment of tactical, and through tactical -- operational and strategic missions.

The particular acuteness of the problems of engaging enemy reserves was due to the lack of effective long-range weapons at the disposal of the operational and strategic echelons. Taking advantage of relative invulnerability at operational depth, both sides were able to maintain their support echelons and reserves in a combat-ready state and could at critical moments in the engagement or operation utilize them to reinforce forward large units and units, with the aim of increasing the firmness of defense or developing a successful attack.

Bombers were the only means capable of directly hitting these reserves. Even with their relatively limited performance capabilities, they hindered maneuver by enemy reserves and prevented the enemy from promptly building up his forces in those areas which were the most endangered or advantageous to him. This provided the tactical command echelon with the capability of concentrating main troop effort on the battlefield for the accomplishment of tactical missions, which created favorable conditions for rapid penetration of the enemy's entire tactical defense depth, as well as for repulsing enemy thrusts in a defensive posture and halting an attack.

On the other hand, the successful advance of troops in the enemy's tactical defense zone made it possible to maintain and reestablish operational and even strategic reserves and to utilize them to perform more important missions at operational depth. This ensured the development of tactical penetration into operational, enlargement of the overall depth of advance and achievement of the objectives of the operation.

This is confirmed by the experience of recent wars. Effective utilization of tank armies and air power, as well as support echelons and operational reserves, constituted one of the conditions for successful operations by our troops in the tactical zone and their deep penetration of enemy defenses in the offensive operations of the second and third phases of the Great Patriotic War, as well as a high firmness of defense.

Troop tactical activities are strongly influenced by the quantity of manpower and weapons at the disposal of the strategic and particularly the operational command echelon. This determines tactical troop densities, combat formations of units and large units, the depth of their missions, methods of operations, organization of coordinated actions, control, combat support and supply. Suffice it to say that a lack of requisite manpower and weapons at the disposal of the strategic and operational echelons at the beginning of the Great Patriotic War compelled our troops to establish a center-of-resistance defense system along axes of advance; therefore the enemy frequently penetrated our defense system without any particular effort. This was one of the reasons why the advance of units and large units during this phase of the war was characterized by shallow depth and incomplete accomplishment of assigned missions.

Conditions for placing at the disposal of the operational command echelon sufficient quantities of tanks, aircraft, artillery, antiaircraft defense weapons and various types of reserves were created only as the armed forces deployed and they became better equipped, as the armies and fronts became reinforced. This exerted a certain influence on tactical operations of units and large units. They became more active and decisive in accomplishing assigned missions, while the depth of attack and stability of defense increased.

All this, however, in no way affected the dependence of the success of the operation on the results of troop tactical actions and the attainment of strategic objectives on the accomplishment of operational missions. In the final analysis the main role in accomplishing operational and strategic missions in past wars was played by tactics, a consistent and sequential winning of victories on the battlefield. The main efforts of the operational and strategic command echelon were focused on securing these victories, since they did not have at their disposal weapons with which they could directly accomplish their inherent missions of destroying or disabling operational and strategic targets at depth.

The above-examined fundamental theses on the correlation of strategy, operational art and tactics were characteristic of past wars. But to what degree are they applicable under present-day conditions?

In order to reply to this question one must bear in mind "that in a future world war, if the imperialists initiate one, nuclear missile weapons will constitute the deciding means of warfare. Nonnuclear weapons will also be employed, while under certain conditions units and subunits may conduct combat operations exclusively with nonnuclear weapons."¹ This of course cannot help but have an effect on the correlation of strategy, operational art and tactics.

In tactics we have become accustomed to examining a combination of fire and movement as the foundation of tactics. The appearance of nuclear weapons on the battlefield, or more precisely introduction into the tactical zone, disrupted this principle. The weapons infinitely increased destructiveness and its instantaneous effect over hundreds of kilometers entered into conflict with the practically unchanged rate of movement of troops on the battlefield. This conflict was intensified by the fact that the appearance of nuclear weapons resulted in a manyfold increase in kill zone parameters, while troop protection against fire and attack remained almost at the previous level. Thus the combat capabilities of nuclear weapons no longer fit into the framework of traditional tactics. The altered combat properties and capabilities of the new weapon negated the old methods of combat operations and engendered new ones, which were in conformity with the new weapons. This is an objective law of warfare, a manifestation of its effect under new conditions.

The same statement applies to other parts of the art of warfare. For nuclear weapons tactics, operational art and strategy went far beyond the bounds of our customary concept. Such concepts as attack and defense, front and rear areas, operation and engagement lose their customary meaning. At the same time the new weapon is accompanied by the birth of a new art of warfare, new tactics, new operational art, and new strategy, unlike anything which was created in past wars. Their further elaboration constitutes a most important task of the present day. Particular importance is acquired by consideration of the thesis that "war can be initiated with the employment of nuclear weapons or nonnuclear weapons," and "different variants of utilization of all types of weapons possessed by the enemy are possible."²

The development of nuclear missile weapons and the equipping of the armed forces with these weapons has also introduced certain changes in the character of interrelations among the component parts of the art of warfare. Transfer of nuclear weapons to the disposal of the strategic, operational and tactical command echelons gives each great independence and enables them to choose for themselves the means and methods of military operations within the zones of their responsibility and within the bounds of their authority. Nuclear weapons now can be used not only to support troop tactical operations but also for direct performance of various strategic, operational and tactical missions. There has been a particular increase in the capability of the strategic echelon to promote the successful conduct of operations and the capability of the operational echelon to promote the success of tactical actions. In addition, in a nuclear war the employment of strategic nuclear weapons can exert decisive influence on the character of tactical operations. The enormous destructiveness and great effective range of these weapons, as well as a high degree of combat readiness make it possible for the strategic command echelon to commit these

weapons and to secure the accomplishment of strategic missions before operational and even tactical nuclear weapons can be employed. This will inevitably have a decisive influence not only on methods of tactical and operational activities but also on the achievement of overall success.

Today the downward link between strategy, operational art and tactics is expressed not only in determination of the objectives of combat operations and in formulation of tasks for lower-echelon elements but also in the direct influence by the weapons of the higher command echelon on the entire course of combat operations, in more precise distribution of tasks accomplished by the strategic, operational and tactical echelons, and in lessened dependence in accomplishment of operational and strategic missions on troop tactical actions.

All this indicates that in a nuclear war, if the imperialists initiate one, the role of strategy in achieving victory over the enemy will become many times greater than in the past. Therefore the preparation of strategic means and strategic command elements for such a war acquires decisive significance under present-day conditions.

Thus nuclear weapons have changed the traditional stepped interrelationship between strategy, operational art and tactics and have given them greater independence. In operations without the employment of nuclear weapons the general principles of interrelationship among the component parts of the art of warfare are retained under present-day conditions. Only their specific content is changed. It has become broader, richer and more complex in view of the increased combat potential of nonnuclear weapons and the increased scope and dynamic nature of combat operations.

The interrelationship between strategy, operational art and tactics is also traced in the concepts of the art of warfare on which armed forces organizational development and preparation for war are based. These concepts or fundamental theses are defined and adopted by strategy, although they begin to take form in tactics when new weapons and military equipment are developed, and then are passed on to strategy through operational art.

Let us take as an example the well-known thesis of concentration of troop efforts at the decisive time and place. It was born in tactics, developed together with it and moved on to strategy in altered form. With the development of the operation this thesis became an important demand of operational art. But it was not the tactical but rather the strategic command echelon which elevated this thesis to a principle and formulated it in corresponding training manuals.

The demand that victory be achieved through the joint efforts of all services was born on the battlefield, and it also was made into a principle

by the strategic echelon and incorporated in the field manuals. Thus weapons and their combat performance characteristics objectively influence the development of the principles of the art of warfare. They proceed from the laws of war and, once perceived and acknowledged, take their place in appropriate field manuals.

We have examined one aspect of the interrelationship between strategy, operational art and tactics. This is essentially an objective aspect. It reflects the conditions, tendencies, and factors determining this interrelationship. But in phenomena of war, just as in all other phenomena of societal affairs, objective factors do not operate by themselves but rather in the process of man's societal activity, in utilization of these factors by man. Behind each type of weapon and combat equipment stands man -- the soldier, the commander. They determine in one way or another the methods of a weapon's utilization and consequently methods of combat operations. Their knowledge, ability, skill and morale-fighting qualities determine the effectiveness of utilization of military equipment, success in the engagement and operation, and the final victory in war. This is a subjective factor, which must be taken into consideration in examining problems connected with the correlation of strategy, operational art and tactics.

In light of subjective factors, the inter relationship of these three components of the art of warfare is particularly clearly and lucidly manifested in the decisions of commanders. Essentially the reaching of any decision consists in comprehensively assessing, taking into consideration and fully utilizing advantageous aspects of objective conditions for accomplishing assigned combat missions. The ideal decision is that in which one has achieved maximum correspondence between objective and subjective factors, the conditions of combat operations and troop capabilities on the one hand, and on the other hand the specified methods of accomplishing combat missions, that is methods of conducting the engagement and operation.

As regards the decision at the strategic echelon, in defining the tasks, forces and means for operational formations, this decision to a certain degree influences their methods of operation. In the same way the operational command echelon influences the decisions of subordinate commanders and consequently the methods of tactical actions of large units and units. This influence can be both positive and negative, depending on how fully and correctly the commanders evaluate and consider in their decision the objective factors and their influence on troop actions. It is particularly important correctly to assess the combat capabilities of both hostile and friendly troops, the correlation of forces, the probable character of hostile activities, the combat capabilities of the manpower and weapons of the strategic and operational echelons which can be utilized in the interests of strategy, operational art and tactics, and the

influence on troop combat operations of the terrain and the time at the disposal of the troops for preparations for carrying out the assigned missions.

Conclusions from assessment of these objective factors find expression in the plan and decisions of the various commanders, in distribution of reinforcements, designation of width of zones and sectors, assignment of combat missions, and in organizing coordination of effort. Introducing appropriate changes in these and other elements of the decision, the higher command echelon actively influences the decisions of subordinate commanders.

This influence proceeds along two lines. The first is the bringing of the combat capabilities of the forces at the disposal of subordinate command echelons into conformity with assigned missions. This is achieved either by reinforcing troops with the means at the disposal of the operational and strategic command echelon or by narrowing frontages, depth and complexity of missions, specifying appropriate axes for conducting combat operations, or by additional attachment of manpower and weapons at the beginning and in the course of combat operations, taking into account the importance of assigned missions, or by utilizing reserves, with their mission assigned by the operational or strategic command echelon in the interests of the engagement or operation respectively.

The second line is the conduct of combat with the means at the disposal of the higher command echelon with enemy reserves, aircraft and artillery located beyond the range of tactical or operational weapons. Utilizing this capability, the higher command echelon influences the decisions of subordinate commanders in the required direction.

Unit, large unit and formation commanders in turn, in order to ensure accomplishment of assigned missions and achievement of the objectives of the engagement and operation, should precisely comprehend the plan of the higher commander, the role of their unit, large unit and formation in implementing this plan, and know how assistance from the higher command echelon will be expressed. Taking this into account, a decision is made and methods of conducting the engagement and operation are determined. Thus the inter-relationship between strategy, operational art and tactics in the light of subjective factors is expressed in the fact that the strategic command echelon actively influences correct decision-making by the operational echelon and the accomplishment of operational missions. A similar role is played by the operational echelon in respect to the tactical. The tactical command echelon in turn, utilizing the prevailing conditions, seeks accomplishment of combat missions by units and large units and secures thereby achievement of the objectives of the operation, and through them the strategic war aims are achieved.

This interrelationship is of a logical nature; the strategic, operational and tactical echelons must take it into account.

The role of the subjective factor increases immeasurably under the conditions of nuclear warfare. The strategic and operational command echelons can fully assume accomplishment not only of strategic and operational missions but also of tactical missions, leaving to the units and large units tasks of consolidating gains in various forms.

The above are several fundamental theses on the correlation of strategy, operational art and tactics. This correlation is not a constant. It varies, depending on the role played by each component part of the art of warfare in the process of their historical development, on change in the means and methods of conducting military operations and on the specific conditions of a given war. In conformity with this, command cadres should clearly understand the place and role of the tactical, operational and strategic echelons of the armed forces in achieving objectives in a nuclear war and in conducting combat operations with nonnuclear weapons. In the former case there is required the ability to consolidate gains achieved by strategic and operational-tactical nuclear weapons, and in the latter -- the ability to ensure accomplishment of operational and strategic missions by successful troop operations on the battlefield.

FOOTNOTES

1. A. A. Grechko: Na strazhe mira i stroitel'stva kommunizma (On Guard for Peace and the Building of Communism), Voenizdat, 1971, page 55.
2. Ibid., page 55.

PRINCIPLES OF MILITARY ART AND THEIR DEVELOPMENT

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The continuous development of society, and particularly of its productive resources, is making substantial changes in the art of warfare, in the methods of preparing for and conducting military operations. Its rate of development has not been uniform: it has steadily accelerated in conformity with the rate of development of productive resources, with scientific and technological advances. In the age of feudalism the art of warfare developed very slowly, remaining almost unchanged in the intervals between major wars, which enabled warring states to prepare for the next war, utilizing past experience, and to initiate the next war with essentially the same means and methods employed in the final stage of the preceding war.

In the era of capitalism, which was accompanied by rapid development of productive resources and socioeconomic changes, each major war, beginning with the Franco-Prussian War, signaled a new stage in the improvement of military art. The Franco-Prussian War, World Wars I and II were conducted with various means and methods, and each constituted an important landmark in the development of the art of warfare.

We should note that the development of military art continued in the intervals between these wars, in connection with the rapid growth of the economy, science and technology. For example, development of the theory of employment of large masses of tanks, aircraft, and airborne troops, as well as elaboration of the theory of the deep engagement and operation took place between the two world wars and resulted in World War II being conducted by different methods than those used in World War I. Military art in World War II solved the problem of penetrating a deeply-echeloned, fortified defense, of developing tactical into operational success and achieving high-maneuver actions, which was beyond the capability of the art of warfare practiced in World War I.

Following World War II, in connection with gigantic development of productive resources, unprecedented scientific and technological advances (the scientific and technological revolution) and, in particular, the development of nuclear missile weapons and electronic computers, the technical equipment of armed forces changed, that is the material base of the engagement, operation and war as a whole. New weapons require new forms and methods of troop operations; consequently the principles of military art also change.

The principles of military art are the fundamental, guideline principles applied in the organization and conduct of the engagement, operation, and war as a whole. Cognized, objectively-operating laws of war find expression in them. They are not invented by individuals but are the result of scientific synthesis of practical activities, revelation of objective, repeating and essential relations.

"...Principles do not constitute the point of departure of an investigation," wrote Friedrich Engels, "but rather its final result; these principles are not applied to nature and human history but are abstracted from them; nature and mankind are not weighed with principles but rather the contrary; principles are valid only to the extent to which they are in conformity with nature and history" (K. Marks and F. Engel's: Soch. [Works], Volume 20, page 34).

The principles of military art proceed from the laws of war but differ radically from them. While the laws of war are objective in character and exist outside man's consciousness in the very phenomena of war, the principles of military art are ideas which arise on an objective foundation and which remain in the sphere of consciousness. They are dual in nature: on the one hand they are focused on necessity determined by the effect of the laws of war and on the other express the relative freedom of creative activity of military commanders.

Laws operate independent of man's will and desire, independently of whether or not they are favorable to the military commander, whether or not he is pleased with the effect of these laws. He cannot simply select those laws he chooses but must deal with them as they are. Principles, on the other hand, are employed by the military commander consciously, in relation to specific situation conditions. In them are also successfully combined the requisite character of action of the laws of war and relative freedom of conscious activity within the framework of this necessity.

The laws of war do not specify how one must proceed in order to gain victory. Principles, however, while based on laws, encompass recommendations on the most expedient actions, that is, recommend what must be done to gain victory over the enemy and how one must act. But these recommendations are given irrespective of the specific situation. Therefore they are all acknowledged identically important in theory, which examines principle divorced from circumstances, but their significance changes in practice: in one situation certain principles may be of dominant significance, while others will be dominant in a different situation. Successful application of the principles of the art of war is directly dependent on the creative activity of the military commander, on his ability to control his troops, to analyze the situation and to draw the correct conclusions from it.

With change in the conditions and character of a war, the principles of military art change both in content and form. Some of them, engendered by past conditions, lose their significance and are replaced by new ones. Although the formulation of certain principles remains unchanged for a protracted period of time, the principles themselves assume new content.

Soviet science has acknowledged and does acknowledge principles as general guiding theses. They are elaborated on the basis of synthesis of the experience of employment of armed forces branches in past wars and in the course of operational and combat training, as well as analysis of the capabilities of modern weapons, proceed from practical experience, influence it and find confirmation in it.

Let us examine the fundamental principles of military art and some trends in their development.

The most ancient principle of the art of warfare, discovered by Epaminondas, Theban general, in the Battle of Leuctra in 371 B.C., is the principle of massing of men and weapons on the decisive axes.

Examining the military history of the ancient Greeks, Friedrich Engels wrote: "Epaminondas was the first to discover a great tactical principle which even today determines the outcome of almost all decisive battles: unequal distribution of troops along the front for the purpose of concentrating forces for the main attack in the decisive area" (Marks and Engel's: Soch., Volume 14, page 355).

The essence of this principle consists in the fact that in order to achieve victory over the enemy one should not distribute one's men and weapons uniformly along the entire front but should concentrate an overwhelming quantity on a selected axis (or area) at the proper time, with the objective of establishing a decisive superiority over the enemy. One can leave minimum forces on secondary axes and in secondary areas, taking a calculated risk. The endeavor to be equally strong at all points leads to a scattering of forces along the front and ultimately to defeat.

This principle has been extensively employed by outstanding generals in all past wars. It was manifested differently as productive resources grew, as new weapons were developed, and as armies assumed mass proportions. In the wars of the feudal period only infantry, cavalry, and later artillery were massed on the decisive axes in major battles, while in World War I, with the appearance of tanks and aircraft on the battlefield, it became necessary to mass these weapons. Massed employment of tanks at Cambrai in 1917 made it possible to achieve tactical penetration of the German defenses and to demonstrate the necessity of mass tank utilization on the battlefield.

This principle was particularly extensively applied by the Soviet Command during the Civil War and Great Patriotic War. During the Civil War of 1918-1920, when the young Soviet state was forced to fight on 4 fronts (against Kolchak, Denikin, the White Poles, and Vrangeli'), the Soviet Command sequentially massed the available limited forces, initially against Kolchak, then against Denikin, the White Poles, and Vrangeli'.

The principle of massing of forces on the main axis was also applied by the front. In April 1919, at the initiation of the counteroffensive against Kolchak, two thirds of the forces of the Southern Force of the Eastern Front were concentrated along a frontage of 200 km, on the main axis of advance, while only one third remained on the other 700 kilometers of front.¹ In July 1920 the Western Front, developing an offensive operation against the White Poles on a 450-km front, concentrated on the main axis of advance, along a frontage of 120 km, 500 guns, 1200 machineguns and 60,000 bayonets and sabers, leaving only 35,000 along a frontage of 330 km.²

In order to achieve penetration during the Great Patriotic War an overwhelming superiority over the enemy would be established, as a result of resolute concentration of troops and principal weapons in selected sectors along the front. The troops of the 1st Ukrainian Front in the Vistula-Oder Operation, for example, with a total front of 250 km, broke through the enemy's defense in a zone 39 kilometers wide, comprising 16 percent of the total offensive frontage. In the area of breakthrough were concentrated 77 percent of rifle divisions, 89 percent of artillery, 100 percent of tanks and self-propelled guns, and 100 percent of air power, which made it possible to establish operational densities of 223-296 guns and mortars and approximately 80 tanks per km of breakthrough frontage and to achieve a preponderance over the enemy of 9.6-fold in infantry, 9.7-fold in artillery, and 10.2-fold in tanks.³

An analogous concentration of main forces on decisive axes was effected in defensive operations as well. In the Battle of Kursk 28 percent of rifle divisions and more than 50 percent of artillery and tanks at the disposal of the front were concentrated in the defense zone of the Thirteenth Army of the Central Front, which comprised only 10 percent of the total frontage.⁴ In the Balaton defensive operation the Fourth Guards, Twenty-Sixth and Twenty-Seventh Armies, the XXIII and XVIII Tank and First Guards Mechanized Corps defended in a sector to the north of Lake Balaton with a frontage of 83 km, while only the Soviet Fifty-Seventh and Bulgarian First armies defended on a frontage of more than 200 km to the south of Lake Balaton.⁵

The principle of massed employment of forces on decisive axes is just as important today, although it is implemented differently than in the past.

In the course of combat operations with the employment of nuclear weapons there is no need to concentrate a large number of troops and weapons in limited areas, since superiority over the enemy under these conditions is achieved primarily by massed employment of nuclear weapons on decisive axes in order to destroy enemy main forces and major targets. Exploiting the results of such nuclear strikes, the troops mop up the enemy, operating not in compact but in dispersed combat formations.

We read in a U.S. Army field manual, for example: "The employment of nuclear weapons favors operations by small, highly-mobile units..." Further on it recommends: "If during the course of an offensive operation it is necessary to concentrate troops, this is done only at the decisive point, in the immediate vicinity of the enemy and for a short time. Under conditions where nuclear weapons are not employed, a substantial concentration of mobile troops on decisive axes is permitted."⁶ Similar views are expressed in the West German and U.S. military press.⁷

During an operation superiority over the enemy on the main axis should be constantly maintained by means of skillful maneuver of troops and weapons from other sectors of the front and from depth.

Closely connected with the principle of massing of forces on decisive axes is another important principle of military art -- dispersion.

An increase in the rate of fire, effective range and power of weapons in the wars of the 19th century made it necessary to disperse troops in order to reduce casualties from hostile fire. For example, the appearance of the rifled-bore shoulder weapon in the Franco-Prussian War of 1871 produced the extended formation, as Friedrich Engels wrote, even in spite of commander wishes. Subsequently, with the appearance of machineguns and increased rifle-machinegun firepower, spacing between men in the skirmish line continued to increase. At the beginning of the Russo-Japanese War of 1904-1905 the spacing was 5-1.5 p a c e s, increasing to 4-6 p a c e s by the end of that war, and reaching 8-10 p a c e s by the end of World War I. With an increase in the range and power of artillery fire, division and regimental columns, upon approaching the enemy, began breaking up initially into battalion and subsequently into company and platoon columns.

The massed employment of air power in World War II and the increased firepower of artillery, particularly with the development of rocket launchers, made it necessary to disperse large units and units not only on the battlefield but also on the approach, and also demanded deeper placement of reserves and support echelons: army support echelons were placed as a rule no closer than 12-15 km, while tank corps were placed 20-25 km from the forward edge of the battle area (FEBA).

Under present-day conditions, in connection with the area nature of the effect of nuclear weapons, dispersal of troops has acquired different content, and its importance has greatly increased. It is becoming a major principle of military art and will be carried out in all types of combat operations, and consists in breaking down units and subunits parallel and perpendicular to the front into intervals and spacings ensuring successful accomplishment of the combat mission and maximum reduction of casualties caused by nuclear weapons, air strikes and conventional weapons fire. Dispersed deployment of troops will constitute a normal state not only in a combat zone but also far beyond its boundaries. It has now become dangerous to deploy and to move in large, compact masses, regardless of distance to the enemy.

The degree of troop dispersal is determined in relation to the nature of the mission, the degree of troop cover, protective properties of the terrain, and the probable size of the nuclear warhead the enemy may deliver.

Troop dispersal does not eliminate the necessity of their concentration at the requisite place and time to mount powerful attacks. But today concentration should be effected from approach march formation, secretly, swiftly, from various directions and from depth, and precisely at the moment of attack. After the attack troops are again immediately dispersed, in order not to present a target for a hostile nuclear warhead. The skill of the commander and the degree of troop preparedness for mobile actions are revealed in the ability to accomplish this mission under specific combat situation conditions.

General principles of military art also include the principle of achievement of victory by the unified efforts of all basic arms and services, with continuous and close coordination.

This principle has also long been known, but its content has changed sharply from one war to the next. In wars up to the beginning of the 20th century there occurred coordination of efforts primarily between infantry, artillery and cavalry, while by the end of World War I, success in combat required coordination of the efforts of the above three arms with tanks and to some extent aircraft as well. In World War II, in connection with the appearance of new services and arms, success in the engagement and operation required careful coordination of efforts between infantry and infantry direct support tanks as well as with supporting artillery and air power, with anti-aircraft weapons (air defense troops), as well as with engaged mobile tank, mechanized or horse-mechanized groups (large units and formations) and airborne assault forces landing behind enemy lines, and in coastal areas with amphibious landing forces and naval forces as well.

There is no need to demonstrate that the content of coordination became increasingly complex as armies became increasingly heavily equipped with various weapons and combat equipment. The general trend, however, was and remains increasingly better utilization of the advantages of each arm in the interests of most rapid and efficient accomplishment of the mission at hand.

Coordination is effected and maintained during the entire period of combat operations, for even brief disruption disorganizes troop actions, diminishes the force of attack and leads to unjustified losses.

Intelligent coordination of action by all weapons, arms and special troops demands a thorough knowledge of their combat characteristics, capabilities and methods of employment under various situation conditions. Coordinated action can be effective only if the commander of each military unit has been thoroughly briefed on and correctly comprehends the objective of the actions, the overall and particular combat missions and methods of their execution, if he knows with whom, when, how and for what he is coordinating, and if he promptly informs the higher commander on the situation and displays creative initiative aimed at maintaining continuous coordinated action.

The principle of surprise also has an important place in military art. It has also been known for many centuries and has been successfully applied by outstanding field generals. History shows that he who employs surprise in battle has always had an advantage over his adversary. The side which has been subjected to a surprise attack and which has been unable quickly to adapt to the situation, as a rule has suffered defeat. This principle was particularly extensively employed by outstanding Russian general A. V. Suvorov in the battles of Izmail, Rymnik and others.

Lenin discussed time and again the importance of surprise, demanding that the enemy be attacked "wherever and whenever he least expects to be attacked." In the period of preparation for the armed uprising in October 1917 Lenin wrote: "...We must endeavor to take the enemy by surprise, to choose that moment when his troops are scattered" (Poln. Sobr. Soch. [Complete Works], Volume 6, page 176; Volume 34, page 383).

The achievement of surprise, the rout of an adversary who has been taken unawares with minimal losses, expenditure of manpower and weapons has always been and is now considered one of the most important indications of the outstanding military skill of the commander, command personnel and the entire army.

Surprise stuns an adversary, disorganizes him and makes his actions indecisive, and forces him to make new and frequently inappropriate decisions.

During the Great Patriotic War this principle was extensively employed by General Headquarters and outstanding Soviet generals. One example is the surprise achieved by the Soviet Command in the conduct of all encirclement operations, and the Stalingrad Operation in particular. Characteristic in this regard is a postwar (18 June 1945) statement made by Colonel General Jodl, former Chief of the Operations Staff of the OKW. Discussing the failures of German intelligence, he stated: "The most serious failure was in November 1942, when we totally failed to note a heavy concentration of Russian forces on the flank of the Sixth Army (on the Don). We had absolutely no idea of the strength of the Russian troops in this area. Earlier there had been nothing there, and suddenly (our underline -- V. Ch.) a powerful attack was mounted, which was of decisive significance; following this intelligence failure the Führer was highly suspicious of intelligence produced by the Army General Staff."⁸

Surprise can be achieved in combat operations of various scale: in a war as a whole, in an operation and engagement, and can be of various importance in achieving success. Surprise can be strategic, operational, or tactical, depending on the assigned missions and achieved results.

Strategic surprise is one of the most important factors which create the most favorable conditions for achieving strategic war aims, particularly in the initial phase. A sneak attack, as was demonstrated by the German invasion of Poland in September 1939 and the attack on France in May 1940, as well the Japanese attack on Pearl Harbor in December 1941, makes it possible to inflict heavy losses on the enemy, to win time, to seize the initiative, to deprive the enemy of important strategic and economic regions, and to achieve a number of other advantages which are sometimes of decisive influence on the outcome of the war as a whole.

Strategic surprise can be achieved not only at the beginning but also during the course of a war. For example, achievement of strategic surprise by Soviet forces in the Moscow and Stalingrad counteroffensives greatly contributed to the success of these operations.

Operational surprise is defined as utilization of weapons and forces in operations which take the enemy by surprise, where he has been unable to prepare for a response action, has been unable to take the requisite countermeasures and is compelled to conduct combat operations under disadvantageous conditions.

In the operations of the Great Patriotic War, Soviet troops extensively employed various methods to achieve operational surprise. One interesting example of the achievement of major operational results by mounting an unexpected attack is the Memel Operation (October 1944), when the troops

of the First Baltic Front effected a major operational regrouping in order to shift the front's main attack axis quickly from Riga to Memel.

In less than 10 days five combined-arms and one tank army, together with a considerable supporting force, shifted laterally a distance of more than 100 km from the right to the left side of the front. Concentration of such large forces was effected in the operational zone directly adjoining the front; thanks to skillful camouflage and deception measures, the German Command failed to discover the regrouping and to make preparations for a major offensive operation on a new axis. The entire German force in the Baltic was encircled as a result of this surprise attack.

Tactical surprise -- one of the fundamental conditions for achieving success in combat -- is employed in the interests of the subunit, unit and large unit and aims at taking the enemy unawares, at achieving surprise in the actions of one's forces and at gaining for friendly troops more favorable conditions for the conduct of combat.

The role of surprise in combat has become considerably more important under present-day conditions. With the unexpected employment of new weapons, and nuclear weapons in particular, it is possible even with equal and sometimes inferior strength to inflict on the enemy irrecoverable losses in a short period of time, abruptly to alter the correlation of forces in one's own favor, to undermine the morale of the enemy troops, substantially to reduce their combat capabilities, to produce confusion and disorganization in their ranks, to disrupt control and thus to create favorable conditions for decisively crushing the enemy's forces. The adversary who is taken by surprise must hastily change his intentions and shift his plans in conformity with the new, unexpected situation conditions.

Countermeasures to the unexpected attack must be sought hastily, as a consequence of which they frequently may be of little effect.

The element of surprise is usually not achieved spontaneously, by chance. It can be achieved only by intense innovative activity on the part of commanders and staffs and skilled actions by all troops involved.

Surprise is incompatible with stereotype. Stereotype contradicts the very essence of surprise. If the adversary has been deceived once, he will not be deceived a second time with the same device. It is therefore essential constantly to seek new techniques and methods of achieving surprise.

Secrecy is an essential condition for achieving surprise. The enemy is constantly expecting an attack and takes steps to make sure that he is not taken by surprise. Surprise and resulting major success have been achieved

only in those operations and engagements in which secrecy of preparations was maintained. The increasing sophistication of technical intelligence-gathering means makes it possible to obtain information on troops at a considerable depth, more rapidly and with less dependence on weather, time of day, season and nature of terrain than was the case, for example, during World War II. Air reconnaissance possesses particular potential. Modern reconnaissance aircraft carrying various intelligence-gathering equipment can conduct reconnaissance at a substantial distance from the objective, frequently even without crossing the line of the front. This makes it more difficult to achieve surprise and demands, in addition to countermeasures aimed at enemy reconnaissance, constant improvement of means and methods of camouflage, deception and observance of the strictest camouflage discipline by all personnel.

Vigorousness of actions and persistence in achieving the stated objective constitutes one of the general principles of the art of warfare. The experience of past wars indicates that, all other things being equal, success is achieved by he who acts more vigorously and resolutely, by he who persistently seizes the initiative, imposes his will on the enemy and beats him to the punch.

In many of his writings Lenin stated that in warfare one must act with the greatest vigorousness and resoluteness. Resoluteness and pressure comprise three fourths of success, and "each and every detachment should bear in mind that by letting slip by a favorable opportunity for such an operation, that detachment is guilty of unforgivable inactivity, of passivity -- and such culpability is the greatest crime..." (Poln. Sobr. Soch., Volume 11, page 342).

Troop activeness finds concrete expression in constant pressure on the enemy, in prompt utilization of all advantageous situation conditions and all opportunities to attack, in depriving the enemy of the opportunity to choose favorable situations, time, place, direction and nature of actions, as well as in containing the adversary's volition and actions.

Activeness is closely linked with initiative, which is expressed in bold and intelligent daring, in the endeavor to find the best ways to achieve the assigned mission, in willingness to accept responsibility for a bold decision. The Great Patriotic War abounds in examples of outstanding activeness and intelligent initiative on the part of Soviet commanders of all echelons. A vivid example of such activeness and initiative is the suggestion made by Mar SU K. K. Rokossovskiy during preparations for the Bobruysk Operation that the enemy's defense be penetrated in two sectors, while General Headquarters was initially planning a breakthrough in a single area.

Another instructive example of activeness and initiative in the interest of executing the plan of the higher commander are the actions taken by the commander of the Sixth Guards Tank Army of the Second Ukrainian Front, Gen A. G. Kravchenko, in the Budapest Operation. Upon reaching the Hron River on 21 December 1944, the commander of the Sixth Guards Tank Army, correctly assessing the situation (the fact that the Seventh Guards Army had fallen behind), employed a part of his forces for cover on the north and northwest, turning south with the main forces and attacking along the Hron River. Then, in coordination with the Seventh Guards Army, large units of the Sixth Guards Tank Army destroyed the enemy between the Ipoly and Hron rivers and on 26 December reached the north bank of the Danube, where they linked up with mobile troops of the Third Ukrainian Front, having completed the encirclement of the Germans' Budapest force.⁹

The objective can be achieved by various means, but it is important that the accomplishment of each intermediate mission bring the final objective closer. During the course of combat operations the situation changes constantly; there arise unexpected obstacles and various random occurrences which demand departure from the original decision. No matter how complex the situation becomes, however, one should never forget the main objective. The main efforts of the troops, the thoughts and energy of the commander should be directed at achieving this objective.

Such a principle of military art as continuity of military operations is also linked to the principle of activeness. The essence of this principle consists in the fact that initiated combat operations should be conducted vigorously and continuously at any time of the year, day or night, in all weather, until the enemy is totally defeated. Attacks should be delivered with unabating force.

Our troops displayed brilliant examples of continuity in the conduct of combat operations under complex conditions in a number of operations during the Great Patriotic War. As an example we might mention the Battle of the Dnieper and the operation to liberate the Right-Bank Ukraine. In these latter, Soviet combat operations took place along a 1400 km front and, in spite of adverse weather conditions and the spring muds, continued without interruption to a depth of 1450 km. The troops crossed a large number of rivers, including the Dnieper, Ingulets, Southern Bug, Dnestr, and Prut. The river-crossing operations as a rule were carried out under conditions of spring flooding and floating ice, which demanded of the troops enormous effort and self-sacrifice.¹⁰

Continuous actions ensure achieving the objective quickly and with a minimum expenditure of men and materiel and deprive the enemy of the time and opportunity to reorganize his troops, to maneuver reserves, to regroup and attack, to bring up supplies, and to organize resistance on new lines. The continuous conduct of combat operations at a rapid pace

creates unfavorable conditions for the enemy to employ weapons of mass destruction, since he cannot precisely determine the targets and in addition is frequently compelled to shift the location of his offensive nuclear weapons.

Under present-day conditions a halt during the course of combat operations, even for a brief time, means a loss of advantage to the attacking troops, and in addition they risk being subjected to a hostile nuclear strike. During this time the adversary can move up reserves situated at a considerable distance and can establish a defense capable of halting or slowing the advance. As foreign authors emphasize, an increase in the air and ground mobility of ground troops promotes this to a substantial degree.¹¹

A most important and qualitatively new element of this principle is continuous engagement of hostile offensive nuclear weapons.

In the past, prior to the development of nuclear weapons, the capabilities of individual weapons were comparatively limited, and the results of their action could not decisively influence change in troop combat capability and correlation of forces. It was possible not to destroy, immediately upon spotting, hostile artillery batteries discovered during preparations for an engagement; it was possible merely to determine their coordinates and plan on destroying them later, such as during preparation fire.

Today the situation has radically changed. Every nuclear strike, depending on its force and accuracy, has an immediate effect on troop combat capability. Therefore every gun capable of firing a nuclear-warhead round and every hostile missile launcher should be destroyed as soon as it is spotted. Nuclear ammunition should also be immediately destroyed as soon as it is discovered, at fire positions, bases or in transport.

The increasing size of modern armies and their increasingly-dense arming with complex combat equipment and weapons which require special types of supply are increasingly advancing to the foreground such a principle of military art as comprehensive support of combat operations. The essence of this principle consists in the organization and persistent implementation of all measures to support combat operations. It points to the dependence of success of combat operations on careful and thorough support and supply.

"...Every battle," stated Lenin, "contains the abstract possibility of defeat, and there is no other means of diminishing this possibility than organized battle preparation" (Poln. Sobr. Soch., Volume 6, page 137).

Comprehensive support and supply constitutes a most important element in the preparation for and conduct of every operation. We should note that

it is becoming increasingly complex with the development of new types of weapons and other hardware. In the recent past support activities for combat operations included only reconnaissance, security, antiaircraft defense, camouflage, engineer and rear services support, while today new kinds have developed, such as protection against mass destruction weapons, etc. The content of each type has also become immeasurably more complex.

Comprehensive support of combat operations, all types of support and supply services and related measures assume particular importance under present-day conditions. Without prompt acquisition of reliable reconnaissance data on the enemy, terrain, radiation and chemical situation it is impossible to make a correct decision and effectively to utilize available men and materiel. Without adequate supply of fuel and ammunition, the most sophisticated combat hardware will become so much dead weight.

We should note that under present-day conditions, in connection with highly-maneuvering combat operations and potential abrupt situation change (particularly under conditions of employment of nuclear weapons) over a large area, comprehensive support services in an operation require such organization whereby each large unit and unit could be independent, within certain limits, in the conduct of combat operations. They must themselves conduct reconnaissance and protection against mass destruction weapons, effect camouflage, and provide engineer and chemical support services. As regards rear services, large units and units should carry with them adequate facilities and supplies in order to be able to conduct combat operations independently for several days, but at the same time preserving a high degree of maneuverability.

This does not mean, however, that today the role of higher commanders and staffs has diminished in the direct support of actions by the large units and units under them. On the contrary, they now must solve the largest fundamental problems, such as air reconnaissance or antiaircraft defense. They must regularly inform their subordinate commanders on changes in the enemy force, in the radiation and other situations, as well as on physical destruction, flooding and fires in the areas of their operations more frequently and to a greater depth than has been the case in the past. It seems to us that even units operating on independent axes should be continuously briefed during the development of an operation on the situation to a depth of 2 to 3 days of movement. Air, radio intercept, electronic, chemical, and engineer reconnaissance data from higher headquarters should be immediately and automatically communicated to interested units. Successful accomplishment of combat missions and achievement of operation objectives may be extremely difficult without such organization of the entire aggregate of support activities.

The main elements in combat, however, are people. Therefore in comprehensively preparing for and supporting combat operations in an operational-tactical, materiel, technical, combat and engineer respect, it is essential to be concerned with training and preparation of personnel. The resolute and intensive nature of modern military operations and the employment of weapons of unprecedented destructive force have led to a sharp increase in the importance of troop morale and consequently to increased responsibility of commanders, political entities and staffs of all echelons for morale-psychological preparation of personnel for combat. It is based on dedication to the socialist homeland and willingness to give everything, including one's life, in its defense. Every fighting man must be deeply aware of the just nature of our struggle, the criminal nature of the war from the enemy's side, and personal responsibility for defense of the homeland. Lenin taught that awareness by the masses of the war causes and aims, as well as conviction that the war is just, raises soldiers' morale and ensures victory.

We have examined only the fundamental, most general principles of military art. Knowledge of these principles and general development trends will assist the military commander in the specific situation to select the most appropriate principles or consistent combination of principles to achieve defeat of the opposing enemy force.

FOOTNOTES

1. Istoriya voyennogo iskusstva. Kurs lektsiy (History of the Art of Warfare. A Lecture Course), Volume IV, Izd. Voennoy akademii im. M. V. Frunze, 1960, pp 84-85.
2. Ibid., pp 181-182.
3. Ibid., Volume VIII, 1956, pp 91, 92, 96, 123-124.
4. Ibid., Volume VI, 1956, pp 147-148.
5. Ibid., Volume III, 1961, pp 362-364.
6. U.S. Army Field Manual FM 100-5. Field Service Regulations; Operations, 1964, pp 119-120.
7. Wehrkunde, January 1968, pp 3-15; Military Review, March 1969, pp 3-9.
8. Voyenno-Istoricheskiy Zhurnal, No 4, 1961, page 89.

9. Ministry of Defense Archives, Fund 339, List 13252, Document 2, Sheet 19; Istoriya..., op.cit., Volume III, 1961, pp 250-252.
10. Ibid., pp 98-103.
11. Lt Col P. Dillon presents some principles of conducting combat operations under conditions of massed employment of tactical nuclear weapons in an article entitled "Nuclear Saturation" (Military Review, February 1970, pp 10-18).

TROOP CONTROL TO THE LEVEL OF CURRENT REQUIREMENTS

Lt Gen M. Ivanov

The 24th CPSU Congress, examining current problems of policy, the economy, ideology and party organizational activities, focused particular attention on further radical improvement of scientific direction and leadership in all areas of our nation's societal affairs.

A task specified at the congress -- to raise the level of all economic management efforts and to bring economic management into conformity with present-day demands -- also applies directly to problems of increasing the effectiveness of troop control.

The development and practical adoption of new and more powerful weapons, the continuous increase in technological sophistication of the armed forces, as well as the development of forms and methods of conducting modern combat operations are imposing continuously increasing demands on troop control. Under these conditions an all-out improvement in the means and methods of troop control is becoming a task of prime importance.

Increasing attention has been focused on problems of troop control in recent years, as a result of which significant changes have occurred in this area. New communications and automation equipment is being adopted in the line units to an increasing extent; methods and work style of control entities are being improved on a scientific basis; combat documents have been improved. Academy scientists, line officers and general officers have written many articles and published a number of valuable studies on this subject. Problems of troop control are also extensively discussed in the journal Voyennaya Mysl'.¹ Synthesized experience in control is reflected in military regulations, field manuals, guidelines and directive orders.

Life does not stand still, however; the means and methods of warfare are steadily being improved, while achieved results in the area of increasing the effectiveness of control do not always correspond to those demands which are today imposed on troop control.

It seems to us that one of the reasons for this state of affairs is the fact that theory does not always keep pace with practical requirements. Analysis indicates that the bulk of materials on problems of control published in the periodical press, including Voyennaya Mysl', deal with investigation of general problems. They normally examine the essence and content of control, and investigate trends in elaboration of theory of troop control, the psychological aspects of control, methodology of commander thinking, characteristic traits of the style of control activities

of military cadres, etc. All these of course are important matters, and their discussion in the press is unquestionably necessary. It is also necessary, however, to discuss extensively more specific problems of the practical activities of commanders and staffs pertaining to troop control. In particular, it is necessary to examine and elaborate optimal variants of commander and staff operational procedure in organizing combat from the moment an operation order is received, with varying time budgets; it is necessary to discuss problems of more efficient organization of commander and staff labor in decision-making and planning combat operations, to exchange information and to find ways of solving such problems as that of furnishing staffs with more sophisticated staff control and communications equipment, increasing effectiveness and efficiency of information, improving staff training methods, etc.

On the other hand, military practice also sometimes separates from theory, as a result of which not all recommendations of the latter are implemented in the practical activities of control entities.

In this article we shall endeavor to express our thoughts on some problems of increasing control effectiveness.

As is well known, the commander's decision constitutes the basis of control, its most important act at any command echelon. Efficiency in decision-making is presently becoming the most important demand imposed on troop control and one of the most important discussion topics in the journal Voyennaya Mysl'.

Recently radical solution to this problem has been linked with extensive utilization of mathematical methods in combination with electronic computers and the achievements of military cybernetics. Utilization of means of automation is today becoming an inseparable part of the process of decision-making. But one should not forget that decision-making is a commander creative mental process. Consequently, the acquisition of automated system data at the present time should be viewed as a preparatory stage on the way to a decision, which frees the commander of a great many laborious calculations and mental activity.

Experience convincingly affirms that the preliminaries to decision-making under present-day conditions should be of a collective character, as a consequence of an increase in the volume of work involved, its complexity and a sharp decrease in time available for organizing combat operations. Today even the most experienced and well-trained commander is simply unable physically to perform by himself the entire volume of work connected with decision-making. He can successfully cope with this task by relying on his staff. Decision-making can be ensured only by the collective and coordinated efforts of commander and staff.

This matter has been discussed on numerous occasions in our periodicals, and there is general unanimity on the correctness of this statement. In practice, however, staffs do not always occupy the position of reliable commander assistants; many of our commanders do not sufficiently intelligently enlist their aid.

Thus there is a necessity of fully utilizing the entire potential strength of staffs, increasing their role in order that the principle of collective effort in decision-making always constitutes an immutable law. The staff should free the commander to a maximum degree from primary processing and systematization of various data. It must acquire, analyze, and synthesize raw data, on this basis preparing for the commander draft decisions. It is of course understandable that collective labor in no way diminishes the commander's role, nor is it in conflict with the principle of one-man command. Such an organization of the task at hand merely makes it possible practically to apply this principle in a more efficient manner, intelligently and smoothly combining it with the initiative, experience and innovativeness of all control facility personnel. The commander's independence in decision-making will be expressed in the fact that he personally will determine the most important, key matters and will directly supervise the activities of his staff. In the final analysis he and he alone makes the decision and is responsible for it.

This is not enough however, to increase efficiency in decision-making if the commander does not precisely calculate, plan and suitably organize his own labor and that of the entire team of generals and staff officers.

Practical training experience indicates that it is essential to regulate on a strict timetable the efforts of commander and staff not only in the process of decision-making but also during the entire period of preparation for combat operations. To this end it is necessary to draw up a special schedule or timetable which would specify the sequence and specific completion times for all fundamental measures connected with preparations for combat operations. The less time available for preparation, the more rigidly the work must be regulated. The schedule should reflect the entire volume and sequence of commander and staff activities in decision-making and planning of combat operations and should specify who does what when, who prepares what planning documents, and who communicates combat missions to line units and when.

In proceeding to the job of decision-making, the commander begins by studying the operation order (directive order) and immediately enlists all main supervisory control personnel in this task. The result is immediate briefing of chiefs of arms and services on the situation and the commander's intentions; it enables them quickly, in a purposeful and coordinated manner to prepare the requisite data for decision-making and

to take immediate part in planning. The commander's decision is also adopted and announced in the presence of the principal officials and a small group of officer-operators, who formalize the commander's decision and instructions.

Under conditions of limited time to prepare for combat operations it is extremely important that subordinate commanders and staffs be involved in this effort as quickly as possible. Therefore the commander outlines missions and the staff communicates them to subordinates during the process of operation order briefing and plan determination.

Analogous documents are elaborated by the chiefs of arms, services and administrations, as well as by subordinate commanders and staffs, on the basis of the commander's work schedule.

It is not difficult to see that the presence of such timetables, elaborated on the basis of unified principles, at all command echelons makes it easy to save considerable time, increases efficiency and ensures synchronization and smoothness not only in the performance of the commander and his staff but also in all activities of lower-echelon commanders and staff. Therefore this method must be adopted more extensively and boldly in practical command and control activities.

As is well known, decision-making is preceded by considerable and laborious work involved in preparing various reference and computation data. Much time is presently expended in readying such data, and the operation involves a large number of personnel. This can be avoided if standard calculations and reference materials, taking into account varying troop combat activity, are elaborated by staffs in advance and verified in the process of combat and operational training. It makes sense to publish many such computations in a centralized manner, similar to collections of combat documents. In such a case decision-making may require only refinement of a certain computation in conformity with the specific situation. The result will be savings in manpower and resources.

An important role in rapid decision-making is without question played by the commander's personal qualities, his training, experience, erudition, capability of thinking in an efficient manner, the ability to grasp a situation quickly, to establish and maintain a calm, businesslike, productive atmosphere in the activities of the entire team of staff generals and officers. These skills are acquired in the process of active mastery of military affairs, on the basis of comprehensive knowledge, and as a result of regular practice sessions in the course of daily practical training activities. Therefore worthy of particular attention is a constant improvement in the methods of conducting troop exercises, command-staff and staff exercises, war games, drills and commander exercises. Exercises

constitute a laboratory where commanders and staffs learn to function as in actual combat.

Increase in the effectiveness of troop control is directly influenced by efficiency in planning combat operations.

In recent years commanders and staffs have obtained fairly good practical experience in planning and have achieved a substantial reduction in the time required to elaborate planning documents and to improve their quality. But in spite of this fact, much time is still expended on planning and staff practical activities, and sometimes confusion arises which reduces efficiency in troop control.

What possibilities exist for further reducing planning time, and how should one proceed at the present time in resolving this problem?

Experience indicates that in order to increase efficiency of planning it is essential more persistently to adopt into the practical activities of control entities the most progressive and advanced methods. These methods should be applied across the board.

One unified method which is presently being employed and shows considerable promise for the future is parallel planning of combat operations. As has been stated in our press,² it consists essentially in an organization of the efforts of commanders and staffs from top to bottom, where lower-echelon staffs proceed to plan and organize combat operations during the process of and parallel with decision-making at higher control echelons, on the basis of warning orders. This method of control agency operations makes it possible to effect planning in a more organized manner and to complete this entire process considerably more rapidly. It is based on the same procedure as in decision-making. But since commander and staff efforts in the process of decision-making are not yet strictly regulated from beginning to end, the parallelism in operations at all echelons is not yet clearly evident in all instances.

An improvement in efficiency of planning also depends in large measure on well-conceived organization of labor and precise interaction of all staff elements, services and departments in elaborating planning documents.

A typical feature of planning consists in the fact that all arms, services and sections directly participate in elaborating basic planning documents. They prepare and present specific data and calculations essential for elaborating a given document, as well as coordinating the most varied matters. Therefore the time required to prepare each planning document and to complete the planning process as a whole is determined by how rapidly the chiefs of arms and services present the data requested of them.

Sometimes this requires considerable time if operations are poorly organized. This entire process, however, can be greatly accelerated if data submission timetables are rigorously controlled with the aid of the schedule discussed above.

On the other hand, it is possible to control organization of labor involved in planning by means of a substantial improvement in the very process of preparing combat documents.

Experience indicates that due to limited time available for planning, preparation of a great many documents should be effected across a broad front, by the so-called group method, particularly such documents as the commander's decision and the operation order, on the basis of which all planning and combat operation preparation efforts subsequently develop. But even in this case rapid preparation of documents is achieved only when the entire process as a whole and the activities of each officer individually are thought through to the finest detail. Let us take, for example, preparation of the operation order. Its elaboration should be effected literally on a sheet-by-sheet basis. One officer, employing a decision card and commander instruction notes, can immediately dictate the order to his typist, point by point. A second officer checks the typed document on the spot, final-edits each point and reports progress to the chief of staff. The latter, making the necessary corrections, reports on the roughed-in document sheet-by-sheet to the commander; only after this are the final-edited sheets typed on a second typewriter, in the required number of copies. Special points in the order should come from chiefs of arms, services and sections in final-edited form and worded in the same style, so that they can be typed up immediately. Other planning documents can be prepared in approximately the same manner.

In addition to the adoption of more advanced working methods, it is necessary constantly to improve staff efficiency and techniques of preparing planning documents.

This is directly connected with the personal training of staff officers, the establishment of a strict order and sequence in their theoretical training, and improvement of practical skills in preparing documents. Also meriting considerable attention is the staff training of officers at service academies where, studying troop control curriculum, they would master modern methods of preparing combat documents.

In planning combat operations much time is spent on the technical formulation of documents. This is because at the present time we do not have standard requirements on each planning document. Rather varying demands are imposed at different times on a given combat document.

It would be extremely useful to define more precisely the content of basic planning documents and the procedure of their preparation, using this as a guideline in all cases. A definite model should be elaborated, to which one must adhere as much as possible.

In order to reduce planning time, we feel that it would be expedient to revise the content of some documents in order to diminish their volume and speed up preparation.

We should discuss in detail the organization of troop coordination, since this is one of the main problems dealing with combat operations planning and troop control.

Under present-day conditions coordination encompasses solution to a broad range of problems, coordination of the operations of all arms, branches and services and also of diversified, qualitatively new weapons over a large territory. As a consequence of this, coordination has become an extremely laborious process, requiring precise calculations and considerable foresight. Staffs must think through in detail and coordinate the operations of all forces, elaborating concrete mutually-coordinated documents. Consequently, it is essential persistently to seek ways to solve this important problem, in order that coordination can be fully ensured in all cases. It is necessary for commanders and staffs to display maximum activeness and innovativeness in seeking those methods of coordination of troop operations which are most acceptable for each concrete situation, taking more fully into consideration the fact that these methods will differ for different command echelons. While under certain conditions the commander, in organizing coordination, can limit himself to certain instructions to his subordinates, under other conditions this will be totally inadequate. While at the operational echelon organization of coordination can be effected on maps, contour maps and terrain models (sandboxes), at the tactical echelon it should be organized primarily on the spot, in the field.

In theoretical elaborations on this problem it is desirable more fully to reveal the sequence and procedure of commander and staff activities in organizing troop coordination, particularly in the interest of solving the problem of destroying a hostile nuclear missile force.

One must discuss in greater detail problems of coordination of actions by artillery, aviation, tank and motorized rifle troops in penetrating organized defenses and subsequent destruction of opposing forces during the conduct of combat operations with conventional weapons.

Prompt communication of combat missions to the troops is of great importance in improving control efficiency.

Modern communications devices make it possible to transmit orders to troops fairly rapidly. But even such equipment cannot ensure the requisite flexibility and efficiency in the formulation of combat missions if the latter are communicated by staff officers by means of transmitting operation orders to lower-echelon commanders in the form of telegraphic communications, as is frequently the case. This is not a good method. In such a case much time is wasted in writing out, drawing up and transmitting operation orders; subordinate staffs and troops are late in their involvement in preparations for combat, as a consequence of which the simultaneity of operations by all staffs, as discussed above, is not provided.

In order to speed up significantly the communication of missions to combat units, to increase at all echelons the time available for preparing for combat operations and to achieve maximum simultaneity in the operations of control entities, what is essential is a work procedure and sequence in which the commander, in elaborating his decision and outlining his plan of engagement, would specify combat missions and would communicate these missions in part to the executing personnel, by issuing brief operation orders. Initially, when the operation order is received, warning orders are issued, briefing subordinates on the forthcoming operation. Then preliminary missions are communicated to the combat elements, so that they can proceed to organize combat operations as early as possible. When the decision is made, operation orders are transmitted to the combat element, containing combat missions in final form. It is expedient to issue all these orders verbally, by means of direct voice communications with subordinate commanders. Only in this way is it possible to ensure rapid communication of combat missions to the combat elements. Written orders should now be issued for the purpose of confirming and refining previously-issued verbal orders, and not otherwise.

We should state that the employment of standard documents greatly promotes improved flexibility and efficiency in issuing combat missions. If staff officers at all echelons are well trained and coordinated, employment of these documents in the conduct of direct voice communications reduces the time required to issue brief orders literally to a few minutes. Therefore we feel that standard documents should be in widespread use by all staffs.

The most complex problem of troop control is that of collection of situation data, data study and analysis, that is the problem of information. In solving this problem, at the present time principal attention is focused on automating the collection process. This is unquestionably the correct procedure. With the adoption of modern technical devices, and particularly automated control systems, delay in the area of prompt collection of information is reduced to a minimum. At the same time, however, it is necessary to utilize other possibilities of reducing the time required for the flow of information, particularly since such opportunities exist.

As is well known, the principal demands on the collection of situation data are promptness, continuity and reliability of acquired information. With multilevel control, which would seem to be a universal factor, and a large flow of information, observance of these requirements in our opinion demands first and foremost a high level of staff discipline and efficiency in presentation of information.

As is well known, report presentation times are specified by the schedule of periodic reports. In addition, higher headquarters specifies the procedure and sequence of presenting urgent messages and verbal information. Consequently, if all staffs are guided by these schedules and promptly pass on the requisite information without reminders, promptness and continuity of situation information collection will be ensured. There are cases, however, when higher headquarters must "demand" the communication of essential situation data.

Accuracy and correctness of messages and report documents is very important, since this eliminates the need for additional-detail inquiries and requests, on which staff officers are sometimes compelled to spend considerable time.

An important role in reducing situation data collection and processing is played by practical adoption of a unified report pattern by commanders and staffs. In addition to the fact that all reports should be precise and accurate, it is important that they be presented in a specific sequence and reflect all matters pertaining to troop position, status, nature of activities, status of supply, intentions, etc. Experience indicates that this helps officers and commanders more quickly understand one another in communicating with one another, helps achieve a smoother operation and, what is most important, helps save time.

In examining problems pertaining to increasing the effectiveness of troop control, one cannot ignore staff organizational structure.

Recently, in connection with changes in the forms and methods of conducting combat operations, in troop organization and increasing sophistication of hardware, headquarters have also undergone organizational changes. This does not, however, diminish the need for their further improvement.

Of particular importance in solving this problem is an awareness that staff organization has the aim of ensuring successful and rapid performance of specific types of activities, eliminating parallelism and duplication of efforts. It should be based on clear-cut division and specialization of labor. The structure of any headquarters is most expedient if it enables the staff simultaneously and in full scope to engage in preparation of data for decision-making and planning of combat operations, communication of combat missions to subordinate troops, collection and synthesis of

situation data, as well as supervision over activities of subordinates and assistance to subordinates in the performance of assigned combat missions. In addition, staff organization should ensure their smooth division and establishment of fully independent control facilities which are viable and efficient in all respects.

In conclusion we should state that the necessity of increasing the effectiveness of troop control at the present time demands first and foremost that advances in military theory be vigorously adopted in the practical operations of commanders and staffs. In addition to automation of control, positive results can be produced by utilization of other means and potential. We believe that if commanders and staffs possess a practical mastery of advanced, scientifically-substantiated work methods, are able to make rapid decisions and promptly communicate combat missions to executing personnel, if staff training is well set up, if a high degree of staff organization, discipline and staff efficiency is achieved, and if the organizational structure of command entities is in full conformity with the demands presently imposed upon them, the problem of increasing control effectiveness will in large measure be solved, even with partial automation of control processes.

FOOTNOTES

1. Voyennaya Mysl', No 4, 5, 7, 8, 9, 1968; No 7, 8, 10, 12, 1969; No 2, 6, 7, 8, 9, 12, 1970; No 1, 2, 4, 6, 1971.
2. Voyennaya Mysl', No 7, 1970; No 2, 1971.

GENERAL PRINCIPLES OF THE APPROACH TO APPRAISING THE EFFECTIVENESS OF
COMBINED ARMS CONTROL SYSTEMS

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History teaches us that skillful troop control in many battles exerted decisive influence on the outcome of armed struggle. In modern warfare skilled control determines not only the effectiveness of troop combat operations but the very possibility of these operations as well.

But what does skillful troop control mean? What is contained in the concept of effectiveness of control in the modern engagement and operation? What measuring sticks should one apply in approaching an appraisal of quality of control, and how should it be appraised taking into consideration the more complex conditions and character of combat operations? These and other such questions are of both theoretical and practical significance. Their comprehensive elaboration is essential first and foremost to improve staff organization and work methods in utilizing existing technical control devices. These questions are of equal significance in evaluating newly-elaborated control systems.

Without making a claim of completeness of treatment, we shall endeavor to set forth the general principles of approach to evaluating the effectiveness of combined-arms control systems.

In evaluating the control effectiveness of any combined-arms echelon, one always has in mind a specific control system, providing for decision-making and direction of troop efforts in carrying out combat missions. In the most general form such a system is considered as an organic unity of three component parts: control manpower and means; structure of control entities and facilities; relations and functional links of officials in control processes.

The most important of these components is control manpower and means, with the aid of which a response reaction to changes in the combat and operational situation is assured. Of primary significance here are excellent morale-volitional qualities, thorough knowledge and organizational ability on the part of command personnel.

A no less important role is played by that technical foundation with the aid of which control tasks are performed. Its quality determines to a substantial degree the effectiveness of the control system. If this foundation is insufficiently sophisticated, with the modern scale and character of combat operations it is difficult and in some cases impossible to reach a reasonable, let alone optimal decision and to assign missions to executing personnel in a prompt manner.

The second component of a control system is expressed in that organizational definiteness in which control manpower and means are presented.

Finally, the third component is the aggregate of relations entered into by control entities in the process of troop control. This aggregate is manifested through work methods, the rights and duties of control personnel.

Each of these components determines the specific features of a control system. Change in even one of them leads to change in the system as a whole. One must bear in mind that a control system, as an aggregate of the above-enumerated component parts, is inseparably linked with a great many direct and feedback information links with the controlled system (that is with troops as an object of control) and forms together with it a unified whole. Two final indicators -- interlink and integrity -- are determinants. Only under these conditions is the control process proper ensured, and does the control system possess practical significance.

Thus one can consider that a system with the aid of which troop control is effected is a complex dynamic aggregate of specially trained and prepared control entities and facilities, equipped with technical devices, and the activities of which are subordinated to a common goal and aimed at total securement of troop execution of combat missions.

The capabilities of each control entity and facility are determined by its composition, equipment, structure and personnel operating methods. The effectiveness of the system as a whole, however, is not a simple sum of the effectiveness of its component elements. Of decisive significance here is the mutual influence of various elements on one another and on the functioning of the system as a whole. It is precisely for this reason that a systems approach is necessary for appraisal of control.

Taking the above into account, our concept can be formulated as follows. Effectiveness of troop control is the integration of the capabilities in a control system to ensure accomplishment of combat missions on specified timetables and with minimum expenditure of manpower and resources.

In evaluating combined-arms control systems one must take into account a large number of extremely diverse items, namely: to what degree does the given system increase the effectiveness of employment of men and hardware in combat, and missiles-nuclear weapons in particular? How rapidly does personnel response to situation changes pass through the system? To what degree is the system able to withstand enemy attack, particularly with weapons of mass destruction, and what are its capabilities in electronic countermeasures? What is the system's adaptability to conditions of abrupt situation changes? At the cost of what material outlays is control effectiveness achieved? To what degree does the control system permit reducing friendly troop losses in case of an enemy sneak attack? What savings does control achieve in expenditure of resources? etc.

All the above-enumerated and other characteristics of a system with the aid of which control in the engagement and operation is effected can expediently be combined into three large groups of factors defining the operational-tactical effect produced by a control system: system technical indices; economic outlays for the system and replenishment capability. In consonance with this it is useful to examine the operational-tactical, technical, and economic effectiveness of combined-arms control systems.

Operational-tactical effectiveness is an aggregate of distinctive features characterizing in a quantitative respect the capability of a system to handle problems in a prompt and quality manner.

Technical effectiveness is defined by characteristics which quantitatively reflect the technical capabilities of control hardware and convenience of operation of this equipment under various combat situation conditions.

Economic effectiveness is defined as an aggregate of parameters characterizing material outlays for control and capabilities of control outlays compensation and replenishment.

Of primary significance in evaluating a control system as a whole is its operational-tactical effectiveness. For example, in conducting combat operations with the employment of nuclear-missile weapons, the primary appraisal is of the effectiveness of control of these weapons. Up to the present time the principal criterion of control effectiveness in studies devoted to efforts against enemy offensive nuclear weapons in the course of conducting combat operations was the probability of beating the enemy to the attack. This criterion rather graphically reflects the advantages or drawbacks of the control system as applied to a specific weapon. It is insufficiently critical, however, for system appraisals relative to all enemy nuclear weapons. In fact, the zone of action of a given combined-arms element may contain a varying quantity of these weapons, differing from one another substantially in size of nuclear warheads. During the course of combat operations it is impossible with the aid of this criterion to determine in what manner anticipation in hitting each weapon separately affects the success of the engagement as a whole. It is therefore advisable to use a coefficient of strike prevention of enemy attack with mass destruction weapons ($K^{(sp)}$) as a general criterion of control effectiveness in conducting combat operations employing nuclear weapons. This coefficient indicates what part of the enemy's nuclear potential cannot be employed as a result of the fact that our troop control system during the conduct of combat operations will ensure anticipation in the employment of nuclear-missile weapons.

The method of determination and the physical significance of $K^{(sp)}$ reduce to the following.

First of all one determines the mean value of total friendly troops kill area with one strike by all enemy organic offensive nuclear weapons, that is one calculates the enemy's overall nuclear potential reduced to a single salvo:

$$S = \phi \sum_i n_i \sqrt[3]{q_i^2},$$

where $\phi = \text{const}$ -- kill factor (personnel, combat equipment, etc) with nuclear contact surface bursts and airbursts;

n_i -- total quantity of type i enemy offensive nuclear weapons;

q_i -- average warhead size of type i enemy offensive nuclear weapon.

One then in analogous manner determines the average size of the maximum potential kill zone of enemy weapons detected with a given friendly reconnaissance control system, that is one computes the detected hostile nuclear potential:

$$S_0 = \phi \sum_i n_i^0 \sqrt[3]{q_i^2},$$

where n_i^0 -- quantity of type i enemy offensive nuclear weapons detected with the given system by friendly reconnaissance.

After this, for each type of detected enemy offensive nuclear weapon, one determines the probabilities ($P_i^{(an)}$) of anticipating the enemy in launching a strike during the course of initiated combat operations. Taking these probabilities into account, one obtains the mean size of the maximum zone in which it is possible to prevent the destruction of friendly troops as a result of anticipating the enemy in delivering a strike:

$$S(sp) = \phi \sum_i n_i^0 P_i^{(an)} \sqrt[3]{q_i^2}.$$

Finally, one computes $K^{(sp)}$ as the relation

$$K(sp) = \frac{\sum_i n_i^0 P_i^{(an)} \sqrt[3]{q_i^2}}{\sum_i n_i \sqrt[3]{q_i^2}}.$$

Thus coefficient K^{SP} as a criterion of operational-tactical effectiveness of control in the conduct of combat operations indicates to what extent the overall kill area of friendly troops by hostile nuclear weapons is reduced thanks to a control system which ensures preemptive strike capability.

The effort to gain time and ensure successful accomplishment of combat missions is also characteristic of troop operations without the employment of nuclear weapons. Therefore in the conduct of combat operations with conventional weapons as well, it is advisable to adopt an index as basic criterion of operational-tactical effectiveness which reflects to a maximum degree the effect of control on troop combat operations. Damage inflicted on the enemy or prevented losses in friendly troops, for example, can be adopted as such a criterion. Practical application of this criterion, however, involves difficulties in determining the degree of influence of various means and resources on the successful conduct of combat operations as a whole. It is not possible at the present time to find acceptable coefficients of commensurability of totally different combat formation elements and to take into account the great diversity of combat situation factors.

Until such a time as this problem is solved, it will be advisable to adopt as general criterion of operational-tactical effectiveness in the conduct of combat operations without the employment of missile-nuclear weapons the capability of a control system to ensure anticipating the enemy in employment of forces, that is the probability of accomplishment of control tasks within a specified time (P^C). This criterion is advantageous in that it enables one to judge the degree to which a control system provides solution to one of the most important problems in the course of combat -- to anticipate the enemy in deployment, in establishing a superiority in forces on decisive axes, in shifting to decisive actions, and thus frustrating the enemy's plan, forcing him to expend time inefficiently and to conduct combat operations under disadvantageous conditions. The quantitative value of this criterion is found as a function of the time expended organizing combat operations by friendly troops and the time determined by the character of combat operations:

$$P^C = P(t_c < t_p) = \int_0^{t_p} f_n(t) F_c(t) dt,$$

where t_c -- time expended on organization of combat operations by friendly troops; $F_c(t)$ -- function of distribution of random quantity t_c ; t_p -- time required by enemy to ready for combat operations (maximum allowable time); $f_n(t)$ -- density of distribution of random quantity t_e .

Particular criteria for characterizing individual aspects of control can include the criteria of speed, scope, continuity, integrity (survivability and reliability), throughput capacity, mobility, concealment, accuracy and flexibility of the functioning of control systems.

The most important criterion of the speed of a system with which control is effected is the complete control cycle time, that is the time required for a commander and staff response to changes in the combat and operational situation.

An evaluation of the functioning speed of a combined-arms control system can also be made on the basis of particular indices which affect the overall length of a full control cycle. In the capacity of such indices it is expedient to utilize time for the collection, processing and output of information (according to categories of importance) requisite for troop control, decision-making time and time to formulate and communicate combat missions to executing personnel.

In addition to indices determining full control cycle time, of great importance in estimating the functioning speed of a combined-arms control system is knowledge of time to perform work connected with decision-making and elaboration of troop control documents. It is expedient to determine the overall duration of all troop control operations taking into account time expended for these tasks at each echelon and in each control entity. Evaluation of a control system on the basis of this index will make it possible to determine the operations of which control entities are the most determining. Finally, in order to understand the importance of a given control echelon it is also necessary to determine (in absolute quantities and as a percentage relation) time expenditures at each echelon in an appraisal of the overall complete control cycle time.

The criterion of control system scope includes indices which describe its capability of securing control requirements from the standpoint of spatial extent of troop combat operations. A control system appraisal based on the criterion of scope is necessary in connection with a trend toward constant increase in troop combat and maneuver capabilities and an expansion of the spatial boundaries of combat operations at various echelons. The most important indices of control system scope in combat are range of transmission and area of collection of operational-tactical information. Additional scope criteria include number of control facilities and number of correspondents serviced by the system at each control echelon, as well as number of personnel and quantity of equipment (particularly motor transport) available at each facility, and the number of persons engaged directly in problems of control and situated within the service area.

As criteria of continuity of functioning of a system with the aid of which control is effected one can employ mathematical expectations of time of maximum interruption of control or minimum duration of uninterrupted system operation between two interruptions. It is most expedient to determine the quantitative values of these quantities by the simulation method.

To appraise a given control system on the basis of stability means to determine the frequency of system breakdown and the duration of time during which the system remains in proper operating condition. Control system stability is secured by its survivability and reliability. Survivability means a system's ability to maintain its operating capability in the face of hostile action, that is with combat damage to control equipment and

casualties among control entity and facility personnel. Reliability is determined by indices describing its ability to function under conditions of normal operation, in the absence of combat losses.

It is advisable to take a stability coefficient as the probability of failure-free system operation at any arbitrarily-selected moment in time as basic criterion of stability of the control system. In addition, appraisal of control stability can involve such criteria as probability of prompt collection of data essential for decision-making, probability of prompt transmission of operation orders to the principal subordinate force, and survivability of control centers.

The criterion of control system throughput capacity includes indices reflecting its information potential. The following can be utilized for such an appraisal: coefficient of system information content as the ratio of the mathematical expectation of data collected per unit of time to the total quantity of data necessary for troop control; an information processing coefficient, characterizing what portion of the total volume of input data can be processed in a given time segment; information consumption coefficient, indicating what portion of the total quantity of processed data is communicated to and utilized by officials in engagement and operation control; an overall throughput capacity coefficient as a function of the three preceding coefficients.

Any of the above coefficients can be employed to evaluate the throughput capacity of a control system for transmission, processing and utilization both of the total volume of data and for each type of operational-tactical information separately. In order to determine the quantitative value of throughput capacity criteria it is necessary to elaborate a method of determining the volume of information required for control in modern combat at each echelon and in each control agency.

System mobility criteria include indices reflecting the system's capability of prompt displacement. Mobility is one of the most important conditions for ensuring stability and continuity of control. To appraise a control system on the basis of the mobility criterion means to reply to the question of whether the methods and rate of displacement correspond to the demands imposed by the nature of modern warfare. Basic mobility criteria include the ability of control facilities to operate when on the move and their air transportability. Special attention is focused not only on time required to prepare to displace, deploy, and rate of movement of control facilities, but also on off-road capability, particularly across contamination zones and river obstacles.

The higher the control echelon, the greater the significance in evaluating the mobility of a combined-arms control system should be attached to such a

criterion as the availability of highly-mobile control facilities. Such facilities are particularly essential when there is massive employment of nuclear weapons, when large difficult-to-negotiate areas are formed, and it is necessary to respond quickly to combat situation changes.

At the lower echelons the entire control system should be based on mobile control facilities which do not require any deployment or to prepare for displacement. In order to operate in troop boat formations, control entity transport vehicles should not be inferior to those employed by the troops.

At higher echelons it is advisable to employ as principal criterion of mobility the ratio (as a percentage) of time expenditure for displacing control facilities to the total duration of combat operations. In addition, the following can be utilized to appraise the mobility of combined-arms systems: that fraction of time (of total control time) during which control is effected with full manpower and facilities; the ratio of control time from the main control center to total control time; the ratio of time during which all control facilities will be deployed to the time of conduct of combat operations and other criteria.

Two tasks arise in appraisal of control system concealment: appraisal of concealment of siting, displacement and functioning of control facilities, and appraisal of maintenance of secrecy of operational-tactical information used for control, particularly data on commander decisions and combat missions of friendly troops. Criteria for meeting the first of these tasks can include such indices as degree of radio emission of equipment at control facilities, adopted radio equipment operating conditions, number of dummy control facilities, etc. The most important criterion in handling the second task is the degree of secrecy of transmitted information, the quantitative values of which are determined on the basis of control echelons, taking into consideration its value and obsolescence time.

The manpower and equipment employed by the enemy to reconnoiter a control system vary greatly in their physical substance. Therefore it is expedient to appraise concealment of a combined-arms control system by type of reconnaissance. Of particular importance is an appraisal of its concealment against enemy electronic reconnaissance, since the NATO armies focus maximum attention on this type.

A description of the accuracy of functioning of a combined-arms control system includes the following appraisals: degree of conformity between operational-tactical information utilized in the system and actual conditions of the combat and operational situation; accuracy in solving computation problems; optimal nature of decisions.

As a criterion in evaluating the degree of correspondence between information and actual situation conditions it is expedient to employ indices which reflect the accuracy of information acquisition, forming, gathering, processing and output, as well as recency. For a generalized evaluation of information accuracy one can take the summary coefficient of information distortion, which indicates the number of characters per allowable error. Following are the principal indices of information recency: recency as the difference between the moment information is utilized and the moment of situation change, and obsolescence time, that is a quantity indicating how long a given piece of information can retain its value.

Accuracy in solving computation problems is normally estimated with mean square errors of those quantitative values resulting from problem solution. In addition one can employ indices characterizing combat effect, particularly the quantity and approximate value of resources economized by increasing accuracy of calculations.

It is advantageous to consider the optimal nature of decisions in relation to the conditions under which the decisions are made. Optimum criteria are of determining significance in appraising the precision of functioning of combined-arms control systems. In addition, since control is based on decision-making, evaluation of the system as a whole will depend in large measure on an appraisal of the optimal nature of the decision. Therefore maximum attention should be focused on determination of indices and elaboration of methods of appraising the optimal nature of decisions, particularly if one considers that precisely these indices and methods have been elaborated least of all.

Indices characterizing a control system's capability of reorganizing its operations in conformity with altered control conditions, while retaining the requisite level of all other effectiveness indices, are adopted as criterion of flexibility of a control system's functioning.

In appraising the flexibility of a combined-arms control system it is important first and foremost to determine its capability of securing transition from certain control methods to others; shift of control from certain facilities to others; operation in coordination with other systems, including control systems of allied armies. In addition, one should take into consideration a system's ability to solve new, additional control problems, to incorporate more advanced equipment and employ new methods of performing its tasks. The time required to reorganize a control system for operation under altered conditions is employed as fundamental flexibility indicator.

In evaluating newly-elaborated systems one should not limit oneself to an analysis of their operational-tactical effectiveness in respect to a given level of development of operational art and tactics. It is necessary to

consider to what extent the system is capable of functioning normally with the development of advanced weapons, combat equipment and new techniques of warfare.

The above are basic theoretical judgments on methods and criteria of appraising the operational-tactical effectiveness of combined-arms control systems.

An appraisal of the technical effectiveness of a control system consists in an analysis of its technical solutions. The end objective of such an analysis is determination of the technical capabilities and degree of sophistication of control equipment.

The effectiveness of the system as a whole is determined in large measure by the efficiency of control equipment. Therefore an appraisal of the technical effectiveness of combined-arms control systems is inseparably linked with an appraisal of their operational-tactical effectiveness. In appraising the technical capabilities of control equipment, primary attention is focused on ease of working with this equipment under various conditions of combat utilization. At the same time an appraisal of technical effectiveness should be coordinated with an evaluation of economic effectiveness. The sophistication and efficiency of technical solutions pertaining to design of control equipment must in all cases be appraised taking into consideration economic expenditures for implementation of these solutions.

In appraising the technical effectiveness of a combined-arms control system it is necessary first and foremost to analyze its design-technical indices. The most important of these are productivity, operational reliability and mobility of control equipment and the system as a whole, as well as the frequency, weight, temperature and other specifications of its individual elements. Another important design-technical indicator is the degree of standardization of control equipment.

In addition to design-technical indices, it is also advisable to appraise the technical-operation indices of a control system, that is power requirements, consumption of fuels and lubricants, number of operating personnel, weight, area and volume of various equipment, component parts and system elements.

Finally, in appraising the technical effectiveness of systems, particularly newly developed systems, it is necessary to appraise their prospects and implementability. Here one should direct attention to the degree of newness of proposed control equipment, as well as the degree to which the latest scientific and technological advances are utilized, particularly in the area of radio electronics. No less important is the operational,

particularly electromagnetic, compatibility of various system units and elements. In addition, in appraising the prospects and implementability of newly-developed control systems it is important correctly to determine possibilities regarding the construction of a total set of equipment.

In addition to criteria of operational-tactical and technical effectiveness, it is feasible to employ the following criteria of economic effectiveness of a combined-arms control system:

1) economic outlays (absolute computation) for new control equipment and transport vehicles for the system as a whole and its component parts, expressed in the form of a sum:

$$C_{CS} = C_e + C_a + C_o + C_{oo},$$

where C_e -- cost of system elaboration, including outlays for the fabrication of experimental models and the system as a whole; C_a -- cost of system adoption; C_o -- cost of system operation under actual field conditions; C_{oo} -- other outlays;

2) direct (actual) savings achieved by adopting a new control system:

$$C_{as} = C_1 + C_2 + C_3 + C_4,$$

where C_1 -- reduction in cost of maintaining control and communications facility personnel; C_2 -- reduction in outlays for combat documents; C_3 -- reduction of outlays for troop support services; C_4 -- other types of savings;

3) indirect (combat) savings, characterized by cost of increase in potential damage (C_d) inflicted on the enemy, savings in expenditure of manpower and weapons (C_w) and reduced losses in friendly troops (C_l):

$$C_{is} = C_d + C_w + C_l;$$

4) time of repayment of outlays for control system, compensated by actual and indirect savings:

$$T_{as} = \frac{C_{CS}}{C_{as}}; \quad T_{is} = \frac{C_{CS}}{C_w + C_l}.$$

Summarizing our examination of methods and criteria for appraising the effectiveness of troop control, we should emphasize once again that in order to reach a final conclusion on the effectiveness of a combined-arms control system, a separate appraisal of its operational-tactical, technical and economic effectiveness is insufficient. What is required is a comprehensive appraisal of the system as a whole, taking into consideration all types of effectiveness, that is we need synthesized indices on the basis of which one can draw a conclusion on the acceptability of the system being evaluated.

It is advantageous to take the reasonableness of adoption of a control system as the most important of these indices. A system is efficient if the increase in operational-tactical effect produced by it, with a known commensurability factor, is greater than or equal to the increase in its value taking into account direct and indirect savings.

Reasonableness of adoption is determined by the relation:

$$\frac{E_{CS}^{(n)} - E_{CS}^{(o)}}{E_{CS}^{(o)}} \geq \frac{C_{CS}^{(n)} - C_{CS}^{(o)} - C_{AS} - C_{IS}}{C_{CS}^{(o)}} \rho,$$

where $E_{CS}^{(n)}$ -- effectiveness of new control system; $E_{CS}^{(o)}$ -- effectiveness of old control system; ρ -- commensurability factor of system operational-tactical effectiveness and cost.

If this condition is not observed, that is economic outlays for the construction or improvement of a system exceed the rise in the required level of its operational-tactical effectiveness, the control system is inexpedient. In this case ways to reduce its cost should be sought.

Other criteria, reflecting the specific features of the functioning of various system elements, can also be employed in appraising individual control subsystems. For example, in an appraisal of control of radio and radar reconnaissance these will include: anticipated number of enemy installations reconnoitered, timetables for presentation of data on enemy offensive nuclear weapons and other targets, cost of efficiently operating reconnaissance means.

Criteria for appraising rear services control can include probability of prompt support services for troop combat operations, quantity of current stores at supply dumps, outlays for the transport of delivered supplies and equipment, as well as the cost of maintaining rear services records, etc. Control subsystems of the various arms also have their own specific effectiveness indices. General principles of approach to effectiveness appraisal and many of the above-examined criteria, however, are applicable for describing each subsystem.

MILITARY CAMOUFLAGE*

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The experience of World War II and particularly of the national liberation wars of the postwar period indicates that success in any military operation is inconceivable without adequate concealment of both military installations and troop activities. Continuous improvement in camouflage and concealment techniques in peacetime promotes maintenance of a high degree of troop combat readiness.

As is well known, there exist various approaches toward studying camouflage, its content and structure. In our investigations we proceed from the position that there exists a dialectical interrelationship between camouflage and hostile reconnaissance. The essence of this interrelationship consists in the fact that reconnaissance constantly seeks to detect targets and to determine their nature, and this engenders in the opposing side an objective necessity and effort to resort to various forms of camouflage and concealment (active and passive).

Figure 1 shows the structure of military camouflage, as well as the interrelationship between its nature and demands imposed, as the authors see it.

Camouflage is divided into tactical, operational, and strategic.

Tactical camouflage is effected on a tactical scale and consists: in utilizing time of day or night, geographic and weather conditions, employing camouflage devices and materials, with the aim of concealing (camouflaging) separate installations and small subunits, as well as for simulating solitary installations (small subunits) and displaying feigned tactical activity in combination with observance of camouflage discipline.

Operational camouflage is a type of operation support. It promotes the achievement of operational surprise. It includes: keeping operation preparations secret (radio silence, concealed control, dissemination of false information to the enemy); concealment of troop regroupings, camouflage of assembly areas of support echelons (reserves and supply bases); creation of dummy troop concentrations, command posts, defensive installations, structures, etc.

The effect of operational camouflage is achieved only with strict observance of tactical camouflage measures.

* Militärwesen, No 9, 1970; No 3, 1971.

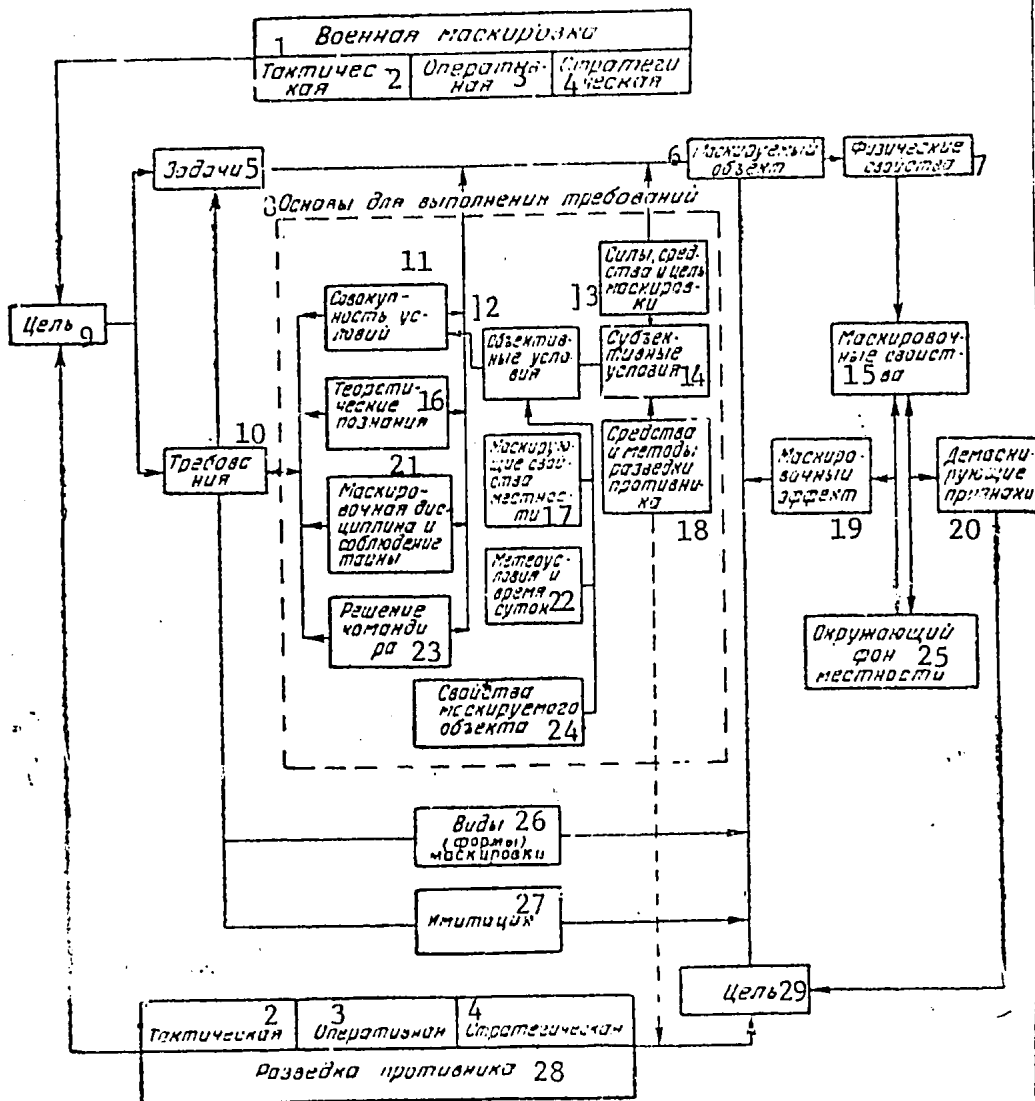


Figure 1. Structure of military camouflage

Key to figure: 1 -- military camouflage; 2 -- tactical; 3 -- operational; 4 -- strategic; 5 -- missions; 6 -- camouflaged object; 7 -- physical properties; 8 -- basis for meeting requirements; 9 -- aim; 10 -- demands; 11 -- aggregate of conditions; 12 -- objective conditions; 13 -- manpower, means and purpose of camouflage; 14 -- subjective conditions; 15 -- camouflage properties; 16 -- theoretical knowledge; 17 -- terrain concealment properties; 18 -- means and methods of enemy reconnaissance; 19 -- camouflage effect; 20 -- revealing signs; 21 -- camouflage discipline and observance of secrecy; 22 -- weather conditions and time of day or night;

(Key to Figure 1 on previous page, continued) 23 -- commander decision; 24 -- properties of installations to be camouflaged; 25 -- terrain background; 26 -- types (forms) of camouflage; 27 -- simulation; 28 -- hostile reconnaissance; 29 -- objective

Strategic camouflage as we define it constitutes a component of defense of home territory and includes camouflage of important installations from the moment of their construction. It is quite obvious that not all such camouflage measures can and should be carried out in peacetime.

The objective of camouflage depends on the nature of the proposed actions (operation) and their scale. In general form it will reduce to preventing the enemy from discovering our intentions, to deluding the enemy, and thus minimizing potential losses. This is achieved by concealing troops well, by reducing the degree of recognition and identification of targets (by altering their external configuration, color, etc), as well as by feigned actions (demonstration).

The following types of camouflage are differentiated on the basis of properties of camouflaged objects: concealment against direct observation -- optical, light, sound, heat, infrared, radio and radar (antiradar), concealment of operation of friendly reconnaissance and intelligence-gathering devices.

Concealment of troops and weapons from hostile ground and air observation is one of the principal duties of commanders of all echelons. Concealment can be total or partial, depending on the situation, terrain conditions, as well as available time. It is possible to reduce the revealing signs of troops and objects, if it is not possible to conceal them from hostile observation, by altering their external appearance. For example, a large camp or supply base can be camouflaged as a town, a tank farm can be camouflaged as apartment houses, while individual military installations can be camouflaged as rubble, smoldering ruins, etc. Important elements of a camouflage effort are the mounting of feigned assaults and the construction of dummy defensive fortifications (control posts). Such actions can be employed not only at the tactical echelon but particularly at the operational and strategic.

We have already noted the existence of a direct relationship between hostile reconnaissance and camouflage (it is indicated in Table 1). The task of camouflage is to conceal installations (targets) from hostile ground, air and space observation both in the area of combat operations and deep in rear areas. Any of the types of camouflage enumerated in the table presumes the fullest utilization of terrain, weather conditions and various means of concealing and camouflaging objects in order to reduce the

Виды маскировки 1	10		11		12		13		16		17		18		21		22		25		26	
	Возможности разведки противника		Наблюдение невооруженным глазом		Наблюдение в оптических приборах		Наблюдение с помощью инфракрасных приборов		Наблюдение с помощью тепловизионных устройств		Фоторазведка		Акустическая разведка		Средства тонирования		Разведка средствами связи		Телевизионная разведка		Радиотехническая разведка	
1																						
2																						
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Table 1. Interrelationship between camouflage and reconnaissance

Key to Table 1 on previous page: 1 -- types of camouflage; 2 -- optical camouflage; 3 -- light camouflage; 4 -- sound camouflage; 5 -- radar camouflage; 6 -- infrared camouflage; 7 -- heat camouflage; 8 -- radio camouflage; 9 -- camouflage of reconnaissance equipment operation; 10 -- capabilities of hostile reconnaissance; 11 -- naked-eye observation; 12 -- observation with optical instruments; 13 -- observation with the aid of infrared instruments; 14 -- active; 15 -- passive; 16 -- observation with the aid of television; 17 -- photoreconnaissance; 18 -- acoustic reconnaissance; 19 -- eavesdropping; 20 -- with sound ranging equipment; 21 -- topographic reconnaissance equipment; 22 -- reconnaissance with communications devices, 23 -- intercepting telephone traffic; 24 -- radio reconnaissance; 25 -- heat ranging; 26 -- radar reconnaissance

effectiveness of hostile reconnaissance. These objectives should also be promoted by comprehensive utilization of various types of camouflage, the interrelationship between which is shown in Figure 2.

We shall briefly describe the basic types of camouflage.

Optical and light camouflage is directed against hostile visual and photographic, including aerospace reconnaissance. It consists in utilizing the camouflaging and concealing properties of the terrain, adverse weather conditions, hours of darkness, observance of specific illumination conditions, giving objects camouflaging shapes, employment of camouflage nets and other devices, as well as the construction of dummy installations, including light-emitting.

Sound camouflage is directed against hostile acoustic reconnaissance and consists in reducing the noise level of operating vehicles and machinery (displacement of mechanized troops, the sound of submarine engines, etc) or in simulating noise produced by dummy installations. The varying nature of concealment properties of terrain, weather conditions and time of day can facilitate or complicate the conduct of sound camouflage. The sound of an operating vehicle motor, the clanking of tracks, and sounds produced by entrenching tools carry further at night and in fog.

Heat camouflage is directed against heat ranging instruments (indicators) and other enemy equipment capable of detecting thermal-contrast objects -- aircraft in the sky, ships in the water, missiles in flight, etc. Heat camouflage supplements optical and improves the overall concealment effect. This is achieved by employing a special heat-insulating screening layer to conceal particularly important installations, by the extensive utilization of heat-protective terrain properties, by employing screens, blinds, by constructing dummy installations with a heat source, as well as by utilizing water or air-cooling systems.

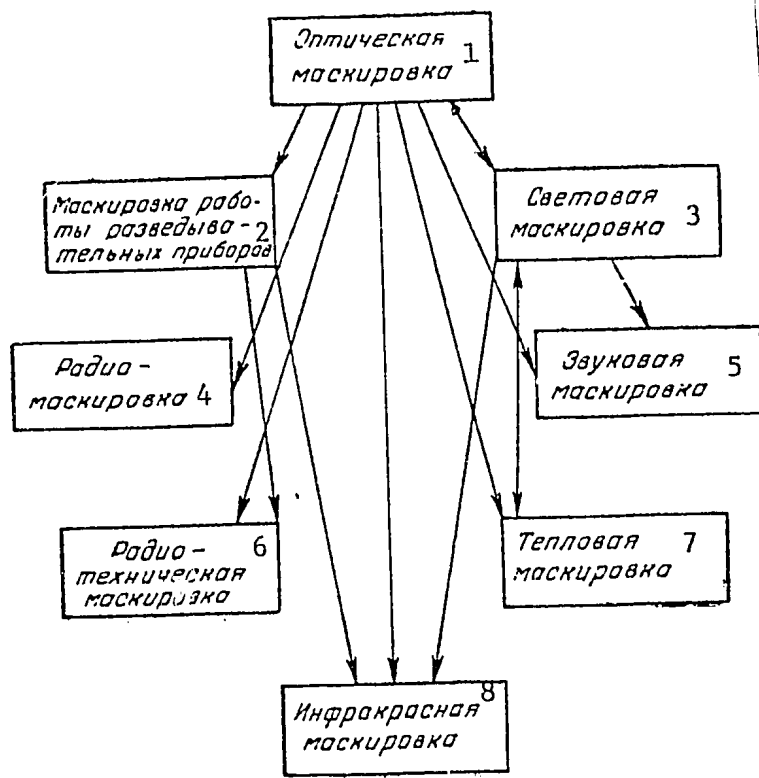


Figure 2. Interrelationship between types of camouflage

Key to figure: 1 -- optical camouflage; 2 -- camouflage of operation of reconnaissance and intelligence-gathering instruments; 3 -- light camouflage; 4 -- radio camouflage; 5 -- sound camouflage; 6 -- radar camouflage; 7 -- heat camouflage; 8 -- infrared camouflage

Infrared camouflage is directed against hostile visual reconnaissance employing active and passive infrared observation devices, as well as against infrared photography. This is achieved by reducing the infrared radiation given off by objects, by setting up additional radiation sources with the aim of altering the configuration of the camouflaged objects or installations, and by utilizing camouflage nets, blinds, and other optical camouflage devices. When employing active infrared observation devices one should periodically change their position; at halting points headlights should be switched off immediately, for technical reasons. The fact that visual reconnaissance comprises the basis of enemy reconnaissance on the battlefield substantially enhances the role of infrared camouflage and at the same time complicates it.

Radar and radio camouflage make the active operation of hostile radar (radio) reconnaissance difficult or impossible. It consists in establishing strict operating conditions, limiting the operation of radioelectronic equipment and eliminating revealing signs when utilizing them. Decoy radar installations are set up, and false information is fed to the enemy. One must bear in mind that identification of concealed or camouflaged installations by hostile radar reconnaissance means is made difficult by the simultaneous display on enemy radar screens of a large number of reflected signals, concealing the true position of the target being sought. When carrying out radar camouflage it is essential to make maximum use of terrain concealing and camouflaging features, carefully to construct troop combat positions, utilizing camouflage devices (camouflage nets, screens, etc), as well as the extensive employment of simulation of targets (setting up corner reflectors, etc). These measures can be particularly effective against enemy ground and air radar reconnaissance.

Table 2. Possibilities of Employing Camouflaging Techniques (Methods) with Various Types of Camouflage

Camouflage Techniques (Methods)	Types of camouflage							
	opti- cal	light	sound	radar	heat	infra- red	ra- dio	operation of friend- ly re- con- nais- sance de- vices
Disruptive Painting	x				x	x		
Camouflage Nets	x	x		x	x			
Decoys and Dummies	x			x				
Decoy Devices	x	x	x	x	x	x	x	x
Change in Telltale Indicators	x	x	x	x	x			x
Feigned Activity	x	x	x	x	x	x	x	x
Smoke	x	x			x			
Blackouts and Dimouts	x	x		x	x			
Utilization of Vegeta- tion (Flooding)	x			x	x	x		

Camouflage and concealment devices include the employment of camouflage painting, various types of camouflage nets and screens, smoke devices, blackouts, strictly-regulated use of communications equipment and observation devices, as well as utilization of terrain background (Table 2).

Selection and utilization of a given camouflaging or concealment device (method) is determined primarily by objective conditions. Of great importance thereby is enemy combat activity and utilized enemy reconnaissance means and methods. One must also bear in mind that one and the same method (means) of camouflage can sometimes be used to accomplish several tasks. For example, employment of various types of camouflage coatings (depending on the nature of the material employed) can protect an object not only from visual observation (photography) but also against being spotted by enemy radar. Nor should one ignore such an effective and inexpensive device as various types of smoke thermal generators and the employment of concealing smokes in general.

Comprehensive utilization of the above types and methods of camouflage will make it possible to achieve maximum effect and to compensate for the tell-tale indications inherent in various military installations. Camouflage should be total, continuous, active, and in keeping with the specific situation and circumstances. This demand acquires particular significance under conditions of enemy utilization of weapons of mass destruction. Increasing sophistication of reconnaissance methods and techniques, including space reconnaissance and utilization of high-accuracy intelligence-gathering devices, demand in turn a constant improvement in concealment and camouflage methods. Therefore modern military camouflage should be based on the latest scientific and technological advances.

THE SIGNIFICANCE OF THE CHEMICAL SITUATION AND ITS EVALUATION¹

Engr-Maj Kh. Gorges
(Abridged Translation by Col I. Andrushkevich)

The American imperialists assign an important role in their aggressive plans to the employment not only of nuclear weapons but also of other weapons of mass destruction as well -- chemical and biological weapons.

Chemical and biological agents have many common properties. These weapons are capable of affecting personnel over large areas, penetrating into various shelters and combat vehicles lacking a tight seal. Their range of effect is very broad -- from moderate effects leading to temporary loss of combat capability, to death. In the opinion of bourgeois military theorists this property of these weapons is unique in comparison with other weapons, particularly since materiel is not destroyed.

Chemical weapons, beginning in 1915, have gone through various stages of development. Each succeeding stage has been distinguished by an increase in the degree of toxicity of chemical warfare agents as well as by the employment of new natural poisons and various toxins.

Means of delivery have developed parallel with the development of chemical weapons.

Today the potential enemy possesses chemical warfare agents with a high degree of toxicity. And he may use these agents, in spite of various existing international treaties and bans. Therefore a correct evaluation of the chemical situation is one of the most important duties of every combined-arms headquarters. We should stress that one cannot equate the terms "radiation situation" and "chemical situation."

The chemical situation is a component part of the operational-tactical situation. It arises as a result of the enemy's employment of chemical agents and encompasses the entire aggregate of conditions which influence troop combat operations. We should emphasize that the chemical situation estimate should consist of two parts: a) theoretical assumptions and predictions (computations), pertaining to the possibility and probable results of the enemy's employment of various chemical agents; b) estimate of the specific tactical situations, weather conditions and nature of terrain.

Knowledge of the chemical situation makes it possible correctly to estimate troop combat capability and to determine the possibility of their further action, better to organize their individual and collective protection, and promptly to conduct warning and preventive measures.

Determination of the specific results of the enemy's employment of chemical agents requires a rather long period of time. Therefore a number of measures to neutralize the consequences of a hostile chemical attack and for protection of friendly troops should be organized initially on the basis of preliminary calculations, in order to refine them subsequently, after details have been obtained.

In estimating the chemical situation it is essential: to determine the dimensions and degree of contamination of areas of terrain, structures and objects by chemical agents; to determine the direction of spread and height of the base of the chemical cloud; to estimate the potential effect and magnitude of irreplaceable losses in personnel subjected to attack.

At the same time it is essential to determine the type of chemical agent employed by the enemy and to determine the damage it has caused, in order to neutralize the consequences of the chemical attack.

The content of the various chemical situation evaluation elements will frequently depend on many factors proceeding from the specific situation. They include, in particular:

type, depth, place and time of the attack, degree of surprise, chemical agent employed, method of delivery, character of affected objects;

position, mission and nature of actions of friendly troops, degree of protection of personnel, total time in contaminated areas;

weather conditions and nature of terrain: ground level wind direction and velocity, temperature and vertical stability of air mass, season, time of day or night, terrain configuration and vegetation, interaction of meteorological and topographic conditions.

Determination of type of chemical agents employed by the enemy will make it possible correctly to estimate the results of its effects and to choose the most effective methods of protection of personnel. Knowledge of means of delivery of the chemical agent will make it possible more precisely to determine the boundaries (configuration) of contaminated terrain.

Persistence of chemical agents is determined to a substantial degree by weather conditions; this applies in particular to the rate of spread, since the latter is determined by wind velocity and ambient air temperature.

Finally, as has been emphasized, any estimate of the chemical situation will be meaningful only when it takes into account specific local conditions.

Commanders and staffs of all echelons should constantly improve methods of rapid and error-free chemical situation estimate. In the interest of prompt and effective protection of troops against chemical warfare agents, one should follow a specific sequence and establish optimal scope of chemical situation estimates. In any case the principal items should be protection of troops against the effects of chemical agents, since the protective gear at their disposal makes it possible to cope with this problem successfully. A prerequisite for purposeful troop protection is comprehensive evaluation of the anticipated effectiveness of an enemy chemical attack.

In conclusion we shall emphasize that one should not underrate chemical weapons as a variety of mass destruction weapons, which the enemy may employ in a future war. The imperialists' intentions of using these weapons compel us to address in all seriousness problems of protection against chemical warfare agents.

FOOTNOTE

1. Militärwesen, No 7, 1970.

RADIO ELECTRONIC EQUIPMENT IN THEATERS OF MILITARY OPERATIONS*

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The equipping of armed forces with modern weapons, particularly missile weapons, jet-propelled aircraft and nuclear-powered missile-armed submarines, has dictated the necessity of preparing theaters and zones of military operations for the conduct of warfare and their equipping in advance with electronic systems and devices. The imperialist member nations of the NATO aggressive bloc, particularly the United States, Great Britain, and West Germany, are applying the greatest efforts in this area.

In the opinion of military leaders in these countries, prior electronic equipping of these theaters will make it possible to accomplish the following strategic missions: to mount surprise attacks on major enemy targets with maximum involvement of all available weapons, including nuclear arms; to conduct dynamic offensive and defensive operations on a wide front and to great depth, employing the men and equipment of formations and large units of all services. In addition, radio electronic systems and devices help secure coordination of ground troops with the other services, as well as control of formations and large units and their effective utilization. In peacetime they ensure the conduct of continuous intelligence gathering, operational training of staffs and combat training of troops, constituting at the same time an important element in maintaining a high degree of armed forces combat readiness.

The principal radio electronic systems and devices with which theaters and zones of military operations are equipped, depending on their intended use, can be arbitrarily divided into the following groups: electronic intelligence; control of forces and their nuclear weapons; control of anti-aircraft, ABM and space defense forces and weapons; radio navigation.

Electronic intelligence systems include radio, television, radar and infrared (thermal) reconnaissance. Under present-day conditions electronic intelligence in the armies of the imperialist states has become one of the principal types of strategic and operational intelligence. Its conduct, in addition to ground equipment, involves the extensive utilization of gear carried on board aircraft, warships and artificial earth satellites. Equipment for the receipt and processing of intelligence data also is included in the arsenal of radio electronic equipment of theaters of military operations.

Ground radio reconnaissance is conducted with the aid of radio intercept networks (stations) and direction finder stations sited in theaters of

*From materials published in the foreign press.

military operations, maintaining continuous watch to intercept propagated signals from enemy radio electronic equipment. According to figures published in the press, the facilities of the National Security Agency alone, these electronic "eyes" and "ears" of the United States, in a 24-hour period intercept and DF several million words in 60 languages in all theaters.

Deployed in every theater, electronic intercept stations make it possible to intelligence-monitor all frequency bands, from the centimeter band to the very low frequency band, and at ranges up to several thousand kilometers.

As a rule the intelligence effort conducted with stationary equipment is supplemented by mobile reconnaissance subunits. According to the West German magazine Stern, "dry-land evesdropping" has been organized to beef up West German electronic intelligence operations in the Western Theater, with the aid of motorized Bundeswehr radio and electronic reconnaissance subunits ranging along West Germany's border with the GDR and Czechoslovakia.

Air, sea and space radio and electronic surveillance is conducted with the aid of strategic, tactical and embarked aircraft, naval ships and artificial earth satellites carrying special intelligence gear on board.

High-altitude reconnaissance flights as well as sea observation capabilities make it possible substantially to increase the range of intelligence coverage.

According to the procedure established by military leaders in the United States and other imperialist nations, electronic reconnaissance aircraft fly regular missions along the borders of the socialist nations and over international waters adjoining their territory, while specially-equipped ships maintain a constant intelligence watch. For example, West Germany maintains two so-called "research vessels" in the Baltic for this purpose, while the United States operates Liberty and Pueblo class naval reconnaissance vessels and specially equipped submarines in the Mediterranean and other seas.

Artificial earth satellites equipped with special radio electronic gear are employed to observe the entire depth of the theater or several theaters simultaneously. The Americans, for example, have built and are operating Ferret satellites, which gather intelligence on radar and radio stations. Satellites launched under the 770 program carry electronic gear to obtain radar maps of terrain. Midas satellites are designed to detect the firing of ICBMs from the infrared radiation of the rocket engine exhaust. It is reported that they can also detect on the basis of

thermal radiation such objects as tanks and trucks. Versatile surveillance satellites carrying electronic and photoreconnaissance gear have been developed under Project 949.

Intercepted signals emitted by radio electronic devices as well as electrical signals into which photographic images are converted are recorded on tape and are transmitted on telemetric channels to ground stations.¹

Satellite communications centers and stations occupy an important place in present-day stationary equipment in theaters of military operations. The Americans have set up such centers and stations in Northern England (Cumberland), in Alaska (Kodiak), in Japan, and in the United States (Hawaii, California, New Hampshire). Figure 1 contains a diagram showing the location of radio electronic intelligence facilities in a theater of military operations.

In the near future plans call for the use of orbital laboratories with alternating crews for the conduct of surveillance from space. In 1973, for example, the United States plans to launch an "orbital workshop" with three astronaut crews on 28 and 56-day missions.

Thus theater electronic intelligence means make it possible to acquire a large volume of information on the enemy simultaneously from a large area, in adverse weather, day and night. The intelligence effort is conducted at great depth, not only in wartime but in peacetime as well.

Radio electronic control systems for military forces and their nuclear weapons are designed to secure troop operations and the employment of weapons during war. In peacetime these systems assist in the daily routine activities of all large units and units within a given theater, particularly nuclear weapons, nuclear weapons alert and nuclear weapons continuous combat readiness.

A network of command posts is set up for control of military forces within a theater; these are stationary structures sited as a rule underground and well protected.

These stationary command posts are established primarily for major headquarters. In the Central European Theater, for example, all principal NATO headquarters, down to army groups inclusively, have such command posts.

An extensive stationary communications system is set up for the control of ground troops in a theater, particularly in the administrative (rear) zone. It is based on main-line and branch radio relay and tropospheric multi-channel links and high-capacity underground cable communications lines.

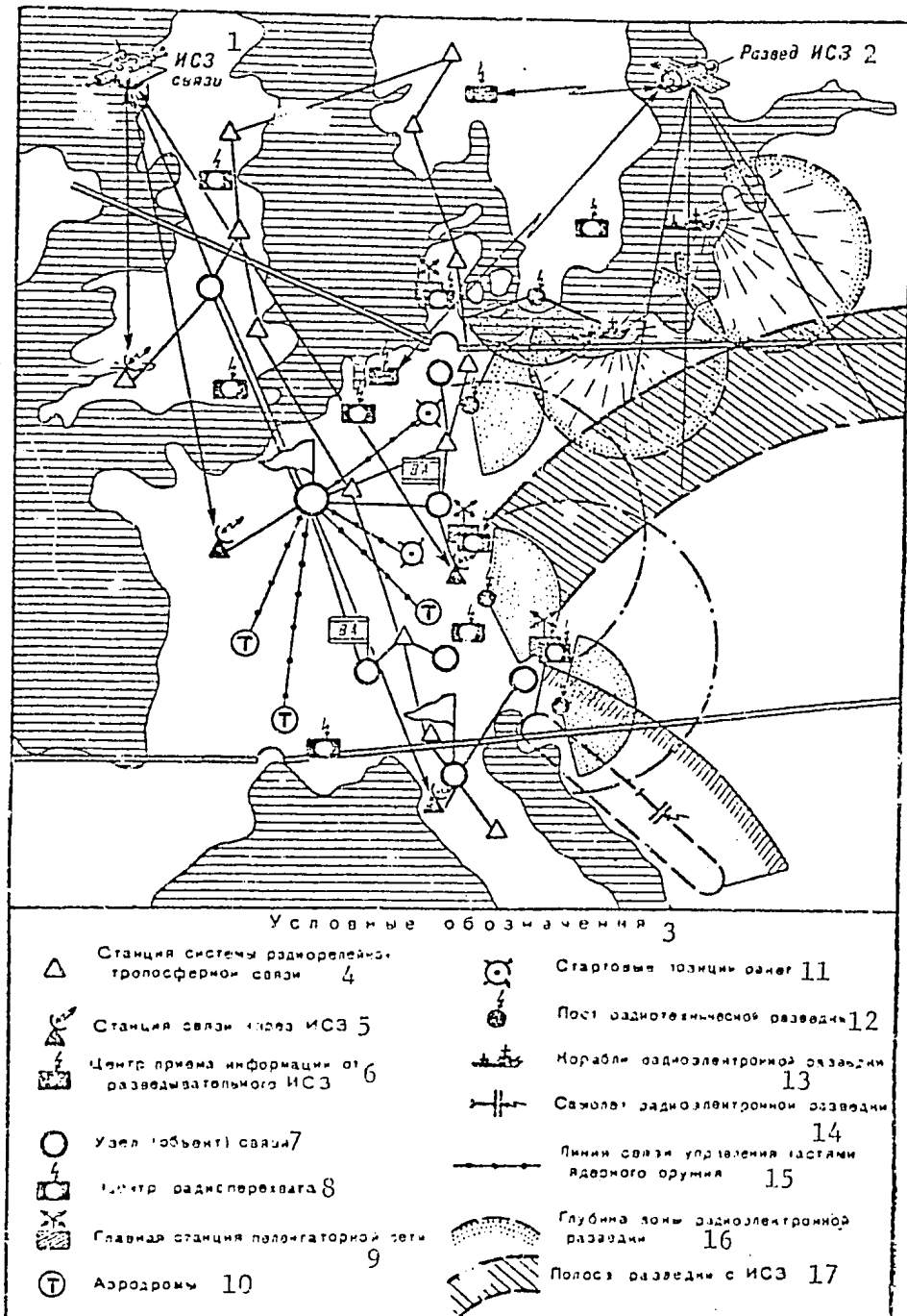


Figure 1. Diagram of location of radio electronic surveillance and communications facilities in a theater of military operations

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Key to Figure 1 on preceding page: 1 -- communications satellite; 2 -- surveillance satellite; 3 -- legend; 4 -- tropospheric radio relay communications system station; 5 -- satellite communications station; 6 -- reconnaissance satellite ground receiving station; 7 -- communications center (facility); 8 -- radio intercept center; 9 -- DF network principal station; 10 -- airfields; 11 -- missile sites; 12 -- electronic reconnaissance station; 13 -- electronic intelligence ship; 14 -- electronic surveillance aircraft; 15 -- nuclear weapons control communications line; 16 -- depth of radio electronic surveillance zone; 17 -- satellite surveillance zone

Radio links formed by short-wave radio sets serve as redundant means of communication in such a system. Territorial communications systems and equipment are most effectively utilized in such a system. In addition, civilian communications lines in the theater are constructed with the thought to their potential maximum utilization for military purposes. For example, the project for laying a 640-channel submarine cable between Italy and Spain calls for redundancy of terminal equipment including sources of electric power, and the capability of automatic switching (in case of necessity) to backup equipment.²

Stationary tropospheric radio facilities are extensively employed in the theater troop control systems; these facilities provide communications with a range of 200-400 km without relay. They can be used to establish high-capacity multichannel links. The Central European Theater, for example, contains the Ace High NATO joint forces multichannel communications system, a complex network consisting of radio relay and tropospheric communications stations. It begins in Norway, covers all European NATO member nations, and terminates in Turkey. The total length of its links is 15,000 km. The equipment of the tropospheric part of the system provides 36 telephone channels, each of which can be utilized for several dozen telegraph (teletype) communications channels. Radio relay links are extensively employed for incorporation of Ace High into the European civilian and military systems.

Radio communications in the shortwave band and underground cable lines in this system are backup elements. According to statements by experts, Ace High has now become the main NATO military communications system in Europe.³

In 1966 the 486L MEDCOM tropospheric communications network was put into operation in the European Theater, linking Spain, Italy, Greece, the island of Crete, and Turkey. This system extends a total of 9700 km.⁴

The stationary theater communications system is linked with army mobile systems, which enables high-level command echelons when necessary to transmit information to large units and units, bypassing intermediate levels.

We should emphasize that major headquarters and command posts in the theater are linked by communications channels (operating on various principles): underground cable, multichannel radio relay, tropospheric links, etc. This increases the system's traffic capacity and improves control stability against hostile fire and jamming efforts.

Mobile command posts can be employed in the theater in addition to the system of stationary command posts. For example, the U.S. and NATO army commands are studying the possibilities of establishing and utilizing airborne command posts. It is believed that military transport aircraft (such as the C-131), specially equipped with communications gear, situation display and information processing equipment, will be little vulnerable to attack and will provide stable and reliable control of subordinate troops and weapons under nuclear warfare conditions. The effective range of airborne radio communications equipment is usually greater than that of ground facilities.⁵

U.S. and NATO military leaders are exerting a considerable effort to achieve further development and improvement of communications facilities. Much has been done in recent years to establish global systems, which will make it possible to support the operations of forces both within a single theater of military operations and in several theaters simultaneously. The following demands are imposed on such communications systems: a high degree of reliability and stability under nuclear warfare conditions, high transmitting capacity, redundancy, interconnection of parallel elements.⁶

For example, the Autodyne global automated system being developed by the United States will link more than 2000 military facilities located on the North American continent and elsewhere. Voice and digital information can be transmitted on its wideband channels. It is planned to deploy 93 communications centers of this system, including 65 on U.S. territory, by 1972.⁷

Another system, Autovon, also consists of switching centers and multi-channel communications links. Nineteen of 20 switching centers, including 12 outside the United States, went on line in 1968.⁸

Information is transmitted on Autodyne system channels in the form of digital groups. In the opinion of U.S. experts, the absence of inter-channel interference during the transmission of information, low cost,

secrecy potential and independence of quality of transmission on length of lines add up to making digital communications close to the ideal type. It is also planned to use digital communications to transmit television images of reconnaissance photographs, maps, diagrams and other documents by narrow-band telephone channels. For this purpose the United States is developing a special Videocoder system, which will utilize regular radio-telephone or satellite communications links.

In the more distant future it is planned to establish a common military automatic communications system from the Autodyne and Autovon systems.

The employment of satellite communications systems being developed for military use is considered particularly promising. In the opinion of experts, as more and more satellite communications systems are put into operation, there will be less need for communications facilities sited on foreign territory, there will be less possibility for the enemy to establish a fix on radio transmitters and consequently to discover various elements of control organization. A characteristic feature of such systems is a high transmission capacity and excellent operational reliability.

One U.S. satellite military communications system calls for the launching into orbit of 19 satellites and the deployment of 11 ground stations (in the United States, on Guam and Okinawa, in South Vietnam, in West Germany, etc).

The Americans are working on several projects for a similar commercial global communications system. According to statements made by U.S. military leaders, these systems can also be used for military purposes.⁹

By mid-1968 the operating U.S. commercial satellite communications system totaled 17 satellites and 28 ground stations. The system was fully in operation by 1969. It was planned to build 12 ground stations in NATO countries, with stations in West Germany, Italy, Turkey and the Netherlands to go into operation in 1970.¹⁰

Radio electronic devices, some of which comprise theater stationary radio electronic equipment, are extensively utilized to control forces and offensive nuclear weapons.

The theater nuclear forces control system is developed and constructed taking into consideration the conduct of combat operations under conditions of employment of nuclear weapons. It is therefore based on radio electronic equipment which is minimally subjected to the destructive effect of nuclear weapons. For example, the 487L control system being built by the Americans in the continental United States and designed to provide strategic air-force communications following an enemy nuclear attack, employs powerful stationary low frequency and very low frequency transmitters with antennas 367 meters in height.¹¹

Thus the theater force control system is based on command posts and their radio electronic equipment, particularly wire (cable), microwave relay and tropospheric communications facilities. Communications systems deployed in the Central European Theater have the capability of rapid transmission of engagement orders and signals, including orders to employ offensive nuclear weapons, to large units of the services.

Radio-electronic theater air defense control systems include a network of detection, warning and guidance centers and sites equipped with stationary or mobile radars, electronic computers and communications gear. Air situation information (after site processing) is transmitted to air defense sector centers, where the decision is made to scramble fighters or fire anti-aircraft missiles. Radar sites may include equipment which automatically takes data from radarscopes, transmits information to command posts and centers for subsequent computer processes. Transmission of control and target designation commands to active air defense means can also be effected automatically. A 412L automated system of this type is deployed in the Central European Theater. It links seven air defense control centers and command posts.¹² Analogous systems are being built by NATO member nations in other parts of the European Theater.

In recent years work has been under way to set up a NATO common automated air defense system under the acronym NADGE. During the course of the project the opinion was expressed that no one country is capable of handling independently all the tasks of modern air defense. U.S. experts explain that this is dictated by the necessity of daily performance, even in peacetime, of an enormous volume of effort. For example, NORAD, the North American Air Defense Command, tracks more than 600 satellites and other artificial objects in space which daily circle the earth in various orbits, as well as daily identifying more than 200,000 aircraft.¹³

The NADGE system will consist of 80 radar stations of various types, automated data processing centers and communications lines. Some of the radars are designed to detect targets at long range (300 km and more). They include two extremely high-power stations in Norway and Turkey. According to the designers of this system, it will take less than 1 minute from target radar detection to output of identifying data. The NADGE system should be fully operational by 1971-1972. Its elements in Belgium, the Netherlands, and West Germany were deployed in 1969.¹⁴

Devices to solve problems connected with ABM and antispace weapon defense comprise an important part of theater radio-electronic equipment to be developed in recent years. These facilities include powerful stationary missile and space objects detection and tracking radar stations. The BMEWS ICBM radar early warning system has been in operation since 1964. It consists of three groups of AN/FPS-49 and AN/FPS-50 powerful stationary

extremely long-range detection radar stations; this system has a missile detection range of 4500-5000 km. BMEWS sites are located in Fylingdales Moor (England), Thule (Greenland), and Clear (Alaska).

Beginning in the sixties, the United States has been working intensively on the development of so-called below-the-horizon radar. In 1970, for example, the AN/FPS-95 high-frequency radar with backscattering went into operation; this radar is designed for extremely long-range missile detection and tracking. In 1967 the U.S. put into operation a below-the-horizon detection radar which detected targets on the basis of distortion of a signal transmitted from one point on the earth's surface and received at another.

As we can see, the operation of an air defense system, and particularly the collection of data on the air and space situation, as well as direct control of air defense active forces and weapons, is based on radio electronic equipment. The most advanced radio electronic gear coupled with high-speed computers is used in air defense systems.

Radio navigation systems are an important component of the radio electronic facilities in a theater of military operations. These systems are used for aircraft and ship navigation. The most widely-used radio navigation systems are Loran, Decca, and Tacan, which are employed in both stationary and mobile versions. Usually several radio navigation system groups of various types, each consisting of three to four stations, are deployed in a theater of military operations. It is known, for example, that several groups of Loran-C are deployed in the Central European Theater. In 1968 16 Decca radio navigation stations went into operation in Norway; one of the purposes of this system is to assist in low-altitude missions. In 1969 construction was reported on a group of three radio navigation stations in Sweden.¹⁶ In a theater of military operations radio navigation system stations are sited in order that their effective zones of operation cover the theater, and particularly probable areas of combat operations.

We should stress in particular that in recent years radio navigation methods have been adopted by ground forces as well. Radio navigation systems are used to obtain position fixes for troops and weapons, particularly missile, artillery and tank units and subunits, on terrain with few landmarks and reference points, during hours of darkness and in adverse weather.

The Loran-A system, developed during World War II, was used only for aircraft and surface ship navigation, and Loran-C, developed in the fifties, was designed primarily for missile-carrying submarines, while the Loran-D system, which was developed in the sixties, is versatile in nature and designed for joint tactical utilization by naval forces, air and ground forces. A Loran-D network, for example, contains three ground-base low

frequency transmitters. This system has been tested and used by the Americans in Vietnam.

The Tacan short-range radio navigation system provides navigation aids for tactical aircraft in a theater of military operations, including departure, en-route navigation, approach to target or reconnaissance area, return to airfield, and landing approach. The system includes a network of ground beacons and airborne receiving and display equipment. Aircraft interrogation results in automatic determination and display of the aircraft's bearing to or from the interrogated beacon, plus distance to station.

Tacan is extensively used in the Western Theater of Military Operations. Approximately 170 beacons of this system have been deployed in Europe.

Figure 2 contains a diagram of the location of air defense radio electronic systems and radio navigation facilities in the theater.

The operating zones of Loran and Decca radionavigation systems cover areas of a theater. Preparing to conduct combat operations simultaneously in several theaters, imperialist military leaders are endeavoring to have at their disposal global radio navigation facilities with an effective range of several thousand kilometers. The Omega radio navigation system, which encompasses the entire earth, constitutes such a global system. The Americans have been setting it up since 1957; it is designed primarily for controlling strategic offensive weapons -- nuclear-powered missile-carrying submarines, carrier task forces and strategic bombers. The system operates in the very low frequency band (10-14 kHz) and will consist of 8 powerful transmitters. At the present time only four stations are in operation (Hawaiian Islands, Norway, Spain, New York). In 1966 the Omega system was tested on civil airways extending 18,000 km. Future plans call for the establishment of four more stations in Japan or the Philippines, Argentina, New Zealand or Australia, and on Madagascar. The Omega system should be fully operational in 1972.¹⁷ Development and deployment of the Omega global radio navigation system graphically demonstrate the aggressive nature of U.S. policy.

Theater stationary radio electronic facilities include radio electronic communications and air navigation facilities located at airfields -- ILS, VOR, compass locaters, etc. In the Central European Theater, for example, aircraft nav aids include omnidirectional VOR beacons, which indicate an aircraft's bearing to or from the station, as well as DME facilities, which measure range from station to aircraft.¹⁸

In recent years special systems for air traffic control in a theater of military operations have been developed in connection with the increased use of jet aircraft in highly-developed nations; these systems are designed for airways surveillance and for air traffic safety in control zones

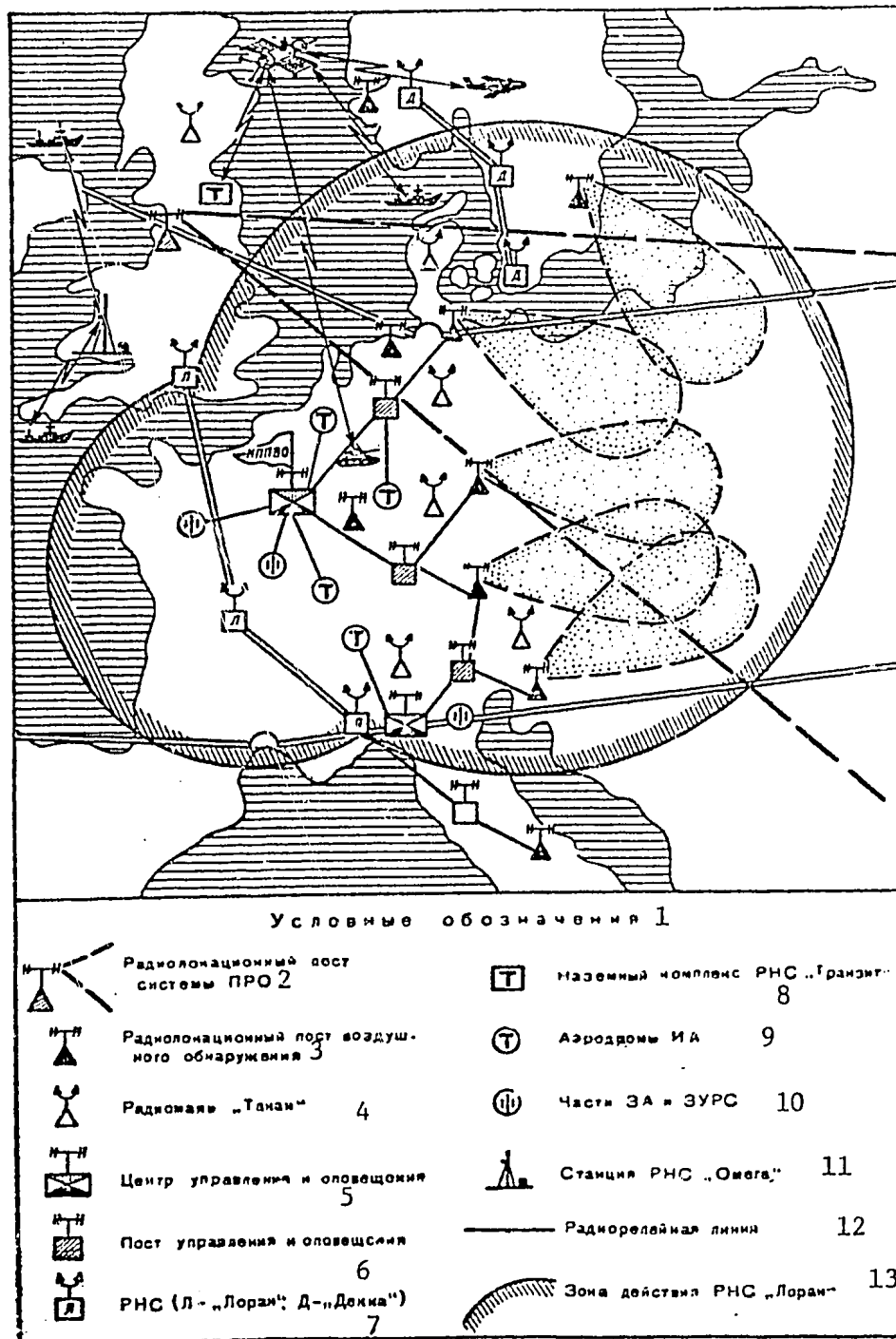


Figure 2. Diagram of location of radio electronic air defense control and navigation facilities in theater of military operations

Key to Figure 2 on preceding page: 1 -- legend; 2 -- missile defense system radar site; 3 -- air detection radar site; 4 -- Tacan beacon; 5 -- air defense warning and control center; 6 -- air defense warning and command post; 7 -- radio navigation system (Л -- Loran; Д -- Decca); 8 -- Transit ground radio navigation system complex; 9 -- fighter airfields; 10 -- antiaircraft artillery and missile units; 11 -- Omega radio navigation system station; 12 -- radio relay link; 13 -- effective zone of Loran radio navigation system

and terminal areas. One of the main demands made of such systems is the capability of controlling both civilian and military traffic under heavy-traffic conditions. One example of such a system is the Mediator system, installed in England. It is designed for air traffic control of military and civilian aircraft at altitudes of 1500-2100 m and above within British airspace. The system consists of a network of radar stations, computer complexes and communications facilities.

Theater radio electronic equipment also includes radiogeodetic systems, designed to determine with a high degree of accuracy the coordinates of fixed topographic objects. For example, the American Shiran radio geodetic system (an improved version of Shoran) can determine range to targets up to a distance of 1500 km with an error not exceeding 3 m. The system includes four transponder-equipped ground sites located at base stations, plus airborne gear.

U.S. military experts place great stock in satellite radio navigation systems (for example, Transit), consisting of several satellites, ground tracking stations, a data processing center, accurate time stations, as well as on-board receiving-display equipment and specialized computers.

Thus military leaders in the imperialist nations attach great importance to equipping theaters of military operations with radio electronic facilities.

On the basis of fundamental development trends, following are the most promising areas in radio electronic facilities for theaters of military operations:

adoption of radio electronic surveillance-reconnaissance systems and facilities with improved performance capabilities;

expansion of the network of multichannel tropospheric and radio relay links, as well as the establishment of satellite communications systems;

establishment of communications systems designed for the accomplishment of special missions (support of operations by nuclear forces, tactical air communications, air defense communications system, etc);

ground forces adoption of radio navigation systems;

improved reliability and invulnerability of radio electronic systems and facilities.

The fact that stationary radio electronic systems and facilities supporting armed forces combat operations in theaters and zones of military operations are under present-day conditions a mandatory and important component of operational facilities in a theater of military operations as a whole faces Soviet military investigators with the task of continuously monitoring the state of radio electronic facilities in theaters of military operations, taking into full account the development and capabilities of these facilities.

FOOTNOTES

1. U.S. News and World Report, 24 September 1969, pp 32-33.
2. Engineer, No 5890, 1968, page 890.
3. NATO's Fifteen Nations, October-November, 1968, pp 58-63.
4. Signal, No 3, 1966, page 62.
5. Interavia Air Letter, 16 June 1970.
6. Armed Forces Management, No 10, 1969.
7. Infantry, November-December 1968, page 57.
8. Product Engineering, No 5, 1967, page 43.
9. Electronics News, No 686, 1968, page 31.
10. Electronics Weekly, No 431, 1968, pp 1, 36.
11. Aviation Week, No 6, 1967, page 27.
12. Interavia Air Letter, June 1970, pp A-E.

13. Plain Dealer, June 1969, page 42.
14. Revue Internationale de Defense, No 4, 1969.
15. Teknisk Tidskrift, No 26, 1968, page 5.
16. Svenska Sjöfartstidning, No 6, 1969, page 6.
17. Undersea Technology, No 12, 1968, page 40.
18. Interavia, No 2, 1969, pp 196-199.

V. I. LENIN AND SOVIET MILITARY SCIENCE

Col Ye. Rybkin, Doctor of Philosophical Science, Professor

Another very interesting and solid study has been added to our military literature, a study dedicated to Lenin's military theory legacy and his practical activities in the area of military affairs -- Lenin and Soviet Military Science by N. N. Azovtsev.*

This study encompasses a broad range of problems of the Leninist military heritage, from the ideological-theoretical foundations of Soviet military science to problems of tactics and personnel indoctrination. Of considerable interest is a special survey section, a systematized list of primary sources and historiography on the military activities of V. I. Lenin.

One virtue of this study is that the author innovatively utilizes the Leninist military theory legacy to interpret and comprehend today's problems. For example, discussing in detail Lenin's development of Marxist doctrine on war and army and his solution of key problems of military science, the author consistently links them with its contemporary level, with those problems which concern us today.

Also remarkable is the fact that the author, who has thoroughly studied Lenin's ideas, advances on the basis of these ideas new theses pertaining to contemporary problems of military science. Although we cannot agree with some of these theses, this fact does not minimize the importance of his innovative approach to the subject.

Discussing the principal aim of the study, Azovtsev writes that, relying on the works of Lenin, numerous party documents, as well as published monographs, he sets for himself the task of "showing Lenin as an eminent military theorist and practitioner and ingenious strategist, under whose guidance an army of a new type was established and victory won over foreign and domestic counterrevolutionary forces" (page 10). The author endeavors to interpret these problems in a comprehensive manner, to comprehend Leninist ideas as an integral system of views reflecting the conditions of the first years of genesis and development of Soviet military science, and at the same time to show the close link between Lenin's ideas and today's military science.

The author makes extensive use not only of Lenin's writings but also archival materials, recollections of Lenin by his contemporaries, and a number of historical works.

* N. N. Azovtsev: Lenin i sovetskaya voyennaya nauka, Moscow, Izd-vo Nauka, 1971, 360 pages.

Chapter One examines the Leninist ideological-theoretical principles of Soviet military science. The author emphasizes that Soviet military science arose not on empty ground but rather on soil prepared by the past development of military affairs. But it was only thanks to Marxism that it acquired a scientific philosophic basis.

Linked to the name of Lenin is a new stage in Marxist military-theoretical thought -- the birth and development of Soviet military science and art of war.

Discussing the Leninist methodological principles of Soviet military science, the author focuses great attention on the principle of historicism and the utilization of the lessons of history for the present day. Of major importance in this respect is Lenin's thesis that "one cannot learn to solve one's problems with new techniques today if yesterday's lessons have not opened our eyes to the erroneous nature of the old techniques" (Poln. Sobr. Soch. [Complete Works], Volume 44, page 205). At the same time he emphasizes Lenin's statement on the inadmissibility of overrating the experience of the past. This tenet is acquiring particular significance today, when in the course of the scientific and technological revolution there is occurring a process of profound changes in all areas of military affairs.

The author presents Lenin's views on the specific features of war and its peculiar features as a form of social struggle; he presents Lenin's appraisal of the relationship between the development of war and politics as well as the correlation of forces of the belligerents. Unfortunately this relationship, which is a fundamental law of war, is insufficiently revealed.

In our opinion the author intelligently systematizes Lenin's ideas on the structure of Soviet military science and demonstrates that military science is an integral system of knowledge, encompassing general theory of military science (which studies the factors, laws and principles of warfare), theory of the art of warfare, and theory of organization and training of armies. We cannot agree, however, with the author's statement that all military historical science comes within the framework of military science. It, as is well known, is a social science, a part of general history. Only such elements as history of the art of warfare, weapons and army organizational development constitute simultaneously to a certain degree elements of military science.

The author has not fully examined the contrast between Soviet and bourgeois military science. To those elements which characterize this opposition (page 35), one should add: while Soviet science is distinguished by an organic coalescence of scientific methodology and science, in bourgeois

military science one notes a deep split between military science and philosophic methodology. This is dictated by the fact that bourgeois general methodology is in substantial conflict with the interests of the art of war.

Lenin attached enormous importance to science as one of the factors of victory in war. It is a well-known fact that today the role of science in warfare has grown immeasurably in comparison with the Civil War. On this basis we today specify scientific potential as a particular factor in warfare. The author examines it within the framework of economic potential. We feel that such an interpretation of this problem fails to reflect contemporary views on the role of science.

A substantial position in the study is occupied by discussion of Lenin's ideas on morale and political factors. The author is correct in stressing Lenin's idea about the unity and at the same time the difference of these factors. Politics is the guiding, organizing force of war, the activities of the governing party, the government; the morale factor is the state of morale of the masses, their willingness or unwillingness to support the war effort. Political leadership should in no case be equated with the morale factor, although it does play a central role in the formation of the latter.

Chapter Two deals with Lenin's substantiation of the principles of building an army of the new type. The author presents the principal theoretical tenets of Marx and Engels on the necessity for armed defense of the conquests of the proletarian revolution and the nature of its military organization; he also discusses Lenin's contribution toward the subsequent elaboration of these problems.

It is noted that the basis of military organizational development is defined by the nature of the social system, by the character of the state. Lenin focused particular attention on the relationship between this organizational development and the processes taking place within the country as well as various aspects of societal affairs. It is precisely from this aspect that the author examines the economic, sociopolitical, ideological-theoretical, and scientific-technical foundations of Soviet military organizational development. The author thoroughly discusses Lenin's assessments and the characteristics of these principles, and draws conclusions for the present day.

Among economic and sociopolitical factors, the author analyzes such factors as the socialist mode of production, the socialist societal and governmental system, the alliance between the worker class and the peasantry, the morale-political unity of our society, guidance by the Communist Party, and unity of army and people.

Marxism-Leninism and its doctrine on war and army, communist consciousness, party-mindedness, Soviet patriotism and proletarian internationalism constitute the ideological-theoretical foundation of Soviet military organizational development.

Examining the principles of military organizational development, the author presents what in our opinion is a good classification of Lenin's guideline theses in this area: "The nature of Lenin's military activities and his emphasis on solving specific military problems at various stages in history make it possible in the first place to specify those principles which directly pertain to creation of the military organization of the proletariat and its further organizational development, in the second place, those principles connected with armed forces combat and political training and, in the third place, the principles pertaining to leadership and guidance of the armed forces" (page 75).

In characterizing this part of the study, we should like to note the extremely felicitous combination of theoretical and historical analysis, the intelligent selection of Leninist theses from his many statements on this matter. We feel that the author has sufficiently thoroughly discussed Lenin's theses on the relationship between forms of organization and forms of combat, on one-man command and centralism, on high degree of armed forces vigilance and combat readiness, on the role of party political effort in the army, on military specialists, etc. We should like to draw the reader's attention in particular to Lenin's statements on the qualities of the leader (see pp 104-106).

Chapter Three examines problems of Leninist direction of a war in defense of the socialist homeland. Here the author limits himself, however, to problems of direction of armed combat, military operations, and analysis solely of military forms and means of combat proper. An analysis of the economic and moral factors in war would be interesting from the standpoint of modern military science, if only as regards their direct link with military operations (for example, an assessment of the interrelationship between strategy and economics, strategy and the morale-political factor); Lenin offers very interesting material on this matter. But the author discusses these questions only indirectly, in passing, in conjunction with other problems. We cannot strongly criticize the author in this regard, however, for statement of the problem in this context would greatly expand the scope of the subject matter.

Selecting as a subject for investigation Lenin's activities as a strategist, the author primarily examines those matters connected with this aspect of our leader's activities. He devotes considerably less attention to a discussion of the particular problems with which the great revolutionary leader dealt. The author was undoubtedly correct in this.

In this chapter the reader's attention is drawn by an examination of Lenin's theoretical tenets and practical activities connected with ensuring unity of military and political leadership, establishment of appropriate government agencies, and development of the ability in military cadres to wage war in a revolutionary manner.

The author cites a very instructive statement by S. S. Kamenev: "I affirm with total conviction," he wrote, "that I, as a participant in the imperialist war, drew no conclusion on the most fundamental question of the war. I overlooked the fact that the terms to engage in war and to fight are not identical. It seems that one can simply engage in war in a formalistic manner... and one can genuinely fight to win -- this is what Vladimir Il'ich's guidance taught me" (pp 125-126).

On this chapter as well, however, we must make a few critical comments. On page 111 the author states that "the socialist mode of production and its socialist economy served as the economic foundation for direction of the armed struggle..." As we know, however, the socialist mode of production was at the time only in an incipient stage of development. The economy of the transition period was characterized by the coexistence of socialist and nonsocialist sectors. This placed a profound imprint on the military capabilities of the state, substantially diminishing them.

In Chapter Four the author examines a theoretical question -- V. I. Lenin on the forms and means of armed struggle. Of greatest interest are those pages on which the author discusses Lenin's views on the correlation between offense and defense, on the connection between forms of struggle and its spatial scope, on partisan struggle, on the forms and methods of training and mobilizing reserves, plus many others.

Considerable attention in this chapter is devoted to Lenin's ideas of activeness, decisiveness, boldness, organization, the element of surprise, massing of forces and careful preparation of operations. These ideas form the basis of the leading principles of the Soviet art of war.

Discussing Lenin's elaboration of the theory of waging partisan warfare, the author notes that the ingenious strategists of the proletarian revolution particularly emphasized the necessity of purposeful party guidance of the partisan struggle. Therefore during the Civil War years this form of armed struggle, which occupied a prominent place in achieving victory over the enemy, was incorporated in war plans, and the rules of its conduct were included in the Field Service Regulations, while the party Central Committee regularly discussed problems connected with guidance and direction of partisan activities and carried out a number of organizational measures, including the establishment of an entire partisan army.

The forms and methods of partisan struggle elaborated at that time constituted a valuable contribution to theory of Soviet art of war.

In discussing the matter of Lenin's guidance of training and mobilization of reserves, the author focuses attention on the fact that under the extraordinarily complex and rapidly-changing conditions of the Civil War, a decision was reached for comprehensive utilization of various forms and methods of assembling and training troops, as well as training replacement personnel. An object of particular concern by Lenin in this regard was the Vsevobuch [Universal Military Training] system, which played a most important role in coping with this task.

Chapter Five merits attention. Here the author endeavors to show the creative development of the Leninist legacy in the area of military science right up to the present. We must say that this is a very ambitious task, for much has already been written on this subject.

We feel that the most interesting treatment of this subject would have been an analysis of specific utilization of the Leninist legacy in solving specific problems of military science following Lenin's death. It would be important to demonstrate how Lenin's ideas live on under new conditions, the elements of his teachings in new forms and at new stages of development of the military organism. The author strives to accomplish this, but he is not successful in every case. In many instances he very neatly captures the "pulse beat" of Lenin's teachings under the new conditions, but in some places the presentation degenerates into a simple rehash of various stages in the development of military affairs.

The author was successful in describing Frunze's activities and the features of development of Soviet military theory in the twenties, and in discussing several questions pertaining to the period of the Great Patriotic War and various elements of the present day. He has not done such a good job of discussing the thirties and the initial postwar years.

The chapter ends with a general description of the state of Soviet military science at the present stage. We must state that on the whole the description is fairly complete and convincing. There are some weak points, however. On page 278 the author discusses the basic tasks of Soviet military science at the present time. These tasks are correctly stated, but the presentation is far from complete. The author discusses only certain aspects of the general theory of military affairs: determination of the range of research in connection with the military technological revolution, explanation of manifestation of the laws of armed combat under conditions of nuclear weapons employment; classification of military science; elaboration of methodological problems; assessment of the potential enemy and critique of his ideology; consideration of economic, moral, military

and scientific-technological potential "in the aspects of military science as a whole and its branches, and elaboration of recommendations for Soviet military doctrine and doctrine on war and army." It is easy to see that the author has failed to treat one of the fundamental elements of military science -- elaboration of theory of art of war, strategy, operational art and tactics. He has also ignored problems of specific military sciences.

One reads with interest those pages where the author discusses the root military scientific theses of Leninist doctrine applicable to nuclear war: problems of correct assessment of the correlation of friendly and hostile forces, on the unity of military and political leadership, on creation of preponderance of forces at the decisive moment and at the decisive point, plus a number of others.

Extremely interesting in our opinion is Chapter Six, in which the author comprehensively describes the sources of the Leninist military theory legacy and presents a survey of the literature. This is not simply a reference chapter: in it the author evaluates studies devoted to examination of the military activities and military-theoretical legacy of V. I. Lenin, and makes an attempt to demonstrate the process of synthesis and development of Leninist ideas in these studies. Unfortunately the author was not entirely successful in showing the initial stages in the study of Lenin's military activities as a process of accumulation, deepening and development of knowledge with a certain succession and interlink among its stages and elements.

In appraising this study as a whole, we should state that the reader is offered an extremely useful book which continues the efforts of many investigators working on the study, dissemination and development of the Leninist military legacy and makes a substantial contribution to this honorable task.

BOOK ON TROOP CONTROL

Col I. Chetverikov

Under conditions of rapid scientific and technological advances, with increasing aggressiveness on the part of imperialism, new and higher demands are imposed on armed forces control. One can no longer be satisfied with established forms and methods, even if they have served well in the past. This was discussed in detail in the Central Committee Report to the 24th CPSU Congress; particular attention was directed to the fact that "problems of control pertain not only to a narrow group of leaders and experts but to all party, soviet and economic organizations, as well as all work forces. This means that improvement of management is an important component of all party activities pertaining to management of the economy."

These party demands fully apply to all aspects of Soviet Army and Navy activity. Therefore the innovative thinking of military experts is focused on the question of how we can more effectively develop the theory of armed forces control under present-day conditions. This is the subject of what we consider to be an interesting book, entitled Fundamentals of Troop Control,¹ which consists of a brief introduction and 12 chapters.

The first two chapters concisely and yet with a fair amount of detail present the development of theory and practice of troop control before and after the scientific and technological revolution.

Subsequent chapters analyze a complex of questions pertaining to troop control. Primary attention is devoted to the most vital problems: examination of radical changes in the technical control base, caused by the development of electronic computer and information systems; discovery of the increasing importance of a comprehensive approach to solving control problems; the authors discuss in detail how, under the influence of advanced technical devices and control methods, the transition is made to flexible and dynamic organizational structures which ensure rapid troop response to various changes in internal and external conditions.

The authors examine this entire complex of very important and complicated matters in the historical relationship of change trends in troop control, based on methodology of Marxist-Leninist theory of knowledge and with extensive utilization of the achievements of various sciences, including mathematics, psychology, and education science.

Chapter III, "System of Troop Control," describes in detail the structure of control systems and various technical devices used in control; the authors list the requirements imposed on control entities and command posts; the term "control system" is defined. This term is still given

various definitions in the literature. In our opinion the authors correctly define control system as "a complex dynamic aggregate of control entities and command posts, interrelated in a specified sequence of subordination, together with their structure and equipment, the interrelations and work methods of officials involved" (page 86).

Also correct is the idea that the structure of troop control systems directly reflects the organizational structure of the troops proper: the higher the position of a troop control system in troop organizational structure, the greater the number of elements it encompasses and the more complex the relationships in that system.

The authors quite rightly assign an important position in this book to an examination of demands on control entities. It is noted that their structure should be as simple as possible and at the same time should ensure precise, continuous, skilled troop control in all situations. The principle of one-man command forms the basis of the organizational structure of control entities. The commander is the basic figure in control. This principle, established in the protracted process of development of control entities, acquires particularly great importance under present-day conditions, when combat operations develop at an exceptionally rapid pace, are distinguished by extreme intensity and abrupt situation changes.

The reader will find in Chapter III useful information on various technical control means: communications, information acquisition, processing of acquired data and the performance of tactical computations, the preparation and duplication of documents -- the state and level of development of which substantially influence the control process. It seems to us, however, that the value of this section would be considerably greater if in examining the solution of complex control problems the authors more extensively demonstrated utilization of automated control systems, electronic computers, computer input devices and information display devices, telecode communications equipment, the application of various cybernetic theories and mathematical methods. It is quite wrong, for example, to devote as much space to computer description as to the description of a dictating machine or typewriter.

Chapter IV discusses the principles of organizing the operation of control entities. The authors discuss in detail principles of troop control and the work style of commanders and staffs, indicating the conditions for increasing organization in the operations of control entities and the possibilities of utilizing network schedules in planning combat operations.

It is noted that the work procedure of commanders and control entities in performing various functions connected with control of subordinate troops will depend in each specific instance on the nature of the assigned combat mission, availability of time, level of officer training, degree of

technical control facilities at headquarters, and other conditions. Definitions of the general principles of troop control also seem correct. The most important are the following: party-mindedness, scientific content, foresight and prediction, one-man command, and centralization.

The principle of party-mindedness proceeds from the class character of warfare and the decisive importance of the morale-political state of military personnel for successful accomplishment of combat missions. An important role in observance of this principle is played by such executive qualities as high ideals, conviction and dedication to the Communist cause, political maturity and sensitivity, an implacable attitude toward shortcomings, efficiency and discipline.

The principle of scientific character of troop control under conditions of the scientific and technological revolution occupies a core position. In order to ensure effective actions by large or small teams armed with complex and diversified combat equipment, essential first and foremost is a scientific approach to troop control, which in the broadest sense means utilization of the objective laws of various sciences by commanders and staffs in their practical activities. It is quite obvious that profound and comprehensive knowledge is required of commanders for implementation of this principle.

The principle of foresight and prediction is inseparably linked to the principle of scientific character, supplementing and enriching it. This principle occupies a prominent place in the theory and practice of troop control, since it is impossible to achieve victory over the enemy without the ability to anticipate and predict.

One-man command is a most important principle both of armed forces organizational development and of troop control during the conduct of combat operations. The importance of one-man command has increased considerably under present-day conditions. It must ensure efficient employment of new weapons, flexible and reliable troop control, as well as firm personnel military discipline.

The principle of centralization of control is inseparably linked to the principle of one-man command. They cannot be equated, however. In practical application of the principle of centralization it is essential to take into consideration those changes which have taken place in the military. On the one hand participation in modern combat of a large number of different arms and special troops with diversified combat equipment demands centralized unification of their efforts and continuous coordination by the higher commander of all actions directed toward accomplishing the common combat mission. On the other hand the more highly-maneuverable character of the modern engagement, less time available to prepare for battle, troop operations on separate axes, increased firepower,

greater volume of control tasks and other factors dictate the necessity of giving subordinate commanders greater independence and the opportunity to display initiative (but intelligent initiative!) and innovativeness in accomplishing missions.

The reader's attention is drawn by pages devoted to scientific organization of labor in the area of control. Of practical interest are statements made by the authors on utilization of scientific organization of labor methods in searching for and finding the best variant of task distribution among control entities and officials, in seeking the most efficient form of work organization, in determining the minimum number and optimal structure of command posts, in selecting effective methods of executing troop control measures under various situation conditions, etc. The authors discuss critical-path planning methods, which have in recent years been extensively applied to practical troop control, methods which make it possible to analyze different decision variants much more fully and deeply in comparison with traditional methods, to reproduce flowcharts for sequence in execution of missions by troops, and graphically to represent the organization of combat operations. Critical-path methods are particularly indispensable for analyzing structure of control entities and seeking ways to increase their efficiency.

Key problems of troop control -- the commander's combat decision-making and planning of combat operations -- are examined in Chapters V, VI, and VII (pp 194-280).

Chapter V, "Collection and Processing of Situation Data in Preparing for and During Combat Operations," in our opinion essentially correctly reflects the significance of prompt collection and synthesis of tactical information in the business of troop control. The authors emphasize that only on the basis of a thorough analysis of situation data and precise calculations is a scientific approach possible in developing the battle plan, in correct determination of troop combat missions, in organizing coordination and all types of support and supply, as well as in controlling subunits during battle. Without such an approach to the problem, as is correctly noted in the study, voluntarism in decision-making and adventurism in actions are inevitable.

The authors group numerous situation data needed by the commander for reaching a well-founded and most expedient decision on the basis of the following elements (in conformity with established traditions): the adversary, friendly troops, adjacent units, radiation, chemical, bacteriological situation, terrain, weather, season, time of day or night. Quite logical is the suggestion on the expediency of including in this list data on the economic state of the combat area and the social-class composition of the population. In our opinion the authors draw a correct

conclusion on the necessity of taking into consideration the interrelationships and interlinks of all situation elements and at the same time the differing degrees of influence by each on a given decision.

It would evidently be useful to end this section with the demands imposed on situation data. Evidently the authors, having decided to discuss the matter in greater detail, have proceeded to examine the scope and content of data pertaining to the situation elements. As a result they have unnecessarily repeated themselves, for in analyzing the process of situation assessment (Chapter VII) they were compelled to return to the matters already discussed in Chapter V.

At the same time we should like to note that a number of statements contained in the first section of Chapter V require more specific comment. For example, it is stated on page 202 that "the lack of specific situation data does not free the commander from the necessity of prompt decision-making." This is a well-known demand contained in field service regulations. Obviously it would be advisable to clarify how the commander proceeds in the given instance (he evidently resorts to utilization of data on the adversary's tactics, the demands contained in his field service regulations, analyzes the experience of past engagements and the history of the art of warfare, utilizes the results of his prediction of the development of events, etc).

Further presentation of material on the problem raised in the above-mentioned three chapters gives rise to some question, since the authors have departed from the logical sequence of the process of decision-making and planning of combat operations, historically established on the basis of considerable combat experience. For some reason they initially examine the planning of combat operations (Chapter VI) and only later study problems connected with the commander's combat decision-making (Chapter VII).

This sequence in presentation of the material also seems strange because at the very beginning of the book the authors quite correctly note: "...The act of decision-making is the most important and critical in the overall control process" (page 25), and "first and foremost the commander makes a decision on the engagement, which comprises the basis of planning of troop combat operations" (page 24). We should add that the commander's decision comprises not only the basis of planning combat operations but also the basis of all troop control. It is another matter altogether that these two processes under present-day conditions are closely interwoven and proceed in parallel, for the limited time available for battle preparation as well as the higher commander's endeavor not to "consume" his subordinate commanders' time requires that they be combined.

Thus it would obviously be more expedient to examine initially matters connected with the commander's battle decision and subsequently combat operations planning.

This comment pertains not so much to the content as to the architectonics of the book. As regards content, we should like to comment on Chapter VI, particularly the first section, "Content of the Planning Process." The authors begin it (page 220) with the sentence: "There exists a rather widespread opinion that initially the commander makes his decision and then his staff proceeds with planning, which boils down essentially to putting the decision into document form" (Our underline -- I. Ch.). We do not understand at all on what is based the authors' assertion of such a simplified comprehension of the process of planning combat operations. We cannot agree with such an assertion.

The content of the planning process is presented in a fairly understandable manner, with great emphasis placed on the preparation of various computation data essential to the commander for his decision-making. Suffice it to say that in the example the computation of time required for the movement of subunits from the line of departure to the final coordination line fails to take into account the depth of the subunits columns, which is impermissible for such a serious study. We also hope that the authors, when working on subsequent editions, will more rigorously coordinate their recommendations with the text. For example, on page 239 they present a variant of distribution of responsibilities among officials. It follows from this presentation that both the commander and chief of staff compute the time required to organize combat operations. Is it necessary for two officers to do this under limited-time conditions? Obviously for this reason more specific recommendations are contained on page 254.

We feel that the best-done chapter is Chapter VII, "The Commander's Battle Decision." The authors examine in detail the content of the decision and the demands imposed on it. They succeed in convincingly demonstrating that the commander can reach a correct decision only if he thoroughly understands the fundamentals of the modern engagement and if he has thoroughly studied weapons performance and methods of combat operations of friendly and enemy troops.

The commander's decision-making is a complex, creative process of intellectual activity. Of decisive significance here is the commander's ability to grasp in detail the current situation, to abstract from the unessential, to concentrate on the essential, to find the general and determining in the individual and isolate it. An essential condition for a correct approach to situation assessment is the necessity of examining each situation element dynamically, that is to assess not only the actual state of a given element at a given moment but also to predict its

possible changes. We feel that the authors have done a good job of revealing this aspect of the commander's activities and have convincingly demonstrated the sequence of his efforts at each stage of situation estimate and decision-making as a whole. We feel that it would be extremely useful here to utilize examples from the experience of our commanders in the Great Patriotic War, in order to stress the great diversity of conditions under which a decision is made and, in addition (perhaps this is the most important), to help the reader understand control of combat and to obtain maximum benefit from the past for the solving of present-day problems. The three examples the authors give are fine, but they are not enough.

The authors devote considerable attention to planning measures involving support of combat operations (Chapter VIII). With the adoption of new weapons (particularly nuclear weapons), the influence of these measures on successful accomplishment of assigned missions becomes incalculably greater. It is no longer sufficient to provide for the organization only of such traditional forms of support operations as reconnaissance, security, camouflage, etc. Other types of support are also required, proceeding from the altered character of modern combat: protection of troops against weapons of mass destruction, electronic countermeasures, and weather services support. At the same time the limited time available for organization of the engagement dictates the necessity of planning all these measures simultaneously (parallel) with combat decision-making and preparation of formal operation documents.

In the modern engagement, where combat operations are conducted at a rapid pace, under conditions of swift and abrupt situation changes, the role of reconnaissance-intelligence becomes more important. The authors correctly note that principal indicators of the quality of reconnaissance planning, in addition to promptness and reliability of information on the adversary and the terrain, include data on the radiation, chemical and bacteriological situation. Manifested in this is the dialectical unity of such types of combat support activities as reconnaissance and protection of troops against weapons of mass destruction. The latter type, as the authors state, comprises an entire system of measures, which in turn are inseparably linked with engineer support and camouflage.

Of definite interest in our opinion is the section entitled "Electronic Countermeasures," written on the basis of materials published in the foreign press. The authors emphasize that success in this effort depends on prompt acquisition of detailed data on the enemy's radio and radar equipment. One source of such information is a long-range, fast and reliable electronic intelligence effort. Here the reader will find many useful recommendations on protection of friendly radio electronic facilities.

The authors devote proper attention to weather service support and quite correctly emphasize the fact that for successful troop control, in addition to knowledge of local terrain conditions, it is necessary to possess a clear picture of temperature and humidity, wind velocity and direction at various altitudes, cloud cover, precipitation, atmospheric pressure, water conditions of rivers, reservoirs, swamps, and the condition of snow (ice) cover. Hence the most important tasks of a headquarters staff, in the authors' opinion, are the following: collection of data on weather conditions, organization of weather observation, prompt warning of troops about dangerous weather conditions, etc.

In examining the problems of rear services support, the authors note that the basic indicator of precise operations of rear services entities is uninterrupted supply in all categories of materiel under all situation conditions. At the same time we feel that the book does not fully present the demands imposed on rear services support in connection with the altered methods of conducting military operations and the potential consequences of enemy nuclear strikes, as well as the procedure and sequence of fulfilling these demands.

Chapter IX is an important one. It examines matters pertaining to the commander communicating his operation decision to the executing agents, as well as organizing and maintaining coordinated effort.

The limited time available for preparing for combat operations, frequent and abrupt situation changes, as well as the increased volume of information required by executing entities demand that commanders and staffs of all echelons employ various forms and methods of communicating decisions to subordinates.

In particular the authors discuss in detail one of the basic forms of communicating a decision -- the operation order. It is emphasized that retention of a certain sequence in presentation (verbal and written) at the various control levels is of great methodological importance. This disciplines an officer's thinking, guarantees against possible omissions, and saves time. In discussing methods of communicating orders and instructions to the executors, the authors note that each method has its advantages and drawbacks. In most cases time is the principal criterion in selection.

At the same time the authors state that while in the last war the method of personal contact between the commander and his subordinates in the issuing of an operation order was in particularly widespread use, today it will not always be possible or expedient, particularly during combat. Therefore the most widespread method will be the communication of orders to subordinates by technical communications channels. It is recommended that the most important instructions be transmitted by the method of direct verbal contact with subordinates.

Examining problems of troop coordination, the authors proceed from a correct conclusion that it is acquiring the force of objective necessity and a pattern of conduct of any combined-arms engagement. But the authors also note that this pattern is not manifested by itself but operates only through the subjective activity of commanders and staffs. Consequently their task is intelligently to utilize this pattern and to master the art of organization and maintenance of precise and continuous troop coordination.

Based on the generally-accepted interpretation of the essence of troop coordination, the authors arrive at two theoretical conclusions which in our opinion are of great practical significance: first of all, organization and maintenance of coordination cannot be separate, detached acts in commander and staff activities connected with troop control but must permeate their entire effort; secondly, the combined-arms commander and his staff play a guiding and decisive role in the organization and maintenance of coordinated action.

Also meriting attention is the recommended method of approaching determination of the content of coordination instructions, particularly in the attack without halting in an attack position. At the end of this chapter the authors examine the features of organization of troop coordinated action in the conduct of combat operations involving only the employment of conventional weapons.

The process of troop control in combat also encompasses such areas of commander, staff and political entity activity as maintenance of high troop morale, monitoring of troop actions, study, synthesis and practical adoption of advanced combat experience and know-how. Chapters X, XI, and XII deal with these matters.

The authors devote particular attention to the question of maintaining high troop morale in combat (Chapter X), correctly considering this area of commander, staff and political entity activity as one of the most important functions of control, unique in content and methods of execution. They note that its successful accomplishment is possible only on the basis of thorough knowledge of Marxist-Leninist doctrine on the morale factor and innovative practical application of the points of this doctrine.

In the first section of this chapter the authors examine the sources of troop morale and the means used to establish morale in the armies of the imperialist nations and in the Soviet Army. For the most part the authors correctly handle this task. But nevertheless one should note that the genesis of the forming of the morale of people and army under conditions of the socialist state are presented insufficiently consistently and completely.

For example, the political and psychological elements on the basis of which the morale of Soviet fighting men is formed in the course of moral-political and psychological training (page 337), for some reason are isolated from the same elements which are inherent in Soviet society as a whole. On page 338 the authors state: "The term morale also includes elements pertaining to the social strata of society, the character and level of culture of people and army, the national features of the people, its customs and traditions, as well as elements expressing the moral state of the people and army..." But it is a well-known fact that the social strata of Soviet society comprise the worker class, the kolkhoz peasantry and the toiling intelligentsia, from which our army and navy are made up. There are no antagonistic conflicts among these strata, and from a socio-political standpoint they form a unified, monolithic Soviet society. The moral strength of this society is comprised of the socioideological and sociopsychological elements formed by the Communist Party in the process of communist indoctrination of the Soviet people.² The content of these elements should have been revealed in greater detail, since they form the basis of moral-political and psychological training of Soviet fighting men in light of the tasks performed by the Soviet Armed Forces. The unity of Soviet people and army, a point which is subsequently discussed in a fair amount of detail, is also formed on the basis of these elements.

Correctly noting that psychological training of military personnel is effected in an organic unity with moral-political training, with the determining influence of the latter (pp 337-338), the authors at the same time claim that the moral-political qualities of military personnel are formed during the course of political training, while psychological qualities are formed in the course of combat training, when military personnel acquire professional knowledge and skills (page 340). A question naturally arises: how is an organic unity of these two types of training achieved? What ways, means and methods are employed to achieve this? Unfortunately the authors provide no answers to these questions.

In the second part of this chapter the authors examine methods of maintaining a high level of morale by troops in combat. As the authors correctly state, the most important thing in resolving this problem is instillment in personnel of a communist ideological outlook, a correct understanding of the nature and features of a potential future war, as well as knowledge of weapons, the nature of modern combat and the methods of waging warfare.

While correctly treating this problem on the whole, the authors in our opinion have failed to avoid certain extremes and a few inaccuracies.

This applies primarily to the description of the nature of a nuclear war (page 349) and the effect of radioactive contamination on troops (page 345). These elements are presented so dramatically that in the opinion of the

authors nuclear bursts and radiation will irrevocably produce fear and a sense of impending doom in all personnel (our underline -- I. Ch.). It is certainly true that radioactive contamination is one of the most powerful effect factors of nuclear weapons. But its effect on the personnel of the arms and services is far from uniform, if only because the combat equipment with which they are armed possesses differing but on the whole reliable protection against radiation. Consequently the morale-psychological state of troops operating in areas of radioactive contamination will vary, and obviously this must be considered in accomplishing the task of maintaining a high state of morale.

The authors correctly note that an abrupt transition from peace to war, for a number of reasons, leads to changes in the morale and psychological state of troops. But they inaccurately illustrate this point with a historical example. They write that at the beginning of World War II the enemy's mass employment of tanks and aircraft, splitting attacks and encirclement maneuver produced in troops fear and a lack of confidence in their capabilities (page 344). What troops are they talking about? We know that World War II began with an attack by Nazi Germany on Poland, followed by Denmark and Norway, Belgium and France. These countries and their armies surrendered in connection with a number of circumstances, although units of the Polish Army and worker detachments, for example, offered the Germans stubborn resistance. As regards Soviet troops, the above assessment of their state during the initial operations of the Great Patriotic War is questionable.

Everyone is well aware of the courage, tenacity, heroism and unshakable faith in victory over the enemy displayed by our troops in the frontier battles and in the defense of the hero cities. It was only the exceptionally unfavorable operational-strategic situation resulting from an enemy sneak attack and the adversary's establishment of an overwhelming numerical superiority on the selected axes of advance which compelled our troops to withdraw. It is true that under these conditions there did occur instances of "tank panic" and "aircraft panic," but these were rare, isolated occurrences which by no means characterized the behavior of our army and navy on the first days of the last war. Historical examples demand absolutely accurate, precise and clear presentation.

A substantial shortcoming of this chapter as a whole in our opinion is the fact that the authors say nothing whatsoever about ways and methods of carrying out troop moral-political and psychological training in peacetime.

Chapter XI, "Verification," is quite elaborate. The authors examine in detail the tasks and methods of verification, its organization and execution. But the material would have been much more meaningful if the authors had discussed an additional, very important function accompanying

verification -- assistance to troops. Without prompt and effective assistance, verification as a control function is transformed into a bureaucratic procedure. Therefore the verification plan contained on page 359 should obviously have included an additional column: "Measures based on verification results and time of execution."

Of considerable interest is Chapter XII, "Study of Combat Experience and Its Communication to the Troops." We must say that this area of commander, staff and political entity activity is frequently totally ignored or discussed very sparingly in military histories and in theoretical works on the art of warfare. One must give credit to the authors for having the courage to discuss the importance and content of this rather complex and important function performed by control entities.

The authors examine the tasks and organization of control entity efforts in studying combat experience, the learning process proper, and the communication of combat experience and know-how to the troops. All these items are discussed fairly completely and in a comprehensible manner, with the exception of a few elements.

For example, in discussing the area of main effort by control entities in the study of combat experience, the authors state what primarily should be studied in the actions of the enemy (page 366). This is correct, but at the same time they should have formulated the principal areas involved in accomplishing an analogous task in respect our own troops, so that the process of study of combat experience does not look one-sided.

The purpose of the war diary is imprecisely stated (page 372). The authors note that it presents the results of a study of combat experience, and at the same time they claim that this document contains basic material for the study and utilization of the experience of completed engagements (our underline -- I. Ch.). The latter statement is correct. In our view the war diary should constitute a fundamental report document, reflecting accurately and objectively the activities of the commander, staff and troops (units, large units) during a specified period of time (usually for a 24-hour period). It should possess equal legal status with operations documents (operation orders, instructions, reports).

During the Great Patriotic War unfortunately war diaries were maintained unsystematically and in a slipshod manner in many units and large units. This occurred because the legal status of the document had not been defined. It is clearly high time to settle this matter officially.

In our opinion the authors correctly pose the question of the necessity of further development and improvement of theory of troop control as a special area of military knowledge. Study of control theory as an independent

discipline at military educational institutions and scientific elaboration of its various aspects through the joint efforts of specialists in the area of the social, applied and military sciences would greatly promote successful solution to practical control problems.

In conclusion we can state that in spite of the noted shortcomings, on the whole the book is both useful and needed. It will play a definite role in the further elaboration of one of the most vital and complex areas of theory and practice of contemporary military art -- troop control. The reader will find in this book well-substantiated advice and recommendations on many matters pertaining to organizing the work of commanders and staffs in securing precise, clear-cut control of subordinate subunits and units in combat.

FOOTNOTES

- 1 D. A. Ivanov; V. P. Savel'yev; P. V. Shemanskiy: Osnovy upravleniya voyskami (Fundamentals of Troop Control), Moscow, Voenizdat, 1971, 384 pages.
2. For more detail see Voyennaya Mysl', No 9, 1969, pp 14-23.