

**WEEKEND MAGAZINE**



**Would we survive it?**



**I**N THE event of a major nuclear war, Australia is one of the safest places in the world to be. The people most likely to die are those in the direct line of attack, especially in the United States, the Soviet Union, Europe and possibly Japan and China.

The blast and heat from nuclear fireballs will kill those within a few kilometres, depending on the explosive power of the bomb. Fallout from surface burst will kill many people downwind as far as hundreds of kilometres.

In Australia we are protected by distance from the direct effects of nuclear war in the northern hemisphere. But there are some indirect effects to worry about. One is global fallout. Large nuclear explosions cause radioactive material to be lofted into the stratosphere, where some of it can move to the southern hemisphere before descending to earth.

Global fallout in Australia will increase the number of cancers and genetic defects. Fortunately, the level of radioactivity will be greatly reduced by the time the fallout reaches Australia. A simple calculation shows that a major nuclear war in the northern hemisphere might cause an extra few dozen cancer deaths per year in Australia — or perhaps a few hundred per year. By comparison, cigarette smoking causes an extra 15,000 deaths in Australia per year.

A much more serious threat to Australians from nuclear war is nuclear winter. Nuclear explosions cause fires, which would release massive amounts of smoke. As well, surface explosions would loft huge amounts of dust into the atmosphere. The smoke and dust would block out sunlight. This would lead to a reduction of the temperature at the surface of the earth, especially in continental regions. This cooling effect has been dubbed nuclear winter.

At the moment there is some disagreement about the temperature drop to be expected. Some

## Australia is one of the safest places to be in the event of a nuclear war. Wollongong University science and technology lecturer Dr BRIAN MARTIN looks at our chances of survival.

scientists expect drops of 20 degrees or more for weeks or months over large areas, while others think the effect may be milder and more localised. In any case, nuclear winter could be catastrophic if it occurred in the northern spring or summer, wiped out a year's crops and led to massive starvation. If nuclear war occurred during the northern winter, the effects would be far less.

Nuclear winter is different from other effects of nuclear war in that many people far from the warring countries could be severely affected.

Most Australians are doubly protected because they live near the ocean. The ocean is a massive heat reservoir, and moderates the cooling effect of nuclear winter.

In addition, Australia produces a large surplus of food, and thus is protected from starvation in the event of crop failures. The most serious indirect effect of nuclear war on Australia would occur if changed weather patterns led to extensive drought.

So much of the indirect effects of nuclear war. It is unlikely that they will have much impact on the physical survival of most Australians. But there is also the possibility that Australia will be directly hit by nuclear weapons.

It is widely accepted by experts on nuclear war strategies that the most likely targets in Australia are the US military bases at Pine Gap, North West Cape and Nurrungar. These bases are remote from major population centres, so few people are at risk. For "soft targets" such as the bases it is likely that attacks would involve the explosion of nuclear weapons in the air above the target. In this case there is relatively little local fallout. An air

burst over Pine Gap would pose little risk to the people living in nearby Alice Springs.

If weapons were exploded at ground level, fission products would become attached to particles of earth and would fall out downwind. But since the three major US military bases are far from population centres, once again this is unlikely to cause major loss of life.

Much more serious is the prospect of direct attacks on Australian population centres. Many analysts who have studied Soviet targeting policy — such as Desmond Ball of the Australian National University — think this is unlikely. Perhaps if a Soviet nuclear submarine happened to be in the South Pacific region when a nuclear war broke out, Australian cities would become targets. Even this is unlikely because most Soviet strategic nuclear submarines stay close to their home ports.

A prime target would be US ships and submarines, thought to be carrying nuclear weapons, in Australian ports. For example, attacks on ships in Sydney Harbour or Cockburn Sound could lead to massive casualties in Sydney or Perth.

Another set of targets would be the many small US military and intelligence facilities throughout Australia, many of them in cities. For example, the US Embassy in Canberra could be a target.

Surprisingly, no detailed study of the effect of nuclear attacks on Australian cities ever seems to have been carried out within the Department of Defence. I have been told that such attacks are considered to be "incredible", meaning that they are thought to be so unlikely that no planning is carried out concerning the aftermath. But the human impact is so much greater that it would

seem an obvious study to carry out.

Some attention to the problem has been given by Des Posener, formerly scientific advisor to the director of the NSW State Emergency Services and Civil Defence. His calculations show that if nuclear warheads are exploded directly in major Australian cities, many hundreds of thousands of people could be killed by the direct effects of heat and blast. In addition, weapons exploded at ground level could lead to just as many deaths due to close-in fallout.

Contrary to popular belief, a single large nuclear weapon would not level any Australian city. A person 10 km from the explosion of a one megatonne nuclear bomb has perhaps a 50 per cent chance of survival. People 20 km away are in little danger so long as fallout does not blow in their particular direction.

What about the fallout then? Where will it blow?

The path of local, close-in fallout depends on the speed and direction of winds high above the surface of the earth. These winds are almost always blowing east. So in most cases the path of fallout from ground bursts will be to the east of the bursts.

One of the best ways to survive a nuclear attack is to be away from the blasts and fallout. In Australian conditions, evacuation seems to be a sensible policy.

If a one-megatonne bomb were exploded at the Sydney GPO, it would kill many people. But people in Penrith or Parramatta to the west would most likely be safe.

It would be a relatively straightforward research project to calculate the range of blast and heat from nuclear explosions, and the likely paths of fallout at different times of the year. This information could then be provided to members of the public by the government. But the implicit attitude in official quarters seems to be that people are better off being ignorant and unprepared.

[The following concluding paragraphs were omitted by the Illawarra Mercury.]

As well as physical impacts, nuclear war would cause massive social and economic dislocations. The cutoff of vital imports and the arrival of refugees are two likely consequences. Hardly any planning has been done in these sorts of areas.

Rather than planning to best survive nuclear attack, another approach is prevention.

If there were no nuclear ships and submarines in Australian harbours, the risk of attack on Australian cities would be reduced. Removal of foreign military bases would make the risk

of any attack at all quite small.

New Zealand has all the advantages for surviving nuclear war that Australia does: southern hemisphere position and population near the coasts. In addition, New Zealand, free of major foreign military bases and nuclear ship visits, has a negligible chance of being directly attacked in a nuclear war.

If you are seriously worried about surviving nuclear war, I suggest moving across the Tasman.