Some Notes on the Human Brain

Compiled by Robert P. Pula

(via Dr. James Broadus, Transylvania College, Lexington, KY, Russell Meyers, M.D., neurologist, Scientific American, 1979 and other more recent publications)

Cerebral cortex: c. 1/10" thick, 20" x 20" if stretched out

Nervous system cells do *not* replace or repair; they are constantly being sluffed off. Shortly after birth, some cells "specialize" to become neurons; then they lose usual characteristics of living cells except conductivity and irritability.

10^{11} neurons (100 billion), primarily in the brain, plus vast numbers of glial cells whose activity is only now being explored.

We lose c. 50,000 brain cells per day; between the ages of 20 and 70 we lose 10^9 brain cells. (1 billion brain cells, but no excuse for senility; still plenty left.)

10^{14} (100 trillion) synapses.

Brain uses 25% oxygen intake of the body; 20% of the blood supply.

Weighs c. 3 pounds.

Characterized as "...a flower at the top of a three-foot stem."

Receives signals from 86 nerves ('connections', 'portals' re 'environments').

1/60 oz. sugar per pint of blood - normal sugar level; variation in either direction leads to coma or convulsions (ref. Pfeiffer's 'tightrope').

Each of the 10^{11} brain cell has c. 127,000 neighbors. Neurons operate in groups.

Nervous system operates on (or 'puts out') c. 10 watts of electrical power. Nerve cells produce and conduct electrical charges (i.e., electrical-chemical charges) made up of oxygen and sugar; they fire often, *but need recovery time*.

Impulse transmission rate in small nerve fibers equals 1 ft/second, 2/3 m.p.h. In large fibers, c. 225 m.p.h. The point: *rate of transmission along nervous system is finite and must be respected.*

Single neurons operate on binary principle; but nervous system as a whole not considered a binary system.

Process note: even bones (the most 'inactive' tissues) are constantly undergoing change.

Some very recent (1995) research suggests that this 'law' of neurology may have to be re-legislated.