

# Biological Weapons

Translated and digested by the MILITARY REVIEW from an article by Doctor Eberhard Krauss in "Truppenpraxis" (Germany) Nr. 3, 1957.

IN FORMER times some armies lost more men by disease and epidemics than in combat. In Napoleon's retreat from Russia, for example, his troops suffered greater losses from diseases than from the cold or the enemy. In World War I there were 150,000 people who died in Serbia from the spotted fever. Those epidemics often have played a militarily important or even decisive role. In recent wars a great deal of attention has been paid not only to the enemy but also to the omnipresent source of mass epidemics. Every German soldier stationed in the Russian theater will remember his periodical inoculations, and those stationed in the Mediterranean area will recall their daily atabrin pills. These and other preventive measures helped to reduce the danger of epidemic diseases to a minimum.

The possibilities of the use of epidemics as a means of warfare against the enemy are not farfetched. One might transfer and introduce the disease artificially into the enemy's army and weaken his manpower considerably. With this thought, which actually occurred early in history, "germ warfare" was born. The aim was to hurt the enemy by the introduction of the disease directly into his body.

This objective could be attained only by employment of biological means, that is, means produced directly by nature (as opposed to the artificially complex explosives or combat gases created in laboratories). Today the term "biological warfare" includes a score of objectives. It is directed against human beings and also against animals and plants. The aim is either to destroy his food or to create a direct danger to him through animal epidemics.

There are several means of biological

warfare. Among these biological weapons are:

**Microorganisms.**—This group includes bacteria and virus already known in everyday life as sources of diseases. An example of bacteria is typhus. Examples of virus are the common cold, and foot and mouth disease.

**Bacteria poisons or toxins.**—Taken from cultures of bacteria are such poisons as the toxins of the *botulinus*, a bacteria responsible for meat poisoning. Its toxin belongs to the strongest known poisons.

**Animals of higher order.**—Insects are known as carriers of diseases (mosquitoes transferring malaria, for example). This group also includes rodents.

**Fungi.**—These cause plant diseases (particularly the fungi causing blight or smut).

In addition to those actual biological weapons, that is, weapons which have a biological source or basis, we may add certain others produced in laboratories such as the "plant poisons." These poisons may, if properly employed, destroy the crops of the enemy prematurely. (The antiweed chemicals offer a good example of the task range of these plant poisons.)

Certain qualities are necessary to make these biological weapons effective. The bacteria and virus have to be highly infectious, they must be able to stay alive for long periods of time under unfavorable conditions in combat areas, and they must be suitable for mass breeding. Toxins and plant poisons must be very effective in small or low concentrations. These are the factors and conditions that limit the great number of otherwise suitable organisms and substances to be employed in combat.

It is obvious, on the other hand, that this facilitates the defense.

The employment of biological weapons may be carried out by plane. It is possible to release them in bacteriological bombs or as a spray. Both systems have their advantages and disadvantages. Employment in artillery shells is possible but not very probable. The introduction by sabotage, however, must be taken into serious consideration in a germ warfare. Here, it might be used very successfully to poison foods or water. Another probability is the introduction of animal epidemics by sabotage.

### Defense

Defense is based upon the detection of the biological weapon itself or the detection of the employment. This poses great difficulties, however, since detection and identification of the employed germs is only possible under a microscope. The actual outbreak of a disease often will be the first sign of their presence. This will be only after days of the original employment, as there is a certain interval (incubation time) between the infection and the appearance of the disease. In order to avoid any further loss of precious time, it will be necessary, therefore, to report immediately and under all circumstances the outbreak of any infectious or unknown disease. Only then can tests begin in special laboratories built for the detection of such war agents. These tests may prove or disprove suspicion of employment of biological means of warfare, since the possibility exists that the disease may be a natural infection.

Naturally, there may be indications of employment of biological weapons even before the actual outbreak of the disease. If the airdrop of bacteriological bombs or the spraying of fog or liquids from planes has been observed, employment of biological weapons must be suspected. Other indications are humid spots in otherwise dry areas (this also may be caused by a ground

contaminating agent), or the abnormal discoloration or withering of plants.

A rise in the number of sick and dying animals is an alarming sign. The fact must not be overlooked that some dangerous animal diseases also may be dangerous to man (for example, hoof and mouth disease). The poisoning of wells is difficult to detect by human senses, but poisoned food may be discovered more easily since it often spoils in the presence of disease-carrying organisms.

In all cases where there is suspicion of a biological attack it will be advisable to collect samples (earth, water, food) for immediate analysis in competent laboratories. This will be essentially the task of the biological defense personnel of the company, but every soldier should have a basic knowledge of these matters.

### Preventives

The defense depends upon the biological weapon employed. It is mainly a responsibility of the army medical service so far as the soldiers are concerned. By preventive measures, however, the troops can make the success of a germ warfare attack unlikely. Above all, personal hygiene is important.

Strict cleanliness of body, clothing, and living quarters, even under combat conditions, will reduce the danger of infection to a minimum. Cleanliness always is desirable, but under biological warfare conditions every soldier must become a "fanatic of cleanliness." Water and soap will be the best weapons of the individual against this enemy. Good health is of great value. A healthy, strong organism easily withstands an infection that would overcome a weak man in short time. Every soldier has to take advantage of every means and chance to keep himself fit.

Sources of infection such as sick or dead animals must be removed immediately. Caution must be observed in the care of food or drink. Only food and drink from closed containers are usable. In case such

containers are not available, food should be cooked at least 10 minutes, or longer if possible. The simple broiling of meat is insufficient, as some germs are very heat resistant.

No one can say today how far plans for this type of operation have gone, or specifically what might be employed in biological warfare. It is known that all great powers conduct constant research in this field. It is difficult to foresee how successful this type warfare will be, for we have no data available upon which to base a prediction. But the possibility and danger should not be underestimated.

On the other hand, most biological weapons will be known, not, perhaps, to the troops, but in any event known to science. Decades ago science started a constant and so far successful war against the same disease-causing organisms that might eventually be employed against man. Impressive proof of this success is the disappearance of almost all epidemics of past centuries. The biological and medical sciences have developed basic defenses that can be adapted to field conditions and are available to every soldier. This will doom any biological warfare to failure before it is even started.

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## Land/Air Warfare--The Navy's Part

Digested by the MILITARY REVIEW from a copyrighted article by Commander C. B. Lamb in "Air Power" (Great Britain) July 1957.

"THE British Army," wrote the late Admiral of the Fleet, Lord Fisher, in his book, *Memories*, "should be a projectile fired by the Royal Navy." Although Lord Fisher was quoting Sir Edward Grey, who made that provocative statement when he was Foreign Secretary at the outbreak of World War I, it is doubtful that either of those gentlemen would subscribe to such a sweeping, oversimplification were they alive today.

It is a truism that the advent of the nuclear weapon has had such an overwhelming effect upon the whole world that, literally speaking, everything is overshadowed by it. No one will ever know what shape a future war will take—until it is upon us. To date, no war has ever followed an expected course or a predicted pattern, and there would seem to be less reason now, when so many new factors are involved, for any strategist to be able to say, with confidence, "this and that will happen."

Should there ever be another major con-

flict which is not ended decisively by the air battle, Lord Fisher's quotation of the statement by Viscount Grey might again have a ring of truth. Through a lack of natural defensive barriers and a desire for access to warm seas, Russian policy always has been one of expansionism. If a situation of stalemate existed after a nuclear exchange, it might be vital for the army to be able to prevent the Russians from overrunning Europe. How would the British Army get there to stop them? We would hope, surely, to take them by air. But would that be possible?

### Air Transport

There is no doubt that NATO's air-lifting capabilities are enormous. It is a much greater and more efficient organization than any that has existed in the past. Assuming that the Royal Air Force's Transport Command in Europe and the United Kingdom, and all the other national forces in Europe capable of mustering powerful transport air forces (the United States,