

The Carter - Jenkins Center presents



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**SECTION
ON
PSYCHOANALYSIS
AND
NEUROSCIENCES**

**THE ROLE OF STIMULATION
(MATERNAL AND OTHERWISE)
IN
BRAIN MATURATION,
DEVELOPMENT
AND PROGRAMING**

Psychoanalysis and Neurosciences: *Recent Advances*.

- **1) The radiological imaging of the brain**
- **2) The work of the Solms**
- **3) Role of external stimulation plus internal maturational forces**

Psychoanalysis and Neurosciences:

Recent Advances

- **4) Role of the mother as a stimulator**
- **5) Children growing in Institutions:**
 - a) Work of Spitz**
 - b) Work of Provence and Lipton**
 - c) Kandel an the Harlow monkeys**
 - d) Work of many others**

Psychoanalysis and Neurosciences:

Recent Advances

- **6) Immaturity of the brain:**
 - a) At birth it weights 300-350 grams.**
 - b) At two years weights 900-1050 grams.**
 - c) Adult weight is 1200-1300 grams.**



Psychoanalysis and Neurosciences

Recent Findings:

- **Recent research by means of MRI's and fMRI's shows many important new facts as to how long the brain continues its maturation and development, particularly so the frontal lobes, cerebellum (well into the twenties) and the corpus callosum.**
- **It points out to a second period of pruning at puberty, which creates the final structure of the frontal lobes.**
- **This perhaps makes possible, to correlate certain adolescent typical behaviors, to these developments**

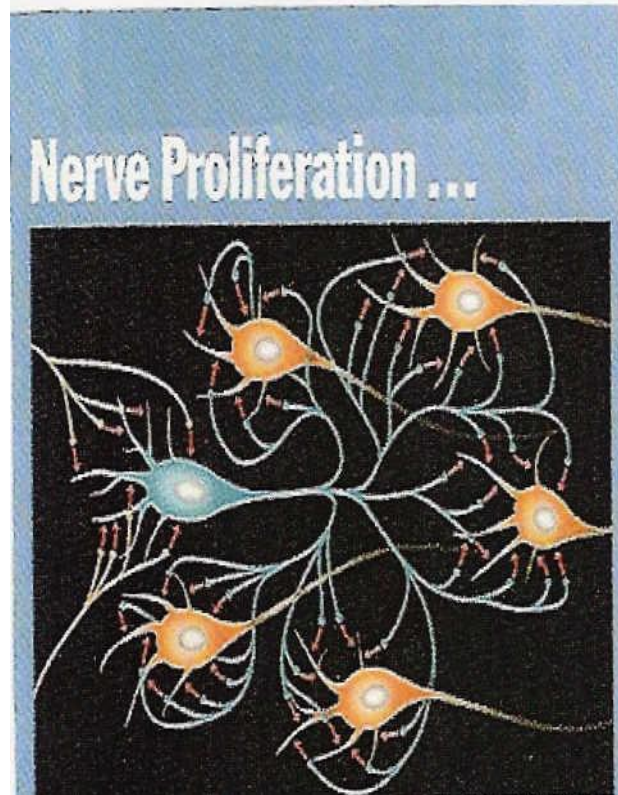
Recent Findings

- **We use to believe that the brain was in most essentials finished by age 4 or 5. Video is by Charles Nelson Ph.D***
- **New fMIR have shown grow spurts in the frontal lobe during the teen years. Video by Dr. Jay Giedd (NIMH) ***
- **They have shown too growth in cerebellum until early twenties. Video by Dr. Jay Giedd (NIMH)***
- **Cerebellum not only coordinates movement but the quality of our thinking processes. (Clumsiness in either area possible!)**

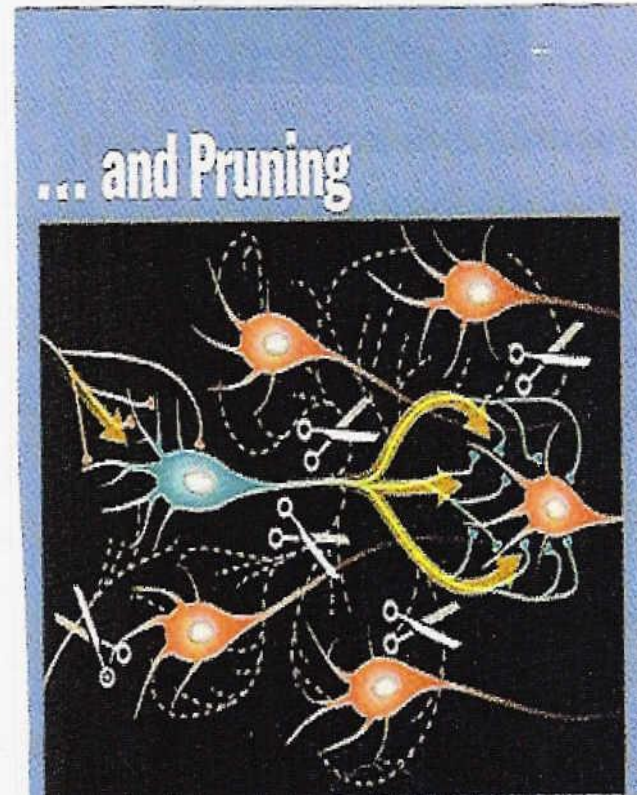
***) All the video vignettes are part of a PBS program entitled “The teenage brain”**

Recent Findings

- The pre-puberty growth in frontal lobes cortex shows as an increase in the thickness of the gray matter in that area according to Dr. Giedd
- What applies early on in life (ie the type of stimulation received, applies as well later on). There is, as well, a second period of pruning in adolescence. The principle here seems to be use or lose it.
- Imbalance between hormonal development at puberty and a brain that lacks the ability to control impulses properly...growth of frontal lobes creates balance. We have known about adolescent erratic behavior in the past, now perhaps we know why

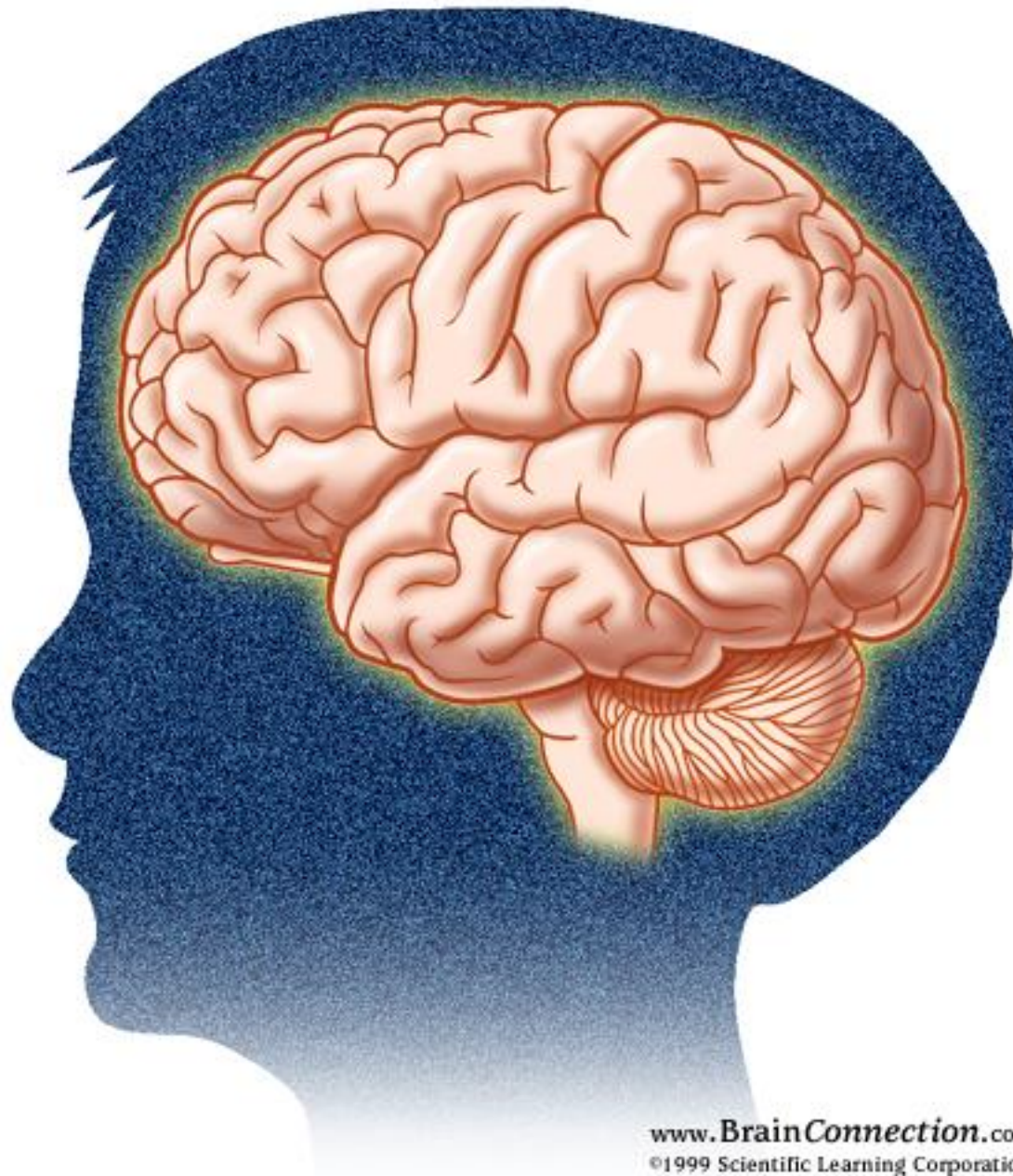


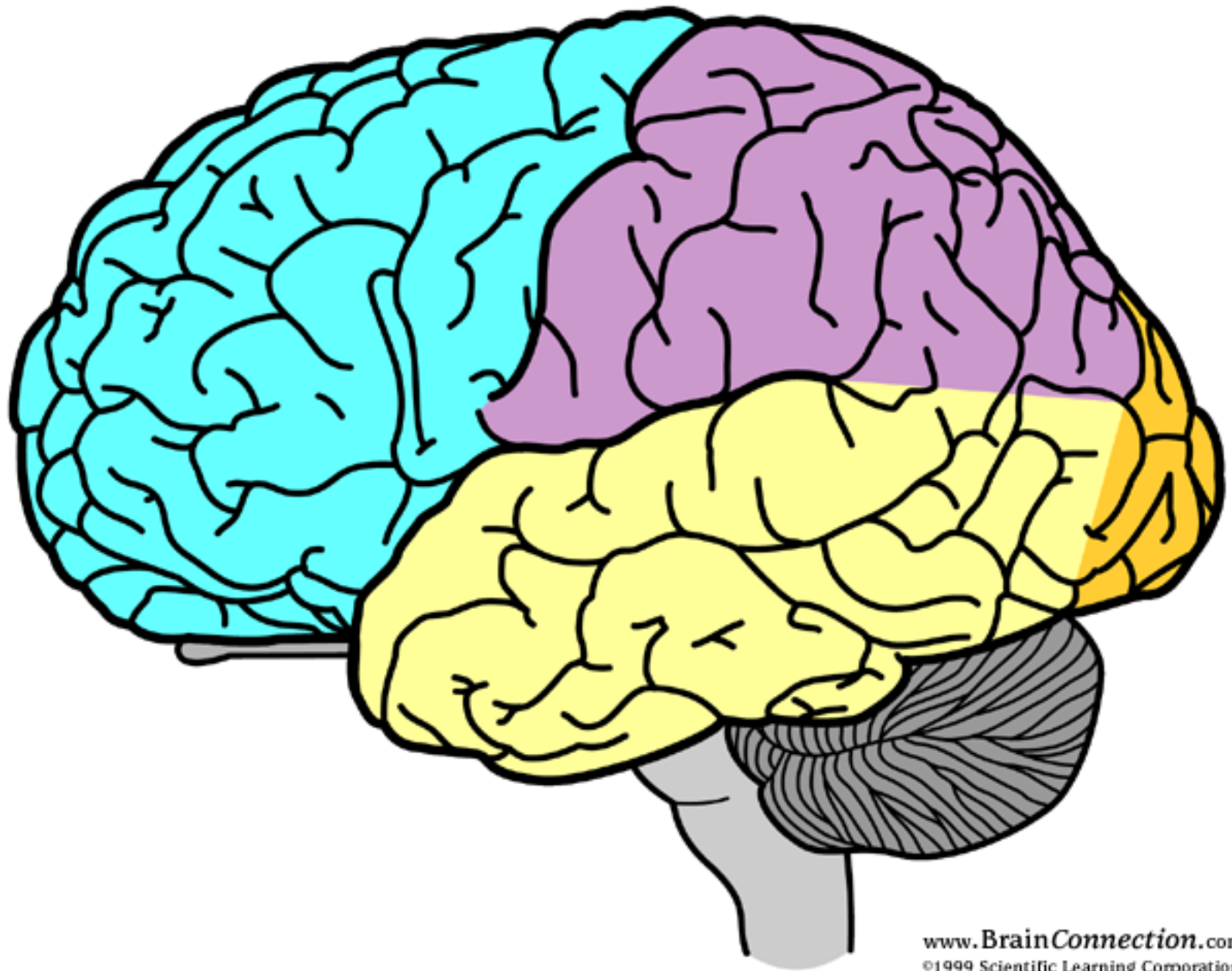
Dr. Giedd thinks that by age 11 for girls and 12 ½ for boys, thousands of new connections had taken place in the frontal lobes, but most of them will be pruned later on.



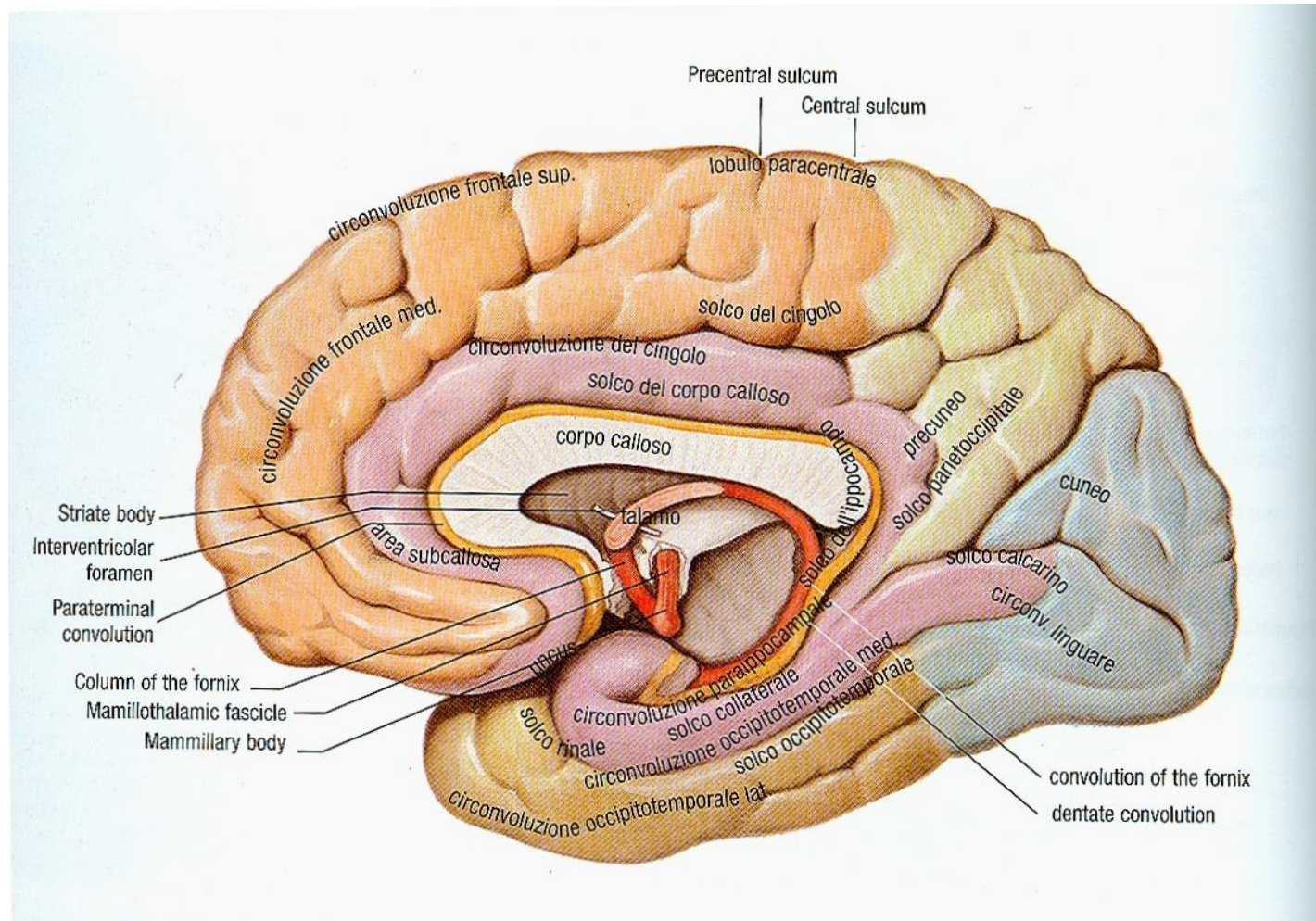
Those connections that are not used or reinforced will end by disappearing, while those that are used frequently will remain.*

***) Pictures from Time magazine (05-10-2004)**

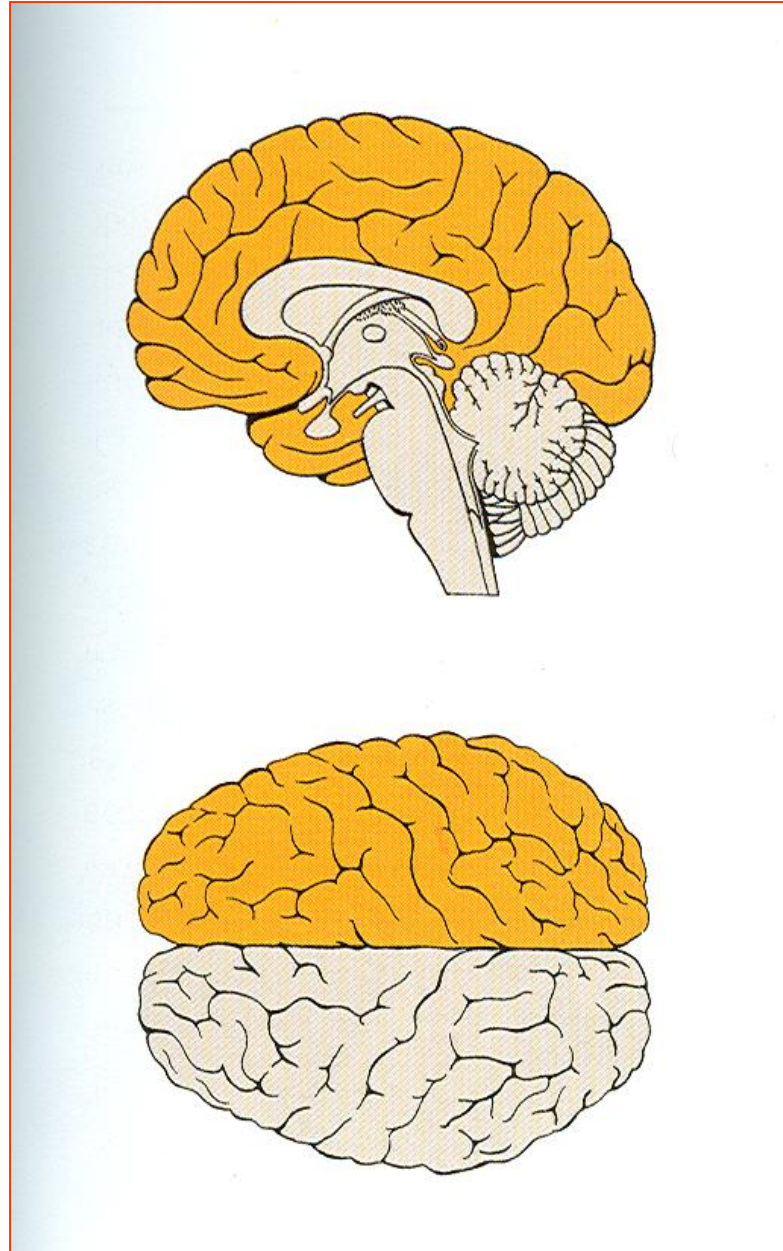




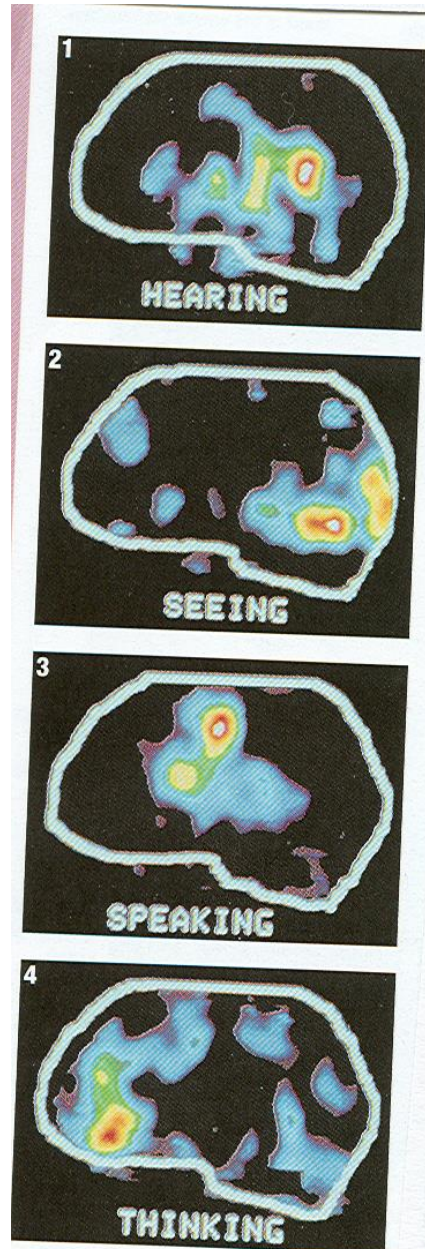
Corpus callosum



Corpus callosum



Pet Scan



Simplified Neuron

76 MIND MEETS MOLECULE

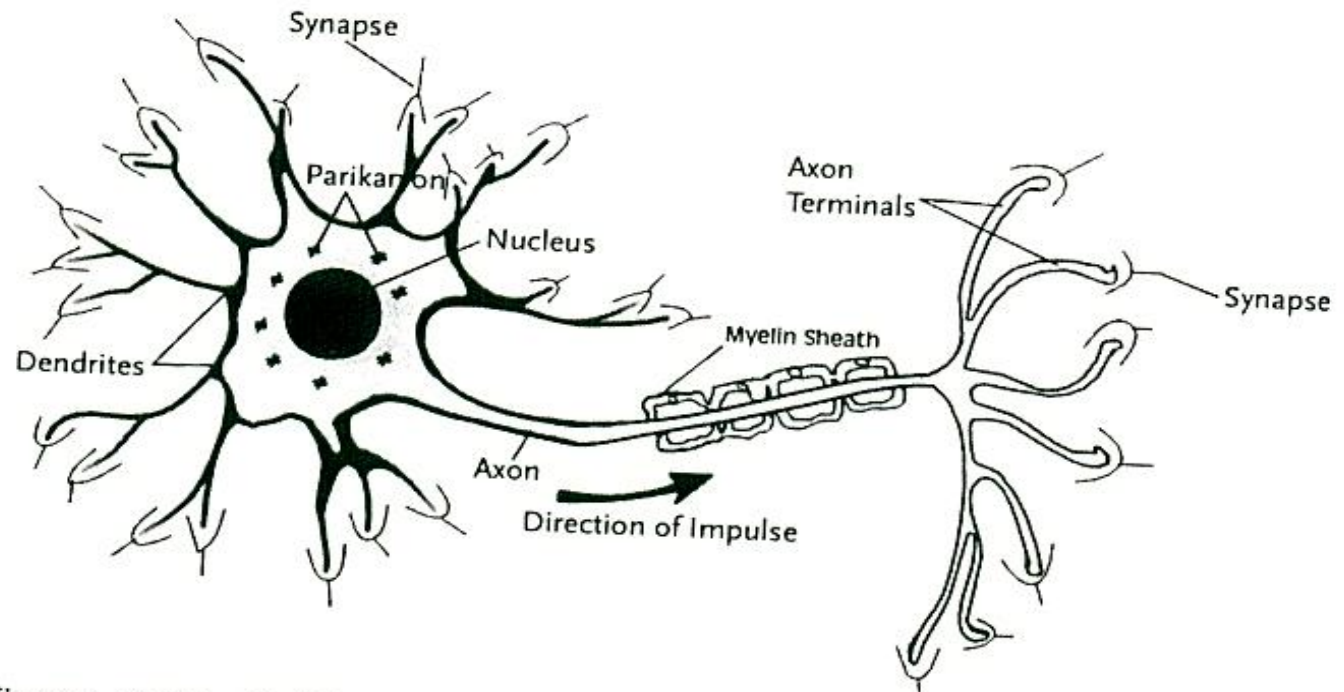
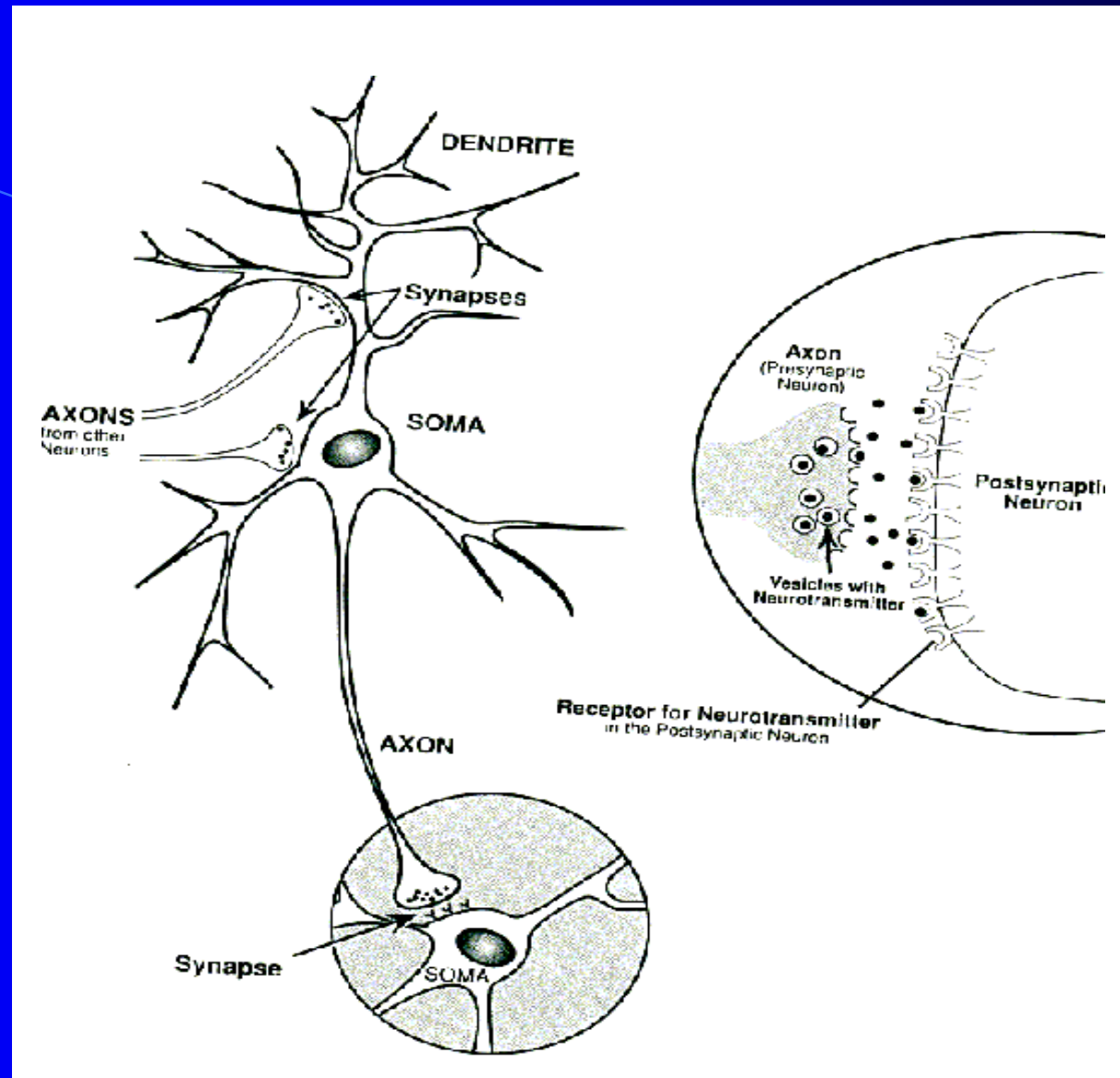
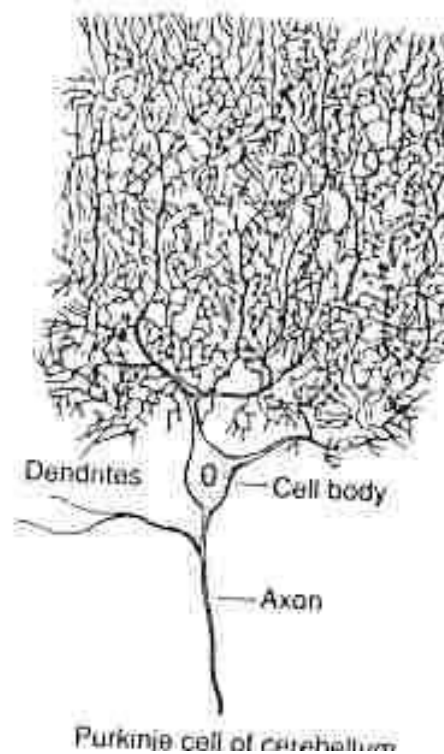


Figure 4-17: Nerve Cell Communication through Synapses

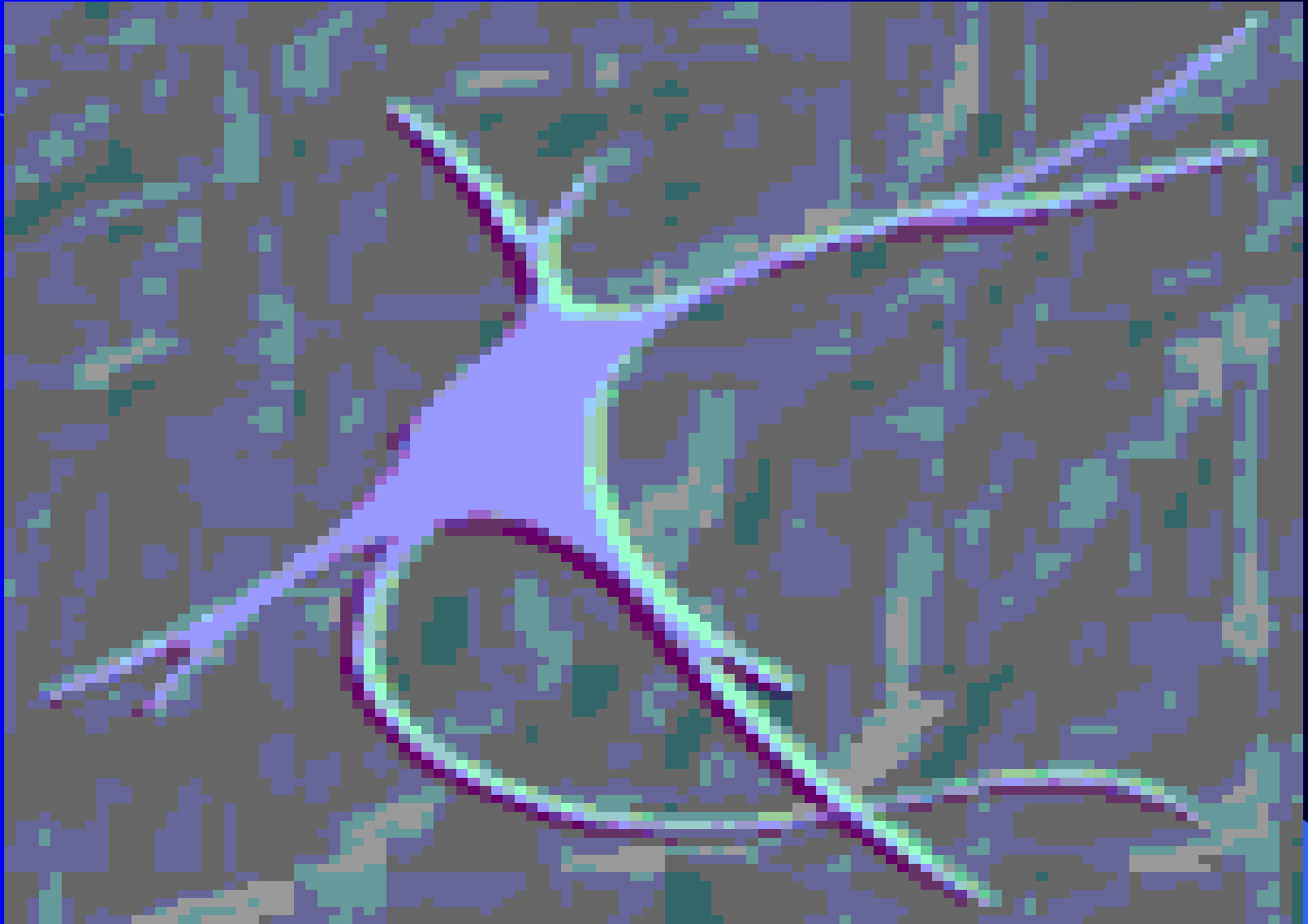
Simplified Neuron



Simplified Neuron



Simplified Neuron



Psychoanalysis and Neurosciences: Recent Advances.

- **In the end the brain will have up to 100 billion neurons, all active at the same time.**
- **Each one of these neurons establishes synaptic connections with up to 100,000 other neurons**

Psychoanalysis and Neurosciences:

Recent Advances

- **This gives a total number of synaptic connections in the range of 10^{27} .**
- **The number of possible combinations of the synaptic connections will be in the range of 10 million.**

Recent Advances

- **EXTERNAL STIMULATION FAVORS:**
 - 1) Increased dendritization**
 - 2) Increased vascularization**
 - 3) Increasing rate of myelinization**
 - 4) Favoring biochemical processes**
 - 5) Hardwiring of path circuits taking place**

Psychoanalysis and Neurosciences:

Recent Advances

- 1) The genome, rats and humans.**
- 2) External stimulation helps develop the hardware while creating at the same time the software necessary to run the function assigned to the structure being developed**
- 3) Importance of the constancy of caretakers**

***) All the video vignettes are part of a PBS program entitled “The teenage brain”**

THE ROLE OF STIMULATION (MATERNAL AND OTHERWISE) IN BRAIN MATURATION, DEVELOPMENT AND PROGRAMING

The End

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