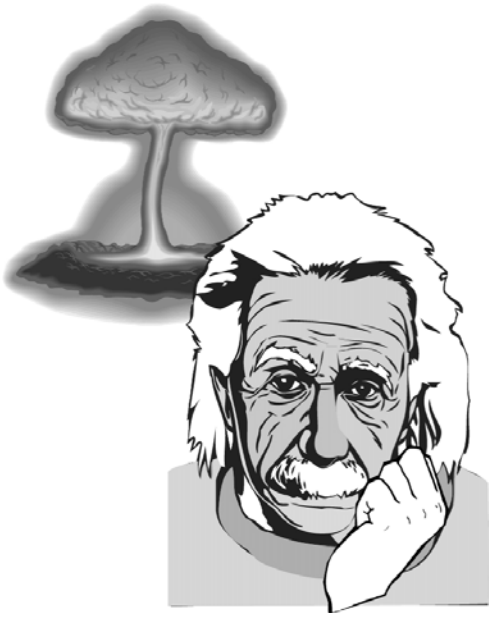
Einstein's Decision



On 2 August 1939 a letter was sent to the President of the United States, F.D. Roosevelt. The letter was signed by Albert Einstein and became one of the most important documents ever written by a scientist.

Einstein's fame extended far beyond his work in physics, he had become an icon of wisdom and humanity. His pacifist views were also well known. This made the so-called 'Einstein letter' all the more dramatic because its message was stark and simple: Einstein informed the President that it was possible to build 'extremely powerful bombs of a new type' by harnessing the power of the atom. The one-time pacifist suggested a way to create a weapon of awesome destructive power.

The destroyer of worlds

Six years later, after many highly talented scientists had worked on the problems of producing such a device, a bomb was exploded in the New Mexico desert. The scientists who had journeyed to the test site to watch the culmination of many years' work in such high spirits returned as more thoughtful men. What they had witnessed was truly awe-inspiring, but the destructive power turned their elation into concern and fear. The leader of the development team, Robert Oppenheimer quoted from the Bhagavad Gita saying: 'I am become Death, the destroyer of worlds'.

One observer, Jim Tuck, spent the coach trip back to the laboratories repeating the question, 'What have we done?' The answer came soon afterwards when atomic bombs were dropped on the Japanese cities of Hiroshima and Nagasaki. Warfare had entered a new and more terrifying age.

The guilty scientist

For the first time in history, science was seen to have unleashed a terrible new weapon. Scientists were seen to be as guilty (or guiltless) as the politicians or the military. Many scientists felt this burden deeply. Robert Oppenheimer summed this up by saying: 'physicists have known sin'. Scientists now shared in the responsibility of warfare.

Scientists have not only opened the Pandora's box of atomic energy, biological and chemical weapons have also been developed. But such weapons are not a wholly new phenomenon. The classical Greeks burned a mixture of pitch and sulphur to poison opponents. Napoleon flooded low-lying land during the siege of Mantua to encourage malaria. And, of course, gas warfare was one of the horrors of the First World War. But new technology has come to the aid of the military, and chemical and biological weapons cause as much concern as nuclear explosives – most recently apparent in the War on Terrorism.

The decisions continue

In the fifty years since the first atomic explosions scientists from many countries have been employed in the development of more powerful atomic weapons. The decision to work in arms-related areas is no easier for today's scientists than their predecessors. It is not only the big names in science that have this decision to make. Many, many people with a whole range of qualifications – from GNVQs to PhDs – work in armaments in

one way or another. All of those working in the field, and all of those that have decided not to work in such an area, have had to think about both sides of the argument.

This decision was forcefully brought home to a young physicist who worked with military submarines. After some thought, she decided to change her career and go into teaching. One reason for the change was that she didn't want to spend her working hours developing machines designed to kill. When she told this decision to her grandfather, a veteran of the Second World War, he was very disappointed. He remembered how the scientists had helped Britain during the war and felt that it was her duty to use her knowledge in a way that benefits and protects our society.

Developing the bomb as a deterrent

The decision, Einstein's decision, is a tough one. It is also worth remembering that while Einstein may have supported the development of a bomb as a deterrent, he was more critical of the decision to use the bomb. Einstein's letter had been addressed to President Roosevelt. But Roosevelt died in April 1945 – before the test in New Mexico on 16 July 1945. It was Roosevelt's successor, President Truman, who took the decision to use the bomb. A year after the bombing of Japan, Einstein's view was reported in the Sunday Express: 'if President Roosevelt had still been there, none of this would have been possible. He would have forbidden such an act.'

Einstein had signed a letter to Roosevelt in the belief that although Roosevelt might sanction the development of a bomb, he would never agree to its use against an enemy that did not possess such a weapon.

Einstein's Decision

What you need to do:

This assignment is about the difficult decisions faced by scientists. You need to consider, with Einstein, whether a deterrent may be acceptable when the actual use of the weapon is not acceptable. Or perhaps research on weapons technology is acceptable because it produces ideas that can improve everyday life. You can tackle this problem in a number of ways, depending on your interest. Here are some examples:

- You could investigate a particular technological advance and consider how this has been used by the military.
- You could look at the historical facts behind, for example, the use of chemical weapons in World War One or Vietnam. Find out who did what and why.
- You could focus on the moral decisions taken by an individual scientist.
- You could develop a piece of creative writing that illustrates and explains the difficulties for an individual when he or she discovers something that could be used in warfare. You might choose to give a fictional account of an historical event or create a character that, in some way, represents us all.

You are going to present your research and personal views in a way that your friends and colleagues understand. Perhaps you want to give a presentation on the subject – a talk or a powerpoint presentation. Perhaps you want to write a paper on the subject or construct a web page. Or you could write a story or prepare a piece of theatre. The end product is up to you – but before that you have to do basic research. This is a vast subject so, whatever you decide, the first thing to do is focus on a particular area . There are many books available on the subject and the web has much useful information – but you have to be on the lookout for sites with a particular axe to grind. Spend time finding out about the personalities and the science involved. Even if you have little knowledge of the science, you will be able to find a book, a website or a person that can help you understand what is going on.

So, here is a possible structure to the work:

- Decide on the area you are most interested in.
- Research the subject (and take detailed notes).
- Decide on your presentation style.
- Work through your research so your ideas come out clearly – but stick to the facts.
- Produce a rough draft.
- Ask your friends/parents/teachers what they think of your draft.
- Produce a final version.

Resources which might help you:

There are many websites with useful information. Here are just

a few:

Useful books include:

Alperovitz Gar The decision to use the atomic bomb Fontana

Hersey J. Hiroshima Penguin

Jungk. Robert Brighter than a thousand suns Penguin