# Oppenheimer.

Have you seen the ‘Hollywood’ blockbuster film ‘Oppenheimer’?

Have you watched the Netflix/BBC IPlayer series ‘Oppenheimer’?

Have you read the Kai Bird, Martin Sherwin ‘American Prometheus’ 700 page Oppenheimer book that took 25 years to complete?

If the answer is yes to all these questions, then surely you should be as excited as I am about following an incredible story of immense importance that gives great insight into the human behaviour of very talented scientists and engineers.

The book has many messages for contemporary life and I do wonder whether current and future generations will also see some of those key messages that will affect the future lives of everyone, everywhere?

- **‘Oppenheimer’** is about the way early 20th Century advances in atomic physics resulted in high-level Physicists coming up with the concept of atomic fission and the realisation that this could create an Atomic Bomb.
- During the 1939-45 Second World War scientists in both Germany and the Allied countries, (USA, UK and Russia) became aware of this possibility and in particular, the Governments of the USA, Canada and UK realised that whoever succeeded first would hold a massive strategic advantage. America took the lead in the race to manufacture an Atomic ‘gadget’ and in relative secrecy the ‘Manhattan project’ was set up at a remote location Los Alamos in 1942, bringing together Robert Oppenheimer, with other great scientists and engineers in order to win the race to be first.
- By 1945, the war was essentially won against Germany, however the American Government used the Los Alamos Atomic Bomb to ‘silence’ the Japanese who had earlier entered the war alongside Germany with their attack on Pearl Harbour. The Scientists and Engineers of Los Alamos had done their job, however the final decision to use the atomic bomb on Hiroshima and Nagasaki was made by the military and USA politicians.

**‘Oppenheimer’** is an incredible story where high-level brilliant scientists made discoveries that equally outstanding engineers turned into a ‘gadget’ and where the final activation of the bomb was made by third parties (the military and politicians) with such a devastating consequence.

There are also other 20th and 21st Century examples where this ‘chain reaction’ of high-level science, followed by engineering excellence and then application by others, results in major global plusses and minuses. These examples however

have not so far ended up with such a big and obvious bang as the Los Alamos Bomb!

- In the early 20th Century scientists and engineers discovered synthetic polymers and this started a revolution that has now created the ubiquitous world of synthetic plastics resulting in both positives and negatives in relation to global plastic pollution. In 1953 a crucial 'key' that unlocked a biological revolution was discovered by Crick and Watson with the discovery of the DNA polymer double helix and since then the scientific understanding of polymer and molecular biological function has transformed the understanding of every aspect of human and animal life. Scientists have made breakthroughs and Pharmaceutical Companies have had massive financial benefit turning these discoveries into life saving drugs and treatments. Perhaps the 'Oppenheimer moment' of this development was in 2019 with the Covid outbreak. Some, but not all, believe the Wuhan outbreak was the result of a virus leak from a nearby scientific research laboratory. Whatever the source, the outbreak had a major negative effect on the entire world. The message should be clear. High-level scientific understanding can be transferred to application with both positive and negative global consequences.

- A second example of the global impact of high-level scientific discovery is the 20th Century IT revolution, followed by the current 21st Century Artificial Intelligence (AI) revolution. The 1950s saw the scientific invention of solid-state electronic devices and its first benign application in a transistor radio. Solid state Microprocessors, then computer chips followed and the information technology (IT) revolution began. Solid-state mobile phones are now everywhere and have become an integral, worldwide part of every day life.
  Computing capacity has now also become so massive that its power can match and will exceed that of the human brain. We are in the world of AI, created by many thousands of high-level scientists and engineers. Few, if any, people in the world have an understanding of the full power of this technology and third parties will be users of AI for their own financial gain and application.

There will of course be huge benefits in relying on an intellect greater than that of the human brain; however, there 'inevitably' will be downsides too. Let's hope we do learn something from the Oppenheimer story and manage to avoid a different type of 'big bang'.

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