Science, technology and the environment: Utopia and dystopia

The development of human civilisation

The history of science and technology is as old as mankind. Since human beings are naturally curious, they have always tried to comprehend the natural and physical world around them. One of the earliest examples of this is the observation of the stars, the planets and the moon.

Man has always used tools to change and manipulate the environment. In this respect gaining the mastery of fire marked an early turning point in the evolution of mankind, because of its many different uses: It provided heat, was used for the preparation of food and made it possible to shape raw materials.

The next milestone was the transition from hunting and gathering to agriculture, which took place during the latter part of the Stone Age (around the year 8000 BC). The social changes which came with this **Agricultural Revolution** were enormous. Social groups settled down and became larger, calling for more governmental organisation. Since farming provided a reliable supply of food, not everybody had to collect food any more and some people could become specialised craftsmen. At about the same time, the wheel was invented, which enabled the development of new means of transport and, what was probably more important, helped to harvest energy (e.g. water wheels, windmills).

The next major change – the **Industrial Revolution** – did not take place until the middle of the 18th century, but several inventions and progress in science had prepared the way: the development of the modern printing press by Johannes Gutenberg in the middle of the 15th century, progress in mathematics and chemistry and the discovery of atmospheric pressure, which led to the invention of the steam engine. The relationship between science and technology came closer than ever before. The pace of technological progress on the basis of systematic scientific research was increased by the foundation of new colleges for engineering.

The changes in society were dramatic. People no longer worked on the land or at home, but in factories built near the coal mines. Towns grew around the factories. Patterns of work changed as manufacturing processes were broken down into smaller parts to make better use of the new production lines. The standard working week was introduced. Steam engines gave working people the opportunity to travel by train to work from dormitory towns. In countries like Britain the Industrial Revolution was completed by the end of the 19th century. The final push into the modern era came with the discovery of electricity, the invention of the automobile and the production of the first synthetics.

The most recent dramatic change began in the 1950s. It is sometimes referred to as the **Technological Revolution**. Our age is sometimes called the **Computer Age** or the **Information Age**. Miniaturisation made it possible for the computer to become an everyday object. The power of computers to store and process information has put them at the centre of the new technological age. Another technology that is changing or could change our lives dramatically is **biotechnology**. Its three branches, genetics, embryology and microbiology, are considered to be the most important – maybe also the most dangerous – development from the second half of the 20th century.

Controversial attitudes – blessing or curse?

Although the majority of the population was still enchanted with technological advances in the 19th century, due to their beneficial effect on the standard of living and on life expectancy, there were already a few warnings. Most technological processes produce unwanted by-products (waste and pollution) in addition to the desired products. Moreover, new technologies seem to create a set of waste products which were previously unknown e.g. radioactive or electronic waste. It is impossible to forecast long-term effects of these. Negative effects on the environment (e.g. the greenhouse effect) have become major global challenges today.

However, there are also some new technologies designed specifically with the environment in mind (e.g. recycling). But not only the environment has been affected by technological progress. There have been fundamental changes in society, too, e.g. the loss of jobs due to automatic production lines. At the same time the moral and ethical foundations of our society are affected by the controversy over progress in biotechnology. The question is whether we have the right to play God.

Literary reactions to social and technological changes: Utopia and dystopia

The term '**utopia**' makes a play on two Greek words: *eu-topos* (good place) – denoting a region of happiness and perfection, as well as *ou-topos* (no place) – naming a region that does not exist anywhere. Sometimes the societies described are meant to represent the perfect society, and sometimes they are created to satirise existing societies.

The term '**dystopia**' (bad place) has come to be applied to works of fiction which present a very negative imaginary world, thus replacing the older term '**anti-utopia**'. Dystopian stories project current negative tendencies in society and politics into the future. They are usually meant as a warning.

The history of utopian/dystopian fiction

The first utopia was Plato's *Republic*. Written in **400 BC**, it presents in dialogue form the idea of an ideal commonwealth. In **1516** Thomas More, an Englishman, wrote a book in Latin about a perfect society on an imaginary island. The book was called *Utopia*, which is also the first time this term was used. The society he describes can be regarded as a primitive form of communism where private property has been abolished, education is available to everyone, men and women are equal and religion can be practised freely.

The second half of the **19th century** saw another increase in utopian fiction. Most of the works were triggered by the harsh economic conditions brought about by the Industrial Revolution and the development of commercialism and capitalism. This also led to pessimistic visions of the future beginning to show up in literature.

The **20th century** with its opportunity for a planned society was dominated by bitterly anti-utopian, or dystopian, fiction. The most prominent novels were Huxley's *Brave New World* and Orwell's *1984*. Huxley describes a society which at first sight is perfect: people in the *Brave New World* enjoy a high standard of living and there is political

and economic stability. The standard of living in Orwell's *1984*, however, is much lower than the one enjoyed by most protagonists in his contemporaries' works. An elaborate system of instruments and strategies helps to control and manipulate the population. The dystopian societies described in these two and other later novels have certain common traits: there is a lack of democracy; the individual is suppressed; there is a strict conformity among citizens; social mobility is non-existent. Furthermore, modern dystopian fiction has another typical characteristic: The societies depicted seem familiar to the reader, who can identify trends or patterns in his world that would lead to the dystopia. For example, George Orwell's *1984* shows a society where privacy does not exist and citizens are constantly watched by Big Brother. It was intended as a warning against totalitarian regimes. Another trend in the second half of the 20th century was the popularity of science fiction and fantasy promoted by the possibilities which modern forms of media e.g. film, offered. The dividing lines between these two genres and between utopia/dystopia are blurry. Occasionally utopian and dystopian fiction is regarded as one branch of 'speculative fiction', which also includes science fiction and fantasy.

Speculative Fiction

Subgenre	Utopia/dystopia	Science fiction	Fantasy
Definition	genre dealing with an ideal society or world (utopia) or presenting the horrors of life in oppressive societies	genre dealing with the positive/negative effects of scientific developments or discoveries on society	genre using magic and supernatural elements in settings, plots and/or themes
Media	mainly novels/short stories; some films based on them	found in almost every medium (e.g. novel, comics, radio, film, music)	found in almost every medium (e.g. novel, comics, film)
Examples	Huxley, *Brave New World*; Orwell, *1984* (see above)	Wells, *War of the Worlds* (novel & adaptation for the radio) Films: *Star Wars, Gattaca, Minority Report* TV: *Star Trek*	Tolkien, *Lord of the Rings* (novels and films) J.K. Rowling, *Harry Potter* (novels and films)