BRISTOL & THE BOMB

FOREWORD

No war the world has ever known has had such a devastating effect as that which a one megaton bomb on Bristol would bring. To foster the illusion that to prepare Civil Defence plans to help us survive a nuclear attack is as dangerous as it is unrealistic. We must never be lead to accept the inevitability of nuclear war nor give up our opposition to any Government's policies that take us closer to the brink of war.

The only defence against nuclear annihilation is to make it less likely. Britain and Bristol would be far less of a target if it abolished its nuclear weapons. That is why Bristol with Labour is one of Britain's 160 nuclear free zone Local Authorities all working for peace – the only real defence. This is a chance of a lifetime that nuclear disarmament offers.

Councillor G.R. Robertson
Leader – Bristol City Council

This booklet, "Bristol and the Bomb", has been paid for with public money contributed by you, the Bristol ratepayers and taxpayers. It has been published to give a hypothetical account of a nuclear bomb attack on Bristol and its consequences. When reading this account, you should bear in mind that it has been authorised by the political majority of Labour and Liberal Councillors on the City Council and is a one sided story, calculated to win support for unilateral nuclear disarmament groups such as CND.

Therefore, I advise you to read this leaflet with caution. Firstly, it is wrong for public money to be used by politicians to push the ideas of CND. Far more important, the only certain way to prevent the dreadful events described in this booklet is multilateral disarmament that is by both sides. Unilateral disarmament only makes nuclear attack more certain.

R.W. Wall
Leader – Conservative Group

This is a booklet about what happens if someone drops a nuclear weapon on us. If it doesn't make you weep for the future of our world it ought to.

But if they tell us we need to have all these bombs so that we can live in peace they must be right. Like unemployment, cuts, or nationalising everything in sight. They must be right about that too otherwise they wouldn't do it would they?

If they tell us that having our own nuclear bombs and American ones as well makes us even safer they must be right because politicians are clever people. Using all our oil to pay for unemployment and Trident must be the right thing to do otherwise we wouldn't be doing it would we?

It goes to show that you don't need to fool all the people all the time – just enough of them.

Councillor R.J. Howell

The help and advice of SANA is gratefully acknowledged.

INTRODUCTION

The Bristol City Council resolved on 13th January 1981:-

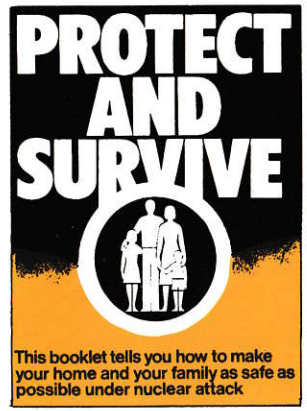
'This Council calls upon Her Majesty's Government to refrain from the manufacture or positioning of any nuclear weapons of any kind within the boundaries of our city.

Conscious of the magnitude of the destructive capacity of modern nuclear weapons, we recognise that our proposals would have little meaning on their own. We therefore directly appeal to our neighbouring authorities in the South West of England and to all local authorities throughout Great Britain to make similar statements on behalf of the citizens they represent.

We believe that it is not in the interests of our people to be either the intiators or the magnet of a nuclear holocaust and firmly believe that such unequivocal statements would clearly indicate the overwhelming desires of the people we represent and could lay the groundwork for the creation and development of a nuclear-free zone in Europe.'

And further resolved on 9th October 1984:-

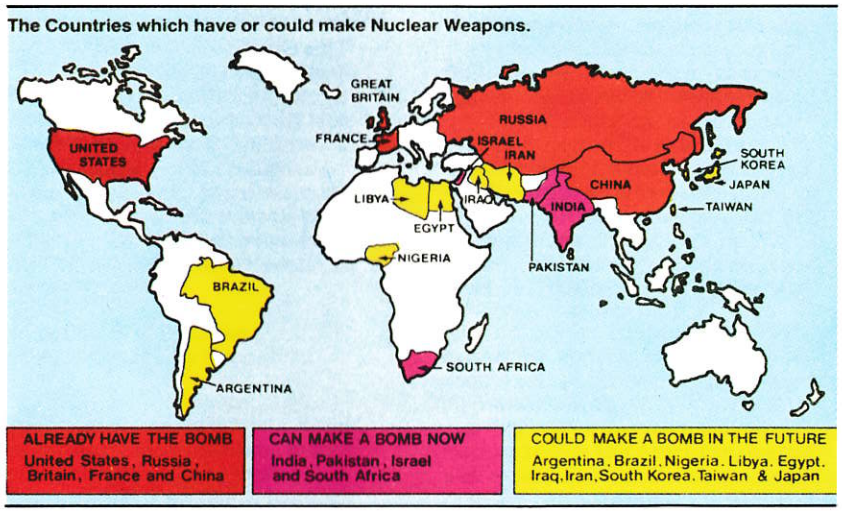
'This City Council is totally opposed to the Civil Defence Regulations being imposed upon local authorities by Central Government. The Council therefore agrees to publish a pamphlet and make it available to the public to explain the effects of a nuclear attack upon the City and population of Bristol.'



THE GROWTH IN NUCLEAR WEAPONS

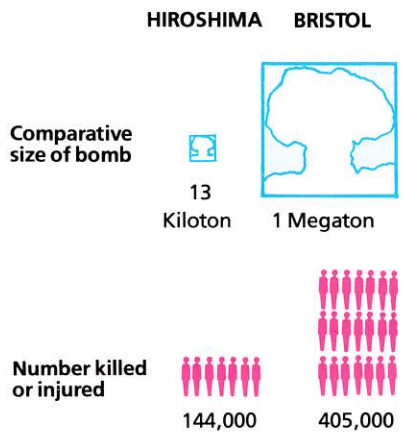
WHO HAS THE BOMB?

The United States and the Soviet Union have the most nuclear weapons. In 1982 the United States had 9,500 strategic warheads and the Soviet Union approximately 8,500. These can be launched from land, from submarines at sea or dropped or shot from bombers. Britain, France and China have them as well. India, Israel and South Africa may have them already. Argentina and Pakistan could get them in the near future. Others are developing them. Even terrorist groups may be able to make and deliver nuclear bombs. The general public does not know at whom all of these weapons are aimed.



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 nuclear weapons of up to 58 Megatons. The atomic bomb dropped on Hiroshima in the Second World War was about 13 Kilotons and it killed 68,000 people and injured 76,000. If Bristol were the subject of nuclear attack, it is quite likely that the bomb would be a one megaton – 70 times more powerful than the Hiroshima bomb. Such a bomb could kill or seriously injure nearly half a million people in Avon.

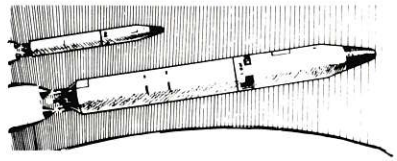


HOW BIG IS THE NUCLEAR ARSENAL?

Between them, the United States and Russia have so many megatons of nuclear weapons that in a war they could produce about 4 tons of TNT for every person on Earth. Many different nuclear weapons have been developed but they can be divided into 3 main categories:-

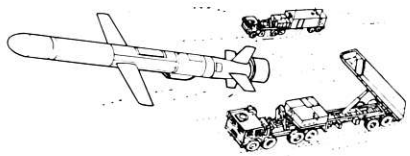
Strategic weapons:
These are long range weapons. Land based missiles (ICBMs) have a range between 4,500 and 9,400 miles. Submarine launched weapons (SLBMs) have a range of between 1,500 and 4,500 miles but the USA's new Trident missiles have a longer range as have the USSR's SSN-8 Mark II. The largest United States missile is the 9 megaton Titan, with a range of 9,400 miles, whilst the USSR's SS-18 can carry a warhead of 10-50 megatons over a range of 7,500 miles.

Because they can totally destroy each other's cities they are sometimes called deterrent weapons. Some



missiles (MIRVs) carry a number of warheads which when released can accurately hit different targets: an example is the Trident C4 mentioned above. The total explosive force of all strategic weapons in existence is about 8,000 megatons. The number of strategic weapons trebled between 1970 and 1980.

Euro-strategic weapons
Also referred to as "Theatre nuclear weapons" or "Intermediate Range Ballistic Missiles" (IRBMs). These can be ground, submarine or air launched and have a range of about 500 to 2,500 miles. They include the very accurate Pershing II, with a range of over 1,100 miles, and the Cruise missiles (range of 1,400 – 1,500 miles) now being 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 they are capable of being used as first strike weapons to destroy strategic missiles which are still in their silos.

Tactical nuclear weapons:
These are short range nuclear weapons (up to 70 miles) intended for use on the battlefield. They include nuclear shells, small nuclear bombs and the neutron bomb.

The USA has about 2,580 tactical weapons. Although not a direct threat to Bristol these weapons have helped to make nuclear war more possible by

introducing the idea of a "Limited" nuclear war in Europe. Europe, of course includes Britain.

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. This escalation could lead to a full scale nuclear war in Western Europe. Britain would be a prime target. Whether or not the United States launched their intercontinental missiles or agreed to a ceasefire, it would be too late for Britain.

"Our future on this planet, exposed as it is to nuclear annihilation, depends upon one single factor: humanity must make a moral about turn".

Pope John-Paul II 25/2/81

"We fought World War I in Europe, we fought World War II in Europe and if you dummies let us, we will fight World War III in Europe".

Admiral G. Le Rocque
EX-US Strategic Planner

"You may reasonably expect a man to walk a tightrope safely for ten minutes, it would be unreasonable to do so without accident for two hundred years".

Bertrand Russell

COULD IT HAPPEN BY ACCIDENT?

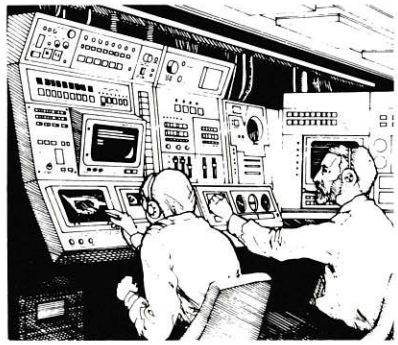
The Americans have now deployed Pershing II and Cruise Missiles in Europe. Pershing II can reach Russian targets in 5 to 6 minutes. The Russians have responded by threatening to adopt a "launch on warning" policy so that their own missiles cannot be destroyed in their silos. As a result of an accident or computer failure, the Russians 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.

"...so I repeat in all sincerity as a military man I can see no use for any nuclear weapons which would not end in escalation, with consequences that no one can conceive".

Lord Louis Mountbatten, 1979

"Nobody knows which dictator, madman or military junta will be able to put a finger on the button next. Or where that target will be".

Daily Mirror 26/1/83



"It would be our policy to use nuclear weapons whenever we felt it necessary to protect our forces and achieve our objectives".

R McNamara, US Secretary of Defence, 1961

HOW MUCH WARNING WOULD THERE BE?

This would depend on the circumtances 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 Hard Rock Civil Defence exercise planned for September-October 1982 there was a supposed 10 day period of diplomatic crisis, followed by 5 days of conventional war before a nuclear attack was lauched on Britain. The government's own home defence plans suggest as little as 2 days warning. Once missiles are launched there could be as little warning as 5 or 6 minutes.

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 radio-active soil. The debris from the crater is sucked up into the mushroom cloud. There it becomes radio-active. Later it falls back to earth according to the wind strength and direction. This gives a high level of radio-active dust or "fall-out" 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. The energy released by the bomb as heat and light blast and shock waves is more widely distributed. These will affect an area about 30% greater than a groundburst bomb of the same size. The electro-magnetic pulse also produced following a nuclear explosion can knock out communications systems over a very large area.

Waterburst:
The bomb is detonated in the sea or a lake and vaporises the water. Later the water returns to Earth as an intensely radio-active rain. Nuclear depth charges have this effect.

WHAT HAPPENS WHEN THE BOMB EXPLODES?

Only a minute after a one megaton groundburst hydrogen bomb hits the City Centre **very little of Bristol would remain standing.** 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 some 7,000ft across would be formed.

The familiar mushroom shaped cloud would then rise into the sky. A blastwave travelling faster than the speed of sound and winds of up to 200 mph would then spread outwards across the city. Within hours radio-active fall-out would come down on most of the city. Blast and heat cause more casualties at first, but radiation can kill and injure more people in the longer term. Damage and casualties are caused by:-

Radiation and Light:
The initial flash of nuclear radiation could kill anyone out inthe open in 1.5 mile's radius of the City Centre eg: **Redland, Easton and Bedminster.** The flash of light could affect people as far away as **Lulsgate, Portishead, Almondsbury and Saltford** – up to 8 miles away. Those 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 **Avonmouth, Keynsham**

and Flax Bourton – up to about 5.25 miles from the City Centre. Those out in the open much closer to the City Centre would certainly be incinerated. Very bad blistering of the skin would occur in places like **Patchway, Bitton and Chew Magna** – up to about 6.5 miles away. First degree burns could be received up to 8 miles away in places like, **Portishead, Almondsbury and Saltford.** Widespread fires would be caused up to about 5 miles depending on visability by furniture and curtains being set alight in houses. Outside fires are started in woods, petrol stations or by burst gas mains. Fires can join together to cause a fire storm which can continue until there is nothing left to burn.

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 being struck violently by debris, particularly by flying glass. Most of the Inner City and suburbs would be destroyed by the blast. Even as far away as **Lulsgate, Severn Beach**

and Nailsea windows would be smashed and roof tiles ripped off. This could let a lot of fall-out enter homes.

Fall-out:
Most of the radio-active fall-out comes down within a few hours. It can kill people up to 50 to 100 miles away. In areas where a lot of fall-out has been deposited it can remain a deadly threat for 2 weeks or more. Most normal houses offer only limited protection against fall-out, particularly when damaged by the blast. 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 400 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 WOULD DO TO BRISTOL

WHY SHOULD BRISTOL 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 prevent any immediate recovery. The government's Civil Defence exercises have included the prospect of a nuclear attack on Bristol. There are a number of potential targets around Bristol – the Airport, Avonmouth and Royal Portbury Docks and British Aerospace at Filton: in time of war, these would all have some military significance for an enemy. A bomb might also be dropped on the City Centre as it is the commercial and administrative centre.

Inner circle indicates area of crater
Outer circle indicates rim of radio-active soil

THE SCENARIO

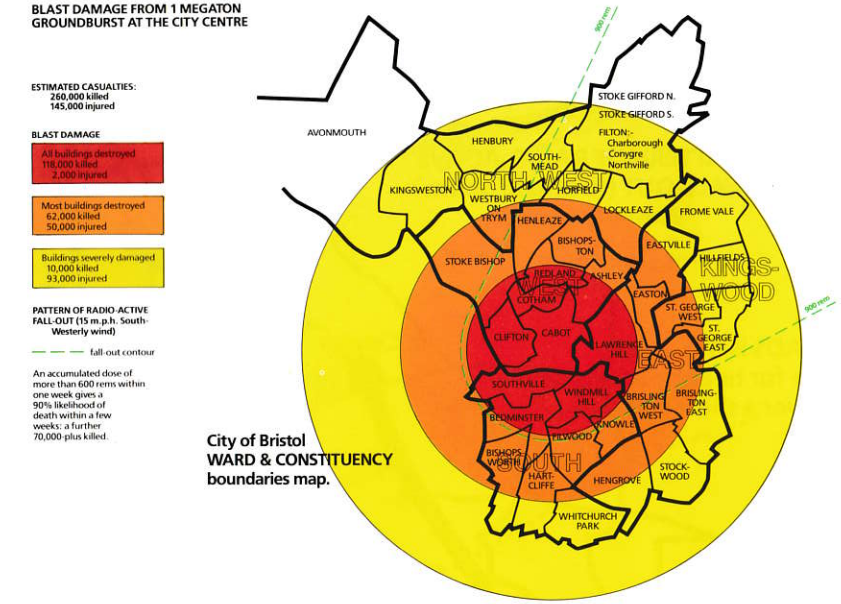
The example of a one megaton groundburst bomb at the City Centre is used here to illustrate, simply, what could happen to Bristol in a nuclear war. It is assumed that the bomb is dropped without warning, on a clear day, at about 8 o'clock in the morning when most people are still at home. The estimates of fatalities and injured have been prepared by SANA – South West Region based on the work of Glasstone and Dolan, the standard authority on the effects of nuclear weapons and used by the United States Departments of Defence and Energy. Other scenarios are of course possible: Avon County Council and the Royal College of Nursing have both considered the effects of a one megaton **airburst** over Bristol.

WHAT WOULD HAPPEN IN THE CITY CENTRE?

Suppose the bomb were detonated near gound level at the City Centre. The Council House, Cathedral, Colston House, Corn Exchange, Bristol and West Building and SWEB would disappear into a huge crater about 200 feet deep and approximately 1,000 feet across. In the area of the crater, the network of underground services – gas, electricity, water supply, sewerage and telecommunications – would be ripped apart. A rim of deadly radio-active soil would be thrown up around the crater which would cover what was left of the City Centre. **Nothing recognisable would be left between Park Street and Corn Street.** This would all occur within seconds.

WOULD THE INNER CITY BE DESTROYED?

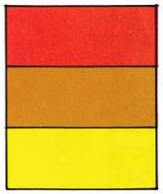
120,000 people live within 1.7 miles of the City Centre. The blast from the bomb would destroy everything within this area. Nearly the whole of **Redland, Cotham, Clifton, Southville, Bedminster, Windmill Hill, Lawrence Hill, Ashley and Cabot electoral wards** would be flattened. Practically everyone would be killed in this circle of complete and utter devastation – about 118,000 people would be dead or dying in seconds from the effects of the blast alone.



WOULD IT BE SAFE IN THE SUBURBS?

124,000 people live between 1.7 and 2.8 miles from the Centre. 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 **Brislington, Bishopsworth, Stoke Bishop, Henleaze and Eastville.** Half the population of this zone would be killed and four out of five survivors would be seriously injured. About 62,000 people would die and 50,000 would be injured. As many as half the survivors could die from burns and others could die later from exposure to radiation.

THE EFFECTS OF A 1 MEGATON GROUNDBURST NUCLEAR BOMB.



BLAST DAMAGE
All buildings destroyed

Most buildings destroyed

Buildings severely damaged

HEAT EFFECTS
on people outside in the open

third degree or fatal burns
second degree or serious burns
first degree or mild burns

PATTERN OF RADIO-ACTIVE FALL-OUT (15 m.p.h. South-Westerly wind)

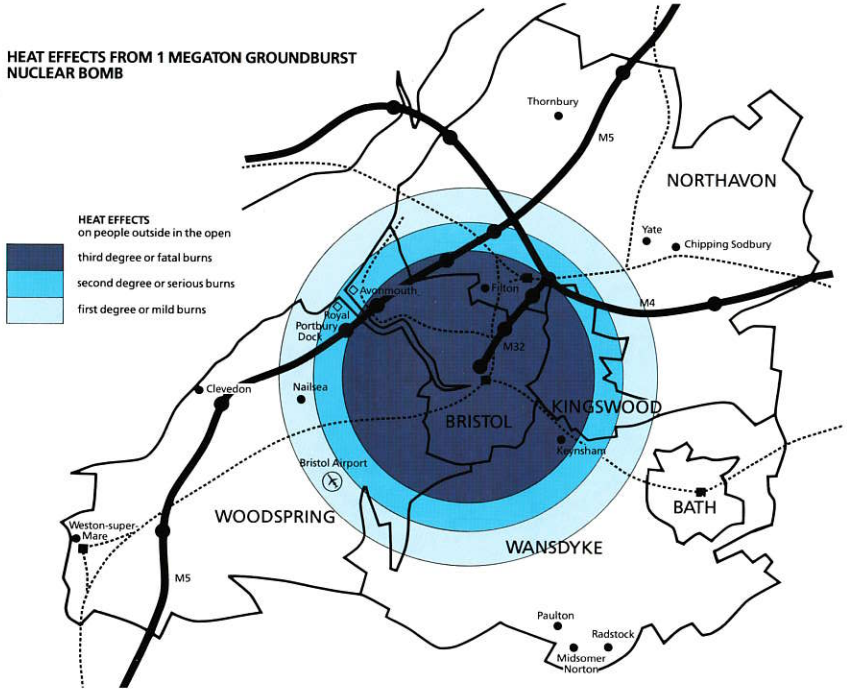
fall-out contours

400-600 RADS is the usual lethal dose for healthy adults when received over a short period.

Thornbury
M5
NORTHAVON
Yate
Chipping Sodbury
900 rem
Avonmouth
Filton
M4
Royal Portbury Dock
M32
Clevedon
Nailsea
KINGSWOOD
BRISTOL
Keynsham
Bristol Airport
BATH
WOODSPRING
Weston-super-Mare
WANSDYKE
M5
Paulton
Radstock
Midsomer Norton

WHAT ABOUT THE OUTLYING AREAS?

Severe to moderate damage would be caused between 2.8 and 4.8 miles from the City Centre. Buildings would 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 difficult to pass. Fires would spread throughout the area which might destroy at least half the buildings. People out in the open or near windows could be severely burned. Most of **Filton, Staple Hill, Long Ashton and Shirehampton** would suffer this damage. Even this far away from the City Centre windows would be blown out and roof tiles ripped off as far away as **Lulsgate, Severn Beach and Nailsea.** This could allow more radio-active fall-out to get into buildings. Approximately 208,000 people live between 2.8 and 4.8 miles from the Centre. Blast would immediately kill 10,000 and injure 93,000 within this area which extends beyond the City boundary.



WOULD I BE AFFECTED BY RADIO-ACTIVE FALL-OUT?

Because of variations in the weather and the lie of the land, it is very difficult to predict the exact pattern of radio-active fall-out. Usually it takes the form of cigar-shaped plume downwind from the bomb-burst. Assuming that the prevailing wind in Bristol, a south-westerly, was blowing at 15 mph, a one-megaton groundburst in the City Centre would deliver in seven days an accumulated dose of 900 rem over a plume 15 miles wide as it passes over Gloucester and Cheltenham, and stretching 95 miles from Bristol, i.e. beyond Rugby. 900 rem over seven days is certain death. As little as 600 rem over seven days would reduce chances of survival to 10%: such doses would be received from the Bristol bomb as far away as Stamford in Lincolnshire. Most of the outlying towns and villages in East Bristol would receive fatal doses of radiation. As ordinary houses offer only a limited amount of protection from radiation most of the survivors of the initial blast would be at risk of receiving a lethal dose of radiation in this area.

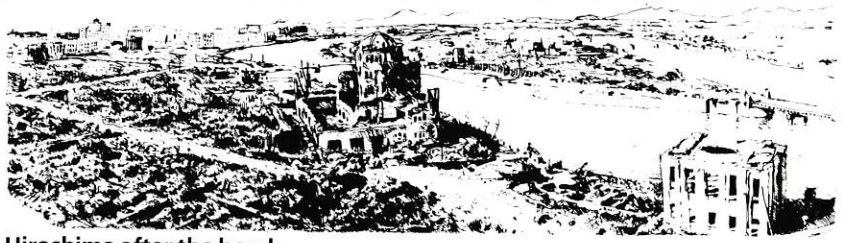
HOW MANY CASUALTIES ALTOGETHER?

452,000 people live within 4.8 miles of the City Centre. 190,000 (42%) would die and 145,000 (55% of the survivors) would be injured by the initial blast. More than 70,000 survivors of the blast would receive lethal doses of radiation. Over half the population (57%) of this area would die, at the very least. If the bomb were dropped around midday, when the City Centre was full of shoppers and office workers, casualties could be 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 would also die later from injuries, disease, thirst and hunger.

THE AFTERMATH IN BRISTOL

WHAT HELP WOULD THERE BE FOR SURVIVORS?

If the Centre of Bristol were hit by a single one-megaton groundburst, there would be about 262,000 survivors of the initial blast within 4.8 miles of the Centre. About a quarter of them would shortly die from the effects of fall-out and about half would be suffering from injuries from the blast. All survivors would require water, food, shelter and facilities for heating, cooking and lighting. Some form of government and communications would be needed to organise all these things. The government has prepared war-time 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 Bristol, or in a full-scale nuclear war, are set out below.



Hiroshima after the bomb

HOW WOULD THE INJURED BE CARED FOR?

The chances of any medical treatment are very slim. The three main hospitals, Bristol Royal Infirmary, Southmead and Bristol General would have been completely destroyed by the blast. Frenchay Hospital would also be severely damaged and only the smaller hospitals in outlying areas would still be fully operative. 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 debris and the high radiation levels for at least two weeks after the bomb had exploded would prevent any large scale rescue operation being mounted. In a real nuclear war the government's health service plans mean that casualties would be classified into three categories: those unlikely to survive after treatment; those likely to survive without treatment and those likely to survive after 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. Even in peacetime only about 100 acute burn cases can be handled at once in the whole country. The treatment of radiation sickness requires blood transfusions and 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 admitted to hospital. The lack of accommodation, staff, anaesthetics and drugs would make it impossible to provide an immediate treatment for multiple injuries and fractures.

WHAT ABOUT SANITATION AND DISEASE?

The main sewage system in Bristol would be largely destroyed. Sewers could be fractured or blocked, particularly close to the City Centre. Hundreds of 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 radiation, lack of equipment and shortage of manpower. Rats and insects are much more resistant to radiation than human beings. They would flourish among the debris and spread disease. In these circumstances there would be great risk of epidemics and infectious diseases. Government plans admit this. Typhoid, cholera, dysentery and tuberculosis would all be likely to breakout according to the British Medical Association.

"It is clear therefore that the burden of casualties from just one bomb, dropped on a city would completely overwhelm the medical facilities of this country".

British Medical Association Report on Nuclear War; 1983

"Most doctors and other health professionals would be unable to render assistance even if they themselves were unharmed because many of the casualties would be in areas of lethal fall-out".

British Medical Association Report on Nuclear War; 1983

WHAT ABOUT THE WATER SUPPLY?

Most of the water supply for the Bristol area comes from the River Severn and the Chew Valley reservoirs. Although fall-out could enter the reservoirs, most of it would sink to the bottom and little would be likely to enter the water supply. The crater caused by a direct hit on the City Centre would sever water mains. 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 most parts of the City would not have a piped water supply. Government plans admit there will be a prolonged disruption of the piped water supply.

A lot of survivors would be suffering from radiation sickness, untreated injuries or illness. As a consequence they would need much more stored water than that suggested by the Home Office (2 pints per person per day for use in the first 14 days after an 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. In Bristol the main fire station at Temple Back would have been destroyed. In any case blast damage would have blocked roads. Radiation and other damage might make it impossible to start water distribution for up to 4 weeks after the attack. Many people could go thirsty or even die of thirst before encountering any longer 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 are dangerously high. In any case, a direct hit on the City Centre would destroy all the shops in Broadmead and the Inner City and most suburban shopping centres. A lot of food warehouses and processing plants would also be destroyed.

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 unlikely that these could be distributed because of blast damage to vehicles and roads, lack of fuel and high radiation levels. Food stocks damaged by the blast could well become contaminated by fall-out or bacteria. Most ports could have been destroyed, so little food could be imported. Fields might be contaminated. There might be no fuel or fertilisers available for farming. The government admits food would be scarce. Many people would go hungry. Starvation could well be a prospect facing survivors.

"I do not think it at all likely that a limited nuclear exchange would remain limited".

H. Brown, US Secretary of Defence 11/1/77

"The first time one of these things is fired in anger everything is lost. The warring nations would never be able to put things back together".

Leonid Brezhnev, 1978

WHAT WOULD HAPPEN TO ENERGY SUPPLIES?

A direct hit on the City Centre would result in the supply of gas and electricity across the city being severed. The electro-magnetic pulse given out in a nuclear explosion could play havoc with the electricity supply system. Sub-stations would be crushed or largely destroyed by the blast. The main gas control centre would be destroyed and fractured mains would result 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 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 (in winter) particularly among the young and elderly.

WHAT ABOUT COMMUNICATIONS?

In a direct hit on the City Centre, Temple Meads, the main Bus Station and most vehicles within about 3 miles of the City Centre would be destroyed. The City Centre bridges would collapse. Roads and streets could be blocked with debris up to 5 miles away. To find food or water or search for relatives and friends most people would have to walk. Fuel would be extremely limited.

The government plans to restrict the telephone service to lines vital to the handling of emergencies if a nuclear war is threatened. In any case most of the City's telephone exchanges would be destroyed by the blast or put out of action by the electro-magnetic pulse. Trunk services would come to a standstill.

"Uncertainty about the targets for a nuclear attack coupled with massive destruction... thus any attempt to lay plans for medical services, for food supplies, for all possible nuclear emergencies becomes a myth".

British Medical Association Report on Nuclear War, 1983

"The Government Civil Defence plans are hopelessly unrealistic. The very idea that planning is possible for the aftermath of nuclear catastrophe is false".

Guardian Leader Comment 4/3/83

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 regional governments. These would have responsibility with the police and armed forces for keeping public order with the use of emergency powers. 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. Human rights and freedoms accepted as normal in peacetime would have vanished. There might be no help for Bristol from the rest of this country as everyone else could be as badly off as us.

"Either side could dismantle half its arsenal without any military disadvantage – there are just not enough targets in either East or West Europe for the weapons already deployed".

Sir Martin Ryle Ex-Astronomer Royal 6/3/83

THE LONG TERM EFFECTS

WOULD THERE BE A RECOVERY?

The immediate effects of the blast and fire would have almost completely destroyed Bristol 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 a real nuclear attack on Britain the economy – industry, agriculture and financial institutions would be destroyed. Money would no longer have any value. Survivors could live in something like a medieval society based on a system of barter and subsistence farming. It would take many, many years for life to bear any resemblance to how it was before the bomb. Furthermore there would be many long term effects, both known and unknown, which could mean that a full recovery might never be possible.

NUCLEAR WINTER – THE END OF LIFE ON EARTH?

In spite of arguments about 'limited nuclear war', many experts think it likely that any nuclear exchange between the Warsaw Pact and NATO would rapidly escalate to a global nuclear war in which a large proportion of the nuclear arsenals would be used. The enormous fires started by a large exchange of nuclear weapons would generate vast quantities of smoke, soot and poisonous fumes. Some of the smoke and soot projected into the atmosphere would soon be washed out by rain. The rest would form a dark cloud which would be carried round the earth by winds. During the first few days the cloud would be patchy and confined mostly to the northern mid-latitudes where the major nuclear targets are concentrated. After a week or so, these regions would probably be covered by an unbroken dark cloud which would spread to cover the whole northern hemisphere in the following weeks. The cloud would probably spread to cover large areas of the southern hemisphere bringing a nuclear winter to those areas as well.

The dark cloud would reduce the amount of sunlight reaching the earth's surface to a few per cent of normal but allow heat to escape. After about ten days, areas under the densest parts of the cloud would be in near darkness – even at noon the light would be no brighter than on a moonlit night.

There would be a rapid and dramatic drop in land temperature to sub-freezing levels for several months, large disturbances in global circulation patterns and dramatic changes in local weather. Even if the war were to occur in summer, many areas might be subject to continuous snowfall for months. The subfreezing temperatures would substantially reduce the chances of human survival on the planet. A spring or summer war would kill or severely damage virtually all crops in the northern hemisphere. Most cultivated food sources would also be destroyed as would most farm animals. Many animals and people that survived would die of thirst as surface fresh water would be frozen over the interior of continents. Available food supplies would be rapidly depleted. Most human survivors would starve.

In such circumstances, of course, the people of Bristol would be affected by the nuclear winter even if no bomb dropped on the City.

WHAT ARE THE LONG TERM HEALTH PROBLEMS?

The main long-term problems arise from the possibility of nuclear winter – intense cold, starvation and breakdown of the social structure. There are further problems with nuclear fall-out. Not all the radio-active 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. Delayed fall-out can contaminate soil, crops and animals. If nuclear power stations or the reprocessing centre at Windscale were hit, even by a small bomb, the reactor would release an additional long-lived radio-active load which could contaminate and render sterile the area covered by the normal fall-out' path. Under these special circumstances there would be no enhancement of the heat blast or initial reduction of the weapon. Some people who survive the initial attack on Bristol 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 fall-out, can result in cancer, particularly leukaemia, and in genetic damage which can cause babies to be born with deformities. In Japan, long-term deaths have been about 300% more than the number of initial casualties.

CIVIL DEFENCE

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". This tells people to stay at home and build their own make-shift shelters. This assumes there is sufficient warning and materials available to build a shelter. A make-shift shelter is unlikely to offer much protection against the blast of the bomb, or against fire. We have already seen that, within 4.8 miles of the City Centre, 190,000 people would be killed and 145,000 injured by the initial blast from a single bomb. However, a make-shift shelter can help to reduce the danger of radio-active fall-out: the extent to which it can help depends mainly upon where you live. If your house has been damaged by the blast and is in an area receiving a lot of fall-out, the chances are that a make-shift shelter wouldn't help very much.

It is, of course, unlikely that Bristol

"Any increase in weapons now has no military purpose and can only increase the risk of war...it can benefit nobody – nobody, that is, who is not involved in the development and manufacture of weapons".

Sir Martin Ryle
Ex-Astronomer Royal 6/3/83

"Defence of the people will be decided by wise and cool judgement, not by the shouting of empty slogans on the streets or the carnival cavortings of woolly people in woolly hats".

Mr. P. Baker – Armed Forces Minister 2/3/83

would be attacked on its own. Although the government has failed to provide local authorities with an estimate of the likely scale and pattern of attack on Britain, it is quite possible, for example, that the prime naval target of Plymouth could also be the subject of a nuclear attack. This means that, Plymouth being about 100 miles south-west of Bristol, the prevailing wind could easily carry fall-out to Bristol in lethal doses. Again, make-shift shelters are likely to be of very limited use.

Could public shelters be a more effective means of civil defence for ordinary people? 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 dreadful aftermath. And they would be very expensive to provide. One estimate, for Britain, was between £1,000 to £1,500 per head. Civil defence expenditure (1982) was between 50p and 75p per head. The government has said that public shelters are not a realistic option for Britain. What about evacuation? Wouldn't people be safer moving out of towns and cities to the country? The problem with this is that no-one knows which parts of the country would be completely safe from fall-out. 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. "Protect and Survive" states that no help will be given to those people who move away from home. It also warns that empty homes may be taken for others to use.

Although the government has amended its guidelines to local authorities for civil defence measures in the past two years, it has omitted the vital information of its estimates of the likely scale and pattern of attack. This makes it impossible to plan sensibly for nuclear war: the effects of radiation, epidemics, homelessness and lack of food and water upon survivors cannot be anticipated. And as regards the long-term problems, current civil defence plans make no provision at all for the possibility of coping with the nuclear winter.

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