



Theology of Neurology: Summary & Conclusions: The Brain's Filing System; Paths of Least Resistance; Making Memories; The Association Cortex

6. Memory, the Brain's Electrochemical Filing System:

Summary:

Memory occurs when learning provides the stimulus that causes permanent changes to take place in neural tissue. This is the transformation process mentioned in Romans 12:2 which results in the renovation of thought. New proteins are produced by the cell nucleus's DNA which then begins a process of permanently encoding the knowledge into an unique memory trace.

This memory trace is recorded forever into long-term memory and may be recalled to the conscious mind by means of the proper stimulus.

Conclusion:

The plasticity of the brain enables it to change its physical properties to accommodate a change in thought and to permanently record that change in an unique electrochemical memory trace.

7. Repetition Enlarges a Trace into a Path of Least Resistance:

Summary:

Every learning experience plus every review, every repetition, and every application, causes the memory trace to enlarge. This enlargement involves the following changes in the neural structure of the brain:

- a. Axonal and dendritic branches elongate;
- b. existing synapses becomes more excited;
- c. new synapses are created;
- d. existing connections are rearranged while new ones come together; and
- e. the electrochemical signal is intensified.

Conclusion:

- 1) As each repetition in learning occurs, alterations are made in the memory trace causing it to become more and more efficient.
- 2) The more you study the subject, the better you understand it, the easier it is to recall, and the more it becomes a part of your lifestyle.
- 3) As an example we constructed a memory trace for the doctrine of salvation and eternal security using John 3:16 as the initial input.
- 4) We enlarged it by subsequently adding information from Ephesians 2:8-9, Romans 8:1, Galatians 4:6-7, and 1 Peter 1:3-5.
- 5) We concluded that the believer at this point was doctrinally invincible on the subject of his salvation and eternal security and noted Colossians 3:1-3 and Psalm 119:105.

8. Memories Are Made of This:

Summary:



There are several different classifications of memories: episodic: specific events; semantic: meaning; declarative: content; iconic: visual short-term; and procedural: motor skills. These classifications of knowledge are retained in the brain briefly in short-term memory, or permanently in long-term memory.

No matter which classification of learning is involved, if long-term memory results, then a permanent change occurs in the neurons of the brain, most emphatically at their synapses. When you learn, four measurable changes occur in the neurons and their synapses creating a memory trace:

- a) Morphological: Structural;
- b) Dynamic: Blood flow and oxygen uptake increases;
- c) Biochemical: Synthesis of new proteins; and
- d) Physiological: Electrical properties.

Conclusion:

- 1) Learning causes the brain to expand its capacity for thought by initiating permanent change in the tissue of the brain.
- 2) This change results in the creation of memory.

9. The Association Cortex: Staging Area for Academic Understanding:

Summary:

The cerebral cortex is the outer covering of the brain and its complexity is unique to man. Human consciousness, reasoning capacity, language abilities, and decision-making occur in this cortex. In order for decision-making to occur, all pertinent data must be analyzed and brought to the individual's academic understanding. Making up the greatest percentage of the cerebral cortex is the association cortex. This area comprises the central processing center for thought, decision, and action. Human volition considers the information gathered in the association cortex and is thereby challenged to act or not act, accept or reject, believe or disbelieve. The decision to accept and believe the information initiates the electrochemical process which results in the establishment of a long-term memory trace.

Conclusion:

- 1- The association cortex is what we have identified as that area of the brain associated with the **νοῦς, nous**, the place where the Holy Spirit makes infinite divine thought understandable to the finite human mind.
- 2- Since the believer is incapable of understanding divine thought, the Holy Spirit must make it perspicuous to him.
- 3- At the point of academic understanding the believer is left free to accept or reject, believe or disbelieve the revelation.
- 4- However, even if he accepts and believes, his finite mind is incapable of processing divine thought into a memory trace.
- 5- Transfer of doctrinal truth from the association cortex into a permanent memory trace must be the work of the Holy Spirit.
- 6- It is the Holy Spirit who must initiate the synthesis of new proteins, it is He who must ignite the action potential of the first neuron, it is He who must coordinate the interconnections of the neural network which establishes the memory trace.



- 7- In short, it is the Holy Spirit who must convert γνῶσις, *gnōsis* into ἐπίγνωσις, *epignōsis* and store it in the seven compartments of the stream of consciousness.
- 8- The biblical documentation for this was noted in a recent review of the corrected translation of 1 Corinthians 2:4-14 in lessons 188 and 189 of the *Clanking Chains* series.