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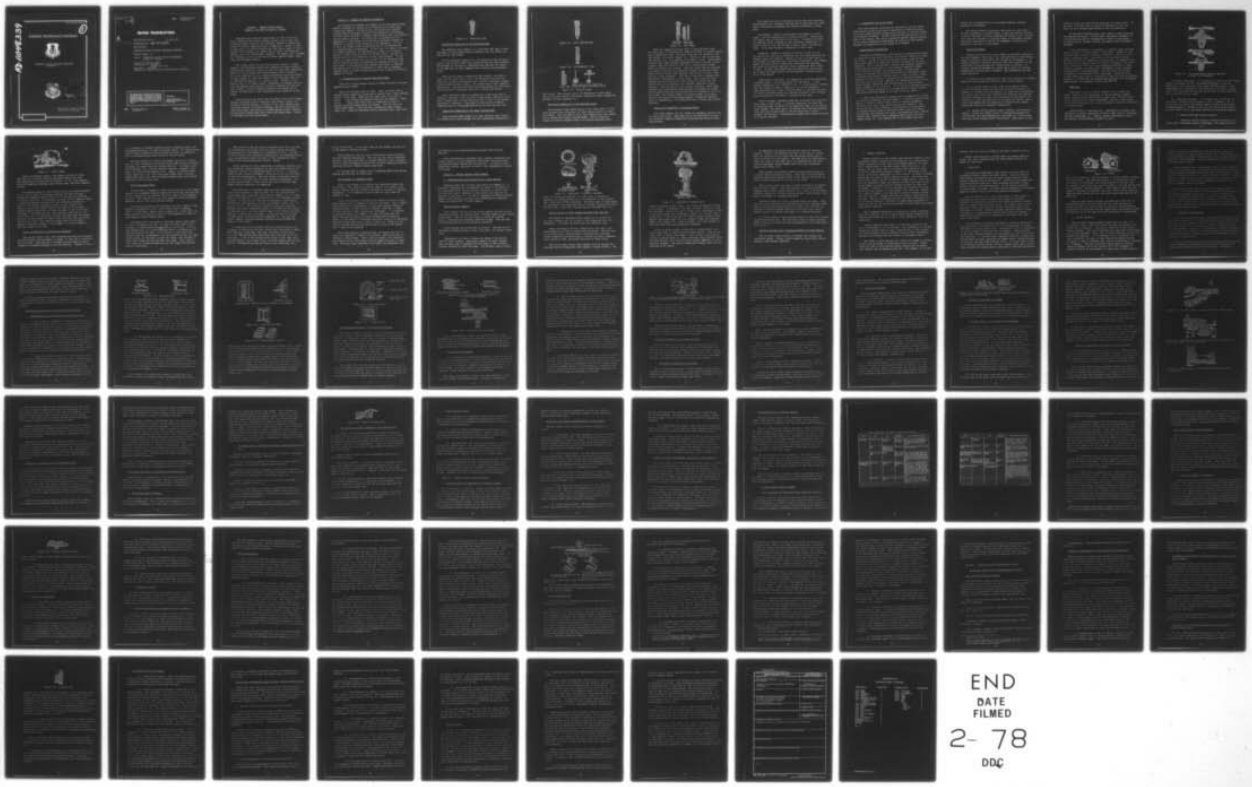

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FOREIGN TECHNOLOGY DIVISION

HANDBOOK ON BASIC MILITARY KNOWLEDGE
(CHAPTER 7)

Approved for public release;
distribution unlimited.

EDITED TRANSLATION

FTD-ID(RS)T-0363-77 30 June 1977

MICROFICHE NR: FTD-77-C-000783

DST76C006068

HANDBOOK ON BASIC MILITARY KNOWLEDGE (CHAPTER 7)

English pages: 75

Source: HANDBOOK ON BASIC MILITARY KNOWLEDGE, China, PP. 330-382

Country of origin: China
Translated by: SCITRAN
F33657-76-D-0390
Requester: FTD/PDRR

CHAPTER 7. DEFENSE AGAINST ATOMIC, CHEMICAL, AND GERM (BIOLOGICAL) WEAPONS

Imperialism and Socialist Imperialism, in order to rule the world, insanely expand their strategic warfare, and do their best to develop atomic, chemical, and biological weapons, scheming recklessly to initiate large scale wars of aggression. Because of this we must reply in a positive fashion with that great slogan of Chairman Mao's with reference to "deeply dig the caves, store many provisions, and do not acknowledge a usurper." Be highly alert, strengthen strategy, do well in the work of defense against atomic, chemical, and biological weapons.

"All things cannot but have two principal natures." Atomic, chemical, and biological weapons have comparatively great casualty producing and destructive uses, but they also have their limitations and are of such a nature that defense against them is possible. It is only necessary for us to grasp the physical nature and effects of these things, to treat them lightly in the strategic view, but to view them as important in a tactical sense. Further, do not blindly fear, do not watch numbly; thoughtwise be prepared, actionwise have method; adopt positive protective measures and thus you will be able to avoid or diminish casualties and damage and to achieve the objectives of self preservation and extinction of the enemy.

Actual practice has proven that the general type of Air Defense measures have many areas of similarity with atomic, chemical and biological defense measures. Because of this, this chapter first introduces general Air Defense knowledge, and later discusses the items which apply specifically to defense against atomic, chemical and biological weapons with their nature and capabilities. Points of similarity are not covered again.

Section 1. General Air Defense Information

Our discussion of general Air Defense is directed toward defense against strategic air strikes on our territory by an enemy using conventional weapons. In time of war, air strikes are a method commonly used by an enemy to arrive at his objective of destroying the other side's political, economic, and military value, and destroying his power to survive. Air action also is insurance for his aggression in other fields, or in the use of military strength and deception to arrive at the objective of his aggression. In view of this, Air Defense forms an important part of the preparations for resisting wars of aggression. At this time our country's military Air Defense capability is unprecedentedly strong, but we cannot, because of this, relax our civil Air Defense effort. Military Air Defense and civil Air Defense are closely interdependent. At such time as an enemy attacks us by air, except for the Liberation Army and the Militia who will be attacking the invading air forces, the great mass of the population must operate effectively in dispersal and taking cover, in the preservation of order, and in emergency disaster work - in order to grasp victory on all fronts in the battle against air attack.

1. Characteristics of Several Basic Type Bombs

Bombs are the main weapons carried by bomber aircraft for attack against surface targets.

There are very many types of bombs. There are those used to destroy "hard" targets and structures of general type - armor piercing and demolition bombs. There are fire bombs used to set fire to surface targets, destroying important material and equipment. There are also personnel bombs which rely on fragmentation effect to produce casualties among people and animals. (All the above are termed basic bombs.) There are also illumination bombs, signal bombs, etc. Below are introduced several important basic bomb types.

Figure 7-1. Demolition bomb.

Destructive Capability of the Demolition Bomb

The demolition bomb (Figure 7-1) is the most used type of bomb. The weight of the demolition bomb is generally over 100 pounds, but some are over 1000 pounds.

The anti-personnel capability of the demolition bomb is principally in the air wave (shock wave) generated when the bomb detonates. The strength of the shock or compression wave destroys the target. At the same time the bomb fragments have a definite anti-personnel effect.

There are two types of demolition bomb casings: one type is thick, and the other type is thin. The demolition bomb with the thick bomb casing is principally used to destroy airfields, bridges, electric power stations (plants), and comparatively "hard" engineering projects. The demolition bombs with thin casings are used mostly for destruction in populated areas and of ordinary structures.

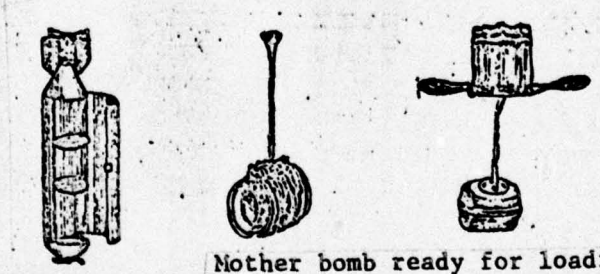
When a demolition bomb is equipped with a time fuse, then it becomes a time bomb. With this kind of bomb several minutes or even up to "several tens of hours" may pass after it falls to the ground and before it detonates. Time bombs are used mainly to destroy communications and transport, To Hinder rescue and recovery work, etc.

Destructive Capability of the Armor Piercing Bomb

Armor piercing bombs (Figure 7-2) have very hard noses (heads) and comparatively thick casings, and their penetration capability is

Figure 7-2. Armor piercing bomb.

Figure 7-3. Anti-personnel bomb.



Mother bomb

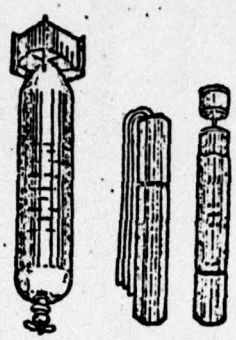
Mother bomb ready for loading, and butterfly bombs in descending attitude

Figure 7-4. Butterfly bomb.

very strong. Their special use is the destruction of hard tagets such as steel and concrete structures, underground works, underground railways, military shipping, etc.

Destructive Capability of Anti-Personnel Bombs

Anti-personnel bombs depend mainly on the large number of fragments produced after detonation for their casualty effect on people and animals. They are small in size, have comparatively thin casings with a comparatively small bursting charge. They are generally dropped on military assembly areas or on densely populated areas.



Large type fire bomb | Small type fire bombs

Figure 7-5. Fire bombs.

There are comparatively many types of anti-personnel bombs. The large types of anti-personnel bombs are similar in external appearance to demolition bombs. The small types have fin assemblies like the feathers of an arrow (Figure 7-3). There is a type of butterfly bomb (Figure 7-4), each weighing one kilogram or more. Loaded inside a mother bomb (whose external appearance is almost like that on the ordinary bomb) are from 90 to over 100 of these butterfly bombs. These are dropped from aircraft. When the mother bomb has descended to a specific altitude it automatically opens, the butterfly bombs emerge from the mother bomb, disperse, and continue to drop - thus are also called "shrapnel." This type of bomb can be equipped with anti-shock, instantaneous, or time fuses. After butterfly bombs equipped with anti-shock fuses have reached the ground they will explode when run up against or are otherwise subjected to heavy pressure. They are very much like a small land mine. Those bombs equipped with instantaneous fuses detonate on touching the target; those equipped with time fuse explode after the passage of 10, 20 or 30 seconds. The casualty effect of butterfly bombs is not great. They are used mainly for blocking highways, bridges and important lines of communication, or in denying an area to rescue and recovery personnel.

Destructive Capability of Incendiary Bombs

Fire bombs (Figure 7-5) all contain an inflammable mixture used to cause fierce fires. Their main use is the destruction by fire of such important targets as ammunition, petroleum and ration storage installations.

Fire bombs are not all the same as far as their fire producing characteristics are concerned, and they can be classified into three types, concentrated, dispersed, and various combinations of these types:

Concentrated. Only for concentrated fire damage to a point target. Not for dispersed use by fleets of aircraft. Mainly used for targets that are difficult to set afire. A thermite fire bomb, for instance, after it begins to burn, generates temperatures of 3000° C, more or less, and can emit a fierce, white, eye-piercing light. It can burn through 2 centimeters of steel plate.

Dispersed. Whether it ignites in the air or after it hits the ground, this type can be dispersed over very large areas and can quickly create fire disaster. Because of this it is much used to burn targets of large area which are easily inflammable. For example, napalm (jellied gasoline) bombs, after descending and igniting, may spray out and start many small fires, causing the whole target to burn. One small type napalm bomb can spread fire over an area up to about 250 square meters, and its duration of burning can be up to 20-30 minutes.

Combination of the above. An example here is yellow phosphorous incendiary bombs. Yellow phosphorous can self-ignite. It can produce temperatures up to 800-900° C, and it is much used in combination with napalm in order to improve its use as an incendiary. Some incendiary bombs contain a certain amount of explosive in order to produce casualties among fire fighting personnel in the vicinity, thus increasing the difficulty of putting out the fires.

Based on weight, incendiary bombs may be divided into large and small types of many kinds. In external appearance the large type of incendiary bomb is similar to the demolition bomb, and is individually dropped. The small type of incendiary bomb often has hexagonal form, and from "several tens" to 100 are bound into a "stick" (bundle) for the drop, to automatically disperse and continue the drop at a pre-set altitude.

2. Preparation for an Air Attack

With their habitual craftiness the Imperialists and the Social Imperialists initiate their wars of aggression as "Undeclared Wars," so we must always maintain thoughtwise an attitude of constant preparation without relaxation. We must conscientously perform well in the work of Air Defense, take strict precautions against surprise attacks by the enemy, avoiding and diminishing the results of such attacks. The work of preparation for air attack is as follows:

Organizational Preparations

Population concentrations, industrially and commercially developed cities and market areas frequently are important targets for enemy air attack. In order to reduce unnecessary losses, areas of this nature must begin at an early date the work necessary for air raid dispersal. For all the personnel, material and equipment capable of being dispersed there must be a plan assuring organized movement to and from the villages, the mountain areas, or safety zones. Production personnel and worker personnel who are temporarily unable to disperse must advance a unified plan or course of action, closely organized so that the work of preparation for temporary dispersal and cover can be well done. Material left behind must be put in dispersed storage, especially that material which is easily burned, easily exploded, or is poisonous. It is even more desirable that this material be safely installed in a reliable place in order to avoid even greater disaster damage in the event of an air strike.

A timely and effective air defense must be organized on a basis of current circumstances and requirements. It should be based on the spirit of "unite to control wars, unite in military management, the masses must unite, the specialists must get together." The militia serves as the foundation, the specialists as the backbone in building various types of specialist units, such as Air Watch and Warning, Anti-Aircraft Fire Units, Investigations Units, Chemical Defense Units, Recovery Units, Emergency Repair Units, and Fire Fighter Units, etc. The organization for Air Defense must also

provide for the disposition of the necessary weapons, material, machinery and equipment.

The various grades of specialist units must put into effect a unified leadership, a unified command, a clear and definite division of duties, and must be closely organized for united action. Furthermore, they must implement a thorough program of specialist training and regular inspection of special use equipment, in order to be prepared at any time to enter combat.

Construction Works

During an air attack the direct causes of personnel casualties are bomb fragments, shock wave, fire, and strafing; the main indirect cause of personnel casualties is the collapse of buildings, etc. An effective method of avoiding casualties from these causes is in the construction of the necessary air defense works or shelters. In cities, underground passages and tunnels may be built, or existing underground facilities may be modified. The requirements are that these facilities:

(1) Based on the peculiarities of the local situation, be located, marked out and divided into sections, down to small details.

(2) Be located based on their roles in the defense scheme. Some of the defense works must take into account the direction of assembly for defense, have arrangements for combat and accomodations for living, have cover, have capability for dispersal and movement, survival, striking the enemy, and maintaining the requirements for production. Other installations will be mainly for defense, and in time of battle must have the capability to preserve life, support production, and aid in striking a forward blow.

(3) Provide defense against atomic, chemical, and biological weapons. Record the compass courses of underground passages and tunnels which have many entrances, are very long, are trunk passageways with branch passages which form networks. Note special points.

Carefully divide into sections the whole plan of defense works. In this way, if a small part or section is destroyed, it will not cause the whole defense works system to lose its usefulness.

The problems of waterproofing, water removal, windproofing and flooding must be solved. In peace time, maintenance management of the defense works must be strengthened in order to guard against collapse from sun, weather, and age, and against loss and damage to equipment.

In the countryside it is possible to construct simple and easy caves, trenches, or various types of field works. Methods of construction can be found by referring to Chapter 3, Section 5, but it must be emphasized that: there must be not less than 15 meters between shelters; and neighboring structures must be separated from the shelter by a distance equal to one-half the height of the structure. The shelter must not be near anything susceptible to high pressure collapse, or things easily inflammable, easily exploded, or productive of poisonous matter. Use efficiently the terrain configuation, and implement clever camouflage. Conditions exist in some areas under which it is possible to make full use of convenient materials in reinforcing and strengthening shelters, or in developing semi-permanent and permanent defense works. (Fig. 7-6)

Camouflage

Camouflage is used to conceal yourself, and to confuse the enemy. That is, it is taking what is real and making it appear false, taking the false and making it appear real, in order to add to the difficulties of enemy reconnaisance aircraft, create errors in his strike delivery, and to avoid or diminish losses and casualties in friendly areas.

Among methods of camouflage are: camouflage by coloring, using vegetation or natural camouflage, blackout (light control) camouflage, and smoke camouflage, etc. Usually, natural camouflage is used in the daytime; during darkness, blackout is used.

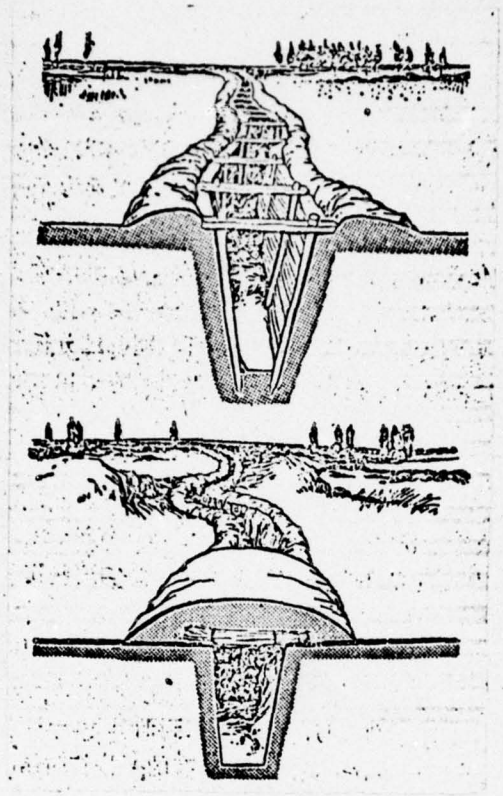


Figure 7-6. Use conveniently available material to support and strengthen.

(1) Daytime camouflage: It is necessary to use all of the natural plants and foliage from the surrounding environment so that the camouflage of the installation will blend colorwise with it. When camouflaging it is necessary to pay attention to all visual aspects. "Don't just look after the head and not the foot, or only look after the top and not the four sides."

(2) Nighttime camouflage: It is comparatively difficult for the enemy to discover ground targets in time of darkness. But it is very easy for him to see exposed lights and white colored light-reflecting objects. Because of this, at the time of an air attack all must observe strict camouflage measures by maintaining blackout.

a. Window camouflage (window blackout):

Generally, window curtains or shutters (boards), etc., can be used to implement blackout camouflage. For window curtains

several layers of cloth, or several layers of paper, may be used to form the curtains. Rice straw or mats may also be used, the principle being not to show light. The size of the window curtains or board coverings generally should be 20 to 30 centimeters larger than the window frames, and they must be closely fastened to the wall in order to guard against wind or shock waves striking them, shaking them loose, and permitting light to show through. When bombs explode, in order to prevent glass windows from shattering and injuring people the glass should have strips of cloth or paper stuck to it horizontally and vertically.

b. Camouflage of lights:

Light shades are the principle items used to camouflage lights, especially the lights used within rooms, all of which rely on shades for camouflage. When camouflaging lights, the position of the light bulb must be halfway or more within the shade, and must not be allowed to shine on reflective surfaces.

Light shields, shaded lights and light shielding panels, etc. are the most commonly used items in camouflaging the lamp rays of communications equipment. In meeting a tense situation, communications restrictions must be implemented. All vehicles must temporarily stop. Those vehicles on especially important missions should turn off their lights and continue to drive.

Observation and Warning

All levels must organize air watch sentries. They must set up air watch nets to facilitate early awareness of enemy intentions and to strengthen the eyes and ears of the command unit. The duties of watch and warning sentries are: whenever enemy aircraft are observed estimate the direction of flight, the type of aircraft, altitude, and number; watch for hidden enemy partisans on the ground communicating with the enemy aircraft. Oversee blackout and camouflage control; keep in close touch with the local military, the government, and public security organizations, and report the situation to them.

When it is possible that enemy aircraft may have sneaked into friendly territory for an air attack, an air raid alarm must be issued notifying all to disperse and take cover. All preparations for defense against air attack must be made. The air defense alarm must be passed to the highest air defense command unit in the area so that it can assume overall control. If some units and areas are unable to hear the air defense alarm, a specific individual may be detailed to transmit the alarm by specially aranged signals after the siren beings. Air alarm equipment must have regular inspection and maintenance.

3. Actions at the Time of Air Attack, and Eliminating the After-Effects of the Air Attack

What to Do After Hearing the Air Raid Alarm

After hearing the Air Raid Alarm, all personnel must preserve complete silence in order to be able to hear orders and thus be able to quickly and systematically initiate protective measures.

Watch and warning sentries must be especially alert; anti-aircraft fire details must quickly get to their emplacements and prepare to fire at the enemy aircraft. Security and Investigations personnel must quickly get into their own sentry boxes to maintain order. At the same time, these personnel, while completing the above-mentioned duties, must give full attention to their own protection. The other specialist units must complete their preparations, stay under cover, and await orders.

All personnel, except those otherwise authorized, must complete the work of preparation as prescribed, each person bringing along with him his protective equipment and daily living necessities. Preparations include deciding the points at which to enter the protective works, deciding the routes thereto, and deciding what people will go where. Within the shelter, in order to reduce the use of oxygen, it is necessary to remain quiet and still, not to smoke, and to use candles or oil lamps little or not at all.

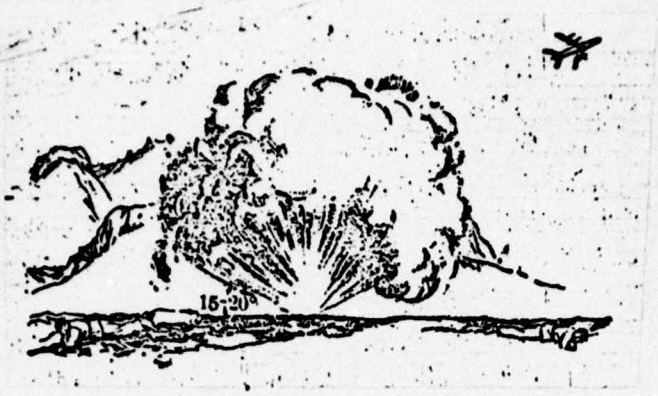


Figure 7-7. Safety angle.

People in wilderness areas or open spaces outside the cities must make use of terrain features and ground objects for cover. When taking cover, actions must be decisive. Do not crowd together, and avoid dangerous buildings, high voltage lines, and other dangerous objects.

The dropping bombs and their effects follow the forward progress of the line of flight of the enemy aircraft, and when the bombs explode the fragments take the form of a "V" as they are projected in various directions. The direction of travel of the fragments leaves a safety zone between the earth and lower projected fragments of from 15 to 20 degrees measured at point of burst (Figure 7-7). Because of this, when enemy aircraft drop bombs in the vicinity, personnel must quickly move to either the right or left of the line of flight of the enemy aircraft. When hearing a bomb give out the sound "shoo--", it is clear that the bomb is already near the ground, and that you must quickly lie down, cover your ears, open your mouth, and shut your eyes. Your chest and stomach must not be closely against the ground in order to avoid damage to the inner organs or the sense organs of the head.

Rescue and Recovery of Personnel and Equipment

When the air raid is over, some buildings and production equipment may have suffered various degrees of damage, or there may be disastrous fires involved. There may also be wounded and dead among personnel trapped in collapsed buildings or air raid shelters. Because of this,

it is necessary to speedily implement rescue, emergency repair, and firefighting measures, in order to diminish losses. The large militia and the poeple's masses all must actively join with the specialist units in eliminating the after effects of the air attack.

The first thing is to rescue the wounded, and also to actively seek out those individuals who may have been caught beneath collapsed buildings or trapped within air defense shelters. If possible under the conditions, try to recover important material, equipment, documents, and other written material, etc. Always, in recovery operations, people must come first, and other things later; the badly wounded must come first, and the lightly wounded later; the old must come first, and the young later.

How to Extinguish Fires

In peace time, a program of common sense education in fire fighting must be implemented among the masses so that at any time they will be well prepared for the possible use of all types of fire fighting equipment. When fighting fires you must depend on various different materials, and you must use different methods.

When ordinary materials and buildings catch fire, water is used mainly to extinguish the fire. After cotton cloth or wadding, rolls of cloth, paper, bamboo, wood, or grass, etc., catch fire, you must spread out the layers or piles of these materials in order to guard against flames creeping within.

When materials of the nature of petroleum ignite, water cannot be used to extinguish the fire. You must use foam, carbon tetrachloride, or carbon dioxide extinguishers to put it out. If an oil tank catches fire, it is possible to devise means of releasing the oil from the bottom of the tank. If oil barrels or cans catch fire, besides using fire extinguishers, you must quickly use wet rice bags, cotton quilts, and overcoats to cover the flames, then add sand to press these things down and suffocate the flames. Also, quickly take those oil containers which have not yet caught fire and move them to a safe place.

When electric wires and electric equipment catch fire, you must first disconnect the current, then use carbon dioxide and carbon tetrachlordie fire extinguishers to extinguish the fire. In order to avoid electric shock casualties among people, and spreading of the fire, you definitely cannot use water in fire fighting and rescue efforts before disconnecting the electric current.

Before putting out fires originating in dangerous chemicals, you must definitely clearly understand the kind and capabilities of the chemicals, then use the appropriate means for the job. In general, fires in water soluble inflammable liquids can be put out with water or foam fire extinguishers. When fire starts in petroleum products, it must be put out with foam or carbon dioxide extinguishers. You can only use dry sand to cover and put out fires in reduced light metals (sodium, potassium, and magnesium).

With reference to incendiary bombs and other incendiaries, the most effective method of handling these is to use sand and earth or wet straw bags, overcoats, cotton quilts, carpets, etc., to cover them; or, to dig holes in the ground and bury the incendiary objects in them. You can also use foam fire extinguishers, carbon tetrachloride fire extinguishers, and fire extinguisher powder, etc., to put out the fire. When thermite incendiary bombs have just been dropped, they cannot immediately ignite, so go ahead and use shovels to pick them up, or use long handled tongs to pick them up and throw them into a nearby pond or cistern. You may also get rid of them on empty ground, letting them burn themselves out. But you must protect against incendiary material spurting out and burning the bodies of those nearby.

If enemy aircraft drop napalm, when you discover that you are in danger of being burned you must quickly take rainclothes or waterproof material, straw bags, hemp bags, overcoats, cotton quilts, etc., wet them and wrap them around your body, then get out of the fire area. If any of the burning napalm sticks to your body, don't use your hands to try to beat it out. You must quickly take off the affected clothing and use sand and earth or wet straw bags, etc.,

to put out the fire. If you can't take off the clothes, you can roll on the ground to smother the fire.

When putting out fires you must differentiate between important and less important emergencies. First put out the fires in important material, then deal with those in ordinary material; first extinguish fires in easily inflammable material and in nearby dangerous materials, then deal with more ordinary things lying about.

At the same time, be highly alert in guarding against bad persons seeking opportunities for destruction.

Safe Disposal of Unexploded Bombs

After an air attack it is possible that unexploded bombs exist in the area. These bombs are a serious threat to the safety of the people's masses, and they influence carrying out the work of disaster management. It is necessary to quickly seek out these bombs and dispose of them.

First, the area must be divided into suitable sections to which search parties will be detailed to look for the bombs. After a search party arrives at its destination, it must make inquiries among the populace (masses) in that area as to possible locations of bombs, and then proceed to those locatons and investigate. It is reported to the search party, for example, that when the bombs came down there was sound and shock, and some buildings were collapsed by shock. On the surface of the ground there were traces of an unexploded bomb such as the entry hole, a crack or rent, etc. Receipt of this kind of evidence can help the search party to carry on the search, and to clear up the situation.

After discovering an unexploded bomb, the danger area must be marked out (generally a radius of 250 meters), and sentries must be detailed to sentry posts. Traffic must be stopped, help mobilized, and movement of the local people from the danger area must be organized. The search party then waits until after the responsible unit

has disposed of the unexploded bomb and normal order has been restored.

After discovering an unexploded bomb, ordinary individuals must promply report it to the responsible authorities, then take action to establish police custody over the bomb area. In order to avoid unfortunate results, they must not take it upon themselves to dispose of the bomb.

Section 2. Defense against Atomic Weapons

1. Characteristics and Capabilities of Atomic Weapons

"Everyone knows that no matter what matter one engages in, if he doesn't understand the circumstances or nature of the matter, or its relationship with external matters affecting it, then he will not know the rules of existence of that matter, and thus will not know how to deal with it." In order to implement an effective defense against atomic weapons, you must, then, understand the characteristics and capabilities of atomic weapons.

What Are Atomic Weapons?

Atomic weapons are also called nuclear weapons, and here we are referring to atomic and hydrogen bombs. Hydrogen bombs are also called fusion bombs. They both use the fusion or splitting of atomic nuclei, instantaneously releasing tremendous energy. They are used for producing destruction and personnel casualties.

Atomic weapons can be delivered by aircraft. They may also be delivered by guided missiles, rockets, artillery, and through torpedo tubes.

"Equivalents" are used to express the degree of the awesome power of atomic weapons. Equivalents compare the power released when an atomic bomb is exploded with the weight of TNT (trinitrotoluene) required to equal this power. For instance, when an atomic

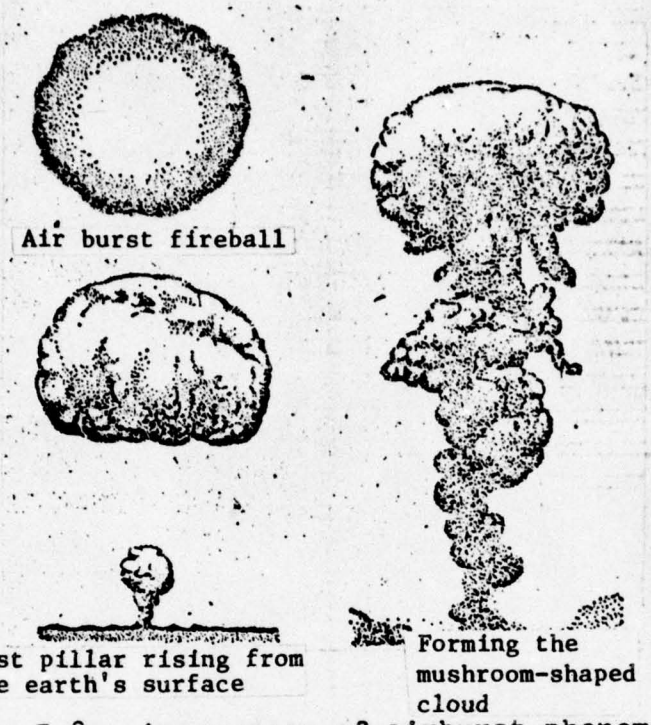


Figure 7-8. Appearance of airburst phenomena.

bomb of 20 kilotons equivalent (2 x 1,000 tons, in Chinese) is exploded, the energy released by it is equivalent to that released when 20,000 tons of TNT is exploded. The great power of atomic bombs is, according to the equivalent size of the bomb, divided into levels of 1,000 tons, 10,000 tons, 100,000 tons and 1,000,000 tons, etc.

Types of Burst of Atomic Weapons and What They Look Like

The methods of exploding atomic weapons can be divided into air burst, ground burst (or on water), and underground burst (or underwater). Air burst and ground burst are generally used.

Bursts occurring in the air (simplified to "air burst") are bursts which do not come in contact with the ground. The main uses of air bursts are to cause personnel casualties and to destroy surface targets in the battle area, to destroy factories, communications centers or hubs, and ground structures in large cities.

When an air burst occurs, there appears first an unusual eye-dazzling flash following which there appears a bright fireball. The

Figure 7-9. Appearance of ground burst.

fireball continues to grow larger, its surface boiling and writhing as it ascends. It gradually turns dark, and after several to "over ten" seconds it turns into a white colored cloud, continuing to rise at very great speed, and continuing to expand. At the same time, a bulky pillar of dust rises from the earth's surface, and at an even greater speed rises after the cloud forming a large tall mushroom-shaped cloud (Figure 7-8). After the smoke cloud stops rising, it then moves with the wind and gradually disperses.

Bursts on ground surface (simplified to "ground bursts") are bursts which come in contact with the ground surface. They are generally used to destroy hard targets on the surface or below ground surface at shallow depth, to create casualties among personnel within air raid shelters, and to set up severe residual radiation to affect personnel movement. The scope of damage and casualty effect is less than that of air bursts.

In appearance, the ground burst and air burst are basically similar. Points of dissimilarity are that in the case of a ground burst the fire ball is in contact with the ground surface and at first is similar to a half sphere. The dust pillar is comparatively bulky, the color is very dark, and it is connected with the cloud from the beginning, rising together with it to form a mushroom-shaped cloud (Figure 7-9).

Under surface (sub-surface) bursts are bursts which occur at a certain depth below ground surface. Their main use is to destroy important underground engineer works, create craters, and to set up severe residual radiation in the area of the burst.

Water surface bursts are those in which the burst is in contact with the water surface. Their main purpose is to destroy surface shipping, naval bases, harbor entrances, etc.; also, to set up severe residual radiation in the burst area and within a certain area of the marine environment in a downwind direction.

Underwater bursts are bursts occurring within the water. Their main use is the destruction of underwater and surface shipping, water control projects and obstructions in the water, etc., and they can also set up intense residual radiation in the burst area, and in certain areas of the marine environment in a downwind direction.

The various types of bursts mentioned above all have their special characteristics and uses. The type that is used is usually selected based on the plan of battle and the circumstances of the target which is to be hit.

Casualty and Destruction Producing Elements of Atomic Weapons

When an atomic weapon bursts, it produces four casualty and destruction agents: thermal (light) radiation, shock waves, initial radiation, and residual radiation.

1. Thermal Radiation.

Thermal radiation is the intense light and heat radiated by the superheated fireball produced by the explosion of an atomic weapon. Thermal radiation can cause direct internal heat damage to the eyes and to exposed areas of the skin (hands, face, neck, etc.). For example, when an atomic bomb of 20 kiloton (KT) equivalent bursts in the air, unprotected personnel within 2 to 3 kilometers of the center of the burst (simplified to "burst center"), or point of thermal projection, can receive various degrees of burns. The closer they are to burst center, the more severe the thermal wounds. Since the eyes can concentrate light, the distance at which the inner eye can suffer damage is greater than the distance at which the skin will be damaged. However, it is only necessary that personnel not look directly at the fireball to avoid damage to the inner eye. Besides this, indirect damage to the body may be caused by burning clothes and other material. Thermal radiation and ordinary light rays are the same. They are transmitted directly, and can be avoided by the use of opaque materials. Therefore, by using opaque materials to cover the body you can effectively diminish or avoid direct burn wounds from thermal radiation.

When inflammable materials are subjected to thermal radiation they can be ignited. Since in cities easily ignited materials are comparatively plentiful, it is easy to start disastrous fires over large areas.

Thermal radiation from a bomb is of very short duration, from only a few seconds to 10 or 20 seconds. Thus, generally, it can only destroy the surface layer of thick, solid articles, Fires started by thermal radiation can be prevented if mud or other nonflammable material can be spread over the surface of inflammable things.

The degree to which articles will suffer fire damage is related to the color and degree of smoothness of their surfaces. Things which are light in color and have smooth surfaces will be burned more lightly, and the opposite holds true. For example, at the same

distance, red cloth will be burned up, but white cloth will not be.

Weather conditions have a certain effect on thermal radiation. Clouds, fog, rain, windblown sand, all these weather effects can weaken its usefulness.

2. Shock Wave.

Shock waves are high speed, high pressure air waves which are transmitted rapidly outward from burst center. They are formed of high pressure air produced when the atomic weapon explodes, which fiercely compresses the surrounding air. Shock waves are transmitted outward from burst center at a speed exceeding the speed of sound (speed of sound is 340 meters/second). As the distance travelled by the shock wave increases, its speed gradually diminishes, its pressure gradually weakens, and the shock wave gradually disappears.

The time required for a shock wave to reach a certain point is determined by the distance between burst center and the point. Generally the shock wave can arrive from several seconds to "several tens" of seconds after the flash occurs. For example, when a 20 KT equivalent atomic bomb bursts in the air, the arrival time of the shock wave at a place 1 kilometer distant from burst center is about 2 seconds; at 4 kilometers the arrival time is about 10 seconds. The effective duration of the shock wave is not really very long, only a few seconds.

With reference to personnel and material losses and destruction, the usefulness of the shock wave is in the overpressures and moving pressures it creates (Figure 7-10). Overpressure is due to compression of the air caused by the abrupt rise in pressure. Among personnel it may cause ruptured eardrums and lung damage, and can crush shelters and structures. It can also enter fieldworks (shelters) through holes and entrances and cause casualties and damage within. Moving pressure is set up by the high speed movement of air. It is much like a fierce wind blowing from burst center, and has a comparatively large positive shock strength and tossing effect, being able to throw men and material

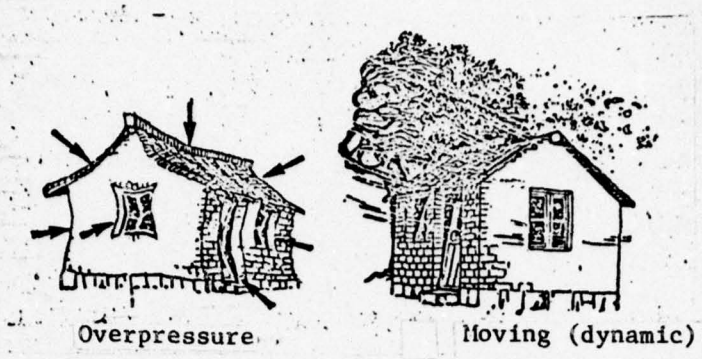


Figure 7-10.

about like projectiles, causing personnel to suffer internal injuries and broken bones. Personnel and material on the ground may suffer the effects of overpressure and moving pressure at the same time. For example, these effects may cause buildings to collapse and shelters to be destroyed, causing casualties. Other indirect casualties and damage to personnel and material from these effects may be caused by sand and rocks, bricks and tile, and broken glass blown about by the shock wave.

When an atomic weapon explodes, personnel must take cover in underground shelters or use strong and firm items with which to protect the body, in order to avoid the effects of moving pressure. If shelters are strong and firm and tightly shut, the personnel within the shelters can at the same time avoid the effects of overpressure.

3. Initial Radiation.

When an atomic weapon explodes, within the very first 10 to 20 seconds it emits a kind of invisible ray which is similar to the X-rays used in hospitals. Both have a strong and effective penetrating strength. This ray can penetrate the human body and materials of a certain thickenss. This, then, is intial radiation, also called penetrating radiation. It is transmitted in all directions from burst center with the speed of light (300,000 kilometers/second). The amount of rays or radiation dose received by personnel is expressed in "roentgens." Personnel receiving a small amount of radiation cannot be damaged, but if one receives 100 to 200 roentgens of radiation then he can be affected by a light case of acute radiation

sickness. The usual symptoms which may develop are headaches, nausea, reduction of white corpuscle count, etc. Usually health is regained within two months. When personnel receive a large radiation dose (500 to 600 roentgens), there is danger that it may be fatal. Treatment must be timely.

Initial radiation has no destructive effect on most materials, but it can cause materials in the vicinity of the burst center which contain aluminum, manganese and sodium, like eating utensils, drugs, soldiers' equipment, and soil, to give off rays. The kind of radiation produced by these materials, after being exposed to radiation from the burst center, is called induced radiation, which also has a certain damaging effect on personnel.

On one hand initial radiation is able to penetrate various materials. On the other hand it can be weakened by various materials. The thicker and denser the material, the greater its weakeneing effect. For example, after initial radiation penetrates a layer of earth one-half meter thick, only one-tenth of its effectiveness remains; when it penetrates a layer of earth one meter thick, only one-hundredth remains; when it penetrates a layer of earth 1.5 meters thick, one-thousandth remains.

4. Radioactive Contamination

When an atomic weapon explodes, mixed within the mushroom smoke cloud are large amounts of radioactive ash which are blown about by the wind and which gradually settle to earth, contaminating the air and whatever else is in the vicinity of burst ground zero and in the area downwind. This kind of contamination is called radioactive contamination. The severity of surface radioactive contamination is expressed in number of roentgens per hour (roentgen/hours), and is called the radiation level.

Since an air burst does not make contact with the ground surface, surface radioactive contamination occurs mainly through induced radiation in the earth in the area of the burst. The area of

WEAKENING EFFECTS ON INITIAL NUCLEAR RADIATION OF SEVERAL TYPES OF MATERIALS

1	2					
	3	4	5	6	7	8
9 $\frac{1}{10}$	10	35	47	50	70	90
9 $\frac{1}{100}$	20	70	94	100	140	175
9 $\frac{1}{1000}$	30	110	141	150	210	270

1. Weakening effect; 2. Thickness of various materials; 3. Steel; 4. Concrete; 5. Brick; 6. Earth; 7. Water; 8. Wood; 9. Remaining Effect.

contamination is small, the radiation level is low, and its influence on personnel activity is not great. However, a ground burst makes contact with the surface, and large amounts of dust and radioactive materials are mixed together to form comparatively large particles of radioactive ash which gradually fall in the burst area and downwind from the burst area (fallout zone), causing contamination over a comparatively large area. As to surface distribution of contamination, it is generally heavy in the area of burst center, becoming lighter as the distance from burst center increases. The surface area in the path of the smoke cloud as it moves downwind is more heavily contaminated than areas upwind and in lateral directions from wind direction, where contamination is relatively light. The scope and degree of surface contamination automatically contracts and diminishes with the passage of time, basically following approximately the "seven-fold rule." Thus, the degree of surface contamination seven hours after burst is one-tenth of surface contamination one hour after burst; the degree of surface contamination 49 hours after burst is one-hundredth of that at one hour after burst. Generally, it is not easy to discover radiation contamination using the eyes only, but it is possible to use instruments to determine where it exists. You can observe the direction of movement of the smoke cloud and thus estimate the approximate location of contaminated areas.

The casualty effects of radioactive contamination and initial nuclear radiation are basically similar. Effective duration of radioactive contamination is longer than that of initial nuclear radiation, and can reach from several hours to several days. In a severely contaminated area it can even persist for several months, but it is definitely not like Imperialism says it is, that it "can persist for several tens of years."

The three main avenues by which radioactive contamination can effect damage to personnel are: the first is exposure to radiation outside the body (ambient radiation), and this is important; second, contaminated air, food, and water passing through breathing passages, eating passages, and wound openings into the body, thus setting up internal exposure; the third is by direct contamination of the skin, which causes skin burn wounds.

To summarize, protective measures must be taken against all four types of casualty and destruction causing elements. Under generally existing circumstances, measures taken in defense against shock waves also have effectiveness against thermal radiation and initial nuclear radiation. Because of this, when selecting defense measures you must emphasize consideration of defense against shock wave, and then give consideration to overall defense against the other elements. With reference to cities and inflammable targets, you must especially emphasize prevention of fires caused by thermal radiation in inflammable objects, and prevention of the spreading of the fire disaster. When a ground burst occurs, after the dissipation of the immediate casualty and damage producing effects you must continue to emphasize protective measures against radioactive contamination.

2. Preparations for Protection against Atomic Weapons

For the most part, organizational and watch and warning preparations for atomic defense are similar to those for defense against conventional air attack. Exceptions are that watch personnel, when an atomic weapon bursts, must quickly determine the type of burst, the location, the direction of movement of the cloud, and the

conditions existing after the shock. They must quickly report these things to higher levels, and must also look to their own protection. When not in possession of thermal radiation protective glasses, they must not look directly at the fireball. After becoming aware of the flash, they must immediately take cover and wait until after they hear the sound of the burst, and then resume the watch.

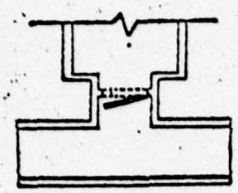
The special casualty and damage producing characteristics of atomic weapons give rise to special requirements for materials and construction of protective shelters, and for the protection of water sources.

Construction Requirements for Atomic Defense Shelters

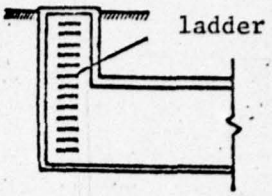
1. The Requirements for Underground Passages and Tunnels

(1) The protective capability of underground passages and tunnels is determined by the ability of the usable part of the shelter (meaning the sections within the entrances) to withstand shock waves. In order to increase a shelter's ability to withstand shock waves, at the time of construction a protective layer of earth or stones (simplified to protective layer) must definitely be put over its top. The thicker the protective layer, the greater the ability to withstand the shock wave. At the same time, in fulfilling the serviceability requirements mentioned above, all possibilities must be exhausted in diminishing the width and height of the underground passages. Under similar conditions of external force, the wider and taller the underground passage, the less its ability to withstand shock waves.

(2) Since the protective layer over the entries and exits is frequently thinner than that over the main areas, entryways and exits with high outside exit areas are easily damaged by shock waves; thus exit and entry openings constitute points of importance in assuring adequate protection in underground passages and tunnels. In order that their protective capabilities may be increased, entry and exit ways must make utmost use of terrain and terrain features, and must be thoroughly camouflaged. Each underground passage or tunnel



Through-foyer type



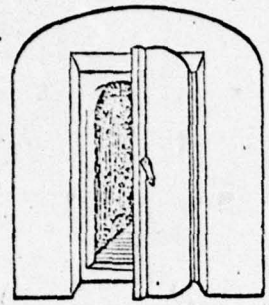
Slanted-well type

Figure 7-11. Entry-exit ways.

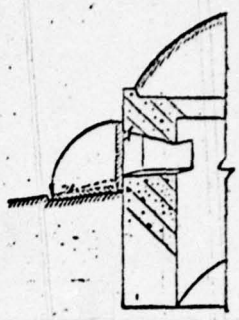
has at least two entry-exit ways (whether leading to other passages or not), and each should have an exit to the outside. The outside exit must be away from any building a distance equal to 1 to 2 times the height of that building, in order to avoid obstruction in case the building collapses. The exit must not protrude above the ground surface too much. In construction, if at all possible the "through-foyer" type exit must be used. The anti-shock wave effectiveness of this type entrance is comparatively good; it is not easily obstructed and, furthermore, entry and exit is convenient. The perpendicular (slanted) well type entry-exit (Figure 7-11) also has comparatively good protective effectiveness against shock wave, but entry and exit is not convenient, and generally it is used only as an emergency entry-exit.

(3) Shock waves and contaminated air (meaning air which has been polluted by radioactive dust and ash, and by chemical and bacteriological warfare materials) can take two routes to invade underground passages and tunnels. One is through exit-entries, and observation and firing ports; the second is through ventilation and smoke ejection pipes, etc. Furthermore, contaminated personnel can also carry radioactive dust and chemical and biological warfare materials into the shelter. Because of this, collective protection equipment must be installed within the underground passages and tunnels; for instance, apply protective sealing material to doorways, install shock wave dissipating equipment on ventilation openings, and equipment for filtering poisonous materials from the air indoors and in decontamination chambers, etc.

Each doorway of the underground passage or tunnel must have installed at least one protective door, and observation and firing



Protective Door



Protective Shield

Figure 7-12. Protective seal equipment for doorways.

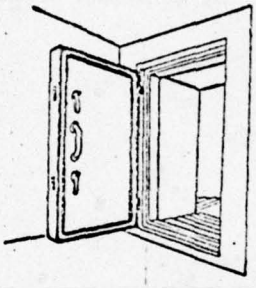


Figure 7-13. Close-fitting doors.

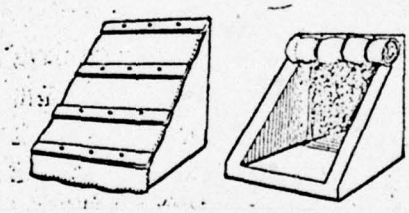
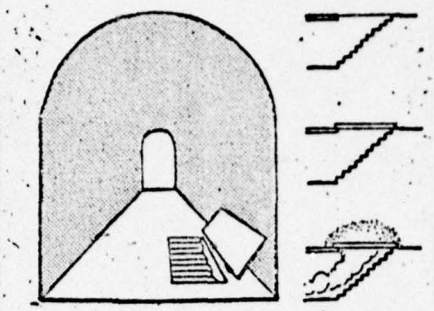


Figure 7-14. Close-fitting curtains.

ports should have protective shields installed (Figure 7-12). Within the protective doors there should be installed 2 or 3 close fitting doors (Figure 7-13) or "close fitting door curtains" (close fitting curtains) (Figure 7-14). At the places where main passages meet branch passages and where these passages connect with blockhouses or other defense works, there should be installed protective doors, close fitting curtains, or trap doors which may be sealed. Thus the whole system is divided into sections, based on protection requirements (Figure 7-15). Close fitting door curtains may be made of various rough screening materials like pieces of hemp sacking, and waste cotton, etc.



1. Open trap door.
2. Closed trap door.
3. Trap door sealed with earth.

Figure 7-15. Sealed trap doors.

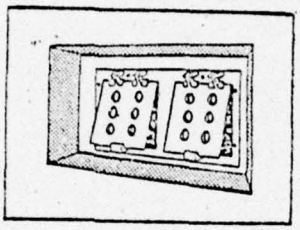
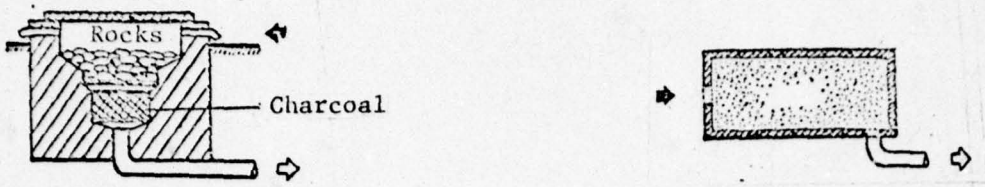


Figure 7-16. Flexible doors.

Anti-Shock Wave Equipment for Ventilation Openings

There are two kinds of generally used anti-shock wave equipment. One kind is "wave blocking equipment," which keeps the shock wave outside. For instance, various types of flexible or spring-hinged doors (Figure 7-16) are forced shut automatically by the pressure of the shock wave on its arrival, blocking entry of the shock wave. After the shock wave has passed, they automatically open, assuring ventilation. The other kind is "shock wave dissipating equipment," which disperses or dissipates the shock wave. Examples are the rock-filled shock dissipating chamber and the shock wave diffusion chamber. All these must make main use of obstruction and reinforcing use of dissipation-obstruction and dissipation combined.

Installations for filtering poison gas from inside air and air entering through ventilation openings consist of chemical filter canisters, ventilation machines (fans, etc.), ventilating pipes and ducts (valves), etc. The size and number of chemical filter canisters and ventilating fans can be decided based on required capacity.



Rock shock dissipating chamber Dispersion chamber

Figure 7-17. Shock wave dissipating equipment for ventilation openings.

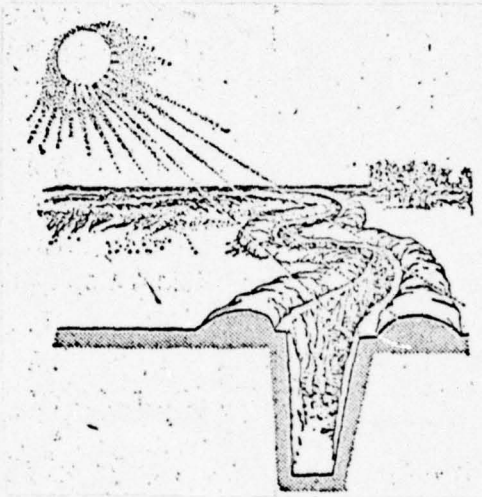


Figure 7-18. Protective use of trenches.

Indoor decontamination chambers are provided mainly for the decontamination of contaminated personnel when they enter the shelter. Polluted water and polluted materials used in decontamination must be put outside the underground passage or tunnel, and the water discharge opening must be fitted with shock wave dissipating equipment.

2. Field Works Requirements

(1) Trenches and communication trenches, because of the usefulness of the screening effect of the perpendicular walls and earthen shoulder of the trench, have an interior of such shape as to provide a certain area of defilade. Personnel concealed in the bottom of the trench (Figure 7-18) can diminish or avoid damage from thermal radiation, initial nuclear radiation, and shock wave.

When under cover within a trench, it is most important to prevent the collapse of the trench walls. In order to increase the

protective capability of the trench, its depth must be increased, but the trench walls must also be strengthened suitably. Furthermore, maximum effort must be made to build the trench in curving directions, because the sharp turning angles of trenches built in a folded or zigzag pattern invite easy destruction by shock waves.

(2) When the burst center is in prolongation of the line taken by the trench, the shoulder and perpendicular walls generally cannot provide defilade. In this case individual cover or holes within the trench or in the trench walls must be used for protection. When an atomic bomb bursts, the damage radius for personnel who are in foxholes (perpendicular sided holes) with a protective layer of earth about 1 meter thick, will be only one-third to one-fourth that for personnel in the open. There is practical proof that curving trenches are more effective protection than trenches which do not curve; holes opening away from burst center are better than those opening laterally to the direction to burst center; those opening laterally are better than those facing burst center.

(3) Observation and firing port installations of defense works are easily damaged. Because of this, the construction materials surrounding the openings must be strong and firm; moreover, all possibilities for making them low must be exhausted (without obstructing observation or fire). Protective shields must be installed over the ports. Use straw bags or rocks fitted together to add strength and in order to protect the surrounding loose earth from being blown away.

(4) Covered shelters are very useful in protection against all four of the casualty and damage producing elements of atomic weapons. When a 20 kiloton equivalent atomic bomb bursts in the air, under generally existing circumstances the personnel damage (wound) radius for personnel within a covered shelter (1.2 meters of loose earth, 1 protective door and 2 close fitting doors installed) is only one-fifth of that for personnel in the open.

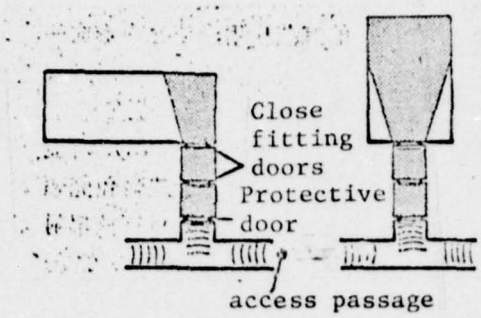


Figure 7-19. Diagram demonstrating the use of right angle relationship of access passage and main chamber in construction of shelter.

Damage to covered shelters is mainly in obstructed doorways, shattered door leaves, and broken doorframes. Because of this, in converting or constructing covered shelters, doorframes and door leaves must be made firm and strong, and passages and main areas must be connected throughout. In order to avoid having pieces of broken door leaves cause indirect casualties, it is best if access passages and main areas are constructed with the right angle lay-out (Figure 7-19).

Within the protective shelter, and especially in underground passages and tunnels, there should be shovels and picks, and various other tools prepared for use in rescue and recovery operations after the shelter or exit-entry ways have been damaged.

Protection of Material, Equipment and Water

Weapons, ammunition, vehicles, petroleum products, rations, medicine, and other materials and equipment, including water, are things which the great army and civil population, in order to fight and live, must not be without. Because of the public duty of bringing a war to a successful conclusion, good protection of materials, equipment, and water sources has an all-important meaning.

1. Protection of Materials and Equipment

When an atomic weapon bursts, the main damage to materials and equipment arises from the effects of shock wave and thermal radiation. Protective methods generally include five kinds: "defilade," "cover," "bury," "smear" (protective coating), and "holes."

Defilade - use emplacements or pits, and communication trenches to provide defilade for materials and equipment. Damage radius is generally about one-half to one-third of that in the open. Use hills or mounds, pits, sturdy structures one side of which faces away from burst center, and chasms and ditches which run crosswise to the direction of burst center. Use these things to secure defilade for materials and equipment. They have a definite protective effectiveness.

Cover - by using covers of fireproof cloth and fire resistant materials to cover piles of materials and equipment exposed to the sky, thermal radiation damage can be diminished or avoided, and radioactive contamination averted. Among often used types of cloth covering are woven fiberglass material with plastic binder (as a covering material), this having the best anti-thermal radiation properties; also, cotton canvas or sailcloth material which, however, lacks somewhat compared to fiberglass.

Bury - take the materials or equipment and bury it underground, or cover it with loose earth. For example, damage to lead wires and electric cables can be prevented by burying them 10 to 20 centimenters underground.

Smear - damage from thermal radiation to piles of materials and equipment exposed to the sky can be diminished by smearing the surfaces with mud paste, plaster, fire resistant paint, etc. When using cloth covers or reed mats to cover materials, smearing a layer of mud paste or plaster on their surfaces can effectively prevent damage from thermal radiation.

Holes - storage caves or holes, underground passages, tunnels, mine tunnels, mountain coaves and grottoes and kilns, etc., are very useful in protecting all kinds of materials and equipment.

Nowadays the use of round earthen granaries has spread widely throughout the cities and countryside - they are a kind of cylindrical shaped food granary, using such materials as mud and rice straw in

their construction. They have comparatively good effectiveness in protection from thermal radiation and shock wave.

2. Protection of Water

When an atomic weapon bursts it is easy for surface water supply systems to be damaged, causing definite difficulties in securing water for use in production, everyday living, and decontamination. In order to assure in time of war an uninterrupted supply of the necessary water, effective measures must be taken to assure its adequate supply.

(1) Install emergency water supply systems: In order to guarantee that there will be water to use at any time, suitable streams, revervoirs, or underground water sources in the vicinity must be selected in time of peace, and prepared to serve as emergency water sources. Available water sources must be sectionalized so that various independent water supply systems can be set up. All effort must be made to see that pumping stations and pipelines are buried underground in order to avoid damage to them.

(2) Dig water wells and emergency reservoirs: When constructing underground passages and tunnels, there must be plans for space within underground passages and tunnels in which to dig water wells or emergency reservoirs. When digging wells on the surface, easily collapsible buildings and structures must be avoided in order to guard against having the well openings obstructed. Also, attention must be given to the addition of sealed covers for the wells to protect the well water against contamination.

(3) Store water: Before an atomic weapon attack, water tanks, troughs, boxes, buckets, tubs, jars, or various other receptacles can be used for storing water within the shelter. In order to prepare a source of water on the surface for use when contamination is present, lids can be added to jars, water boxes, buckets, and other receptacles, and they can be buried underground for storage.

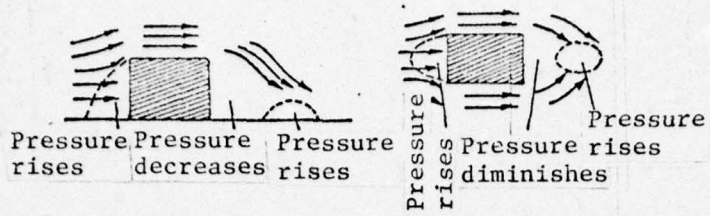


Figure 7-20. Theory of defense against shock wave with reference to terrain shapes and objects.

3. Actions at the Time of an Attack

Atomic attack warnings are divided into three categories: preparatory warning, urgent warning, and all clear. On hearing the preparatory warning, protective preparations must be made; actions on hearing the urgent warning are the same as for an air raid. When the attack occurs, attention must be given to the following two points:

Defensive Actions under Emergency Circumstances

Use terrain and terrain objects carefully so as to avoid injury. This is one effective action to take in defense against atomic weapons under emergency conditions. When the shock wave arrives at various terrain configurations and terrain objects like mounds, cliffs, chasms, road foundations, ditches, and strong structures, its pressures are diminished (1 to 7 times). When the shock wave flows past retarding lateral or protruding terrain features or objects, the vicinity of the face away from burst center experiences a small lessening of overpressure. Moving (dynamic) pressure is very small and may diminish to none. After flowing past the areas of diminished pressure behind terrain shapes and objects, the shock wave converges and pressures again increase (Figure 7-20). Thus, the areas around the sides or faces of terrain features and objects away from burst center where pressures are diminished can be used for protection. Generally speaking, those terrain features and objects which are useful in defense against shock wave can all obstruct thermal radiation and weaken initial nuclear radiation.

The flash is the atomic bomb burst's most obvious signal. After becoming aware of the flash, those personnel who are unable to get

into a shelter must not look at the fireball, and must quickly and decisively lie down, making use of the nearest terrain features and objects (the same as the action taken in lying down when within exposed trenches). The direction in which one lies down must be decided based on the direction of the location of the atomic bomb burst and on the special nature of the terrain features and objects. Personnel on open ground must face with back to the burst center and lie down (Figure 7-21). When terrain features and objects are comparatively small, in order to emphasize protection of the head, personnel must face in the direction of burst center and lie down (Figure 7-22).

In order to avoid suffering indirect injuries, personnel who are within rooms and cannot get outside to get under cover must avoid open doors and windows and lie down under beds or tables which are against the walls in the corners of rooms (Figure 7-23).

If the flash is observed while driving a vehicle, the brakes must immediately be applied. Personnel on the vehicle had best quickly lie down in the vehicle. Personnel who cannot lie down should assume a posture as low as possible, and, in order for personnel to avoid injury by being thrown about by the shock wave, they should hold tightly to the vehicle's sides, side benches,or other handholds.

Defensive Requirements for Personnel within a Shelter

After an atomic bomb has burst, and if it is a tightly closed shelter equipped with forced air chemical filtering, the first thing which must be done is to isolate the shelter (close all openings, etc). Next, depending on the circumstances, start the forced air poison gas filtering system or forced air air filtering (cleaning) system.

When an atomic weapon bursts, personnel taking cover within the shelter should use their fingers or cotton balls to block their ear passages to prevent ruptured eardrums. In order to diminish injuries to the head and body when subsurface atomic bursts occur, if at all possible they should not be allowed to touch the walls of the shelter.

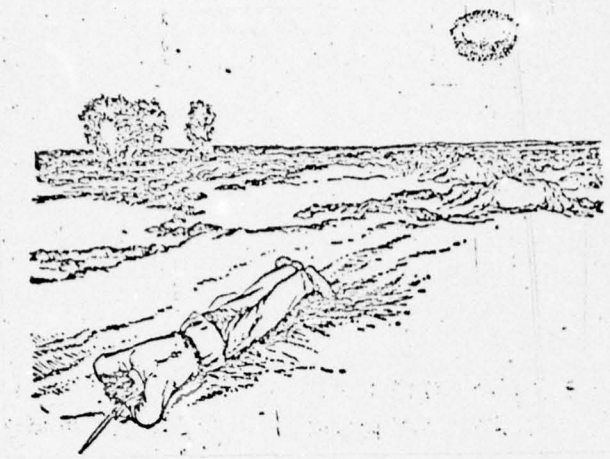


Figure 7-21. On open ground, lie down with back to burst center.

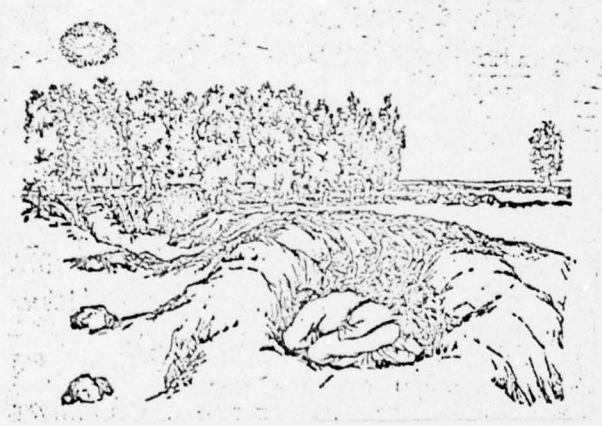


Figure 7-22. When terrain features and objects are comparatively small, face burst center and lie down.

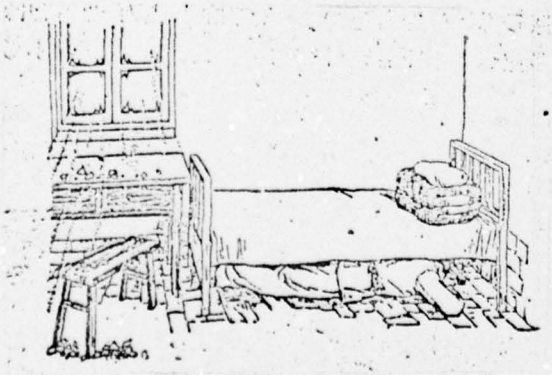


Figure 7-23. Within rooms lie down under beds which are pushed against walls.

In general, personnel taking cover within shelters exposed to the sky should lie down, and they must be prohibited from looking at the fireball. When lying down, the eyes must be shut, the mouth naturally open, face downwards, with the two forearms crossed to make a pillow under the head. In order to avoid shock injuries to internal organs, the chest must not be pressed tightly against the earth. Also, if at all possible use materials like rainclothes, clothes, or bedding to cover exposed skin. When taking cover in a one-man shelter, you must squat down so that your posture is as low as possible. After you hear the sound of the burst, you can then stand up.

4. Actions after the Attack

After the attack, the troops and militia having the duty of prosecuting the war must rapidly regroup organizationally and complete their preparations for war in order to meet the attack of the invading enemy. The great army, people, and the specialist units must all cooperate closely, speedily clarifying the radioactive contamination situation, and with due speed eliminating the consequence of the attack, making all haste to reinstate productivity and orderliness.

Detecting Radioactivity

Radiation detection, then, is the timely examination of contamination conditions within the unit concerned and its specified area of responsibility, the marking on the surface of radiation levels and boundaries of contamination, and the finding and marking of detours (skirting roads). Radiation detection is usually the responsibility of chemical warfare detachments and personnel who have received specialist training. In the activation and organizing of these units, they should be composed of 2 or 3 people and should be equipped with radiation detection equipment. Also, uranium mining radiation survey equipment or simple radiation alarm equipment may be used to determine whether or not radiation contamination is present.

When engaged in radiation detection, it is most important to consider the places over which the cloud has traveled, the areas of

population concentration and activity, and other important targets (like bridges, river mouths, etc.), as part of the process of area radiation detection. Further, go over several routes in the process of finding out and clarifying the conditions of contamination within the area. In order to clarify the contamination conditions in every direction, directional reconnaisance must be initiated. Roads skirting the contaminated area, or other road lines specified as detours, must be reconnoitered.

Contaminated areas generally are marked in units of 0.5, 5, 50 or 100 roentgens/hour. Ordinarily, the boundaries of contaminated areas are marked as 0.5 roentgens/hour, and 0.5 to 5 roentgens/hour designates areas with light contamination. 5 to 50 roentgens/hour designates moderately (middle) contaminated areas, 50 to 100 roentgens/hour designates severely contaminated areas, and over 100 roentgens/hour designates areas of very severe contamination. Radiation detection personnel must replace the boundary markings of contaminated areas at suitable times based on the conditions of change in radiation levels.

Emergency Rescue and Recovery, Firefighting, and Emergency Repair

Methods of emergency rescue and recovery, firefighting and emergency repair after an atomic weapon attack are basically the same as those used in the case of attack with conventional weapons, but there are a few special points to consider.

The shock wave may frequently cause injury to the internal organs. Because of this, the wounded, when being rescued, should be raised or put down very carefully. Every effort should be made to administer mouth-to-mouth breathing as a method of artificial respiration to personnel who have stopped breathing. In order to avoid increasing the severity of internal injuries, do not use the method involving pressure on the chest. Do not forcefully tug out personnel who are pinned inside collapsed rooms or shelters when attempting rescue. When attempting rescue in contaminated areas, quickly remove wounded personnel from the contaminated area, then proceed with first aid.

After the atomic weapon attack, even though the area over which fires have started is comparatively great and individual fires are comparatively many, there may be, at the time of initiation of fire-fighting, several places where the fire situation is not really severe. In this case, after the shock wave has passed, the population (masses) must be put to work fighting the fires.

Emergency repair personnel must first perform emergency repairs on urgently needed roads, bridges, and important production and life supporting installations like water supply, electricity supply, and communications systems, broadcasting systems, communications centers, and protective shelters.

Fighting units must first make emergency repairs to weapons, equipment, protective shelters, and communications and liaison systems, in order to complete their preparations for battle. With reference to severely contaminated weapons and equipment, when circumstances permit they should be decontaminated, then given emergency repair. If there is no time for this, the important parts may be wiped clean before use.

Protection of Personnel in the Contaminated Areas

In order to reduce the harmful effects of radiation contamination, personnel within the contaminated area must don protective face masks or respirators in good time. Towels, handkerchieves, or clean clothing may also be used to muffle the mouth and nose. Put on protective boots or trousers, tie sleeves tightly, use rain clothes, plastic cloth, bedding, or any such readily available material to cover exposed skin. Don't heedlessly come against contaminated objects, sit, lie down, or take off protective articles. If at all possible do not eat food, drink water, or breathe smoke within the contaminated area, and do all you can to reduce the period of your stay in the contaminated area.

When the area in which people are living becomes very lightly contaminated, the people must immediately shut doors and windows to

stop radioactive ash and dust from entering rooms, and personnel must be outside as little as possible in order to reduce harm from radiation. When contamination is severe, personnel can continue to take cover within the shelter, or they can evacuate the area.

When personnel traverse a contaminated area, they generally have three routes from which to choose - routes skirting the area, directly though it, and through underground passages. When skirting the area, you must stay far away from burst center, following the edge of the area around upwind from burst center and laterally keeping away from the line of wind direction over burst center. When traversing directly, you must cross rapidly, avoiding areas with high radiation levels. When crossing in vehicles, besides taking individual protective measures you must close doors and windows and close canvas tops. Personnel on vehicles must not dismount unnecessarily. When getting on and off vehicles don't come in contact with tires or fenders. Vessels crossing contaminated areas of water must close portholes and cross at high speed. Personnel who must remain on decks, must strengthen protective measures.

After crossing a contaminated area, personnel, vehicles, and vessels must be examined for contamination as quickly as conditions will permit, so that timely decontamination may be effected.

Eliminating Radioactive Contamination (Decontamination)

Decontamination is getting rid of the radioactive ash and dust present on surface areas of personnel, material, and equipment to the extent that permissible, or lower, levels of radioactivity are present on them, lessening the injurious effects on personnel of radioactive contamination.

1. Decontamination of Personnel

When personnel leave the contaminated area, they must immediately undergo decontamination. First, brooms, tree branches, etc., are used by personnel on themselves or on each other to brush and pat clothing

cleaning off radioactive ash and dust present. While brushing and patting, personnel should stand upwind of the flying dust. Next, face masks and respirators are removed, mouths rinsed, noses blown with the fingers, and soap and water is used to scrub the exposed parts of the body. When there is no water, things like towels or handkerchieves can be used to rub dust off, rubbing once, folding the cloth to expose a clean surface, rubbing again, etc. When conditions permit, showers may be used to bathe, or personnel may bathe in streams or rivers that have not been contaminated, thus accomplishing decontamination of the whole body. After this washing, personnel must be examined, and if their level of contamination is under the permissible level they may leave to carry on.

2. Decontamination of Materials, Equipment, Roads, and Structures, Etc.

Methods of decontamination can, in general, include: "patting," "sweeping," "wiping," "washing," "shoveling."

Patting - Using tree branches or thin sticks to tap or pat the outer surfaces of contaminated materials and equipment.

Sweeping - Using brooms or brushes to sweep off or brush off contaminated weapons, instruments, technical equipment, roads, exposed works or shelters, structures, and production tools, etc.

Wiping - Using dry or damp cloth to clean off contaminated weapons and production tools, etc.

Washing - Using water, soapy water, laundry soap powder, etc., to wash contaminated clothing, and using pressure water sprinklers to wash off contaminated weapons, production tools, technical equipment, asphalt road surfaces, etc.

Shoveling - Shoveling away a layer of earth 3 or 4 centimeters thick from the surface of exposed shelters and other works to decontaminate them.

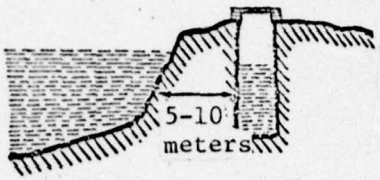


Figure 7-24. Water filtering wells.

3. Taking Care of Grains, Foodstuffs, and Drinking Water

In the case of well-wrapped foodstuffs on which contamination is present only on the outer surfaces, contamination must be brushed or swept off. The foodstuffs within the wrappings can then be eaten. Contaminated foodstuffs with damaged wrappings may be decontaminated by using the washing or scouring method. Grains and food items which cannot be washed or scoured may be decontaminated by throwing away the surface layers.

Measures must be taken to purify contaminated water sources. Some methods follow:

Using soil to purify: To each liter (about 1 kilogram) of water add a small handful of fine-grained earth, then add alum in order to speed clarification of the water. Shake and stir for about three minutes, then let stand for 3 to 5 minutes. After this take the clear water on top for use.

Dig water filtering wells: When water sources like rivers and lakes become contaminated, water wells can be dug in places 5 to 10 meters away from the banks so that the river and lake water can seep into the wells (Figure 7-24).

After being subjected to these processes, grains, foodstuffs, water, etc., must all be examined. When contamination levels are within permissible limits, they can be consumed.

4. Items to Keep in Mind

(1) Items which are considered to be possibly contaminated must first be subjected to contamination examination in order to decide whether or not to decontaminate, and which parts of the item to emphasize in decontamination.

(2) Points at which decontamination is by washing must be a certain distance away from water sources. Water disposal ditches and holes for polluted water must be dug in order to avoid the pollution of water sources by water used in decontamination.

(3) Used water must flow into specified channels, conduits, or holes for polluted water. Used and damaged cloth and cotton, and dust and debris swept from contaminated streets, passages, and structures must be deposited at specified points where it must be buried in deep holes. Markings must be put up at these points.

(4) Foodstuffs and materials which are temporarily not needed and cannot be decontaminated, or whose contamination levels, after several attempts, have still not been brought down to permissible levels, can be put aside until after automatic degeneration of radioactivity to permissible levels has occurred, at which time they can be used. Meanwhile they must be appropriately piled and marked.

SECTION 3. DEFENSE AGAINST CHEMICAL WEAPONS.

1. Characteristics and Capabilities of Chemical Weapons

The various kinds of poisonous chemical materials which are used for casualty effect on personnel and animals, and to destroy vegetation, are called toxic agents (commonly called poison gas). Artillery shells, rockets, guided missiles, spraying equipment mounted on aircraft, hand grenades, land mines and all other such weapons containing toxic agents are chemical weapons. The external shells (shell or bomb casings) of chemical weapons are the same as the various kinds of anti-personnel bombs or shells except that the shell casings of

chemical weapons are generally marked with a stripe and contents note of a particular color (like red or green), so that they can be differentiated from others.

Kinds, Uses and Special Characteristics of Toxic Agents

Chemical weapons can be divided into several categoies, as follows:

(1) Nerve agents: The most important are "sha-lin" (Sarin), Soman and "wei-ai-k'e-szu" (VX). They can damage the nerve system. The poisonous effect of these toxic agents is relatively great, their injurious effects are quick, and they have strong penetrating capability. When personnel are severely dosed there is danger to life, unless timely first aid is administered.

(2) Vesicant toxic agents: The most important are mustard gas and lewisite gas. These gases can cause blistering and destruction (bursting) of the tissue of skin, eyes, and breathing passages. Poisonous effect of this type of toxic agent is comparatively great, it has a strong penetrating capability, and after personnel are dosed the time required for recovery is comparatively long.

(3) Lassitude inducing ("lose capability") toxic agents: Most important is "pi szn" (BZ). This can cause personnel to temporarily lose the capability for normal activity after being dosed, but generally cannot endanger life.

(4) Toxic agents which poison the whole body (cyano-type toxic agents): Most important are hydrocyanic acid (prussic acid) and cyanic-chloride. They can destroy the ability of the cells of the body to use oxygen. Their poisonous nature is comparatively great, they are quick acting, and severely dosed personnel are in danger of death without timely emergency treatment.

(5) Irritant toxic agents: Most important is chloralacetophenone, also called "shih ch'i" (CZ) and "has-ai'szu" (CS). It can

severely irritate the eyes and breathing passages, causing severe tearing and sneezing. If personnel can put on face masks or leave the area, after 10 to 20 ("a few over 10") minutes the symptoms may disappear.

(6) Suffocating toxic agents: Most important is phosgene (carbonyl chloride). It can damage the lungs, producing swelling and excess fluid, and can produce suffocation when dosage is severe.

In addition to those above, there is a type of weed eradicating (defoliant) agent. In use its appearance is as a white, orange, or blue powder (also called "blue poison," which contains arsenic) or as oily droplets which can turn plant leaves yellow, and cause them to wither and dry up. Personnel who breathe air, or by mistake eat food or drink water contaminated by this agent, or whose skin comes in contact with contaminated materials, can be harmed by it.

Duration of Toxic Effectiveness and Routes of Contamination

When toxic agents are used in the form of toxic vapors, or smoke, their period of persistency is relatively short, generally "from 10 to 20, to up to 100" minutes, so they are called temporary (non-persistent) toxic agents. There are several not easily dispersed toxic agents like mustard gas, vesicants, and CS, etc., which can take the form of droplets or powders when used, and thus have relatively long persistency, at the least several hours, and at most up to 100 days or more, and thus are called persistent toxic agents.

Toxic agents in the form of vapors or smoke have their most important effect in contaminating the air, achieving poisonous effect by passing through the individual's breathing passages. Toxic agents in the form of droplets or powders are used mostly to poison or contaminate ground surface or objects upon it. The vapors from such agents can also poison the air, getting onto the skin, into the eyes, and into the breathing passages, and causing individuals to be poisoned in this fashion. Eating poisoned food and drinking poisoned water by mistake can also be a source of poisoning.

The Limited Nature of Chemical Weapons

Although chemical weapons have comparatively great casualty effect, when they are used it is easy for them to be affected by various influencing conditions, and they have very great limitations.

They are influenced by climatic conditions. When toxic agents are used at dawn, or in the evening when the wind is light, they are not easily dispersed and their effect is comparatively great. When they are used when wind direction is uncertain or the wind speed is comparatively great, their effectiveness is comparatively small. Rain can wash away toxic agents, and can cause various toxic agents to be diluted or to lose toxicity. Snow may cover over the toxic agent. A layer of snow 20 centimeters or more thick can have an isolating effect on the toxic agent.

They are limited by wartime conditions. The reason an enemy releases toxic agents is to achieve his objective of destroying our strength to carry on through obstructing our offensives or attacks and capturing our bases. When we and the enemy join battle, it is difficult for the enemy to use chemical weapons for fear that he himself will be damaged.

The use by the enemy of chemical weapons is something that can be completely protected against; it is only necessary that we shall have received protective training and that we shall have made protective preparations.

2. Defense against Chemical Weapons

How to Discover the Release of Toxic Agents by the Enemy

Based on traces or indications which give rise to suspicion, reconnaisance units or personnel who have received special training must be dispatched to clarify the scope and type of toxic contamination. This must be done in order to offer protection, decontamination, and emergency treatment to distressed people in the area. Furthermore,

FORM IN WHICH SEVERAL TOXIC AGENTS ARE USED, AND THEIR SYMPTOMS.

KIND	NAME	ODOR	FORM IN WHICH USED	PRINCIPAL SYMPTOMS WHEN DOSED
Nerve agents	"Sha lin" (Sarin)	Slight odor of watermelon	Vapor, also can take form of droplets	Pupils of eye contract, breathing difficulty, face turns greenish purple, mouth drips saliva, heavy sweating, body trembles, muscular spasm or tension.
	Soman	Slight fragrance. Industrially produced type has a camphor-like odor.	Same as above	Symptoms same as above, but more poisonous, quicker effect.
	"Wei-ai-k'e-szu" (VX)	No odor	Mist or vapor, also can take droplet form	In vapor form, breathing passages are affected and the symptoms are as for Sarin. In droplet form, when the skin is contaminated, first there is local trembling, sweating; when the symptoms are developed, they are like those for Sarin.
Vesicants (blistering agents)	Mustard gas	Strong odor of garlic	Droplets, and also mist or fog	When the skin is contaminated, during an initial period there is no pain. Several hours later redness appears and watery blisters rise. When the eyes are contaminated, they redden and are light-sensitive. When the breathing passages are contaminated, mucus flows, there is coughing as with a heavy cold. When contaminated food is eaten by mistake, there is nausea, vomiting and diarrhea.
	Lewisite gas	Weak odor of Indian mallow	Same as above.	Similar to mustard gas, but when the skin is contaminated, pain is very quickly evident. When the breathing passages are contaminated, excess mucus

(continued next page)

KIND	NAME	ODOR	FORM IN WHICH USED	PRINCIPAL SYMPTOMS WHEN DOSED
	Lewisite gas (continued)			and swelling of passages is likely. When digestive passages are contaminated, severe bleeding can occur. In severe contamination, symptoms of arsenic poisoning can occur.
Lassitude-inducing agents	"pi szu" (BZ)	No odor	Smoke	Pupils of the eye dilate, pulse quickens, cheeks flush, mouth dries, walking is unsteady, affects mental activity.
Toxic agents which poison the whole body (cyano-type)	Hydrocyanic acid (prussic acid)	Odor of bitter almonds	Vapor	Thick-tongued (speech impeded), face and lips become bright red, the head aches, there is difficulty in breathing, muscular tension or spasm, and pupils of the eye dilate.
Irritant toxic agents	"*Hsi-ai-szu*" (CS), also known as CZ, chloralacetophenone	No odor; No odor; Fragrance of the lotus or water lily	Smoke or powder	Eyes pain and tears flow, coughing, pain behind the sternum, sneezing, skin prickles.
Suffocating toxic agents	Phosgene	Odor of rotting hay or rotting apples	Vapor	After contamination, tears flow, there is coughing; after several to 100 minutes, there comes (the phenomenon of) a passing feeling of false well-being (the latent period); several hours later, the effects continue and breathing difficulties appear, the face becomes greenish purple. Coughing up of phlegm, and vomiting froth are among the symptoms.

the contaminated area must be clearly marked in order to keep personnel from entering it by mistake.

(1) When the enemy aircraft spray toxic agents, in order to hit highly remunerative targets and to hit them accurately, they frequently choose to fly low and to spray the smoke or vapor from beneath the wings of the aircraft. Thus, they look the same as aircraft spraying agricultural aids. When toxic agent bombs (or atrillery shells) burst, the sound of the burst is low and deep and they produce a colored smoke. The shell fragments are large, and the shell crater is shallow and damp, and in the vicinity of the shell hole there may still be droplets or spots. When enemy ground units release toxic agents, they don gas masks, take cover and wait. Such irregular activities of the enemy are an indication that toxic agents are present.

(2) When toxic agents in the form of droplets are dropped on plant leaves, the oily droplets may be apparent on the leaves and soon colored spots will appear. As time passes the leaves may wither and roll up. If the toxic agent falls on the flowers of plants, the blooms may undergo obvious color change.

(3) Bees, flies, grasshoppers, etc. feel the effects of toxic agents relatively rapidly. After being contaminated they can very quickly show difficulties in flying, trembling wings, and various other symptoms. Hemp sparrows, parrots, rabbits, dogs, sheep, when dosed, exhibit at various times the symptoms of blinking, eye pupils expanding or contracting, salivating, staggering, breathing difficulties, and various kinds of irregular activity. When water is contaminated, small fish within the water, and locusts can very quickly evidence the phenomena of a quickening of activity, haphazardly jumping and creeping about, and later, difficulties in moving. The small animals mentioned above may die in the order noted when severely dosed.

(4) For the most part toxic agents all have their own distictive odor. When suddenly a special odor becomes evident in the air, it is possible

that the enemy has used chemical weapons, but, to avoid becoming an unnecessary casualty, you cannot move about, especially to smell it. Furthermore, if personnel experience blurred vision, tearing eyes, slurred speech, breathing difficulties, chest distress, itching skin (or burning feeling), etc., these are possibly the initial symptoms of toxic poisoning.

How to Defend Against Chemical Weapons

When it is discovered that the enemy has used chemical weapons, or when there are suspicious indications of such use, you must quickly protect the breathing passages and eyes in order to prevent contaminated air from entering the body through the breathing passages, and to prevent injury to the eyes. When enemy aircraft spray toxic agents, or whenever there is an explosion of chemical bombs (or artillery shells), or when there are flying or splashing droplets or toxic agents in the form of a very thick fog in the air, besides quickly protecting the breathing passages and eyes you must have overall body protection in order to keep droplets of toxic agent from contaminating the skin and clothing. When there are toxic agent droplets on the surface of the ground, you must also protect the lower limbs in order to prevent the droplets from contaminating the shoes and socks.

1. Theory and Methods of Protection

Based on the special use characteristics and routes of contamination of a toxic agent, the basic theory of protection against toxic agents is, of course, to devise means of keeping toxic agents off of the body, and, at the same time, guarantee that personnel can breathe clean air. For example, the wearing of protective clothing and gas masks, entering tightly closed shelters, etc., can keep toxic agents away from the bodies of personnel. The filter canisters on chemical defense face masks, and the forced air chemical filter equipment of tightly closed shelters, etc., can filter the toxic agent from the air, enabling personnel to breathe clean air.

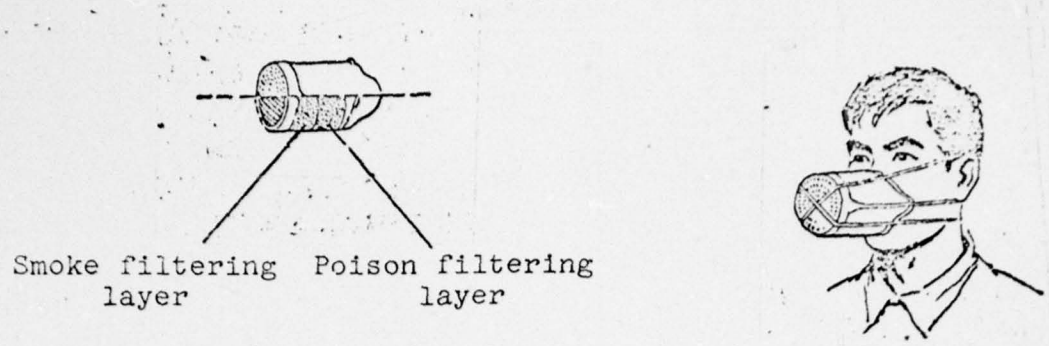


Figure 7-25. Wearable anti-toxic canister.

Methods of protection against chemical toxic agents are generally divided into two types, group protection and individual protection:

Group protection: When discovering that the enemy has released chemical toxic agents, all but those who have duties to perform must quickly get into shelters, close the sealing doors, and quickly initiate isolation measures (gas masks, protective clothing, etc.). After determining that the high concentration of toxic agent has passed, turn on forced air chemical filtering equipment in order that clean, filtered air may enter the shelter - avoiding casualties.

Individual protection: Means the use of individual protective equipment for protection. Standard (regulation) equipment for protecting the breathing passages and eyes is the gas mask; regulation equipment for protecting the surface of the body is protective clothing, etc.

2. Do-It-Yourself Methods and Equipment Using Locally Available Materials

(1) Simple and easy protection of the respiratory passages: Protective items and methods are as follows:

Wearable chemical defense canisters (Figure 7-25) containing filtering material. Tube-shaped bodies for these protective items can be made of sheet iron (tin-can type), tube sections of bamboo, or waxed cardboard cylinders (it is best to use rubber or similar material to form a gasket where the end of the tube meets the face, in order to avoid air leaks). Inside these cylinders are placed

two layers of poison filtering material. Use sawdust, paper shreds, or sugar cane fibers, etc., to put in the smoke filtering layer to filter out toxic agents taking the form of smoke or fog. To absorb or destroy toxic agents in vapor or gaseous form, use in the poison filtering layer activated charcoal (you can use locally charred walnut shells, coconut shells, peach pits, apricot pits, almond nutshells, and wood products as raw material) or slaked lime, pulverized brick, etc. Slaked lime is made with a mixture of half-and-half lime and mud (you cannot use sand or gravel) with water squirted on it to form grains the size of large rice grains. After it is dried, it can be used. "Soda brick granules" (soda ash, soda lime) means taking very porous brick and breaking it up into fragments the size of large rice grains, soaking it in a 20% lime and water solution for several minutes, then taking it out and drying it, after which it can be used.

Wearable protective respirators containing filtering material: Use several layers of toweling or gauze to make a respirator (mouth mask). Put activated charcoal or slaked lime granules in the respirator, or soda lime granules, both of which can protect against toxic agents in the form of vapor and smoke or fog.

Protective respirators (mouth masks) soaked in soda solution: To make a mouth mask use toweling (8 to 12 layers) or gauze (30 to 40 layers). Before using, soak in a soda solution (20% lime water or 10% soda (water) solution). Take the mouth mask material out of the solution, wring it out and it can be used. In order to reduce irritation to the skin due to the soda solution, you can add a layer of gauze or dry cloth to the inside surface of the mouth mask.

(2) Simple and easy means of protecting the eyes: Use ordinary wind glasses (goggles) and seal up the air dispersing and ventilating holes with rubber or rubberized cloth; they then become anti-toxic glasses. They can then be used not only for use as a general convenience item, but will do as chemical defense glasses as well (Figure 7-26). Under emergency conditions a transparent plastic membrane or isinglass ("glass paper") can be used, using "scotch

Figure 7-26. Chemical defense glasses.

tape" (rubber cloth) or rubber cement to stick it directly onto the glasses frame.

(3) Simple and easy means of protecting the skin surface of the body: To protect the body you can take cover in rooms, covered shelters, or you can use items like rain clothing, wide rain hats, leaf capes, rainproof cloth, rain umbrellas, oil cloth, plastic cloth, oiled paper, etc., to cover the body. When emergency conditions exist, you can also use the densely growing leaves of large trees to keep off the toxic agents sprayed by aircraft, causing them to be usable to fall on clothes and skin. Wearing high-topped rain boots or rubber shoes, or using rubberized cloth or oiled paper, etc., to wrap around the legs can also stop toxic agent droplets from contaiminating the legs and feet.

3. Items to be Emphasized

(1) There must be no leaks in equipment for protecting the breathing passages. Method of checking for leaks is: Breathe in a mouthful of smoke, put on the anti-gas tube or anti-gas respirator, then breathe out naturally. If no smoke seeps out, this is proof that there are no air leaks. Anit-gas tubes and anti-gas respirators containing filtering material must be kept in plastic bags when not in use, to avoid loss of effectiveness.

(2) When using equipment for protection of the breathing passages, be certain that it makes a tight seal with the face. After the mask in on, you must first expel a mouthful of air which will blow out the contaminated air which was inside the mask, then maintain regular and slow breathing. In order that the toxic agent be kept from passing through the filtering material, you cannot violently inhale the air.

(3) Protective items made from these readily available materials have a relatively short protective period, and personnel must make every effort to shorten the duration of their stay in the contaminated area. If the period during which they must stay in the contaminated area is relatively long, they must be replaced at timely intervals.

(4) When leaving the contaminated area, you must go against the wind, or laterally from wind direction, keeping clear of specified points. When moving about in a downwind direction from the contaminated area, you must keep in mind protective measures so as to avoid injury.

(5) After protective tubes and respirators containing filtering materials have been used, you must take out the filtering material and bury it. After being decontaminated, protective tubes, respirators, rain clothing, rain shoes, etc., can then be used again.

4. Protection of Animals

Protective measures should be taken based on what is suitable for the area, and on what is practical under conditions existing at the time. For donkeys, horses, etc., underground passages and tunnels can be constructed; protective respirators, protective throw cloths, protective hoof coverings, etc., can be made for them.

5. Protection of Material, Equipment, Rations and Water

Material, equipment and rations must be placed in the covered parts of mountain caves, tunnels and underground passages. The containers for stored grains, and other foodstuffs must have covers and be tightly closed. Materials, grains and foodstuffs in open storage ("exposed to the sky") can be covered with grass 15 to 20 centimeters thick, over which a cover of grass matting is placed; or they can be buried under loose earth. Water wells and tanks must have protective covers.

The above simple and easy methods are supplied for reference, but don't be limited to them. You can combine the practical necessities of the moment with what is suitable for the time and place in choosing protective measures.

How to Decontaminate

In order to avoid or diminish injuries to personnel from toxic agents, timely and satisfactory decontamination must be effected. In decontamination, since there are different kinds of toxic agents and contaminated objects, and different kinds of decontamination methods and agents from which to choose for the job, the selection of the means of decontamination must be based on which is most simple and easy, which can do the job, and which will not damage the contaminated object.

(1) Decontamination of personnel: When the skin is contaminated, you must first use materials like cloth, paper, dry earth, etc.,to absorb the droplets of toxic agent on the skin. Then use cotton balls or cloth dipped into decontaminant solution to wash the parts contaminated. Some decontaminant solutions have a corrosive effect on the skin, so after 15 minutes, you must use clear water to rinse it off to avoid this corrosive effect. When there is no decontaminant solution available, you can use large quantities of clear water to rinse the areas as a means of getting on with the decontamination process. When the eyes are contaminated, you can use a 2% sal soda solution or cooled boiled water as a rinse. When wound openings are contaminated and when nerve toxic agents are involved, you can use 2% sal soda solution as a rinse. With vesicants you can use 1:1000 potassium permangante solution as a rinse. In the process of decontamination you must avoid expanding the area that has been contaminated. Used cotton balls, etc., must be buried or burned.

When you have left the contaminated area and conditions permit, you can go ahead with the washing of the whole body so as to completely free the skin of decontaminant agent remaining on it, and

of such of the bad effects of the toxic agent or decontaminant as are possible.

(2) Decontamination of clothing: Ordinarily decontamination can be accomplished by boiling in water for half an hour to an hour (counting the time from when the water reaches a rolling boil); and if you put some soda or soap in the water, the effect will be even better. You can also dry clothing before a fire to decontaminate it, and if you dampen it and rub on some grass or wood charcoal (charred grass or wood), then dry it again before a fire; decontamination will be even more thorough. Other than these methods you can decontaminate by ventilating and letting the sun shine on clothing (using this method it is not easy to achieve thorough decontamination when the items are contaminated by VX and/or Lewisite droplets), but a comparatively long period of time is required. After clothing is decontaminated, it should be washed clean in soapy water and dried. When you are boiling, baking, or ventilating the clothing there must be no personnel downwind of the operation, and the personnel doing the job must be wearing complete protective outfits.

(3) Decontamination of weapons, appliances, and production tools: Weapons, appliances, and tools which are not affected by decontaminants can be decontaminated by whatever decontaminants you choose to use. When weapons, appliances, and tools which will be affected by decontaminants are involved, or when decontaminants are lacking, you must make a suitable decision as to what decontamination method to use, spraying off with water, boiling in water, putting the article out in the sunshine, or immersion in kerosene, etc. In the decontamination of delicate instruments you can use alcohol or gasoline to wipe it a few times. When unpainted wooden items are severely contaminated, even after the surfaces have been decontaminated, you must brush some decontaminant on the decontaminated parts in order to prevent the contaminant which has been absorbed from seeping out and damaging people.

(4) Decontaminating areas in which personnel must move about: When there is contaminated air remaining within rooms or shelters, you must open doors and windows to let fresh air flow through, or use artificial means of expelling the contaminated air. When outside areas of activity are contaminated by persistent toxic agents, you can decontaminate by spraying decontaminants about. You can also use the shoveling away method, the covering with loose earth, etc., method, the burning method, or the washing away method to decontaminate. The thickness shoveled away should ordinarily be: earth, 3-7 centimeters; snow, 20-25 centimeters. This thickness of loose coverings of earth, grass, etc., must be over 10 centimeters.

(5) Decontamination of foodstuffs and drinking water: You can use the ventilation method or washing with warm water to decontaminate foodstuffs which have been contaminated with toxic agents in the form of vapor or gas. Wrapped foodstuffs which have been contaminated with toxic agents in the form of droplets, powders, or smoke, must first have the surface wrappings decontaminated. When the contaminated layer of wrapping has been removed and thrown away, the remaining wrapping can be decontaminated by ventilation or forced water spraying. After the surface wrappings and surfaces of glass and metal food containers have been decontaminated, the contents can be used.

Water that has been contaminated by Salin, Soman, mustard gas, or cyano-type toxic agents ordinarily should be first filtered through sand, or alum should be used to cause the toxic agent to precipitate. Then the clear water should be boiled one-half hour or more, after which it is fit to drink. With water that has been contaminated with Lewisite gas, you should first add soda (cause the water to have soda content) then add alum (to each liter of water add 0.4 gram), then boil 1-1.5 hours, after which time decontamination can have occurred. After decontamination in this fashion, let the water clear, and take the cleared water on the surface for use. With water that has been contaminated with BZ you can use activated charcoal or pressure boiling to decontaminate it.

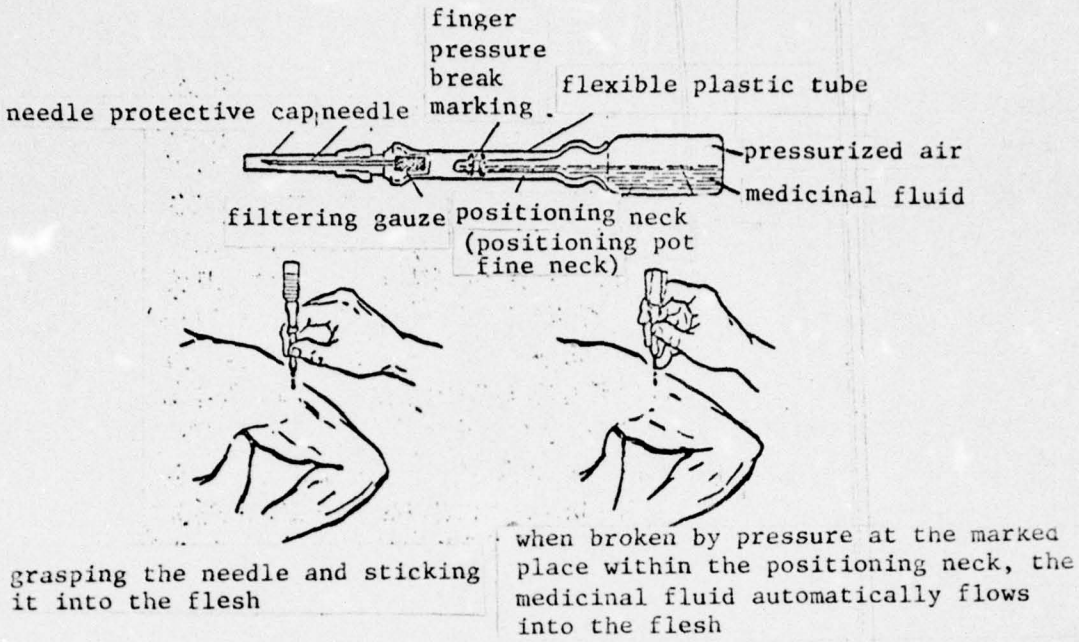


Figure 7-27. Nerve toxic agent emergency aid syringe (inoculator) and its use.

After foodstuffs and drinking water have been decontaminated, they must undergo examination to make sure they are non-toxic, after which they can be consumed.

How to Give First Aid

When personnel are contaminated, they must give timely aid to themselves and to each other.

When giving first aid, you must first help the wounded to use their individual protective equipment, then speedily remove them from the contaminated area (severely wounded personnel must first be given emergency treatment, then removed). When skin and eyes are contaminated, every effort must be made to decontaminate them; when outer wound openings are contaminated, cooled boiled water or clean water must be used to flush them off; when wounds on limbs are contaminated, tourniquets must be applied and the time of application clearly noted; when contaminants have passed through the mouth, you can put your finger into the throat of the affected person to induce vomiting. The mouth should be rinsed.

Below are indtoduced several emergency aid measures for personnel who have been contaminated:

(1) Emergency treatment of personnel contaminated with nerve toxic agents: Personnel contaminated with toxic nerve agents must immediately be inoculated with emergency nerve gas inoculant (Figure 7-27). When there is no emergency inoculant, you must inoculate the flesh with atropine (2-4 milligrams) and "Lu Lin Ting" (see Translator's Note 1 below) (0.5-1.0 grams).

15-30 minutes after administering the medicine, if symptoms have still not diminished, you must use the medicine again. When the affected person's breathing stops, you must quickly begin artificial respiration, and when the heart stops beating you must begin external heart massage.

Herbal medicines also have a certain curative effect for personnel who have been contaminated with toxic nerve agents. For example, the flowers, fruit, stalks and roots of the "Yang-chin-hua - foreign gold flower" (scientific name, stramonium or datura alba; commonly called "Yeh-pi-ma-tzu," wild castor oil plant, or Jimson weed in English) all contain atropine. If the juices of the whole plant are extracted in a press, or if the plant is finely chopped and simmered to decoct the atropine content, the cooled fluids can then be swallowed as medicine, and can have comparatively good effect as an antidote for the poison. If these fluids are used together with "Lu Lin Ting" (see Translator's Note 1) the result can be even better. When a heavy dose is being given, use a sterile needle and mix the solution with "Lu Lin Ting" (see Translator's Note 1).

(2) Emergency treatment of personnel contaminated with vesicant toxic agents: There is an initial period during which symptoms are not apparent in personnel who have been contaminated with mustard gas. When the scent of garlic, which is peculiar to

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Translator's Note:

1. Lu Lin Ting = (chlorine, phosphorous, fix) - antidote for nerve agents. In the following notes, chemical terminology for the items mentioned is not available to me.

mustard gas, is smelled, you must find out whether or not personnel have been dosed. Skin or eyes which have already been contaminated, or which you suspect have been contaminated, must be quickly decontaminated by washing, and this includes open wounds. When contaminants have passed through the mouth, you must quickly induce vomiting. When contaminants have passed into the breathing passages, the patient can inhale anti-smoke agents to reduce pain and stop itching (anti-smoke agent is made of ether 20 milliliters, chlorogorm, alcohol each 40 milliliters, ammonia 5-6 drops, all mixed together). Conditions permitting, the patient should be taken to a hospital.

After personnel have come in contact with Lewisite gas, they may develop severe pain, in which case you must quickly use as a decontaminant 5% "erh-shi-ping-shun" (see Translator's Note 2) ointment (when the eyes are contaminated, use 3% ointment). Or, you can use 5-10% tincture of iodine to decontaminate (after 5-10 minutes, use plenty of water to flush off). You can also use a 2% solution of sal soda as a flush. After decontaminating, you must quickly give an intramuscular injection of "erh _?_ chi lei" (see Translator's Note 3) antidote, and take the patient to hospital as soon as possible.

(3) Emergency treatment for personnel who have been contaminated with incapacitating toxic agents: After being contaminated with BZ take (orally) eserine salicylate, also known as physostigm salicylate (1-3 milligrams two times each day) or inject intramuscularly "chia-lan-t'a-min" (see Translator's Note 4) (10-20 milligrams, 2 times each day). This will also have a certain curative effect. Affected personnel must have careful nursing locally, or must be taken to the hospital for treatment.

(4) Emergency treatment for personnel who have been contaminated by toxic agents which affect the whole body (cyano-type

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Translator's Notes:

2. Erh chi-ping-shun = (di-radical propyl alcohol)

3. Erh _?_ chi lei = (2 _?_ base, kind) - antidote for Lewisite gas.

4. "Chia-lan t'a min" is apparently a transliteration of a name taken from our TM on the subject, and is an antidote for BZ.

agents): The symptoms of hydrocyanic acid (prussic acid) poisoning develop quickly. Heavily contaminated personnel are in danger to life within minutes. When rendering emergency aid the affected person must quickly inhale iso amyl nitrite (which is an emergency remedy for heart constriction pain). This means to break off the tip of the medicinal vial and place it into the nostril of the patient so that he can breathe in the vapors (when wearing a protective mask, place the medication within the mask so it can be inhaled). For each dose (consisting of 0.2 - 0.3 milliliters) breathe for one-half minute, and after a break of 2 minutes breathe another half minute, and in this fashion the patient can breathe in 5-6 successive doses. When the patient stops breathing, he should be caused to inhale the medication under conditions of artificial respiration. After inhaling the medication, the patient must as soon as possible be injected intravenously with sodium mitrite (3%, 10 milliliters, each minute inject intravenously 2 milliliters) and sodium hypo-sulphite (25%, 50 milliliters, each minute inject 5 milliliters), or quickly get him to a hospital for treatment.

(5) Emergency treatment for personnel contaminated with irritant toxic agents: When it is observed that intestinal pain and coughing has become difficult to bear, the patient can inhale anti-smoke agent. Generally it is not necessary to take the patient to hospital for treatment.

(6) Emergency treatment for personnel contaminated with suffocating toxic agents: Personnel contaminated with phosgene should, during the latent period (temporary period of euphoria), remain quiet and rest - they should especially avoid strenuous bodily activity. At the same time, they should be closely watched and their body temperature maintained. When conditions permit, they can be given sedatives. When symptoms include difficulty in breathing, artificial respiration must definitely not be used, but oxygen must be given immediately. The patient must be taken quickly to hospital for treatment.

(7) Emergency treatment for personnel who have been contaminated with defoliant agents: Timely decontamination measures must

be effected, eyes washed, vomiting induced. Special attention must be given to personnel who have been contaminated with the blue colored toxic agent. This type of agent contains arsenic (arsenic trioxide). When severely contaminated, quickly inject "erh ? chi ting erh suan na" or "erh ? chi chia huang suan na" (see Translator's Note 5).

SECTION 4. DEFENSE AGAINST BACTERIOLOGICAL WEAPONS

1. Nature and Capabilities of Bacteriological Weapons

What are Bacteriological Weapons.

Artillery shells, bombs, guided missiles, and others containing bacteriological warfare agents are called bacteriological weapons. They are not the same as shells or bombs which depend on shell fragments for personnel casualty and destruction effect. They depend on the dissemination of bacteriologic warfare agents for casualty effect on personnel, animals, and agricultural items.

Among the bacteriological warfare agents that the enemy is most capable of using are:

Bacteria: Cholera spirilla, plague bacilli, anthrax bacilli, and rabbit fever, etc.

Toxins: Botulism bacilli toxins, staphylococcus toxins, etc.

Rickettsial disease: Q-fever rickettsial disease, typhus rickettsial disease.

Virus diseases: Smallpox virus, yellow fever virus, and various kinds of brain fever viruses, etc.

Translator's Note:

5. "Erh ? chi ting erh suan na" = 2 ? base (or radical) ting (?) 2 acid sodium; and "erh ? chi ping huang suan na" = 2 ? base acetyl sulphur acid sodium.

Microorganisms: "Germs organized within fluid-filled sacs," cocci, etc.

Methods of Dissemination of Bacteriological Warfare Agents.

When an enemy uses bacteriologic weapons he generally attacks large and middle-sized cities, factory and industrial areas, communication hubs, military assembly areas, and other such rear area targets in order to influence our support in material and manpower to our front lines. There are some bacteriologic warfare agents whose latent period is short and which are comparatively less contagious, which can be used in battle in order to weaken our fighting strength.

The two most important methods which the enemy may use for dissemination of bacteriologic warfare agents are:

(1) Dissemination of bacteriological warfare agents as an atmospheric suspension: Bacteriologic warfare agents in atmospheric suspensions, then, means taking the bacteriologic warfare agent and spraying it into the air, causing it to take the form of very minute droplets which can float or remain suspended in the air for a comparatively long time. When these minute droplets of bacteriologic warfare agent form a mixture with the air, they are called bacteriologic warfare agent atmospheric suspension. When the enemy uses aircraft to drop germ bombs, and uses artillery or guided missiles to deliver germ warfare shells, there is formed, after explosion, an atmospheric suspension. When he uses low-flying aircraft to spray the agents, a bacteriologic warfare agent atmospheric suspension is also formed, contaminating the air. The area covered by this method of contamination is broad, and it is easy to cause large numbers of people to be infected at the same time and to become sick. This is the enemy's main method of using bacteriologic weapons.

(2) Disseminating vectors (or mediums) carrying bacteriological warfare agents: This is another method of disseminating bacteriological warfare agents. The enemy uses aircraft to drop

germ-carrying fleas, rats, flies, and other disease carriers, and he also can use his special agents to disseminate bacteriologic warfare agents, using this method to contaminate water sources, foodstuffs, and the atmosphere.

The Dangerous and Disease Inflicting Nature of Bacteriological Warfare Agents.

Bacteriological warfare agents are able to pass through the breathing passages, open wounds in the skin, and onto the body's mucous membranes. The bites and stings of insects can be used as an invasion route into the body. The infectious nature of these agents is strong, and a small amount entering the human body can cause people to contract the disease. Because of this the incidence of infectious disease can generally be comparatively severe, overall. In the cases of cholera, pneumonic plague, anthrax, rabbit fever, pulmonary anthrax, etc., if timely measures are not taken, individuals with light cases generally will lose their capability to work for a period. In severe cases life will be endangered.

The great majority of infectious diseases caused by bacteriologic warfare agents can all be passed by sick individuals to other individuals and thus be broadcast contagiously among the masses. Among these plague, cholera, smallpox, and typhus are comparatively severe, and can have varying degrees of influence on our fighting and production capability.

Some bacteriologic warfare agents can also infect local animals and insects which then become sources of epidemics and constitute persistent hazards.

Limitation of Bacteriologic Weapons, and Possibilities for Defense against Them.

The use of bacteriologic warfare agents has very great limitations. The natural limitations to which they are subject are comparatively great. The enemy's direct spraying of bacteriologic

warfare agent atmospheric suspensions and of chemical weapons are the same in that they are both subject to the influence of wind, rain, and snow. Drought, high temperatures, and sunshine can all increase the speed of disintegration and death of the bacteriological agent. Because of this they are generally used under conditions of daybreak, twilight, late at night, cloudy weather, very light wind, etc. The existence and activity of insect and small animal germ vectors are also subject to seasonal and environmental limitations, and under unsuitable conditions it is very easy for them to die or be unable to get about for the purpose of SPREADING disease.

The damaging effects of germ warfare agents are not as quick as those of chemical weapons. In general, all of the germ agents have a latent period, the shorter being several hours and the longer being over ten days before illness appears. If it can be discovered at an early period, timely treatment given, and disease prevention measures taken, then the occurrence and spread of infectious diseases can be diminished or controlled.

Other things that can be done to diminish the occurrence and spread of disease and lighten the harm done by germ weapons are: in peacetime develop the patriotic doctor movement; discipline the body and improve its quality, thus imporving the capability of the body to resist infectious disease.

2. Protection against Germ Weapons

Deciding What Kind of Germ Agent Has Been Used.

Germ warfare agents and germ weapons used by the enemy must be quickly discovered, and timely decision must be made as to their type and kind in order to facilitate quick selection of the appropriate disease prevention measures. When you run across suspicious phenomena, you must carry out a very detailed inspection and give a timely report of what you understand of the situation - gathering together what specimens you have and taking them to the appropriate sanitary

and disease-prevention authority so that decisions can be made based on detailed analysis of this material.

(1) Deciding by the traces of what has been disseminated: When enemy aircraft use a direct spray of germ warfare agents in atmospheric suspension, they generally fly very low and also spray a smoke or fog. When they use bombs (or artillery shells) to disseminate the germ warfare agent, the sound of the exploding germ-bearing projectile is small, low, and deep. After it explodes the shell crater is shallow and small, and sometimes large, thin shell fragments can be seen. Surrounding the point where the projectile has burst there may be traces of POWDER or globules of fluid.

The above-mentioned traces of dissemination are for the most part similar to those in the case of the use of chemical weapons. However, to have an injurious effect on personnel, germ weapons require a latent period. They cannot, as they can in the case of chemical weapons, evidence so quickly the symptoms of contamination. Because of this difference, whether personnel do or do not quickly show evidence of contamination after the attack is a point which is of use in differentiating the attack from one with chemical weapons.

When enemy aircraft disseminate disease-carrying vectors, insects and small animals can appear in abnormal numbers, or in kinds abnormal for the locality, or abnormal for the season, etc. Sometimes miscellaneous things not normal to the area can be discovered, or insect containers and special containers for small animals, like bombs with four shelves (Figure 7-28).

(2) Decision based on result of chemical analysis. The main purpose of chemical examination is to determine whether or not the enemy has disseminated germ warfare agents. When discovering traces of the use of germ weapons by the enemy, you must quickly gather the insects and contaminated items at hand (shell fragments, tree leaves, rocks, water, etc.) and take them to the sanitation and disease prevention authority for examination. If you come upon sick people, you must quickly gather specimens of blood, phlegm, urine,

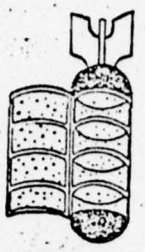

Figure 7-28. 4-shelved bomb.

excrement, etc., and take it for examination. When gathering these things, you must take measures for your own protection, and do not directly put your hands in contact with these specimens. The specimens must be separated according to their kind and put in clean containers. The containers must be well sealed to prevent the spread of germs - but you cannot soak it in decontamination fluids. On the wrapping of the containers you must note the particulars of the specimens, the time, name of item, and the name of the unit and individual by which it was collected.

(3) Decision based on the circumstances in which illness has already occurred: If, after discovering traces of enemy dissemination of germ warfare agents in a certain area, similar symptoms are discovered in many of the sick people and animals in another similar area, this makes it clear that the enemy may have disseminated germ warfare agents.

When an infectious disease occurs in an area that has never had it before, or where the occurrence of the infectious disease is seasonally abnormal, then close attention should be given to these areas.

If examination indicates that there are disease germs on items that the enemy has dropped, or examination of specimens indicates the presence of disease germs not present before in the area - both can be strong support for deciding that the enemy has used germ weapons.

How Protection Can be Provided.

(1) Immunization programs: There are immunization programs which can be undertaken for prevention of disease, and for increasing the body's resistance to disease. They are effective measures in the prevention of infectious diseases.

(2) Protection against atmospheric suspensions of germ warfare agents: Most important is the prevention of the germ suspension from passing through the breathing passages, skin, or mucous membranes and entering the body. Methods for this are for the most part the same as for defense againt chemical weapons. However, since germ warfare agents do not penetrate effectively, there can be fewer layers of respirator material; or hand towels, etc., may be used to cover the mouth and nose. For body protection, it is best to wear clothing of disease-preventive material, but when wearing ordinary clothing you must tie the outer clothing in with a waist belt, bind the sleeve openings and trouser openings, use handkerchieves to muffle up the neck, wear a suitable hat, and make every effort to cover the exposed or protruding parts of the body. After individual protective items are taken off, they must be quickly decontaminated.

(3) Protection against germ bearing insects: It is important to protect exposed skin and to not let insects sting or bite you. It is best to wear anti-disease clothing, but when you wear ordinary clothing you must take measures like those for protection against agents in atmospheric suspension. When conditions permit you can also wear a hat which protects against mosquitoes, or you can wrap around you netting which has been soaked in insect repellent, and use insect repellent to rub on exposed areas of skin. Generally, the repellent can protect against insect bites for 2-6 hours. Moreover, in the window and door openings or exit-entry ways of the covered parts of rooms, tents, tunnels, etc., you can put up gauze windows and gauze doors, or you can hang up door curtains that have been soaked in insect repellent, and spray insecticide on the walls and the area around entryways in order to get the insects out and keep them out. Around structures you can use things

like artimesia, eucalyptus (gum tree) leaves, the mountain pepper tree, maize, etc., to set afire and produce smoke, thus driving insects away.

Dealing with Contaminated Areas and Areas in Which Disease Exists.

Contaminated areas which have been attacked with germ weapons, and disease areas where communicable disease has already appeared, must be quickly quarantined. The disease situation must be taken under supervision and santitation control must be strengthened in order to prevent the spread of disease. During the period of quarantine the several operations as follows must be carried out:

1. Put into effect isolation and sanitation measures.

In areas where the enemy has caused contamination by the dissemination of germ weapons, and in areas where such severe infectious diseases as plague, cholera, and smallpox are already present, blockades must be put into effect forbidding unauthorized personnel and material to pass in and out. Sick people must be isolated for treatment.

In order for the infected personnel within the contaminated area and the area where sickness exists to receive timely treatment, and to prevent the broadening of the scope of infection, the masses must be stirred into action with demands that they concern themselves with their comrades around them, and that they quickly report the discovery of sick people. Sanitation personnel must make daily inquiries as to the appearance of symptoms in personnel who may have been infected, taking their body temperatures, and putting them temporarily to bed for laboratory analysis - in order to facilitate early discovery of sick people.

2. Make arrangements for decontamination operations.

The objective of decontamination operations is to get rid of or kill germ warfare agents. Since there are different types of

things to be decontaminated, you can select from the following measures:

(1) Decontamination of contaminated personnel: When conditions permit, bathe, or use soap to scrub the contaminated parts. If before washing you use decontaminant to wash the contaminated parts, the effect will be better.

(2) Decontamination of animals: You can use clear water and a brush to flush off contaminant. Medicinal decontaminant can be used in the same fashion it is used as a decontaminant wash for people's bodies.

(3) Decontamination of clothing: Clothing can be boiled in boiling water 30-60 minutes, or it can be soaked in decontaminant solution. Clothing made of furs, pelts, or synthetic fibers can be decontaminated with ethylene oxide or formaldehyde.

(4) Decontamination of vehicles, weapons, and production tools: You can use water to spray and brush thoroughly, or use medicinal decontaminants. After rubbing decontaminant agents on these items, wait 15-30 minutes then use clear water to spray and wash. Then rub with oil and lubricate to avoid corrosion.

(5) Decontamination of areas of human activity and of the living environment of sick people: The inside and outside of rooms can be decontaminated with medicinal decontaminants. Outdoors the burning method, flushing with water method, the airing in sunshine methods, and the shoveling away and burying methods of decontamination may be used. Basically, these methods are like those for defense against chemicals. While awaiting the natural death of germ agents, certain areas may be temporarily blockaded against the comings and going of people who may become contaminated.

(6) Decontamination of foodstuffs and water: Generally the steaming and boiling method can be used. Medicinal decontaminants can also be used in the case of vegetables, melons and fruits,

and wrapped foodstuffs. Germ contaminated water had best be decontaminated by boiling. After boiling 5-10 minutes, it can be used for drinking. When decontaminating group drinking water supplies, bleaching powder, etc. can be used.

(7) Decontamination of sick people's phlegm, urine, and excrement: You can double the volume of these with 10-20% triturated bleaching powder, mix it and wait 2 hours; or add triturated lime of similar concentration to double the volume of the material, stir, and decontamination will be accomplished in 4 hours. In cases of infectious diseases of the breathing passages, you must attend to decontamination of the air.

At the same time, extermination of insects, rats, and other vectors must be attended to. Not only must the insect and rodent vectors released by the enemy be exterminated, but the insect and rodent vectors native to the locality must be destroyed as well.

CLOSING COMMENT

In order to set firmly the direction to be taken in accordance with Chairman Mao's grand strategy of "all people are soldiers," and to fill a requirement for it in connection with the military training movement for the intelligent youth in every nook and cranny of our great country, we have produced this book entitled "Basic Military Knowledge." We have referred to related materials and have brought together in this book the special characteristics of modern warfare. The whole book is divided into seven chapters. The first three chapters discuss the details of basic military techniques; the fourth and fifth chapters discuss the details of basic military tactics and insuring the adequacy of the Rear Services. The sixth and seventh chapters introduce operational techniques and knowledge under conditions of modern warfare.

As the great revolutionary leader, Lenin, pointed out many times in the past, imperialism is aggression, thus imperialism is war.

Today, imperialism and socialist imperialism are the causes and sources of war.

Our great leader, Chairman Mao, pointed out in a speech given on 20 May 1970 that, "That danger of a new world war continues to exist, the people of all nations must make all preparations. But, before that occurs the main inclination of the world will be toward revolution." In order to successfully prepare for a war against aggression, we must follow the guidance of Chairman Mao, maintaining a high state of alertness, and doing our utmost in the study of things military. If imperialism or socialist imperialism should have the audacity to embark on a war of aggression against our country, then we will firmly, thoroughly, cleanly, and completely exterminate them.

"Everything should be decided based on whether it is in exact accord with the thought and political lines." As we study these military things, we must be aware of the history of the battle within the party between the two political lines and the two military lines, conscientiously studying the related writings of Chairman Mao, and his deep and penetrating criticism of the revisionist political and military lines of Lin Piao. We must firmly and thoroughly implement Chairman Mao's military line, and his propertyless class political line. In order to do this, we publish recurring short commentaries in the magazine "Red Flag," entitled "Conscientiously Study Chairman Mao's Military Writings," which serve as a substitute forward to this book. We hope that the reader will study them conscientiously.

When we produced this book, we kept in mind the practical needs of the great and intelligent youth of our country, and based on these needs we have done our best to promulgate Chairman Mao's military thought. We have also done our best to keep in mind the following points:

1. In the organization of chapters and sections and in the selection of material we have done our best to combine theory and

practice, and to achieve uniformity in the content of our citizen soldier training program.

2. We have striven to use popular and easily understood language to facilitate self-study. When introducing theoretical knowledge and technical work, we have done our best to provide illustrations to match so as to aid understanding. When introducing several commonly used types of weapons in the second chapter, we have first taken one model or kind of that type of weapon and emphasized the explanation of its principle and construction in order for the reader to more easily have a feeling for the rules of handling and use of other weapons of that type.

3. We did our best to introduce simple and easy methods. For instance, in the sixth and seventh chapters we emphasized the introduction to the routine use of weapons to attack aircraft, airborne troops, and tanks, and the use of local materials and local methods in the defense against atomic,chemical, and bacteriologic weapons.

In the course of the writing and editing of this book, we have solicited ideas from a part of the intelligent youth from throughout the country, and have also received vigorous support from concerned units - for which we express our heartfelt thanks. Since our own study of Chairman Mao's military writings is highly inadequate and we lack practical miliary training, it has been difficult to avoid the presence in the book of not a few shortcomings and mistakes. We hope that the great intelligent youth of the country, and the workers, farmers, and soldiers who are our readers will criticize and correct.

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4. TITLE *(and Subtitle)* HANDBOOK ON BASIC MILITARY KNOWLEDGE (CHAPTER 7)		5. TYPE OF REPORT & PERIOD COVERED Translation 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR*(s)*		8. CONTRACT OR GRANT NUMBER*(s)*
9. PERFORMING ORGANIZATION NAME AND ADDRESS Foreign Technology Division Air Force Systems Command U. S. Air Force		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE 13. NUMBER OF PAGES 75
14. MONITORING AGENCY NAME & ADDRESS*(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)* UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

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E408	AFWL	1
E410	ADTC	1
E413	ESD	2
	FTD	
	CCN	1
	ETID	3
	NIA/PHS	1
	NICD	5