FAMILY GUIDE
EMERGENCY
HEALTH CARE

A REFERENCE GUIDE FOR STUDENTS OF
THE MEDICAL SELF-HELP TRAINING COURSE
ACKNOWLEDGMENT

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INTRODUCTION

Individuals and families have an essential role in national defense—a role that is both simple and complex. Simple because it requires rather elementary preparedness measures on the part of every person. Complex because it demands that each person be ready to live on his own for 2 weeks—the period following a nuclear attack when outside assistance might not be available.

The importance of this role becomes readily apparent when one appreciates the fact that the ability of the United States to recover from a nuclear attack and continue as a free and democratic Nation would depend upon its most precious resource: human life. Buildings, machines, powerlines—these could be replaced. But not the individual American.

Obviously, we would be only deceiving ourselves if we were to expound the idea that all persons could survive a nuclear attack. Many would be killed by the blast and thermal effects of the weapons. But many others—most Americans—would survive if they had made certain preparations after accepting their personal responsibilities in national defense.

A nuclear attack could deny you access to doctors, nurses, and other medical personnel; hospitals, clinics, drug and grocery stores; normal water, sewerage, fuel, and power services. All of these services and facilities are normally important to the health of your family, and you might have to get along for a time without any of them.

Your problem and responsibility would be: How to maintain health without help.

The purpose of this handbook is to assist you in meeting that responsibility. The handbook is not intended as a substitute for professional medical care. It is intended only to help in maintaining health and alleviating suffering during any period of disaster when professional care and normal services might not be available. This handbook is only available to those who have completed the Medical Self Help Training Course.

Some of the preparations you can make for the health of your family in an emergency are as simple as they are important. For example, there are certain supplies you should have on hand. You should make sure that all vaccinations, such as smallpox, tetanus shots, and others recommended by your physician, are kept up to date for all members of the family. These and other preparations should be made now because there would not be time to do them in an emergency.

The handbook covers a wide range of health topics. There is information on treating a toothache; there is also information on childbirth. The space devoted to any one topic is necessarily limited. But every bit of information is aimed at one central theme: Helping you alleviate suffering and sustain life in that critical personal period following a nuclear attack—the first 14 days.
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SECTION I

Part 1  RADIOACTIVE FALLOUT AND SHELTER
Part 2  HEALTHFUL LIVING IN EMERGENCIES

RADIOACTIVE FALLOUT AND SHELTER

A nuclear attack against the United States could start a multitude of health problems. The newest and perhaps strangest of these would be associated with radioactive fallout.

Actually, the only new part of the term "radioactive fallout" is the second word—fallout. Radioactivity is older than man—as old as the cosmic rays and mineral deposits that have given off nuclear radiation for centuries, long unnoticed by man and of no general concern to him. The problem, then, is fallout, a modern term to describe a modern threat. The single explanation of this complex danger is in the term itself: It is a danger that could fall out upon man and his environment—the newest airborne weapon of the nuclear age.

Nuclear weapons were developed for just one purpose—to make military use of the tremendous energy and explosive power in the atom. This power was demonstrated at Hiroshima and Nagasaki, and it ended World War II. But about 9 years later a series of nuclear tests in the Pacific focused attention on another atomic danger: radioactive fallout. The test results supported the theories of a few, surprised many, and brought a new threat to millions, for they planted the seeds that grew into this fact: In a nuclear attack, this thing called fallout could endanger more people than the blast and heat from the nuclear explosions.

Solutions to the problems associated with the fallout threat start with the answer to three questions: What is fallout? What are some of the protective measures against fallout radiation? What are the effects of radiation on humans?

RADIOACTIVE FALLOUT

The detonation of a nuclear weapon near the surface of the ground results in four major effects: (1) blast, (2) heat, (3) initial radiation, and (4) residual radiation. The first three effects can cause severe damage over a broad but limited area—broad when compared with the area of damage from conventional weapons in World War II, and limited when compared with the area that could be endangered by radioactive fallout. For example, a ten-megaton nuclear burst at ground level could result in effects generally as follows:

1. Blast—Would destroy most buildings 5 miles from the point of explosion. The destruction 7 miles away would be less severe,

*A 10 megaton weapon has the explosive power of 10 million tons of TNT.*
but injuries would be high, caused by flying debris (about 150 square miles of damage).

2. Heat—Severe damage and heat capable of causing second-degree burns (on the bare skin of persons in the open) over an area with a radius of about 18 miles from the point of explosion (about 1,000 square miles).

3. Initial radiation—Extremely high dose of radiation over an area with a radius of about 2½ miles from the point of explosion (about 15 square miles).

4. Residual radiation—High dose rates of radiation from fallout over an area 20–30 miles wide and 150–200 miles long, down wind from the point of explosion (3,000–6,000 square miles). The pattern of fallout and its dimensions would depend upon wind conditions at the time. It is the long-distance threat of fallout that could make it of greater danger to more people than the other effects of a nuclear explosion. If the enemy did what our military planners estimate they could do, hundreds of bombs on the United States could create hundreds of lethal ribbons of fallout. No one can say where these bombs will be dropped, nor just how the winds will affect the fallout on a particular day. It is for this reason that shelters in every community must be provided in order to save the lives of millions of people who might otherwise die from an overdose of radiation caused by fallout. Be assured, however, that even in a nuclear war, radioactive fallout will not cover the entire world and kill everyone.

Although radioactive fallout is a complex subject, it is not necessary to understand the subject in great detail to be able to appreciate the danger and devise protective measures for it. The first step is answering the question: What is fallout?

When a nuclear weapon is exploded close to the ground, thousands of tons of earth and debris are forced up into the atomic cloud—a cloud which may reach an altitude of 16 miles or more before leveling off. The particles of dirt and debris become contaminated with radioactive materials from the explosion. They are scattered by the winds, especially at high altitudes, and later fall to earth in the form of dust-like particles carrying radioactive materials. This is fallout. The radiation from the fallout particles can damage living cells, causing injury or even death.

The fallout particles that transmit this threat to life may be visible in the form of dust, especially if fallout arrives in dangerous amounts. However, the radiation from the particles is invisible and can be detected and measured only through the use of special instruments.

Another important characteristic of fallout is that things, or people, who are exposed to radiation do not themselves become radioactive. Nothing that fallout contacts will become radioactive. Take the fallout away by washing an object, then there is no radiation from that object. The practical application of this fact is in the use of foods; canned foods, for example, which may be covered with radioactive dust can safely be eaten if the dust is carefully washed off the can before opening.
The most important health rule concerning radioactive fallout involves a type of preventive medicine: Protect yourself from the radiation. There are three means by which the intensity of radiation is reduced and protection is achieved:

1. Time
2. Distance
3. Shielding

**Time.**—Although there is no way of actually destroying radioactivity, fallout radiation decreases in time through a process known as radioactive decay. This decay is rapid at first, and then becomes slower as time passes. A significant decrease in radioactivity comes during the first 24 hours of its existence. For example, if the radiation is measured as 3,000 roentgens per hour at one hour after the explosion, it would decline to 300 roentgens per hour after seven hours, and down to 30 roentgens per hour after two days. This decay rate follows the rule of thumb that every sevenfold increase of time after detonation will reduce radiation intensity by a factor of 10. Following a nuclear attack, the period of greatest danger from fallout probably would be the first 48 hours. During this high danger period it would be essential to remain inside a good fallout shelter. After that you could probably leave the shelter for *brief* periods, but it might be several days or weeks before you and others in your community could safely spend much time in the open.

**Distance.**—Distance from the source of the radiation also is an important factor. For example, if a person were standing in a large, smooth field contaminated by radioactive fallout, and another person were on a tower 20 feet above the field, the radiation hazard faced by the person on the tower would be only about two-thirds of the hazard faced by the person standing on the contaminated ground. A combination of distance and shielding can provide effective fallout protection.

For example, the intermediate floors of tall buildings that are constructed of heavy materials can provide excellent fallout protection. The distance from the ground and from the roof of the building, where fallout particles would land, would provide part of the protection, and the shielding inherent in the heavy materials used in the construction of the building would provide part of the protection.

**Shielding.**—Shielding means shelter. Because of the high penetrating power of fallout radiation, heavy and dense materials such as dirt, stone, and concrete, are needed to absorb the damaging rays. The general rule is: The heavier or more massive your shield, the better your protection. Interior areas of large buildings offer good protection; while attic space, for instance, in a house with a wooden or asphalt shingle roof offers very little.

The Federal Government is surveying buildings throughout the Nation in order to mark those which offer good protection from fallout. These are stocked with austere supplies of water, food, medical needs, radiological instruments and sanitation equipment. The objective is to develop fallout shelter space for every person in the United States as quickly as possible. Many millions of
spaces, however, will have to be provided by private industry, institutions, churches and home owners. As these public shelters are located and marked, learn where they are, and be ready to get into one quickly, if necessary. Keep informed as to whether essential supplies have been stocked or whether occupants need to bring food and water, or other items with them. This information can be obtained from your local civil defense office.

Many families in the Nation, who are too far away from public shelters, will need to build one in their own home or on their premises. The shelter area should have enough space and be stocked with enough water, food, and other essentials, to take care of your family for two weeks.

In arranging your shelter, you can provide for sleeping with tiered bunk beds, fold-up cots, or studio couches in order to save as much space as possible and provide more room during the day. If it is impossible to provide sleeping space for all, you may have to take turns in resting, some members of the family sleeping by day and others by night. One member of the group should be awake at all times to guard against bad air conditions and fire.

Privacy will be hard to achieve, but it may seem very valuable to you. Light-weight screens, easily moved and not too space-consuming, might be used to divide some of the sleeping, bathing, and sanitation areas. This is particularly desirable in apartment houses or other group shelters. Curtains, hung from the ceiling or between tall pieces of furniture, could be used to provide privacy for temporary emergency toilet facilities.

You should try to arrange to have a regular electrical outlet in the shelter as power may continue in many areas covered with fallout. Candles, kerosene lamps, and other fuel-burning appliances should be used inside a shelter only when absolutely necessary. They not only use oxygen, but also give off heat and possible carbon monoxide. If electrical power fails, there should be arrangements for some type of battery-powered, low-level lighting, also a portable radio to be used to listen to emergency broadcasts. More specific details can be obtained from pamphlets you can request from your local civil defense office.

Shelter living would be crowded. You would probably face problems of temperature, ventilation, humidity, and other discomforts. Nevertheless, shelter occupancy tests have shown that typical Americans of both sexes and widely divergent ages can live under shelter conditions for periods up to two weeks without too much stress. Neither the crowding nor lack of privacy prove to be as serious a discomfort factor in shelter living as people expect them to be. Agitation and tension can be expected to be greatest immediately following shelter entry and prior to anticipated release, but can be minimized through effective planning.

The simplest activity of everyday life would require effective management in a shelter. Eating, cleaning, sleeping, personal cleanliness, sanitation, and taking time involve shelter management, adjustment, and teamwork. Arrangements for sleep, involving quiet, lighting, and conversion and relocation of banks for night and daytime use, are very important. They would affect the
sleep obtained by shelter occupants, and would be an important factor in the adequacy of shelter space.

Points to remember about protective measures against radioactive fallout:
1. The least that a person should do is to go quickly inside the best available shelter or his home, and stay there.
2. The more dirt, stone or concrete that surrounds you, the better protection you get.
3. Interior offices and space away from outside walls and roofs of tall buildings can provide good shelter.
4. All marked and stocked shelter space offers good protection.
5. Learn where these public shelters are, and if not within walking distance, build a home shelter.
6. Plans for various home shelters can be obtained from your Civil Defense Office.
7. Based upon a system of radiological measurements, levels of fallout radiation can be reported over the radio. Remain in your shelter until you know it is safe to leave.
8. Clothing will keep radioactive dust from contact with the body, but should be removed or brushed off before entering a shelter.

POSSIBLE EFFECTS ON HUMANS

Much has been written about the possible long-range effects from exposure to radiation—increased incidence of leukemia shortening of the life span, and genetic implications. No doubt exposure to fallout radiation would result in some increases in the small percentage of such occurrences normally expected. However, other effects of radiation, called acute effects, could result in sickness or death in a relatively short time. In the event of a nuclear attack on the United States, it is these acute effects that would have to be dealt with first.

Although scientists generally agree on the amount of radiation damage the body can sustain without causing sickness or death, there are so many variables involved that no one can state precisely how radiation would affect all persons. For any individual case, these variables include the duration of the exposure, the age, and general health and vigor of the person. However, in spite of these and other variables, certain guidelines can be given and these are outlined in the following table:

<table>
<thead>
<tr>
<th>Probable Acute Effects of Radiation</th>
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<tbody>
<tr>
<td><strong>Short-term, whole body exposure in roentgens</strong></td>
</tr>
<tr>
<td>0-100</td>
</tr>
<tr>
<td>100-200</td>
</tr>
<tr>
<td>200-400</td>
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<tr>
<td>400-600</td>
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<tr>
<td>Over 600</td>
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*Short-term exposure is usually defined as the total exposure over a period of about four days. A roentgen (R) is the unit used to measure exposure dose of gamma radiation. Exposure dose rate is expressed in roentgens per hour (R/hr).
These acute effects would be modified considerably if the radiation dose were received over a long period of time. The body repairs some of the damage (perhaps up to 90 percent) if it is given time. For example, a whole body exposure of 600 r or more in a short period of time—say, 4 days or less—would be fatal in most instances. But the same total exposure probably would not cause death or any noticeable effects if it were acquired in small doses over a much longer period—say, a year or more. However, it is well to keep in mind that any radiation received, other than that received for medical diagnosis and treatment, is harmful because the body can never repair all the damage. (See Radiation Sickness for a discussion of the symptoms of radiation sickness and the recommended treatment.)

The above figures are useful primarily for planning purposes and to civil defense officials who possess the radiological instruments and who know how to use them and interpret their readings. In the event of a nuclear attack, most people will not know even approximately the number of roentgens to which they individually have been exposed. Only those who go into an adequate shelter before fallout arrives, and remain there, can have an assurance of escaping radiation sickness.

Civil defense personnel who have emergency assignments will wear dosimeters, an instrument which will show the accumulated amount of radiation to which they may be exposed. Your local radio station will broadcast information after the attack where fallout is occurring. This is based upon reports by the civil defense radiological monitoring system. These reports are necessarily general; so, without certain knowledge of amounts of exposure to yourself, play it safe—go into shelter early and remain there.

Radiation sickness. Like so many other sicknesses, can be treated. Depending upon the dose received, recovery is possible. Points to remember about possible radiation effects on humans:

1. People do not all react the same to equal amounts of radiation, but for most people there will be no obvious effects even to whole-body exposure of 100 roentgens. There may be, however, some harmful long-term effects.

2. With an increase in dosage over 100 roentgens whole-body exposure, people become ill.

3. A dose of 700 roentgens received in a few days with whole-body exposure will kill most people.

4. Without a certain knowledge of amounts of exposure, play it safe—go into shelter early and remain there.

5. If you have been exposed, seek the best shelter and avoid additional radiation.

6. In caring for a person suspected of radiation sickness, just be sure he is free of any fallout dust. He cannot transmit radiation sickness to you.

7. Some radiation may cause temporary sterility, or temporary loss of hair.
PUBLIC Fallout Shelter

This is the official fallout shelter sign of the Office of Civil Defense, Department of Defense. Look for these in your city and remember where they are, so if necessary you can go quickly to the shelter nearest you. The Federal government is provisioning public shelters with austere supplies of water and food for as many people as the shelter will hold—5 1⁄2 gallons per shelter space. Survival biscuits and a carbohydrate supplement are stocked to provide 10,000 calories per shelter space. Also included are sanitation supplies, medical kits and radiological monitoring equipment. In many places local governments are stocking additional desirable items. It would be advisable to keep informed on the progress and plans in your own community concerning what things to bring to a public shelter. You would likely be requested to carry into the shelter with you such things as special foods and supplies for the baby, special dietary requirements, and other personal medical needs. Some of the items which you may not be allowed to bring with you include perishable foods, firearms, intoxicants, pets and bulky possessions. If shelter living is forced upon us by an attack or natural disaster, a great majority of the population will resort to the public shelters. Others will have their own private family shelter, and the principles of healthful living apply equally to both. If you are to have your own shelter, there are certain emergency supplies that you should have stored, and certain basic sanitation procedures you should be prepared to follow.

WATER

Water would be one of your most essential supply items in an emergency. You can get along without food for quite a while, but you must have safe drinking water. Amounts needed will vary
depending upon shelter temperatures, kinds of food, and health of shelter occupants. While people can usually survive on an average of one (1) quart per person per day for drinking, it would be better to have two (2) quarts or more per person per day for food preparation and cleansing. Plan your emergency water supply for a minimum of fourteen (14) days. When there is a limited amount of water available, FIRST—set aside an adequate amount for drinking; SECOND—if anybody is suspected of having radioactive fallout on his skin, wash with soap and water; THIRD—the next most important use of water is for washing hands.

If your regular water supply comes from a community waterworks, you will have to have an emergency supply of water because the waterworks system might be affected by bomb damage, power failure, or contamination.

Glass jugs with tight-fitting covers or stoppers make good water storage containers, provided they have been thoroughly washed with soap and water and rinsed several times before being filled and sealed. They should be packed tightly with wadded newspapers or cloths between jars to prevent breakage. Polyethylene containers also are good for storing water.

Water that has been carefully stored for long periods of time will be as safe to drink as fresh water, but may not taste “fresh”. Some may want to test their stored water for smell, taste every 3 months, but it is not necessary for health. Odors as it might become, it will still be usable in an emergency.

You will also probably have available several sources of drinking water in the water system built into your house; for example, from the storage tank of a hot water heater, the flush tank of a toilet, and the house water pipes.

A well and pump is a desirable emergency source of water for drinking, food preparation, sanitation, and cooling purposes; particularly for large shelters.

Although some waterworks may be shut down after an attack, many other water plants would continue to function and to produce safe drinking water. Local authorities would let you know as soon as possible whether the public water facilities are in operation and whether the water is safe to drink.

If the public water supply is contaminated or if there is damage to the community water system, you may receive instructions to close the water shutoff valve for your house to prevent contaminated outside water from flowing and mixing with the safe water inside. Thus, it is important for you to know the location of the water shutoff valve for your house, and to make sure now that it is in good working order.

In the event of attack, use the water within the shelter first and make it last as long as possible. Do not leave the shelter during the first few days to go to other parts of the house to obtain water supplies unless it is absolutely necessary, and when you do go, collect the water rapidly so that your time outside the shelter is as short as possible.
How To Purify Water

After you have used up all your supplies of water within the house, you may have to purify water obtained from other sources. Never use outside water without purifying it unless your local authorities say it is safe to do so.

There are two kinds of contamination—germs and radioactive materials—which may exist in water and make it dangerous to use. They may occur separately or together. Use methods suggested below to purify water.

If the water is not clear.—Strain it through a paper towel or several layers of clean cloth to remove as much of the foreign matter as possible, or place the water in a deep container and let it settle. Then pour or siphon off the clearest part through a clean cloth or paper towel. Straining cloudy water is an important and basic step in the process of removing both germs and radioactive contamination.

To kill germs in water.—Several methods of treatment can be used. None of the following methods, however, will remove radioactive contamination from water.

1. Water purification tablets.—These tablets, containing iodine or chlorine, can be bought at a sporting goods store, chemical or drug store, or from a store that sells equipment for swimming pools. The bottle containing the tablets will give instructions on how to use them.

2. Chlorination.—Water can also be purified by chlorinating it with a household bleach solution. Make sure that the bleach you buy for this purpose is a liquid bleach of the sodium hypochlorite type. Labels of many such household bleaches include instructions on how to use them to purify water.

   If the label does not carry any instructions for purifying water, use about 10 drops of bleach to a gallon of water.

   Mix the water and bleach solution thoroughly and let it stand for 30 minutes. After that time you should still be able to smell a slight chlorine odor. This odor shows that the water is safe to use. If there is no smell of chlorine, you should again treat the water with the same amount of bleach solution as before and let it stand for another 15 minutes before you use it. The taste or smell of chlorine in water is a sign of safety. It is not harmful. If you cannot detect chlorine by this method, do not drink the water. The bleach solution may have become too weak.

3. Iodine.—Ordinary tincture of iodine may be used to purify small quantities of water. Add 20 drops to each gallon of clear water or 40 drops for cloudy water. Mix and allow to stand for 20 minutes before using.

4. Boiling.—If heat is available, boiling the water is a good way to destroy germs. Boil vigorously for at least one minute. To improve the taste of water after boiling, pour it back and forth from one clean container to another after it has cooled. This puts air into the water and makes it taste better.

To remove radioactive contamination from water.—As pointed out earlier, although boiling or the chemical treatments will kill harmful germs, they will not remove radioactive contamination.
from water. If such contamination exists, your local authorities will advise you.

Surface water supplies, such as rivers, lakes, and open reservoirs may be contaminated by fallout. However, many fallout particles are so heavy that they quickly settle to the bottom. Also, the regular water treatment (coagulation, sedimentation, filtration) of public water systems will remove most of the fallout contamination. Very little of the dangerous fallout material would be dissolved in the water.

Water softener or ion exchange systems used in many buildings and homes will remove most of what little fallout may be dissolved in the water in the same manner as is done to chemicals which cause “hard” water.

It should not be necessary to purify the water you have stored in closed containers.

**FOOD**

You should have at least a 2-week supply of food on hand at all times. Include foods that fit the habits and preferences of your family, that will provide a balanced diet, and are rich in energy. Avoid heavily salted foods because they will increase your need for drinking water.

For diabetics, babies, and others needing special diets, you should store an adequate supply of the proper foods.

You will need foods that do not require refrigeration because your gas or electricity may be shut off. The major portion of your food supply should be made up of foods not needing cooking. Shelter cooking would be improvised at best, and difficult. Also, any open flame will use up oxygen, liberate heat, and may produce carbon monoxide.

**Some Suggested Foods**

*Canned.*—Fish; Fruit and Juices—these will help supply your liquid requirements; Macaroni; Meats; Milk—particularly if there are babies, invalids, or old people; Poultry; Soups; Spaghetti; Stews; Vegetables.

*Packaged.*—Candy; Cereals, some sugared; Cookies; Crackers; Raisins.

*Also.*—Bouillon cubes; Coffee, Tea, instant type; Cooking fats and oils; Cheese spreads; Honey; Jam; Peanut butter; Salt; Sugar.

Food required for special diets.

Baby food—Strained Meats, Fruits, and Vegetables.

You should use foods from your emergency supply regularly, and replace them.

**Making Sure Stored Food Is Safe**

After an enemy attack, the contents of cans, jars, cartons, and other food packages that have not been broken would be safe to eat. Food that has been stored indoors should be safe to eat. Wipe or wash carefully cans, bottles, or other containers that may have
been covered by radioactive dust. Contaminated fresh fruits or vegetables should be prepared for eating as described under “Contamination Precautions.” Dispose of the rags or water and contaminated fruit peelings by placing these outside the shelter.

Refrigerators and home freezers should be kept closed as much as possible, especially if gas and electricity are cut off, to conserve perishable food. If the gas or electric service is not restored within 12 hours, eat or cook the most perishable items. If they begin to spoil, throw them away before they contaminate other foods that keep better.

Food will keep in home freezer units for varying periods after the power is shut off. If the capacity of the freezer is 4 cubic feet, the food in it will keep about 3 days; if the capacity is 12-36 cubic feet, the food will keep about 5 days.

Fresh milk sours easily, and nonrefrigerated milk should be used as rapidly as possible. However, sour milk is not harmful to health.

**EMERGENCY SANITATION**

Good sanitation procedures are always an important part of maintaining good health, and they would be particularly important in the emergency period following a nuclear attack. Following is some basic information on supplies you should have and procedures you should follow in an emergency.

**Sanitation Supplies**

Detergent; Soap—also needed in caring for sickness or injury (See “Medical and First Aid Supplies.”); Water purification tablets (iodine or chlorin); Tincture of iodine or household bleach may also be used; Pail with cover—small size to use as temporary toilet; Cans with tight covers for storing wastes; Cans with tight covers for garbage; Old newspapers; Rubbish box; Plastic bags; Household bleach to use as disinfectant; Creosol (saponated creosol solution); Insecticides; Rubber pants and disposable diapers (if needed, for babies); Rubber sheeting; Sanitary napkins—also useful as dressings (See “Medical and First Aid Supplies.”); Toilet tissue.

**Disposal of Sewage**

Failure to dispose properly of human wastes can lead to the spread of such diseases as typhoid, dysentery, and diarrhea.

If water service is interrupted by a nuclear attack, you will not be able to use a water flush toilet, and one of your first tasks to make shelter living possible and safe will be to provide temporary toilet facilities.

As indicated under “Sanitation Supplies,” a metal pail with a cover can be used as a temporary emergency toilet. A commode, such as is often used in the bedroom of invalids and elderly persons, would probably provide a more comfortable arrangement. You can improvise a commode by cutting out the seat in a chair and placing a pail under it. A plastic bag placed in the pail with the bag top overlapping the seat will be helpful in confining wastes and in waste disposal. A household disinfectant, such as creosol, may help to control odors if a small amount is put in the toilet after each use.
The contents of the emergency toilet should be emptied into a second larger can (a covered garbage can or other waterproof container) as often as necessary for storage. The larger storage can should be placed as far away from the people in the shelter as possible and kept tightly closed. A supply of old newspapers—at least a week's accumulation—will come in handy for various sanitary uses, such as wrapping garbage and lining large containers.

When radioactive fallout no longer presents a severe hazard, the wastes that you have accumulated should be removed from the shelter area, taken outside, and buried under 12 to 24 inches of earth. Never deposit wastes, liquid or solid, on the surface of the ground. Insects and rodents may carry infection from them to humans. In urban areas, local authorities may make arrangements to collect and dispose of wastes.

Disinfectants (household bleach and creosol) may be helpful in controlling odors. They will also help control insect breeding in containers that cannot be emptied immediately. Store such disinfectants safely away from children in the shelter.

If there is chronic illness in the family that requires rubber sheeting or other special sanitary equipment, make sure now that adequate supplies are available.

If there is a baby in your shelter, you may find diaper laundering a problem under disaster conditions. It is best to keep on hand an ample supply of disposable diapers. However, if these are not available, emergency diaper needs can be met by lining rubber pants with cleansing tissue, toilet paper, scraps of cloth, or other absorbent materials. If you prefer, any moisture-resistant material can be cut and folded to diaper size and lined with absorbent material.

**Disposal of Garbage and Rubbish**

Garbage sours and decomposes. It must be properly stored and handled if odor and insect nuisances are to be prevented in the shelter.

Wrap the garbage in several thicknesses of newspaper before putting it into your garbage container. The paper will absorb some of the remaining moisture and make possible longer storage without unpleasant odors. A tight-fitting lid on the garbage can is important to keep odors in, and flies and other insects out.

When radioactive fallout no longer presents a severe hazard, garbage may be disposed of outside the shelter in the same manner as human wastes.

Rubbish should be kept at a minimum and placed in a large container, separate from garbage. When it is safe to take it outside, it may be burned.

**Vermin Control**

Control of vermin would be an important factor in disease control following an enemy attack. There are actions that can be taken now, and procedures to follow during an emergency that would be effective.

*Preparedness Action.*—Keeping vermin under control now would
lessen the health danger from insects and rodents during an emergency period. This involves good sanitation habits, including the sanitary disposal of human wastes, garbage, and rubbish, and the use of pesticides when necessary.

Spraying or painting the interior of the family fallout shelter with a 5 percent DDT solution is a good preparedness action for insect control. The insecticide will be effective for several months if it is applied to the walls and ceiling of the shelter to the point of obvious dampness. Insecticides containing chlordane, dieldrin, diazinon, malathion, or rotenone also may be used for this purpose. In using these insecticides, extreme care should be exercised to avoid inhalation or contact with the skin. Should accidental contact occur, the affected skin areas should be washed immediately with soap and water.

In addition, you should have quick-acting insecticides which rely on pyrethrum or pyrethrins (available at most grocery stores), a fly swatter, and screening material ready for use in an emergency, and mouse and rat traps, particularly if rodents are a problem in your area.

Emergency Procedures.—Previously described emergency procedures for the sanitary disposal of sewage, garbage, and rubbish would be an essential part of vermin control following an enemy attack. In addition, the use of screening to keep out insects, and insecticides to kill them would be important. For safety purposes in a crowded shelter, and also for quick action, insecticides containing pyrethrum as the principal active ingredient are most useful.

For the control of lice or other insects infesting the body, a 10 percent DDT dust or a 1 percent lindane dust is recommended. The dust should remain on the body, in hairy places, and in the clothing for at least 24 hours, and then be washed off. A second treatment 7 to 10 days later will kill lice that have hatched since the first treatment.

Traps and clubs may be the best way to kill mice and rats in the confined area of a fallout shelter. Poisons, such as warfarin, should prove effective, but take time to act on rodents so are useful only in the general area outside the shelter proper.

Special precautions should be taken in storing and using poisons to make sure that they are out of the reach of children. It would be dangerous to use poison baits inside a fallout shelter. Also, insecticides in spray form should be used with great care in the closed, confined area of a shelter. Inhalation of their fumes could be dangerous, an explosive hazard is possible, and the spray could injure the eyes of those in the shelter. Dusts and wettable powders are safer to use than sprays in a closed area. Be sure to observe the precautions given on the label when using any insecticide or other poison.

Contamination Precautions

If there is falling fine ash or dust, you may have been exposed to fallout before reaching shelter. Shake your clothing outside the shelter before entering it. Once inside, wipe off or preferably wash your body and hair if water is available. Also clean off any supplies you are carrying which may have been similarly con-
taminated. If there is a drain in the shelter, pour this wash water
down it. Otherwise throw the water and wiping materials outside.

Obviously, you should not leave a shelter while fallout is still
coming down. And you should not leave it later, unless vital to
do so, without being informed by local authorities that it is safe
to do so, or without measuring the intensity of the radiation in
your area with a special instrument. (Radiation measuring in-
struments, developed for use by the public, are available. Local
civil defense authorities can give you information about the
instruments.)

At first you may be able to stay outside the shelter only for brief
periods, but as radioactivity decreases, the time outside can be
lengthened. The radiation hazard decreases rapidly in the early
period after the burst. During the first 48 hours, fallout radiation
may decrease to about 5 percent or less of its original intensity.
Even at the end of two weeks, however, plants and objects which
have received considerable fallout may still be dangerous. Even
if your local authorities report it safe for you to leave your shelter
and move about outside, the fruits and vegetables you may gather
from a garden should be cleaned before you eat them.

You should take the following steps:

1. If the fruits or vegetables are of good size and solid (like
   beets, peaches, or potatoes) first wash them carefully and then peel
   them.

2. If they are covered with a husk or with outer leaves (like
   corn, head lettuce, or cabbage) remove the husk or leaves first,
   then wash the inner contents.

3. If it is a vegetable or fruit (like spinach or strawberries)
   which can neither be peeled nor husked, do not eat it unless food is
   scarce. In any case, wash such foods thoroughly before using.
   Do not attempt to add to your water supply from containers
   that have caught rainwater running off a contaminated roof.

When you leave the shelter, you should wear heavy shoes, or
rubbers or boots over your regular shoes. It would also be desir-
able to wear coveralls over the clothes you wear in the shelter.
Gloves should be worn if you are going to handle anything that
might be contaminated.

These outer coverings should be removed upon your return,
just outside the entrance to your shelter. If any part of your body
has been contaminated by the radioactive dust, brush it off before
reentering the shelter, and wash with soap and water, if possible.
Then dispose of the water.

Household pets will be subject to the same radiation dangers as
humans and should be treated accordingly. Pets should not be
permitted to go outside and then reenter the shelter until it is
known that there is no longer a radiation hazard in the area.
Otherwise, they could bring in considerable amounts of radio-
active particles.

If you plan to keep a pet with you in your shelter, you will need
a supply of food and water for him, and you must be careful to
dispose of animal wastes in a sanitary fashion as you do human.