Alan Turing: Way Of Life

I chose Alan Turing after watching the 2014 film The Imitation Game, discovering the significant impact he had on World War II and his relatively unknown contributions. His work as a Computer Scientist, Engineer, Mathematician, and Philosopher lead to the foundation of many current technologies and new scientific fields. The inventions he both theorized and designed promoted a number of victories for the allies and supported the development of modern personal computers.

Turing was born on June 23rd of 1912, the son of a civil servant working for the Indian Civil Service (ICS). Thus, Turing was taught at top private schools, entering a well-known independent boarding school at age 13 by the name of “Sherborne School”. He began to show signs of high intelligence and talent amongst his teachers, gravitating towards his natural interest in mathematics and sciences. Nevertheless, Turing lacked motivation and comprehension in his classical studies, such as English, often being criticized by his teachers for his messy handwriting. Alan Turing’s main motivation for his work is presumed to many to be for the science and betterment of others; not status, fame, or wealthiness. In terms of higher education, Turing studied mathematics for four years at Cambridge University, from 1931 to 1934, graduating as a first-class honors student. In 1936, Turing presented a paper that coined the notion of a universal machine, later referenced as the “Turing machine” with the capability of computing any calculations, a necessary predecessor to the modern computers of today. Afterward, he moved to New Jersey to study mathematical logic at Princeton University. Within two years, he completed his Ph.D. at the age of 26. Alan Turing then returned to Cambridge to work at a government job decrypting german communication messages, right around the start of World War II.

Enigma was a german device that encrypted messages meant to be used over radio signals for military and diplomatic communication. The machine used a mechanism that would scramble the twenty-six letters of the alphabet using a different code every day. Initially, Turner created the Bombe at Bletchley, a government facility, to decipher enigma messages. However, the number of possible combinations was far too great to calculate in one day, approximately 151 trillion. Nevertheless, he figured out that by inputting some known words at the start of each day it would limit the number of possibilities to 17,576 combinations. For example, distinguished abbreviations and words were identified every day in the german daily weather forecasts. The bombe would limit an incomprehensible amount of sequences of enigma codes to a manageable few, then be used for further analysis. Later, at least two hundred of the machines were built and placed in differing military locations all over England, the United States Navy designed their own version as well. By knowing the location of the German U-boats, could direct their allied convoys from them. The “breaking of an enigma” was also essential for winning the allies the Battle of the Atlantic, a battle between the western allies and Germans for the power of Atlantic sea routes, and other crucial attacks such as D-day. Many historians estimate that without these advancements the war would have continued for two more years and cost two million more lives.

After the war, Turing moved to London working for the National Physics Laboratory, designing computers for the government. During this time he was credited for designing the first personal

computer and what went on to be known as a Universal Turing Machine, a machine able to be programmed to perform any calculation. He also went on to serve in the Mathematics and Computing departments at the University of Manchester. In a 1950s paper referencing future artificial intelligence, he created the Turing Test. A test determining whether a computer can exhibit human behavior that is indistinguishable to a human. This benchmark influenced and sparked the discussion over artificial intelligence. In the middle of this cutting-edge work, during an investigation into the burgling of Alan Turing's house, he confessed to a relationship with another man. Being charged and convicted with "gross indecency", he was served with twelve months of hormone therapy or imprisonment. After a year off the treatment, he was found deceased in his bed, poisoned by cyanide. The official coroner's investigation concluded that the death was by suicide. A popular theory was that his suicide was a result of the symptoms of the strong medications and taken by a half-eaten apple found near his bed. While the apple had never been tested for cyanide, some had theorized that death could have been caused by accident, due to unintentionally inhaling hazardous fumes from a laboratory in his house. Some have also gone on to rule his death as a murder by the secret services, as Turing had a hold on significant classified material and homosexuals were noted as threats to national security. After a deliberate internet campaign, Prime Minister Gordon Brown candidly apologized for Turing's "utterly unfair" treatment by the government. Years later, in 2013, Queen Elizabeth II granted Turing a royal pardon.

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