

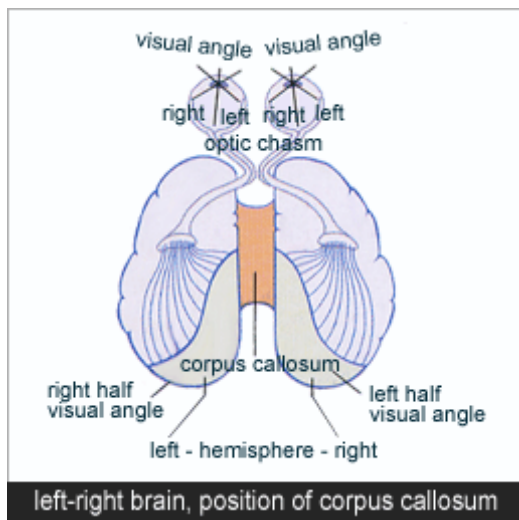
## Theoretical Background of MC<sup>2</sup>

Excerpt from "Experiment on the available effect of the learning program of MC<sup>2</sup>" 1994 (Prof. In-Jae, Lim and 3 others from Institutes of Education Research in Seoul National University)

### 1. Theoretical definition of traditional studying

Studying something was traditionally believed to be promoted by "repeated practices with concentration". It has been proved by the experiment on the effect of memory advancement by W. James and by the experiment on the effect of memorization by Ebbinghaus. Also it is focused on "repetition and practice" in functionalism and behaviorism by 5 laws of learning by Thorndike and "meaning acquisition through insight" in behaviorism.

### 2. New introduction of neuropsychical concept



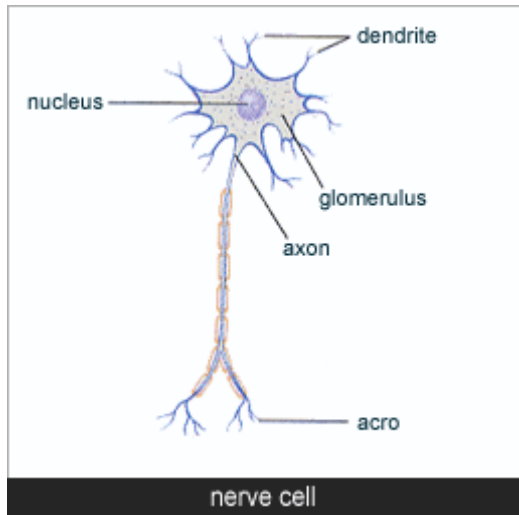
During the time the traditional academic theories find relief in the psychological research, efforts to explain academic phases in brain psychological demention have been increasing gradually. The very first attempt was done by D. O. Hebb and he tried to explain academic phenomenons relating to activities of cerebral cortex (Hergenhahn, 1988, pp338-423). Hebb insisted intelligence and perception were learned with experiences, not given from the birth as those believing in innatness insisted. According to him, people born with randomly interconnected neuropil, therefore in the course of lifetime with sense

experiences this neuropil can be organized and interact effectively with outer circumstances.

In this point of view, Hebb separated learning into two parts (childhood and adulthood) and tried to explain this with the concept of cellular aggregateness and aspects order. Cellular aggregateness and aspect order (continual activities of provisionally interconnected cellular aggregateness) is well formed with diverse stimulations in childhood period, then in adulthood period by recompositioning of aspect order more creative and cognitive learning can be achieved. In his theory, learning at childhood becomes a framework for the later learning. Therefore, it is very important to have abundant experieces in earlier period.

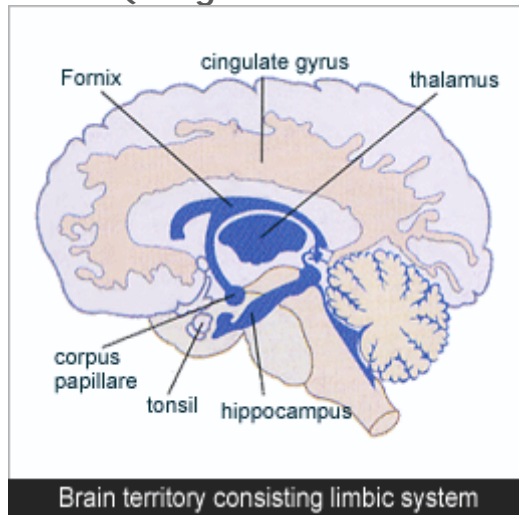
### 3. RAS Arousal Theory by D. O. Hebb

Relation between stimulation level and cognitive function is to be explained in a way of RAS Arousal theory Hergenhahn, 1988, pp401-402). RAS (reticular activation system) is located between above spinal cord and below hypothalamus size of a finger and is related to sleeping, concern, and emotional behaviors. Next, arousal or arousing function along with cue fuction is 2 major functions of neural impulse and means that through collateral produced in sense passageway



from spinal cord to RAS (hypothalamus) sense impulse increases RAS activities. Consequently, activation of RAS is an index of arousing function so vigorous activities represent high level of arousing function. It is important for RAS to reach proper level of arousing function in order to maximize guide of cue function of stimulation in the relation between arousing level and execution. If arousing level is too low, then sense information cannot be used; in contrast, if it is too high, too much information is analyzed in cortex, which will occur complication and strange behaviors. Therefore, for the most suitable cortex function it is important to have proper level of arousal.

#### 4. LPT (Long Term Potentiation) Theory By T. V. P. Bliss



LPT stimulates certain part of brain to expand or increase the activities of cerebrum such as memory, learning ability, or creativity stably. In details, disposition exists in central nervous system to store information and it shifts the efficiency of synapse, which means by strengthening the connections of synapse, the memory ability can be enhanced. Amount of learning is related to quantity of changes of synapse within activated neuropil. It represents the relation between learning and LPT. The strength of trace of memory while acquiring information (memory) and long after the time depends on quantity of synapse

changes in pertinent neuropil. It represents the relation between olivion and weakened LPT. Therefore, it becomes obvious that there is a correlation between LPT and forming memory.