TIMELINE – CHAPTER 4

THE HUMAN ORGANISM AND THE PERCEPTION OF LIGHT AND SOUND

1997 Invention of the DVD

The DVD is an optical digital disk with many applications: it can be used for video, audio, data storage, and other similar things. It looks like a CD, but the coding format and the density of information contained on the two disks are different. Many people and many different companies worked on developing the DVD. This type of disk was invented in 1995 and has been marketed widely since 1997. For viewing films, it quickly replaced the VHS cassette, which became the standard in the 1980s. Intitially DVD stood for "Digital Video Disk," then creators suggested "Digital Versatile Disk"; now it is referred to simply as DVD. As for the music compact disk, it had arrived on the scene in 1979 and had been marketed since 1982.

1979 Activation of the first portable telephones

In Sweden in 1979 the first portable telephones appeared. At first, they were used only in vehicles and on boats. A portable telephone operates like a cordless phone, with a receiver and an emitter linked to an antenna. The first portable telephones in vehicles were fed by a battery block or directly from the vehicle's battery. They also are called mobile phones, cellular phones or cells—reference to the division of service areas into small cells, each with an emitter-receiver (or transmitter). The network is controlled by a computer information system.

1943 Invention of the colour television

Scottish engineer John Baird, inventor of black-and-white television, presented the first public demonstration of colour television at London's Dominion Theatre. To display different colours, the television made use of three electron cannons in the cathode ray tube: one blue, one green and one red. The first television shows in colour were broadcast in 1951 in the United States, in 1966 in Canada and in 1967 in Europe.

1925 Invention of the black-and-white television

Television is the transmission by radio (electromagnetic) waves of animated images that are reproduced at a receiving station called a televiser. Scottish engineer John Baird, successful in obtaining the first true televised image in his laboratory, conducted a public demonstration in London in 1926. This television was activated by a mechanical system and heralded the official birth of television in Europe. Meanwhile, American inventor Charles Jenkins also was producing live images and conducting similar demonstrations. The first public broadcast to hit the airwaves was in 1931 in France, thanks to French engineer René Barthélemy. The first television sets appeared on markets in Europe and the United States in the 1930s. In Canada the first television sets did not appear until 1952.

1906 First broadcast of speech and music on AM radio

The first public radio broadcast with the sounds of voice and music was aired in the United States by Canadian inventor Reginald Fessenden. The broadcast was captured at locations many hundreds of kilometres away. He had already succeeded in transmitting voice for the first time in history in 1900 thanks to amplitude modulation (AM). Although AM radio has the advantage of being simpler in operation, FM (frequency modulation) radio has grown more quickly as a result of its superior sound quality. The first radio broadcasts on FM radio took place in 1929.

1876 Invention of the telephone

In 1876 Scottish-born American inventor Alexander Graham Bell patented the telephone he invented, initially a simple machine that transformed sound into electrical signals. After travelling through a wire to a distant destination, the signals were converted by another machine into sounds. The first telephones featured only a microphone and a speaker, but had no dial. A hooked cradle for the speaker on the side of the device was used to place a call to the operator. In 1877 American inventor Thomas Edison perfected the telephone by adding a microphone that improved the quality of voice transmission. The rolling dial was added in 1923 by Antoine Barnay of France; it allowed the user to call directly without passing through an operator. Later the dial was replaced by the touch-tone keypad in use today.

1874 Invention of the electrical light bulb

A Canadian student invented the electrical light bulb, which was then perfected in 1878 by English chemist, physicist and inventor Joseph Swan and American inventor Thomas Edison, who patented the device in 1879. This first incandescent bulb was made with a carbon filament in a vacuum bulb. When a weak voltage was applied, the filament burned, providing light for several hours.

1849 Precise measurement of the speed of light

The first estimate of the speed of light was made in 1676 by Dutch astronomer Oläus Römer, who was studying the movement of the satellites of Jupiter. He evaluated the speed of light at about 215 000 kilometres per second (km/s). In 1849 two French physicists were able to measure the speed of light more accurately using different methods inspired by the experiments of Galileo. Hippolyte Fizeau, using a light source, a rotating notched wheel and a mirror, was first. His evaluation was 315 300 km/s, an overestimate of the precise speed now known. Next was Léon Foucault who, with the use of a rotating mirror, succeeded in 1862 in establishing the speed of light at 298 000 km/s—very close to the exact speed, which is rounded to 300 000 km/s. These experiments proved that light is a wave (composed of electromagnetic waves).

1801 Discovery of ultraviolet rays

Ultraviolet rays, wavelengths of greater length than the spectrum of visible light, were discovered by German physicist Johann Willhelm Ritter, who studied their action on silver chloride. This phenomenon led to the development of photographic plates.

1636 Measurement of the speed of sound

The speed at which sound waves travel (the speed of sound) was first measured by French mathematician and philosopher Martin Mersenne. Scholars made further attempts to measure the speed of sound through various experiments, such as placing cannons at different heights. Eventually the actual speed of 343 metres per second (m/s) was ascertained with the help of many experiments conducted by European scientists—French, English, Dutch, Italian and German—and in the 18th century by French astronomer and physicist François Arago. Later, in the 1820s, studies were done in atmospheres other than air: in water and in solids.

1589 Discovery of how prisms can split light

In his writings on lenses, Italian physicist Giambattista Della Porta reported on optical experiments with a triangular prism. Around 1666 Isaac Newton clarified this discovery and demonstrated by using a prism to disperse colours that white light is composed of different colours. He came to this conclusion by studying the phenomenon of refraction, in which light changes direction when it passes from one medium to another: from the air to the prism and from the glass to the air. He showed that different colours of light come from its refraction at different angles.

1285 First use of corrective lenses for the eyes

Invention of corrective eyeglasses is attributed to Italian physicist Salvino Degli Armati. They were composed of convex lenses in circular frames made from different materials, often with a handle. These glasses, used for reading and writing, were meant for near- and far-sightedness. Toward the end of the 15th century, concave lenses were invented to correct myopia. In the 18th century, earpieces were added to eyeglasses to hold them in place behind the ears; people no longer had to hold them with their hand or wear uncomfortable pince-nez.

CIRCA 50 Demonstration of the law of reflection

While the laws of the reflection of light have been known since antiquity, it was around the year 50 that Greek engineer and mathematician Heron of Alexandria explained that the angles of incidence and reflection of light rays are equal, thus allowing light to travel the shortest distance possible. The same is true for flat and convex mirrors. Fermat's Principle, established in 1657 by French mathematician and physicist Pierre de Fermat, clarified this rule by stating that light rays take the path of the least distance.

CIRCA –2500 Use of a darkroom to produce an inverted image

In China philosopher Mo-To made a discovery that would have an important impact on the history of photography. He observed that light coming into a room through a small hole projects onto the opposite wall an inverted image of objects situated in front of the hole. Later in the fourth century B.C., Greek philosopher Aristotle used the same principle to observe solar eclipses in a darkroom. In the 11th century, Arabic mathematician and physicist Ibn Al-Haytham Alhazen used a darkroom to study phenomena related to light. Around 1839 this principle was applied to develop the technique of photography and the same technique is still used in all cameras.