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# Nuclear/Missile Armament and Some Principles of Military Doctrine

by

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Universal recognition of the enormous and even decisive significance of nuclear/missile armament, as experience shows, does not exclude various opinions nor even radical divergencies in the evaluation of its influence on armed combat. Divergence of views on the principles of preparing for and conducting modern war, as well as on the structure of the armed forces naturally follows from this.

In the history of the development of armed forces there are many known instances when new equipment (tekhnika), despite its universal recognition, continued to be underestimated for a long time, and did not find its true place in the army. In addition, obsolescent equipment was over-evaluated for a prolonged period of time, thus holding back understanding of the new equipment.

Something of the sort is taking place right now in the introduction of the newest types of armament and in the clarification of their role in warfare. A great number of works and official and non-official studies have been published in many countries, in which the new weapons are evaluated and conjectures are made on their use and on the necessary reorganization of armies.

In this literature it is quite clearly shown that the agonizing process of reorganization is still far from being completed even in rough form, and that there is still insufficient clarity regarding the decisive problems.

Judging by the special literature, everything which is being accomplished in the area of restructuring and reorganization of forces, particularly of ground troops, thus far conforms well with existing, old military doctrines, principles and views on the conduct of battles, of operations and of the war as a whole. Questions regarding the duration of war, its sweep, the enlistment of human masses into the armed forces and the role of the economic potential are all examined in the light of old military theories.

In specific terms, this is expressed in the fact that the new weaponry is for the most part considered as a means of considerably increasing the firepower of the army; therefore, there is basically nothing new from the organizational point of view. A new technical means of combat has appeared - a new arm of troops is created, as was the case with aircraft, tanks, and still earlier, with artillery. The old arms of troops are modernized as much as possible and "assimilate" nuclear charges and missiles. Armies continue to consist of the usual arms of troops (modernized, of course) - plus missile troops.

In other words, the process of assimilating the new means of armament which is now taking place can be characterized as follows: proceeding from the experience of the past and taking into consideration the achievements of the present, armies are adapting nuclear/missile armament to the established views on the preparation and conduct of war.

This is a natural process - blessed by the ages - of an empirical approach to the solution of little-explored problems. Such an approach, which is the

only possible and normal one for the military science of capitalist countries, is completely unacceptable to the armies of the socialist countries, the military science of which is built on Marxist-Leninist teachings on war. Obviously, we must go faster and further both in the theory of using nuclear/missile weapons and in their production.

However, as is known, there are substantial gaps in our military-theoretical thought - "...in a number of problems we have not shown the necessary creativity, ...scientific boldness and daring, and we have long marked time".[1]

What, in our view, are the reasons why our military-theoretical thought lags behind the practical problem of organizing the army?

The first reason, an organizational-methodological one, lies in the fact that the indispensable minimum of tactical-technical information about the new means - not only ours but also the Americans' - reaches the organizations which carry on military-technical work in extremely scanty amounts. This leads to insufficient understanding of and under-evaluation of nuclear/missile weapons. Together with this, certain technical perfections and modernizations of old types of weapons are more widely known and lead to their over-evaluation under contemporary conditions.

The next reason is more complex. We received our initial information on nuclear means of warfare from American sources. These broadly showed the properties of low-yield nuclear weapons. As far as their potentialities in a full-scale war are concerned, low-yield nuclear weapons (and medium-yield bombs as well)

1. From the speech by R. Ya. Malinovskiy at the All-Army Conference of Secretaries of Primary Party Organizations.

are primarily operational and operational-tactical weapons. In our view, they are legitimately considered as a means of increasing troop firepower, and the use of them conforms well with previous principles of conducting war. Our own military thought has also lingered more than was necessary on the analysis of the potentialities of low-yield nuclear bombs and, in fact, has not approached the study of the potentialities of powerful, multi-megaton nuclear bombs.

It is clear to all that even 20 kt nuclear charges with missiles call for tremendous changes in the conduct of war and for fundamental changes in the conduct of battles and operations. But the question of what changes follow from the use of intercontinental missiles with charges of 2-5 mgt and even more, remains little-explored to the present time. The first widely published positions on these questions were expressed by N.S. Khrushchev and R. Ya. Malinovskiy in speeches at the January session of the Supreme Soviet of the USSR and later in an address by R. Ya. Malinovskiy to the All-Army Conference of Secretaries of Local Party Organizations. In the light of these widely known statements, we consider it necessary to dwell on some of the characteristics of highly powerful nuclear bombs with TNT equivalents in millions of tons (mgt).

We know from publications of the existence of bombs with a force in TNT equivalents of 1,2,3,5,10 and 20 million tons.

Calculations can be found in American reference books of the combat effects of bombs of 40,50, and 100 million t. In order to be able to imagine the military significance of such means of destruction, we will touch in passing on the potentialities of destruction and annihilation of megaton bombs, about which some materials have been published.

Below is Table 1, which shows the combat effectiveness of megaton bombs in relation to their yield (area is in sq. km.).

TABLE 1

| Characteristics | Structures | People | | | Size of radio-active cloud (sq. km. |
|---|---|---|---|---|---|
| Yield in TNT equiv. (thousand tons) | Shock wave partially destr. | Radioactive contamination of terrain | | | |
| | | up to 500r | up to 300r | up app.100r | |
| 1,000 | 300 | c.1,000 | c.2,000 | 10,000 | c.4,000 |
| 2,000 | - | c.2,000 | c.4,000 | 20,000 | c.12,000 |
| 5,000 | 9,000 [sic] | c.5,000 | c.10,000 | 30,000 | c.22,000 |
| 10,000 | 1,300 | c.10,000 | c.20,000 | 100,000 | c.45,000 |
| 20,000 | 3,200 | c.20,000 | c.40,000 | 200,000 | c.80,000 |

Note: 1. The table was compiled on the basis of foreign materials.

2. Exposure to a dose of 500r causes death in more than 50 percent of cases; radiation of up to 300r - death of up to 15 percent; the rest lose combat effectiveness for a number of months; doses of 100r cause nausea and vomiting in up to 10 percent of the cases and partial loss of combat effectiveness in the rest.



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It can be seen from the Table that megaton bombs raise thousands and tens of thousands of cubic kilometers of radioactive dust into the atmosphere. This dust settles back to earth quite quickly, contaminating thousands and tens of thousands of square kilometers with a lethal concentration and hundreds of thousands of square kilometers with a combat concentration (boyevaya kontsentratsiya). The flash (svetovoye izlucheniye) and the shock wave are devastating only at the moment of action, but the radiological factor of megaton bombs is hundreds of times more important.

As is well known, various shelters protect well against the shock wave and the flash. No shelters can - in practical terms - protect troops from the radioactive substances of megaton bombs, the action of which lasts for many days and weeks, and extends over tremendous areas.

Table 1 shows convincingly that radioactive contamination of terrain by megaton bombs can become the principal factor of combat.

Let us examine more fully the radiological action of a 20 mgt bomb on the basis of testing carried out by the Americans.

In March 1954, on the atoll of Bikini, in the Pacific Ocean, a bomb was exploded with a TNT equivalent of about 15-20 million t. During the explosion, from 30 million t. to 100 million t. of various radioactive particles of earth were thrown into the atmosphere (for 1 t of conventionally exploded TNT, 1.5 - 5 t of earth is not so very much).

As was reported in publications, as a result of radioactive fallout as early as 36 hours after the blast, the cumulative dosage of radioactive contamination in an area of 15 thousand sq. km. reached 900 r, and in an area of approximately 26 thousand sq. km. it reached 670 r.

In an operational situation, 26 thousand sq. km. can be considered as the territory occupied by a front (an area 250-300 km. wide and 80-100 km. deep). We imagine that with the correct exploitation of meteorological conditions, the covering of the territory of a front with the radioactive products of the explosion of one 20 mgt bomb would not only lower the combat effectiveness of the troops of the front, but would also necessitate their abandoning a significant portion of, if not the whole of that territory.

If, as a result of meteorological conditions, the radioactive products of the explosion have the possibility of spreading to an even greater area, then it turns out that in an area of 120-130 thousand sq. km. the level of radiation will be about 200 r, and in an area of 200 thousand sq. km. about 100 r.[1]

Perhaps the figures cited here are only the product of theoretical calculations not based on actual testing. Unfortunately not. Preparing for the testing of thermonuclear bombs, the Americans declared a danger zone in the Pacific Ocean of 130 thousand sq. km. before 1 March 1954. But as is known, Japanese fishermen of the vessel "Fukuryu maru", which was 145 km. from the point of detonation, the inhabitants of the Marshall Islands and American military personnel on the atoll of Rungelap, at a distance of 250 miles (about 400 km.) from the epicenter, all suffered as a result of the explosion of 1 March 1954.

These facts forced the Americans during the repeat tests on 19 March and 22 May to extend the danger zone to 780 thousand sq. km., that is, by six times. Japanese expeditionary vessels which were at sea from May to July established that contamination of water took place in an area bounded by $10^{\circ}$ to $18^{\circ}$ North Latitude

1. These figures were taken from the book, "Nuclear Weapons and Foreign Policy".

and 150° to 175° East Longitude, that is, an area of 1,560 thousand sq. km. Two months after the last explosion, the radioactivity of the water at a distance of 1,920 km. from the island of Bikini still exceeded by 20 times the maximum permissible dose for drinking water.

If one takes into consideration the fact that such countries as West Germany and England are about 250 thousand sq. km. in area, the meaning of the residual radiation of one 20 mgt bomb blast becomes clear from all points of view.

In our view, it should be absolutely clear from the above that nuclear bombs of great yield are above all a means of radiological contamination of vast areas with all the resulting consequences.

As was already stated, however, a bomb of 20 mgt is not maximal. If it is found to be advisable, 50 and 100 mgt bombs may be employed.

Before proceeding to further discussion it should be pointed out that usually the characteristics of shock wave and flash are given for optimum conditions. This cannot be said for radiological contamination of terrain. It is known that surface bursts increase the radiological potentialities of bombs, while air bursts decrease them. Nevertheless, test studies indicate that usually 25 to 50 percent of the high-energy particles fall out in the areas of the burst, and the rest, penetrating the high layers of the atmosphere, fall out during the course of many years and cannot have any significance for military purposes.

This means that from the military point of view megaton bombs can be even more effective (by 2-3 times) if optimum conditions for the burst are established from the radiological point of view. In order to do this, it is necessary first of all to know the most advisable heights for bursts. Apparently contact bursts of megaton bombs with a certain digging-in to

the earth will permit the raising into the air of more radioactive particles, and in such a case more of these will fall out in the area of the burst and fewer will escape into the stratosphere. Besides this, the chemical composition of the ground and soils of the blast areas can also exert a great influence on increasing the effectiveness of the blast products. Such elements as sodium, iron, silicon, and others can substantially increase the radioactive mass of particles which are raised into the air. A firm knowledge of local meteorological conditions in possible strike areas becomes of enormous significance to the proper use of powerful bombs. These conditions should be studied well in advance, and materials should be systematically amassed in such amounts that they would permit a good prediction of the meteorological conditions at any given time.

Let us examine the problem of employing powerful nuclear weapons in operational-tactical situations.

What does radioactive contamination of areas mean to combat formations of troops? As an example, let us examine the effect of bomb strikes in areas which are occupied by combat formations of troops on the defense (Table 2).

Table 2 shows that nuclear bursts will cause death by radioactive contamination for large masses of people dispersed over tremendous areas in the course of a few hours after the bursts. A division which occupies 200 sq. km. is liquidated with one 1-mgt bomb; 4-5 divisions, occupying an area of up to 2,400 sq. km., will lose their combat significance with the strike of two or three 1-mgt bombs or of one or two 2-mgt bombs, during which a large percentage of the personnel may die and the rest will have to be immediately evacuated; a field army (in the USA - up to 350 thousand men) can be liquidated as a military organism with two 10-mgt bombs. At the same time, in addition to contamination, from 4 to 10 percent of the territory (hundreds and thousands of square kilometers) would be devastated by the shock waves and by fires from the flash.

Quantity of bombs needed to create radioactive contamination of fatal and critical concentrations in areas occupied by combat formations of troops in defense.

TABLE 2

| Military Unit | Occupied Area in KM² | Number of Personnel (Authorized TO) | Number of People Per KM² | BOMBS REQUIRED | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 20 KT | | 100 KT | | 300 KT | | 1 MGT | | 2 MGT | | 10 MGT | | 20 MGT | |
| | | | | fatal | critical | fatal | critical | fatal | critical | fatal | critical | fatal | critical | fatal | critical | fatal | critical |
| Division | 200 | 14,000 - 16,000 | 70 - 80 | 20 | 2 | 6-7 | 1 | 3-4 | 1 | 1 | - | 1 | - | 1 | - | - | - |
| Corps | 2,400 | 70,000 - 90,000 | 30 - 35 | 240 | 10-15 | 60 | 4-5 | 20 | 2-3 | 2-3 | 1 | 1-2 | 1 | 1 | - | 1 | - |
| Army | 23,000 | up to 350,000 | 20 - 25 | 2,300 | 100 - 150 | 500 | 20-30 | 250 | 10-15 | 20 | 2 | 10 | 1 | 2 | - | 1 | - |

NOTES: 1) As can be seen from the table, the use of bombs with an equivalent of more than 1-2 MGT is not required against formations of troops.

2) The table is constructed from foreign source materials.

Approximately the same results would be obtained if the combat formations of troops on the offense were examined.

Analysis of the data in the Table from the point of view of effective use of nuclear bombs shows that bombs of large yield are more advantageous than low-yield bombs, both from a combat and from an economic point of view.

Let us examine an example. In order to force the enemy troops to abandon an area of 2,400 sq. km., it is necessary to carry out 240 strikes with bombs of 20 kt yield in the course of a few hours. To launch such a number of missiles in a few hours, it would be necessary to use up to ten troop missile organizations each with 1,500-2,000 men and with 300-400 vehicles of all types. Working under combat conditions, everything else being equal, such a troop organization will suffer losses proportional to the amount of its personnel and equipment.

The same area can be destroyed with only 2 or 3 bombs of 1 mgt or with 1 bomb of 2 mgt. This will be carried out /one or two words missing/ times faster and, under equivalent conditions, with losses smaller to the degree that the number of people involved are fewer and to the degree that they were in firing positions for less time.

It must also be noted that the production of 240 bombs of 20 kt is apparently considerably more expensive than 2 or 3 bombs of 1 mgt.

Does this mean that small-yield bombs are completely unnecessary? No. If bombs of megaton yield, correctly used, are capable of deciding the fates of nations and the over-all outcome of the war, then kiloton bombs will be completely effective for the destruction and elimination of individual targets, for the most part the delivery vehicles (nositel) of nuclear/missile

weapons, individual bases, and launching pads. Kiloton bombs will also be needed in operations with strategic goals, particularly when it is necessary to avoid unnecessary victims.

The existing concept that the primary form of using nuclear/missile weapons is the operational-tactical form arose in the army from earlier doctrine on warfare. This form narrows the technical possibilities of nuclear weapons, leads to an inefficient decrease in the yield of nuclear weapons and ultimately makes it necessary to have mass quantities of small-yield nuclear weapons, and hence a large number of ground troop missile units, the effective use of which becomes in itself problematical.

Even today there is a widespread opinion that a nuclear/missile weapon is fabulously expensive, that the basic raw materials used in its construction are obtained with great difficulty and in small quantities. This leads to the conclusion that the economic factor does not permit giving this weapon a sufficiently mass character. In this connection we will briefly examine the following two questions: the understanding of mass quantity (massovost) as applied to nuclear/missile armaments and the cost of nuclear bombs.

What do we mean by mass quantity as concerns missiles and nuclear equipment? This question has fundamental significance in the evaluation of the role of new means of warfare and in the understanding of the nature and peculiarities of nuclear/missile warfare. Nuclear means of warfare are so immensely powerful that a comparatively small number of them can already be considered mass.

If 100-200 atomic bombs can create a turning point in a battle and assure victory, then this number can be considered as mass for a specific goal. If, in order to win a world war, 300-400 thermonuclear bombs are sufficient, then this quantity will also be considered sufficiently mass.

Therefore, "mass quantity" should be understood not as just any large quantity, but as that quantity which satisfies the requirement or need for it to a definite degree. From this point of view as regards nuclear/missile armaments the concept "mass quantity" will mean that quantity which permits the quality of individual means of armament to be manifested in a decisive manner.

In light of this, the numbers of bombs mentioned above may be considered as "mass" for all practical purposes.

From the speech of Marshal of the Soviet Union Comrade R. Ya. Malinovskiy it follows that 100 2-mgt bombs will turn a territory of up to 500,000 sq. km. into a desert. To inflict utter defeat on a state or states, it is, of course, unnecessary to completely destroy everything. It is important to destroy the important residential centers whose areas comprise not even ten but only a few percentage points of the over-all territory. It follows that the aforementioned 100 bombs are capable of demoralizing the resistance of a state which occupies not 500,000 sq. km. but a great deal more, for example, all the West European NATO allies. In this sense, 100 2-mgt bombs is a sufficiently mass quantity, since the problem of defeating the enemy in Western Europe is solved with this number.

As a result of exercises in the USA during which strikes were delivered against 50 out of 170 typical city areas, it was calculated that these strikes by powerful bombs threatened to liquidate 25 percent of the entire population, up to 50 percent of the means of transportation and up to 60 percent of American industrial enterprises. By analogy with these figures, it follows that 100-120 20-mgt bombs can incapacitate no less than three-fourths of the industry and more than 50 percent of the population of the USA.

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Therefore, 100-120 20-mgt or 100-150 2-mgt bombs are the quantity which, if used correctly, will decide the outcome of the war.[1] With this figure we exhaust the understanding of mass quantity for bombs of given yields. To use this quantity of powerful bombs we evidently need a small number of strategic missile troop units.

The situation is different as concerns low-yield bombs. In radiological effect, the above-mentioned number of powerful bombs is equivalent to 100-135 thousand 20-kt bombs. It follows that in the case of such bombs, if the principal aims of the war are to be gained primarily by the use of low-yield bombs, the concept of mass quantity will be defined in many tens of thousands.

Now, regarding the cost of nuclear bombs. In 1954-1955 the production of one kilogram of basic nuclear material (uranium 235) cost about 20 thousand dollars. The total cost of a kilogram of natural uranium was about 100 dollars and a kilogram of heavy water, 65 dollars. Based on these prices of raw materials and on the special features of the production of the first nuclear bombs, it was established that one 20-mgt bomb cost about 100 million dollars. In recent years, important research was conducted on the use of natural uranium together with its isotopes and other fissionable materials in nuclear bombs, which would permit lowering the cost of the bomb to 2-10 million dollars.

In technical literature for the years 1958-1959 there is information to the effect that the cost of nuclear materials, and along with them, the cost of the weapons themselves had significantly decreased.

1. It appears that the liquidation of nuclear/missile bases requires a certain number of kiloton bombs of comparatively weak yield /two or three words missing/... atmosphere .../

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This gives a basis for supposing that by 1960 the cost of nuclear bombs is within the limits of from several hundred thousand dollars for low-yield bombs to several million dollars for megaton bombs. In 1959 it was reported that a nuclear charge of 3-mgt yield for the Atlas missile is valued at 2-3 million dollars.

This cost is large in itself, but in comparison with tanks which come to hundreds of thousand and airplanes which cost millions, some of them even tens of millions of dollars, nuclear weapons are comparatively cheap, particularly if the military effectiveness of the two is compared.

From the above it follows that the budgetary capabilities of the largest countries permit the accumulation of nuclear weapons in mass quantities. As concerns missiles there is obviously no doubt that at the present time the status of industry, the availability of processed special materials, the construction-technical level of missiles and guidance instruments permit the organization of mass production of all types of missiles, including intercontinental.

Judging by the foreign press, the cost of missiles in series production is placed at 2.5-5 million dollars for intercontinental, 1.2-1.5 million dollars for strategic, and several hundred thousand dollars for operational-tactical missiles.

All that has been said above about the effects of megaton bombs, about economic and productive capabilities, permits us to come to the conclusion that the nuclear/missile weapon has become (or can become) a mass weapon, and its destructive, and in particular its radiological characteristics, are actually capable of creating conditions in which the fundamental object of the war - the destruction of the enemy - can be accomplished technically in a short period of time and without overtaxing the economy of powerful industrial countries.

We believe that a view of contemporary warfare, of prevailing military doctrine and of the principles of organization of the armed forces must differ radically from views of war, not only of the pre-atomic period, but also of a war in which the operational-tactical use of low-yield nuclear/missile weapons plays the leading role. Proceeding from this, we will examine the following questions:

- the time limits (limit of duration) of a nuclear/missile war;

- the nature of the course of the initial period of war and the tasks of the armed forces in a nuclear/missile war;

- the principles of the organization of the armed forces.

The time limits of a nuclear/missile war. The history of mankind recalls wars of various durations, up to hundred-year wars. The duration of wars depends principally on the sharpness of the contradictions and the economic and technical capabilities of the warring sides. The question of the permissible time limits of a war had no decisive significance in the past. The means of warfare, the means of destruction were essentially so small in comparison with the creative capabilities of mankind and of nature that the thought of the possibility of monstrous destruction and mass annihilation of people never arose.

The question is posed differently today. It is clear from the above-mentioned considerations that if the number of nuclear weapons sufficient to liquidate human life on earth has not yet been created, it can be created in the immediate future. In this connection, the most destructive factor is radioactive contamination.

However, the process of radioactive poisoning of the atmosphere and the earth's surface cannot be

instantaneous. This process can take place in a certain span of time. Consequently, the time span from the moment of the beginning of a nuclear world war to the moment of the poisoning of the atmosphere of the globe (or a given zone of it) with a concentration of radioactive substances dangerous to human life on earth can be called the time limits of a war.

The ultimate limit of a war depends on a series of factors, namely:

- the scientifically determined limit of concentration or radioactive substances in the atmosphere;

- the quantity and quality of the nuclear devices detonated;

- the intensity of the nuclear bursts;

- the height of the bursts and their distribution over the surface of the globe, and on certain other factors.

We will not examine the above-mentioned factors in detail. For the goals of this work it is important to show that the scientific solution of the question of the time limits of war is an absolute necessity.

Obviously, the basic solution of this question depends on the definition of the maximum permissible dose of atmospheric contamination. Kissinger's book, "Nuclear Weapons and Foreign Policy", states that a doubling of the natural dose is required to eliminate all life, which can be achieved in the northern hemisphere by 300-800 50-mgt bombs or 750-2,000 20-mgt bombs. This number of bombs can evidently be built by even one state.

What conclusion should be drawn from the arguments on the time limits of a nuclear/missile war, if such a war is thrust on us? There can be only one. The main decisive phase of the war, defined as the complete

paralyzation of the enemy's nuclear strength, must be achieved in the shortest possible time; this must be much shorter than the time necessary to create a dangerous radioactive concentration. The technical possibilities for such a solution are evidently available.

A protracted nuclear/missile war with a decision in favor of one side is excluded because such a war on the strength of military logic, as past experience teaches, must be waged with increasing severity and with the use of ever more powerful and ever more numerous destructive nuclear weapons. The result of such a course of war would be equally disastrous for all warring sides.

A decision in favor of one side depends on readiness and ability to finish the war in the shortest possible time. A great deal has been said in our press recently concerning the fact that even the bourgeois military ideologists reject the theory of a short-term nuclear-missile war. Such statements have, in fact, been made in the West. But this cannot serve as a serious argument in favor of a prolonged nuclear/missile war.

Prior to the appearance of nuclear armaments, representatives of Western military thought created a large number of theories about short-term war, about blitzkrieg. It is well known that Hitler's military doctrine was based on this. Such blitzkriegs were particularly alluring against countries with inadequately developed industry or with comparatively small territory. Capitalism was deeply interested in such an approach to war because an extended war accompanied by arming of the masses in our time would very probably lead to revolutions. The experience of two world wars has already shown that both wars were prolonged and protracted. The principal reason for this phenomenon could be formulated thus: comparative equality of forces, means and potential capabilities of the warring sides in the course of a certain segment of time under conditions of comparatively weak means of warfare (destruction).

Is there anything new in this question of nuclear/missile weapons? Evidently, yes. The material base for a war lasting for years may not even exist, considering contemporary means of destruction, which substantially (by a large factor) exceed the means of creation.

How are these new conditions reflected in the interests and the ideology of the warring classes?

First of all, one must keep in mind that no normal man can be interested in the destruction of mankind. The matter is different, however, from the point of view of the ruling classes who are disappearing from the scene of history.

History has shown more than once that a dying class, a dying social order, gives birth to theories and dogmas of human destruction characterized by the phrases "apres moi le deluge" and "better be atomized than communized". For reactionary forces, doomed to perish by dint of historical hopelessness, a long war (like any other war) is not contraindicated, the more so since preparation for such a war is economically advantageous for certain monopolistic circles.

Preparation for an extended war is many times more costly than for a short war and the profits of capitalists many times higher in this case. Preparation for an extended war is conducted on the basis of the theory of maximum application of the country's economy to the needs of war and requires expenditures on all other forms of armament and other requisites of a long war as well as on nuclear/missile weapons. This facilitates an increase in the concentration of capital and in the monopolistic power of certain groups. But from the point of view of the cost of the military machine and its combat effectiveness, the nuclear/missile weapon is the cheapest and a short nuclear/missile war is relatively the most economical in expenditures on the forces of destruction. And if the nuclear/missile

weapon, in reducing the duration of war, reduces the incomes of the monopolies, then the pertinent groups of monopolists will, of course, be for a long war.

Therefore, as a result of economic reasons and partly because of the aspirations of groups connected with military production to preserve the commanding position which they hold in the economy of a country like the USA, the theory of an extended war receives wide circulation. This theory ties in well with the necessity of keeping colonial and economically weakly developed countries under the threat of war and even to thrust wars upon them.

The interests of the progressive forces of the world dictate a different approach. The material prerequisties for the victory of the socialist world over the capitalist world by peaceful means have already been created. Consequently the progressive forces are keenly interested in avoiding war. But if war becomes inevitable, the new world, naturally, must strive to keep war losses to a minimum and consequently should do all possible to keep the war short and, in any case, to finish the decisive phase of the war prior to substantial atmospheric contamination over large areas.

The nature of the course of the initial period of a war and the tasks of the armed forces in a nuclear/missile war. In examining these questions we start from the proposition that the leading capitalist states are preparing for a nuclear world war, in which they will strive for a decisive result at all costs. In technical times, such a decision means the inevitable use of the most powerful nuclear and other weapons against which the other side must use no less powerful destructive weapons within certain time limits to gain the victory.

Before the age of nuclear/missile armaments it was considered that the direct manifestation of war was armed conflict between two opposing armies of

peoples, of states, or of social classes. Contemporary technical means of warfare, as N. S. Khrushchev pointed out, dictate a different concept of the physical process of war itself. For a number of economically powerful and heavily populated states which are, however, small in territorial size, the war can end in their complete defeat and even destruction before the main part of the armed forces of these countries can enter into action. For the USA, the situation is somewhat different. The disruption of their potentialies for resistance will require more time and weapons and, obviously, it will be difficult to avoid some strikes from their side. In these circumstances, strikes in the enemy's industrial rear, and on his political and administrative centers acquire an overwhelming significance. Powerful strikes, capable of disrupting (or liquidating) the economy and the organized control of the country and the army, will naturally undermine the base of military activity and the existence of the armed forces.

Concurrently, strikes must be made on the necessary number of strategically active (or potentially active) targets (bases, launching pads, naval vessels) from which the enemy can launch nuclear weapons at our economic and political centers. In these cases, the strikes could be made with bombs of lower yields. Given the selection of the appropriate bomb yields and their technically correct use, it is possible to indicate tentatively the quantity of nuclear weapons required. We realize that defining our views on just this point in concrete terms can be most vulnerable for a number of reasons. But the importance of the problem demands this concrete definition, it requires a point of departure. In our opinion, even a mistake of 2-3 times in this case should not be embarrassing; it is important to show the possible nature of the process based on actual material.

Analysis of data published in foreign literature indicates that for a world war about 200 bombs from 1-2 mgt to 15-20 mgt and about 600-900 bombs from

10 to 30 kt (for strikes on nuclear weapons targets, if there are 300 as is reported in the press) are needed.[1]

It would seem that a total of 1,000-1,100 nuclear strikes are not many for a world war and all these deliberations may appear to be unfounded. However, it should be remembered that a similar number of strikes (chiefly by hydrogen bombs of the type detonated at Bikini) is capable of creating radioactive contamination (higher than 600 r) of an area of about 2 million sq. km. and contamination of over 50 r of an area of about 20 million sq. km. (This does not allow for the enemy's detonations of nuclear weapons.) Moreover, hundreds of thousands of kilometers will be devastated by shock waves and flash radiation. This fact necessitates a very careful approach to the use of megaton bombs in general, and particularly in Europe, where population density is extraordinarily high.

Apparently, however, the use of nuclear/missile weapons under technically optimum conditions may not require such a quantity of megaton bombs for destruction of the NATO bloc.

Therefore, it appears that just a few hundred powerful nuclear bursts will be the primary and decisive factors affecting the outcome of the war and that they will be made in the first hours and days of the war. It follows that the initial period of a war becomes its decisive period, the period in which the armed forces solve the primary technical problem of the war - to liquidate the enemy's capability to use nuclear/missile weapons, to undermine his will to fight and to weaken decisively his forces and means.

1. If enemy atomic targets are greater in number, or if these targets are specially concealed, then the number of small-yield bombs can be increased somewhat. Such an increase on the radiational situation in the world .../two or three words missing/.

The second period of war, undoubtedly protracted in time, will evidently consist of liquidating the resistance of military organisms still extant, of rendering immediate all-round aid to victims and of reconstructing the economies and state systems of the appropriate countries.

In this period, considering the scale of destruction, reconstruction work will require extended and enormous efforts by the socialist countries and the enlistment of large masses of peoples, possibly numbering in the millions.

It appears that during this period, the principal role will be played by the ground troops, aviation, and navy.

One can proceed from a different concept, according to which the primary tasks of a future world war will be resolved by ground armies on fronts in coordination with strategic missile troops, aviation, and the navy; to achieve victory it is necessary to destroy the enemy's armies and to occupy his territory; strikes by the strategic missile troops deep in the enemy rear will play an important but subsidiary role. This would mean that we underestimate the potential of powerful multi-megaton nuclear bombs and of long-range missiles, that we will have to create tens of thousands of low-yield nuclear bombs, form a large number of operational-tactical missile units, maintain various mass types of troops and a multi-million man army, and base all plans on an extended war with the inherent consequences of economic overstress and of losses many times greater than the losses of World War II.

A third concept is also possible. Keeping aside, in a technical and practical sense, the principal and decisive role of strategic missile troops, to maintain powerful ground and interacting and inter-dependent air and naval forces, which, like the ground troops would be saturated with operational-tactical missile units and constantly perfecting (by type of troops) their combat and auxiliary equipment.

This is a cautious concept calculated to finish the war in the shortest possible time, but if unsuccessful in this, to be prepared to wage an extended war with the maximum efforts of all the forces and means of the country and of coalitions of countries.

Past experience teaches us that at the beginning of all great wars, the opponents seriously overestimated their own strength and underestimated the enemy's strength. Moreover, not a single war ever went the way it was planned.

It is possible that in the course of a war a situation can arise in which the strategic missile troops of both sides will turn out, for various technical reasons, to be not entirely reliable, that they will only partially fulfill their tasks, and that the decisive effect will not be achieved. In this instance, during the time period necessary for the restoration of the combat capability of the strategic missile troops for the Eurasian war sector, the role of the ground troops and of aviation will become decisive. The role of the navy will also increase, particularly that of submarines. From this point of view, the third concept appears to be the most acceptable, despite the fact that it leads to a substantial increase in the burden of expenditures prior to the beginning of war and presupposes an even sharper increase with the initiation of war.

At the same time, if war is thrust upon us, we must be so prepared that the strategic missile troops can send sufficiently powerful strikes in the first minutes to paralyze the enemy countries and armies and to deprive him of his nuclear/missile weapons. The operations of the other types of troops during the initial period of war must be coordinated with the operations of the strategic missile troops and be subordinate to them.

From all that has been said it is obvious that the nuclear/missile weapon is primary and decisive in the present period fo time; for this reason the strategic missile troops have become the primary and decisive type of troops, with all the consequences ensuing from this fact. The situation is somewhat different as concerns the quantitative side of the question. The primary and decisive type of troops need not be and indeed will not be the most numerous. The ground troops and the PVO troops will be more numerous.

The new means of warfare, as was said earlier, bring upon the scene other types of troop formations - medical-sanitation and reconstruction formations - which have every reason to be mass formations, and to be formed and undergo training on territorial principles. In our opinion this question requires very profound investigation.

Until the recent past, ground troops were legitimately considered as the primary type of armed forces, since they carried out the principal tasks of war, which amounted to the total defeat of the enemy's armed forces and the taking of his territory. Now, when the forms of war are changing and its principal tasks will evidently not be decided on fronts in direct engagements of opposing armies, but rather in the interiors of countries, the ground troops cannot carry out the principal task of war independently.

In addition to the usual resources of combat materiel, the ground troops have missile equipment with a limited radius of operation. With these means of armament, the ground troops can neither withstand the strikes of strategic missile troops nor protect the country from these strikes. At the same time, the ground troops must be regarded as forces which, together with the air forces are capable of assuring victory in all circumstances.

Taking into account the possibility that megaton bombs may be used on the battlefield, it is necessary to make an all-round evaluation of the existing organization and the current combat formations of ground troops and of their suitability for nuclear/missile war.

As history teaches, the combat formations of troops and the corresponding organization of troops change form depending on the means of combat, and primarily on the decisive means, firepower. The more effective the fire means of war, the more profound the changes. Right up to the appearance of nuclear/missile weapons, to the degree of the strength of fire, combat formations have grown more and more deeply.../two or three words missing/.

The tendency to thin out military formations has increased in the past five years under the influence of nuclear/missile operational-tactical weapons, but contemporary organization of troops (preserved from the pre-atomic period) and under-evaluation of the new conditions of conducting war fetter and retard this tendency.

It appears that combat formations of ground troops can become sufficiently vital and combat ready through fulfillment of the following conditions:

- increasing the combat independence (autonomy) of all organizational levels (zveno) of troops, and particularly of the lower - the tactical ones;

- increasing the firepower of tactical elements of units and large units;

- substantial increase in the speed of moving of troops;

- a sharp thinning out of personnel and equipment in combat formations.

Increasing the combat independence of all levels (zveno) of the troop organism is possible by weakening or eliminating the mutual dependence in combat (but not cooperation) between organizational elements (yedinitsa) of troops. The principles of standardization of the means of combat and auxiliary equipment, of organizational autonomy and of a broad independence in carrying out combat missions, must underlie army structure from the primary cells (yacheyka) through all succeeding levels.

Organizationally, it appears advisable to create units (chast) composed of interchangeable, uniform, primary tactical elements (yedinitsa). The creation of regiments of ground troops composed of elements which have high firepower, are completely mobile, tactically independent, and low in personnel composition, and which in case of loss can be easily replaced by similar ones, must have a positive effect on the viability of combat formations.

An increase in speed of movement can be achieved by full mechanization of troops, which would increase this speed by several times in cross-country, as well as in road, movements. Movements of large combat groups of ground troops by aircraft must become common and be applied in the very broadest dimensions.

* * *

Existing military doctrines are built on the following basic principles:

- a country's entire economy and the country as a whole prepare for war beforehand;

- calculations are based on a protracted war and on mass armies which will enlist the greatest possible number of the healthy male and female population;

- victory or defeat in war is decided on fronts of opposing armies; the strength of armies is determined in the final analysis by the viability and power of the rear;

- the theaters of military operations are studied from the standpoint of the decisive significance of frontal combat of armies, and in this connection, plans for achieving war aims are worked out which take into account the factors of time, space, forces and means; the capabilities of enemies and allies are studied in this same manner;

- military operations are based on principles of seizure of the initiative, concentration of maximum forces and weapons on the main axis, on the selection of the most advantageous time for initiation of operations and for delivery of the main strike;

- the achievement of the basic goals of war absolutely presupposes the total defeat or destruction of armies and the seizure of the most important parts or all of the enemy's territory.

In light of the new quality of nuclear/missile armament it can be said that the above-listed principles of contemporary military doctrine are subject to radical review. Some of the principles will lose their significance entirely, others will take on a different content.

New doctrines must be built on the basis of the potentialities of mass nuclear/missile and radio-electronic means of warfare. Their principles must reflect a new approach, a new understanding of the dimensions of time, space, destructive forces, and forces of resistance.

The new military doctrines must proceed primarily from the principal and decisive role of nuclear/missile strategic weapons in war, and, consequently, from the principal and decisive role of the type of troops armed with these means of combat.

Basic principles of the new doctrine could include the following propositions:

- the contemporary power of the forces of destruction is immeasurably greater than that of the forces of creation;

- the nuclear/missile weapon is a mass type of weapon, is relatively economical, and, from the combat point of view, it is the most effective;

- the range of nuclear/missile weapons ensures their reaching any point on the globe; in this connection, their accuracy satisfies practical requirements;

- the theater of military operations is the entire globe;

- the primary task of the armed forces in war (from our point of view) should not be the seizure of territories, but of depriving the enemy of the possibility of using nuclear/missile weapons; in case of necessity, temporary occupation is permissible;

- a nuclear/missile war must be short-lived; its active phase can be measured in days or weeks;

- the time limits of a war must be determined by the power of the nuclear weapons, and the intensity and number of bursts which will not cause a dangerous saturation of the atmosphere and of the surface of the globe or the expanse of our country, or allied and non-combatant countries, with radioactive substances.

In our opinion, investigation of the questions connected with the elaboration of military doctrines and a discussion of them within definite limits must be considered the most vital necessity for contemporary military thought. It is in this light that the present article offers itself as a means of posing the question. Moreover, it seems to us that the time has come not only to exchange views on these questions through articles in journals, but also to cooperate in every way in the creation of fuller works.