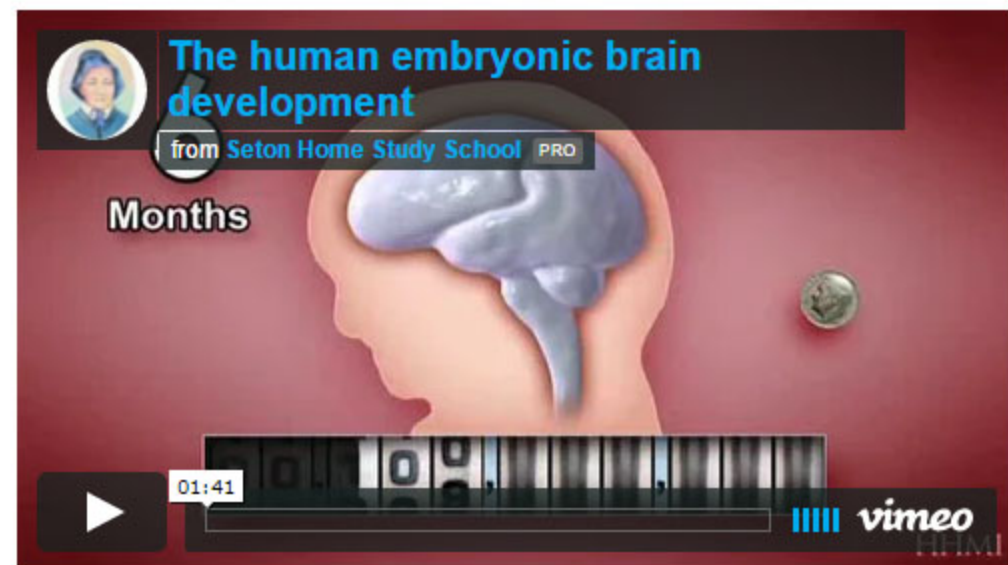


D. Weeks Five to Seven

The fifth week through the seventh week is a time of continued organogenesis and growth. The **embryo** has grown 10,000 times in size, a **brain** has developed, and blood is flowing through its vessels! The **head** grows rapidly and becomes round and erect. The eyes, nose, and **mouth** develop and form the face of the baby. This may seem like great progress, and it is, but the developing baby needs to progress more as it marches on toward the trillion cells that will be present in its body at birth.

At six and one-half weeks, all of the twenty milk tooth buds are present. The arms and legs are no longer buds but limbs. They begin to elongate, and fingers and toes emerge from the previous elbow-like buds.

All of the major organs have formed and continue to grow, giving the body a more human-like form. **Glucagon** [glü-ka-gon] has been found in the **embryo's pancreas** as early as the sixth week, and **insulin** by the seventh or eighth week. At the eighth week, the baby's **stomach** is secreting gastric juice. The presence of **glucagon**, **insulin**, and gastric juices are strong evidence for the complexity of life, even in these early stages of development.



Sometime during the end of the fifth and the beginning of the sixth week, **brain** waves become detectable with an instrument known as an **Electroencephalograph** [ē-lēk-trō-ēn-sef-a-lō-graf] (**EEG**). This was first reported in the Journal of the American Medical Association in October 1964. Not only is the **brain** working at this stage, but also signals are transmitted along the nerves.

During these weeks, the movement of the **embryo** is quite extensive, and has been documented by many scientists and doctors. In 1986, Dr. Liley photographed a fascinating display of embryonic movement by capturing a baby sucking his thumb. Another scientist, L. B. Arey, described in his textbook the following displays of motion in the womb: "By the sixth week, if the area of the lips is stroked, the child responds by **bending** the upper body to one side and making a quick backward motion with the arms. In the eighth week, if you tickle the baby's nose, he will flex his **head** backwards away from the stimulus."

Likewise, an article by Dr. James Dobson gives the following account: "When a surgical technician opened the abdomen for a tubal **pregnancy** (the fertilized ovum developed within the **Fallopian tube**), the tube expelled a 1-inch long child, about 4-6 weeks old. It was still alive in the sac and the tiny baby was waving its little arms and kicking its legs and even turned its whole body over."

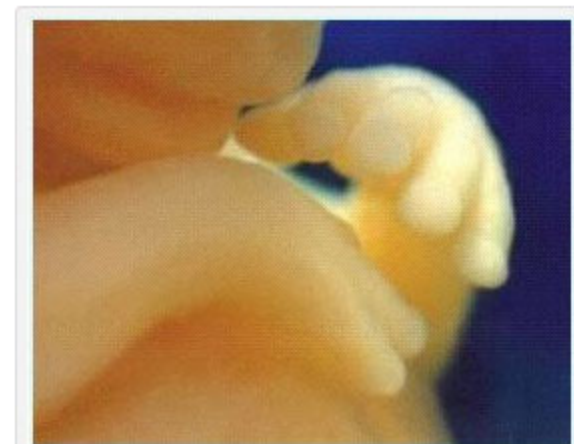


Figure 1-8. Preborn baby sucking its thumb.

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Quarter 3

CHAPTER 9



REPRODUCTION AND
REGULATION OF THE CELL

CHAPTER 10



SINGLE-CELLED
ORGANISMS AND FUNGI

CHAPTER 11



THE PLANT KINGDOM

CHAPTER 12



INVERTEBRATES: PART I

2.2 Cells: the Building Blocks of Physical Life

Section Objectives

- Discuss the three parts of the cell theory.
- Name five functions of the cell.

An organism is a form of life. If we interpret the word "form" using the Book of Genesis, we might understand it as "kind." There are many organisms, and scientists called taxonomists place these in five kingdoms: Monera, Protista, **Fungi**, Plantae, and Animalia. Some organisms are **unicellular** (single-celled) and very small and are called microorganisms. One such microorganism that lives in our digestive tracts is a bacterium known as *Escherichia coli*. It is in the **Kingdom** Monera.

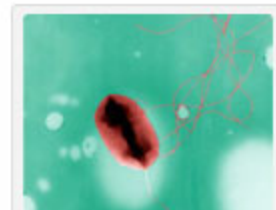


Figure 2.1-1. *E. coli* bacteria.

Obviously, other organisms with which we are familiar, especially plants and animals, are **multicellular**, or composed of many cells. Humans are multicellular, because the human body contains trillions of cells. The complexity, **order** and functions of these trillions of tiny cells are evidence of the existence of God, as well as God's creativity and **intellect**.

Cell Theory

In 1665, Robert Hooke, an English scientist, examined a slice of cork under a microscope. Hooke noticed that the cork was composed of many small compartments. Hooke named these compartments "cells" because they resembled the little rooms, or cells, of a monastery. As you may recall from your reading of the lives of the saints, many monks lived in large monasteries, but they slept or prayed in tiny rooms, or cells, often with only a bed and a table.

The cork cells seen by Robert Hooke were nonliving. Hooke did not pursue the study of the **structure** and function of living cells. However, almost 200 years later, in 1835, Felix Dujardin, a French biologist, determined that many living microorganisms were composed of a single cell. He also observed that the internal substance of all living cells was similar.

In 1838, Matthias Schleiden, a German botanist, reported that all plants were composed of cells. Shortly thereafter, Theodor Schwann, a German zoologist, concluded from his studies that all animals were composed of cells. About two decades later, Rudolf Virchow, another German, observed cells that were in the process of dividing and concluded that cells can arise *only* from other cells.

The observations from the above scientists formed the basis of Cell Theory, which states:

1. The cell is the basic unit of structure for all living things.
2. The cell is the basic unit of function for living things.
3. All cells come from other cells by the process of cell division.

Cell Functions

Most cells are a little less than 10 micrometers in length. One meter is equal to 39.37 inches, and 1 micrometer is one millionth of a meter, or one millionth of 39 inches. About 2,000 cells can fit across the width of your fingernail. As tiny as these cells are, their functions are truly amazing to study. All cells require energy from food in **order** to perform their functions. The process by which organisms obtain and use food is called **nutrition**. Some cells are able to make their own food, while other cells must obtain food from their environment.

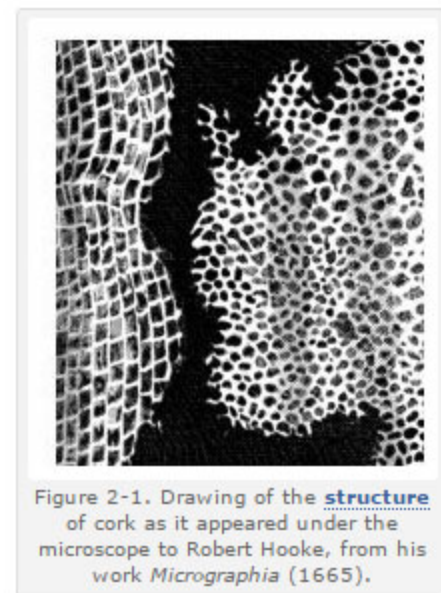


Figure 2-1. Drawing of the **structure** of cork as it appeared under the microscope to Robert Hooke, from his work *Micrographia* (1665).