VII. Short- & Long-Term Memory

Your memory store contains vocabulary, language skills, facts, life experiences, people, places, skills, etc. These memories are chemically coded and stored by alterations in the pattern of countless synaptic connections among the neurons of the brain.

Learning and memory are different. Learning refers to the acquisition of information while memory is the preservation of that information that makes future recall possible. The mind can store visual images in short-term memory for a few seconds. This is called iconic memory from the Greek word *eikon*, meaning "*image*."

James compares iconic memory to a negative believer who acquires academic understanding of the Word but doesn't make the faith transfer to long-term memory.

> **James 1:23** - If anyone is a hearer of the word **[short-term memory]** and not a doer **[long-term memory]** he is like a man who looks at his natural face in a mirror;
>
> **James 1:24** - for once he has looked at himself and gone away **[iconic memory]**, he has immediately forgotten what kind of person he was.
>
> **James 1:25** - But one who looks intently at the perfect law of liberty **[Bible doctrine]**, and abides by it **[recall and application from long-term memory]**, not having become a forgetful hearer **[short-term memory]** but an effectual doer **[execution from a wheel-track of righteousness]**, this man shall be blessed in what he does.

Short-term memory is lost due to lack of repetition. It must be rehearsed and repeated in order to transfer it to long-term memory. The brain is designed so as not to retain every piece of information ever taken in. Otherwise, it would be crammed with a lot of useless minutia. But what is useless minutia to one person is considered important knowledge to another, thus volition is left free to decide what is to be forgotten or retained in memory.

Therefore, all information comes into the brain on a short-term basis and is lost unless it is retained through memorization into long-term status. Information which is considered useless is lost within 10 seconds. With practice, new information and skills are stored in long-term memory on a permanent basis.

Karl Lashley, a pioneer in brain research at Johns Hopkins University in the late 1920s, named the long-term memory traces "*engrams*." This term is defined by:

Encyclopaedia Britannica, 15th ed., s.v. "engram":

> *In neurophysiology, a change in the neural tissue that accounts for the phenomenon of memory; a memory trace.*

Webster's Ninth New Collegiate Dictionary, s.v. "engram":

> *A change in neural tissue accounting for persistence in memory.*

American Heritage Dictionary, s.v. "engram":

> *A persistent protoplasmic alteration occurring on stimulation of living neural tissue accounting for memory.*

Oxford English Dictionary, s.v. "engram":

> *A permanent change in the neucleus of a cell due to stimulus.*

The catalyst which brings about these changes in the brain's neurons is the process of learning. Knowledge that is transferred into long-term memory causes permanent electrochemical changes in the brain's neurons creating an engram—the neurologist's term for what the Bible calls a wheel-track.