Cerebrum Encyclopedia Article

Cerebrum

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The cerebrum, the largest part of the human brain, accounts for approximately 5/6 of its mass. Often regarded as the brain's thinking center, the cerebrum is divided into left and right cerebral hemispheres whose outermost layer -- the cerebral cortex -- consist of grayish cell bodies that make up most of the brain's "gray matter." The hemispheres communicate through the *corpus callosum*, or "hard body," which has a tough consistency in contrast with the brain's generally soft tissue. Below the convoluted cortex are nerves that lead to other parts of the brain and to the spinal cord. The cortex's convolutions are either *sulci*, the lines that demarcate the convolutions, or *gyri*, the brain tissue that forms ridges between the sulci. The sulci and gyri are similar in most brains and the most prominent one have been mapped and named. For instance, the *central sulcus* and the *lateral sulcus* found in each cerebral hemisphere are very prominent. The cerebral hemispheres are also marked off into regions called lobes: the frontal, parietal, temporal, and occipital lobes. Each lobe is associated with different functions, including the auditory, visual, sensory, and motor areas. One major area of the human brain is called Broca's convolution, an area associated with language. It is named after the French surgeon, Pierre Paul Broca, who in 1861 discovered through postmortem studies that patients with *aphasia*--the inability to speak or understand speech--had physical damage to the same area of the brain.

While all vertebrates possess a cerebrum, it does not have the same importance in all of them as it does in human beings. Studies have shown, for instance, that a frog's behavior changes very little even after its cerebrum is removed. It can catch flies and its sexual functioning is unimpaired. Cats, on the other hand, while still able to purr, swallow, and move to avoid pain after their cerebrum has been removed, become sluggish and robotlike in their movements. Monkeys become severely paralyzed and can barely distinguish light and dark. A human whose cerebrum was removed would become totally blind, almost completely paralyzed, and would soon die, even though able to breathe and swallow.