

# The Triune Brain

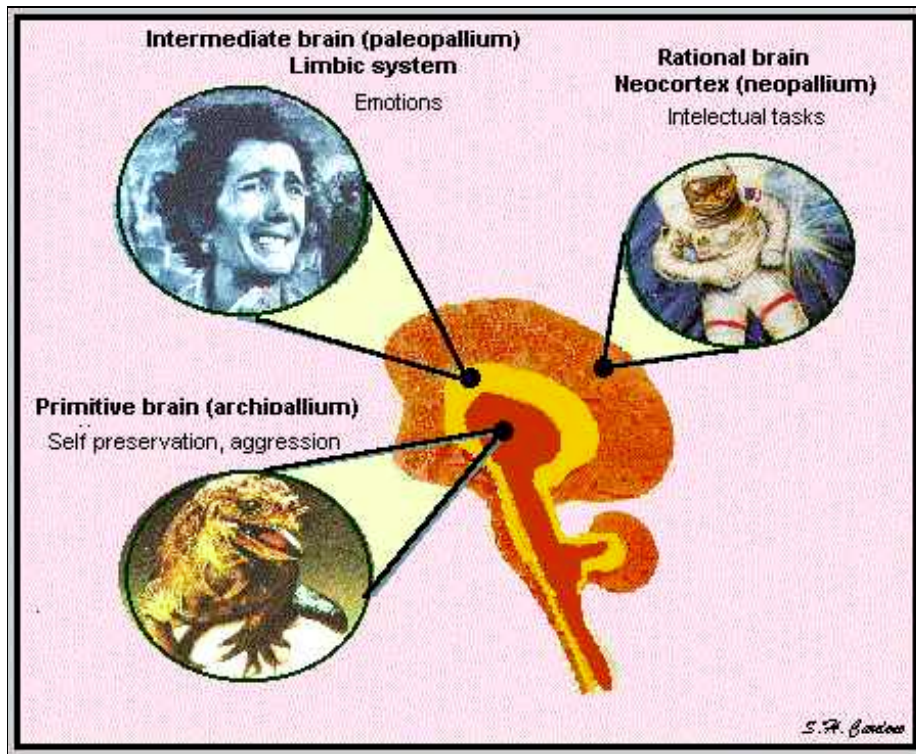



illustration from  [The three units of the human Brain](#) -  
Júlio Rocha do Amaral, & Jorge Martins de Oliveira  
(image somewhat degraded to speed up download)

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The neurologist Paul MacLean has proposed that our skull holds not one brain, but three, each representing a distinct evolutionary stratum that has formed upon the older layer before it, like an archaeological site :He calls it the "triune brain." MacLean, now the director of the Laboratory of Brain Evolution and Behaviour in Poolesville, Maryland, says that three brains operate like "three interconnected biological computers, [each] with its own special intelligence, its own subjectivity, its own sense of time and space and its own memory". He refers to these three brains as the neocortex or neo-mammalian brain, the limbic or paleo-mammalian system, and the reptilian brain, the brainstem and cerebellum (see above diagram). Each of the three brains is connected by nerves to the other two, but each seems to operate as its own brain system with distinct capacities.

This hypothesis has become a very influential [paradigm](#), which has forced a rethink of how the brain functions. It had previously been assumed that the highest level of the brain, the neocortex, dominates the other, lower levels. MacLean has shown that this is not the case, and that the physically lower limbic system, which rules emotions, can hijack the higher mental functions when it needs to.

It is interesting that many esoteric spiritual traditions taught the same idea of three planes of consciousness and even three different brains. [Gurdjieff](#) for example referred to Man as a "three-brained being". There was one brain for the spirit, one for the soul, and one for the body. Similar ideas can be found in [Kabbalah](#), in Platonism, and elsewhere, with the association spirit - head (the actual brain), soul - heart, and body in the belly. Here we enter also upon the [chakra](#) paradigm - the idea that points along the body or the spine correspond to nodes of consciousness, related in an ascending manner, from gross to subtle.

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**The Reptilian Brain.** The **archipallium** or primitive (reptilian) brain, or "Basal Brain", called by MacLean the "R-complex", includes the brain stem and the cerebellum, is the oldest brain. It consists of the structures of the brain stem - medulla, pons, cerebellum, mesencephalon, the oldest basal nuclei - the globus pallidus and the olfactory bulbs. In animals such as [reptiles](#), the brain stem and cerebellum dominate. For this reason it is commonly referred to as the "reptilian brain". It has the same type of archaic behavioural programs as snakes and lizards. It is rigid, obsessive, compulsive, ritualistic and paranoid, it is "filled with ancestral memories". It keeps repeating the same behaviours over and over again, never learning from past mistakes (corresponding to what [Sri Aurobindo](#) calls the [mechanical Mind](#)). This brain controls muscles, balance and autonomic functions, such as breathing and heartbeat. This part of the brain is active, even in deep sleep.

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**The Limbic System (Paleomammalian brain).** In 1952 MacLean first coined the name "limbic system" for the middle part of the brain. It can also be termed the paleopallium or intermediate (old mammalian) brain. It corresponds to the brain of the most [mammals](#), and especially the earlier ones. The old mammalian brain residing in the limbic system is concerned with emotions and instincts, feeding, fighting, fleeing, and sexual behaviour. As MacLean observes, everything in this emotional system is either "agreeable or disagreeable". Survival depends on avoidance of pain and repetition of pleasure.

When this part of the brain is stimulated with a mild electrical current various emotions (fear, joy, rage, pleasure and pain etc) are produced. No emotion has been found to reside in one place for very long. But the Limbic system as a whole appears to be the primary seat of emotion, attention, and affective (emotion-charged) memories. Physiologically, it includes the the hypothalamus, hippocampus, and amygdala. It helps determine valence (e.g., whether you feel positive or negative toward something, in [Buddhism](#) referred to as *vedana* - "feeling") and salience (e.g., what gets your attention); unpredictability, and creative behaviour. It has vast interconnections with the neocortex, so that brain functions are not either purely limbic or purely cortical but a mixture of both.

MacLean claims to have found in the Limbic system a physical basis for the dogmatic and paranoid tendency, the biological basis for the tendency of thinking to be subordinate feeling, to rationalize desires. He sees a great danger in all this limbic system power. As he understands it, this lowly mammalian brain of the limbic system tends to be the seat of our value judgements, instead of the more advanced neocortex. It decides whether our higher brain has a "good" idea or not, whether it feels true and right.

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The **Neocortex**, cerebrum, the cortex, or an alternative term, **neopallium**, also known as the superior or rational (neomammalian) brain, comprises almost the whole of the hemispheres (made up of a more recent type of cortex, called neocortex) and some subcortical neuronal groups. It corresponds to the brain of the primate mammals and, consequently, the human species. The higher cognitive functions which distinguish [Man](#) from the animals are in the cortex. MacLean refers to the cortex as "the mother of invention and father of abstract thought". In Man the neocortex takes up two thirds of the total brain mass. Although all animals also have a neocortex, it is relatively small, with few or no folds (indicating surface area and complexity and development). A mouse without a cortex can act in fairly normal way (at least to superficial appearance), whereas a human without a cortex is a vegetable.

The cortex is divided into left and right hemispheres, the famous left and right brain. The left half of the cortex controls the right side of the body and the right side of the brain the left side of the body. Also, the right brain is more spatial, abstract, musical and artistic, while the left brain more linear, rational, and verbal.

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## Links



[Limbic System: The Center of Emotions - Introduction: The three units of the human Brain](#) - Júlio Rocha do Amaral, MD & Jorge Martins de Oliveira, MD, PhD - overview and expansion upon of the MacLean theory.



[The Laws of Human Consciousness - Chapter Four of Laws of Wisdom](#) - by R.C.L - includes an excellent coverage of the MacLean hypothesis, as well as Jung's theory of ego-functions.



[Does HAL Cry Digital Tears? Emotion and Computers](#) - this page includes a short summary of the MacLean Triune brain theory, and interesting observations about a patient called "Elliot" with brain damage that gave him a Spock-like logical personality yet rendered him incapable of making even simple decisions.



[Crossing the Threshold of the Unconscious - Into The Basic Brain](#) - from The Three Faces of the Mind: Developing Your Mental, Emotional, and Behavioural Intelligences. **Elaine de Beauport**. The basic brain is more or less like the R-complex of MacLean's paradigm. The author however sees this as only a general association

It is difficult to find an appropriate name for the deepest brain. From the perspective of evolution it is our first brain. It was named the R-Complex by Paul MacLean, because in physical formation it is similar to the brain of reptiles. It is, however, also described in medical texts as part of the central nervous system. Although our deepest brain is similar in formation to that of reptiles, and although some of the basic activities of this brain seem very reptilian such as repetition, imitation, and deception, there are also subtleties in this brain not conveyed by these words. Especially when we take into account the link between this brain system and the entire spinal cord, including the afferent-efferent nervous system and extending to the openings of our skin, the name nervous system brain would seem to convey the much larger implications than I believe are involved.

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