

A LINE ON LIFE

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The Human Brain

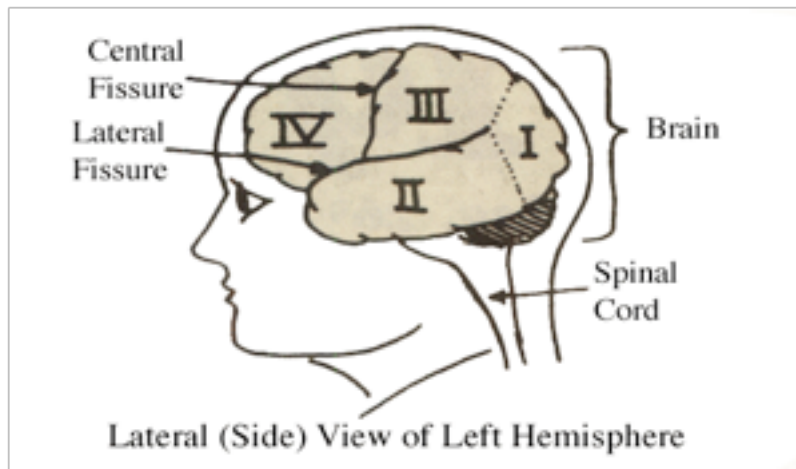
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How do humans differ from animals? Some say that humans have a soul, while animals do not. Unfortunately, science cannot measure or detect the presence or absence of soul. However, science is aware of other significant differences:

1. a hand with an *opposing thumb* for fine manipulation of tools,
2. more developed *vocal cords* for language, and
3. a better developed *brain*.

How does our brain differ from that of animals?

Although we share the primitive portions of our brain with animals, our **cerebrum** is more developed and larger. In humans, the cerebrum is the large wrinkled portion that covers other parts of the brain. In fact, it makes up about 85% of the human brain. The outer part of the cerebrum is called the **cortex** (bark). There are two **hemispheres** (half-spheres) of the cerebral cortex.



As shown in the illustration, each hemisphere of the cortex consists of four lobes. The lobe at the back of the head is the **occipital lobe** (I). It governs our *visual perception*. This area combines pinpoints of light and dark into angles and curves. It then interprets them as specific objects in our environment — from simple geometric figure to trees, flowers and the faces of relatives and friends.

In front of the occipital lobe, but just below the large wrinkle

called the **lateral fissure**, is the **temporal lobe** (II). In its top central portion, the temporal lobe senses the basic elements of *hearing* — tones, duration and rhythm. Surrounding areas interpret these tones as noise, music, language and other meaningful sounds. Inner portions of the temporal lobe receive nerve signals that are interpreted as various *odors*.

The **parietal lobe** (III) is above the lateral fissure, behind the **central fissure** and in front of the occipital lobe. The area of the parietal lobe that runs along and just behind the central fissure receives nerve impulses from all parts of the body related to *pressure*, *cold*, *heat* and *pain*. However, they seem to be arranged *upside-down*. Upper portions receive impulses from the legs, while the lowest portions (nearest the lateral fissure) react to impulses from the head and face. In addition, signals we perceive as *taste* seem to come from this lower area.

Notice that these first three lobes — occipital, temporal and parietal — contain sensory functions. In contrast, *motor functions* seem to originate in the **frontal lobe** (IV). As with our body senses, the primary motor area runs along the central fissure, but just in front of it. Again like the body senses, the motor

control of the legs is in the highest portion, while facial and *speech* functions are farthest down. In front of the primary motor area, the cortex coordinates and smoothes out everyday movements.

**It is the higher functions of the brain
that make us uniquely human.**

However, there are still large areas in all lobes that have no clear motor or sensory function. These areas are called **association areas**. In these areas, memory is stored, thoughts stir, questions are asked, problems are solved, dreams arise and judgments are made. Here lies the essence of human kind — the awareness of our existence and ourselves — along with the awareness of our end, our mortality.

This scientific knowledge may amaze you. However, years ago in a museum, Mark Twain was similarly amazed at a reconstructed skeleton of a huge dinosaur. The museum expert informed Twain that only four bones of the towering skeleton were real. The remaining bones were only plaster casts of what they thought the skeleton was like. In a similar way, the four bones represent what science has discovered about the brain. The plaster casts represent the unknown — the knowledge about the brain that has not yet been discovered. In other words, we know relatively little about the brain, the main physical part that distinguishes humans from other animals.

So whenever you feel "*down*" or insignificant, remind yourself of the miraculous creation of nature that you are — a feeling, thinking human being.
