done people would realise immediately that here was the end of war.

And the American Secretary of War at the time, Henry L. Stimson, wrote: "The bombs dropped on Hiroshima and Nagasaki ended a war. They also made it wholly clear that we must never have another war. This is the lesson men and leaders everywhere must learn, and when they learn it they will find a way to lasting peace. There is no other choice." (1)

Why is it, then, that today we live in peril of the third World War that people said was "unthinkable" and "impossible"?

The world's first shock - the experience that shock men into sanity - has worn off.

While the bombs have grown a thousand times more destructive, the memory of the horror has faded, until nations - and men - have forgotten their resolve.

The strategists coldly reckon how many "megadeaths" a country would be able to stand. And a "megadeath" is a million dead people.

Statesmen talk of "acceptable" and "unacceptable" damage. And they are talking of wiping twenty cities off the face of the earth.

Just try for a moment to imagine a million dead people. Start with your family . . . all of them, to the most distant relative you can remember . . . then your friends . . . then your workmates . . . then *everyone* you passed in the street today . . . or this week . . . everyone in your town . . . men . . . women . . . children . . . dead. That isn't even the beginning of a "megadeath."

A sane person can have only one reaction . . . *it must not happen.*

That is why it is vitally important that as many people as possible should know the facts about nuclear war given here. The surest hope of peace is for ordinary people to understand the issues clearly enough to give determined support to their leaders when they show genuine peace initiative - *and oppose them firmly when they don't.*

Ignore those who tell you that writing to the papers or to your M.P. or taking part in a demonstration will "make no difference." Government policy is often more influenced by spontaneous individual action than you would imagine.

Politicians may pooh-pooh such action simply to discourage you from doing it, for few people at the top like to be criticised or challenged. But no leader - not even a dictator - can afford to ignore altogether the feelings of the people behind him. If *you* do something, many other people may take heart - and all of us together can exert a decisive influence.

One thing ordinary people *cannot* afford in the present situation is to leave it simply to "them." Our leaders, like us, are finding it hard to adjust themselves to the fact that war today is no longer an instrument of policy but a form of suicide. Sometimes the men who speak for us appear to remember this fact, sometimes they don't - and when they don't the lives of all of us hang by a thread.

So whatever the politicians and the press may say about "irrelevant" or "irresponsible" action, we must leave the Government in no doubt about our feelings on this question. It is up to us to encourage our leaders when they act sanely - and to resist them firmly when we believe they are gambling with mankind's future.

NOTES

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OUR "HAIR-TRIGGER" SITUATION.—1. **Accidental War: Some Dangers in the 1960s.** A research paper prepared at Ohio State University, U.S.A., under the Mershon National Security Programme which conducts research into "areas vital to U.S. national security." This report has been published in the U.K. and can be obtained from Housman's Bookshop, 5 Caledonian Rd., London, N.1. 2. Ralph E. Lapp in **Kill & Overkill.** 3. Mershon Report (see above), page 11. 4. A comprehensive collection of statements about accidental war made by strategists, scientists and politicians, entitled **War by Accident?,** is obtainable from Housmans, 5 Caledonian Road, London, N.1.

WORLD WAR III.—1. Physicist Harrison Brown told the American Association for the Advancement of Science, January, 1962: "If developments continue in the future as they have during the last 15 years, I believe that an all-out nuclear war involving the Soviet Union and the United States is in the long run inevitable." 2. Writing about Britain's V-bomber force in the **Sunday Pictorial,** 26th November, 1961, Woodrow Wyatt says: "If only such an unthinkably small portion as 10% got through, that would be 20 major Russian cities (and their populations) from Moscow downwards gone for ever." The same applies the other way, of course. 3. Holifield Hearings 1959, page 846. 4. Ralph E. Lapp, **Survival,** page 159. 5. The eyes of rabbits 300 miles away were burned by the flash from an American H-bomb test explosion in 1958. 6. Dr. Frank Shelton told the Holifield Committee: "If the crater breaches the subway, it will send a blast away down it and pretty well clean it out for distances like several miles, I would imagine." (Holifield Hearings 1959, page 30). 7. Ralph E. Lapp in **Survival,** pages 161-2. 8. Dr. F. Shelton, Holifield Hearings 1959, page 25. 9. Figures based on U.S. estimates of casualties from a 10-M.T. bomb on cities of this size. A British civil defence estimate puts injuries at 210,000 but does not say how many would be killed. 10. John Maddox, "The 100-Megaton Bomb," **The Guardian,** 19th September, 1961.

THE THIRD DESTROYER.—1. Gordon M. Dunning, U.S. Atomic Energy Commission, has stated that even 80 days after a nuclear attack, when iodine-131 radioactivity had dropped 1,000 times, "it is doubtful if pasture lands would be usable." Holifield Hearings 1959, pages 445-6. 2. Hugh Everett III and George E. Pugh. "The Distribution & Effects of Fallout in Large Nuclear-Weapon Campaigns." Reproduced in Holifield Hearings 1959, pages 859-81. 3. "The Civil Defence Fraud," **New Statesman,** 3rd September, 1960. 4. Reported in **The Guardian,** 29th November, 1961.

WHAT ABOUT CIVIL DEFENCE?.—1. In a memorandum on civil defence presented to the Birmingham City Council in 1961, John Fremlin, a nuclear physicist, and Simon Sevitt, an expert on burns, said: "Thousands of willing volunteers as well as the general population are being misled into thinking that something effective can be done in a nuclear war." Obtainable from the Secretary, Science for Peace, 70 Elms Road, Harrow Weald, Middx. 2. Lt.-Gen. Sir William Stratton, Inspector-General of Civil Defence, quoted in **The Guardian,** 18th October, 1961. 3. Gen. Irwin in "The Bomb," B.B.C. Home Service, 6th February, 1961. 4 Quoted in the **Sunday Times,** 9th November, 1961. 5. See Holifield Hearings 1959, page 161. In the Fremlin-Sevitt memorandum (see above) it was stated: "Many defence workers confidently assert that if you stay indoors until you are told to go out, you are safe. This is not true, and even persons sheltering in basements where there is likely to be a ten-fold degree of protection could be killed by radiation." 6. M. C. Berenbaum, "Radiation Doses from Very Close-in Fallout." 7. T. Triffet, U.S. Naval Radiological Defence Laboratory, explaining these new findings to the Holifield Committee said that the fallout data given in official American—and British—handbooks "may be seriously in error." 8. See (9) above. 9. From Ministry of Health Circular 9/60 to local authorities. 10. M. C. Berenbaum in a statement to the authors. 11. **Proceedings of the Royal Society of Medicine,** November, 1957. 12. Holifield Hearings 1959, page 252. 13. As above, page 254. 14. Published by Ballantine Books, New York, 1960. 15. Quoted in **The Strategic Air Offensive Against Germany,** 1939-45. (H.M. Stationery Office, 1961.) 16. Holifield Hearings 1959, pages 238 & 241.

AND AFTERWARDS . . .—1. Eugene Quindlen, Office of Civil & Defence Mobilisation (now merged in U.S. Defence Dept. as Civil Defence Directorate). Holifield Hearings, 1959, page 854. 2. Gordon M. Dunning, Division of Biology & Medicine, U.S. Atomic Energy Commission. Holifield Hearings 1959, pages 449 & 656. 3. John Hersey, **Hiroshima** (Penguin Books). 4. As above. 5. Robert Jungk, **Children of the Ashes** (Heinemann). 6. **Peace News,** 11th May, 1962. 7. Quoted by Martin Caidin, **The Night Hamburg Died.** 8. Speaking in "The Bomb," B.B.C. Home Service, 6th February, 1962. 9. Robert Jungk, as above.

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Further copies of this report can be obtained from Housmans Bookshop, 5 Caledonian Road, London, N.1.; 12 for 4s. 6d., 50 for 15s., 100 for 25s., 1,000 for £11, 10,000 for £90.

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Report to the nation

H-BOMB WAR

What it would be like

THIS REPORT has been issued because so little has been done to tell the British people the facts about nuclear weapons and H-bomb war.

If war broke out tomorrow, most of us on this island would be dead within a few hours . . . and those who were left alive might well wish they had died.

In a situation like this, each one of us clearly has the right to be told what will happen, so

that we can say yes or no to what is being done in our name.

Yet our leaders have chosen to gamble on the "nuclear deterrent" without making clear to the nation all the risks involved, and the appalling consequences if we find ourselves, as a result, in a nuclear war.

This report, which has been written with the help of scientists, is an attempt to make these facts known before it is too late.

It tells you what nuclear weapons will do; why war by accident is a growing danger; what an H-bomb attack would be like; and how much protection and chance of survival civil defence is really likely to give us.

These facts make grim reading. But most people, we believe, would sooner know them than be kept in the dark and lulled into a false sense of security.

When you and your family and friends have read this report, it is for you to say whether you think Britain should go on with the H-bomb gamble . . . or whether you think the time has come to stop and think again about the whole terrible business.

TODAY'S WEAPONS—1 *The bombs*

IN AN ORDINARY explosion - a chemical explosion - one ton of TNT changes in a split second into a huge mass of hot gas and produces enough energy to flatten a block of buildings.

In a nuclear explosion, matter changes straight into energy - into blast and heat. This process is so efficient that one *pound* of atom bomb fuel produces as much energy as 9,000 to 10,000 *tons of* TNT.

Because of this tremendous power nuclear explosions are measured in "kilotons" (1 K.T. = 1,000 tons of TNT) and "megatons" (1 M.T. = 1,000,000 tons of TNT). In 1961 the Russians exploded a bomb of 57 megatons.

When matter vanishes in a nuclear explosion, blast and heat are not the only effects. There is a third destroyer - radiation. Rays are sent out which can kill a man, not by burning or tearing apart his body, but by attacking the body's cells and chemical processes.

This deadly radiation - unseen and unfelt - comes first from the explosion itself, then from the dust and debris that falls from the sky over an area of thousands of square miles. In a war radio-active fall-out could kill or injure scores of millions who escaped the actual H-bomb blasts.

No-limit bomb

After the Americans had used the first atom bomb on Hiroshima, killing or injuring over half the city's population, they warned Japan that they now possessed "the most destructive explosive ever devised by man."

The world thought then that the A-bomb, with thousands of times the blast of any previous bomb, was the ultimate weapon.

Then came another development - the hydrogen bomb - which is as much of an advance on the A-bomb as the A-bomb was on the World War II "blockbuster." Today's H-bombs are 500 to 2,500 times as powerful as the bomb that destroyed Hiroshima.

There is a limit to the possible size of the A-bomb. The fuel - uranium 235 or plutonium 239, both made from ordinary uranium - may go off in an explosive chain reaction too soon if too much of it is packed together. There is no danger of this happening with the materials used in an H-bomb, so it can be made as big and destructive as its designers want.

This is because a different process is used in the H-bomb. Instead of large atomic nuclei being broken up smaller ones are "fused" together. Scientists found that the nuclei of light substances like hydrogen, helium and lithium can be made to combine and will then also release explosive energy (this is what is happening in the sun to produce its light and heat).

Bargain bomb

But however much H-bomb fuel you put together it will not "fuse" and explode until you heat it to 1,000,000 deg. C. or more. At present the only way this enormous heat can be produced is by a fission explosion. So a fission (A-) bomb is used to trigger the fusion (H-) bomb.

When matter is turned into energy by fusion you get a bigger explosion, lb. for lb. of fuel, than by fission. Fusion of 1 lb. of "heavy hydrogen" can produce as much explosive energy as 26,000 tons of TNT - compared with 9,000 to 10,000 tons of TNT from fissioning 1 lb. of uranium 235.

So the H-bomb does more damage for its size than the A-bomb. It is also made with cheaper materials. The A-bomb fuels, uranium 235 and plutonium 239, are extremely expensive to produce. Whereas lithium deuteride, used in the H-bomb, costs only about 1/200th of the price of plutonium.

The biggest bargain of all is the "fission-fusion-fission" bomb. This was first tested by the Americans in 1954 and is now the standard type of large H-bomb. It is a fusion bomb with an outer casing of ordinary uranium. Normally, ordinary uranium will not go off in an explosive chain-reaction, but it will do so when triggered by an H-bomb.

By using ordinary uranium, which is even cheaper than lithium deuteride, you get a huge blast at a bargain price. To produce a 20 megaton explosion with uranium 235, it has been reckoned, would cost about £35,000,000. The same size of blast using ordinary uranium costs less than £100,000.[1]

The "FFF" bomb, as it is called, has another advantage in military eyes. In a fusion explosion not much of the fuel is left behind as radio-active debris. And it is this debris that helps to spread radiation over a large area. With the "FFF" bomb you get it both ways - an H-bomb-sized blast and huge quantities of fission debris from the uranium casing. Dangerous fall-out from the 1954 American "FFF" bomb covered 7,000 square miles.

A specially murderous type of "FFF" bomb could be made by encasing an H-bomb in cobalt instead of

How it happened

The atom was once thought to be the smallest particle that existed. Then it was found to consist of even smaller particles clustered round a core or "nucleus." It is from the atom's nucleus that the city-blasting force of the H-bomb comes. This is how nuclear energy was discovered and used . . .

1919: Ernest Rutherford showed that particles could be split off the nucleus of an atom. When this was done energy appeared.

1938: Scientists found they could make the nucleus of a heavy atom break into two - the atom of the metal uranium. This process of "atomic fission," as it is called, produces far more energy than simply splitting off single particles.

1942: The next step towards the atom bomb - fission in "chain reaction." As each nucleus broke in half it shot out particles that broke up more nuclei — and so on right through the mass of uranium. Chain reaction can be controlled, producing energy usable for peaceful purposes.

1945: Over Hiroshima and Nagasaki the world saw what happens when atomic chain reaction is allowed to race away at full millionth-of-a-second speed. The two bombs each exploded with the force of some 20,000 tons of TNT - 20 kiloton weapons.

uranium. It would throw out a vast amount of radio-active cobalt vapour into the earth's atmosphere. As this would probably kill nearly everyone in the world within a few years, military scientists see it - at present - as a suicidal weapon.

Bigger and bigger . . .

The British Government's latest Civil Defence Manual, published in 1959, refers to 15-megaton H-bomb tests, but says there are "few potential targets in the world which would justify the use of so powerful a weapon." Since then the Russians have tested their 57-megaton bomb and boasted they could make a 100-megaton bomb - and Western scientists do not doubt it. Such a bomb, ten times the power of the biggest envisaged in our civil defence planning, would probably *weigh* no more than ten tons.

The Russians, having put a 6½-ton sputnik into orbit, could deliver a bomb weighing ten tons to Britain by rocket - and even to North America. In any case, a 100-megaton bomb could be carried in a plane.

But the Civil Defence Manual implies that weapons this big are unlikely to be used. Many Western statesmen said the Russian 57-megaton test was a propaganda bang of no real use.

This argument is based on the way bomb blast works. The Hiroshima bomb left a circle of total destruction about a mile across. A bigger bomb makes a bigger circle, but this circle does not grow at the same rate as the explosive power of the bomb. Doubling the power of a bomb will not make its circle of destruction twice as wide.

Bomb size	Estimated blast circle
10 megatons	**16 miles across**
20 megatons	**20 miles across**
50 megatons	**26 miles across**
100 megatons	**34 miles across**

But the circle in which the bomb's heat starts fires is not only bigger, but widens much faster than the blast-circle as the bomb grows in size. A 10-megaton bomb, with a 16-*mile blast circle,* will set fire to dry wood and paper *within a circle* 45 *to* 50 *miles across.*

Bomb size	Estimated fire circle
10 megatons	**45 miles across**
20 megatons	**60 miles across**
50 megatons	**100 miles across**
100 megatons	**140 miles across**

Many British and American experts, therefore, think the big bombs will be used as giant incendiaries to set huge areas on fire.

By exploding the weapon 40 miles up on a clear day, one US scientist reckons, the fire circle of even a 10-megaton bomb could be widened to 80 miles across.[2] And one 500-megaton bomb, it has been suggested, "would probably be enough to burn the whole of England."[3]

TODAY'S WEAPONS—2

BY THEMSELVES nuclear bombs are terrible enough. Their power of destruction is enormous. But when they are combined with the new and highly ingenious methods of firing them on to their targets, absolute war is brought within reach of every part of the earth's surface. And the time needed to destroy the civilisation that has taken centuries to build is reduced to minutes. H-bombs today can be carried in faster-than-sound aircraft. They can be hurled from one continent to another at tremendous speed - and with deadly accuracy - in rocket-propelled missiles. They can be carried in submarines (to sneak undetected within range of their targets) and then fired from under water.

And they are not likely to miss. There are devices that guide some rockets by remote control. Other types can steer themselves over long distances. Yet others will follow their quarry doggedly until it is destroyed. Darkness, fog or bad weather have no effect.

Nor has either side in the Cold War a monopoly of these missiles. Both America and Russia not only have enough nuclear weapons to wipe out mankind - they both have enough missiles to deliver them.

The old . . .

	Explosive power
World War II "blockbuster"	**1 ton of TNT**
German V-2 rocket	**„ „ „ „**
Fully loaded bomber plane	**10 tons „ „ „**
Heavy World War II air raid	**1,000 tons „ „ „**

and the new . . .

Early A-bomb (Hiroshima)	**20,000 tons of TNT**
Biggest A-bomb	**500,000 „ „ „**
Early H-bomb (1952)	**3,000,000 „ „ „**
"FFF" bomb (1954)	**15/17,000,000 „ „ „**
Latest H-bomb (1961)	**57,000,000 „ „ „**

ALL the Allied raids on Germany during the six years of World War II killed about 500,000 people.

TWO small A-bombs dropped on Japan in August 1945, killed at least 100,000 people.

The missiles

How we bomb now

First there are the manned aircraft - the British V-bomber Force, the US Strategic Air Command, the Soviet Air Force.

These aircraft do not need to "drop" their bombs in the old way. They can carry them in guided missiles which they fire after flying within range of the target.

In the West - and perhaps in Russia, too - there are always some planes carrying H-bombs on "airborne alert," flying round and round in the sky. This is in case a nuclear attack comes so suddenly that planes on the ground do not have time to take off on their revenge mission.

Then there are rockets with a range of about 1,500 miles. These can be based on land, like the Thor missile, or carried in submarines, like Polaris.

The present policy of the West makes use of these by surrounding Russia with a ring of bases within that distance, while Polaris-equipped submarines prowl the seas round the Russian coast. Similarly, Russia has Western Europe "covered" by medium-range missiles. Long-range missiles like the Atlas are powered by rockets similar to those used for space flights. They can take their loads of destruction thousands of miles. It is estimated that many of these rockets can carry the equivalent of 10,000,000 tons of TNT at speeds up to 20,000 m.p.h., while the same scientific ingenuity that has put rockets in orbit round the earth will be employed to make sure they find their targets.

Finally, there are what are called "tactical" nuclear weapons. Though these are often as large as the atom bombs dropped on Japan, they are regarded today as commonplace battlefield weapons.

They can be rocket-fired from practically any sort of vehicle. By bazooka, even. From vantage points on land, on sea, or in the air they can be used against troops, towns or transport. And they can be guided in many different ways.

The rocket revolution

The missiles that carry nuclear bombs have been developed mainly from rockets like the German V-2s used to bombard London during World War II.

While the Allies were developing the atom-bomb Hitler was concentrating on rockets and had gone further in their design than any other nation.

There was no way of stopping Hitler's V-2s - they all got through. Though the Russians now claim to have a method of stopping modern missiles, experts in the West think that no sure defence against rocket attack is even in sight.

Some of today's missiles have been designed by the very scientists who worked on the V-2, for the end of the war saw both America and Russia scrambling to get hold of these experts in terror.

The one-time head of Hitler's rocket development, Dr. Wernher von Braun, is now chief of the US Army Ballistic Missile Agency. And many of the men who used to work with him are on the other side of the Iron Curtain.

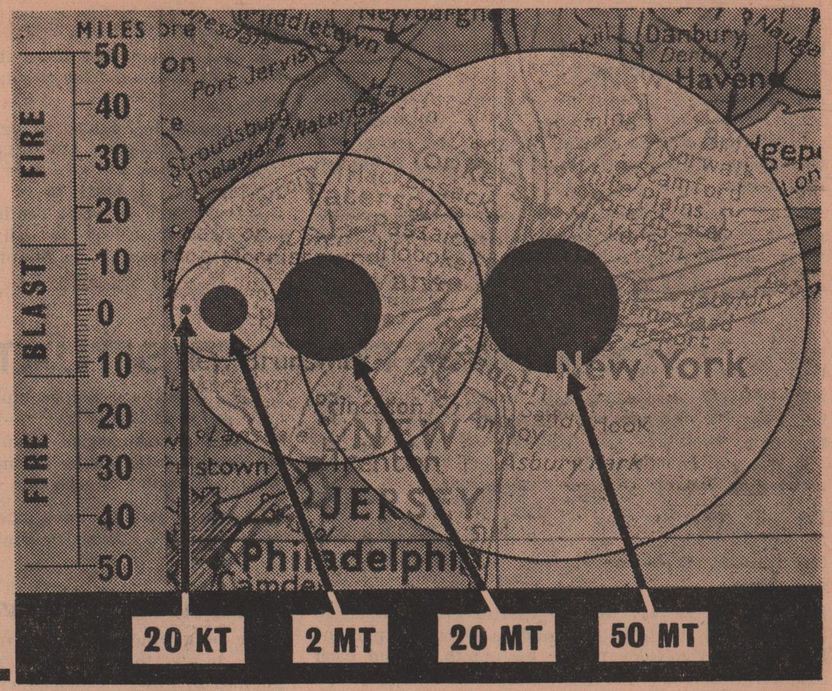
The main effort everywhere has been put into developing rockets because they offer many military advantages over the old method of firing projectiles from guns.

When you fire from a gun all the energy is applied before the shell leaves the barrel. The firing force is limited by how big you can make the gun barrel and how much recoil you can deal with.

Once the shell leaves the gun no further control of speed or direction is possible. If there is even a slight error in aim or speed, or if the target moves, then the shell misses.

Rockets have revolutionised all this. A rocket carries its own power, so that the missile reaches a much higher speed and can travel much further. As we know, rockets can now be made with enough thrust to escape from the pull of gravity and go circling round the earth. This rocket-power can be used to carry big H-bombs from one continent to another.

Diagram courtesy of the *New Statesman.*



The map on the right shows the blast area of nuclear weapons in black circles. The chief effect of nuclear weapons, however, is not in blast but in fire, shown on the map in open circles. A 50-megaton bomb exploded at 35,000 feet over London would create a gigantic firestorm stretching from Cambridge in the North to Brighton in the South.

With a rocket, too, there is no recoil - so an aircraft, for instance, can fire a heavy missile that would once have needed a land-based gun.

And aiming, of course, has become a new science. Radio, radar and other devices can be used to decide after launching when certain stages of the rocket will fire, so that its course can be corrected after it has left the ground.

Another type of missile can be made to change direction to follow a moving target, no matter what is done to try and dodge the attack. In the nose is a "homing" device which pulls the missile on to its target.

The rocket revolution means that war in the future will be totally different from anything we have known in the past.

Interception by fighter planes, dog-fights with pilots duelling in the skies, anti-aircraft batteries and search-lights . . . these are no longer in the scheme of things. Nuclear war is likely to be a one-night, once-for-all shooting match in which death and suffering on an unimaginable scale will be delivered without warning - merely by pressing a few buttons.

OUR HAIR-TRIGGER SITUATION

NO ONE in his right mind would willingly wipe humanity off the face of the earth. Politicians and statesmen, strategists and scientists, all agree that an H-bomb war is unthinkable . . . while the rest of us assure ourselves "It will never happen."

The only reason we have H-bombs at all, we are told, is to strike back if we are attacked. The theory is that this threat of annihilation-in-return will deter any would-be aggressor.

But it is not so easy to keep control of the situation. Both sides in the Cold War add to their stockpiles of H-bombs and missiles month by month. And each addition means another chance for something to go wrong.

The "deterrent theory" depends on being able to launch your own H-bombs before you are obliterated. So the whole system has to be kept at hair-trigger readiness - with less and less chance to check if you are making a mistake.

Political mistakes, too, could lead to situations where, for instance, one side would be tempted to call the other's bluff . . . when they might not be bluffing.

Even the "strategies" concocted around the H-bomb could lead to situations that might start a war. Suppose the British Government decided to launch a *real* civil defence programme, with deep shelters, intensive training for the public, and detailed evacuation plans. The Russians might well think these were preparations for a nuclear war in earnest . . . and then what?

Our situation today is one where a burnt-out valve, a radar operator with a hangover, a stupid politician, a man with a nervous breakdown, or a strategist who guessed wrong could put the world in peril.

Accidents do happen

"The accidental explosion of one or more nuclear weapons in the next ten years is not improbable," according to a study carried out at Ohio State University in America.[1]

In a book published in the US a leading nuclear scientist reveals that a 24-megaton nuclear bomb nearly exploded when it had to be jettisoned over North Carolina last year. Five of the six interlocking safety devices were later found to have triggered in sequence to explode the bomb. "Only a single switch prevented the 24-megaton bomb from detonating and spreading fire and destruction over a wide area."[2]

Nuclear weapons have, in fact, been involved in about ten major accidents, although none has yet blown up.

On one occasion a Bomarc nuclear missile is known to have put itself in the ready-to-fire position. One theory is that two radio signals - one from a police car and one from a local station - combined by accident in the missile's "brain" to give the secret firing order.

Anti-aircraft missiles have launched themselves at least twice and have misfired several times.

And when the warning goes?

"The only trouble with it (radar) is that it sees too well. It sees things that are not there," says General Thomas B. Power, Commander of the US Strategic Air Command.

But the general has to assume that what the radar sees is real and send his planes streaking for Russia; it has happened more than once already.

So far he has found out the mistake in time and the planes have returned. But what will happen when all the planes are replaced by missiles that cannot be recalled and "do not have effective 'destruct' systems which would allow them to be destroyed in flight?"[3] False warnings are not just something that could happen. They *do* happen. One example was on 5th October, 1960, when radar in Greenland reported that an attack had been launched against America. The alarm was given, but fortunately someone checked the readings. They turned out to be radar echoes from the moon.

Whose finger on the button?

So little time would be available to decide whether war had really started that the real decisions about the future of mankind have been taken out of the hands of the people you vote for and put into the hands of remote military commanders who are answerable to no one.

A study carried out at Ohio State University (mentioned above) declared quite categorically: "The President has already been obliged to delegate, in fact if not in principle, some of his ultimate authority to order the use of nuclear weapons. . . . He will be forced to delegate more." (1)

The possibility that irresponsible or misguided action by a relatively junior officer could result in the launching of one or more nuclear weapons, and retaliation by the enemy, is one of the many perils of the arms race. Soldiers are in no way immune from mental stress, and during World War III 43 per cent of all medical discharges in the American Forces were for psychiatric and similar reasons - nearly half of them, it is thought, before actual battle experience. (1)

Sooner or later someone - a pilot, a submarine commander, a mechanic, a general - will crack under the strain. Any one of them could finish it all. (4)

Do they want peace?

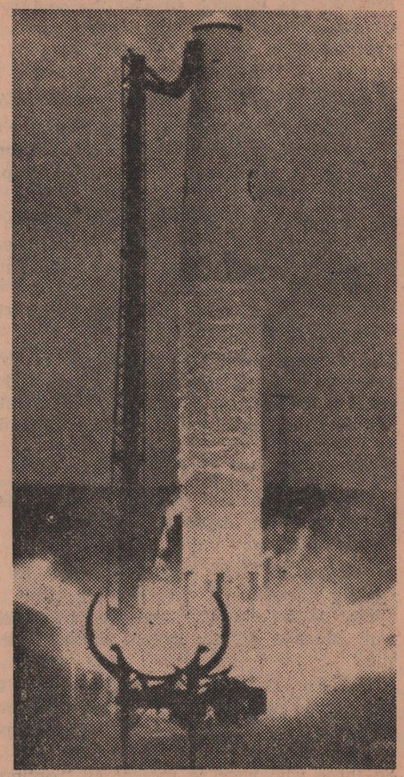
Our lives today hang in the balance of the "deterrent theory." Only because the sides are more or less equal, we are told, is total war avoided.

Yet each side is struggling to get ahead of the other. Soon, for instance, America's nuclear force will be based on missiles hidden in concrete pits or in submarines, while the Russians claim they have an anti-missile-missile.

How long before one side is tempted to strike . . . while the advantage still goes to the one who strikes first?

Even the strategists are beginning to ask "What if the deterrent fails?" And they answer with ever more horrible theories. Like the "slow motion war" - obliterating one city at a time, and stopping for discussions between each round.

Some way *must* be found, the strategists says, to make H-bomb war "credible." . . .



WORLD WAR III

WORLD WAR III, if we let it come, will be unlike anything mankind has ever known. The killing and destruction will be so terrible that experts think it could not last for more than 24 or 48 hours.

In that time millions of us will have been wiped out . . . and millions more left sick and injured to fight for life in a country reduced to ruins and poisoned by radio-activity.

This is not science fiction - it is what many responsible people think it is bound to happen within a few years if Russia and the West go on building up H-bomb stocks and preparing to use them.[1]

Attack

The British Government counts on our getting at least a week's warning of a coming H-bomb attack from the rise in world tension, giving us time to evacuate cities and build refuges. Many experts, however, doubt if we should get anything like so much warning.

We might do so, they say, if H-bomb war grew out of a smaller war. But if the attack were an act of desperation or due to a mistake - and both could easily happen - it would almost certainly come suddenly. Then we should be lucky to get one hour's notice.

How would the attack come? Would there be the approaching roar of massed bombers . . . or only the sudden blinding flashes of the nuclear fireballs, swiftly and soundlessly shot from the sky by rockets?

At present no one really knows what to expect. Nor does anyone know what the pattern of attack is likely to be . . . whether H-bombs would be aimed mainly at military bases, or at cities, or at the whole population at random.

Some experts think the bombs would be exploded high up to set fire to huge areas . . . others that they would be exploded low down to suck up great quantities of earth and cover the country with radio-active fall-out. So governments can only twist and turn, trying to make some show of defence while the bombs get bigger and the missiles more deadly.

But whatever is done, for millions of people there is no hope of protection. *Some of the bombs will always get through.* Even modern defences cannot bring down all the planes in a massed bomber attack (our own reprisal threat to Russia depends on this)[2] - and there is even less hope of rockets being stopped.

Because of the colossal power of each single bomb, those that do get through will be enough - in the words of official UK and US handbooks - to bring "death and destruction on a greater scale than ever before" and "leave a tragic world."

Against attack by rockets - which would take 10 to 12 minutes to reach this country from Russia - the Fylingdales Early Warning Station in Yorkshire (not yet ready) is designed to give *four minutes' warning.*

Relaying this warning all over the country will take 20 seconds, according to the Government's present plan (originally one minute was allowed).

Three minutes 40 seconds..

That leaves three minutes 40 seconds for civil defence command posts to take decisions and issue orders . . . sirens to be sounded . . . 50,000,000 people warned to take cover.

All this assumes that the warning system - a complicated network of radar devices, computers and communications - works from start to finish without a hitch. Against attack by bomber planes we can rely, says the Secretary for Air, on "a reasonably long period of warning - several minutes."

Meanwhile the Russians now claim to have a 12,000-mile-range missile which can fly round the world and come in through the "back door," outflanking Britain's and America's enormously costly early warning systems.

Bases or cities?

No one pretends that millions of deaths can be avoided if H-bombs are exploded right over or near heavily populated areas.

A motion on civil defence adopted by the London County Council on 3rd October, 1961, admits that "there is no practical means of providing Londoners with effective defence against thermonuclear (H-bomb) war."

An official US estimate of casualties from two 10-megaton bombs on New York (which has about the same population as London) was 6,098,000 people killed and 2,278,000 injured.[3]

So those who want to present an "optimistic" picture of World War III prefer to believe that cities and towns will not be the chief targets. The main attack, they say, would be on airfields and rocket sites, and our cities might escape

But even in America - a country of 3,000,000 square miles - many people think it would not make a great deal of difference if military bases *were* the main H-bomb targets. Most of the population would still be in peril through living near these bases, or from off-course bombs or from fall-out.

In Britain, where we have scores of airfields and rocket sites crowded into an area of 92,000 square miles, it is a vain hope to imagine that H-bombs will distinguish between "military" and "civilian" targets.

What the bomb will do

An H-bomb kills and destroys in different ways depending on how high in the air it is exploded.

Exploded near the ground it scoops out a crater up to a mile wide, smashes everything within several miles, and forms a towering "mushroom" cloud of radio-active dust and debris which comes down as deadly fall-out. **Exploded higher up** it causes wider destruction by blast and fire, and also kills and injures by radiation from the fireball, but produces less fall-out.

Exploded very high up, where the air is thin and more of the bomb's energy goes into heat, it is mainly a fire weapon. A 10-megaton bomb exploded 30 miles up, says an American scientist, "could send a searing wave of heat over an area of 5,000 square miles."[4]

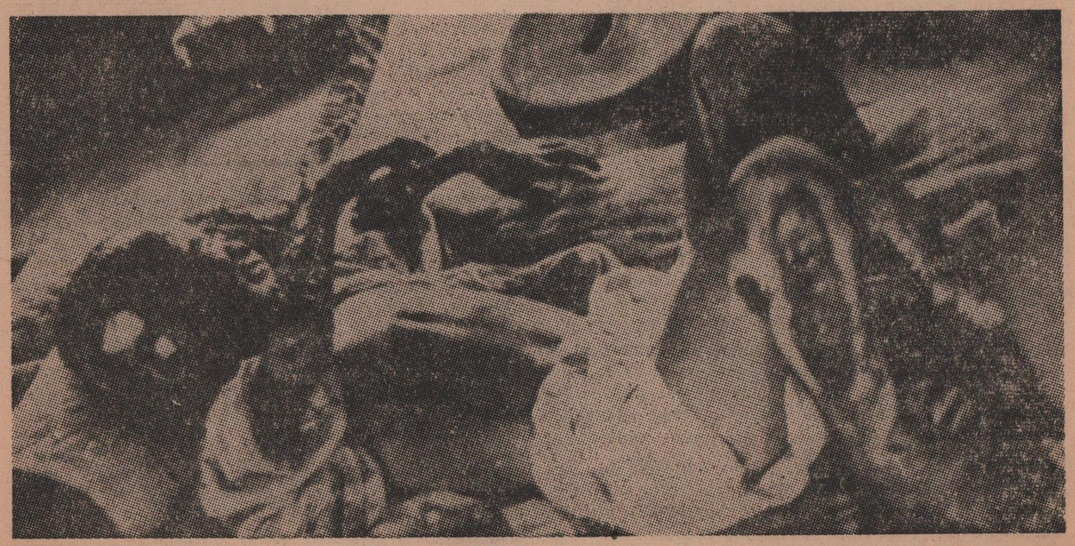
A 10-megaton bomb exploded over your neighbourhood would . . .

- **Give off a flash quicker than your eyes can blink to protect themselves - and bright enough to blind temporarily and probably burn the eyes of people looking at it from two or three hundred miles away.[5]**
- **Grow in 40 seconds to a blindingly bright fireball three miles across - and as hot as the inside of the sun.**

Then, depending on how high up it was exploded . . .

- **Blow a crater up to 240 ft. deep and ½ mile to 1 mile across - and with a huge rim of piled-up wreckage out to twice that distance. The hole would go deeper than London's underground railway (which is 192 ft. below the street at its deepest point), and the blast wave would probably travel along the tunnels and kill people sheltering in them right out into the suburbs.[6]**

A victim of the Hiroshima bomb.



- **Burn you fatally or very badly up to 22 miles away if you were unprotected, and blister your skin up to 25 miles away.**
- **Start big fires up to 20 miles away and smaller fires up to 28 miles away.**
- **Completely smash everything within 3½ miles, destroy brick buildings up to 7 miles away, and damage houses and block streets up to 15 miles away. Within a circle of at least 30 miles across, people sheltering in basements or ground floor rooms would be in danger of their homes falling in on them.**
- **Bring down steel bridges up to 4 miles away and kill or injure people by flying glass and bricks (and flying people) up to 14 miles away.[7] According to an American civil defence expert, hills give "very little, if any," protection from H-bomb blast.[8]**
- **Kill or fatally injure 400,000 to 700,000 people out of a city population of 1,000,000.[9]**

All that can be done by one quite small 10-megaton bomb. In an H-bomb attack this scene of mass killing and destruction would be repeated perhaps fifty times in different parts of the country - and all in one night, not over years.

Instead of a large number of smaller bombs the attack might be made with a few very big bombs. This is what would happen if the Russians used their threatened 100-megaton bomb. . . .

THE FIREBALL would grow to 8 miles across.
BRICK HOUSES would be destroyed within a circle 34 miles across.
FIRES would be started (and skin blistered) as far away as Oxford and Cambridge if the bomb burst over London.
RADIATION from the explosion would cause death or serious sickness within a circle 14 miles across.
FALL-OUT over at least 1,000 square miles would be so bad that anyone unprotected for as long as an hour would die from the radio-activity.

THE THIRD DESTROYER

PEOPLE who survive the blast and fire of nuclear explosions will have to face the third destroyer - radiation.

Imagine hundreds of thousands of tons of radium dust scattered about. That is what it would be like in areas covered by radio-active fall-out..

Radium was the first radio-active substance to be discovered towards the end of the 19th century. It is radio-active because it is made up of atomic nuclei which are "unstable" - which are breaking down all the time into lighter forms of nuclei containing less particles.

As the radium nuclei break down or "decay" they shed energy by giving off two types of invisible particles, *alpha particles* and *beta particles,* as well as invisible rays similar to X-rays called *gamma rays.*

Since discovering radium scientists have found that there are hundreds of these unstable, radio-active substances. Most of them do not exist in nature - man has made them by splitting up natural atoms in the laboratory. A nuclear fission explosion is atom-splitting on a huge scale and produces some 200 types of radio-active substances.

Many of these, including two of the most dangerous to life, certain forms of strontium and caesium, were not known until nuclear explosions created them.

How radiation destroys

All the radio-active substances in fall-out give off one or more of the three kinds of radiation we get from radium - alpha and beta particles and gamma rays. All three kinds harm us by attacking our cells and living tissue.

Substances giving off alpha and beta particles are dangerous mainly if you are close to them, or if you get them inside your body by breathing them in or eating them in food. Those giving off gamma rays are dangerous at a distance.

This is because alpha particles usually travel only a few inches in the air, and beta particles not more than 20 or 30 feet - and both can be stopped by a thin sheet of material. Whereas gamma rays can reach you from thousands of feet away and are so penetrating that they go right through brick walls - and, of course, through clothing and our own bodies.

The pioneers using radium did not realise how dangerous it was, and some of them died as a result of radiation exposure.

Now we know that when radium gets into the body it collects in the bones. The radiation from it then stops new blood forming properly - lowering our resistance to disease and causing anæmia and sometimes leukæmia (blood cancer) - and also damages the bone-building cells, which can lead to bone cancer.

Strontium-90 - one of the substances in H-bomb fall-out - collects in the bones like radium and does the same sort of damage.

Nowadays even a fragment of radium is handled with great care, and people using it are protected by strict safety rules. Similar precautions are taken with other radioactive substances used in industry and medicine.

When you see the care taken with such tiny amounts in peacetime, and then think of the huge quantities of radioactive material produced by an H-bomb explosion, you begin to realise how terrible the danger from radiation will be in a nuclear war.

Radioactivity is measured by a unit called a "curie", named after the radium pioneers, Marie and Pierre Curie. The safety level of radioactivity in milk after H-bomb tests is measured in minute fractions of a curie. The amount of radioactivity produced by a nuclear explosion of even one kiloton produces hundreds of millions of curies.

A danger for years

While some of the radioactivity produced by a nuclear explosion disappears quickly, a lot of it stays a danger to life and health for years.

This is because, though all radioactive substances decay in time into harmless ones, they do so at very different speeds.

One thing that makes some of the substances in H-bomb fall-out so dangerous is that they are long-lived enough still to be giving off radiation when they are lodged inside our bodies, perhaps years afterwards.

Iodine-131 - the radioactive form of iodine which gets

into milk and is particularly harmful to young children - has a "half-life" of eight days, which does not sound very long.

This does not mean, though, that after eight days all the radioactivity has gone. It means that after eight days the radioactivity has dropped to half, and after another eight days to half again (a quarter of the original amount) and so on.

After the accident at the Windscale atomic factory in Cumberland in 1957, when iodine-131 was scattered all over the countryside, the milk from local farms was dumped into the sea for **six weeks** afterwards - not eight days.

So it would take months before the amount of iodine-131 scattered about in an H-bomb attack lost its radioactivity. (1) And iodine-131 is very short-lived compared with some of the products of H-bomb explosions, for their "half-lives" go up to thousands of years.

Already H-bomb tests have exposed us all to the danger of radioactive substances getting into our bodies and causing disease.

The main danger with H-bomb tests is the fall-out that drifts round the earth and comes down on grass and crops, getting into our food and then into our bodies.

Four of the most dangerous substances when they get inside our bodies are *strontium-90, iodine-131, caesium-137* and *carbon-14* (radioactive carbon which we breathe in with air and which has a "half-life" of 5,600 years).

The special danger of strontium is that it is chemically very much like calcium, so our bodies use it in the same way and send it into our bones.

Similarly, our bodies use iodine-131 like ordinary iodine and send it to the thyroid gland, which helps to look after our growth. The danger here, especially in babies under six months, is that physical and mental growth will be stunted - and also that cancer will develop in the thyroid gland.

Caesium-137 and carbon-14 can attack the sex cells in both men and women, making people more likely to have abnormal or diseased children.

H-bomb tests have also increased the likelihood of deformed, idiot and diseased children being born in the future. Radiation is known to be one cause of these inborn defects, and H-bomb tests are adding year by year to the dose we normally get from our surroundings.

Fall-out in war

Those are some of the dangers from H-bomb tests. But the radiation danger after an H-bomb attack would be so much worse that there is no real comparison.

It is not only that the amount of radioactivity would be thousands of times greater, so all the present dangers would be vastly multiplied. There would also be an entirely different kind of danger - coming much sooner, and much harder to protect ourselves against.

Strontium, which gives off beta particles, is not a big threat to life and health until it gets into the body. It is substances giving off gamma rays that would be the worst danger in the first weeks after an H-bomb attack. For these rays, remember, can shine on you from thousands of feet away - and they go through bricks, concrete and even steel.

The first heavy fall-out from a nuclear explosion contains a huge quantity of this gamma-radiation. Areas of thousands of square miles are cleared during H-bomb tests so that no one will be exposed to it. But, in an H-bomb attack, explosions over military bases or cities would cover the country with this heavy fall-out.

The survivors of the blasts would be living for days or weeks in a radioactive oven.

Over large areas it would be asking for serious injury or death to step outside your specially protected "refuge room". And in the worst areas even sandbagged brick walls could not save you from a very harmful and perhaps fatal dose of radiation.

You do not see or feel anything at the time. You only know later that you have been harmed as the first sickness and weakness begins to come on. Radiation can be detected only by special instruments.

No kind of special clothing could protect you if you went outside to look for food. And if you had an instrument which told you that even indoors your family were getting a dangerous dose, you could do nothing more to save them.

There is no sort of chemical that will get rid of radiation. Burning contaminated objects is no use, because the ashes still give off the rays.

The only thing to do would be to try and wash away some of the fall-out dust from inside and near your home. But that would not be safe until the dust had lost some of its radioactivity.

Even when it is too fine to see, fall-out dust is still highly dangerous. Everything you used in cleaning up - rags, water, brushes, the bag of your vacuum cleaner - would become radioactive, too. It would not be enough to throw them away. You would have to make sure they were buried somewhere well away from any human beings.

Doses - and what they do

The most important thing for you and your family would be to try and keep down the dose of radiation you got in the first few days after the attack.

If there was time beforehand, the Government might have issued people with radiation instruments, as they did with gas-masks in World War II.

The purpose would be quite different, of course. Gas-masks protect you against gas. Radiation instruments do nothing to protect you - they merely tell you if the dose you are getting is enough to injure you or kill you. And you might be helpless to do anything more to protect your family and yourself than you were already doing.

Small doses of radiation received over a number of days add up and are as bad for the body as getting one bigger but shorter dose. The body can stand a larger amount in small doses if these are spread over, say, a whole year. But after an H-bomb attack it would make no difference if you took in 700 units of radiation over the first seven hours or the first seven days - it would still kill you.

It is impossible to know what dose of radiation you would be likely to get. The figures given in civil defence booklets are based on the fall-out from a single bomb. In wartime, of course, there would be a lot of bombs, making it much harder to calculate what the total radiation doses would be.

It would depend on how many bombs were used, how powerful they were, the wind and the weather at the time - and how far away you were from the nearest bomb.

Two American defence experts have tried to take all these points into account and have worked out a way of estimating what the total number of deaths and injuries from fall-out is likely to be. (2)

Using their figures, a British scientist, Dr. M. C. Berenbaum, has calculated that 62 ten-megaton bombs would be enough to kill everyone in Britain if we were unprepared - or 95 per cent of us if we had six months in which to train, and build shelters. (3)

The attack might not be big enough to kill so many people. But this is what radiation would do to you and your family as the dose you took in mounted up minute by minute. . . .

A big dose brings death within a few hours.

Smaller amounts bring on "radiation sickness" - a disease that starts with vomiting and diarrhoea and may lead to delirium and death.

If you recover from radiation sickness, you do so slowly. You will probably lose your hair for a time and suffer from internal and mouth bleeding. Many survivors never really get well and are always liable to die from infections that would not have harmed them before.

If you get a dose of radiation and seem to recover, you may still develop cancer years afterwards. Cases of leukaemia and other forms of cancer are still being reported in Hiroshima and Nagasaki from the A-bombs exploded in 1945.

A pregnant woman who has had a large dose of radiation is more likely to have a miscarriage or give birth to a stillborn or deformed child.

An H-bomb war would also increase enormously the chances of deformities and other defects being passed on *permanently* to future generations. Fall-out, contaminated food and the general increase in the earth's radioactivity would all add to this terrible danger.

The famous American chemist and Nobel Prize winner, Dr. Linus Pauling, is convinced that H-bomb tests will mean millions more crippled and sub-normal children in future generations. Dr. R. H. Mole, an expert at the Government's Atomic Research Station at Harwell, thinks Dr. Pauling's predictions "are not all that wrong." (4)

No one knows for certain how much harm H-bomb *tests* are doing to future generations. But every responsible scientist admits that H-bomb *war* may leave us with an appalling total of inborn deformities and defects.

Spread over many generations, the final toll all over the world could be hundreds of millions of H-bomb-fathered cripples, idiots and invalids.

WHAT ABOUT CIVIL DEFENCE?

ALL planning for civil defence under H-bomb attack is based on a little knowledge plus a lot of guesswork. Those who work out the plans know this quite well, but it is not made clear enough to the public.

No scientist claims to understand the effects of nuclear bombs in more than one or two ways which he has specially studied. So in making his calculations he has to assume that conditions in other ways would be more or less normal.

The planners who use his figures do the same. The result is that plans are produced which deal, say, with blast damage but not fall-out, or fall-out but not fire.

These plans often depend on help coming from outside. In an actual H-bomb attack, when everything was happening at once, would there be anyone to bring this help?

Independent scientists who have studied civil defence handbooks think that the picture given there is much too optimistic. (1) Though the facts and figures quoted are mainly correct, the plans based on them are unrealistic.

This is the danger of civil defence propaganda - a danger against which many people in America and Britain keep warning us. It misleads the public into thinking that H-bomb war will not be so bad after all, and that we have more chance of survival than we really have.

The motives of the ordinary civil defence volunteer are good - he simply wants to be able to help in time of trouble. But Governments use civil defence to hide from their populations the fact that an H-bomb war will mean certain death, mutilation or misery for the vast majority of people involved.

Evacuation

For years the British Government has claimed to have a plan - "much bigger than anything attempted in the last war" - for moving out 12,000,000 people from cities to safer areas if H-bomb attack seemed likely.

By 1961 this plan had been scrapped because, according to a civil defence chief, "estimates of the destructiveness of fall-out have gone up." He added: "A new plan is now being discussed." (2)

Plan No. 2, announced in February 1962, is for 9½ million people - mothers and children, the old and the sick - to move "voluntarily" from cities to "reception areas".

"As a short-term evacuation scheme," commented one paper, "it seems to prove the proposition that in an island of this size all anti-nuclear defence schemes have a lunatic unreality. . . ."

Meanwhile the Americans seem to have lost confidence in evacuation. The latest U.S. civil defence booklet says it is "now of less general value than it appeared to be a few years ago." This is because of the danger to evacuees from fall-out and the risk of sudden rocket attack (*and in a country over thirty times as big as Britain!*).

That seems to be the feeling, too, of a former British civil defence chief who spoke on the B.B.C. recently. He thought the best policy for an individual facing an H-bomb attack would be to "stay put." (3)

Evacuation plan No. 1, which looked so solid and reassuring in print, never came to anything. Is plan No. 2 likely to have any more reality?

Secret booklet

The Government has issued a series of Civil Defence Manuals, and also a 9d. booklet called *The Hydrogen Bomb*. But in an emergency, we are told, "more detailed advice would be distributed free to everybody in the country."

This booklet is to be "a comprehensive manual of instruction to the householder about the steps he could take to help himself and his family should war come."

Does this booklet exist yet or is it still to be written? Civil defence chiefs, knowing it took the Americans months to prepare a 48-page booklet on nuclear war recently, sent out to 25,000,000 householders, are worried in case the British booklet comes too late to help anyone.

They are highly critical of the secrecy over this booklet and emergency plans in general.

General Sir Sidney Kirkman, Director-General of Civil Defence from 1954 to 1960, has said: "The politicians have not done enough to educate the public, and that's the first thing they should have done." (4)

Another civil defence leader has said: "If you wait until just before the bombs start dropping to dump knowledge in people's laps, it would be simply criminal." (4)

Why does the Government refuse to issue this booklet - if it exists - despite pressure from civil defence people?

Is it because they prefer to leave the nation in ignorance of the terrible risks they are taking by gambling on the H-bomb?

One of the civil defence handbooks is called *Radioactive Fall-Out: Provisional Scheme of Public Control.* This scheme divides the country round an H-bomb explosion into "W", "X", "Y" and "Z" Zones, according to the dose of radiation you would receive there from debris and dust coming down.

A dose of more than 600 units, whether you got it within hours or days, would almost certainly kill you. Between 350 and 500 units would bring on attacks of nausea, vomiting and other symptoms, from which you would have a 50-50 chance of recovering. Below that, you would suffer from serious or slight "radiation sickness", depending on the dose.

The most dangerous area - nearest to the explosion - is called the Z-Zone. Fall-out from one 10-megaton bomb would produce a Z-Zone 70 to 100 miles long and about 12 miles across.

All over the Z-Zone the dose in the open would be at least 1,000 units an hour 60 minutes after the burst, and would add up to over 2,800 units in 48 hours.

The dose would be higher, the closer you were to the explosion. Ten miles away, it would be 3,000 units an hour at the end of the first 60 minutes. Closer still, it might reach 10,000 units an hour.

The Civil Defence Manual says of this area of about 1,000 square miles: "Wholesale clearance of the zone would have to be undertaken if sickness and death were not to overtake the great majority of the people in it."

No rescue work would be possible for the first 48 hours. After that, acording to the scheme, rescue teams from the next zone, Y, would move in, freeing and carrying out survivors.

This plan would work only if a single 10-megaton bomb were exploded over a very large area, neatly producing W-, X-, Y-, and Z-Zones.

If several bombs were used, their fall-out areas would almost certainly overlap, turning hundreds more square miles from less dangerous X- or Y-Zones into deadly Z-Zones.

So this whole scheme is only a plan on paper and could easily prove useless in a real H-bomb attack.

And even if fall-out areas did not overlap, fifty 10-megaton bombs on Britain - quite a likely size of attack - would turn 50,000 square miles of our 90,000 square miles into the worst possible Z-Zones.

Safe indoors?

Civil defence literature for the public, such as *The Hydrogen Bomb,* gives the impression that by staying indoors and taking "simple precautions" you could protect yourself against the worst effects of an H-bomb. This is completely misleading. The booklet itself says elsewhere that an H-bomb (meaning the smaller type) would blow a crater a mile wide . . . cause "total destruction" up to 3½ miles away and "irreparable damage" up to 5 miles away . . . start big fires up to 10 miles away.

So you would have to be at least 15 to 20 miles away for "simple precautions" to help even against blast and fire. Then there would be the danger of radiation from fall-out. . . .

Sandbagging windows and blocking the chimney will not *stop* the harmful rays outside from reaching you indoors. It only *cuts down the dose* you get - for nuclear rays go through brick and concrete but lose strength in doing so.

How protected you would be indoors would depend, first, on the amount of radioactivity outside and, second, on the amount of protection your house or flat gave you.

The Civil Defence Manual says that a "ground-floor refuge room" (i.e. one sandbagged, etc.) in a semi-detached house would reduce the radiation dose from outside by 25 to 40 times. A bungalow or detached house gives much less protection.

Experiments carried out in America have thrown doubt on these figures, which were worked out theoretically. (5) It now seems unlikely that you would get anything like 40-fold protection in your "refuge room".

Even if you did, however, one scientist has calculated that there would still be an area of 250 square miles (after a 10-megaton explosion) where the radiation dose *indoors* in the first 48 hours would add up to 650 units - enough to cause death. (6)

Studies of fall-out from nuclear tests have shown, too, that it comes down very unevenly, sometimes producing "hot spots" which can be many times more dangerous than was expected.

In any case, scientists have now found that the figures for radiation doses used in British civil defence planning are wrong. While the dose drops more rapidly than was thought, *in the first six hours it is nearly twice as much.* (7).

These new figures mean a much higher radiation dose in the "close-in" fall-out area, up to 100 miles from the explosion. Overlapping of fall-out would probably raise the dose still further.

According to a recent calculation, a modest 130-megaton attack on seven targets to the west of London could produce a radiation dose in Central London of 18,225 units in 48 hours. (8)

If that happened, half the population of London would die from fall-out alone - even if every single person was in a "refuge room" giving the officially hoped-for maximum of 40-fold protection.

CASUALTIES: THE PLAN

THE GOVERNMENT'S first idea was to use mobile first-aid units in an H-bomb attack. As the bombs have got bigger, this plan has been dropped in favour of what are called "Forward Medical Units".

These units would be set up "as far forward as suitable accommodation could be found - and fire, fall-out and debris permitted." This is farther away from the blast than the mobile units would have been.

The present plan for dealing with casualties is this: (9)

First-aid parties will be sent into the damaged area to give emergency treatment to "the more seriously injured" (only) and then take them to *ambulance loading points.*

Ambulances will be stationed 15 to 20 miles away from city centres and on the outskirts of smaller towns.

Ambulance shuttle services will move the injured from loading points in the damaged area to the Forward Medical Units, and from there to hospital.

Hospitals will mostly have been evacuated from larger towns to "reception areas", and extra hospitals set up in these areas.

CASUALTIES: THE QUESTIONS

DOES THIS PLAN hold out any real hope of the millions of trapped and injured being rescued - or being looked after if they are? Let us look at it more closely . . .

One 10-megaton explosion would, it is reckoned, leave people trapped in the ruins up to 7 miles away and badly injured up to 11 miles away. Streets out to 5 miles would be completely blocked, and still partly blocked 13 miles away. Meanwhile big fires would rage as far out as 12 miles from the blast-centre.

These would be the sort of conditions facing rescue teams who tried to work their way into the worst damaged area from outside (not counting fall-out). Even round the edge of this 24-mile-wide circle, reaching, freeing and bringing out survivors through the blocked and burning streets would be a heroically difficult task.

So no realistic plan can hold out hope of rescue for the hundreds of thousands trapped and injured closer in to the explosion. They would die from their wounds, or from fire, suffocation or radiation, before they could be reached.

One estimated figure for casualties from two 10-megaton bombs on London is: 1,000,000 people killed outright, another 1,000,000 trapped and 600,000 hurt, half of them badly.

Most of the million trapped would die before rescue came, according to one scientist (10) - and so would the 300,000 people badly hurt. So total deaths in London from two 10-megaton bombs would reach over 2,000,000 from the immediate effects alone.

Even this figure is low compared with the official U.S. estimate of what two 10-megaton bombs on New York would do. The Americans expect nearly 3,500,000 of the city's people to be killed the first day and over 2,500,000 more to die from their injuries within three months.

Supposing the more easily rescued people could be brought out from the edge of the damaged area, what sort of medical treatment could they expect?

Official plans were outlined at a meeting of the Royal Society of Medicine in 1957. (11) They give a much grimmer picture than the Government's booklet, *The Hydrogen Bomb,* which simply says: "After a hydrogen bomb attack there would be far more injured than even the expanded hospital service could cope with. Many might not be able to reach hospital. . . ."

The doctors were frankly told that a 10-megaton bomb on London would cause 135,000 cases of burns and that a third of these "will be so severe as to be 'non-transportable' - a better term than 'hopeless'".

In other words, right at the start, 45,000 terribly burnt people would have to be left to die.

Another 45,000 would be expected to "look after themselves and each other" because they would be "minor" cases. This group includes people with 20% of their whole skin surface burnt - which in peacetime is looked on as a very serious injury needing expert doctoring and nursing.

Only people with 20% to 40% of their bodies burnt - the "moderate" group - would get proper medical attention, according to the plan.

Even then time would be desperately short because of the huge number of injured - and also because a dose of radiation soon begins to slow down healing and increase the risk of infection. So there would be "no room for differences of opinion". One of the main methods of treatment would be mass amputations.

Here is a scientist, Dr. William T. Ham Jr., speaking before an American Congressional Committee set up to hear about the effects of H-bombs. . . .

> **"You are faced here with the instant production of perhaps millions of burns casualties, and the question is what can we do about it?**
>
> **"The answer we are trying to drive across is that the ordinary treatments that we do adopt under the best conditions for burns would be absent and that the mortality figures for burns would be much greater under such conditions. . ."**
>
> **A MEMBER OF THE COMMITTEE: "You are saying that the medical profession would simply be unable to cope with such a situation?"**
>
> **DR. HAM: "Exactly, sir."** (12)

FIRE-STORM

MANY EXPERTS, especially in America, are convinced that H-bomb explosions over built-up areas will unleash the phenomenon known as FIRE-STORM . . . a gigantic, uncontrollable fire that sucks in air at hurricane force to fan and feed the flames until everything is completely destroyed.

The world has had little experience of this terrifying phenomenon. What we know of it is based on the fire-storms caused in World War II by incendiary raids on Hamburg, Dresden and Tokyo, and by the A-bomb exploded over Hiroshima.

In Hamburg the fire-storm burnt to death about 70,000 people . . . in Dresden 300,000 people . . . in Tokyo 136,000 people . . . the only "conventional" bombing raids to kill on the scale of the atomic bomb.

What a fire-storm is like has been described by Martin Caidin, a leading U.S. writer on military subjects, in his book *The Night Hamburg Died.* . . (14)

"A *thing* of pure flame rears high over Hamburg, a fire which has captured an area of almost six square miles, which howls in elemental fury and terrorises all who are caught in its blinding glare."

The winds sucked in by the fire-storm, says Caidin, reached *a speed of* 150 *m.p.h.,* and the flames roared *three miles* up into the sky. In the furnace-hot temperature of over 1,400° F. thousands of people died in the city's shelters, of heat or of suffocation, as the fire consumed the oxygen in the air.

The Police President of Hamburg wrote later in his report:

> **"The scenes of terror which took place in the fire-storm area are indescribable. Children were torn away from their parents' hands by the force of the hurricane and whirled into the fire.**
>
> **"People who thought they had escaped fell down, overcome by the devouring force of the heat, and died in an instant. . . A population ready and prepared for the alarm were literally overwhelmed by the fire, which reached its height in under an hour."** (15)

Over 6,000 acres of Hamburg were gutted by the fire-storm, compared with 100 acres at Coventry in the worst German raid on Britain.

For a fire-storm to start, it is thought, at least every other building in a built-up area of several square miles must be set alight.

The British Civil Defence Manual says a fire-storm is "unlikely" because some buildings would shield others from the heat-flash of the H-bomb.

American civil defence experts, on the other hand, see it as "an almost inevitable consequence" and think that a fire-storm involving the entire 25-mile radius of New York City is "quite conceivable."

This was stated at an official U.S. inquiry with the comment: "Just what measures can be adopted for survival during a fire-storm are not readily apparent." (61)

Martin Caidin himself - formerly Atomic Warfare Specialist with the New York State Civil Defence Commission - adds this warning:

"But even the debacle of Hamburg will be as nothing against the holocaust of thermonuclear (H-) bombs. For the sake of mankind's future existence, have we heeded the lesson?"

AND AFTERWARDS . . .

THE BRITISH GOVERNMENT says that even after an H-bomb attack on this country there would be "millions of survivors." This is the main civil defence recruiting slogan. It has helped to persuade thousands of people that there would be some kind of future left for Britain after World War III.

Unless the attacker were determined to wipe us out, using say 1,000 megatons of bombs, very probably there would be some millions left alive after the blasts, the firestorms and the radiation.

Left alive . . . but would they be "survivors" in any real sense of the word?

One U.S. civil defence expert, after telling an official committee that a modest-sized H-bomb attack on America would be likely to kill 42,000,000 people and injure another 17,000,000, went on to say reassuringly that a "substantial nation" would be left. (1)

But this is just theory. No country in the world has had the experience of having 60,000,000 of its people killed and injured by a one-day attack. No one knows what the effects will be on civilised life - or on the minds of the people left alive.

Hell on earth . . .

First, look at some of the physical conditions in which the "-survivors" would be living. . .

Food, crops and animals everywhere will have been burnt up or poisoned by fall-out. A scientist from the U.S. Atomic Energy Commission says that in the worst-hit areas there is likely to be enough radio-activity in each *square foot* of soil to kill anyone who absorbed it. (2)

An American strategist, Herman Kahn, has suggested taking steps beforehand to grade the sort of foods that will be available after an H-bomb war. Food "A," the least dangerous, will be for children and pregnant mothers only. "B," ten times more dangerous, will be for everyone, but high-priced. "C," ten times more dangerous still, will be less expensive . . . and so on.

Mr. Kahn is an optimist. Dr. Bentley Glass, Professor of Biology at an American university, thinks those who survive the first 24 hours of a nuclear war between America and Russia will probably die of starvation.

"Food would not be edible," he has warned, "and no crops could be grown for several years."

Of course our Government is building up stocks of food and other supplies - and some of these may escape the blast, fire and fall-out. But what chance will there be of getting this hoarded food to places where it is needed?

Imagine the effect on the railways and roads if twenty of our main cities are blasted off the map and with smashed bridges, wrecked vehicles, rubble and heavy fall-out cutting routes at dozens of other points all over the country.

Remember, too, that electricity stations, gas works and supply systems will have been hit, leaving large areas without light, heat or power. Without water, too, very probably, for mains bursts will have dried up the taps, and water from rivers and ponds may be dangerously radio-active.

With dying and wounded everywhere, and medical services completely overwhelmed, the risk of epidemics breaking out will be acute. More especially as people's resistance will have been lowered by radiation.

Disease will be brought out of the smashed sewers by swarms of rats - and germs, like flies and other insects are much less easily killed by radiation than we are.

Hell in the mind . . .

All this is just a glimpse of the physical chaos in which the "survivors" will be struggling to feed and shelter themselves. But what will be the effect on people's *minds* of it all . . . the terrible things they have seen, the ordeals they have gone through, the primitive conditions they have to face?

Let us look at one of the dress rehearsals . . . Hiroshima.

Don't forget this was a very small bomb. And that the rest of Japan was, by nuclear standards, undamaged. Food, medicine and helpers could reach Hiroshima. And the people of the city knew that, somewhere outside, the civilised world was going on more or less normally. It will not be like that for those left alive in World War III.

The weight of physical horror in Hiroshima attacked even well-controlled minds. . .

> **Mr. Tanimoto found about twenty men and women on the sandpit. He drove the boat on to the bank and urged them to get aboard. . . He reached down and took a woman by the hands, but her skin slipped off in huge glove-like pieces. He was so sickened by this that he had to sit down for a moment. . .**
>
> **On the other side, at a higher spit, he lifted the slimy living bodies out and carried them up the slope away from the tide. He had to keep consciously repeating to himself, "These are human beings."** (3)

At the Red Cross Hospital "plaster, dust, blood and vomit were everywhere. Patients were dying by the hundreds, but there was nobody to carry away the corpses. . . . After 19 straight hours of this gruesome work Dr. Sasaki was incapable of dressing another wound." (4)

Kazuo M. was 14 when the A-bomb went off over Hiroshima. Slightly wounded, he staggered on through a labyrinth of fire. . .

> **"Kazuo-san, please help me!" Whoever was calling knew my name. . . But who? Who was this thing, a girl? Her hair was burned off. Quite naked. Only the rubber belt that had held up her trousers still clung ridiculously about her hips. The lower part of her body was smeared with blood and filth, and was badly cut, a deep wound.**
>
> **I asked: "Who are you?"**
>
> **"I'm Sumiko."**
>
> **Then I knew. Sumiko! She lived just near us. But this couldn't be she. . . She had been such a beautiful child that we had nicknamed her "the white lily."**

In 1950 Kazuo M., who had become a vagrant and minor criminal, was convicted of murder. He asked for the death penalty, but the court, after discovering his disturbed mental condition, gave him life imprisonment. (5)

Mrs. Barbara Reynolds is the wife of an American doctor who went to Japan with the U.S. Atomic Bomb Casualty Commission, but gave up his job to do more to help the A-bomb survivors. The couple have lived for years among the people of Hiroshima. And this is what Mrs. Reynolds says about the emotional after-effects of the bombing:

> **These are desperately, desperately important, because we are all going to have the emotional effects if these bombs are used. It's not just going to be the physical effects. It's going to be the death of the soul. The people of Hiroshima have suffered a death of the soul.** (6)

That was Hiroshima. . . Now look at Hamburg, where 70,000 people died in the fire holocaust caused by heavy R.A.F. incendiary bombing.

"For weeks afterwards," says an official German account, "eye-witnesses were unable to report without succumbing to their nerves and weeping hysterically. They would try to speak, then would break down and cry: 'I can't stand seeing it again - I can't stand it.'" (7)

Those were the small dress rehearsals. The scientist, Dr. J. Bronowski, because of what he saw in Hiroshima and Nagasaki, is sure that civilised life in our Western cities could not survive the far worse destruction of H-bomb attack.

"It's not just people who die, it's the city, it's the community that dies," he has said. (8)

Robert Jungk is a journalist who recently wrote a book about the survivors of Hiroshima. What that one small bomb did to the Japanese city and its people has given him, he says, "a faint indication" of what the world would be like after a nuclear war.

"We may assume," he writes, "that what would be left . . . would not be a totally dead desert without human inhabitants, but rather a single huge hospital, a world in which everyone was sick and wounded." (9)

And a vast hospital, everything suggests, in which few will have the physical conditions, the strength or the will to go on living - let alone to "rebuild society."

The scene in Hamburg after a "conventional" bombing raid which produced a firestorm killing 70,000 people. In the firestorm in Dresden 300,000 people died in a single night; in Tokyo, 136,000 people. A 50-megaton bomb would create a firestorm over an area of 8,000 square miles.

NOW IT'S UP TO YOU

WE HAVE TRIED TO TELL YOU as clearly and honestly as we can what it will be like if H-bomb war comes. But it is impossible to put into words the horror that it would mean.

Try to recapture the sense of shock that was felt when the first two atom bombs were dropped on Japan.

Harold Urey and other well-known atomic scientists thought then that when humanity saw what science had