Table 3-4
I. NEUROPLASTICITY:
A Summary of Microscopic Changes in the CNS

From Research on Mammals Concerning
Enriched vs. Control vs. Deprived Environments,
Prenatal, Perinatal and Post-Natal CNS Lesions.

Note: Major research data is based on mice, rats, gerbils, cats and primates.
Minor research data is based on humans with few long-term follow-up studies
and/or post-mortem data.

Changes at The Synapse:
- Synaptic knobs or spines
- Configuration of synapses
- Neurotransmitter substances
- Speed of conduction across the synapse
- Post-synaptic membrane changes

Changes in The Dendrites:
- Dendritic sprouting (collateralization or growth)
- Dendritic fields

Changes in The Soma or Cell Body:
- "Manufactures" cells' chemical energy & transports down axon.
  - "Induction process": helps to maintain viability of neuron-neuron, neuron-gland, neuron-effectors & neuron-receptors.
  - Rule: the closer the lesion is to the soma the greater the chances that the neuron will die and vis-a-vis.

Changes in The Axon:
- Axonal sprouting at terminals in CNS
- Axonal collateralization
- Dorsal root sprouting of a peripheral nerve in CNS.
- Remodel circuitry (and/or alternate pathways or "aberrant pathways")—anatomical reorganization of circuitry. Found at all levels of CNS and in all areas at these levels and remodeling can occur at all ages following CNS or PNS insult.

Note: In the fetal CNS it appears that neuronal death (due to a lesion) is the "prime initiator" that stimulates the CNS to restore itself.