

VI. General Details about Memory and Recall

Waters, Frank. "The Santa Fe Trail." In The Earp Brothers of Tombstone. New York: Clarkson N. Porter, Inc., 1960. Reprint. Lincoln: University of Nebraska Press, 1976, pp. 49-51.

Remember the various terms we have noted that describe what the Bible calls a "*wheel-track*":

1. Memory Store
2. Memory Trace
3. Engram
4. Cognitive Map

The biblical words for wheel-track are, in the Hebrew, (1) *magal*, and (2) *derek* and, in the Greek, *trochia*, all of which are usually translated into the English as "*path*" or "*way*."

Further, each language uses its term to idiomatically define a person's vision (or, worldview), way of life, or lifestyle. The thing which establishes one's worldview, way of life, or lifestyle is the accumulation within his memory of beliefs, philosophies, ideas, thoughts, opinions, convictions, attitudes, and values.

The presence of these things in one's memory are constantly recalled to one's conscious mind due to certain stimuli. Stimuli exciting recall may be external and usually involve the senses, i.e., sight, sound, touch, taste, or smell.

These senses may excite internal stimuli for recall and often involve the emotions which originate in the limbic system. Once senses bring something to the conscious mind by means of recall, often what occurs next is a rush of emotions which react to what memory places into the conscious mind.

Example: There is that person in your life who causes you great stress and discomfort.

You are in your assigned place of work doing your job and with no upsetting thoughts on your mind. Then you hear his voice. You look up and you see his face. As he gets closer you smell his bad after shave. He walks up and gives you a far too familiar touch on the shoulder. You can almost taste your distaste for him.

Inside your brain these sensory wheel-tracks serve to fire up into the conscious mind all you know and largely detest about this person. Immediately, the emotions emerge from the limbic system—bitterness, implacability, hatred, anger, malice, et al.

Finally, you have reached critical point. You can't take it anymore. Without warning, you bellow a billingsgate, and, even surprising yourself, leap from your workplace, whirl around, and coldcock the scum bag.

Now that's the example. Let's see how all this works within the brain. (Transparency: 3 brain structures)

The human brain is made up of three separate, but interconnected parts, labeled here as (1) the Reptilian, (2) the Old-mammalian, and (3) the New-mammalian.

The Reptilian complex is responsible for behavior involved in self-preservation. It stimulates a search for food, the ability to establish a territory, to mate, and to make the big decision of whether to fight or flee. The reptile has no emotional capacity because he does not possess the second part of the brain called the Old-mammalian.

The Old-mammalian consists of the limbic system which deals with the emotional feelings that guide behavior. Destroy the limbic system in a mammal and it regresses to a reptilian condition.

The third part of the human brain is the cortex. It is capable of problem-solving and memorizing information. This cerebral cortex further provides us with our language, our ability to reason, to deal with symbols, and to develop a culture. It is within this cortex that we possess the capacity to process information.

If it were not for the cortex, the human would take on the emotionalism of the animal kingdom and if effect would be no different from the animals. Interestingly, the limbic system seems to be the base of operations for the sinful nature.

(Transparency: Cerebral Cortex) When you hear your antagonist, receptors in the ear send audio signals to the Temporal Lobe's auditory area which processes the information.

Every person has his own unique voiceprint which can be stored as a memory trace in the Temporal Lobe. Once your antagonist's voiceprint is recognized, you are immediately able to pull his name out of yet another memory trace.

You turn and then focus his image into the Occipital Lobe's visual area. His identity is verified by memory traces which catalogue what he looks like. As he approaches, the odor of his after-shave-from-hell hits your olfactory cells which line the mucous membrane in the rear of the nasal air passages.

The axons from the olfactory receptors extend to the olfactory bulb (Transparency: Olfactory, et al.). From there it connects with the cerebral cortex, hippocampus, and hypothalamus where memory traces of your antagonist are excited. Then he touches you. Sensory nerves in the shoulder transmit signals to the brain through the fourth vertebra.

This sensation of being touched arrives in the brain through a processing center called the Thalamus and then up to the cerebral cortex. Although there is nothing to taste here, you may have a bad taste in your mouth but that in this case is simply idiom. All these senses have activated numerous memory traces or engrams and your limbic system goes into overdrive by firing up several temptations from its emotional complex.

The brain has a central processing center which accumulates all these memory traces and then makes a decision as to how to handle the situation. Volition may decide to follow the temptation of the emotional sins of anger, hatred and vindictiveness and verbalize this through vilification.

The vocabulary storage located in Wernicke's area provides the verbiage which is transferred over to Broka's area for syntax. Your thought with its semantics structured to communicate your hostility, is transmitted to the motor cortex which controls the muscles of the larynx, tongue, and lips to speak your message.

If violence flairs at this point from the limbic system, then you put other muscles into action through the motor cortex, ball your fist, and enter into an altercation right there in front of the entire office. During all of this, memory traces were activated all over the brain and decisions were made based on the paths of least resistance.

In other words, no one enters into such problem-solving unless there are wide wheel-tracks which are habitually applied under stress. The more these wheel-tracks are used the less thought goes into submitting to their behavior patterns. With each succeeding episode, the further down the road you go to the ultimate use of violence.

With this general description of how behavior works, let's now turn our attention to how all this occurs in the electrochemical transmission system originating in the neurons of the brain.