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WHAT WILL HAPPEN TO ALICE

IF THE BOMB GOES OFF ?



DS

Roman Kull
November 85

The consequences for Alice Springs
of a nuclear explosion over the
Joint Defence Establishment at
Pine Gap

or

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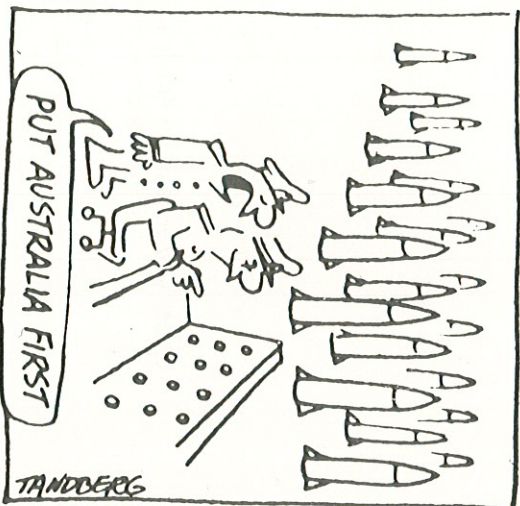
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INTRODUCTION

This booklet discusses the effects on Alice Springs of a nuclear explosion over the Joint Defence Establishment at Pine Gap.

There are two possible scenarios; an air burst above the installation and a ground burst at the installation. We shall outline and discuss each scenario. Because the establishment is a soft target, that is, it is above ground and has delicate equipment, an air burst is the more likely event.

An air burst could be detonated at between one and three kilometres above the ground. In this range of heights the explosion would give a sufficient over-pressure to destroy the domes and their equipment. In this discussion I have assumed the detonation will be at one kilometre, because that gives the maximum necessary over-pressure.

Desmond Ball in his article "Limiting Damage from Nuclear Attack" suggests that an ICBM from mainland Asian USSR would be used to hit the Pine Gap establishment. These are SS-11s and SS-18s and their yields per warhead range from .5 to 24 megatonnes (MTs). The larger warheads are not likely to be used for such a small target, so a missile with a .5, .9 or 1 MT warhead would be used. In this discussion we have described the effects of a one megatonne warhead.

The effects of a nuclear explosion can be divided into immediate, late and long term effects. There is no distinct cut off between each period. Immediate effects occur at the time of or just following the explosion, late effects occur from the day after until a couple of weeks after the explosion, and long term effects occur after that.

The exact effects depend on a large number of variables especially the time of day when the explosion occurs and the weather at the time. Accordingly the discussion has to be fairly non-specific in parts.

IMMEDIATE EFFECTS

The explosion of a one megatonne warhead, one kilometre above the Joint Defence Establishment at Pine Gap would have immediate effects due to the Electro-magnetic Pulse, the flash, heat, the blast and radiation.

E.M.P.

At the moment of detonation the Electro-magnetic Pulse (EMP) caused by the explosion would stop absolutely everything that was dependent on electricity. Lights, cars, telephones, radios and TV's would all cut out.

The EMP effect lasts minutes to hours. However the power surge it causes would internally damage electrical equipment especially radios, TV's and telephones. The town electrical grid system would be rendered inoperable. All this would be irreparable.

We would be left without lots of functioning technology:- no transport except by foot or bicycle, at least for a few hours; no communication except by speech and hand-writing; no light except by fire and candle; no heat except fire and gas; no refrigeration.

Flash

The flash would blind anyone up to a distance of 80 kilometres away who was looking in the direction of Pine Gap at the moment of the explosion or who, noticing the flash, instinctively glanced towards it. People in the south and western town area are shielded from the flash by the ranges. People on the East Side and outside Heavitree Gap however would be likely to see the flash.

Heat

Effects of the heat released by the explosion extend to about 15 to 20 kilometres. Similar to effects from the blast, most damage would occur outside Heavitree Gap.

Everything flammable within 10 kilometres of Pine Gap would catch fire. This includes the White Gums Estate, parts of the airport road and Stuart Highway, a section of Larapinta Drive, the Rangers' Station at Simpsons Gap and all scrub and animal life in that 10 kilometre radius.

Any people in the open along the South Road, at the airport and even at Simpsons Gap would receive the equivalent to mild up to severe sunburn, depending on exactly where they were.

Any people in the open west of the South Road would receive third degree burns.

Blast

The blast has the most effect within about 15 kilometres of ground zero. Alice Springs town proper will therefore sustain little if any damage. The Macdonnell Ranges would block and lessen the effect of the blast as well. However, most windows in town would be shattered and there would be danger from flying glass.



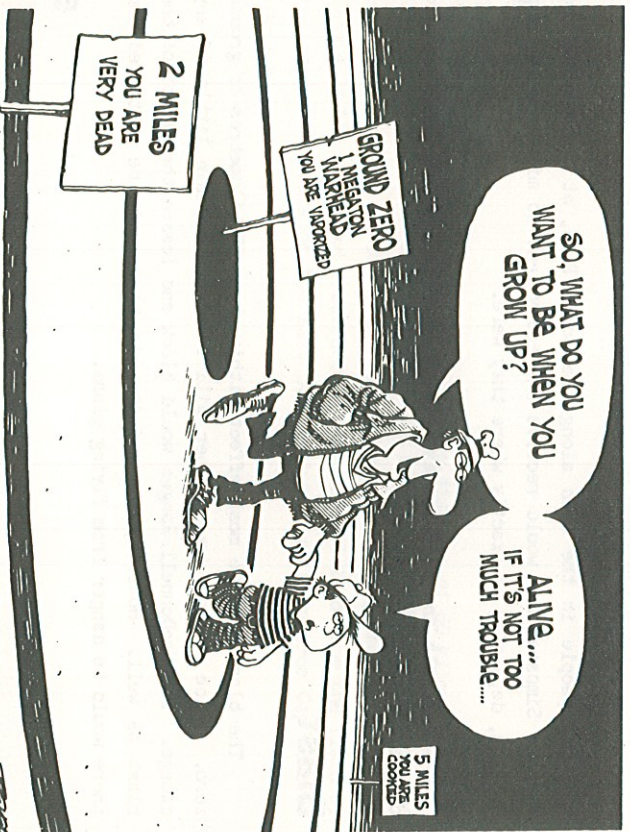
Outside Heavtree Gap, the White Gums Estate, many of the buildings along the airport road and even the airport itself are within the 15 kilometre blast affected area. White Gums, although partially sheltered by Blatherskite Range, would be severely damaged. The control tower and aeriels at the airport would probably be significantly damaged.

People in this area would be injured directly by the blast, by flying debris and by collapsing buildings.

Radiation

With an air burst minimal radiation is put into the atmosphere. The area immediately around ground zero and the area three to five kilometres down wind of the blast would be heavily contaminated. None of this immediate radiation would effect the town.

However some radiation is released into the atmosphere, as high as 20 kilometres. The winds will carry that radioactive material considerable distances. Some settles out along the way. For instance the air burst at Maralinga in October 1956 released radiation which was carried over Adelaide, Sydney and out over the Tasman Sea to New Zealand. High though not lethal radiation levels were recorded in Adelaide.



Because the distribution of radiation is so dependent on variables in wind velocity and direction we can make no estimation of radiation effects on Alice Springs apart from saying that if the wind was coming from the southwest quarter, Alice Springs would receive some radiation.

In any case the general level of local radiation would be increased and result in contamination of resources, and increased genetic mutations.

Radiation reaching the town would probably not be lethal and would arrive the day after. It might be sufficient to cause bone marrow suppression and gastrointestinal effects. This would decrease people's resistance to infection, cause some bleeding and bruising, and nausea, vomiting and diarrhoea. Most people would not need life supporting treatment; a few might need symptomatic treatment.

A Ground Burst

Before we go on to discuss the late effects we shall briefly describe the ground burst scenario. This is considered the least likely eventuality.

The immediate effects due to flash, blast, heat and radiation would be less than those outlined above. There would be no EMP. The ranges would modify the effects by shielding the town and, to a lesser extent, the White Gums area from the blast. But the effects outside Heavtree Gap would be essentially the same.

The big difference would be with radiation. A ground burst creates a lot of dust which is sucked into the atmosphere by the fireball to the height of about 25 kilometres. This mass of dust is then carried by the wind and deposited in a long trail, up to 40 or so kilometres wide and hundreds of kilometres long.

This is called the plume. In theory it travels in a straight line but in reality it meanders unpredictably with shifts and gusts of the wind. Hotspots of higher than expected radiation occur in unexpected places.

Although the wind in Central Australia usually blows from the southeast, if on the day it was blowing from anywhere in the southwest quarter, Alice Springs would be enveloped in the plume of radiation at greater than the lethal dose (about 450 rads). This would happen within hours of the explosion. Everyone would die of radiation poisoning within 24 hours.

If the wind direction was from other points of the compass, there is still a reasonable chance of Alice Springs receiving a serious though less than lethal dose of radiation.

In this scenario, blast and radiation effects would stress the medical services in Central Australia beyond coping. Very many people would die, untreated. Large tracts of Central Australia would become uninhabitable.

LATE EFFECTS

Besides the radiation effects mentioned before, there would be the effects of injuries and burns sustained by people from outside Heavitree Gap. Then there would be the psychological reaction of people to the realisation that there had been a nuclear war.

There would be the effects of no water, no power, diminishing stores of food and fuel.

Medical Factors

One can only guess at the numbers of burnt and injured. There might be as many as a thousand people outside Heavitree Gap during the day time. The majority would be between five and twenty kilometres from ground zero. So there may be up to a hundred killed and several hundred injured.

Many would not need medical attention as such but probably would want it. There are about 60 doctors in the town. This gives an initial ratio of one doctor to ten injured.

However not all doctors may choose or be able to work. They may prefer to be with and look after their families. Several of the more serious cases may need prolonged attention by more than one doctor.

As is found in other disaster situations uninjured people often seek medical attention thinking they are injured or sick.

Initially most of the injured would be south of the ranges and the doctors north of the ranges with no motorised transport to take one to the other.

Within a few days radiation sickness would start to appear, adding to the number of unwell. At the same time people would be becoming ill because of infections and because of the stress of coping with this disaster.

Ignoring those already sick and injured and those becoming unwell due to causes other than the nuclear explosion and its after effects, Alice Springs Hospital could possibly cope with 10 serious injury and/or burn cases, and possibly with another 40 major cases.

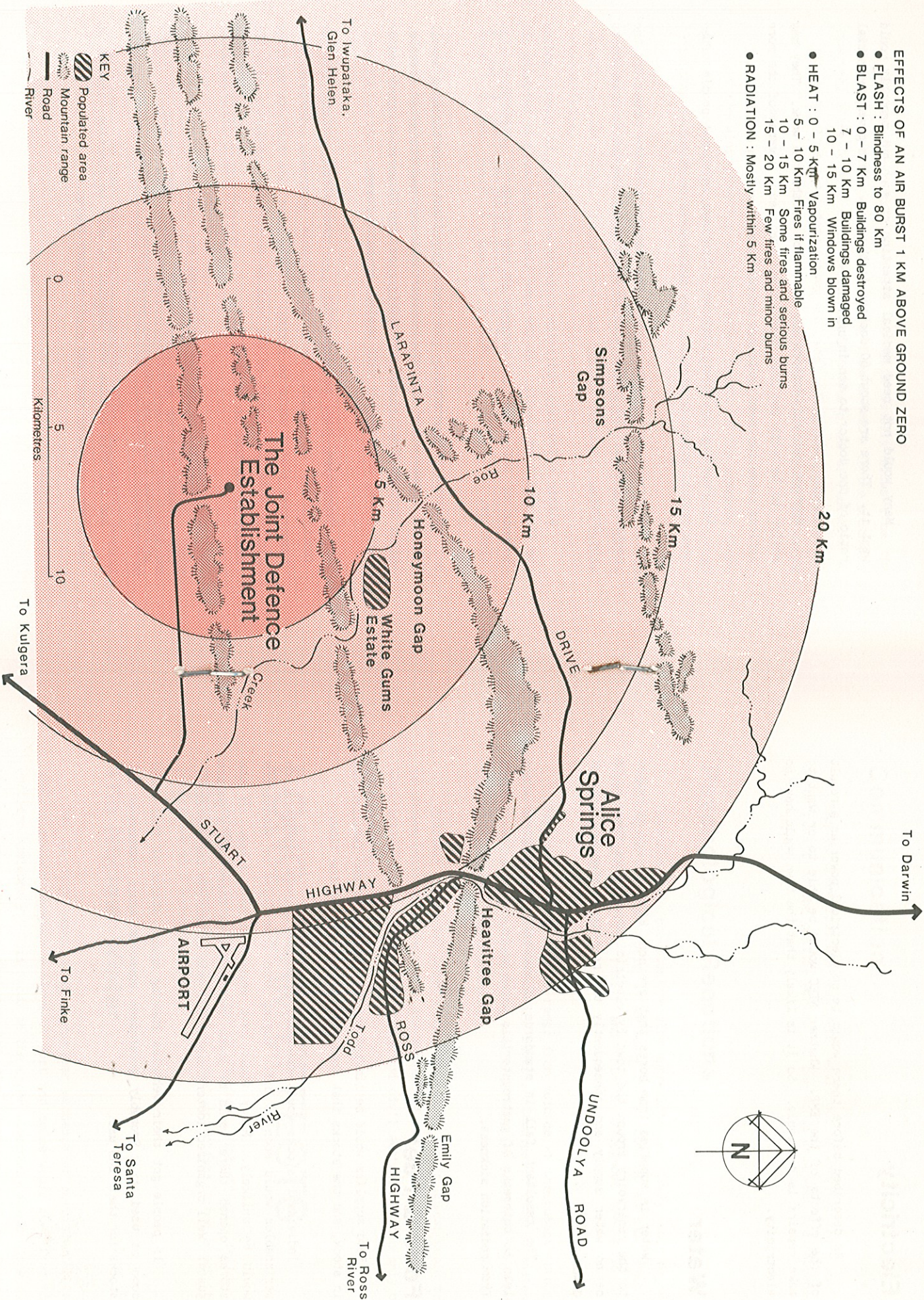
Evacuation may be impossible as the airport might not be functioning, nor might there be suitable aircraft. Certainly no commercial planes would be flying. At the same time Adelaide would be dealing with the result of the bomb on Murrumbidgee, and Darwin with the result of the bomb on its airfield.

The addition of serious infectious and radiation sickness cases to the already injured and burnt would ensure that stocks of blood, intravenous fluids and medicines would rapidly run out.

And all this assumes the hospital is able to function; that is it has power, stores of fuel and staff to work there.

EFFECTS OF AN AIR BURST 1 KM ABOVE GROUND ZERO

- FLASH : Blindness to 80 Km
- BLAST : 0 - 7 Km Buildings destroyed
7 - 10 Km Buildings damaged
10 - 15 Km Windows blown in
- HEAT : 0 - 5 Kt^m Vapourization
5 - 10 Km Fires if flammable
10 - 15 Km Some fires and serious burns
15 - 20 Km Few fires and minor burns
- RADIATION : Mostly within 5 Km



Electricity

As described before there would be no electrical power as a result of the effects of the EMP. Whether NTEC would be able to or want to make repairs is debatable. So it is likely that the town would have no electricity.

Water

Water is supplied from bores that are near Pine Gap and is pumped to the reservoirs around the town by electric pumps. Thus there would be no water supply and consequently the sewerage system would break down.

The resultant fall in standards of sanitation and hygiene would lead to outbreaks of gastroenteritis which would compound the problems from radiation sickness.

Food & Fuel

Food supplies would be limited to what individuals and families had in stock, and the stocks that food shops in town had at the time.

Individual stocks would run down quickly. Without refrigeration perishables would soon go off. Buying food from Coles or Woolworths would be unlikely. Money would have ceased to have value. If the stores opened there would be panic buying unless there was a police guard. Well organized looters may indeed hold up and rob the stores.

If people got their vehicles running again, stocks of fuel would soon be used up. Probably government agencies would commandeer all stocks for their own use.

Communications

Because communications' equipment would not be working, there would be no news from the outside world. No one would know what has happened or is happening.

Psychological Reactions

Psychological reactions are also unpredictable. There would be the realisation that the world as we know it has come to an end. People would be concerned for family and friends throughout the world and unable to contact them.

People's reactions would range from suicide at the outset through to a stoical "carry on at all costs". Studies of other disasters show that about 75% of people are unable to cope and function. They are apathetic, aimless and depressed.

Possibly the social order would break down. The ruthless would try to ensure their own survival at the expense of the weak and defenceless. What action would be taken by police and civil authorities can only be speculated on.

LONG TERM EFFECTS

Scientists now believe that a "Nuclear Winter" will follow a nuclear war. Although controversial, most scientists agree about the principles of a nuclear winter.

The Nuclear Winter

Two to four weeks after a nuclear exchange of more than a few hundred nuclear weapons a cloud of dust and smoke would come from the northern hemisphere. This cloud in the upper atmosphere would block out the sunshine, bringing darkness and then freezing cold to Central Australia.

The cold itself would inflict great hardship on all living things. Surface water would freeze denying animals anything to drink.

It is thought that not enough light will penetrate the cloud for photosynthesis to occur. Without the sun's energy plants will die followed by the animals that feed on them.

Plant and animal life would possibly be wiped out by the cold and darkness. Humans would be without most sources of food and many raw materials.

Associated Factors

With the dust and smoke would come radiation and pyro-toxins. These latter are formed from burning hydrocarbons and other chemicals.

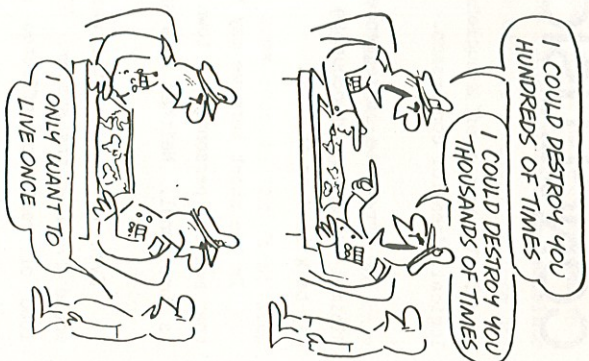
Radioactive fallout entering the biosphere would have direct effect on living things by causing radiation sickness or damage. Indirectly it would increase the rate of genetic mutation, decreasing organisms' ability to live and to reproduce.

The toxins would be scattered over the countryside. Any surviving animals or plants would have to contend with these as well.

After the Winter

After weeks or months the clouds would settle and disperse. Light and heat would return. Because of chemical reactions between the smog and the ozone in the upper atmosphere, the ozone would have been depleted. Ozone usually absorbs ultra-violet (U-V) light. Without this ozone more U-V light would come through to the Earth's surface.

The eyes of all living things are sensitive to U-V light and excess exposure causes blindness. Without appropriate protection, for example special filter glasses, any animal surviving the nuclear winter would go blind.



In a world severely depleted of food, blinded animals would have even less chance of finding food. In a world depleted of animals, blind animals would have great difficulty in mating.

Insects, bacteria and other unicellular organisms are much more adaptable and proliferate much faster than the more complex animals and plants. They are less sensitive to radiation than other life forms. In a situation of great and rapid change these organisms would have better chances of surviving and breeding.

Persistent darkness, below freezing temperatures, widespread ionizing radiation, toxic air pollution, unpredictable weather, increased levels of U-V light, plagues of insects and pests consuming scarce resources would each alone be a disaster. After a nuclear war they would all happen together.

The world's biosphere would be severely effected. Countless species would become extinct. Recovery, if it ever occurred, would take a millenia. The outcome would be an unrecognizable new Earth. Mankind would probably not be there.

CONCLUSION

The scenario of a nuclear war is taken through its stages to its logical, dreadful conclusion.

The immediate consequences for Alice Springs may not be too bad. Minimal damage would occur to the town. However several hundred people may be killed or injured.

In the short term we may be able to cope medically but this assumes that medical personnel in town are willing to work and that the hospital is functional. Neither is a safe assumption.

Even if the hospital was functioning, more than 40 serious cases would overload the system. These injuries and the steadily increasing load of radiation affected people would soon use up all stocks of medical supplies.

People will suffer various degrees of non-coping. They will be afflicted by radiation sickness and infections consequent on failure of the water and sewerage services.

Social cohesion will break down and the weak would become prey to the strong.

Then to end it all would come the Nuclear Winter. Although most would survive the immediate effects and many survive the later effects, few if any would survive the cold and its consequences.

By this document the Medical Association for the Prevention of War and Scientists Against Nuclear Arms seek not to terrify people but to give as factual an account as is possible so that people can make informed decisions about the nuclear arms race and its consequences.

Danger lies not only in that one side may use nuclear weapons in a tactical, local skirmish, and a full scale global nuclear war escalate from this but, as is quite possible, there will be a machine failure and one side, believing they are being attacked, will respond. The other side in turn will respond while they have a chance.

We wish to emphasize that preventing this catastrophe is the only way. Once events have been set in motion then it is too late.

We suggest a freeze on the nuclear arms race is the first step toward averting this course of events.



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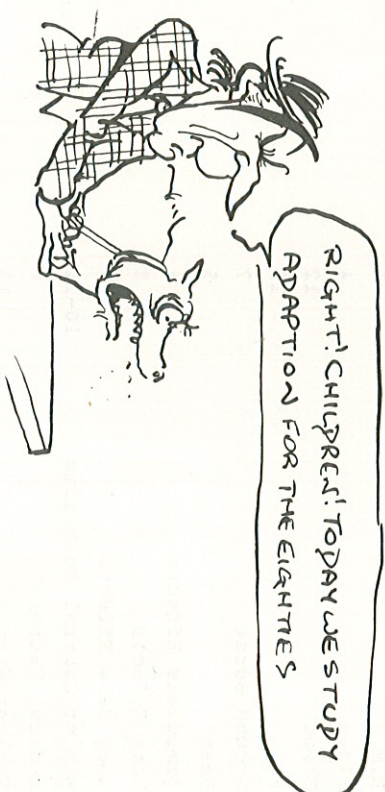
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INDEX

Blast	6
Communications	13
Electricity	12
E.M.P.	4
Flash	4
Flood	12
Fuel	12
Ground Burst	7
Heat	5
Immediate Effects	4
Late Effects	8
Long Term Effects	13
Map of Central Australia	10-11
Medical Factors	8
Nuclear Winter	13
Ozone Layer	14
Psychological Reactions	13
Radiation	6-7
Radioactive Fallout	14
Water	12

