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CENTRAL INTELLIGENCE AGENCY  
WASHINGTON, D.C. 20505

8 April 1976

MEMORANDUM FOR: The Director of Central Intelligence  
FROM : David H. Blee  
Acting Deputy Director for Operations  
SUBJECT : MILITARY THOUGHT (USSR): The Employment  
of Biological Weapons

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article examines the state of development of biological weapons by the United States, prospective targets, methods of employing these weapons, and the factors involved in planning an attack. The biological warfare means believed to be in the American inventory include lethal and disabling disease pathogens and chemical defoliants, which may be employed in operational or tactical situations or for sabotage. This article appeared in Issue No. 2 (72) for 1964.

2. Because the source of this report is extremely sensitive, this document should be handled on a strict need-to-know basis within recipient agencies. For ease of reference, reports from this publication have been assigned

DAVID H. BLEE

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## Intelligence Information Special Report

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SUBJECT

MILITARY THOUGHT (USSR): The Employment of Biological Weapons

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 2 (72) for 1964 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is Colonel of Medical Service A. Vorobyev. This article examines the state of development of biological weapons by the United States, prospective targets, and methods of employing these weapons. The biological warfare means believed to be in the American inventory include lethal and disabling disease pathogens and chemical defoliants, which may be employed in operational or tactical situations or for sabotage. Disease pathogens may be dispersed by atomizing them through the use of spraying equipment, bombs, and missiles, or may be spread through infected insects. Unmanned aircraft and balloons are mentioned as delivery vehicles. The author also examines the effects of meteorological conditions on the employment of biological weapons, and the factors involved in planning an attack.

End of Summary

Comment:

[REDACTED] The SECRET version of Military Thought was published three times annually and was distributed down to the level of division commander. It reportedly ceased publication at the end of 1970. [REDACTED]

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The Employment of Biological Weapons

(According to American Information)

by  
Colonel of Medical Service A. Vorobyev

Current United States efforts toward the development of biological weapons employing casualty-producing pathogenic microorganisms are given just as much attention as the development of missile/nuclear weapons and other means of armed warfare. Statements by American military leaders reveal that this defensive weapon plays a considerable role in the aggressive plans of the Pentagon. According to the chief of the scientific research and experimental design operations of the US Army Staff, General Dick, chemical and biological weapons, as well as the means of protection against them, will be further developed in 1970 in the US.

In recent years the Americans have expanded considerably the area of consideration of the problems of biological weapons. Whereas earlier (in the 1950's) attention was paid primarily to the characteristics of the probable means of biological warfare -- pathogenic microbes, in recent years the questions of their combat employment have been studied as well. The most important questions of the use of biological warfare means were reflected in the field manual of the US Army, "Operations" (FM 100-5), published in 1962. In the same year there appeared for the first time the special field manual FM 3-10 "Chemical and Biological Agents Employment", which gave the specific information needed for planning and executing a biological warfare attack. These regulations, as well as other literature, considered the problems of organizing the materiel-technical support of troops in connection with the employment of biological warfare means. Having solved the specific technical problems of developing and producing biological weapons, the Americans are moving on to the next stage in mastering them -- training the troops and bringing them up to a state of constant combat readiness for biological warfare.

The American command views the biological weapon primarily as a means of mass destruction of personnel over large areas in the dispersed battle formations that are characteristic of modern warfare.

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The possibility of mass destruction of personnel with a relatively small expenditure of biological means is explained mainly by the small dosage of microorganisms required to infect humans, as well as by the fact that a biological aerosol can be transported by the wind a great distance from the site where the biological preparation was dispersed. For example, to infect a person with tularemia, the pathogen of which is being developed by the Americans for military purposes, requires that the person inhale with the air only about 10 microbes; it may also be pointed out that only one bite of a mosquito infected with the yellow fever virus will cause the person bitten to contract the disease.

American publications point out certain peculiarities of biological weapons which influence their combat employment. In particular, they emphasize the slow effect of these weapons on the infected persons because of the incubation period of the diseases that are caused by the disease pathogens. The length of the incubation period of the diseases studied for military purposes in the US fluctuate from several hours (for botulism) to several weeks (for brucellosis). When the tularemia pathogen is used, a massive infection of enemy personnel will be noticed within 3.5 days, yellow fever within six days, and Q-fever within 15 to 18 days after the biological warfare attack. If biological warfare means are used to destroy animals and plants, the effect on the country and its armed forces will be much slower. Thus, if crops are destroyed, even over a large area, a shortage of foodstuffs will not occur until the reserves of agricultural products in the country have been exhausted.

The second peculiarity of biological weapons is the fact that when they are used where the belligerents are in close contact there is a certain danger that one's own troops may be destroyed. In the first stage of the study of biological warfare means such a danger was associated primarily with the possibility of the outbreak of mass epidemics which could spread even to the troops employing the biological weapons. At the present time it is thought that the destruction of one's own troops can happen primarily as the result of an incorrect choice of the limits of dispersion of the biological preparation and, as a consequence of this, the spreading of the aerosol to the area of deployment of the troops who are executing the biological warfare attack. In the field manual, "Operations", it is pointed out that, in view of the above peculiarities, biological weapons are in general more suited for the destruction of strategic targets. However, these antipersonnel means also can be used on the battlefield, i.e., for tactical purposes.



Here it is pointed out that the diseases caused by a biological warfare attack will by no means in all cases spread from infected persons to healthy persons in the manner of epidemics. Such an assumption is based, apparently, on the fact that many of the diseases being studied by the US for war purposes (for example brucellosis, tularemia, botulism) as a rule are not transmitted from person to person. Because of the slow effect of the pathogens on personnel, if biological weapons are to be employed against operational-tactical targets, it is considered essential to make a precise calculation of the time involved, so that the appearance of mass sickness among the enemy will coincide with the initiation of aggressive actions by one's own troops.

As the field manual, "Operations", points out: "The employment of chemical and biological weapons has the greatest effect when it is coordinated with the scheme of maneuver, with other types of fire, and with plans for conducting special actions, for example, setting up obstacles. Such employment of chemical and biological weapons produces the maximum effectiveness of the action of fire and maneuver." (p. 117).

From the American point of view the most favorable targets of strategic value for the employment of biological weapons are:

- strategic reserves of the enemy and the centers for the training of these reserves;
- strategic missile bases and the Air Defense Forces of the Country;
- the most important transportation centers (major ports, railroad junctions, airports), and troop supply and unloading stations;
- important industrial and administrative centers, as well as the main areas of agricultural production.

The massive spreading of infectious diseases in the interior of a country can disorganize the existing strategic reserves, make it more complicated to man them with conscripted contingents, can disrupt the normal operation of industrial enterprises, transportation, communications and administrative facilities, and, by carrying out sabotage together with the employment of biological weapons, can incapacitate the personnel of major staffs and important civilian institutions.

According to the information in American manuals, for operational-tactical purposes biological weapons can be used with the mission of wearing down the enemy forces and reducing their numbers during the preparation for any large-scale offensive, or in a defense. The most favorable targets for the employment of biological warfare means are the



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operational reserves of the enemy, concentrations of troops at ports and airfields of disembarkation, bypassed pockets of enemy resistance, large supply centers and transportation lines.

In the case of a mobile defense, biological warfare means can be employed against an enemy who is in the immediate vicinity of the forward edge of the battle area. During the time an individual position is being defended, the destructive effect of the pathogens may not reach the maximum level. Nevertheless, in the course of the entire defensive operation the enemy will be satisfactorily weakened as a result of the large-scale sickness of his personnel.

In the view of the Americans, the propagation of diseases and the contamination of various military rations and materiel-technical supplies by pathogenic microbes as the result of a biological warfare attack provide an acute disruption of the operation of the enemy's operational rear area. The biological warfare decontamination of contaminated objects and the decontamination treatment of personnel require considerable time and a great number of forces and means; the rear services in this case will be additionally encumbered by the necessity of supplying the troops with decontaminants and the equipment for using them.

Besides the disease pathogens, chemical defoliants (classed as a biological weapon in the US) can be employed for operational purposes. These defoliants cause the deciduous crowns of trees and shrubs to fall and thereby reveal the location of enemy troops. At present the Americans are using such means on a wide scale in South Vietnam in an attempt to expose the location and lines of transportation of the partisans.

The best weapon for operational-tactical use is the biological aerosol, which can spread over a large area and penetrate any unsealed shelter. The Americans believe that biological warfare means will find wide use in operations against partisans based in areas (mountains, swamps) that are difficult for troops to negotiate and, as a rule, insufficiently supplied with the required means of protection.

Biological weapons can be used for both strategic and operational-tactical purposes in conjunction with other types of weapons according to an overall plan for combat actions. By their capability to destroy targets over large areas, biological weapons can increase the scale of destruction of personnel achieved by employing nuclear or chemical weapons. In individual cases where personnel must be incapacitated without destroying valuable materials, the use of biological weapons alone, without

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the use of other means, may prove to be the most expedient.

When training troops in the planning and execution of a biological warfare attack, the Americans emphasize the importance of the correct choice of biological weapons and of methods of employing them, delivering them to a target, and assessing the meteorological factors and terrain conditions. In each specific case the choice of disease pathogens is determined by the length of the incubation period, their stability in the environment, and the severity and duration of the diseases caused by them. For tactical purposes, the disease pathogens with short incubation periods and which are not transmitted from one individual to another obviously would be used for the most part. In the case of strategic employment of the pathogens against the deep interior of a country, the length of the incubation period would not play an essential role, whereas the ability to spread in the form of epidemics would be considered a positive factor by the attacking side. In the US the biological warfare means are classified in two categories:

-- pathogens with lethal effect, that cause those diseases that terminate in death if timely and correct medical treatment is not available;

-- pathogens that disable personnel; they cause diseases that rarely end in death but do exhaust an individual and rob him of his ability to work for a certain period of time.

American specialists believe that, for every case, those pathogens should be selected which will provide the greatest effect under the conditions of the specific combat situation. In particular, they point out, the second category of pathogens will be used against targets where a civilian population predominates (particularly of friendly countries), and also in certain local wars where large casualties would not be desirable for political reasons.

Disease pathogens can be dispersed by the atomization of the preparation in the air (creation of a biological aerosol or a biological cloud), as well as by means of infected insects. As they point out, the method used most is that of atomizing the biological weapon in the air, since that ensures the destruction of personnel over large areas immediately at the moment of attack and independent of further spreading of the diseases from the infected to the healthy.

The Americans consider acceptable, and are also developing, the method of employing pathogens through infected insects. However, the possibilities of this method are limited by the biological characteristics

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of the vectors: low stability in storage, and the necessity of strictly determined habitability conditions for sustaining stability. Thus mosquitoes infected with yellow fever will attack a person and, consequently, infect him only if the temperature is between 16 and 39 degrees centigrade. In order to increase the possibility of using infected insects for military purposes, the US is conducting work on the cultivation of those varieties that will remain active even at very low temperatures (for example, seven degrees centigrade). As a positive factor in the employment of infected insects the Americans point out that with this method, under favorable climatic conditions, it is possible to create a nidus of long-term infection in an area where enemy troops are deployed (island, isolated region) and thereby rob them of the ability to resist. This circumstance is explained by the fact that the insects that have been scattered within the region can survive a long time (tens of days) in the environment and continue to infect people.

The atomization of the biological preparations in the air can be done with biological bombs, spraying apparatus mounted on aircraft and certain types of missiles, by means of biological sea mines and other devices. The US places the main emphasis on working out the problems of biological warfare attack from the air.

Depending on the combat situation and the task assigned, the biological warfare means may be atomized directly over the target or beyond its limits on the windward side. In the first case, the bombs dropped on the target, by bursting upon impact with the ground, create the numerous point sources of the aerosol. These sources, by mixing when there is a flow of air, create a dense biological cloud that covers the target area and causes the infection of people.

In the second case, the atomization is done with special devices from aircraft or also by means of biological bombs. The latter are dropped along an established line on the windward side of the target and create a belt of contaminated air, which is considered to be a linear source of aerosol at the surface of the earth. The cloud that develops is uniform (if the terrain is open and level); it drifts with the wind into the target area, contaminating the ground level of the atmosphere.

When the preparations are atomized from an aircraft a linear source of aerosol is produced that is elevated above the surface of the earth. In this case the biological cloud is at first at a certain altitude (depending on the flight altitude of the releasing aircraft) and may not cause infection. However, as it drifts toward the target, if the line of release





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has been selected correctly, the cloud will descend into the ground layer of the atmosphere and produce infections in people. The higher the altitude from which the biological warfare means is employed by the atomization method, the more widely the biological cloud will spread, and the more complicated will be the calculations associated with the damage to the target. For this reason a biological warfare attack obviously will be executed from low altitudes.

In the view of the Americans, the use of biological weapons by means of atomizing the biological preparation through the bursting of warheads directly above the target is best done when the target is relatively small in size (for example, several hundred square kilometers) and when precise data are not available on the direction and force of the wind in the target area.

Atomizing the substance beyond the limits of the target from the windward side is favorable for large areas when precise data are available on the meteorological conditions. In this case the attack will surely have a great element of surprise. As shown in the US Army field manual, FM 3-10, the air over an area several thousand square kilometers in size can be contaminated by the atomization of the load of biological warfare means from one delivery vehicle (aircraft or missile).

One of the main principles that the Americans keep in mind in the development of biological weapons is that these weapons must be delivered to targets by the same means as other types of weapons. In the opinion of the Americans, the development of special means of delivery is justified only if the inventory models of these means of delivery do not satisfy the necessary requirements (for example, do not guarantee a casualty-producing concentration of the preparation at the target, or satisfactory range of dispersion of the preparation). On the basis of the above-mentioned principle, the Americans are establishing the characteristics of the types of biological weapons applicable to the existing means of delivery and are modernizing them as these means are developed. Thus the first biological bombs and clusters accepted into the US inventory in the early 1950's are designed for employment from aircraft with speeds on the order of 700 kilometers per hour. At the present time in field tests the biological warfare means are delivered to targets primarily by B-52 bombers. It is also considered possible that biological warfare means can be released from other types of aircraft (for example, fighters) if the execution of the assigned task can thereby be ensured.

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The Americans have developed a method of employing biological warfare means by using missiles. The warheads of various missiles can be filled with small biological bombs or containers and the corresponding apparatus for atomizing the preparation. Special variants of warheads containing small biological bombs have been developed for the Honest John free rocket and the Corporal guided missile. In the literature we find information on the possibility of using the Sergeant missile and certain cruise missiles for the delivery of biological weapons to targets. Many other types of missiles that are available and under development in the US armed forces may also be suitable for this purpose. In the case of several missiles a determination has been made of the possible areas over which they can infect people with the biological warfare means they carry. For example, the Honest John free rocket with a warhead containing small bombs with tularemia preparation will ensure contamination of the air over an area from 70 to 380 square kilometers in size.

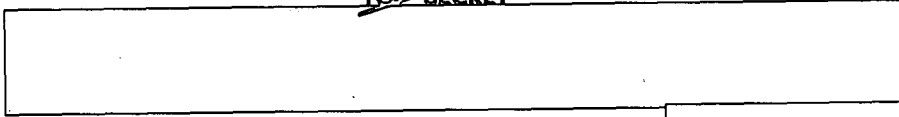
For the delivery of biological weapons to targets the US Army command has approved the use of lightweight radio-guided aircraft similar to the unmanned reconnaissance aircraft SD-2, SD-4 and SD-5, which are in the army inventory. Such aircraft can lift several hundred liters of biological warfare preparation on one sortie and atomize it over a considerable area (from several hundred to thousands of square kilometers).

For a biological warfare attack from the air, the Americans also intend to use free unguided aerostats (balloons). This method of attack is most feasible for large areas such as the large areas of cultivation of agricultural crops.

In addition to the means of attack from the air, the US is developing various means of delivering biological weapons for use by the ground forces (for example, backpack sprayers) and the navy,

The Americans are also studying sabotage methods of employing biological weapons. The execution of these methods is facilitated by the variety of biological warfare means, the difficulty of detecting the disease pathogens, and the small amount of biological preparation required to contaminate one target or another. The nature of the sabotage operation with the use of the pathogens can be quite varied: contaminating food products, water in water supply systems or reservoirs which supply the population, atomizing biological warfare means in living areas through the ventilation system, etc. If biological warfare means are sprayed from an automobile driving past a large staff or other important facility in the rear of the enemy, the people working in this facility can be

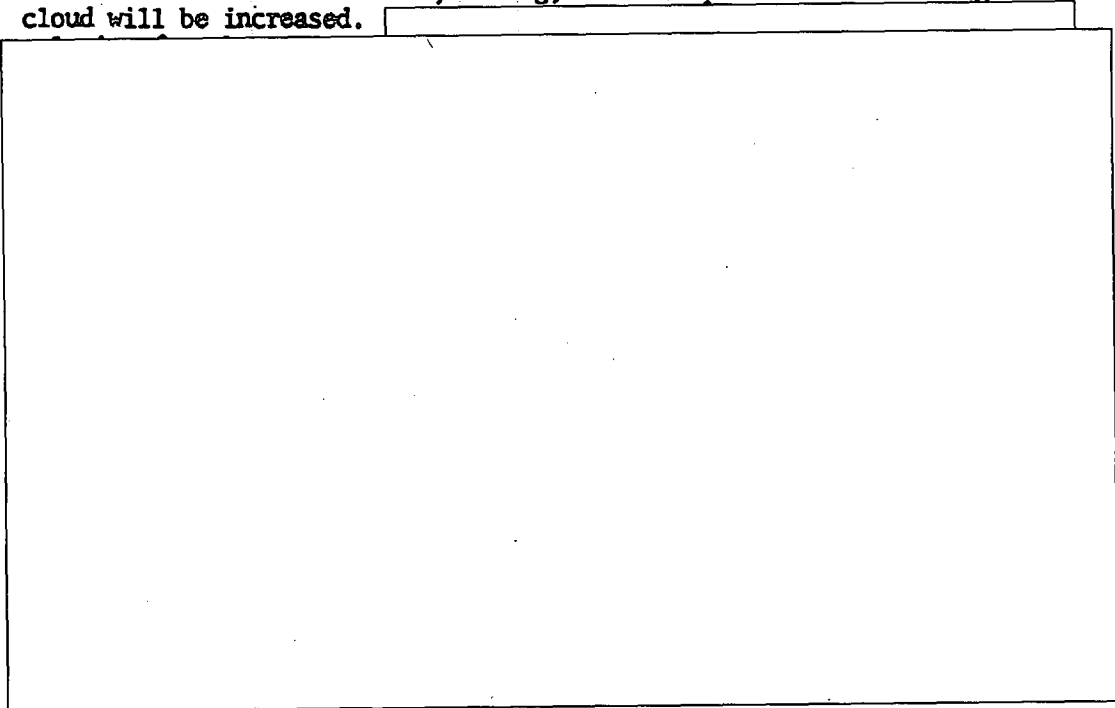
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incapacitated. Biological warfare means also can be disseminated by a saboteur with a backpack sprayer or other device filled with the preparation. For purposes of maintaining secrecy it is possible to spray the preparation some distance from the target selected for the attack, since the aerosol is transported a considerable distance by the wind.

In all cases of the planning and execution of a biological warfare attack, a careful estimate is made of the meteorological conditions (wind velocity and direction, degree of stability of the ground layer of the atmosphere, air temperature and humidity), terrain conditions and other factors (for example, the degree of protection of the enemy personnel) which influence the effectiveness of the employment of biological weapons.

The wind determines the direction and area of dissemination of the biological cloud. The greater the velocity of the wind, the farther the viable microbes will be separated from the spot where the preparation was released. If the wind is very strong, the dissipation of the biological cloud will be increased.





As a rule, pathogenic microbes are more stable at low temperatures and high air humidity. The nature of the terrain and the presence of precipitation in the form of rain, snow, or fog influence the dissipation of the biological cloud and the process of the settling of the aerosol. Rain washes the aerosol particles out of the air, thereby reducing their concentration. When the cloud moves over a wooded area the aerosol particles settle on the crowns of the trees and, in populated places, on buildings.

It is well known that the mass destruction of an enemy who is provided with means of protection is extremely difficult to carry out. According to American data, the losses from biological weapons employed by the method of atomization in the air are reduced 90 percent, other things being equal, if correct and timely use is made of gas masks. Immunization of personnel can cut the losses in half. At the same time we should keep in mind that immunity to diseases as a result of immunization is distinguished by its exceptionally high specificity, i.e., people acquire immunity only to those diseases against which they have been inoculated with the specific vaccine. In view of this, particular importance is ascribed to the problem of timely discovery of enemy plans for employing biological weapons, which can provide enough time to administer inoculations precisely against those diseases whose pathogens are intended by the enemy for biological warfare attack.

The planning of a biological warfare attack includes a determination of the numerous data that characterize the expenditure of biological warfare means for the destruction of targets, the limits of atomization of the preparations, the range of dissemination of the biological cloud, as well as the expected level of losses among the personnel of the enemy. It should be pointed out that obtaining such data involves very complex calculations and an appraisal of a great number of interdependent values. Thus, the expenditure of a biological preparation to destroy a target depends on the characteristics of this preparation, the method of employing it, the area of the target, meteorological conditions, the level of losses in enemy personnel that the attacking side reckons to achieve, and many other factors. Such calculations can be made only by highly qualified specialists working with modern electronic equipment. For this reason the US has developed and introduced into the troops special nomograms and graphs which simplify to a maximum degree the production of the necessary data. Thus the calculations become accessible also to the people doing the actual planning for the employment of biological weapons.



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In the planning and execution of a biological warfare attack much attention is paid to ensuring the safety of one's own troops. For this purpose the line of safe deployment of the troops is computed, plotted on a map and established on the terrain. The troops taking part in the biological warfare attack can cross this line (and approach the area where the biological preparation is released) only in the case of an extreme necessity dictated by the combat situation, and only if protective measures are employed.

At the present time the US has determined the general principles for the employment of biological weapons and the procedure for supplying them to the armed forces. A committee of the Joint Chiefs of Staff decides the main questions in this regard. Once the appropriate authorities have decided that biological weapons will be employed, they may be used independently by the command of the field army or army corps within the limits of the theater of military operations.

All the branches of the US armed forces now have such an organization that will allow them to use chemical and biological weapons independently or jointly. If the ground forces have to use biological weapons to destroy a target that is beyond the range of their own delivery means, the ground forces may obtain support from the air or naval forces operating within the particular theater of military operations. The request for such support indicates the nature and location of the target, the purpose and expected result of the use of biological weapons, as well as the deployment of one's own troops in relation to the selected target.

The planning of the biological warfare attack in accordance with the concept of the command is executed by the chemical branch of the staff of the corps or higher formation in conjunction with the operations and intelligence branches. The plan for the employment of these weapons is an integral part of the overall operational plan of military actions within the theater.

The volume of production of biological weapons, the development of strategic reserves of the weapons, and their distribution among the theaters of military operations are established by the committee of the Joint Chiefs of Staff in accordance with the war plans. Within a theater of military operations the weapons are distributed by the command among the armies (corps), and the necessary reserve is apportioned. The commander of an army (corps), having received biological warfare means, may determine independently the time and targets for their employment in accordance with the overall plan of military actions in the absence of special instructions

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from a higher command. Within the armed forces, the direct planning of the supplying of troops with biological warfare means is done by the logistics branches (directorates, sections) of the staff, whereas the storage of these weapons in all stages of supply is under the control of the logistics departments in conjunction with the departments for operational matters and combat training.

From the factories the biological warfare means are transported by air, railroad, or truck to the depots for chemical, biological and radiological weapons of the Army Materiel Command for the continental United States, where the warheads and other means of employment are charged with biological preparations. Then the weapons are taken by air or ship to the base depots for special warheads in the theater of military operations and from there, via army (corps) special weapons supply points, they are delivered directly to the units that carry out the biological warfare attack. In view of the fact that biological warfare means lose their casualty-producing capability to some degree during storage, we may assume that they will not be kept in storage at depots for long periods of time either in the US or in a theater of military operations.

If necessary, biological weapons may be delivered to the units and large units directly from the factories or from the depots of the Army Materiel Command. At the present time, it is planned to supply troops with biological weapons within a theater of military operations through those channels that supply the troops with nuclear weapons, i.e., through the base depots for special warheads and the supply points for special weapons. At the same time the question is being debated regarding the establishment of special channels for supplying troops with chemical and biological warfare means so as not to overload the subunits engaged in the delivery and storage of nuclear weapons.

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