TIMELINE – CHAPTER 7

THE HUMAN ORGANISM AND THE EXTERNAL WORLD

1989 First graft of fetal brain tissue to treat Parkinson's disease

Parkinson's disease, a degenerative illness of one type of neurons in the nervous system, causes symptoms such as shaking, stiffness of extremities and impaired movement. To treat this illness, a group of Swedish researchers performed the first graft from human fetuses of neuron-containing tissues, which secrete dopamine, a substance deficient in those who suffer from the disease. The tissue is grafted directly onto the brain of a patient by a technique that has since spread to the United States and throughout Europe.

1949 First use of lithium to treat certain kinds of mental illness

The first efficient treatment of a mental illness such as bipolar disorder (manic depressive psychosis) was developed by Australian psychiatrist John Cade. It was a treatment using lithium salts, or lithium carbonate. This substance is believed to have a positive effect on active receptors of the membrane of neuron cells. Lithium salts are used to help stabilize a patient's mood and today are the most widely prescribed treatment for this type of mental illness.

1929 Invention of the electroencephalograph: recordings of brain activity

An electroencephalograph is a curve traced onto paper representing the electrical activity of the brain as measured by electrodes attached to the skull. German neurologist Hans Berger developed the technique and recorded the first signals of the brain's electrical activity. This new technique was further developed in the 1950s and gave rise to many studies of the brain's electrical activity within the context of different diseases of the nervous system—epilepsy, in particular.

1851 Invention of the ophthalmoscope for examining the retina

To assess the health of an eye, an examination of the retina—part of the back of the eye—is essential. An ophthalmoscope is used to conduct such an examination. This instrument was invented by German physicist Hermann von Helmholtz. The basic tool was comprised of a mirror and a hole through which an examiner could look at a patient's eye by making use of an external light source reflected in the mirror. It was perfected in a number of stages and the ophthalmoscope used today contains its own light source. The instrument also can be used to examine other parts of the eye such as the cornea, the iris and the lens.

1837 Discovery of neurons

Purkinje cells, named after Czech anatomist and physiologist Jan Evangelista Purkinje who discovered them, were the first neurons (nerve cells) to be described. Neurons are the principal cells in the cerebral cortex (outermost layer of the brain) and are involved in the learning of movement. Some years later, in 1865, German physician Karl Deiters suggested the modern representation of a neuron with its different parts. In 1891 Wilhelm von Waldeyer-Hartz, a German anatomist, named nerve cells *neurons*.

1795 Development of electrotherapy for the treatment of facial paralysis

This ancient medical technique involves the use of electricity to treat illnesses. Electrical shocks produced by an organ of "torpedo" fish, for example, were used to treat ailments such as migraines. Later in the 18th century as attempts were made to better understand the mechanism behind these electrical shocks, their application to treat facial paralysis was developed. During the 1830s French physician Guillaume Duchenne de Boulogne developed different applications for the use of electricity in treatment of muscular atrophy and paralysis.

1756 Discovery of the action of nerves on muscles

Swiss doctor and botanist Albrecht von Haller demonstrated that muscles contract in response to action of the nerves. Today the effect of nerves on muscles is known to be of an electrical nature. In the late 18th century Italian physicist and doctor Luigi Galvani used experiments on frogs to show that muscles contract from the action of electricity. Alessandro Volta, an Italian physicist, used these findings to invent the electrical battery.

CIRCA 1160 Discovery of the retina's role in vision

The retina is a thin membrane of nerve cells at the back of the eye. It transforms an image into a nerve signal that the brain can understand. Thanks to the retina, colour and motion can be perceived. Its role in vision was discovered by Arabic doctor and philosopher Averroès (Abu–al-Walid ibn Ruchd). He demonstrated that the retina is a sense organ of the eye receptive to light.

CIRCA –275 Discovery of nerves

Greek doctor and anatomist Herophilius of Alexandria, who founded a medical school in Alexandria with Erasistratus, studied the brain and concluded that it was the centre of the nervous system. Following his work on dissection of the human body, he was the first to make a distinction between arteries and veins and between nerves and blood vessels. He discovered motor nerves and sensory nerves.

CIRCA –1300 Perfecting of cataract operations

In ancient Egypt, diseases of the eye were common. Typical was a cataract, which makes the lens of the eye opaque, weakening vision and often leading to loss of sight. At the time, surgery involved reduction of a cataract instead of its removal. It was French doctor Jacques Daviel who around 1750 developed the first modern cataract-removal operation. Today the lens of the eye can be surgically replaced by a synthetic lens implant.

CIRCA –3000 First treatment of a broken bone by immobilization

It was in Egypt that the first immobilizations were practised to heal bone fractures. Strips of cloth soaked in mud and wrapped around a limb maintained the bone in place when they dried. Today doctors in many cases follow the same principle with plaster to hold broken bones together.

CIRCA **–12 000**

First cranial surgery

In prehistoric times, the oldest form of surgery was practised using tools made of flint: trepanation, or the drilling of a hole in the skull. Remains of skulls having undergone such an operation have been found dating back to the Mesolithic era. Different theories have been formulated about the reason for trepanation—it is believed, for example, that trepanation was used to treat mental or neurological illness or even persistent migraines. In ancient Greece around the fourth century B.C., Greek physician Hippocrates (believed to be the father of modern medicine) decried the practice of trepanation. Still used today to remove certain tumours, the technique is now performed with advanced instruments.