



Survival in a Nuclear War

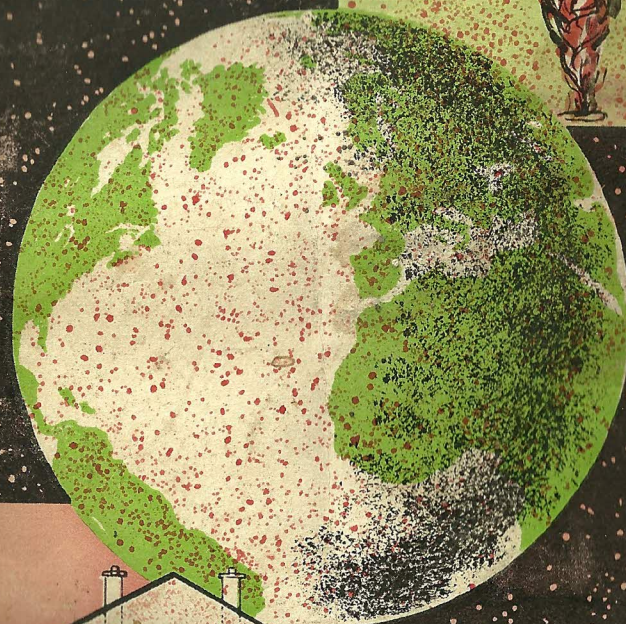
ADVICE ON

Protection in the Home and on the Farm

"The risk of nuclear war, which has caused the Government to issue this booklet specially for householders, may remain for many years. So keep the booklet carefully. Hang it, or place it, where you can easily find it in an emergency—it could mean the difference between life and death for you and your family."

COSAINT SHIBHIALTA

BÁS



BEATHA

WHY THIS BOOKLET

Nuclear weapons have added a new and deadly peril to modern war—**RADIOACTIVE FALL-OUT**. It can affect every home and every farm in the country. It can come to us on the wind from other countries. It cannot be seen or felt, but we have instruments to tell us when it is about.

In a nuclear war, thousands of our people could die from the effects of radioactive fall-out and thousands more could become seriously ill, if they did not know how to protect themselves. Protection is not too difficult for the householder to provide for himself and his family. This booklet tells you how it can be done.

Radioactive fall-out, being airborne, shows no preference for city, town or countryside. It can menace all alike. The farmer, therefore, has to think of the hazard not only to himself and his family, but also to his livestock and crops. Guidance on how to deal with these special problems is included.

Fall-out is unique in the way it can affect any part of the country no matter how remote, even if we are not otherwise affected by war. But we cannot assume that nuclear weapons will not, in a future war, be exploded on our country either accidentally or deliberately. Some account is given of the direct effects of a nuclear explosion. In spite of the appalling destruction and loss of life which such a catastrophe could cause, it would still be possible for people to do a lot for their own safety and survival.

I would urge you to read this booklet carefully. It could be the means of saving your life and the lives

of your loved ones. If you are a farmer, it could also help you to protect your livelihood—and the nation's food supply. You will see that there are some things you could be doing now to help yourself and your family to survive in a nuclear war. Ní h-é lá na gaoithe lá na scolb!

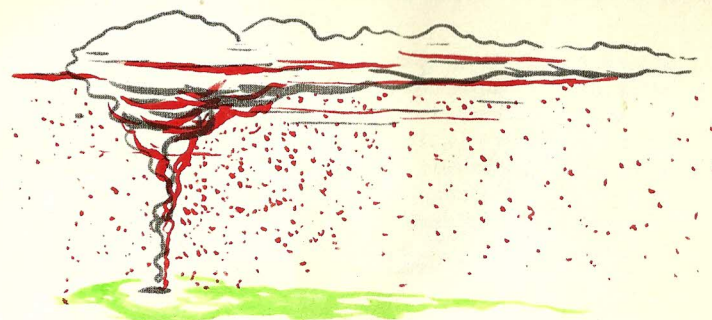
The risk of nuclear war, which has caused the Government to issue this booklet specially for householders, may remain for many years. So keep the booklet carefully. Hang it, or place it, where you can easily find it in an emergency—it could mean the difference between life and death for you and your family.

Gearóid Ó Beithéarthaín

AIRE COSANTA

CONTENTS

	Page
Introduction	i
Chapter I—Fall-out Protection	
Radioactive Fall-out—What is it?	1
Fall-out Warning	2
The Refuge Room	6
Getting out of Areas of Heavy Fall-out	11
Getting back to normal	12
Advance Preparations	14
Chapter II—The Farmer and Fall-out	
General	24
Advance Measures	25
What to do when Warning is given	27
After Release from Refuge	28
Steps towards Recovery	34
Chapter III—First Aid	
Radiation Sickness	35
How to stop Bleeding	36
Artificial Respiration	38
Burns	38
Crush Injury	39
Treatment for Shock	39
Chapter IV—Direct Effects of Nuclear Weapons	
A Nuclear Explosion—what would it be like?	41
What to do at the moment of Explosion	42
What to do after the Explosion	44
Releasing Trapped People	46
Fire Hazards and Protection against them	48
Escape and Rescue from Burning Buildings	53
	iii



Chapter I

FALL-OUT PROTECTION

Radioactive Fall-Out—What is it?

After a nuclear explosion particles of dust fall to earth not only around the position of the explosion but many hundreds of miles away. These are particles which were lifted into the sky by the explosion and then carried along by the winds.

These particles are radioactive. In other words, they are giving off invisible rays. This radioactive dust is what is known as "FALL-OUT". The invisible rays (radiation) can cause damage to the body. The rays are similar in nature to those emitted by an X-Ray machine but are more powerful. X-Rays have many medical uses but an overdose of them could be fatal. In the same way an overdose of the radiation given off in a fall-out area could kill you. A somewhat smaller amount could make you ill and again there are smaller doses of radiation which you could take without any apparent ill-effect.

In an area where fall-out has come down on the ground, the power of the rays falls off rapidly with the passage of time and in most of these areas the radiation would be tolerable after a few days, assuming appropriate precautions (described later) had been taken. For these first few dangerous days we must take exceptional measures to save ourselves.



Radiation from dust in the vicinity



Dust on skin causes burns and sores



Small amounts can be dangerous inside the body

The radioactive dust can threaten us in three different ways as the sketches show. We must try to avoid each of these dangers. **STAYING INDOORS IS THE ANSWER.** Since you may not be able to see the dust and since the rays themselves cannot be felt by the body, you may well ask—"How will I know when to go indoors?" Here is the answer to your question.

Fall-Out Warning:

Fall-out warnings will be broadcast by *Radio Éireann*. Plans are based on three stages of warning:

1. **National Alert** indicating that war has broken out and that this country may become affected by fall-out or, indeed, be hit by nuclear weapons.
2. **Advance Warning** indicating that fall-out is approaching your area but is not expected to arrive for about one hour.

3. **Final Warning** indicating that fall-out has started, or is about to start, in your area.

These warnings will also be spread locally to as many people as possible by members of the *Gárda Síochána* and the Civil Defence Warden Service. For the final warning, all possible means of raising the alarm will be used, e.g., by sounding double notes, beats or peals, on sirens, hooters, bells, whistles or motor car horns, etc. The time available between the outbreak of war and the approach of fall-out, however, may be too short to allow giving the **ADVANCE WARNING** for some areas.

What to do when Warning is Given:

When you hear the **NATIONAL ALERT** (i.e., War has broken out), keep your radio set switched on and tuned in to *Radio Éireann* all the time—day and night. Keep it beside your bed at night. Follow any instructions given over the radio.



National Alert:

If you are at work, you may be advised to go home. Some people in essential services will have to stay at their posts, but they will be told about this beforehand and will have protection where they are.

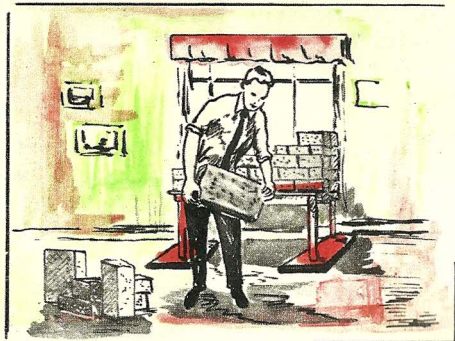
If you are a long way from home and unable to get back there in a few hours, you will have to make up your mind where you are going to take cover and go there immediately. Managers of hotels and institutions should be prepared to provide protected accommodation for those in their care.

Check on your food and water stocks (see pages 20 and 21). You should try to have enough food and stored water to last the whole household, and possibly one or two extra people, for at least 14 days.



Advance Warning:

When you hear the ADVANCE WARNING you know that fall-out will start in about one hour's time. If you have not



already done so, complete the shielding of the windows and doors of your refuge room as described on pages 14 to 19. Shut

all windows and outside doors. Bring your car under cover so that it will not be covered with radioactive dust afterwards. From this point on, you should restrict your telephone calls so as not to interfere with essential Civil Defence communications. Continue listening to Radio Éireann.

Final Warning:

When you hear the FINAL WARNING you know that fall-out has started, or is about to start. If you have fires in grates or boilers extinguish them. Turn off your water supply at the stopcock and any gas or electric water heaters in use. Go into your refuge room immediately (even if your preparations are incomplete). Bring your radio set with you or make sure it can be heard in the refuge room.

People away from home and caught in the open by the final warning will have to appeal to the nearest householder for shelter. Householders should help such people and allow for this in their preparations.

Yellow flags hung along roads will indicate FINAL WARNING to motorists and other road users.



Life in the Refuge Room:

If you have heard the warnings and followed instructions you should be in your refuge room by the time fall-out starts.

You will not be able to go outside again for at least two days, but you must try to keep abreast of what is going on. Keep your radio set tuned in to Radio Eireann. You will be kept up-to-date on what the fall-out situation is all over the country, but, more important than that, vital instructions can be conveyed to you in this way.

Food and Water:

You have to eat, even in the midst of a nuclear war. But your meals will seldom be cooked. Cooking uses up air and makes the enclosed atmosphere of the refuge room heavy with odours. Your stock of food will be made up of tinned goods and other foods which require little or no cooking. A portable stove could be used to boil water and heat foods.



Radiation passing through your stored foods and water will do them no harm, but you must be very careful not to let radioactive dust get on them. The safest thing is to assume that the dust **IS** on the tin or the wrapping (or whatever it is that covers the food or water). This will remind you to wipe tins and containers thoroughly before you open them and generally to avoid contaminating foods and water. You should remove food wrappings very carefully and put them into a dustbin in your refuge room.

Knives, forks, plates, cups and similar items should be kept under cover to protect them from contamination. It saves a lot of trouble if you use disposable items. Among other things it saves washing up.

The public water supply is likely to be contaminated. Do not use it after the **FINAL WARNING** unless you are clearly informed that it is safe. This is why you should have turned it off at the stopcock—just to make sure—before you entered your refuge room. In certain circumstances the supply will be

cut off in any case by the Local Authority. You will have a supply of clean water stored in advance. (For quantities and method of storage see "Advance Preparations", pages 21/22). In the early hours of fall-out use the supply in your refuge room. Do not draw from the bath or from any other source which would require you to leave your



refuge room. This is because the radiation may be very powerful at this stage. After about 24 hours, or so, you could make **brief** visits to other parts of the house, if necessary.

Sanitation:



During the first 24 hours the sanitation problem **must be solved within the refuge room**. In the notes about advance preparations (see page 22) a covered bin or bucket or chemical closet is recommended in the refuge room. Rig up a screen around it in a corner of the room and use it as a w.c. during the first day of refuge. After the first day of fall-out, **brief** visits to an indoors w.c. are permissible. In order to conserve your stock of clean water, flush the w.c. with water which has been used for washing.

Ventilation:

All outside doors and windows must be kept shut. A door of the refuge room opening into another part of the house may be opened gently from time to time if the refuge room eventually becomes unbearably stuffy. If there is a fireplace in the room it will help to provide good ventilation. There is no need to fill up chinks around windows and doors as dangerous amounts of fall-out cannot get in that way or down the chimney. If the chimney has a wide straight flue it would be better to put a cover over the top of the flue, without, however, interfering too much with the draught.



Use this door for ventilation

Air drawn into the refuge room in the ways mentioned would unavoidably carry some small amount of radioactive dust with it. This is not dangerous if you follow the instructions for preventing contamination of food, drinking water, cups, etc.

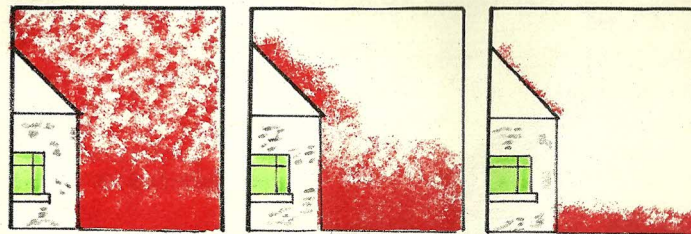
You use up less air when you are sitting quietly or lying down than when you are active.

Heating and Lighting:

As a general rule do not light a fire in your refuge room. It uses up too much air. As far as possible keep warm by using blankets and heavy clothing.

As long as the electricity supply is kept going, lighting will be no problem. Plans are being made to ensure that supplies will be maintained in fall-out conditions. It would be a good idea, however, to have an electric torch (with spare bulbs and batteries) and candles and matches.

Danger when Fall-out is Fresh:

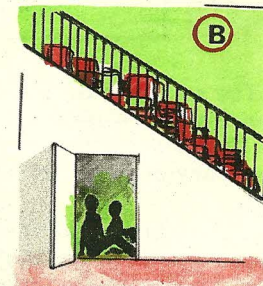


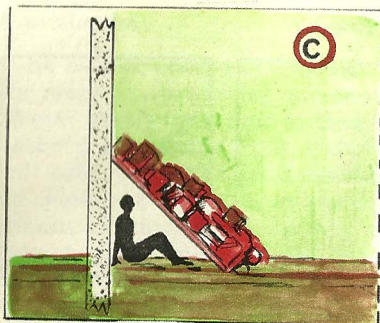
During Fall-out

Fall-out over. Radiation still strong

After a day

After fall-out starts, the dust continues to fall for several hours and the radiation danger gets steadily worse. The rays remain strong for several hours before easing off, but after a day has passed they will have weakened a good deal. The fullest protection you can possibly get should be obtained during these hours when the radiation is strongest. Some parts of the refuge room give better protection than others. The small space beside a chimney breast (the space away from the nearest outside wall is best) might be used and in this cramped space the family might huddle for a few hours (Sketch "A"). For people who have their refuge room in the hall, the space under the stairs could give extra protection if shielding materials were piled up overhead and at the sides (Sketch "B"). (In Sketch "B" the shielding at the sides has been omitted to show the family in refuge). Strong tables with earth-filled boxes, or earth-filled sacks, or concrete blocks, on them would give extra overhead protection, and with bedding underneath, would provide your sleeping quarters as well.

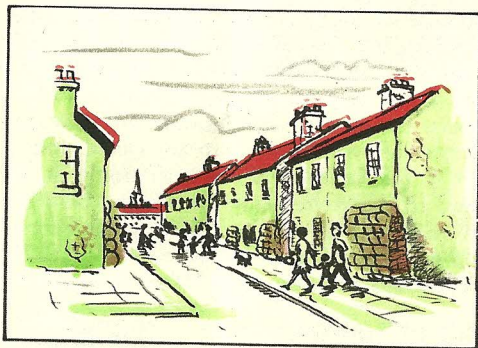




A similar advantage could be gained by forming a "lean-to" against an internal wall and heaping heavy materials overhead (Sketch "C"). These latter methods would give better protection than that described in Sketch "A".

Extra protection is very important if your neighbourhood is heavily covered with fall-out. People in badly affected areas will be advised of this by radio.

Release Time:



The strange existence in refuge will eventually end. About two days in refuge may be expected but this period may have to be extended somewhat if the authorities think it wise to do so. In any case you will eventually be told when it is safe to go out.

It is possible that there may be no conditions attached to your release. In many areas, however, people will be told that they can spend only a specified number of hours per day outside

the refuge room, and still less in the open. Later on, these restrictions will be eased and eventually they will end altogether.

While the restrictions are in force—DO EVERYTHING YOU ARE TOLD BY THE AUTHORITIES. This will be your greatest safeguard. The danger will not be apparent to you and will be all the greater for that reason.

Getting Out of Areas of Heavy Fall-out:



It is possible that some areas may receive such heavy fall-out that people will have to leave them.

The plan for such areas is to wait until the radiation levels fall low enough, and then move everyone rapidly out of the area to a safe part of the country. This clearance would be carried out about two days after fall-out started.

People with cars would be expected to provide their own transport. The authorities would provide transport to move the rest.

If intense fall-out occurs in your area, you must not leave your refuge room until you are told to do so. But remember a few points:

If You have a Car:

1. **Do not move until you are told**
 - when to go;
 - where to go;
 - what route to follow.

Until you have this information stay in your refuge room.

2. Do not leave with a half-empty car. Fit in as many passengers as possible. Do not take luggage at the expense of passenger space. Keep car windows closed.

If You have no Transport:

1. Wait in your refuge room until the transport arrives to collect you.
2. Keep luggage to a minimum. Take only what can be carried on your person and fitted in one small suitcase.
3. Keep your time in the open as short as you can.

You will have to leave behind you many valuable possessions. Livestock will have to be left behind on the farms, and town dwellers will have to leave their domestic pets.

Take some food with you—enough to last for a whole day if possible. Bring some drinking water also (or a flask of tea or coffee, etc., if possible). Take all your important papers with you (insurance policies, etc.). And do not forget money.

At all stages of the clearance operation you should do exactly as you are told.

Getting Back to Normal:



Clearance will not be necessary in most areas and most people will be in their own homes. When you are released from refuge you may feel that everything is back to normal.

Certainly the immediate danger (and the greatest one) is over, but there are other hazards which persist. They are dangers which arise from radio-

active dust getting on the skin, or worse still, inside the body.

Avoid bringing dust, mud, etc., into the house. Keep it out of the kitchen in particular. Have a special pair of outdoor shoes and remove them before you come into the house.

Take special precautions when you do "dusty" jobs. If you are stirring up dust, wear a handkerchief or cloth over your nose and mouth. Cover as much of the skin as possible. Wear gloves. Before you come back into the house remove all outer clothing as well as shoes.



Wipe the table and shelves in the kitchen with a damp cloth. Dispose of the cloth—it may have become contaminated. Keep the food covered.

Get rid of the dust from your surroundings. Your vacuum cleaner could be very useful for this purpose. Remember that because the dangerous dust accumulates in the bag it would have to be buried. Wash or hose down concrete paths, etc. This gets the dust into the drains where it is less dangerous. Hose or wash the roof **downwards** from the ridge—avoid forcing dust up under the slates or tiles. If you are served by a public water supply this decontamination will have to wait until the supply is turned on again.

If you run short of stored drinking water, do not use water which has been collected off roofs in the fall-out period. It would be very dangerous.

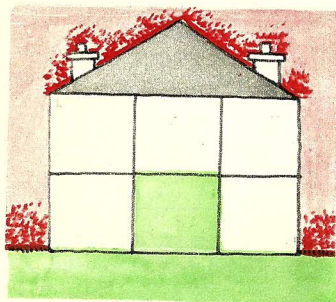
With sensible preparations it is possible to survive in a fall-out situation. But you cannot leave all your preparations until the last minute. There are some things you should do in advance.

ADVANCE PREPARATIONS

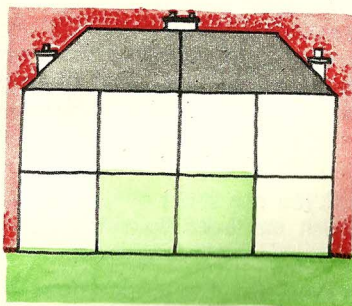
Select Your Refuge Room:

This is something you can do right away. Have a look at your house and try to imagine it with fall-out dust lying on the roof and on the ground outside like an invisible layer of snow. Pick a room which will get you away as far as possible from this dust—and at the same time put between you and the dust as many walls and other layers of heavy materials as possible. The best place is a basement. The ground floor of a two-storey house can also give good protection.

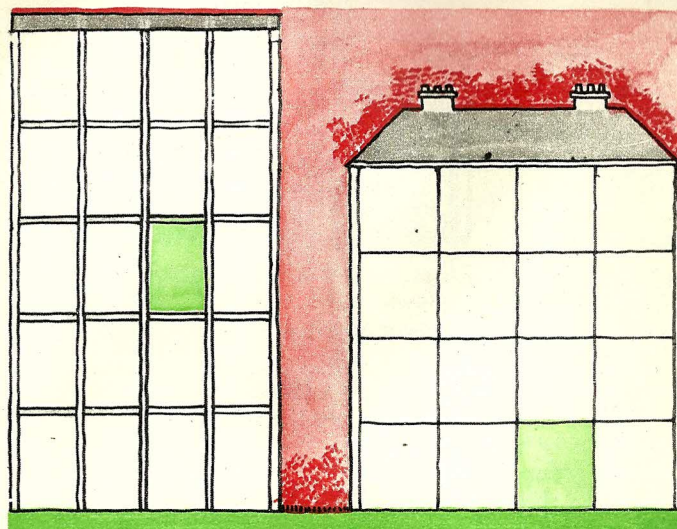
The sketches show the best refuge room in different types of dwellings.



Detached house. Centre of house
—ground floor.



Semi-detached. Room beside
adjoining house.



Modern flats; concrete
floors. If over four storeys,
middle floor normally safest.

Flats; timber floors. Ground
floor normally best.

There are other considerations which cannot be shown in the sketches—

A room with a small window is better than one with a big window.

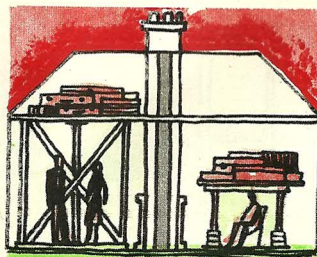
A room which is shielded by another house is better than one with an open outlook.

Do not forget that the dust will be on garage and outhouse roofs as well as on the roof of the house.

If you live in a cottage or bungalow the roof is too low for safety and you will have to take special action to increase your overhead shielding. How to do this is shown in the sketch on page 16. The methods illustrated on pages 9 and 10 (except, of course, the one involving a staircase) could also be used.

Dwellings of very thin materials (such as caravans, tents, prefabricated houses) or with a lot of glass will not give adequate protection unless they can be shielded on all sides and overhead

Ceiling supporting
shielding materials;
shored up.



Improved
overhead
platform.

by heavy materials. People who live in such places may have to choose between the following:—

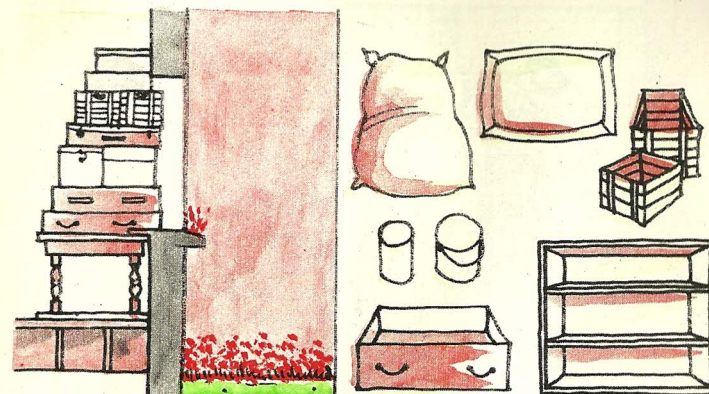
1. Move in with relatives or other people who have a more substantial house.
2. Arrange to take cover in a large building of substantial construction. You will avoid the shielding problem if this building has no windows or if its windows are high from the ground.

You should bring food and water with you.

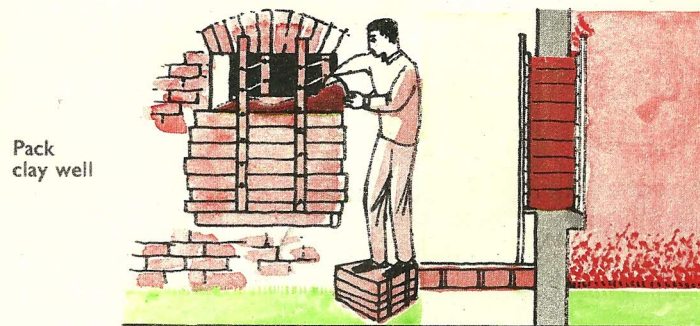
Plan Your Shielding:

Windows and doors give hardly any protection against the dangerous rays. The windows and any outside doors of **your refuge room** will have to be shielded when you take cover there. This also applies to its inside doors if they are not already shielded by thick walls. (Normally, of course, inside doors leading to the hall will be shielded by the opposite wall of the hall). You can plan this shielding now. You can assess what amount of shielding materials will be required and plan how you will have these materials in time. You can plan to block windows and doors in one or more of these ways:—

1. By building up a barricade of bricks or concrete blocks outside the window (or inside if the floor will take the weight). It should be about equal to the wall thickness. You will not, normally, need mortar.
2. By making a thicker barricade of containers filled with earth. Sacks, pillow cases, boxes, furniture drawers would do as containers. Use also items of furniture that can be filled with earth (wardrobes, chests of drawers, bookshelves, etc.). This type of barricade should be about one-and-a-half times the wall thickness.

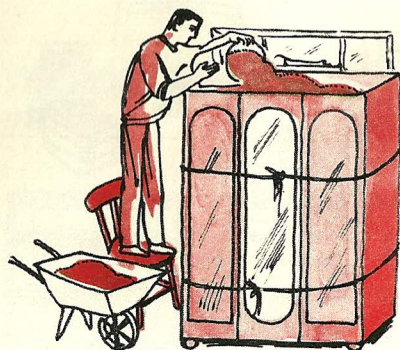


3. By removing, if necessary, the window sashes and erecting improvised shuttering, as shown in the sketch. The shuttering is supported by wiring the outside posts to the inside ones through the window opening.

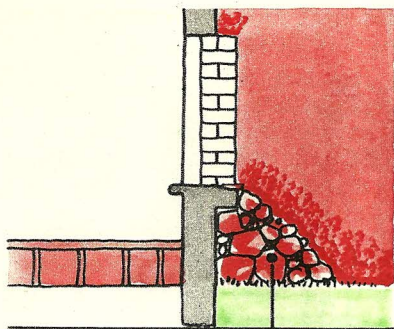


Pack
clay well

You must not forget that dangerous radiations will be coming down from the roof as well as in through the walls. You should try to reduce these radiations by placing some shielding materials on the floor above your refuge room. If you have nothing else, move all the furniture, books, etc., you can into the room above the refuge room. **DON'T OVERLOAD FLOOR HOWEVER.**



Here is a wardrobe being used to shield a window. The clay should be packed down well.

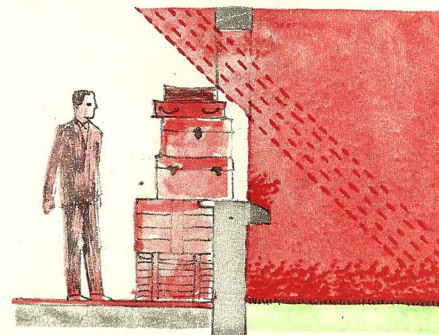
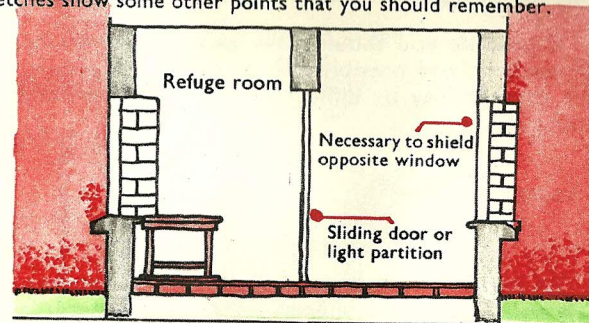


Stones; clay.

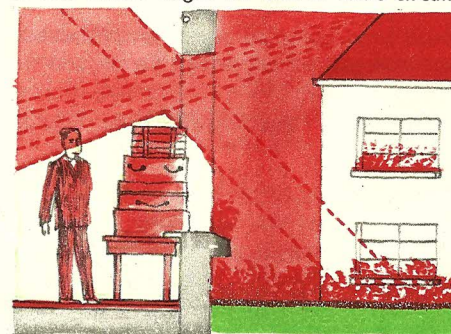
Before you finish planning your shielding, remember that you should provide for extra protection for the peak hours of fall-out. This type of refuge-within-a-refuge is described on pages 9 and 10 "Danger when fall-out is fresh".

Whether you intend to go under the stairs (if your refuge is in the hall) or under the table or use some other method, you will want extra shielding materials. Allow for them now in estimating your requirements.

These sketches show some other points that you should remember.



This type of low shield might be safe in some circumstances . . .



... but it could leave you exposed. Scattered radiation could also affect you.

Stock of Food

If possible you should have enough food to last the whole household, and possibly one or two extra people, for at least 14 days (it may be difficult to buy food even after you leave refuge)..



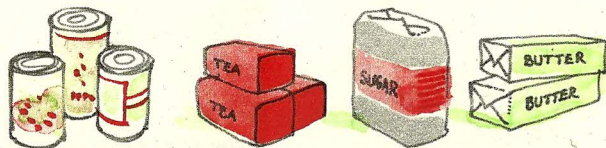
You could begin to build up your stock from now on. The money will not be wasted. You can keep using and replacing your stock as time goes on and the food will always be fit for consumption.

About the type of food to buy—

It should be covered so that the radioactive dust cannot reach it. This points to tinned foods and well wrapped goods.

It should require little or no cooking. This again indicates tinned foods.

It should "keep" for a long time.

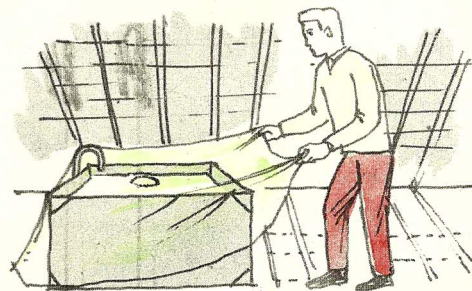


Here are suggestions for your emergency food stock.

Tinned meat	Instant coffee
Tinned fish	Raisins
Tinned vegetables	Chocolate
Tinned fruit	Salad oil
Tinned or packet soups	Packaged cereals
Tea	Bottled drinks
Sugar	Biscuits (tinned or wrapped)
Butter	Condensed milk
Margarine	Dehydrated foods

Bread (pre-wrapped if possible or covered with paper, etc., after purchase) and fresh milk are very important additions to your emergency supply, but they can only be added at the last minute.

Water



You may be without the public water supply for 10 to 14 days. Water from pumps and wells may be contaminated. You will need about 10 gallons of stored water for every person you expect in your refuge room (again allow for one or two extra persons). The bath and sink will give substantial storage for most families. Use milk cans, churns, barrels, etc. The storage tank in the roof could be covered so that it and the hot water system form an extra reserve of safe water. When you get the FINAL WARNING turn off the stopcock so that this system will not be contaminated. Now is the time to find out where the stopcock is or to provide a turn key if a stopcock is not fitted. Tie up the ballcock of the w.c. so that your water reserve will not be wasted in flushing.

Lay in at least a half gallon per person IN THE REFUGE ROOM ITSELF. Use bottles, jars and buckets (if they can be covered). Water keeps best in a dark place.

All emergency water should be covered carefully against contamination and the doors and windows of the rooms in which it is stored should be kept closed.

It is important to remember that boiling will NOT remove radioactive contamination from water.

Sanitation:

For waste disposal, have a tightly closed bin and a supply of newspapers for wrapping items (slows decomposition). Another covered bin or bucket or chemical closet is required for use as a w.c.

Lay in also—

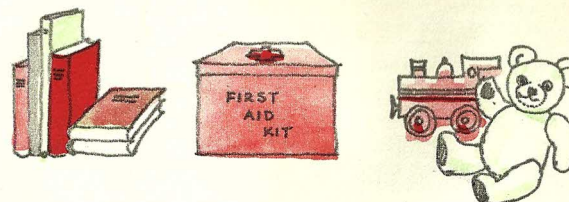
Screen;

Toilet paper;

Turf-mould, dry earth or ashes;
Disinfectant.

Other Requirements:

Portable stove for boiling water, a supply of fuel for it, a kettle, a covered saucepan; Corkscrew; Tin opener; Bottle opener; Toys and games for children; Soap, basin, towels; Mattresses, blankets, pillows; Books and magazines.



First-aid items (including aspirin and household medicines, etc.); Electric torch with spare bulbs and batteries; Matches, candles; Crockery and cutlery (covered); Tea towels; Rubber or plastic gloves; Clock; Special requirements for babies and invalids, etc. Box for personal papers.

Finally, the most important item of all—



The Radio Set

A battery operated radio set is much better in these circumstances than a mains operated one. Get one if you can and have spare batteries. Whatever set you have, make sure in advance that you can hear it in your refuge room, if you cannot instal it there.

Chapter II

THE FARMER AND FALL-OUT

General

The farmer must protect himself and his dependants in a fall-out situation. In that way he is no different from any other householder. Livestock and crops, however, are affected by fall-out and this gives him additional problems which town dwellers do not have.

It is in the farmer's own interest to protect his means of livelihood from the effects of fall-out and in doing so he will also be benefiting the whole population. Food will be scarce in the aftermath of a nuclear war and the people will be depending on the farmers for a supply of uncontaminated farm produce.



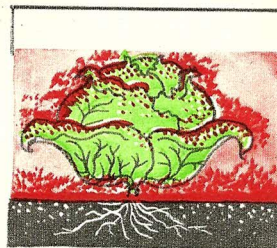
Radiation from surroundings

Radioactive dust on the body

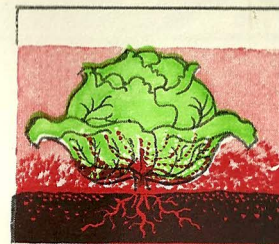
Radioactive dust inside the body

The sketches indicate that a cow, or any other farm animal, can be injured by fall-out in the same three ways as a person can. The third one is the greatest danger because in this way the produce of the animal (milk in this case) is affected and people can be injured if they consume it.

Crops are also affected as indicated in the sketches.

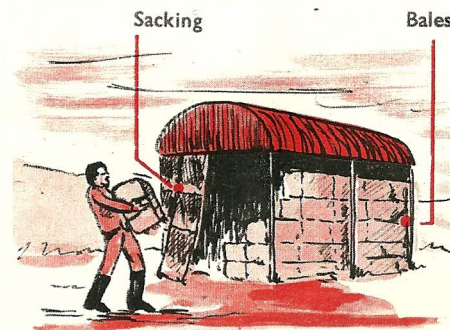


Plants can be contaminated on their surfaces

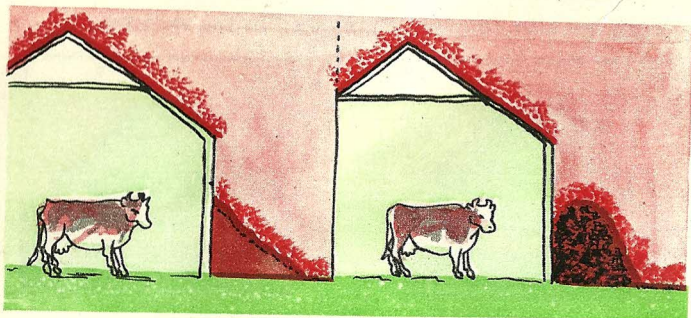


Worse still, growing plants can absorb radioactive material from the soil

Advance Measures:



Animals should be brought in under cover for at least the first two days of fall-out. Plan now how to do this. Have you room for them all? If you are short of room you might consider using a hayshed adapted, as suggested in the sketch, in a way that will keep out the fall-out dust. If you are still short of room a neighbour may be able to help you. Otherwise some animals will have to be left out. Milch cows, of course, are the most important animals in this connection and should get the best quarters.

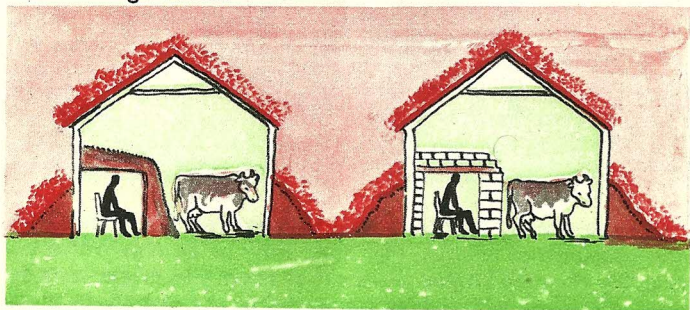


Where possible bank up clay, stones, turf or any other convenient materials against the wall.

The protection given by farm buildings can be improved by piling materials against the walls, as shown in the drawings. This could be done in advance.

Watering and feeding your animals under cover for two days is a problem in itself. You can plan now how to do this and make any advance preparations that are possible.

Cows will be in great pain during the refuge period unless you make arrangements for milking them. What you could do in advance is to build up a heavily protected "box" in the byre so that somebody can stay with the cows during the danger period. He will, of course, require water, food, etc., as provided in the refuge room.



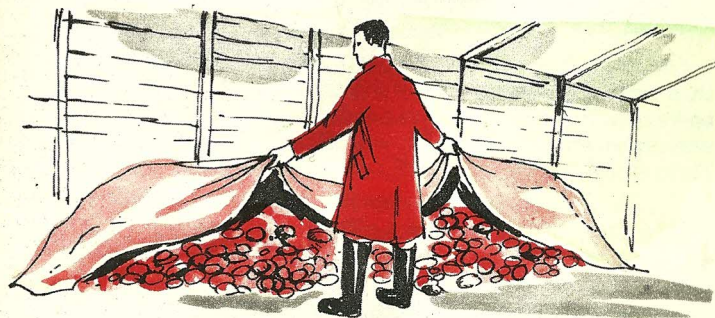
When fall-out is expected cover up hay, silage and other produce which might be consumed by animals later on. This also applies to produce intended for human consumption. Cheap plastic sheeting is very useful for this purpose. Tarpaulins are also useful.

When You get Warning:

When you get a fall-out warning, you should carry out the following actions, in addition to those set out in the previous chapter:—

National Alert:

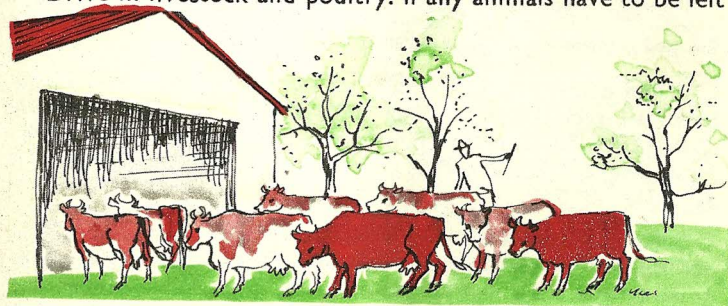
Lay in water and fodder for the livestock. Cover hay, silage, seed in barns, etc. Cover open wells to prevent contamination. Cover tanks and water butts. If they are fed from roofs, turn the downspout away from the containers so that dust will not be washed in. Cover tractors and other farm machinery.



Plastic sheeting and tarpaulins are very suitable as coverings. But if you have none of these materials, use something else instead, for example, corrugated iron sheets, boards, sacks, anything at all that will keep the fall-out dust from settling on hay, water, etc.

Advance Warning:

Drive in livestock and poultry. If any animals have to be left



out, keep them in an enclosed yard or in a small field (preferably bordered by trees). Make arrangements for milking. If you cannot leave anyone with the milch cows you can cut down the milk production by reducing the water and food supply to them.

Final Warning:

As soon as you get the final warning, go into your refuge room immediately whether you have completed your preparations or not.

After Release:

Several problems will occupy the farmer's mind after he is released from refuge.

Grazing: You will be anxious to let cattle out to graze and thus reduce your own work in attending to them. It is better to keep animals in as long as possible. The grass will be covered with radioactive dust which will affect their milk if they eat it. The following measures will help to reduce this danger—

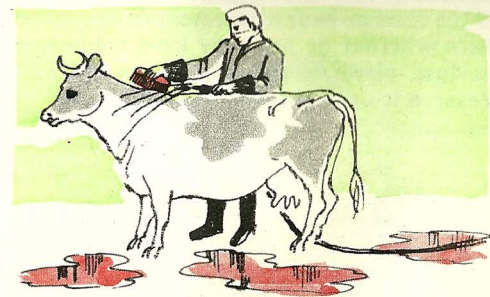
Cut this contaminated grass and rake it off for safe disposal (preferably burying it). Use a nitrogenous fertilizer to bring on a fresh growth. Alternatively let less important animals graze before the milch cows are let out.



Cut and remove contaminated grass

When dairy cattle are finally let out, do not let them range freely all over the farm. They will swallow a lot of radioactive dust if they do. Confine them to a small grazing area at a time. Again use fertilizers so that a small area can support a number of cattle.

Exposed Animals: Animals which were exposed during fall-out will have the fall-out dust trapped in their coats. Hose them down or clip their hair to get rid of the dust. Wear gloves and



protective clothing and wash yourself thoroughly afterwards.

The animals which were out in fall-out will have suffered hidden damage from the radioactive rays given off by the dust. If the exposure was great, they may sicken and die in a few weeks. Even if they recover, they will never be worthwhile animals again. You should not slaughter them, however, unless you are officially advised to do so.

These are the signs to watch for—



The animals are tired and lie down a lot. Their appetite decreases. Milk production falls off. Diarrhoea and bleeding occur. (It should be borne in mind, however, that these symptoms are common to many animal diseases). Try to isolate sick animals. The flesh may not be dangerously affected by the radioactive material which the animals have swallowed. This radioactivity will be concentrated mainly in the bones but will also be found in the intestines and blood. The bones and offal would be dangerous to use and should be buried. If necessary the authorities would make special arrangements for slaughtering cattle.

Suspect Food: Milk and eggs are both liable to be affected, but only if the cows or hens have eaten contaminated food. If you are not sure whether or not they have swallowed any of the dangerous dust, play safe and do not use the suspected food. Try to preserve it until there is time to test it.



Preserve eggs with waterglass.

Make butter and keep it for test. Feed the skim milk to pigs or bullocks (it will not affect their flesh).



If you would not eat these foods yourself, it is hardly necessary to say that they should not be marketed. Any food which was uncovered in the house during fall-out should be buried.

Suspect Crops:

Crops can be affected in two ways—

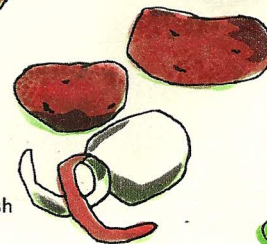
Externally—where the dust is merely resting on the surface of the plant.

Internally—where the radioactive elements get into the soil, are picked up by the plant roots and become part of the plant itself.

External Contamination can often be removed quite easily. Examples are shown in the drawings.



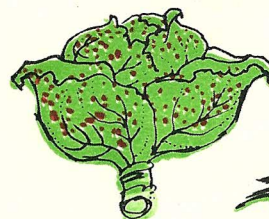
Apples—peel and wash



Potatoes—peel and wash



Peas and beans—remove pod



Lettuce and Cabbage—
remove leaves, use heart



Leafed vegetables
—do not use



Soft fruits—do not use

Internal Radioactivity: Growing plants only are affected internally (and only after the first few days).

Crops which were growing during fall-out should not be used (or marketed) until they have been tested. If food got very scarce people could use potatoes—they would not be too badly affected. Green vegetables which were growing during fall-out should not on any account be eaten. They should be put aside for testing. Growing cereal crops would also be affected but if the grain were badly needed, threshing would remove a lot of the danger.



Haystacks or stacked grain which were left uncovered in the open would be contaminated—but only in the top few inches.

If the top six inches were removed and the sides pared, the rest would be safe to use. Do this slowly and carefully so as not to stir up dust.

Breeding:

Radioactivity has genetic effects on both male and female animals. If affected animals are mated, the offspring may be abnormal in some way.

Use only the artificial insemination scheme for several months. You would not see many ill effects if you used affected **cows** for breeding. It would be better to get such cows in calf so as to increase milk production.



For hatching, try to breed from birds which were indoors during fall-out. If all your poultry are affected by fall-out it would be better to use their eggs for hatching than to stop breeding altogether.

Personal Protection:

You yourself are more important than any of your animals. Take the following precautions against getting dangerous dust on your person.

Wear special outdoor clothing: change clothing and boots before going indoors.

Wear gloves when working: rubber ones are best. Wash the exposed parts of the body often and thoroughly. When you are doing a job which stirs up dust (threshing, stacking hay, etc.) take extra precautions as shown in the sketch.

Do not smoke or eat while you are doing a dust-raising job. Wash thoroughly after you finish.





As time goes on the danger gradually diminishes. Here are some ways in which you can help to speed the process.

Wash radioactive dust off roofs, paths and hard surfaces. Try to ensure that the dangerous dust is removed to a safe distance from where people and animals spend their time. If it is washed into underground drains so much the better.

Plough the dangerous dust under. Deep ploughing will put the radioactive materials below the roots of many crops.

Put lime on your land—both pasture and tilled land. This reduces the uptake of the dangerous element Strontium 90 by grass and crops.

You will be continually advised by the authorities. Unless you are told to do otherwise, continue to sow your usual crops in the usual way.

Chapter III

FIRST AID

In the conditions brought about by nuclear warfare, doctors might not be available to everyone when needed—they might, for instance, be forced to remain in refuge from fall-out. Several days could pass before skilled medical attention could reach all those needing it. A knowledge of first aid would, therefore, be a great help and could save many lives.

Training in first aid can be obtained from your local branch of the Civil Defence Casualty Service, the Irish Red Cross Society, the St. John Ambulance Brigade of Ireland, or the Order of the Knights of Malta. There are also special publications on these subjects and every householder would be well advised to get one.

An untrained person can do more harm than good in trying to give first aid. But if someone is obviously going to die in a short time unless he gets help, then even an untrained person should do all he can for him.

The following brief notes on the first aid treatment of certain conditions are not a substitute for a course of training in first aid or for a proper manual on the subject.

Radiation Sickness:

If a person is exposed to too much radiation the body cannot repair the damage without suffering injury. There will be no visible injury, but after a few hours the person will complain



of stomach upset and fatigue, with perhaps, some vomiting and diarrhoea later. He should have complete rest, fluids to drink, be kept comfortable and warm and, when food is taken, it should be soft and easily digested. He may require a doctor's attention later.

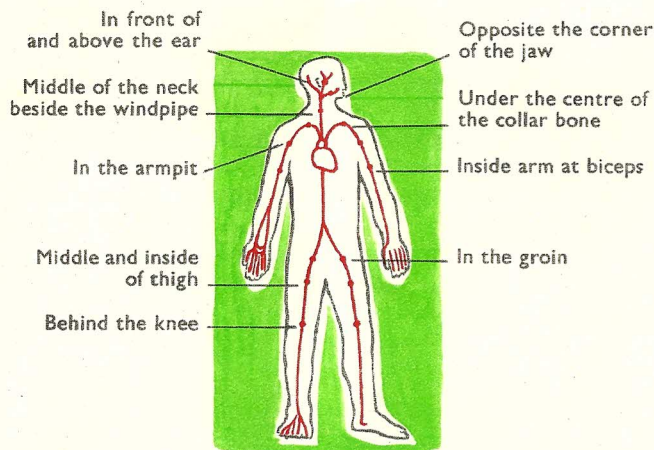
If the exposure to radiation has not been serious, only mild sickness will occur and recovery will be rapid. If the exposure has been severe, recovery may take several weeks or even months. If the exposure has been very great, death can occur in hours or weeks.

Radiation sickness is **NOT** contagious and no harm can come from helping those affected.

To Stop Heavy Bleeding:

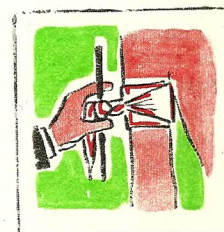
1. Press a pad firmly over the bleeding and hold it there.
2. If this does not stop the bleeding, press on the nearest pressure point above the bleeding.

The sketch shows where these points are. You will feel a pulse there.



3. If the wound is on a limb, tighten up a tourniquet to stop the flow of blood to the limb. The sketch shows how to do this.

Stay with the patient because it is most important to release the tourniquet every 15 to 20 minutes.



Handling Fractures:

Fractures show themselves by the unnatural shape of the part and by being painful when touched and there may be swelling and bruising. In the case of fractured limbs the part should be supported firmly and a rigid splint applied before the person is moved. If the skin is broken or bone protrudes, the fracture is compound and the area should be covered with a clean dressing to prevent infection.



Artificial Respiration:



The mouth-to-mouth method shown in the sketch is an excellent one.

1. If there is foreign matter visible in the mouth, clear it out quickly with the fingers or a cloth wrapped around the fingers. Remove dentures.

2. Tilt the head back so that the chin points upwards. In addition pull or push the lower jaw up into a jutting-out position.

3. Open your mouth widely and place it tightly over the patient's mouth. At the same time pinch the patient's nostrils shut, or close the nostrils with your cheek. Or, close the patient's mouth and place your mouth over the nose. Blow into the patient's mouth or nose. Blowing into the nose is better if the nostrils are free.

4. Remove your mouth, turn your head to one side, and listen for the return rush of air that indicates air exchange. Repeat the blowing effort. For an adult, blow at the rate of about twelve breaths per minute watching to see that the chest is moving up and down. For a child, take relatively shallow breaths appropriate for the child's size at the rate of about twenty per minute.

5. Keep up the effort as long as possible—some experts recommend up to two hours.

Burns:

When there is severe burning, with blisters or destruction of the skin, the part should be covered with a clean pad or other material and bandaged lightly. NOTHING else should be applied. If a large area of the body is affected and especially if the person must wait for removal, give drinks of a salt solution (one level teaspoonful of salt to a quart of water).

Crush Injury:

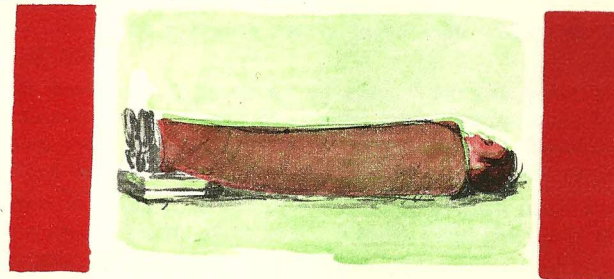
You may be able to release people who are trapped under heavy debris. Many would be suffering from crush injury. This may not appear to be very serious, but the person could die



later on from the effects of poisons generated in the crushed part. The treatment is to give plenty of water or, better still, water mixed with bread-soda (two teaspoons to a pint). Keep the crushed part uncovered.

Shock:

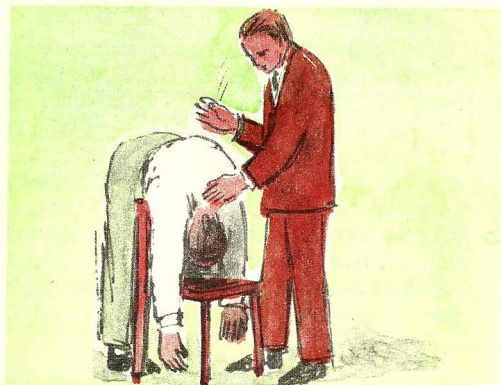
Many casualties would be suffering from shock. This is not a state of mind but a serious physical condition which could kill the person. You will know he is affected by shock if he is pale or greyish, clammy and frightened.



Lay him flat. Wrap him up to keep him comfortably warm and raise his feet about 9 inches (unless they are injured). Reassure him as far as you can.

Choking:

Many people taken out of collapsed buildings would be suffocating from dust, etc., in the mouth, nose and breathing passages. Clear out the nose and mouth. Bend the person over a chair or some such object and thump him vigorously on the back.



Chapter IV

DIRECT EFFECTS OF NUCLEAR WEAPONS

A Nuclear Explosion—What Would It be Like?

The power of nuclear weapons is measured in kilotons and megatons. A one-kiloton weapon has the explosive power of 1,000 tons of T.N.T.; a one-megaton weapon has the explosive power of one million tons of T.N.T. Nuclear weapons may be many megatons in size, but their destructive range does not increase in direct proportion to their size.

Here is a general description of the probable effects of a one-megaton weapon exploded at, or near, ground level.

The explosion would produce

A BLINDING FLASH

lasting some seconds, accompanied by

A SEARING HEAT

and followed, some seconds later, by

A HURRICANE-LIKE BLAST.

It would leave a crater nearly half-a-mile wide and about 100 feet deep.

Most buildings up to about $1\frac{1}{2}$ miles from the point of the explosion would be totally destroyed. Buildings between $1\frac{1}{2}$ and $2\frac{1}{4}$ miles away would be damaged beyond repair. Between $2\frac{1}{4}$ miles and 9 miles, the damage would vary from severe to slight.

A person exposed in the open to the heat flash could sustain fatal or severe burns up to about 5 miles from the point of the explosion.

Fires would be caused extensively within a radius of about 5 miles and isolated fires could occur for a further two miles or so.

Radioactive fall-out of a particularly high intensity could be expected to start falling on or near the damaged area in a short time after the explosion.

Obviously if a nuclear weapon exploded on or near a city or large town, the immediate devastation and loss of life would be very great and large numbers would be injured or trapped in their homes.

Is there anything then that can be done to reduce the casualty figure? Yes, quite a lot. People can greatly increase their chances of survival if they know what to do.

The heat and blast could cause many casualties for a considerable distance from the point of the explosion. The most serious effects of the heat would be on the exposed parts of the body, e.g. the face and hands. If caught in the open a person could be thrown to the ground by the blast, but the main danger would be from the objects hurled around—bricks, tiles, glass, etc.

The main things to do, then, are—

AVOID BEING HIT BY FLYING OBJECTS.

TAKE UP A POSITION WHERE YOU WILL NOT BE BLOWN ALONG THE GROUND.

SAVE YOUR FACE AND HANDS FROM BURNS.

What To Do at The Moment of Explosion:

INSTANT ACTION IS NECESSARY.

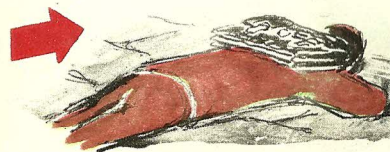
Outdoors: If you are out in the open—

TURN YOUR BACK TO THE FLASH.



Turn your back to the flash. Hands in front of body.

Throw yourself
down in a direction
away from the explosion



Lie in the lowest spot
you can find



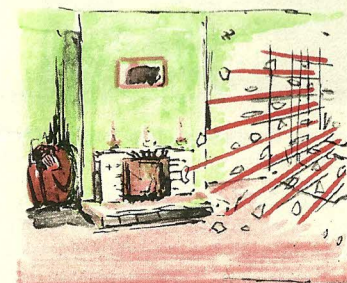
THROW YOURSELF FLAT ON THE GROUND WITH
YOUR HANDS UNDER YOUR BODY.

PROTECT YOUR HEAD AND THE BACK OF YOUR
NECK WITH ANYTHING YOU MAY BE CARRYING
(an overcoat for example), OR WITH YOUR COAT
COLLAR, ETC.

If you get into any local hollow or low spot, you greatly
increase your protection.

Indoors: Flying glass is a
very serious danger.

GET AWAY FROM THE
LINE OF THE WINDOWS.
GET INTO A STRONG
POINT (beside the chimney
breast, under the stairs, un-
der a strong table or desk).



Flying glass is a great danger

What to do after the Explosion:



Fires would be started by the explosion. Try to tackle them immediately or they will quickly get beyond control.

Turn off gas, fuel-oil and electricity. After the fires are out, turn off water.

What About Fall-out?

Fall-out will not start in the vicinity of the damaged area for at least half-an-hour. In this time try to help your neighbours who may be injured or trapped under collapsed buildings (more about this later).

See that there are heavy materials overhead



Prop up the ceiling if necessary

Place shielding materials at windows and doors

After half-an-hour you will have to take cover from fall-out. Your own house may be so badly damaged that it will no longer offer enough protection and you may have to look for shelter elsewhere. A large substantial building with the roof still intact, or a basement in any building, would give good protection. Improve this protection as shown in the sketch. If possible, bring food and water with you.

Flight is no Solution:

Many people would be tempted to flee from the damaged area as fast as they could travel. This would be the wrong thing to do. You cannot tell which way fall-out is travelling. The wind at ground level gives you no indication. If you run away, you may get into heavy fall-out. You cannot expect to get adequate shelter and food, especially if there are thousands of other fugitives on the road. By crowding the roads, you would also be holding up incoming help for the stricken area.

It is better to stay where you are and take cover. Later on, you will be directed to safety.

If You Have to Go Out in Fall-out:

If you are forced to leave your refuge (by fire, for example), take the following precautions to stop the dust getting on your person or inside your body:—

Wear a cloth around your nose and mouth.

Cover the head.

Wear a scarf.

Wear gloves.

Tie cuffs of coat and ends of trousers.

Wear plastic mac or light overcoat which you can dispose of afterwards.

Do not smoke or eat while you are out.

What To Do in a Fire Storm:

If fires are not quickly tackled and put out, a fire storm could develop in a city after a nuclear explosion. Strong winds would blow in to fan the giant fire, and within the fire storm area everything would be burned to the ground.

You would not escape death by taking cover. Get out of the area as quickly as you can. Since the winds blow in towards the centre, you will find the quickest way out of the fire area by moving **into the wind**. Wrap a wet blanket or overcoat around you.

Releasing Trapped People:

If you attempt to rescue people from damaged buildings, there are a few things you should know for your own sake as well as for the casualty's safety.



Do not force doors in



Watch out for evidence of imminent overhead collapse

Searching Damaged Buildings:

Make a careful examination of the building before you go in. The sketches show the type of accident which could happen and the need for caution.

When you get into the building keep close to the wall both on floors and stairs.

Do not touch **any** wires whether you think they are alive or not.

Searching Under Rubble:

People **can** survive under totally collapsed buildings. This is possible only because voids are formed in the debris under collapsed floors, heavy furniture, etc. If you hear somebody



Form lane along ground level from here

calling for help from under debris be very careful not to cause the void to collapse. Climbing over the rubble could cause such a collapse. Clear a lane through the rubble, along ground-level, as shown in the sketch. Do nothing which would cause the debris to slide or collapse.

Wear Gloves:

Wear gloves at all times in carrying out rescue work. You could get radioactive materials into your bloodstream through cuts on your hands.

Handling and Moving Casualties:

TREAT INJURED PEOPLE VERY GENTLY

When moving them, put them on a stretcher or some sort of improvised litter.

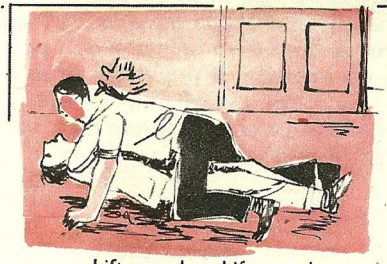


A door used as an improvised stretcher

On some occasions there will be no time to stretch a casualty. You might have to move one from a burning building, for example, and you might have nobody to help you. The sketch shows a method which would enable you to move an unconscious person even if quite heavy. This cannot be applied when moving a casualty down a stairs. Ease him down as shown in the drawing on page 48.



Tie wrists together



Lift, crawl . . . Lift, crawl



Support the casualty's back with your thigh

There would be a great many trapped and injured people after a nuclear explosion. Survivors in the area should give them all possible aid until help arrives from the outside.

FIRE:



In World War II, fire accounted for a very high proportion of the total civilian casualties. In a nuclear war, fires started by the heat flash of nuclear weapons would be an even greater hazard. Fire brigades would, of course, do all they could, but they could not hope to deal with more than a fraction of the fires. People would have to do their best to prevent and fight fires in their own homes and, if possible, help their neighbours to do likewise. If individual fires were allowed to get out of control they would link up and a fire storm could develop. This would cause complete destruction of the area affected and great loss of life.

Fire Prevention:

In order to prevent the heat flash from entering your house



and starting fires inside, do one or more of these things when the authorities give warning:

KEEP VENETIAN BLINDS AND SHUTTERS CLOSED.

USE **HEAVY** CURTAINS—woollen ones are best; bright colours are better than dark.

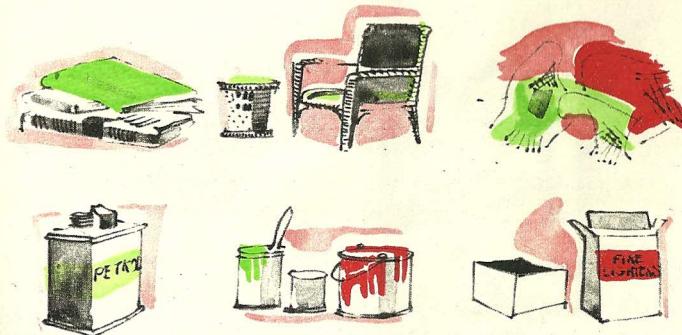
FIX BLANKETS ACROSS WINDOWS, SKYLIGHTS, GLASS DOORS, etc.

WHITEWASH WINDOWS, etc. (Apply the whitewash to both the inside and outside of the panes).

Flimsy curtains should be taken down from windows. The heat flash could set them on fire.

Remove Materials that Ignite Easily:

They are a danger and should be got rid of—from both the outside and the inside of the building.



Papers and magazines; wicker furniture; rags, paints, etc.

Here is a list of the commoner ones.

Newspapers	Rags
Magazines	Petrol
Cardboard boxes	Paraffin
Lampshades	Paint tins
Wickerwork furniture	Cleaning fluids
Flimsy curtains	Firelighters

An outhouse which has no window would be a good place to leave such materials until the danger is over. Do **NOT** store them in the attic space.

Store Extra Water:

You will be laying in a supply of water for your own use during the refuge period. You should lay in **extra** water for firefighting purposes. A few buckets on each floor would be the minimum.

Putting Out Fires:

In spite of all precautions some fires would be started by a nuclear explosion. Here is how to deal with them.

Most of these fires would begin in a small way. You could tackle those started in your own house and put them out in a short time. But you must not delay or the fire might be gone beyond control.



What to Use:

If the water supply is still available, you could use a garden hose to pour water on the fire. If the water supply is cut off, use your stored water. Use any container you can lay hands on

to throw water on the flames. A stirrup pump would be the best thing to use. If no water is available you can beat the flames out if you tackle them promptly. Use a brush, a mop, a mat, a blanket, a sack, etc. Sand or earth might also be used.



Difficult Fires:

If fires are let grow for a while, they will be difficult to put out. Here are a few things to remember—

ENTERING A BURNING ROOM: Be careful in opening the door. The knob or door handle may be very hot and burn you badly; or when you do open the door, a blast of hot air and smoke may rush out and hit you in the face.

Stoop down low and open the door slowly, protecting your hands with a handkerchief or clothing and keeping your face shielded by the door. Be prepared for pressure from the door if it opens towards you.





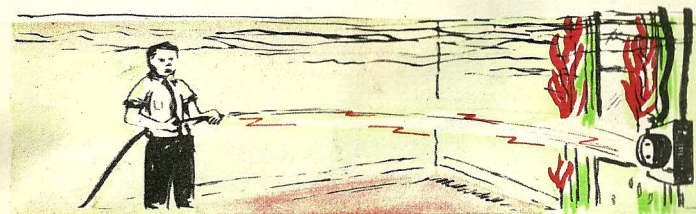
KEEP DOWN: The room may be so hot and full of smoke that you cannot get into it. If you get down on the floor you may find that you can crawl in. There is a layer of cooler and clearer air near the floor.

DO NOT OPEN THE WINDOWS : If the windows are intact do **not** open them (in order to clear smoke or for any other reason) until the fire is out. If the windows are broken, or if you open them, the fires in the house will burn more furiously because they then have plenty of air.

MAKE SURE IT IS OUT: When you think the fire is out, go back and look again. Fires have a way of starting up again when the firefighters have left. If there is any fresh smoke, find out what is smouldering and extinguish it.



BE CAREFUL OF ELECTRICITY: If you have switched off the electricity supply or if it has been cut off by the explosion, you have no worries on this score. If the supply is still on, you should cut it off before using water on fires.



FIRE EXTINGUISHERS: If you have a chemical fire extinguisher, read the instructions before you use it. Some makes will not operate at all if they have been turned the wrong way up.

Escape and Rescue from Burning Buildings:

If you are trapped in a burning building (you are upstairs, for example, and the stairs is on fire) you must resist the inclination to panic.

Get into a room which has not yet caught fire and close the door behind you. Try to attract attention at the window. If there are any materials (e.g., sheets or curtains) at hand to make a "rope", get to work on it at once.

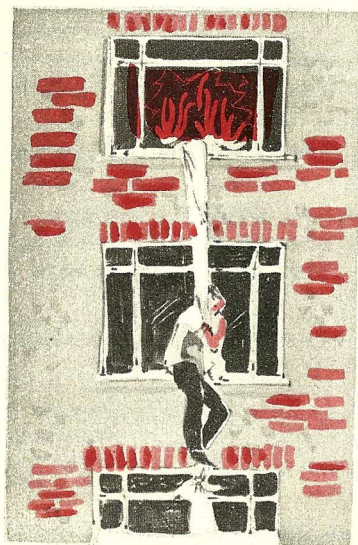
Eventually the room will fill with smoke. Stay near the window and put a wet handkerchief over your nose and mouth.

If you get lost in a smoke-filled room, search for the door or window methodically. Crawl straight ahead until you meet a wall and then go around by the wall until you come to the door or window.

If the room in which you have taken refuge catches fire (or if you have failed to find a room which is not on fire) you will have to leave by the window.

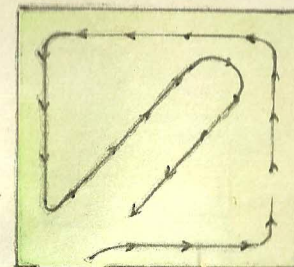
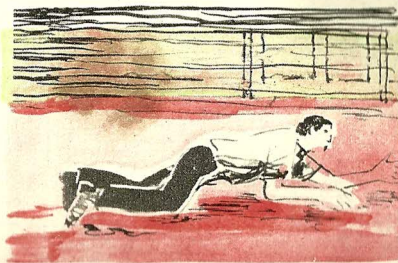


Get out on the window sill, stay there as long as you can bear it and shout to attract attention. If everything fails, you will have to jump.



Shorten the drop as indicated in the sketch. From a first floor window this is quite safe. From higher storeys you should try to get at least part of the way down on a rope, or improvised rope, before you let go.

Ropes can be improvised by knotting sheets or curtains together. Test the "rope" before you trust your weight to it.



SEARCHING A BURNING BUILDING: If you are looking for casualties in a burning building, it is much safer for you to start at the top of the building and work down. In searching a smoke-filled room, crawl around by the walls first and then crawl diagonally across the room, making wide sweeps with the hands.

If you find any unconscious casualties you could move them to safety by using the methods described on page 47.

Cover design and illustrations were prepared for An tAire
Cosanta by David L. Murphy, Dip. A.I.C., A.N.C.A.
(Design) in association.

Printed by Hely Thom Ltd.