TIMELINE – CHAPTER II

THE HUMAN ORGANISM AND THE DEVELOPMENT OF TECHNOLOGY

2009 Planned inauguration of the world's highest tower in Dubai (United Arab Emirates)

Construction of the Burj Dubai tower began in 2005. When completed, it will stand 750 to 950 metres tall and contain 160 floors. It will be taller than the Taipei 101 (101 floors) in Taiwan, which measures 508 metres in height and was built in 2004. Long considered as the world's tallest tower, the Empire State Building in New York was completed in 1931 and stands 381 metres in height. It held the record for 41 years. The Twin Towers (415 metres and 417 metres) of the World Trade Centre took the title when they were built in 1972, followed by Chicago's Sears Tower at 442 metres, which set the record in 1973. By comparison, the Eiffel Tower, constructed in 1889, stands 325 metres tall (counting its different antennas). It was the tallest structure in the world until the construction of the Empire State Building was completed in 1931.

1976 Completion of construction of the CN Tower in Toronto

Reaching 553 metres in height, Toronto's CN Tower was completed in 1976. At first, the tower was owned by the transportation company Canadian National, which is why it is called the Canadian National Tower or CN Tower. The Canada Lands Corporation purchased the tower in 1995. It is among the seven wonders of the modern world (20th century monuments) according to the American Society of Civil Engineers.

1963 Development of the first software for technical design

While studying in the doctoral program at MIT (Massachusetts Institute of Technology), computer scientist I. Sutherland invented Sketchpad, the first technical design software. This type of software was a precursor to the field of computer-aided design (CAD).

1938 Invention of the ballpoint pen

Hungarian journalist László Biró developed the first ballpoint pen with his brother Georg. Their invention combined a fast-drying ink, which had been developed for newspapers, and a nib containing a ball that rolled freely. The first prototype (principle of a rolling ball) for a ballpoint pen had been advanced by American John J. Loud. The Biró brothers marketed their invention and founded the Biró Pen Company, calling their product *birome*—still commonly used in Argentina to refer to a ballpoint pen. The disposable ballpoint pen—known as the Bic—was created in France by Marcel Bich in 1953.

1917 Completion of the Québec Bridge: world's longest cantilever type

Construction of the Québec Bridge began in 1900. The choice of a cantilever design allowed for greater distance between pillars. The bridge collapsed during construction in 1907, was rebuilt the following year and completed in 1917. The official inauguration was held two years later. The bridge measures 987 metres in length and has the longest span in the world: 549 metres. It is followed by the Forth Rail Bridge in Scotland (1890), which has a span of 512 metres (for the two main arches) and measures 2.5 kilometres in length. The Québec Bridge was declared an international historical monument on May 23, 1987 by the Canadian and American Societies for Civil Engineering (CSCE and ASCE). The Jacques-Cartier Bridge, built in 1930, and the Champlain Bridge, built in 1962, serve Montréal and are the same type of construction as the Québec Bridge.

1896 Opening of the school of architecture at McGill University, Montréal

Before the end of the 19th century, an education that specialized in architecture was rare in Canada. Architects learned their trade from their employer, or came from England or the United States where they had already studied. When the growth of urban centres created a greater demand for architecture specialists, the first Canadian school of architecture was opened in 1890 at the University of Toronto in Ontario. The first school of architecture in Québec opened its doors at Montréal's McGill University in 1896. In 1907 the first French-language school of architecture was founded at Montréal's École Polytechnique; in 1964 this school was integrated into the Université de Montréal. Today there are 10 recognized schools of architecture across Canada.

1850 First North American manufacturer of drawing instruments

Until the second half of the 19th century, most drawing instruments used in North America came from Europe. In 1850 the first North American manufacturer of drawing instruments opened for business in Philadelphia. Today the company still bears the name of its founder—Theo Alteneder & Sons Inc.—and is run by his descendants. It is famous for having provided drawing instruments for the U.S. government during World War I.

1564 Invention of the lead pencil

In 1564 a core composed of graphite, a mineral discovered in England, began to replace lead in pencils—still called "lead" pencils to this day. The name "graphite" was coined from the Greek word *graphein* in 1779 by Swedish chemist Carl Wilhelm Scheele, who discovered that graphite is actually a form of carbon. Since pure graphite was expensive in 1795, French physicist and chemist Nicolas-Jacques Conté developed the pencil known today made of graphite mixed with clay. The proportion of the two materials determines the relative hardness of the "lead": the higher the graphite content, the blacker the line (B). The HB pencil is of medium hardness, H symbolizing the clay content, or hardness.

1040 Invention in China of the first printing press

Chinese inventor Pi Cheng created the first system of printing using moveable characters engraved in clay. The printing process was thus made easier since text could be printed by line instead of using a single large block. A printing process called *xylography* had been used previously in China. This procedure involved ink and wooden characters or long pieces of wood with relief engraving to reproduce images or texts on paper. Later in the 15th century German printer Johann Gutenberg developed and familiarized the West with the printing process when he printed his famous Bible using moveable metal type. During the Middle Ages books were reproduced by copyists working by hand.

CIRCA –30 Drafting of the first known treatise on architecture

During this period in the first century B.C., Roman architect Vitruvius (Marcus Vitruvius Pollio) wrote his famous treatise on architecture, which is also the oldest such work. In the course of ten volumes the author presents the architectural techniques of Ancient Rome, from skills of the craftsmen to construction materials and use of machines. This treaty, written in Latin and entitled *De Architectura*, was first translated into English (*The Ten Books on Architecture*) in 1543.

CIRCA –2000 Invention of the alphabet

The alphabet is one of humanity's greatest inventions. The Phoenicians, great explorers of the Middle East, invented the ancestor of the modern alphabet during the second millennium B.C. They simplified the two systems of writing at the time: cuneiform used in Mesopotamia, hieroglyphics used in Egypt. The Phoenician alphabet was the first system to replace the use of images and symbols to represent actions and objects, with letters that formed words as they were read. This alphabet contained only 22 consonants; vowels were introduced by the Greek alphabet in the ninth century B.C. The Phoenician alphabet is the ancestor of nearly all modern Western alphabets—including the Latin alphabet, which is the basis for languages such as French, Spanish, Italian, English and German.

CIRCA –3000 First appearance of hieroglyphics

The Egyptians first used hieroglyphics on the walls of their temples, sculpting or painting them. This form of writing was later found on tombs, papyrus, pottery and the like. Many alphabets with Latin characters grew from this system and some are still used to this day: the Phoenician alphabet, then the Greek, Hebrew, and Armenian alphabets. Hieroglyphics are a form of figurative writing that was used for more than 3000 years. When drawing their hieroglyphics, the Egyptians drew inspiration from the environment: objects from daily life, animals, plants and parts of the body. It was only in the early 19th century that French Egyptologist Jean-François Champollion began deciphering hieroglyphics. Cuneiform, another writing system that used pictograms, appeared around the same time in Mesopotamia.

CIRCA –80 000

Discovery of oldest known geometric figures

In the Blombos cave, a prehistoric site in South Africa, the first stones engraved and painted with geometric carvings or lines were discovered. This is one of the first manifestations of prehistoric art by modern man. American professor Christopher Henshilwood of New York University discovered these artifacts during an expedition in 2002.