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Kirklees and the **BOMB**



Designed and Published by Kirklees Metropolitan Council.

40p

ERRATA

Please note:

That BRITAIN and FRANCE should be coloured RED on the map on pages 4 and 5.



What is the purpose of this booklet?

Kirklees Metropolitan Council became a Nuclear Free Zone in January 1981, joining a movement now involving over 150 local authorities. The motion passed by the Council called upon 'H.M. Government to refrain from the manufacturing or positioning of any nuclear weapons of whatever kind within the boundaries of Kirklees, and to ensure that no nuclear waste is dumped or transported through the area of Kirklees.' On becoming a Nuclear Free Zone the Council also committed itself to giving the public more information about the questions of war and peace and the effect of nuclear war and a Peace Sub-Committee was set up in May 1983. The Peace Sub-Committee is able to advise on and consider all peace matters and further the Council's commitment to give information to the people of

Kirklees. This booklet is just one part of that commitment.

This booklet tells of the effect that a nuclear explosion might have on the Kirklees District. Home Office publications such as 'Protect and Survive' appear to suggest that with a few simple precautions, the majority of people could survive a nuclear war. Another Home Office publication 'Nuclear Weapons', in some scientists' view, including the British Medical Association, underestimates the death and destruction caused by the bomb. Much objective research has been done by American and British scientists into the real effects and these present a very different picture. The calculations used in this booklet are based upon the findings of the US Department of Defense. The Metropolitan Council feel a deep responsibility that the people of Kirklees should be made aware of the real chances of survival. The facts are set out in this booklet.

KIRKLEES AND THE BOMB

What does this booklet contain?

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KIRKLEES AND THE BOMB

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THE GROWTH OF NUCLEAR WEAPONS

Who has the bomb?

The United States and the Soviet Union have the most nuclear weapons. In 1983 the United States had 9,700 strategic warheads and the Soviet Union approximately 8,800. These can be launched from land, from submarines at sea or dropped or shot from bombers. Britain, France and China have them as well. Experts believe India, Israel and South Africa may have them already. Argentina, Pakistan, Iraq, Libya and other countries may have them before 1990. Even well organised terrorist groups may be able to make and deliver nuclear bombs.

How powerful is the bomb?

The highly destructive power of nuclear weapons is usually referred to in terms of kilotons or megatons. One kiloton (KT) is equivalent to one thousand tons of the high explosive TNT. One megaton (MT) equals a million tons of TNT. Trials have been held with weapons of up to 58 megatons. The atomic bomb dropped on Hiroshima in the Second World War was about 12KT and it killed 68,000 people and injured 76,000. The bomb which may be used against Kirklees could be a one megaton bomb – 70 times more powerful than the Hiroshima

Comparative size of bomb



12 Kiloton

Hiroshima

Number killed or injured



146,000



1 Megaton

Kirklees



235,500

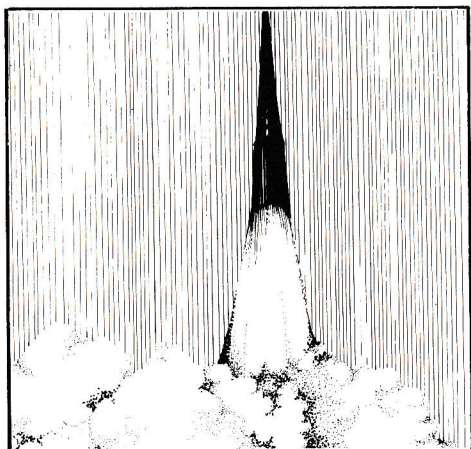
bomb. Such a bomb could kill or injure over 235,000 people in the Kirklees District.

How big is the nuclear Arsenal?

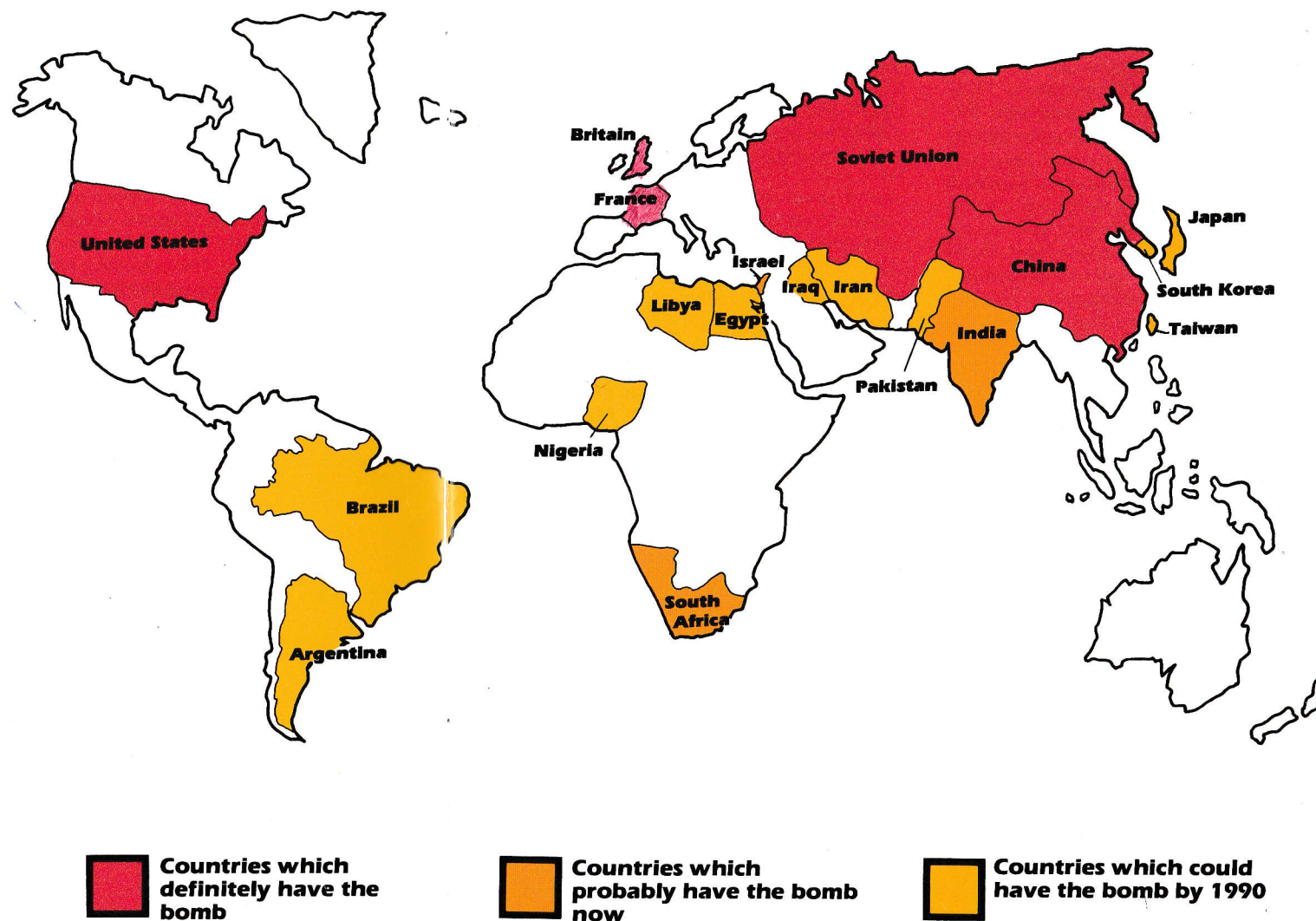
Between them America and Russia have so many megatons of nuclear weapons that if expressed in terms of TNT there would be the equivalent of about 4 tons of TNT for every person on Earth. America has approximately 30,000 nuclear weapons of various sizes and the Soviet Union 17,000-23,000. The size of the weapons and their power varies enormously. The biggest war-heads may have an explosive power of 20 MT. The smallest are light enough to be carried on a mans back and have an explosive power of 0.01 KT, the equivalent of 10 tons of TNT. These might be used for special operations in war time. Because of the variety of nuclear weapons they are normally divided into three categories:

Strategic weapons

These are long-range weapons. Land-based missiles (ICBMs) have a range of between 4,500 and 9,000 miles. Submarine launched weapons (SLBMs) have a range of between 1,500 and 4,500 miles. The new American Trident 2 missile may have a range even longer than this. The largest



Countries which have or may soon have the bomb



American missile is the 9 MT Titan whilst the Russian SS18 can carry a 20 MT warhead.

Some missiles carry a number of warheads which, when released, can accurately hit different targets. These are called multiple independently-targeted re-entry vehicles, or MIRVs. The total explosive force of all strategic weapons in existence in 1983 is about 10,000 megatons. The number of strategic weapons trebled between 1970 and 1980 and continues to grow.



Intermediate Range Weapons

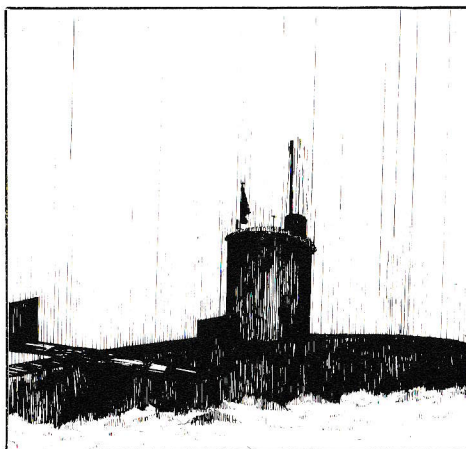
These are sometimes referred to as 'theatre nuclear weapons' or 'Eurostrategic weapons'. These can be ground, submarine or air launched have a range of about 500 to 2500 miles. They include the very accurate Pershing 2 and Cruise missiles, both recently deployed under the control of the United States in Europe. These new, more effective weapons, make all of Europe more vulnerable to nuclear devastation. They carry smaller warheads but because of their accuracy it is argued that they could be used as first strike weapons to destroy missiles which are still in their silos, or the command bunkers which control their launch.

Tactical Nuclear Weapons

These are short range nuclear weapons (up to 70 miles) intended for use on the battlefield. They include nuclear shells, small bombs and missiles and mines. The neutron bomb, if deployed, would be a tactical weapon. The US has about 28,000 tactical weapons and the Soviet Union 14-20,000. Although not a direct threat to Kireles, these weapons have made nuclear war more likely by introducing the idea of a 'limited' nuclear war in Europe. Europe, of course, includes Britain.

What nuclear Weapons has Britain got?

Britain has 64 submarine launched Polaris missiles which it may soon replace with the more powerful Trident 2. In addition all the armed services have other nuclear weapons. The RAF has ordered 220 Tornado ground-attack aircraft which can drop nuclear bombs of up to one megaton. Many Royal



Navy ships carry nuclear depth bombs for anti-submarine warfare. The British Army on the Rhine has four batteries each with 12 Lance tactical nuclear missile launchers. The Army also has 130 nuclear-capable howitzers in Germany or on order. Some of these can fire 10 KT shells up to 18 miles. It is estimated that Britain owns over 1000 nuclear weapons.

HOW A NUCLEAR WAR COULD START

Could a conventional war escalate into a nuclear war?

If a conventional war broke out in Europe and NATO army divisions were overrun, then, in line with NATO's 'flexible response' policy, tactical nuclear weapons could be used. In the ensuing chaos and destruction, communications could break down and the conflict could rapidly escalate. Russia might anticipate this escalation and could launch a full scale nuclear strike on Western Europe. Britain would be a prime target. Once a nuclear war has begun it is unlikely that either side will be able, or willing, to negotiate a cease fire.

Could it be the result of an overseas war?

Imagine that the West's oil supplies are threatened by a revolutionary uprising in one of the Oil States. The US government might believe the Russians are behind the revolutionaries and could alert their Rapid Deployment Force. The Russians could respond by sending their own forces to the area. If the war intensified NATO or Russia may intervene. Almost inevitably the other side would respond. The Russian response could be to attack NATO supply points in Europe. Whether or not nuclear weapons were first used in the Middle East or Europe, the conflict could escalate to a 'limited' European nuclear war.

Alternatively a war involving two Third World states with nuclear weapons might result in a nuclear war which could drag the super-powers in. It is reported that Israel prepared nuclear weapons for use in the 1973 Yom Kippur war. The Soviet Union, at the request of the USA, lent nuclear war-

heads to the Egyptians as a counter-balance.

Could it happen by accident?

The Americans have deployed Pershing 2 and Cruise missiles in Europe. Pershing 2 can reach Russian targets in 8 minutes. The Russians have responded by threatening to adopt a 'launch on warning' policy. In other words they may decide to launch missiles when they **think** they are under attack. 'Launch on warning' reduces the chances of missiles being destroyed before they take off. As a result of an accident or computer failure, the Soviet Union might believe that an attack has been made against them and launch their own missiles. In 1980 American computers detected three nuclear attacks which were not actually taking place and began preliminary launch procedures. The complexity of modern technology has increased the chances of a nuclear war starting by accident.

How much warning would there be?

This would depend on the circumstances in which a nuclear war broke out. There could be a prolonged period of international crisis preceding a nuclear war by several months. Or there could be a sudden crisis which quickly escalates into a nuclear war. In the government's proposed Hard Rock Civil Defence exercise there was a supposed 10 day period of diplomatic crisis, followed by 5 days of conventional war before a nuclear attack was launched on Britain. The government's own civil defence plans suggest as little as 2 days warning. Once missiles are launched there could be as little warning as 3 or 4 minutes for the general public.

THE EFFECTS OF A NUCLEAR EXPLOSION

Are there different types of explosion

The damage caused by a nuclear bomb depends not only on its size and power but also on the type of burst and the weather – particularly wind strength and direction. There are three types of burst:-

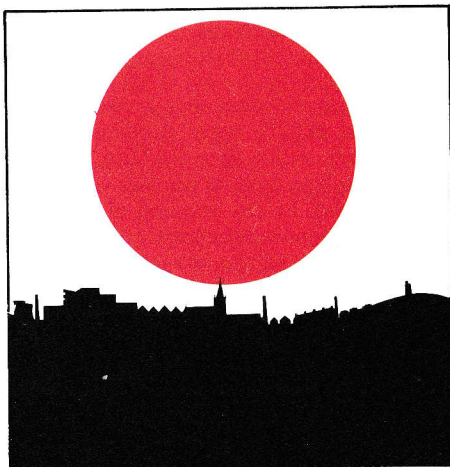


Groundburst

The bomb is detonated at or near ground level causing a huge crater surrounded by a rim of deadly radioactive soil. The debris from the crater is sucked up into the mushroom cloud. There it becomes radioactive. Later it falls back to earth according to the wind strength and direction. This produces radioactive dust or 'fallout' which can kill people over a very wide area.

Airburst

The bomb is detonated in the air. The fireball doesn't touch the ground. Little debris is sucked up. Most of the energy of



the bomb is released as blast and shock waves. These can destroy an area about 50% greater than a groundburst bomb of the same size. If it is detonated at a great height, an electro-magnetic pulse is given out which can knock out communications systems over a very large area.

Waterburst

The bomb is detonated in the sea, a lake or estuary and vapourises the water. Later the water returns to earth as radioactive rain. Nuclear depth bombs can have this effect. In coastal explosions or in an estuary tidal waves may be caused, creating greater destruction along the coast.

What happens when a bomb explodes

Only one minute after a one megaton airburst hydrogen bomb explodes over the Deighton/Dalton area, very little of Huddersfield would be left standing and widespread damage would be experienced throughout

the Kirklees District. Immediately on detonation there would be a blinding flash of light and deadly nuclear radiation would be emitted. Within three seconds an intensely hot fireball nearly 9,000 feet across would be formed. A blast wave travelling faster than the speed of sound and winds initially over 1000 mph would spread outwards across the District. If the bomb on Kirklees were just part of a general nuclear war, fallout might arrive from other explosions within hours.

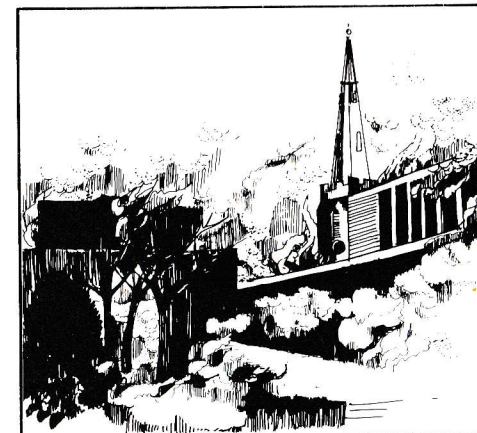
Radiation and Light

The initial flash of nuclear radiation could kill anyone out in the open in Upper Heaton, Sheepridge and Deighton – up to 1½ miles from the point of detonation, which has been chosen as a fairly central point in Kirklees. The flash of light could be seen over 30 miles away, from places like Sheffield, Pontefract, Bolton and Harrogate. Those accidentally looking directly at the explosion could be blinded.



Heat

The temperature of the fireball can reach millions of degrees at its centre and many thousands of degrees at its edges. The heat flash could cause fatal burns for people out in the open or near windows in



Huddersfield, Slaithwaite, Honley, Dewsbury and Kirkburton – up to about 7½ miles from the point of detonation. Those out in the open much closer to the centre could be incinerated. Very bad blistering of the skin would occur in places like Meltham, Holmfirth and Denby Dale – up to 9½ miles away. First degree burns could be received up to 12¼ miles away – the rest of Kirklees District – in places like Marsden, Holme and Hepworth. Widespread fires could be caused by furniture and curtains being set alight in houses. Outside fires could be started in petrol stations, woods or by burst gas mains.

As heat and light travels in a straight line hills will protect some people further away from the explosion. As the explosion would occur very high up – at 9000 ft – but most hills in Kirklees are less than 900 ft, people would only be shaded by the hills if they were actually on the slope the other side of the hill from the explosion. Heat and light would still reach valley floors. Areas which might receive some shielding from the heat and light effects include parts of Upperthong, Thurstonland, Shelley, Upper Cumberworth, Flockton, Cleckheaton and Batley.

Blast

Those reasonably protected from radiation, light and heat by being securely

indoors at the time of the explosion would still experience the terrific force of the nuclear blast as the shock wave travelled over them. Most casualties would be caused by people being crushed as buildings collapse around them or either by being hurled into objects or by being struck violently by debris particularly by flying glass. The whole of Huddersfield, Fenay Bridge and Mirfield would be destroyed by the blast. No part of Kirklees District would be unaffected. Even in Marsden, Scisset and Holmbridge windows would be blown in and tiles ripped off. This could let a lot of fallout from other explosions enter homes.



Hills tend to increase the effect of blast. For those sheltered from heat the blast would be just as strong as areas without hills in the way. For places which are on slopes facing the explosion, or in narrow valleys up which the blast wave might travel, the effect of the blast could be increased. For this reason places like Kirkburton or Meltham which generally face Huddersfield; or Holmbridge and Marsden which are in narrow valleys might receive greater damage than otherwise expected.

Fallout

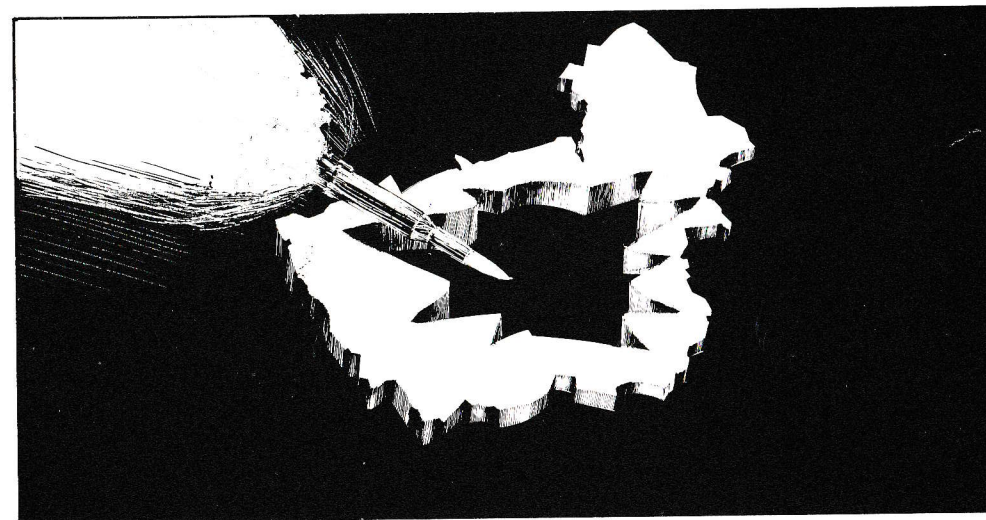
There would be no immediate fallout from the bomb on Kirklees because it is airburst. However in a full scale nuclear war

fallout might be caused by other explosions. Most radioactive fallout from these bombs comes down within a few hours. It can kill people up to 100 miles from the explosion. In areas where a lot of fallout has been deposited it can remain a deadly threat for 2 weeks or more. Most normal houses offer only limited protection against fallout. The amount of protection offered can be increased by building a make shift shelter in the house, following guide lines given in **Protect and Survive**. However, should the house be damaged, as most houses in Kirklees Metropolitan District would be, the amount of protection even these shelters could offer would be severely reduced.

Radiation destroys body cells and causes nausea, vomiting, diarrhoea, hair loss, anaemia, sterility, leukaemia and cancer. It reduces the body's resistance to infection and disease. People usually do not know how much radiation they have received. Even low doses (below 100 rads) can cause sickness, sterility, long term cancers and genetic disease. Those exposed to a dose of 450 rads, over a day or two, become very ill and about 50% will die. At a dose of 600 rads hardly anyone will survive. The young, elderly, sick and injured are much more vulnerable to radiation sickness.



WHAT A ONE MEGATON BOMB WILL DO TO KIRKLEES



Why should Kirklees be attacked?

Both military and economic targets are likely to be attacked. The aim of a nuclear war is not only to destroy the enemy's fighting capability but also to delay any recovery for as long as possible. This holds true for both superpowers.

The Soviet **Military Historical Journal** notes: *War must not simply be the defeat of the enemy, it must be his destruction.* This condition has become the basis of Soviet military strategy".

The US Department for Defense Annual Report for 1977 says: 'An important objective of the assured retaliation mission should be to retard significantly the ability of the USSR to recover from a nuclear exchange and regain the status of a twentieth century power more rapidly than the US'.

Kirklees might be attacked because of the many industrial and chemical works,

which would be important in restoring industrial production after a nuclear war. Co-incidentally, some works have a number of military contracts. Thus, destruction of these targets could also affect the country militarily.

The example of a one megaton air burst bomb over the Deighton/Dalton area is used here to illustrate, simply, what could happen to Kirklees in a nuclear war. It is assumed that the bomb is dropped on a clear summers day, at about 6 o'clock in the morning when most people are still at home.

What would happen close to Deighton/Dalton area?

Suppose the bomb was detonated 9000 feet above Deighton/Dalton. Everything within 2½ miles would be flattened. The eastern half of Huddersfield and as far as Birkby, Edgerton, Fenay Bridge, Mirfield and Upper Hopton would become a waste-

land of rubble. Parts of the M62 would be destroyed. In this area the network of underground services – gas, electricity, water supply, sewerage and telecommunications would be blasted apart. Mill Hill Hospital at Bradley would be destroyed. This would also mean that the Control Centre in Manchester Road would be severely damaged and made inoperable.

What would happen to the rest of Huddersfield

Up to 4¼ miles away from the point of detonation most buildings would be destroyed or irreparably damaged. Streets would be blocked with debris. Most cars, buses and lorries would be destroyed. Spontaneous fires would start and the whole area could become a fire zone. Little would be left standing in Huddersfield, Highburton, Lepton, Grange Moor, Whitley Lower, Hartshead, Liversedge and Leymoor. St. Luke's Hospital, Storches Hall Hospital, Huddersfield Royal Infirmary and Mirfield Memorial Hospital would be reduced to ruins. Half of the population could be killed and four out of five survivors might be injured. About 38,000 might die and 30,000 be injured, many of whom would die in the ensuing weeks.

What about the towns further out

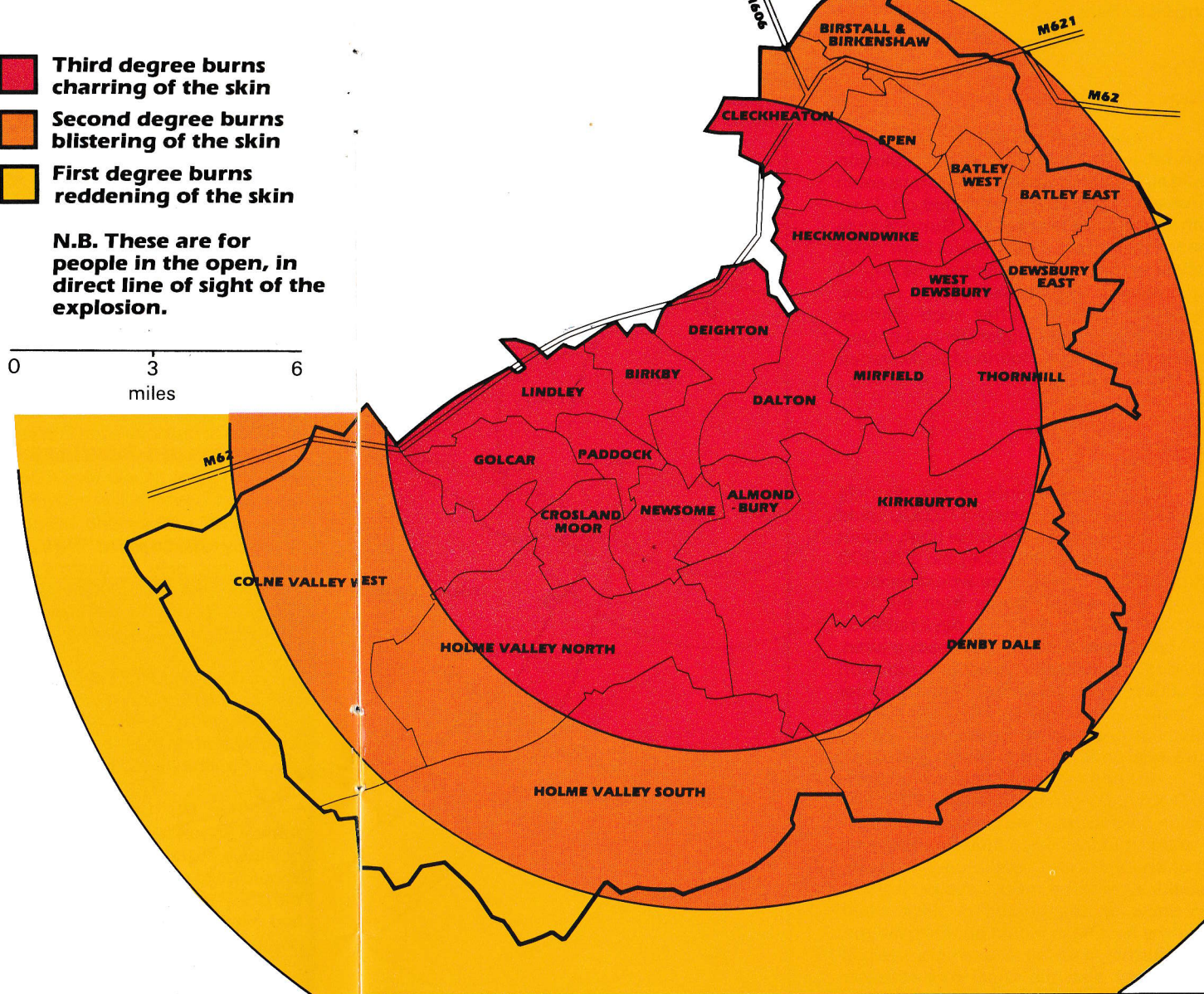
Severe to moderate damage would be caused up to 7½ miles from the point of detonation. Buildings could lose their windows, frames and interior partitions. The contents of upper floors would be blown out and walls would crack. Debris would make most streets in built-up areas impassable. Fires could spread throughout the area which might destroy at least half the buildings. People out in the open or near windows could be incinerated. Cleckheaton, Heckmondwike, Batley, Dewsbury, Honley, Brockholes, Holmfirth, Upperthong, Hepworth, Shepley, Shelley, Skelmanthorpe, Emley, Flockton and Overthorpe might suffer this damage. Oakwell Hospital, Staincliffe General, North Bierley Joint Hospital and Dewsbury

Heat effects from a 1 megaton airburst explosion above Deighton/Dalton area.

- Third degree burns
charring of the skin
- Second degree burns
blistering of the skin
- First degree burns
reddening of the skin

N.B. These are for people in the open, in direct line of sight of the explosion.

0 3 6
miles



General Hospital would all be damaged beyond use. Even this far away from the centre of the detonation 9,000 people might be killed and 84,000 injured. The buildings in this area would offer little protection from fallout should it be caused by nuclear explosions elsewhere.

What would happen at the edges of the district?

The whole of the District not already covered, up to 13 miles from the explosion could suffer minor damage. Windows could be blown in and roof tiles ripped off. Even with the help of a **Protect and Survive** style shelter this might allow fallout from other nuclear explosions, should there be any, to enter houses, with possible fatal results. The areas likely to suffer such damage include Clayton West, Upper Denby, Longley, Hade Edge, Holme, Holmbridge, Marsden and Hey Green.

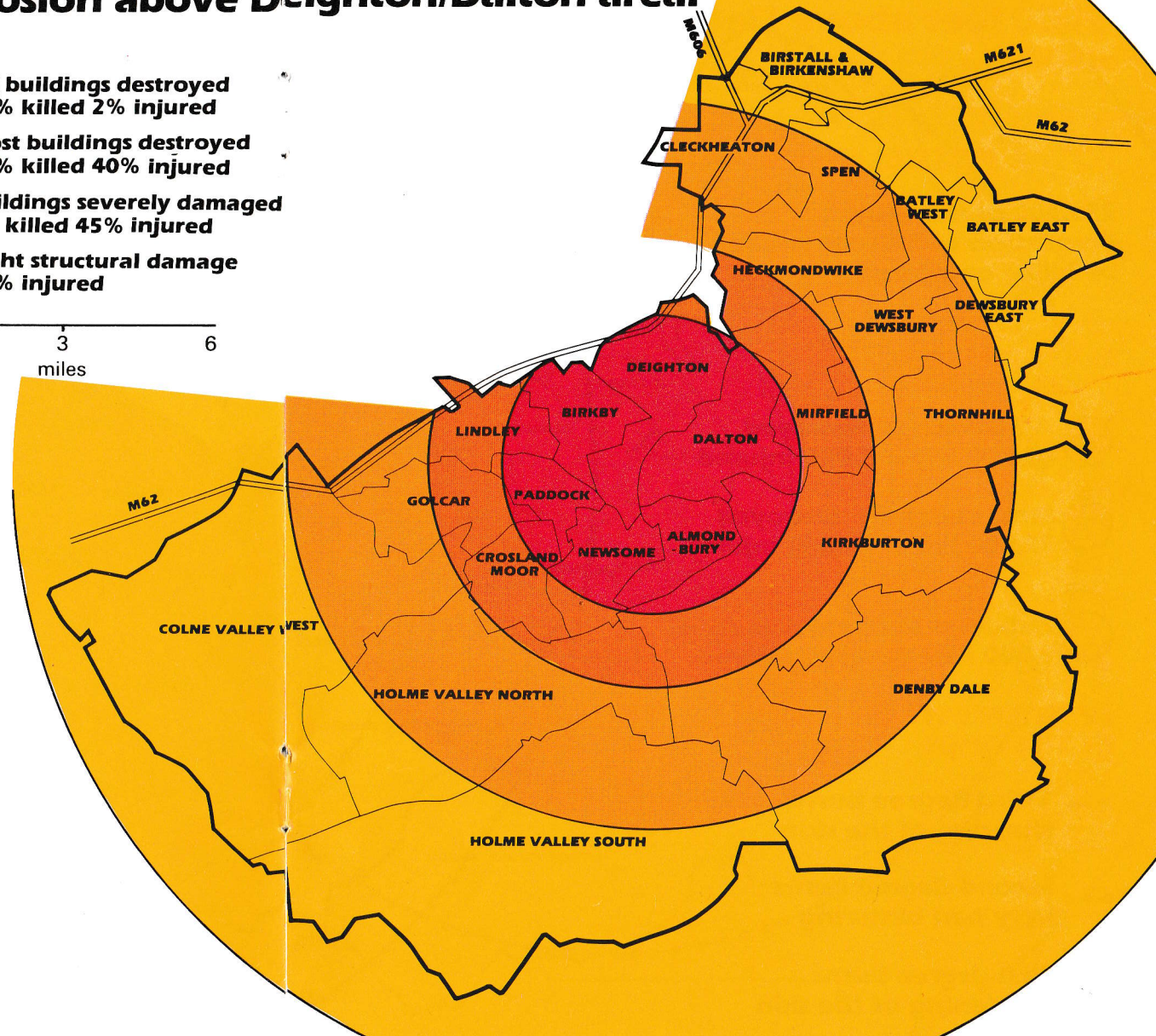
How many casualties altogether?

Roughly two thirds of the districts population of approximately 370,000 could be killed or injured by the initial blast. About 109,000 may be killed (29%) and 126,000 injured (34%). Many more would received fatal or very serious burns from the heat flash or from fires. Within 2 days radiation from fallout may add to those already injured. Without including possible radiation casualties, within 2 months the total number of fatalities may rise to 140,000 (38%). Thus, just one nuclear bomb could kill or injure just under $\frac{1}{4}$ of a million people or 63% of the population of Kirklees Metropolitan District. There could be about 135,000 uninjured survivors. If the bomb were dropped about midday, when Huddersfield was full of shoppers and people were at work, casualties could be much greater. If there was snow on the ground or thick cloud cover the heat flash would be reflected and travel further and kill even more people. People may also die later from disease, dehydration and hunger.

Blast damage from a 1 megaton airburst explosion above Deighton/Dalton area.

- All buildings destroyed**
98% killed 2% injured
- Most buildings destroyed**
50% killed 40% injured
- Buildings severely damaged**
5% killed 45% injured
- Light structural damage**
25% injured

0 3 6
miles






The effects of a 1 megaton airburst 9000 feet above Deighton/Dalton area.




TOTAL POSSIBLE CASUALTIES

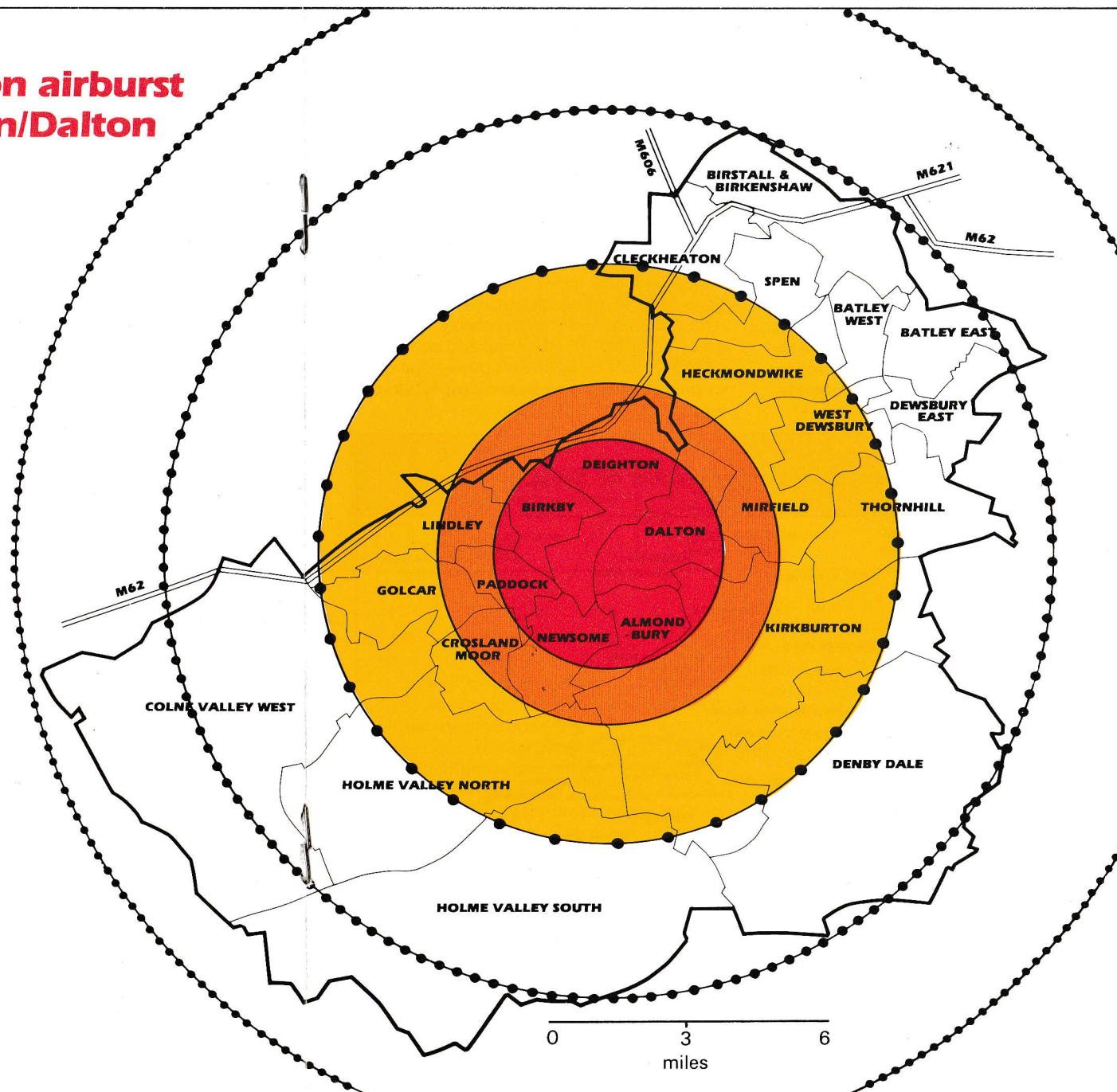
235,500 of the District
Population of 370,000 could
be killed or injured

BLAST DAMAGE

-  All buildings destroyed
62,000 killed 1,000 injured
-  Most buildings destroyed
38,000 killed 30,000 injured
-  Buildings severely damaged
9,000 killed 90,000 injured

HEAT EFFECTS ON PEOPLE IN THE OPEN

-  Third degree burns
charring of the skin
-  Second degree burns
Very bad blistering
-  First degree burns
Reddening of the skin



THE PROSPECT OF AN ALL OUT NUCLEAR WAR

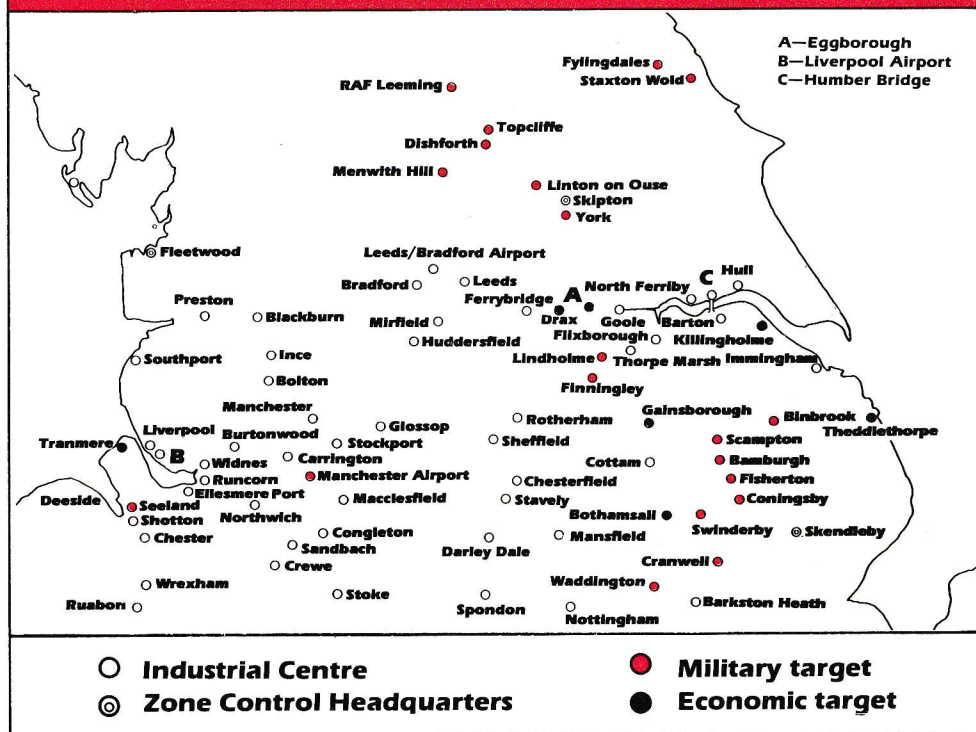
What could happen?

So far we have just looked at what one bomb could do to the Kirklees District on its own. It is unlikely that just Kirklees would be attacked on its own. The government's own estimate of the scale of attack on Britain have included one of 125 nuclear weapons with a total yield of about 200 megatons. Thus, in an all out nuclear war much of the country could be destroyed and Kirklees could expect very little help from outside.

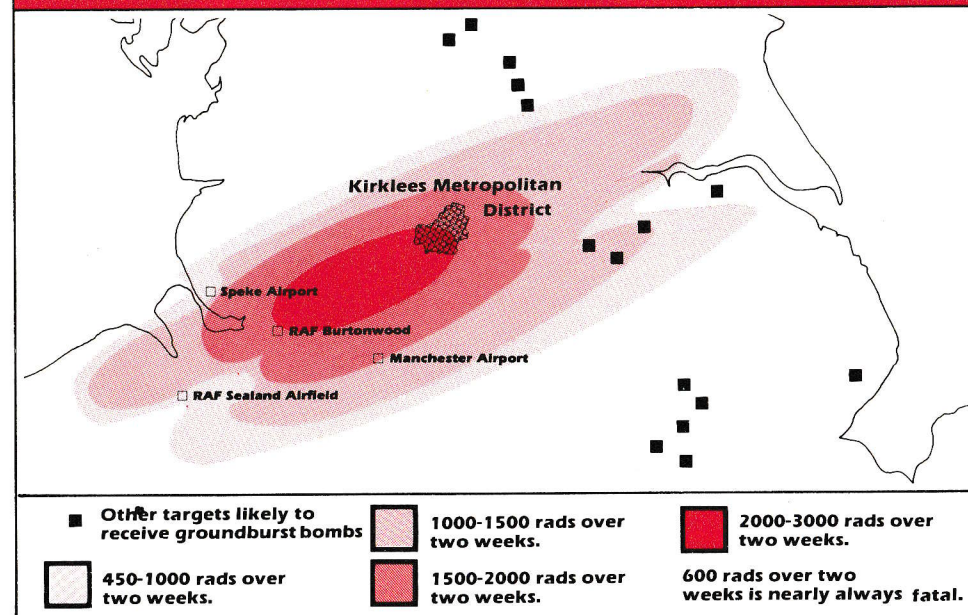
What are the most likely targets?

Military targets are likely to be hit first. These would include British, American and NATO military installations such as missile bases, airfields, army bases, communications and command centres, and arms manufacturers. This would probably be followed by an attack on industrial and economic centres, such as cities and power stations, to prevent any immediate recovery after a war.

Possible targets in the North of England



The effect of fallout from targets downwind of Kirklees in a limited nuclear war



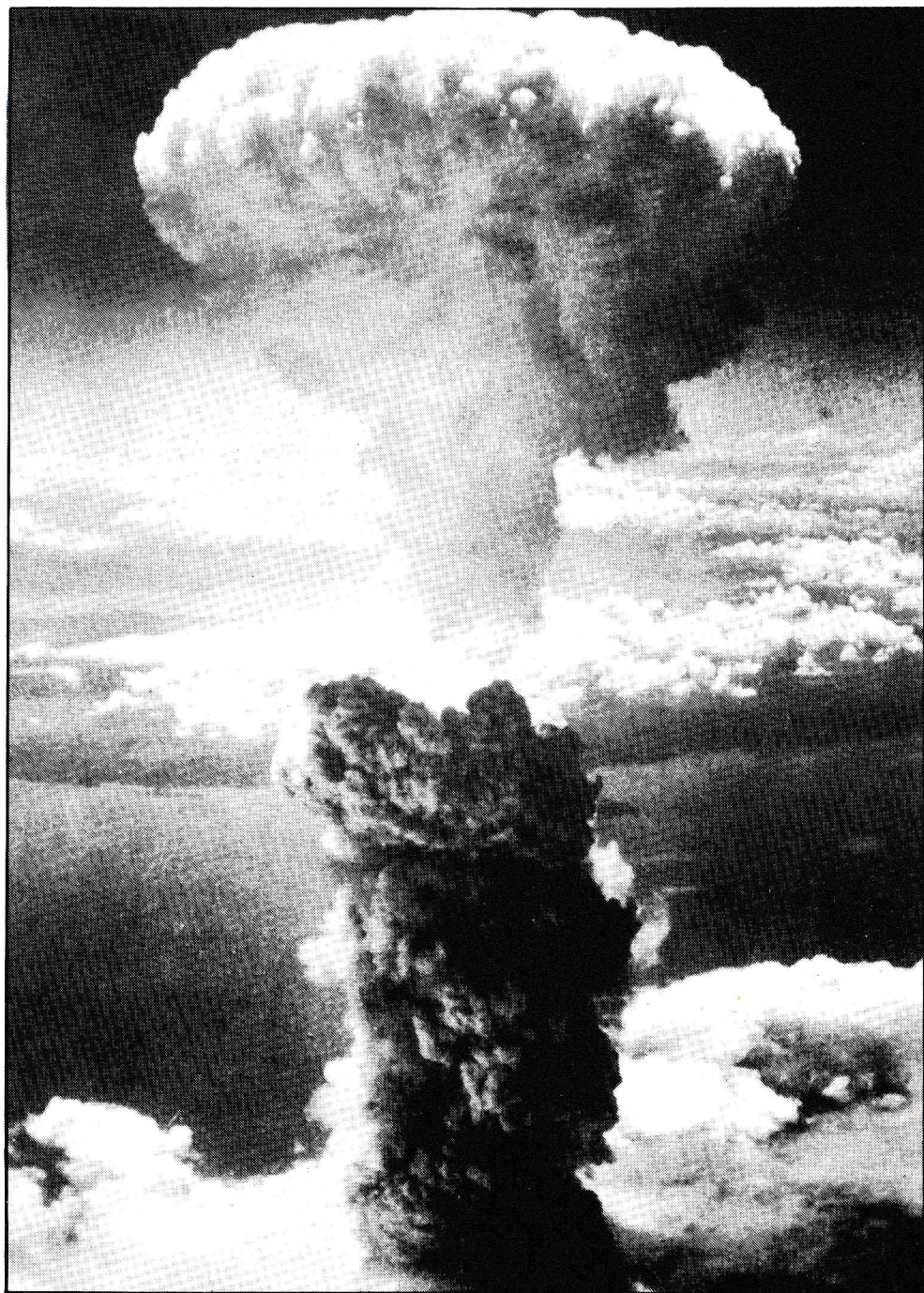
What if only military targets were attacked?

It has been argued that a 'limited' nuclear war could be fought, in which case only military and arms manufacturers might be targets. Locally targets might include the Leeds/Bradford airport, the runway of which would be suitable for use by military aircraft. This might be hit by a ground burst bomb so as to crater the runway. The Royal Ordnance Factory at Barnbow might be a target. If a one megaton bomb were used the blast would cause damage in Cleckheaton, Dewsbury and Heckmondwike. The US communications centre at Menwith Hill near Harrogate might well be another target. Perhaps more significantly attacks on military installations in Lancashire and to the south west of Kirklees could result in lethal doses of fallout in the district. For instance a one megaton ground burst bomb at RAF Burtonwood west of Manchester could result in

high levels of radiation in Kirklees if the wind were blowing in the right direction. It has been calculated that in a 'limited' nuclear attack over 16% of the population of West Yorkshire would be immediately killed or injured. However, in this booklet we shall continue to look at the effect of a one megaton airburst near Huddersfield.

Could anyone in Kirklees survive an all out nuclear war?

The greatest immediate threat to life for most of the District's population would be from the initial blast. Following this the risk of fallout from attacks on other targets would cause further casualties. Even when this danger is past there are still many problems to overcome, some of which may present problems greater than those posed by the bomb itself. We look at these problems next.



Courtesy of Hulton Picture Library

THE AFTERMATH IN KIRKLEES

What help would there be for survivors

If Kirklees were hit by a single one megaton bomb there could be about a quarter of a million survivors. Approximately half of these might be injured and would require medical treatment. All would require water, food, shelter and power for heating, cooking and lighting. Some form of government and communications would be needed to organise all these things. The government has prepared wartime contingency plans for all public services. The government has stated that 'the basic essentials of plans should be capable of implementation within 48 hours'. The problems that would face both survivors and the public services, as a result of just one bomb dropped on the outskirts of Huddersfield, or in an all out nuclear war, are set out below.

How would the injured be cared for

In the example of an airburst 9,000 feet above Deighton/Dalton there could be 126,000 people injured. The chances of any medical treatment are very slim. Mill Hill Hospital would be flattened; St. Luke's Hospital, Storthes Hall Hospital, Mirfield Memorial Hospital and the Huddersfield Royal Infirmary would be no more than ruined shells. All other hospitals would be severely damaged, structurally unsafe and probably unusable – there would be no fully operational hospitals in the District. Many doctors and nurses would have been killed. Many of the injured could be trapped in the rubble but the chances of rescue and treatment are low. Roads blocked by fallen trees and debris and the risk of high radiation levels for at least two weeks after the bomb

had exploded would prevent any large scale rescue operation being mounted.

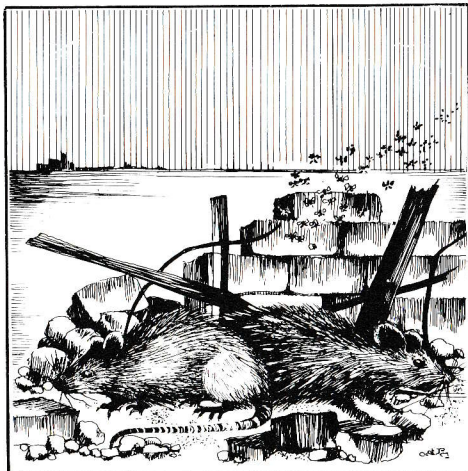
In an all-out nuclear war the government's health service plans intend to classify casualties into three groups; those unlikely to survive after limited treatment; those likely to survive without treatment and those likely to survive after limited treatment. Only the last group would receive any treatment. The four most important medical problems would be: burns, radiation sickness, multiple injuries and extreme psychological shock. There may be thousands of burns casualties requiring specialised treatment. The nearest hospital with major burns facilities is Pinderfields Hospital at Wakefield, with 14 burns beds. The treatment of radiation sickness requires blood transfusions, but the shortage of blood would make it practically impossible to offer any effective treatment. In fact, government health service plans specifically state that people suffering from radiation sickness only, should not be offered treatment. The lack of accommodation, staff, anaesthetics and drugs would make it impossible to provide any immediate treatment for multiple injuries and fractures.

It is not surprising, given the number of casualties and the likely scale of damage, that the British Medical Association concluded that the National Health Service could not cope with the casualties from a single nuclear explosion, let alone a nuclear war.

What about sanitation and disease?

Kirklees has a large number of sewage and water treatment works. The works on the River Spen in Dewsbury and on the Calder to the north of Bradley would probably be destroyed. Those at Oakenshaw, near

Thornhill and Clayton West would probably be damaged, perhaps put out of action. As a result untreated sewage might enter the water supplies. Sewers could be fractured or blocked near to the centre of the explosion, an area including most of Huddersfield. Thousands of decomposing human and animal corpses would lie buried under rubble and in buildings. It would be impossible to remove these bodies quickly because of the threat of radiation, lack of equipment and shortage of manpower.



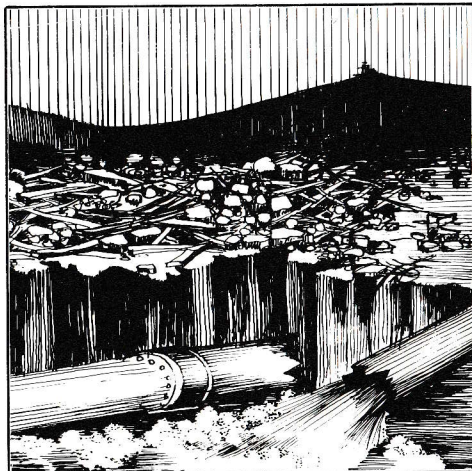
Rats, insects and bacteria are much more resistant to radiation than human beings. They would flourish amongst the debris and spread disease. In these circumstances there would be great risk of epidemics of infectious diseases. Government plans admit this. Typhoid, cholera and dysentery would all be likely to break out according to the British Medical Association.

What about the water supply?

Most of the water supply for Kirklees comes from reservoirs in the south and west of the District, on the edge of the Pennines. Because there are few objects to destroy and reservoirs are solidly built it is unlikely that they will suffer much physical harm. Longwood Reservoirs are within 3 miles of the explosion, it is possible that the

dams here may be damaged or broken. Weirs and locks on the River Calder and the Calder and Hebble canal may well be destroyed and may cause localised flooding. Fallout could enter the reservoirs, but most of it would sink to the bottom and little would be likely to enter the water supply.

However, the blast caused by the explosion would sever water mains near the centre of the explosion. This could cause flooding in some areas and a drop in water



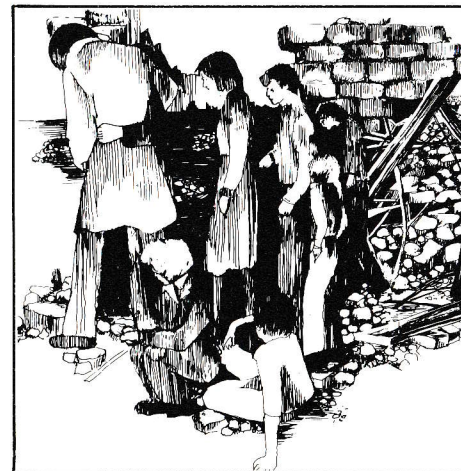
pressure in others. It is unlikely that there would be any energy to pump water. Consequently, except in parts of the district where the water is distributed by the pressure of gravity, it is unlikely that there would be a piped water supply. Government plans admit there will be a prolonged disruption of the piped water supply.

A lot of survivors may be suffering from radiation sickness, untreated injuries or other illness. As a consequence they would need to store much more water than that suggested by the Home Office in **Protect and Survive** (2 pints per person per day, in the first 14 days after the attack). Thirst might drive people out of their shelters to face the hazards of radiation sickness. The Fire Service would be responsible for the distribution of any available water. Many people could go thirsty and even die of

dehydration before encountering any long term dangers.

Would there be any food

If there was no warning few people would have sufficient food to get them through the first two weeks. That is when radiation levels outside may be dangerously high. An explosion over Deighton/Dalton would destroy most of the shops in Hudders-



field, Liversedge and Cleckheaton and many of those in Dewsbury, Batley and many other smaller towns and villages.

Even if there was a warning, the Home Office has acknowledged that not everyone would be likely to be able to get 14 days supply of food. There could be food shortages, panic buying or just insufficient warning to acquire a stockpile. There may be local stockpiles of food for emergency public consumption. It is likely that there would be problems distributing these because of blast damage to vehicles and roads, lack of fuel and the possible danger of fallout. Food stocks damaged by the blast could well become contaminated by fallout or bacteria. Most ports could have been destroyed, so little food could be imported. In the long term problems faced by farmers might further reduce food available. The govern-

ment admits food would be scarce. Many people would go hungry. Starvation could well be a prospect facing survivors.

What would happen to energy supplies?

An explosion above the Deighton/Dalton area may well result in the supply of gas and electricity across the district being cut. The electro-magnetic pulse given out



by a high altitude nuclear explosion could play havoc with the electricity supply system. Sub-stations would be crushed by the blast and overhead power cables, many of which cross the north of the District, would be brought down. Gas pipes could be destroyed and fractured resulting in a loss of pressure and the cutting off of the gas supply. Both electricity and gas supply are organised on a national basis. In the event of a full scale nuclear war, power stations and gas pipelines would probably be devastated. Thus there would be no energy supplies for cooking, heating and lighting. The government itself has acknowledged this. This, together with the destruction of most housing, would make conditions worse for the injured. It could even lead to death from hypothermia particularly among the young and elderly.

What about communications?

In the attack on Kirklees the main rail and bus stations are within 2½ miles of the explosion and would therefore be destroyed. Many bridges over the Colne and the canal would be destroyed. This would add to the chaos caused by broken sluices and lock gates making movement across the river very difficult. Roads within 7½ miles of the centre of the explosion could be blocked by rubble or fallen trees. Parts of the M62 might be destroyed as well. There would be no fuel. To find food or water or search for relatives or friends most people would have to walk.

The government intends to restrict the telephone service to lines vital to the handling of emergencies if a nuclear war is threatened. In any case many of the Districts telephone exchanges would be destroyed or put out of action by the electro-magnetic pulse. Long distance services would come to a halt.

The government also plans to prevent all except essential services using designated main roads in the run up to, and following a nuclear war. These 'essential service routes'

include the M62, along its whole length; the A62 from Huddersfield to Manchester; the M606 from Cleckheaton to Bradford; and the A629 from Huddersfield to Sheffield.

Who would be in charge?

In the event of a nuclear attack on the whole country, there would be no national government but a system of 21 regional or zone governments. These would have responsibility, with the police and armed forces, for keeping public order with the use of emergency powers. Locally the control centre on Manchester Road, if it survived, would be used as the District Control Headquarters. The main objective, according to the Home Office, would be to aim at the conservation of resources for longer term survival rather than immediate short term aid to the hardest hit. Actions which in peacetime would be unacceptable may become commonplace. There is provision for forced labour, trial without jury and capital punishment. Human rights and freedoms accepted as normal in peacetime would have vanished. There might be no help for Kirklees from the rest of the country as everyone could be as badly off as us.



THE LONG TERM EFFECTS



Photo Courtesy of BBC Hulton Picture Library

Hiroshima after the bomb

Would there be a recovery

The immediate effects of the blast and fire would have almost destroyed Kirklees as we know it. Thousands of people may die in the following weeks and months from radiation sickness, disease, starvation, thirst and injury due to the lack of medical treatment. In an all out nuclear attack on Britain the economy, industry, agriculture and financial institutions would be destroyed. Money would no longer have any value. Survivors would live in something like a medieval society based on a system of barter and subsistence farming. It would take many years, if ever, for life to bear a resemblance to how it was before the bomb. Further

more there would be many long term effects, both known and unknown, which could mean that a full recovery might never be possible.

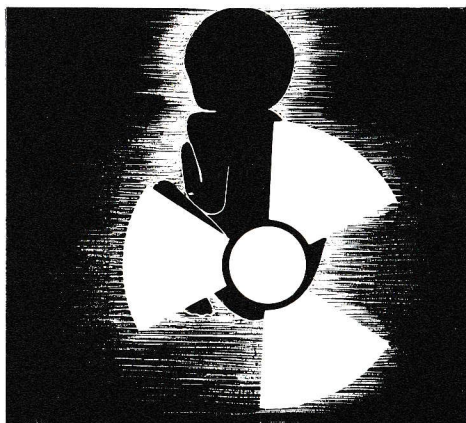
What about farming?

Farming in Britain depends upon machinery for nearly everything: sowing, harvesting, milking and feeding. Without fuel the machinery would grind to a halt and much agriculture with it. Fertilisers and pesticides would not be available. Crops would be planted by hand, would not grow so well and might be more likely to be diseased or eaten by pests. The amount of land that could be cultivated by hand would

be far less than that used at present. Starvation could be almost inevitable. A recent article in *Farmers Weekly* argues that because of all these problems the number of immediate survivors of a nuclear war in Britain might be reduced by two thirds within two or three years. For Kirklees this could mean that the number of long term survivors might be reduced from 230,000 to 77,000.

What are the long term health problems?

Not all the radioactive debris in the mushroom cloud comes back to earth immediately. Some can remain for several years high up in the atmosphere, where it can be carried by strong winds for thousands of miles. As much as 10% of the radioactive material of the bomb can remain dangerous for over 25 years after detonation. Delayed fallout can contaminate soil, crops and animals. If nuclear power stations or the reprocessing centre at Sellafield, formerly called Windscale, were hit, even by a small bomb, the reactor would release its huge and long-lived radioactive load. Such an



attack could make life in practically the whole of Britain hazardous for years or even decades.

Some people who survive the initial attack on Kirklees could suffer from the

effects of low doses of radiation for many years afterwards. Long term, low dose rates of radiation, whether acquired through immediate or delayed fallout, can result in cancer particularly leukaemia, and in genetic damage which can cause babies to be born with deformities.

Could it mean the end of life on earth?

At the end of October 1983 a group of the world's leading scientists, including scientists from Britain, met to investigate the effects of a nuclear war on the atmosphere. Their findings are most grim. Following a war involving less than half the world's nuclear stockpile many millions of acres of forest and most of the major cities in the northern hemisphere would be left burning. Hundreds of thousands of millions of tons of soot would pour into the sky. As a result the sky would be blackened out for months, there would be twilight at noon. As the sun's heat would be prevented from reaching the earth's surface temperatures would plummet to around -25° where they would remain for months. This has been called the 'nuclear winter'. Even when the sky clears and the temperature returns to normal, because of the ozone destruction high in the atmosphere larger amounts than normal of ultra-violet light would reach earth, causing skin cancers and cataracts in animals and stunted growth in plants.

Without food and in freezing conditions most people would die. The conditions might also spread to the southern hemisphere. Up to 50% of the world's species of plant and animal life might become extinct, particularly vulnerable are animals and plants in the tropics. Following the dislocation of the food supply system hunger would be even more widespread in the southern hemisphere. Even the continued existence of humans as a species might be put at risk. The body of scientists also concluded that, in certain circumstances, the 'nuclear winter' might be brought about by a limited nuclear war of 100 to 400 megatons.

CIVIL DEFENCE AND NUCLEAR DETERRENCE

How effective is civil defence for Ordinary people?

What advice does the government offer to ordinary people to enable them to survive a nuclear war? Current government advice is set out in the publication *Protect and Survive*. The booklet outlines some actions householders should take if a nuclear war seems likely. People are recommended to stay at home and construct an inner

refuge assumes there is sufficient warning and materials available to build a shelter. A make-shift shelter offers little protection against the blast of the bomb. We have already seen that in Kirklees 109,000 people could be killed and 126,000 injured by the blast from a single bomb. However a make-shift shelter can help to reduce the danger from radioactive fallout. If your house is far enough away from an explosion so that it receives little or no damage the shelter can make the difference between life and death

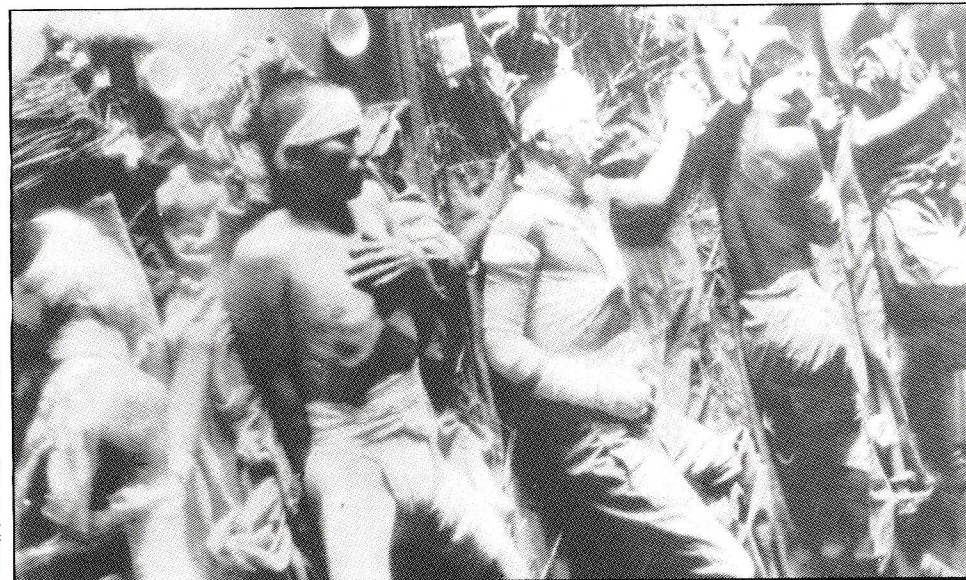


Photo Courtesy of BBC Hulton Picture Library

refuge within their house, using either a solid table or doors covered with dense materials. The purpose of the inner refuge is to increase the protection the house provides against radioactive fallout. The booklet also lists essential items which should be taken to the shelter room. Items range from food and water to first aid equipment. Instructions on what to do if an attack should occur and the meaning of signals given by air-raid warning sirens are also included. The book-

let assumes there is sufficient warning and materials available to build a shelter. A make-shift shelter offers little protection against the blast of the bomb. We have already seen that in Kirklees 109,000 people could be killed and 126,000 injured by the blast from a single bomb. However a make-shift shelter can help to reduce the danger from radioactive fallout. If your house is far enough away from an explosion so that it receives little or no damage the shelter can make the difference between life and death

What about public shelters or evacuation?

Some neutral countries, such as Sweden and Switzerland have invested in public shelters. However, many people may

not be able to reach a public shelter in time. The survivors would still have to face the dangers of starvation or a 'nuclear winter'. The shelters are also very expensive. One estimate for Britain was between £1,000 and £1,500 per head. Civil defence expenditure in 1983 was approximately £1 per head. Public shelters are not a realistic option for Britain.

Would evacuation be better? Would we be better out of the towns? The problem is that no-one knows for certain which parts of the country would be safe. There might not be enough time to organise an evacuation. Early evacuation could be seen as a hostile action and could lead to a nuclear attack. The government has rejected evacuation as a means of civil defence. Evacuation would make the problems of supplying food and water even more difficult.

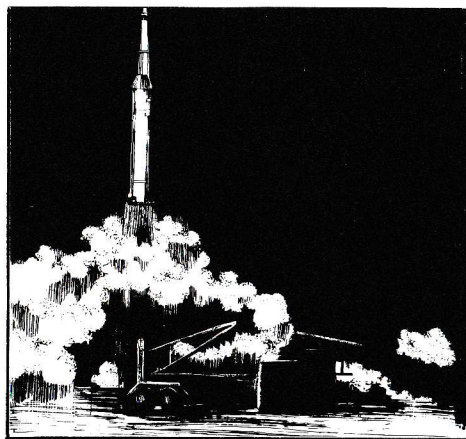
Won't nuclear deterrence prevent war?

The government says that nuclear deterrence has kept peace between east and west for nearly 40 years. Nuclear weapons cannot be disinvented. The risk of escalation deters either side from launching an attack on the other. Everyone is agreed that their use must be prevented. But can nuclear deterrence continue to keep the peace?

Over 20 years ago both the USA and USSR had sufficient weapons to destroy the others' cities. Since then there has been a vast increase in the number of weapons on both sides. The number of strategic warheads trebled between 1970 and 1980. Many scientists and strategists agree there are now far more weapons than are needed for deterrence. The spread of nuclear weapons to more countries might increase chances of nuclear war.

NATO has a strategy of 'flexible response'. This means that, in the event of an invasion of Western Europe involving

only conventional forces, NATO may respond with tactical nuclear weapons. Many strategists think these smaller 'battlefield' nuclear weapons have increased the chances of nuclear war. They consider that the use of these weapons against an attack by conventional military forces might lead to escalation and a full scale nuclear war. On the other hand some argue that their presence make even a conventional attack less likely.



However, the greatest concern for many scientists and strategists is the development of more modern, highly accurate missiles. These could be used as 'first strike' weapons. This includes the Pershing 2 missile being deployed in W. Germany. There has been speculation that these new missiles will be aimed at Russian missiles capable of hitting the USA. They have helped promote the idea of limited European nuclear war. They have also resulted in the Russians threatening to adopt a 'launch on warning' policy. This might increase the chances of an accidental nuclear war.

All these views may be correct. Nuclear deterrence may have worked up to now. On the other hand more countries are getting the bomb. First strike weapon systems are being produced now. Can we continue to rely solely on deterrence to prevent nuclear war? It may have worked for forty years, but will it continue to work for another forty, eighty or a hundred years?

WHAT ORDINARY PEOPLE CAN DO ABOUT THE BOMB

What can we do?

The first thing is to make up your own mind about the bomb and its effects on you, your family, your community and town. Try to reach your own conclusion. Do not fool yourself by thinking it is best left up to the experts. You can make your own voice heard without taking part in any rallies for or against the bomb. You can write to your District Councillor, your Member of Parliament or even the Secretary of State for Defence. Remember they are all dependent upon your vote for their jobs. Discuss it with your friends and neighbours, raise the issue at your church, school, club or community organisation. You could contact one of the many local or national organisations who are concerned with the issue. *The decision is yours.*

How can I find out more?

Make a point of reading about the nuclear debate in your newspaper and watching when it's on TV. There are a lot of books available on the bomb and its effects, many of which are available in the public library. Some books which you might wish to read include:-

Protect and Survive. HMSO 50p
Domestic Nuclear Shelters. HMSO 50p
Nuclear Weapons. HMSO £3.75
Hiroshima J. Hersey Penguin £1.25
As Lambs to the Slaughter. P. Rogers, M. Dando, P van den Dungen. Arrow £1.75
A Policy for Peace. Fieldmarshal Lord Carver. Faber & Faber £2.50
Defended to Death. G. Prins. Penguin £3.50
Nuclear War. The Aftermath, J. Peterson & D. Hinrichsen. Pergamon Press £2.95
Protest and Perish. P. Towle, I. Elliot, G. Frost. Institute for European Defence and Strategic Studies £3.75.
Domesday. S. Openshaw, P. Steadman, O. Greene. Basil Blackwell, £4.95.

When you have made up your mind you may wish to contact one of the following organisations who may be able to put you in touch with like-minded people locally:

British Atlantic Committee, RUSI, Whitehall, London, SW1A 2ET.
Campaign for Nuclear Disarmament, 11 Goodwin Street, London, N4 3HQ.
European Nuclear Disarmament, 227 Seven Sisters Road, London N4
World Disarmament Campaign, 238 Camden Road, London.
Youth for Multilateral Disarmament, 32 Smith Square, London SW1.

Local groups

Batley C.N.D. sec. Philip Hardstone, 97 High St. Birstall, W. Yorks. Tel. Batley 442687
Denby Dale C.N.D. contact Denis and Alison Green, 15c Miller Hill, Denby Dale, W. Yorks Tel. Hudds. 862481
Spennings Dale C.N.D. contact Stewart Jackson 5 Scar End View, Off Scarr End Lane, Dewsbury WF13 4NX Tel. Dewsbury 464039
Greenham Women's Newsletter contact Linda Sugrue, 322 Wakefield Rd., Denby Dale, HD8 8SD Tel. Hudds. 863349
Huddersfield C.N.D. sec. Alison Stopher, 101 Birkby Hall Road, Birkby, Huddersfield HD2 2XE Tel. 511499
Huddersfield Green Society P.O. Box B9 Huddersfield
Huddersfield Y.C.N.D. sec. Kathryn O'Sullivan, 12 Glastonbury Drive, Longwood, Huddersfield HD3 4SA Tel. Hudds. 659056
Kirklees East C.N.D. sec. Darryl Booth, 8 Woodlands Drive, Lepton, Huddersfield Tel. 604761
Kirklees Peace Forum sec. Caroline Melotte, 24 Eastgate, Honley, Huddersfield HD7 2PA Tel. 662377
 - Inter Peace Group meetings to liaise with Kirklees M.C. Peace Sub-committee.
Shepley Peace Group sec. Ann Ellis, 163 Lang Head Rd., Shepley, Huddersfield HD8 8BW Tel. 606244
Teachers for Peace contact Di Lawson, 106 Roberttown Lane, Liversedge WF15 7LY Tel. Heckmondwyke 409427
West Yorkshire European Nuclear Disarmament sec Peter Thompson, 7 Mariners Drive, Bradford BD9 4JT Tel. Bradford 45912

AN A TO Z OF NUKE SPEAK

Atom Bomb: First, less powerful fission based type of nuclear weapon. They were used against Hiroshima and Nagasaki.

Air Burst: Nuclear weapon detonated in the sky to give maximum blast damage.

ABM: Anti-Ballistic Missile intended to destroy incoming enemy missiles.

ALCM: Air-Launched Cruise Missile—US missile launched from bombers which has an accuracy of less than 100 yards after a flight of 1,500 miles.

Ballistic Missile: Rocket powered missile which hits its target by falling back to earth under gravity like any object thrown in the air.

BMA: The British Medical Association is a body of eminent doctors. They produced a report called 'The medical effects of nuclear war.'

CEP: Circular Error Probable—measure of accuracy of a missile. The smaller the CEP, the more accurate the missile.

Chevaline: New improved warhead for the British Polaris missile launched from submarines. It was developed in total secrecy, at a cost of £1,000 million between 1968 and 1979.

CND: Campaign for Nuclear Disarmament—formed over 25 years ago shortly after the first British H-bomb was exploded.

Cruise missile: a missile which travels all the way to its target under power; unlike a ballistic missile.

Deterrence: Preventing an attack by threatening to launch a counter attack.

EMP: Electro-Magnetic Pulse. A short burst of intense radio waves given out on detonation of a nuclear bomb which can knock-out electronic equipment.

Eurostrategic weapons: Medium range weapons based in and intended to be used in Europe. Also known as 'intermediate' or 'theatre' nuclear weapons.

Fallout: Small particles of debris

sucked up in the mushroom cloud which become contaminated and fall back to earth as radioactive dust.

Flexible response: NATO military strategy of possibly using nuclear weapons to repulse an overwhelming conventional attack.

Fire ball: An intensely hot, expanding ball of fire formed within seconds of the detonation of the bomb.

Fire zone: An area liable to spontaneous fires cause by the intense heat after the detonation of the bomb.

First strike: Usually used to refer to a pre-emptive attack on an opponent's missiles while they are still in their silos. The recent development of more sophisticated and accurate weapons has made a first strike attack more feasible.

First strike capability: Having missiles accurate enough to destroy enemy missile silos, and so prevent retaliation. Breaks down the idea of deterrence.

First degree burns: Reddening of the skin.

Fission: Splitting of heavy atoms such as uranium or plutonium to release the powerful force of the atomic bomb.

Fusion: Combination of light atoms such as tritium or deuterium to release the more powerful force of the hydrogen bomb.

Gamma radiation: Deadly, high energy rays released on detonation of a nuclear bomb. Gamma rays can pass through even the most dense materials.

Ground burst: Nuclear weapon detonated at or near ground level to create maximum fallout.

GLCM: Ground-Launched Cruise Missile. The USA is installing 464 in Europe including 160 in Britain. The first arrived at Greenham Common in November 1983.

Hydrogen bomb: Second, very powerful fission based, nuclear bomb.

Hard Rock: The name given to the governments proposed 1982 civil defence exercise.

Half life: Time taken for 50% of radioactive atoms to become non-radioactive.

ICBM: Inter-Continental Ballistic Missile with a range up to 9,000 miles.

IRBM: Intermediate Range Ballistic Missile with a range of up to 2,500 miles.

KT: Kiloton. Equivalent to 1,000 tons of TNT.

Launch on warning: An immediate nuclear counter-attack, when one side thinks it may be under attack from another.

LD 50: A dose of radiation which would kill 50% of healthy adults. About 400 rads to 500 rads over 2 days.

MT: Megaton. Equivalent to 1,000,000 tons of TNT.

MIRV: Multiple Independently-targetable Re-entry Vehicle. Missiles with several warheads for different targets.

Multilateral disarmament: An agreement by all nuclear weapon owning states to reduce the number of nuclear weapons they possess.

NATO: North Atlantic Treaty Organisation, formed by the western powers in 1949. The military leader is always an American.

Nuclear winter: The intense cold and darkness which may prevail world wide after a nuclear war.

Over-pressure: The force of the blast caused by a nuclear explosion, usually expressed in pounds per square inch.

Peacekeeper: New, long-range, highly accurate US missile, each armed with 10 warheads.

Platform: Any structure from which nuclear weapons are launched. Could be a silo, vehicle, plane or submarine.

Polaris: British submarine launched missile.

Poseidon: American submarine launched missile.

Pershing 2: New, very accurate, medium range (1000 miles) American ground launched ballistic missile. 108 are to be deployed in W. Germany by the end of

1985. The first were deployed in December 1983.

PF: Protective Factor—Theoretical measurement of the protection offered by a building from radiation.

Proliferation: The increase and spread of nuclear weapons amongst the nations of the world.

Rad: Unit of radiation absorbed by the body.

Radiation: See gamma radiation.

Radioactive: Giving off harmful nuclear radiation—gamma rays and high energy particles.

Residual radiation: Radiation given off by fallout.

SALT: Strategic Arms Limitation Talks—held between US and USSR.

START: Strategic Arms Reduction Talks—new name for SALT since 1982.

Second degree burns: Blistering of the skin.

Second strike capability: Having enough well protected missiles to enable retaliation after nuclear attack. Essential for the theory of deterrence.

Square Leg: The name given to the governments 1980 civil defence exercise of a nuclear attack of 200 MT on Britain.

SS missiles: Russian surface to surface missiles. Includes long range missiles such as the SS18 and the more modern medium range SS20.

Strategic weapons: Long range, intercontinental weapons.

SLBM: Submarine Launched Ballistic Missile.

Theatre nuclear weapons: Medium range weapons. Based in and intended for use in Europe.

Thermal radiation: The heat flash emitted on detonation of a nuclear weapons.

Thermonuclear weapon: Hydrogen bomb.

Titan: The largest American missile with a 9 MT warhead and a range of 9300 miles. In 1980 one of these missiles exploded in its silo, throwing the warhead over 200 feet.

Tomahawk: American name for the GLCM.

Third degree burns: Charring of the skin.

Trident 2: New American, long range, accurate and more destructive SLBM. Britain is to replace Polaris missiles with Trident 2.

Unilateral disarmament: A decision by a single country to independently reduce or abandon nuclear weapons.

UKWMO: United Kingdom Warning and Monitoring Organisation, responsible for detecting a nuclear attack on this country.

Warhead: Nuclear bombs carried by missiles.

Waterburst: Nuclear weapon (usually a depth bomb) detonated at sea.

Warsaw Pact: Organisation of 8 Eastern European states for 'friendship, mutual assistance and co-operation'. Russian forces are deployed in all Pact countries except Rumania. The eastern equivalent of NATO.

Yield: The destructive power of a nuclear warhead, measured in kilotons or megatons.



Photo Courtesy of BBC Hulton Picture Library