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Some Thoughts on the Development of the Soviet Army Tank Troops

by

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The development of armored equipment attains exceptionally important significance under modern conditions, and it is completely natural that lately, in our classified military press, a discussion of this question has started. The fact that our prominent military leaders participated in the discussion of the vital problems of developing our Armed Forces, including the tank troops, should be welcomed. We should never forget that truth is born of controversy, and even more so when we use such a tested weapon as Marxist-Leninist dialectics. The discussion of these questions attained such an active nature that it cannot be disregarded. Therefore, we decided to join in it and to share some of our thoughts concerning this. It goes without saying that we have not assigned ourselves the goal of giving the final, categorical conclusions on all these questions.

The discussion concerns the problems of developing armored equipment, the development and intent of tank troops, their organizational structure, and methods of their employment in warfare. The most varied and contrary opinions have been expressed. The opinions of some comrades have split on several problems. Some hotheads consider that the development of tank troops has been turned into a serious problem, and one can even hear the voices of certain ultra-innovators who say that the tank has outlived itself and its development has reached a dead end. All this is quite understandable; we are living through such a difficult period in the development of military

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art that it is not so easy to find the right path, as it seems at first glance.

Lately, Soviet military art has been developing rapidly in connection with the creation of new combat weapons. We cannot lag behind this development. It should be taken into consideration that people always accept new ideas with difficulty, despite the fact that people are the creators of these ideas. Also, rash conclusions and categorical assertions having little validity should not be tolerated because they can lead us to large errors which are hard to correct. Therefore, it is essential to approach the problems under discussion profoundly and comprehensively, especially the conclusions that result from the discussion. Comrades should not be censured for their statements and suggestions that seem foolish at times [redacted]

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During further development and technical improvement of tanks, the great potentialities incorporated in them for conducting mobile combat operations became evident. Therefore, in the period preceding the Second World War much attention was given to the development of tank troops in the major countries of the world. A great number of tanks possessing high combat qualities appeared on the battlefields of the Second World War. The massed employment of tanks, supported by powerful air strikes and artillery fire, permitted a successful resolution of the problem of breaking through the defense and developing an offensive to a great operational depth. As a result of this, the Second World War, with the exception of certain periods, basically had a mobile nature.

The main positive result of mass employment of tanks in the past war consists of this.

Simultaneously with the development of tanks, weapons for combating tanks, antitank weapons, were [redacted]

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being developed. Over a prolonged period of time there has been a persistent competition between the tanks and the antitank weapons. During the years of the Second World War, despite the mass employment of fairly effective antitank weapons, the tanks stood up to them and retained their overwhelming superiority until the end of the war.

In order not to make a mistake in evaluating the combat characteristics of our modern tank troops and in determining the direction of their future development, let us briefly examine the path followed by them in the Second World War. This will also help us reveal some lessons of history that should not be forgotten.

The tank troops of the Soviet Army played an outstanding role in the defeat of fascist Germany's armed forces. Possessing such remarkable qualities as high mobility, great firepower, and good armored protection, the tank troops became the main strike force of our ground forces.

The skillful employment of great masses of artillery and aircraft to neutralize the enemy defense, followed by a massed tank attack in close coordination with infantry, ensured the successful breakthrough of the fascist German troop defense. Tank troops played an especially great role in developing the breakthrough and finally defeating the opposing enemy groupings. These troops were the leading force in conducting operations to a great depth at high speeds. Tank armies and tank and mechanized corps, led into the breakthrough and led by brave and courageous commanding officers, always decisively rushed into the enemy's operational depth, encircled and broke up his main groupings, routed the reserves, and captured important areas and lines. Such employment of tank troops gave a mobile nature to the operations of the Second World War, permitted the swift achievement of the defeat

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of enemy operational groupings, and the penetration of the operational formation of his troops to a great depth in a short period of time. The tank troops have the right to be proud of the results of their operations in the Second World War.

In the past it was said about the cavalry: "the glorious history of cavalry is the history of its commanding officers". This aphorism refers to the tank troops to an even greater degree: an indecisive commanding officer at the head of a tank army, tank corps, or tank division is a most frightening, a most fatal thing. No matter how perfect armored equipment is, an indecisive commanding officer at the head of the tank troops cannot ensure their successful combat employment. We should always firmly remember this condition. The decisive factor that ensured the successful employment of tank troops in the Second World War, however, was the high level of Soviet armored equipment. Socialist industry and our designers armed the tank troops with splendid tanks and assault weapons. It is generally known that not a single foreign state, that actively participated in the Second World War was able to achieve the same high level in the development of armored equipment as was achieved in the Soviet Union.

The Soviet Army entered the war having three types of tanks: light (BT and T-26 and a little later the T-60 and T-70), medium (T-34), and the heavy (KV). The medium and heavy tanks were considered to be the basic ones. However, there were extremely few of these tanks, and at the beginning of the war the basic part of our tank pool was composed of light tanks that were obsolete by that time. This was already evident from the experience of the Spanish Civil War in 1936 to 1939. It is true that not all the highly placed military leaders understood this. Many of them considered that we did not need better tanks and that war could be conducted with the existing tanks.

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Such leaders hindered tank development but a sober calculation overruled them, and, as is known, before the war our tank troops began to be rearmed with new types of tanks. However, we were unable to complete this by the beginning of the fascist German attack because time was lost.

Our medium T-34-76 tanks and heavy KV tanks which were completely modern at that time and, with their comparatively powerful armament and better armor protection, proved to be more powerful in single combat with German T-III and T-IV medium tanks. They also suffered fewer losses from antitank weapons than the German tanks.

All this indicates that we took the correct direction in the development of armored equipment on the eve of the war. It ensured a qualitative superiority for us in armored equipment over fascist Germany at the beginning of the war. In the initial period of the war, however, because of a whole series of great mistakes connected with Stalin's personality cult and his military environment (voyennoye okruzheniye) which permitted the treacherous attack of fascist Germany, the Hitlerites were able to achieve considerable superiority in the number of tanks, especially on the main axes, and also in the methods of their combat employment over the Soviet Army. This affected the operations of our troops very adversly and led us to serious defeats in the initial period of the war.

It is essential to note that by the summer of 1943 the fascist army was armed with new "Panther" and "Tiger" heavy tanks and also with "Ferdinand" assault guns, which had better armored protection and more powerful armament while our tanks fundamentally remained the same. On the eve of the Kursk battle a certain qualitative superiority in armored equipment temporarily passed into the hands of

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fascist Germany. It was under these disadvantageous conditions that this outstanding tank battle occurred which ended, however, with the greatest defeat of fascist Germany. The backbone of Hitler's Germany was broken in this battle.

The qualitative superiority of the German tanks over our tanks did not last long. Already in 1944 mass quantities of T-34-85 tanks began to arrive with an 85 mm gun that was good for that time. The new IS heavy tank, armed with a 122 mm gun and having powerful armored protection, arrived to replace the KV tanks. The German "Panthers" and "Tigers" and also "Ferdinands" could no longer compete with our new tanks. It is true that the T-VI-B heavy tank, the "King Tiger," which had approximately the same armored protection as our IS tank, became part of the German equipment. But the German tank was armed with an 88 mm gun, and its weight reached 68 tons as opposed to 46 tons for our IS tank. Besides, there was only a limited number of T-IV-B heavy tanks in the German Army. At the same time, a large number of assault guns, including heavy ones, became part of our army's equipment. All this ensured the reliable superiority of our armored equipment over that of the Germans until the very end of the Second World War. Our industry also ensured the quantitative superiority in tanks over fascist Germany and its allies.

The tank equipment of our allies in the last war — the British and American tanks — were also inferior to our tanks. The basic British tanks, MK-III (Valentine) and MK-IV (Churchill), had weak armament (a 57 mm gun) and low speed (26 to 32 km per hour). The American (M4A2 and T-26-E3) tanks were superior to the British tanks in armament (75 mm and 90 mm guns) and had a greater speed; however, they also were inferior to our tanks in maneuverability, armament, dimensions, and were

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very heavy. The Soviet tanks had powerful diesel engines installed in them, and at that time this was something quite advanced in world tank building.

Consequently, during the years of the Second World War, Soviet tank building firmly occupied first place in the entire world. It provided our army with remarkable combat vehicles -- tanks and assault guns, which aided the successful conduct of war against fascist Germany.

Parallel with the development of tanks during the Second World War antitank weapons were being developed. As is known, we began the struggle against fascist tanks with bottles of flammable mixture, with antitank grenades, bunches of regular hand grenades, antitank rifles, etc, which, strictly speaking, required single combat of a man against tanks. We did not have any alternative. For that reason, we used divisional 76 mm and 107 mm guns, and also 37 mm and 85 mm antiaircraft guns together with antitank artillery to combat enemy tanks. But all these systems proved to be cumbersome and clumsy and little suited for combating tanks. In 1942, we had the mass production of 45 mm and 76 mm antitank guns and antitank rifles set up, and this strengthened our antitank defense. The 76 mm gun became the basic weapon of antitank artillery. In 1943, 57 mm antitank guns began to reach our army. In the same year the artillery received armor-piercing subcaliber projectiles for the 76 mm regimental guns and 122 mm divisional howitzers. In 1944, the delivery to the army of SU-85 assault mounts, armed with an 85 mm gun, and 100 mm antitank guns began in mass quantity. Field and antiaircraft artillery and aircraft with special antitank bombs, the so-called PTAB (antitank aerial bomb - protivotankovaya aviatsionnaya bomba) which were successfully employed to destroy tanks, were brought in to combat tanks. A considerable number of tanks were put out of action

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with antitank mines. However, the basic burden of combating enemy tanks was borne by the antitank artillery, especially 45 mm and 76 mm antitank guns, which destroyed the greatest number of enemy tanks. Moreover, the basic shell was the armor-piercing subcaliber projectile. The shaped charge antitank shell (kumulyativnyy snaryad) showed great effectiveness; however, it was inferior to the armor-piercing shell as far as accuracy and range of a grazing shot. Of course, a large number of German tanks were destroyed by our tanks. During the years of the Second World War the tanks proved to be quite an effective weapon to combat enemy tanks.

It is essential to note that our system of antitank defense proved to be more successful in all respects in comparison with the antitank defense system of the fascist army. The bases of our antitank defense were the tank-destroyer brigades and regiments and also SAU regiments. Possessing great maneuverability, these large units and units were thrown into the axes of the enemy tank attack, quickly assumed firing positions, and fired at enemy tanks. Tank units and large units were also thrown into the axes of the enemy tank attacks, and they combated the tanks in coordination with tank-destroyer units and SAU units. It is quite understandable that in this organizational form these antitank units and large units, including both battalions and separate companies of antitank rifles, appeared to counteract the German tank divisions, against which we quickly concentrated these weapons. In the defense we skillfully created so-called antitank areas that fully justified themselves. The turning back of a great mass of enemy tanks was achieved in this way in the Kursk battle, in the battles near Budapest, and in other sectors.

The German fascist army also had a large number of antitank weapons, including powerful guided mobile

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mines, which not only were not inferior in effectiveness to our antitank weapons, but were even superior to them. The 75 mm guns and the assault mounts, armed with 88 mm guns with a high muzzle velocity of the shell, were especially effective. However, the basic mass of antitank weapons of the German Army were in infantry divisions, and it did not have such mobile and powerful large units and units as our tank-destroyer brigades and regiments.

The Germans created a fairly solid antitank defense on the offensive sectors of our troops but on different organizational principles. Their antitank defense was less adaptable for fast maneuvering and concentration of efforts on certain axes, and when they were subjected to our artillery and aircraft strikes they were put out of action faster. To restore the overwhelmed antitank defense the Germans had to bring in new forces and weapons, but often these did not exist. All this greatly simplified our breakthrough of the enemy defense. Of course, in this matter an important role was also played by such factors as the general artillery fire superiority of our army, initiative in operations, and higher military art.

Still, from this indisputable historical fact the important conclusion suggests itself: the success of combat operations is ensured not only by the availability of the necessary weapons of armed combat, but also by their skillful employment.

It is necessary to note that by the end of the war the Germans had succeeded in creating a menacing weapon against tanks — the Panzerfaust, based on the employment of shaped charge antitank shells. It was a mass rocket-firing weapon which was inexpensive to manufacture. Its range of operation was fairly small, and the infantry was armed with it.

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Any tank armor was burned through by the shaped charge shell of the Panzerfaust. True, it must be said that this weapon made its appearance not because of the easy life the Germans led, but it also appeared, in its way, as a weapon for single combat of man against a tank — that with which we started, the Germans ended with — but it was already unable to exert any noticeable influence on the outcome of the war because by that time the fate of fascist Germany was already decided; however, it indicated the appearance of a new effective close combat anti-tank weapon.

The successful employment of tank troops in the past war, the same as of other arms of troops, to a considerable degree depended on their organizational structure. In this question we were able to achieve a definite success. During the years of the Second World War the organization of the Soviet tank troops corresponded quite closely to the nature of war and the methods of employing tank troops in it, in comparison to the organization of the tank troops of other states. However, we did not arrive at it at once.

At the beginning of the war, in connection with the lack of tanks, we had to reject mechanized and tank corps. By the fall of 1941, the Soviet Army had separate tank brigades, regiments, and battalions which were used to reinforce rifle and cavalry large units. As the saying goes, it was necessary "to cut one's coat according to the cloth."

Already in the initial period of the Second World War, the progress of armed combat indicated the need to have more powerful tank large units to combat enemy tank groupings and to exploit one's success. In 1942, the mass production of tanks was set right, and this made it possible to begin forming tank and mechanized corps and then tank armies. In

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1943, we established the organization of the tank troops which remained without any substantial changes until the end of the war.

The special features of this organization were limited to the following. The composition of the Soviet Army had a fairly large number of separate tank brigades, tank and tank assault (tankosamokhodnyy) regiments. They were all used mainly to reinforce the rifle divisions as tanks for direct infantry support. In the defense, they ensured the necessary stability of the combat formations, and on the offensive they played a decisive role in the successful breakthrough of the enemy defense. All the separate tank brigades and regiments were under the orders of the command of the fronts and the Supreme High Command, but in some armies, and even in corps, they had their own organic tank assault regiment. This provided us the opportunity to concentrate the tank troops on the main axes when carrying out offensive operations.

To develop the offensive and to conduct mobile operations in the operational depth, our army had tank and mechanized corps as well as tank armies. They were not assigned to task of breaking through the enemy defense; they were intended for entry into the breakthrough carried out by the rifle divisions together with the NPP (direct infantry support - neposredstvennaya podderzhka pekhoty) tanks, with artillery and aircraft support. This ensured the retention of tanks in these large units and formations to perform the main task of the operation - the rout of the enemy grouping in mobile operations in cooperation with and with the support of aircraft. But in practice, tank and mechanized corps and tank armies did not stop before the creation of a finished breakthrough and, as a rule, were brought in to complete the breakthrough of the defense with its subsequent development.

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The tank corps had three tank and one motorized rifle brigades in their composition. The mechanized corps included three mechanized and one tank brigades. Initially the tank army included tank and mechanized corps, rifle and sometimes cavalry divisions. But such a tank army did not exist for a long time. Soon only the tank and mechanized corps were left in its composition - a total of two or three corps, or just the opposite, tank and mechanized large units were withdrawn from their composition, and it was replenished with rifle divisions and was transformed into a conventional army.

The German Army had tank and motorized divisions that approximately corresponded to our tank and mechanized corps, although as for the number of tanks, they were inferior to the latter. There were also tank armies in the composition of the German troops, but until the end of the war tank and infantry divisions were included in their composition, i.e., they had a combined composition. Separate tank or assault battalions were added to reinforce the infantry divisions. In the British and American armies, there were armored or tank divisions; they did not have tank armies. Thus, during the period of the Second World War, the Soviet Army had the best organization of the tank troops, and in the Second World War this permitted us to achieve important superiority over the German fascist army also in the methods of employing tank troops in operations.

For the German Army it is characteristic that its tank divisions and armies operated in the first echelon from the beginning and until the end of an operation, and they received independent offensive zones, broke through the defense on an equal footing with the infantry divisions and the field armies, and developed the breakthrough themselves. In this, fundamentally they counted on tanks and aircraft;

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they did not have powerful artillery for the breakthrough, especially at the beginning of the war. This method of tank troop operations was successful at the beginning of the war when a firm defense and a solid front did not exist and our troops did not have experience and weapons to combat a great mass of tanks. However, in the further progress of the war, the situation changed fundamentally. The breakthrough of the prepared defense became the most difficult stage of the offensive operation. During a breakthrough the tank troops, if they were drawn in for this, suffered their greatest losses in tanks. However, the Germans did not change their tactics of employing tank troops. As before, the breakthrough of the defense was carried out by the tank divisions. That is the way it was during the entire 1942 campaign, then near Kursk and in the area of Lake Balaton near Budapest. It is natural that when breaking through a strong defense that is well saturated with antitank weapons tank divisions lost the basic mass of tanks and successes could not be achieved. Thus, during the war the Germans were unable to overcome their established pattern in the employment of tank troops.

Our tactics for the employment of tank troops differed from those of the Germans to a significant degree. First of all, the great massing of tanks on sectors of the breakthrough should be noted. Up to 80 to 90 percent of all tanks available in a front were usually concentrated on the axis of the main strike, and the density of the tanks reached 85 units per kilometer of the front, including up to 30 tanks and SAU for direct support of infantry. The enemy defense was overwhelmed by artillery and aircraft and was then broken through by the operations of rifle divisions, reinforced by separate tank brigades and tank and assault gun regiments. Mobile troops - tank armies or tank and mechanized corps were led into the created breakthrough, and they completed the breakthrough and

immediately rushed into the operational depth. The mobile troops were usually assigned the tasks of enveloping the basic enemy groupings and encircling and destroying them. In the last stage of the war mobile troops were often employed for a swift advance to a great depth with the goal of splitting the front, of dividing enemy groupings, of destroying them by units, and of capturing important operational lines and areas as swiftly as possible. As a rule, the mobile troops daringly detached themselves at a considerable distance from the remaining forces of the front and conducted decisive mobile operations in the enemy rear. The depth of the mobile troop advance sometimes reached up to 600 km (the Belorussian and the Vistula - Oder operations). The speeds of the tank troop advance fluctuated between 30 and 40 km, but in certain periods they reached 60 km per calendar day. In the operation to rout the Kwantung Army, the 6th Guards Tank Army, despite the difficult conditions of the mountainous terrain, advanced at a rate of about 80 km per calendar day. In those periods when the army did not meet organized enemy resistance, the speed of the advance reached 120 km per calendar day.

Thus, during the Second World War the Soviet Army achieved a very real superiority over the German-fascist army in the art of employing tank troops. As for the American and British army tactics of employing tank troops - they were not at a high level and were not distinguished by great mobility and swift operations.

The great experience acquired by the Soviet Army in the years of the Second World War, in problems of combat employment of tank troops, their technical equipping, and organizational structure, were taken into consideration by us both in the development and improvement of tank troops in the postwar period. However, we could not limit ourselves only to the experience of history in this

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important matter, and we were keen in searching for new paths in the development of tank troops.

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The future development of Soviet military art must proceed not only and not so much along the path of interpreting lessons of past wars, even though they must be taken into consideration, as along the path of consistent and persistent investigation of fundamentally new methods for conducting combat operations which permit the fullest use of the combat capabilities created by the development of weapons of armed combat.

The development of armored equipment, the organizational structure, and the methods of combat employment of tank troops were decisively influenced in the postwar period by such factors as thegeneral scientific and technical progress in the country, the appearance of powerful nuclear/missile weapons, and the change in the nature and in the methods of conducting war. The swift development of antitank weapons also played an important role and continues to do so.

In comparison with the Second World War, a future war will be conducted with qualitatively new weapons of armed combat. The broad employment of nuclear/missile weapons and modern combat equipment has sharply increased combat capabilities, the strike force, and troop mobility. This led to the review of opinions on the nature of a future war, on the technical equipping and organization of the Armed Forces, and also the basic tenets for conducting combat operations and armed combat on the whole, which were established on the experience of the past war.

In a future war the objectives of armed combat will be not only the armed forces deployed in the theaters of military operations, but mainly the

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deep rear area of the warring sides - the industrial base, supplies of raw materials and foodstuffs, the system of state control, communications, and also strategic weapons of armed combat deployed beyond the limits of the theater of military operations.

Nuclear strikes against important enemy objectives at the front and in the rear and swift operations of forces and weapons on the ground, in the air, and on the sea, with the purpose of employing the results of these strikes for the final enemy defeat is the basis of combat operations of the armed forces. The combat operations of the ground troops will attain great swiftness, dynamic quality, and mobility. In short periods of time they must be able to carry out a purposeful offensive over the entire depth of the theater of military operations. The decisive role in achieving the high speeds of the offensive will belong to the tank troops, who must possess high combat qualities. It is precisely on the basis of these requirements that we must proceed when determining the paths of future tank troop development.

The improvement of Soviet tanks and their armament in the postwar years mainly proceeded along the line of increasing firepower and effectiveness, mobility, of improving armor protection, of equipping them with a system of antiatomic protection, of providing them with the ability to cross water barriers on the bottom, of increasing their cruising range, and of increasing their service life. As a result of the large amount of work that was performed, new models of Soviet tanks have been built, that are superior to the latest models of tanks of the armies of the largest capitalist countries - the USA, Britain, France, and West Germany - according to several of their tactical-technical and combat quality features , and they have become part of our armament.

During this period the heavy tanks IS-4 (1947), T-10 (1953) and T-10M (1957); medium tanks T-54 (1946), T-54A (1954), T-54B (1956), T-55 (1958), and T-62 (1961); and the light amphibious tank PT-76B (1957) became part of our armament. Work continues on several experimental models.

There is a 122 mm gun installed on the heavy tank which has a shaped charge antitank shell that can penetrate, in practice, any armor of a modern tank (up to 500 mm thick). The medium tank has a 100 mm gun installed for which a shaped charge anti-tank shell has been adopted that possesses great armor-piercing capability (up to 400 mm). The light tank is armed with a 76 mm gun that has a fairly powerful shaped charge antitank shell. By installing an armament stabilizer (stabilizator vooruzheniya) on all tanks, their firing effectiveness when on the move sharply increased. For example, the firing effectiveness of a T-54B tank at speeds of 18 to 22 kph reached 60 percent. The 115 mm smooth bore gun "Molot," installed on the T-62 medium tank, with a 1615 m/sec muzzle velocity of the armor-piercing subcaliber shell, has very high armor penetration. Besides these there are shaped charge antitank shells for this gun with even higher armor penetrating ability.

The tanks have new devices installed for driving and for controlling fire, including night sights (nochnoy pritsel). On the medium tanks the supply of ammunition is increased (from 34 to 43 rounds), the horsepower of the engines has been increased to 580, and the cruising range to 500 km.

All these and other improvements greatly increased the combat characteristics of tanks. Our medium tanks possess especially good combat qualities. They firmly hold the title of the best tanks in the world.

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The combat qualities of our tanks may be seen when comparing them with the tanks of our probable enemies. For comparison it is adequate to take the basic types of tanks which may include: in the USSR, the medium T-55 tank and the new T-62 tank; in the USA, the M48A2 medium tank and the latest new tank M-60; and in Britain, the MK-IX-X tank. The experimental models of medium tanks that have been built in France and West Germany are not finished and have not become part of their armament yet.

From the given data it can be seen that the T-55 tank with its 100 mm gun is superior to the American M48A2 tank according to several indicators: it weighs less, has better armor protection, more or less equal firepower, and a greater cruising range. However, it is inferior to the American M-60 tank and the British "Centurion" tank in firepower. This is explained by the fact that a 105 mm gun is mounted on their tanks for which there is a subcaliber shell with a muzzle velocity of 1475 m/sec. We do not have such a shell for our 100 mm gun yet. It is necessary to speed up the creation of a subcaliber shell for rifled guns on all types of tanks.

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	USSR		USA		Britain
	T-55 with D-10T2S gun	T-62	M48A2	M-60	"Centurion" MK-IX-X
Year produced	1958	1961	1956	1960	1959
Combat weight, tons	36	36.5	46	46.27	51
Armor protection in mm:					
hull-front	100	100	110	About 150	76
side	80	80	51-76	51-76	51
turret - front	200	200	178	178	152
Armament (caliber in mm)	100	115	90	105	105
Muzzle velocity of armor-piercing shell, m/sec	895	1615	930 1245 (subcaliber)	1475 (subcaliber)	1475
Armor penetration in mm at 2000 m with an angle of fire of 0° to 60°:					
armor-piercing shell	122-55	—	130-45	—	—
subcaliber shell	Being developed	270-100	200-60	220-85	220-85
shaped charge antitank shell	390-150	440-200	—	—	—
Unit of fire	43	40	60	57	70
Maximum speed, kph	50	48	45	48	34
Horsepower of engine	580	580	850	750	650
Cruising range, km	500	500	310	400	190

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As for the T-62 tank, it is superior to the American M-60 tank according to the basic features, especially in the range of grazing shot and armor penetration. It should be kept in mind, however, that the smoothbore gun has several important shortcomings; in particular, the metal body (sektor) of the subcaliber shell that shatters right after the firing creates the danger of striking our own troops operating in front of the tank. For a certain period this gun may ensure the qualitative superiority of our tanks over the tanks of our probable enemy. But we do not have the right to be content; we must decisively move ahead to a significantly greater distance in the quality of tanks from our probable enemies.

If we compare the T-10M heavy tank with the American M103 (1956) tank, then our tank has slightly better armor protection and a greater speed and cruising range. The British heavy tank "Conqueror" (1954) has more powerful armament, for the 120 mm gun mounted on it has a subcaliber armor-piercing shell with a muzzle velocity of 1550 m/sec.

We made an effort to achieve a qualitative superiority of our heavy tank over the American and British heavy tanks by installing a 130 mm gun on it. Experimental models were prepared. But because of this the tank became too heavy. It became necessary to give up further work on these models. Our T-62 medium tank may successfully wage combat against the heavy tanks of the USA and Britain. Also, the T10M tank possesses combat qualities that are not bad.

Our PT-76B light tank is inferior to the American M41A3 (1956) light tank in armor protection and firepower. But it is almost 10 tons lighter and is amphibious, which is very important for conducting reconnaissance, and has a greater cruising range. As for the other models of light tanks, the experience of the Second World War showed that it was inadvisable to use them, and we stopped building them.

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Heavy Tank Comparison Table

	USSR T-10M	USA M103*	Britain "Conqueror"**
Year produced	1958	1956	1954
Combat weight	50	54.4	About 66
Armor protection (in mm):			
Front - turret	250	127-136	200
Front - hull	120	127	200
Side - hull	80	51	90
Armament of tank (caliber of gun in mm)	122	120	120
Muzzle velocity of armor piercing shell (in m/sec)	950	1000	About 1000 (Subcaliber 1500-1550)
Machine gun (number), caliber (mm)	2x14.5	1x12.7 2x7.62	1x7.62
Armor penetration, in mm at 2000 m (armor piercing shell):			
at a 0° angle of impact	200	200	250-100 (subcaliber)
at a 60° angle of impact	65	70	—
Unit of fire:			
rounds for gun (No.)	30	34	35
cartridges for machine gun	744	7825	7500
Maximum speed (kph)	50	34	34
Cruising range (km)	250	130-160	150

* Until 1954 a total of 300 of these tanks were produced in the USA; tanks of this type are not produced any more. Modernization of the ones produced is being done.

** Until 1959, a total of 250 of these tanks were produced. A new 45-ton tank, the "Chieftain", with a 120mm gun and a 710 hp multiple fuel engine is being tested, but the armor of the hull does not exceed 76 mm.

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On the whole, it may be considered that our tanks possess better combat qualities than the modern tanks of our probable enemy. However, the difference in the combat qualities of the tanks is rather small. Can this situation satisfy us? No, naturally it cannot.

Some comrades consider that the improvements in tanks that were effected in the postwar period are adequate, that they ensured the creation of a completely modern combat vehicle, and that there was no special need to seek other, more radical ways to develop armored equipment. After all, our probable enemies also have not thought up anything special in tank construction.

It seems to us, however, that the question is somewhat different. Above we determined the combat effectiveness of our modern tanks by comparing them with the tanks of our probable enemy. But it is impossible to determine fully the combat effectiveness of tanks in this way. For this, it is necessary to take into consideration other factors as well, first of all the development of antitank defense weapons and also the nature and methods for waging armed combat in ground theaters.

The postwar period has been characterized by the rapid development of antitank weapons, based on the use of shaped charges (kumulyativnyy zaryad). In the first years after the war, recoilless weapons appeared together with the Panzerfaust type of antitank grenades. This weapon was not inferior to tube antitank artillery in armor penetration and even surpassed it. By the end of the 1950s at home and abroad there appeared guided antitank missiles with a tank-destroying range of up to 2 km and more. The shaped charge of the antitank missile is capable of piercing the steel armor of any tank. Moreover, the effectiveness of fire against tanks has sharply increased because the missile is controlled by radio, by wires and by a homing head (golovka). The antitank missiles are small in size and in weight and are mobile, and therefore it is difficult to combat them, but

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it is completely possible to do so.

During the discussion some comrades concentrated all their attention on the search for shortcomings of the antitank guided missiles. Naturally, antitank missiles, like any new weapons, have shortcomings. They are only beginning to be introduced into the armament of the armies, fire with them may be conducted within the limits of visibility, and technically they are not sufficiently reliable. For example, so far they have only been tested under firing range conditions, where nothing influences the operator and he is not subjected to any danger. In combat it can be different. The operator only needs to lose his presence of mind or even to flinch and then the missile in flight will "flinch"also; it will not hit the tank. This is very important. Moreover, the speed of the missile flight is too low, the dead space (mertvaya voronka) (up to 500 m from the launching mount) is too great, and there is the need to see the tank to be destroyed, something which is not always possible. Visibility is greatly influenced by the relief of the terrain,"on paper itwas flat, and they forgot about the ravines and that one had to walk through them," and it is possible that the missile will meet various types of obstructions before reaching the target causing the missile to explode, etc. All this lowers the combat qualities of the antitank missiles. But the indicated shortcomings will be eliminated, and it would be a serious mistake to underestimate this new type of antitank weapon.

We must consider the fact that modern antitank weapons are light, mobile, and very effective in armor penetration. On the battlefield they will be dispersed, and unavoidably part of them will survive, or new units will be moved out to replace the ones destroyed, even on axes where nuclear weapons are used. Therefore, the underestimation of new antitank weapons is very dangerous, and it may lead to

the fact that in a future war our tank troops may meet such surprises which may decisively reduce their combat capabilities.

It is necessary to recognize frankly that our development of armored equipment in the postwar period proceeded without due consideration for the development of antitank weapons. This is a serious lesson, and we must not ignore it. As a result of this, the antitank missiles and other new antitank weapons with shaped charges took the lead over armor. The old method for tank development has been exhausted, and we must find a new one, a drastic path for its future development. N.S. Khrushchev personally assigned us such a task, and we must accomplish it as soon and as well as possible.

III

What direction should the further tank development take?

At the present time this question is being actively discussed, but opinions on it have differed greatly. Some comrades consider that despite the development of antitank weapons the modern tank is a vehicle completely capable of combat, one that does not require fundamental reconstruction, at least for the near future. Others, on the contrary, say that the modern tank, especially the heavy one, has outlived itself, any mass tank attack may be disrupted, and that the production of a tank is not justified economically. Therefore, it is proposed to return to the light amphibious tank or to create a new armored vehicle with a wheeled running gear of the armored-personnel-carrier-type. The foreign press has carried statements that the tank is a weapon of the past war and that for a future war a vehicle with powerful armored protection is not required.

It seems to us that it is impossible to agree [redacted]

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with either opinion. Both now and, obviously, in the future we cannot reject the tank. It has several remarkable combat qualities that permit the successful performance of combat tasks under conditions of nuclear/missile warfare. Among all the other combat vehicles the tank withstands a nuclear burst best, mainly the shockwave and penetrating radiation. This is a very important quality under modern conditions. Moreover, the tank has great mobility and fire and strike force. At the present time the missiles of operational-tactical designation have become the main fire weapon of the ground troops. Tube artillery has ceased to be the "god of war." If the tank is removed from the armament, then the fire and strike force of ground troops will be sharply reduced. One cannot conceive this matter in such a way that all the tasks of fire destruction of the enemy in a future war will be performed only by missile troops of operational-tactical designation using nuclear weapons; many tasks will still have to be performed by conventional fire weapons. Tanks are the best weapons for this. When necessary they can be concentrated on definite sectors due to their high mobility, and this ensures the necessary fire density. Therefore, a tank-type combat vehicle must remain in the armament of our army.

At the same time, the modern tank has become vulnerable to new antitank weapons; is poorly protected from shaped charges; and has insufficient antiatomic protection. Therefore, we cannot remain at the level achieved under any circumstances.

Recent research showed that there are potentialities to increase considerably the shaped charge protection of tanks. This problem is resolved by installing special shielding (ekranirovaniye) devices, the employment of combined (kombinirovanaya) armor, and the use of appropriate forms of armor protection.

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This may greatly increase the viability of tanks on the battlefield. Moreover, it will not require an increase of armor protection and consequently an increase in the tank's weight.

Increasing the tank's antiatomic protection will have important significance. It is achieved by installing special "linings" (podboy) that reduce the flow of neutrons, and also an automatic system for hermetically sealing the tank, by removing radioactive dust from the air, by creating pressurization, etc.. This ensures the protection of the tank's crew from destruction by a medium yield (30 kt) nuclear burst at a distance of 400 to 600 m from ground zero.

Recently, increased combat characteristics of the 100 mm gun have been achieved. The muzzle velocity of an armor-piercing shell of this gun has been brought up to 1015 m/sec, the same armor penetration as achieved by the British 105 mm gun. The firing range of the new 100 mm gun with a high-explosive shell reaches 15 kilometers.

The presence of a large number of tanks with guns having powerful charges and a considerable range of fire in tank and motorized rifle large units permits their use for fire from concealed positions with the goal of performing various tasks and first of all of destroying the missile mounts, atomic weapons, and other enemy objectives both in open and in concealed positions.

The acceptance into armament and the assimilation of the T-62 medium tank with the new smooth bore gun will undoubtedly increase the combat capabilities of the tank troops. This tank may successfully combat any enemy tank, using subcaliber and high-explosive antitank shells. Therefore, it is advisable to have a definite number of tanks with a smooth bore gun.

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At the present time our designers are developing a new model of a medium tank weighing 34 tons which will have a 115 mm smooth bore gun with full mechanization of loading, and this will permit reducing the crew by one man. Subsequently, the tank will also have a rifled gun installed on it with mechanized loading. This tank will have a complete antiatomic, antichemical, and antibacteriological protection and also will have armor that ensures protection from high-explosive antitank weapons of destruction. The tank runninggear will ensure an average speed over terrain (not over roads) of about 45 kph and a maximum speed over roads of about 75 kph.

A noticeable increase in the combat capabilities of tank troops may be achieved by accepting into our armament a medium tank with guided missile armament (range of fire 3 to 4 km), on the creation of which work is proceeding at the present time. This tank should destroy any enemy tank when on the move with one or two rounds.

After the new medium tanks with guided missile equipment are accepted into our armament and are assimilated, it will be possible to raise the question of replacing the T-10M heavy tank because the new medium tanks will have higher combat characteristics. However, it is necessary for us to take into consideration that our probable enemies, especially Britain, continue work on building heavy tanks with increased qualities in comparison with the existing ones.

We should concern ourselves with the problem of building a combat vehicle - a tank destroyer - with guided missile armament of the assault-gun type.

At the present time work is being done to build a half-tracked (or wheeled) combat vehicle with

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missile and small arms armament for the infantry. Such a combat-armored vehicle must have antiatomic protection and high mobility on the terrain, equal to the mobility of a tank.

This "combat vehicle", let us call it that, must have very strong armor protection, have high road qualities, and it must have a low silhouette (prizemistyy) so that it would be easy to camouflage it and would be less vulnerable to antitank guided missiles (PTURS). As for its capacity, it must carry a squad of riflemen (approximately 10 to 12 persons, including the driver and commanding officer. It must be capable of waging combat, i.e., of destroying the enemy with its own weapons, and when necessary the riflemen can leave it and in coordination with it, as well as with their own combat weapon, perform the tasks of an infantry battle. It must replace the armored personnel carrier and provide our tanks with an infantry assault group which it is now completely impossible to transport on the body of the tank.

Together with all this, we must speed up work directed toward the sensible reduction of a tank's weight, the increasing of its mobility, especially the increase of its speed and cruising range, the reduction of the crew while ensuring mutual replacement - the entire crew must know how to drive the tank, etc..

Special attention must be devoted to work on the use of plastics in tank building. Initial results received in this problem testify that plastics (plexiglass) (stekloplastika) may find broad use in building modern reliable tank-type armored vehicles.

The realization of all these primary measures will undoubtedly increase the combat capabilities of our tanks; will make them more reliable against

modern antitank weapons and nuclear bursts; and this will permit the employment of our tank troops with greater success in a future war.

We have expressed some thoughts on the building of new tanks and combat vehicles in the near future. But this by no means reduces the significance of the tanks which we have in our armament. They are quite suitable for combat use and can perform combat tasks successfully. We are firmly convinced that certain statements which appeared in the press and which express doubt about the usefulness of the tank for modern warfare are wrong. The tank continues to be a powerful weapon of modern combat and, by developing, will remain so in the future. However, it is necessary to take into consideration new conditions for employing tanks on the battlefield, in particular the possession of very effective antitank weapons by the enemy. For this it is necessary to take measures in all cases for the decisive neutralization and destruction of these weapons of the enemy, in order to decrease as much as possible the effectiveness of their operation against tanks on the battlefield.

Above we spoke of the immediate task of improving tank equipment. But this is not enough. We must also look into the more distant future. No weapon can be developed successfully if at the proper time a prospective forward movement is not determined. In relation to tanks, this problem has become especially urgent at the present time.

It is quite apparent that despite the presence and development of nuclear/missile weapons mass ground troops will participate in future wars for a long time yet. To wage successful armed combat the ground troops will have to have combat vehicles which, as far as possible, must be able to resist nuclear bursts and protect personnel from light

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radiation and penetrating radiation and also from destruction by conventional weapons i.e., these vehicles must be reliably armored. Moreover, we must have at least two types of combat vehicles: the first type is a vehicle with light armament to conduct an infantry battle ("combat vehicle"-((boyevaya mashina)); the second type should have heavier armament so that it could wage combat against any combat vehicles on the battlefield and achieve success.

The second type of vehicles of the future will apparently appear as a continuation of modern tank development. It is mainly intended for the swift exploitation of the results of using nuclear/missile weapons, for the final defeat of enemy ground troop groupings, and for the seizure of important areas and objectives. For this the tank of the future must be capable of waging successful combat against tanks and lighter enemy "combat vehicles" and of destroying his personnel and the fire weapons of the ground troops, including nuclear and antitank weapons.

It should be taken into consideration that in a future war the enemy may employ a large mass of tanks. They must be opposed by our tanks with such armament which would ensure the reliable destruction of enemy tanks. But in actuality, the combat capabilities of tube artillery are almost all exhausted. In the near future it will apparently be replaced by modern guided and homing missiles with powerful new charges.

However, antitank missiles may not be the only armament of the tank of the future. Antitank missiles are close combat weapons, which are intended mainly for combat against tanks. The tank of the future apparently must have weapons with the aid of which it would be possible to wage combat against enemy tactical nuclear weapons and neutralize the

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conventional fire weapons of the ground troops, first of all, naturally, antitank weapons over a fairly large area.

Tank troop operations will be supported by missile troops of operational-tactical designation. But in several instances this support may not be effective enough, especially when conducting mobile operations in the operational depth. At the present time the missile troops of operational-tactical designation are considerably inferior to the tank troops in mobility. We must decisively increase their mobility. If the battle formations of tank troops contain protected mobile combat vehicles of the tank type but which are capable of delivering nuclear strikes against the enemy, then the combat capabilities of the tank troops will grow immeasurably. We must work on building such a missile combat vehicle, and it should be built.

There are many other problems of a purely technical nature that require resolution: modern tank armament is becoming obsolete, and we must search for a new type of armor - lighter, economically more advantageous, and at the same time very stable and strong; we must improve the running gear of the tank so that it can ensure movement over the terrain at high speeds and great distances; we need a more powerful and more economical engine, etc. Right now we must work on the resolution of these problems.

IV

A discussion is also proceeding on the problems of the role of tank troops in a future war and especially on the organization of these troops. The most varied opinions have also been expressed on these problems. It is impossible to agree with some of these opinions because this would not move us forward but would push us back and would inflict

damage on the combat effectiveness of our ground troops.

First of all, let us discuss the role of tank troops in a future war. There is no doubt that an important role in a future war will belong to the tank troops. This arm of troops may use the results of massed nuclear/missile strikes for their swift movement into the depth and the defeat of the opposing enemy groupings more quickly and more effectively than the motorized rifle or other troops which are organized on unified principles. Together with this it would be incorrect to count on the fact that only the tank troops in their present existing organization would perform all the tasks on the battlefield, as some comrades maintain. Tank troops cannot operate successfully in a modern operation without missile troops of various designations and without close coordination with aircraft and motorized rifle troops in the main theaters of war. The successful conduct of combat operations in a future war will depend on joint, clearly coordinated operations of all arms of troops, first of all of the missile, tank, motorized rifle, and airborne troops. The tank troops played an outstanding role in the defeat of the German fascist troops in the past war, and we must not forget this. Now they must be prepared for operations under the complex conditions of nuclear/missile warfare and for the display of exceptional reliability and endurance.

On the problems of tank troop organization opinions are divided. Some comrades favor the liquidation of the tank army and the transition to a single army organization. There is also an opinion about a transition to a single division organization, the transition to the so-called unified division. These are very serious problems and cannot be simply and easily resolved. The further

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structure of the ground troops and the methods for their combat employment in the future will greatly depend on their correct resolution. Therefore, let us examine them in greater detail and more deeply.

Soon after the Second World War, and taking into consideration its experience, three basic types of divisions were created in the composition of the ground troops: rifle, mechanized, and tank; and the tank army was reorganized into a mechanized army. The rifle division, which included the tank assault regiment (tankosamokhodnyy polk), was intended for breaking through a prepared defense, and the mechanized division was intended for completing and developing the breakthrough. The mechanized army, the composition of which included tank and mechanized divisions, was intended for commitment into the breakthrough and for conducting mobile combat operations in the operational depth. This organization of the ground troops conformed to the methods for conducting armed combat in the ground theaters which were employed in the last war, and it was based on the experience of this war.

This we should not forget even now, because everything new arises from the experience of the past.

The development of the weapons of armed combat introduced changes in the methods of conducting military operations, and this in turn, naturally, required the introduction of corrections in the organization of troops. Nuclear weapons, which were received into the armament at the beginning of the 1950s brought about the most serious and fundamental changes in the methods of conducting military operations. Their further development and the appearance of missiles as a means of delivering nuclear weapons to the target and the mass employment of this weapon completely changed the method of

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breaking through the prepared enemy defense. Military operations acquired a swift and more mobile and dynamic nature, and broad possibilities for the employment of tank troops in the first echelon from the very beginning of the operation were discovered. By this time the complete motorization of the ground forces was achieved.

In connection with this, the decision was made to have one motorized rifle division, instead of rifle and mechanized divisions, and for it to have motorized rifle and tank units in its composition. The motorized rifle division is capable of successfully performing the tasks of breaking through the enemy defense, developing the breakthrough, and conducting mobile operations in the depth. Also, for operations on the main axes it was necessary to have a division with a more powerful strike force and at the same time a lighter one, a tank division, which could develop the offensive at high speeds to a greater depth and which would possess the best capabilities for waging combat against enemy tank troops.

The motorized rifle division was the basic large unit of the combined-arms army, which possesses almost the same combat characteristics, if not greater ones, as the mechanized army. Thus, naturally, the need for a mechanized army ceased. However, it immediately became necessary to have a large unit which would possess swifter, powerful breakthrough force and greater mobility than the combined-arms army. The tank army proved to be the best organization of this type. Its composition normally includes three tank and one heavy tank divisions, but its organization is not a set form, and its composition may be changed depending on the situation. The tank army is intended for performing the most important tasks in operations, which must be performed reliably in the fastest possible way.

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Lately, several significant connections and additions have been introduced into the organization of divisions and armies. The number of personnel in divisions has been sharply reduced, and the number of rear services units and establishments in divisions and armies has been reduced, and this has lightened them and has increased their mobility. In this respect, however, everything has not yet been done.

We must find ways to lighten the divisions further. First of all, we must find new means to provide the divisions with everything necessary to wage combat and also new methods to deliver and transport everything necessary for daily living and combat. The fast development of industry, the appearance of new branches of production, and new discoveries create the necessary conditions for the decisive lightening of the organs and means of supplying and feeding.

Missile subunits, armed with tactical missiles with nuclear charges, and antitank missile subunits are included in the composition of the motorized rifle and tank divisions. Missile large units, armed with operational-tactical missiles with nuclear charges, are included in the composition of the combined-arms and tank army. All this greatly increases the combat capabilities of our divisions and armies and gives them remarkable new combat qualities.

We consider that the existing organization of the ground troops meets modern requirements and that it corresponds to the nature and methods of conducting combat operations in the ground theaters in the initial period of a future nuclear/missile war. In the near future a fundamental change in the organization of the ground troops will not be necessary.

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If we compare the organization of our ground troops with the organization of the ground troops of our probable enemy, it is not hard to come to the conclusion that we have achieved better results in this matter. Our tank division and the armored division of the USA have approximately the same number of tanks, but the American division has two to three times more personnel and motor vehicles than ours. To this should be added the better quality of Soviet tanks and the presence in our tank division of heavy tanks which the American division does not have. It is true that the American armored division does have more infantry and artillery, but this makes it more cumbersome and less mobile. It may be considered that in strike force and mobility the Soviet tank division is definitely superior to the American armored division and also to the tank divisions of the other NATO member countries.

Our motorized rifle division has 1.5 to 2 times less personnel and motor vehicle transport than the corresponding divisions of the NATO member countries. In number of tanks, it surpasses the American infantry division but is slightly inferior to the British and West German divisions. The American division has more artillery while in our division there are more guided antitank missiles. Thus, our motorized rifle division is more mobile and is less vulnerable to nuclear weapons in comparison with the divisions of our probable enemy, and is not inferior to them in strike force and firepower.

We also achieved the best results in the organization of the army, and this is especially important. The armies of the NATO countries include army corps and a large number of divisions and have a complex system of control and cumbersome rear services. Our combined-arms armies, which are

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intended for operations in the Western Theater, do not have a corps control element and have much less personnel and rear services units and installations, even though their firepower and strike force are only slightly inferior to the armies of our probable enemy. The fact that there is a tank army in the composition of the Soviet Ground Troops and none in the NATO army ensures a great advantage for us in conducting combat operations under conditions of nuclear weapon employment.

Thus, it can be considered that the existing organization of our ground troops stands at a higher level than the organization of the troops of our probable enemy and that it corresponds more closely to the nature and methods of conducting combat operations in a future war. Naturally, this does not mean that we must be content and rest on our laurels. During the discussion various proposals were submitted on particular problems of improving the organization of the tank troops; some comrades proposed having single type tank regiments in the tank division, i.e., remove the heavy tank regiments from its composition; other comrades proposed transferring the motorized rifle regiment of the tank division, by battalions, into the composition of the tank regiments of this division; and proposals were also made for liquidating the battalion echelon of control in the tank divisions. All these proposals deserve attention, and they should be thoroughly analyzed and studied, and all that is best which strenthens our combat effectiveness should be used. Such a problem as whether it is better to remove the heavy divisions from the composition of the tank army and to have them in the reserve of fronts or of the Supreme High Command, and to have a single type of division in the tank army should be weighed from all standpoints.

We must work continually on improving troop

organizational structure. But in this matter great caution and discretion must be exercised. Frequent changes in troop organization do not always promote increased combat readiness, more likely, just the opposite; it weakens them because any change in troop organization is painfully experienced by the combat organism.

Can one consider that the need has arisen to create unified divisions of ground troops, divisions with a single organization? It seems to us that there is no such need at the present time.

In a future war, our ground troops will probably have to operate in the most diverse theaters of military operations -- plains, mountains, forests, deserts, and in the Arctic. This fact itself already shows that there cannot be a single troop organization for all these theaters. It is also impossible to create one type of division for the basic theater, the Western Theater. This would result in dispersing of the basic decisive combat weapons such as tanks, missile weapons, etc., and it would complicate their massing on the main axes. The economic potentialities of the state should also be taken into consideration. It would be unrealistic, inadvisable, and completely wrong to provide all the divisions with the necessary amount of tanks and other combat weapons of a decisive nature.

During the discussion, the proposal to organize a third type of division was advanced - a light motorized rifle division without tanks so that it could be used for swift transfer by air. But we have such a division - the airborne landing division. We must work on the improvement of this division, and we must find new reliable and more effective weapons and means for its armament, transport, and landing. Apparently it is time to include the new SU-85 assault guns for armament in the composition of the airborne landing division. The existing

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motorized rifle division can also be transferred easily by air transport it is true, because it has no tanks so far. Therefore, there is no need to create a light division.

Perhaps one hears the greatest number of arguments on the tank army. Some comrades propose that we abandon the tank army and have one type of army. The main argument that is advanced is usually that now there is no special difference in mobility and maneuverability between the combined-arms and tank armies and that the tank army will be unable to break away from the combined-arms army during the offensive operation. But this argument is not completely convincing. The tank army still has relatively more tanks than the combined-arms army, if we proceed from the same number of large units. But this is not the main thing. It has fewer divisions and they are all of one type, it is not as burdened with rear services and is more controllable. Consequently, in strike penetrating force, swiftness, mobility and stability from nuclear strikes, it has definite advantages over the combined-arms army, and it is impossible to disregard this. These qualities must be developed and used as fully as possible.

When resolving the problem of the tank army it is necessary to proceed, first of all, from the point of which method will be used to conduct future offensive operations. Apparently, first of all, the enemy troop grouping deployed in the theater will be subjected to massed nuclear/missile strikes. During this the front and army nuclear/missile weapons will deliver a strike over the entire depth of the enemy operational troop formation. The missile troops of strategic designation will deliver an incomparably more powerful strike against the strategic objectives in the depth of the theater. Undoubtedly this strike will also affect the groupings of the

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armed forces, especially reserves, airfields, rear services of groups of armies, the system of control, etc. We do not have a completely clear concept of what will happen as a result of such a strike. Some say that complete devastation will result and will be difficult to overcome; others say that there will not be such devastation and that considerable life and resistance will remain. Apparently both have to be taken into consideration, but mainly we must consider the huge destruction which nuclear/missile weapons are capable of inflicting and also all the consequences that arise from them. Right after the nuclear strikes the ground troop groupings will move to the offensive. These groupings will have to perform at least two basic tasks: the first, the main task, will be to advance swiftly to a great depth, into the area and beyond the area subjected to missile strikes by strategic designation troops in order to disrupt the mobilization, capture key areas and objectives, and to inflict destruction without allowing the enemy that survived to come to his senses; the second task will be to complete the total rout of those enemy forces that survive the nuclear strikes in the front offensive zones, with the same decisive movements into the depth of the enemy's country.

Today the best means for performing the first task are the tank armies in close coordination with airborne troops; this will be the basic strike force in performing this task.

The tank army may, with greater success than the combined-arms army, overcome areas subjected to nuclear strikes, rout the contacted enemy groupings, which are also very well supplied with tanks, in meeting engagements, and swiftly move to the deepest objectives for the final performance of the tasks of armed combat on the given axis. Our tank

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armies should prepare first of all for this very type of operation.

The combined-arms armies are also capable of delivering deep and swift strikes. Some of them will be directed toward achieving the final goal of the operation in coordination with the tank armies or independently. It should still be kept in mind that the combined-arms army may suffer great losses from enemy nuclear strikes and that it is larger numerically and consequently a little less mobile. All these are insignificant minuses and in no case should they dishearten and hold back our combined-arms armies which should not only strive not to lag behind the tank armies in the speed of the offensive, but should show even higher speeds and capabilities.

It should also be taken into consideration that large enemy groupings will remain in the operational depth. They will be neutralized by nuclear strikes and broken up, but they will still be sufficiently suitable for combat so that they can cause our fronts serious trouble. It is essential to rout, destroy, or capture them, i.e., to perform the second task that was mentioned above. This is also an important task. Without having performed it, it is impossible to count on the successful conclusion of the operation. It is advisable to use the combined-arms armies to rout these enemy groupings, in this way freeing the tank armies for deep strikes.

Consequently, we come to the conclusion that to abandon the tank army at the present time would be completely incorrect. In history there already was an instance when without adequate basis large tank large units (mechanized corps) were eliminated. Reality made it necessary to form them again, but this cost us a lot and time was lost. We should

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not forget this lesson of history.

Tank divisions and tank armies possess high combat characteristics such as mobility, great strike force, and relative stability against nuclear strikes. They are better able than other divisions and armies to utilize the results of nuclear/missile strikes for the swift advance to a great depth and for performing tasks of armed combat with a speed of advance up to 100 km per calendar day or more, given the appropriate organization, support, and momentum. Despite the development of combat weapons against tanks and the changes of conditions and methods of employing tank troops, they will undoubtedly play an important role in the performance of the tasks of a future war, if we are not able to avoid it.

That is how we see the most important tasks of the future development of the tank troops, their armament, organizational structure, and methods of combat employment. The main task consists of broadly developing work on the creation of new types of combat vehicles and new types of armored equipment with powerful missile armament. Until this task is performed, we cannot lessen our efforts even for a minute to improve the existing tank equipment and to improve its qualities and viability. In the development of all types of armament it is essential to adhere closely to the rule: until a new weapon is created, the existing models must be improved. Only under this condition will the constant combat readiness of our armed forces be ensured.

In the area of improving the organizational structure of the tank troops we should proceed in the direction of increasing the firepower and strike force of the large units and formations and their mobility and independence in performing

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combat tasks. At the same time, we must approach changes in the organizational structure of the tank troops with foresight, but very thoughtfully in order to avoid mistakes.

The questions of tank troop development which we have touched upon in this article undoubtedly require further thorough study and practical testing during the everyday activities of our Armed Forces.

We should like to stress once again that to a very great degree the success of tank troop operations depends on the level of the operational training of tank commanding officers and on their courage and decisiveness. The courageous and brave tank commanding officer, leading a tank army, a tank division, or a tank regiment into combat, achieves success in combat, in an operation, and achieves victory over the enemy. The indecisive tank commanding officer who is weak hearted is the likeness of death. Their place is not in the tank troops. We proudly praise such outstanding tank commanding officers as Marshal of the Tank Troops P.S. Rybalko and S.I. Bogdanov, Generals T.I. Tanaschishin, P.V. Volokh, V.I. Polozkov, and many others who gave their life for our great cause. We also praise our outstanding tank chiefs, who are still alive today, for their renowned combat deeds in our great victory. We must cherish and preserve these glorious combat traditions of our valiant heroic tank troops and learn from their traditions - act courageously, bravely, and daringly in combat and in an operation. Figuratively speaking, if the combined-arms armies are a decisive swift battering-ram, then the tank armies are arrows released from a tightly drawn bowstring; they fly swiftly to the designated target. Such must be the operations of our tank armies.

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