



**Prize Winner**

# **Science Writing Year 7-8**

**Diyasha Maheepala**

**Glenunga International High  
School**



**If It Happened Here: The Impact of a Nuclear Bomb on Adelaide - *Special commemorative topic***

**The Unthinkable: Ground Zero, Adelaide**

By Diyasha Maheepala

Over Adelaide's heart, a blinding light grew,  
The skies turned to ash, and the winds never blew.

Tick, tick, the clocks would chime  
No one knew what was waiting in line.

Over Victoria Square, something did fall,  
From a distance, it was an ending call.  
We all stared up, thinking it was rain,  
Yesterday's paper had already warned of the agonising pain.

No one believed at first sight,  
Some had already fled, knowing a bomb was in flight  
The ones who didn't fear  
Was ignorant that the ending was near.

A mushroom cloud rose,  
Within a second or two  
Flashbacks of the "Little Boy" and "Fat Man",  
Remembrance of the ones who knew.

Is this the end? No one could say,  
Glass shattered, and the wind gave way,  
Innocent lives destroyed, a silent ending,  
A shadow fell forever, blending

Tick, Tick, Tick, it was the end....

This poem describes the unimaginable: a nuclear bomb detonating over Adelaide. It explores what the impact might be, both physically and mentally. Nuclear bombs are weapons used for destructive purposes caused by nuclear reactions through fission, or fission and fusion. These reactions release a large amount of energy of Uranium-235, emitting intense heat, light, ionising radiation, and radioactive fallout. The impact of nuclear weapons was seen in 1945 in Hiroshima and Nagasaki, resulting in approximately 110,000 to 210,000 lives being lost, and with Adelaide, this number could potentially increase, considering the density of the population. The population

of Adelaide's metro area is around 1,393,000, as of 2025, and a bomb such as the "little boy" which was used in Hiroshima, would either injure or kill all of these innocent people.

Admiral William D. Leahy, Chief of Staff for Presidents Roosevelt and Truman, said in 1945: 'We had adopted an ethical standard common to the barbarians of the Dark Ages'. Admiral Leahy felt a deep concern for the morals of "modern" society, stating that the use of destructive nuclear weapons was equal to ones used in the "Dark Ages", as it is not used for the protection of the citizens, and instead used as a brutal weapon of death. He mentioned how this ethical dilemma has caused so many hundreds of thousands of innocent lives to be lost.

### ***How a Nuclear Bomb Works***

Nuclear weapons are considered the most destructive creations invented in society, transforming from around a 10-foot weapon to one that instantly vaporises itself, becoming hotter than the sun's 15-million-degree core. A nuclear explosion occurs due to the instant induced fission of the isotope Uranium-235, which may take hundreds of years to decay naturally. The induced fission is the result of causing a neutron to hit its nucleus, making it split and thus creating instability, which leads it to explode. The fission causes the Uranium-235 atom to absorb the neutron and split into two new atoms. This impact results in the release of an enormous amount of energy, along with two or three new neutrons. The new neutrons hit the other new atoms, causing a chain reaction. The rapid chain reaction would happen in a trillionth of a second (0.000000000001 seconds), producing intense radiation, mainly neutrons and gamma rays, and an atomic or nuclear explosion. Emissions of thermal and ionising radiation would be emitted, and a fireball of superheated air would be released, being a mile in diameter. The light produced by the heat of this impact would be brighter than the sun itself, even at a distance of 50 miles.

### ***Area of Impact***

In this theoretical scenario, if the same nuclear bomb, "the Little Boy," were to fall upon the centre of Adelaide, Victoria Square, it would have a blast radius of approximately 1km, with everything under 1.6km being completely obliterated, looking similar to *Figure 1*. A total destruction would result in the loss of lives, landmarks, and infrastructure, and large numbers of people needing treatment in hospitals. Places all across the central market, Rundle Mall, Adelaide Oval, and the Royal Adelaide Hospital would be instantly flattened, with suburbs across North Adelaide and Mile End being hit hard. Places up to 3km in distance would be damaged,



Figure 1: Image of what Hiroshima looked like after the bombing.

with massive fires and collapsed buildings. The impact would continue to spread for more than 5km in radius, all the way up to Prospect. Roofs would collapse, glasses shatter, and anyone who lives within the next few kilometres, all the way up to Mt Barker, and possibly beyond, would be affected by radioactive winds spreading, contaminating food, water, and soil, for many years to

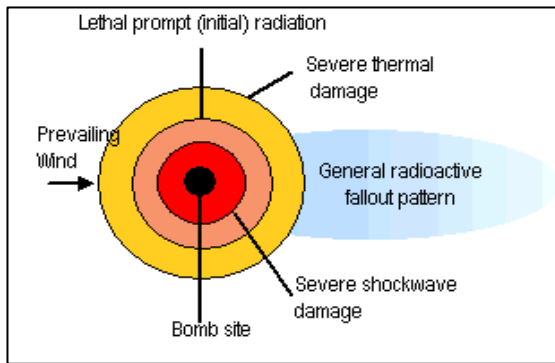


Figure 2: Diagram of impact zones of nuclear destruction

come. The effects of a nuclear bomb are shown in *Figure 2*, highlighting each layer and how it would impact each one. According to *The MIT Press Reader* (Wolfson and Dalnoki-Veress, 2022), direct radiation (which is lethal) from a 10-kiloton explosion would extend for over a kilometre. It is predicted that possibly millions of people could die and, of course, get injured, either through heat effect (fire), thermal burns, unstable infrastructure, or being exposed to too much radiation. The survival rate of such an explosion is extremely low and depends on distance, adequate shelter, and pre-preparation.

### ***Impact on Adelaide's Culture and Citizens***

The destruction does not stop instantly after the blast, as there are after-effects which could last for years or even decades. These effects would impact the environment, mental well-being, and physical well-being of survivors. The environment would be devastated, as stated earlier, with soil, food, and water all being contaminated by radiation, and crops and wildlife would die off, leaving no sign of life. The survivors of this crisis would have to relocate to a new area across Australia or other parts of the world. However, even with many people and governments helping to rebuild the city, it would possibly take around 3-10 years to rebuild, and likely more, considering the areas affected by the bomb are further away. To rebuild Adelaide, federal government intervention and international aid would be continuously needed for an extended period.

Survivors would go through many stages of mental health issues, being affected by the trauma and grief they would have to go through at that time. The citizens of Adelaide would have to continue living, knowing that they have lost their friends, family, community, and homes, and may go through psychological effects of PTSD, anxiety, depression, and grief, and sicknesses such as acute radiation sickness, with the symptoms of hair loss, diarrhea, cancer, or even bleeding. The surviving citizens would face numerous challenges, including difficulties with relocation, social and economic hardships, and financial instability.

The indigenous people of Adelaide would be heavily impacted, as the blast would not only destroy infrastructure and roads, but also the sacred lands of the Kaurna people. The land, which has been theirs for over 40,000 years, holding spiritual and ancestral significance to them, would

never be the same again. Their culture would be minimised, as possibly over half of their population would be gone, resulting in a loss of a sense of identity, by going through a déjà vu of what once happened during the colonial period, when Australia was colonised, and many people died, but in a much worse way. These impacts would cause irreplaceable outcomes and generational trauma for years to come.

### ***Conclusion***

Nuclear warfare does not end with a blast; it begins there. A time no one wants to go back to and experience the suffering and loss of hundreds of thousands of people from the bombing, long gone, but still remembered. If Adelaide, the capital of South Australia, becomes the target of a nuclear bomb, this city, the home of over 1.3 million people, will stand as a reminder of the incredible tragedies and immense losses faced in such outcomes, causing lasting detrimental effects on the state, innocent lives, and the continuing culture. Although only in theory, such an event would be quite devastating. Let Adelaide never become a symbol of what humanity failed to learn from its darkest moments, returning to the 'Dark Ages'.

Word Count: 1315

### ***Bibliography***

“Adelaide, Australia Metro Area Population 1950-2024.” *Www.macrotrends.net*,  
[www.macrotrends.net/global-metrics/cities/206171/adelaide/population](http://www.macrotrends.net/global-metrics/cities/206171/adelaide/population).

International Campaign to Abolish Nuclear Weapons. “What Happens If Nuclear Weapons Are Used?” *ICAN*, ICAN, 2020, [www.icanw.org/catastrophic\\_harm](http://www.icanw.org/catastrophic_harm).

“Introduction | Worldwide Effects of Nuclear War | Historical Documents | Atomciarchive.com.” [Www.atomicarchive.com](http://Www.atomicarchive.com),  
[www.atomicarchive.com/resources/documents/effects/wenw/introduction.html](http://www.atomicarchive.com/resources/documents/effects/wenw/introduction.html).

“Understanding the Blast Radius of Hiroshima.” *HotBot*, 9 July 2024,  
[www.hotbot.com/articles/understanding-the-blast-radius-of-hiroshima/](http://www.hotbot.com/articles/understanding-the-blast-radius-of-hiroshima/).

“William Leahy and the Atomic Bombing of Hiroshima.” [Www.doug-Long.com](http://www.doug-long.com) ,  
[www.doug-long.com/leahy.htm](http://www.doug-long.com/leahy.htm).

Wolfson, Richard, and Ferenc Dalnoki-Veress. “The Devastating Effects of Nuclear Weapons.” *The MIT Press Reader*, The MIT Press, 2 Mar. 2022,  
[thereader.mitpress.mit.edu/devastating-effects-of-nuclear-weapons-war/](http://thereader.mitpress.mit.edu/devastating-effects-of-nuclear-weapons-war/).

Atomic Heritage Foundation. “Science behind the Atom Bomb - Nuclear Museum.”  
[Https://Ahf.nuclearmuseum.org/](https://ahf.nuclearmuseum.org/) , Atomic Heritage Foundation, 5 June 2014,  
[ahf.nuclearmuseum.org/ahf/history/science-behind-atom-bomb/](http://ahf.nuclearmuseum.org/ahf/history/science-behind-atom-bomb/) .

Freudenrich, Craig, and Patrick J. Kiger. “How Nuclear Bombs Work.” *HowStuffWorks*,  
5 Oct. 2000, [science.howstuffworks.com/nuclear-bomb.htm](http://science.howstuffworks.com/nuclear-bomb.htm).

“Zones of Damage after Nuclear Explosion: Generalized - Radiation Emergency Medical Management.” *Remm.hhs.gov*, [remm.hhs.gov/explosion\\_damage.htm](http://remm.hhs.gov/explosion_damage.htm).