

6/10/69

1. Conversation with Phil Nelson

Question raised - ~~is it~~ ~~longitudinal~~ ~~down~~
~~is it~~ ~~down~~ ~~is a single cell~~ ~~response~~ ~~for~~ ~~an~~ ~~anatomical~~ ~~rather~~ ~~than~~ ~~functional~~
[is a single cell response for an anatomical rather than functional (a large part of brain)]

~~Answer~~ ~~is~~ ~~that~~ ~~the~~ ~~question~~ ~~is~~ ~~about~~ ~~the~~ ~~anatomical~~ ~~rather~~ ~~than~~ ~~functional~~

The question should be is it possible to have a single cell response

1. ~~for all neurons~~ or only in some neurons

a) Probably ~~only~~ ~~in~~ ~~some~~ ~~neurons~~ ~~but~~ ~~not~~ ~~in~~ ~~others~~. "Learning" ~~is~~ ~~not~~ ~~produced~~ ~~after~~ ~~a~~ ~~single~~ ~~cell~~ ~~response~~

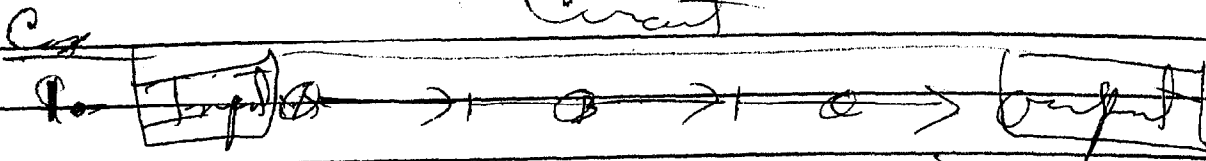
neuron system - but evidence of insect etc there is much evidence of single neuron systems of behavior ~~that~~ ~~is~~ ~~not~~ ~~evidence~~

for "learning" plasticity & some circuits may be plastic ~~learning~~ ~~circuits~~ ~~others~~ ~~are~~ ~~not~~ ~~plastic~~ ~~learning~~ ~~circuits~~

Probable

As learning circuits must be assessable. Not all circuits are assessable.

Event



~~X X~~ 1. Presettable circuit - No reset

~~Can delay output in preset~~

~~Can prevent memory loss~~

1. Delay reset of all channels

2. No output to circuit (presettable) circuit.

3. Delay reception of output.

4. Inhibit transmission

~~X X X X~~ 3. ~~Preset~~

Complete reset circuit ~~error~~

1. Must be (ready) to operate circuit

i.e., read event must occur before circuit is ~~reset~~

functional.

(Circuit misses event)

If I were designing a sensory system,
I'd have a hierarchy of systems.
Not inhibited. ~~Not inhibited~~ ~~Not inhibited~~
~~Not inhibited~~ are "beats" if A always B, ~~Not inhibited~~ A+B
~~Not inhibited~~

Inhibit 2e inhibits synapses
if A always B
if A + C never B

Control 3e synapses always these
(Not represent)

Adaptive
Represent 4.

Adaptive
Instructive 5.

Summary on next page

Theory of synapses:

1. Non-adaptive synapses (Long term) (Non-regenerative)
by occlusion of presynaptic terminal of &
synapse (Break in synapse can
adapt - or part of synapse to
regenerate.

Can have presynaptic
break; if synapse not in i.e. for
cell death.

Non-regenerative synapses - 1. Real
B. Regenerative, Non-adaptive
i.e. again synapse

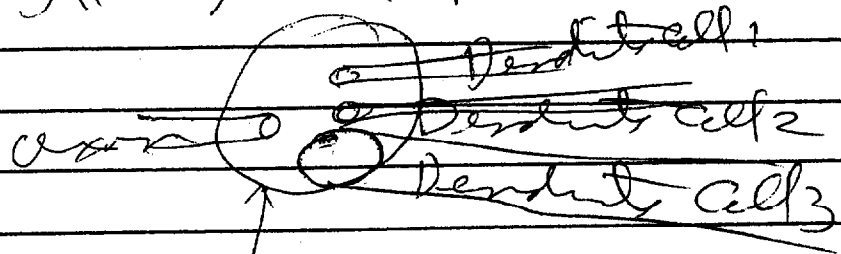
- 1) Inhibitory
- 2) Not inhibitory

2. Adaptive Synapses (Long term)

A. Make break of synapse is permanent
(irreversible) - Gain of new synapse
B. Break of synapse is of synapse
= Reversible

- 1. Axon Reversible
- 2. Dendrite Reversible
- 3. ~~Axon + Dendrite~~
- 3. ~~axons~~
 - a) Portion of axon retracts
dendrite is ~~axons~~
i.e. Filopodial radius
of A and D

~~cell-cell contact~~ ~~adapters~~
Computer for excited nodes



fundamental radius of synapse

What? This may be law of minimum

1) Most synapses far from dendrite

A:D relation is invariant across

~~synapses~~ ~~of different~~ ~~types~~

2) Non-specificity independent
of size for example

3) Variable distance between A:D

**

Results in highly efficient synapses

Superh
idea

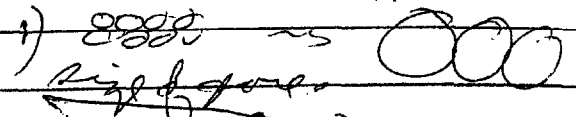
- 1) axonal Dendrite
- 2) axonal Dendrite

order of 1000 synapses per cell
axon from excitatory material that reduces
efficiency of synapses for all of

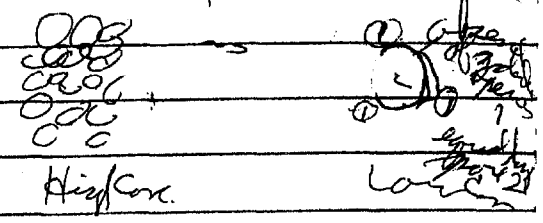
- 1. ~~Molecular Sieve~~ ~~Synopsis~~: $A \cdot B$ with $A -$
 $2 - B$
 $3 - -$
- 1. ~~Barrier Synops~~ $1/2 A \cdot B$
 $2/2 A \dots B$

2. Barrier Synops
 Distance between A & B first but not identical

Diffusion ~~from A to B~~ ~~is hindered~~
 1. Barrier does not ~~allow~~ ~~passage~~



2) ~~Higher Concentration~~



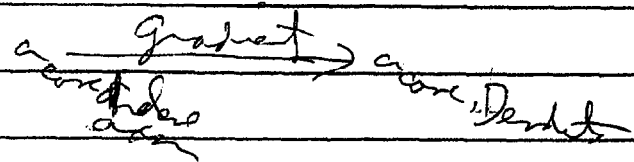
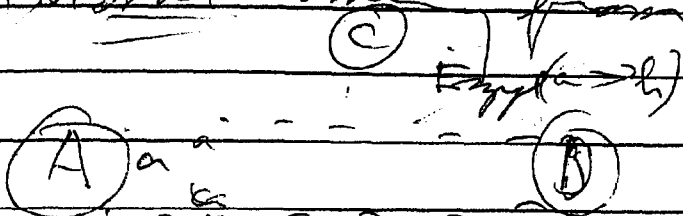
3. ~~Diffusion of molecules~~ ~~for~~

A to B ~~is~~ ~~affected~~ ~~by~~ ~~competition~~
 sites (of ~~both~~ ~~types~~)
 A & B ~~are~~ ~~in~~ ~~competition~~

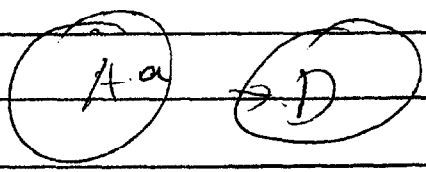
4. ~~Back~~ ~~effect~~
 Flow of ~~molecules~~ ~~from~~ ~~A~~ ~~to~~ ~~B~~ ~~is~~ ~~impeded~~

by ~~those~~ ~~effect~~ A & B ~~equivalent~~ ~~same~~
 time. Molecules from A are ~~not~~ ~~scattered~~
 Conc. of ~~molecules~~ ~~in~~ ~~side~~ ~~A~~ ~~is~~ ~~decreased~~.

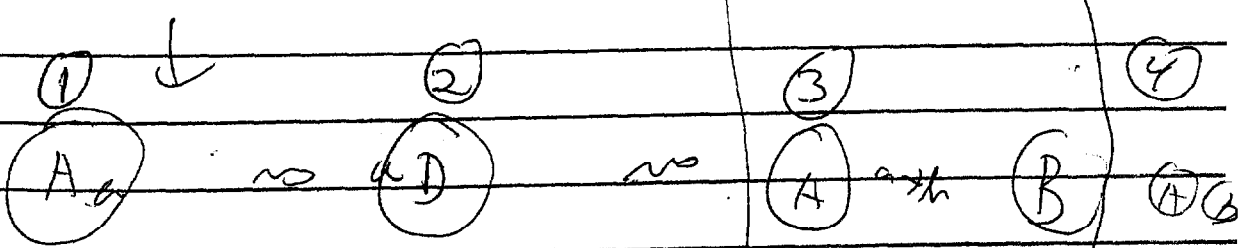
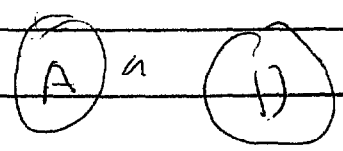
Could be done coming from into C

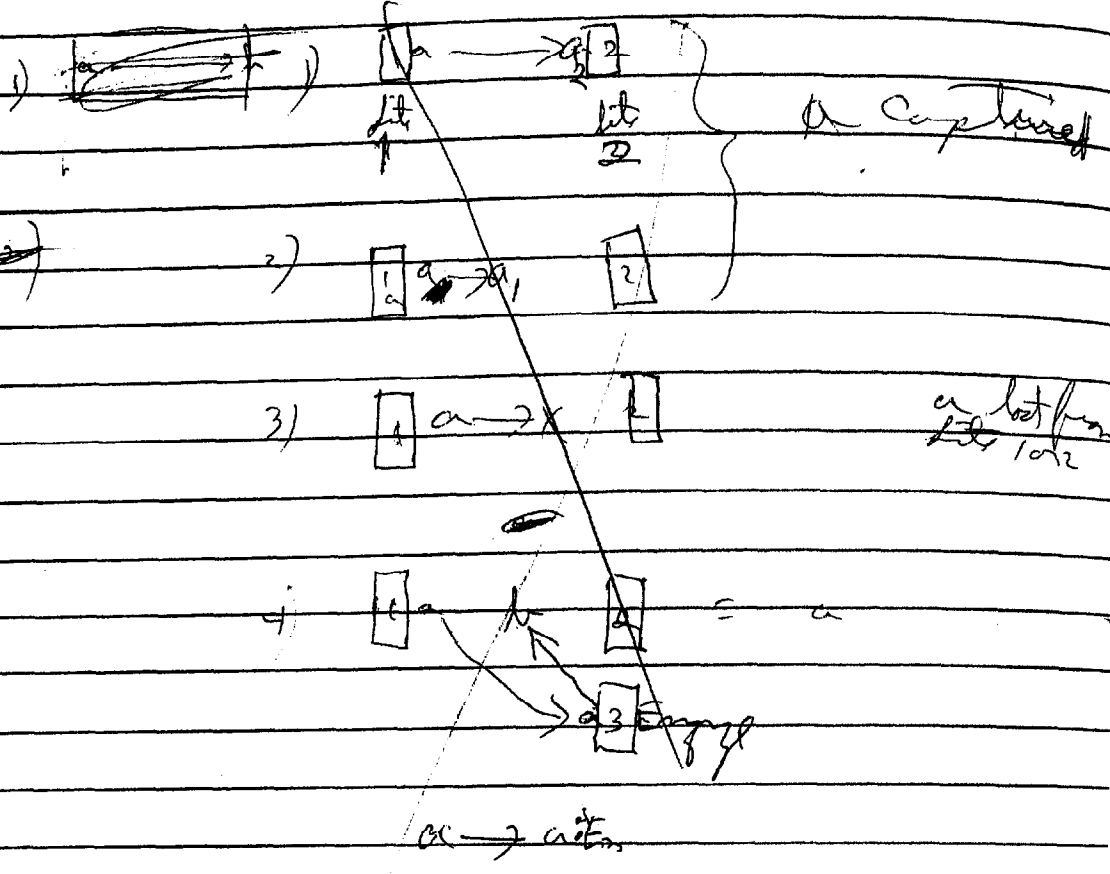


* 5. Competitor ~~negotiate~~ ~~to secure all the role of~~ ~~entry permit~~ ~~to~~ ~~could~~ ~~body~~ ~~with~~



↓

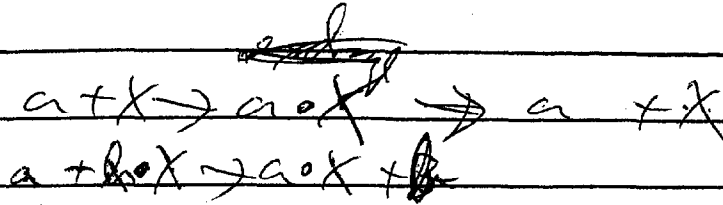
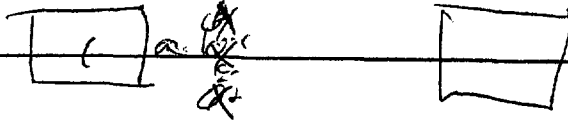




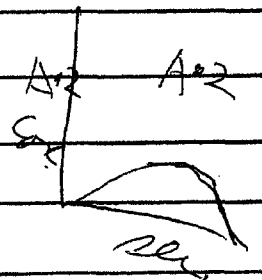
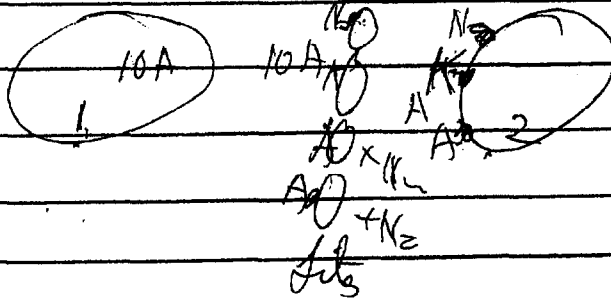
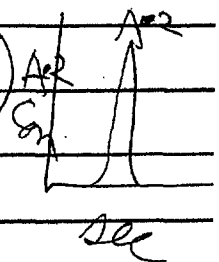
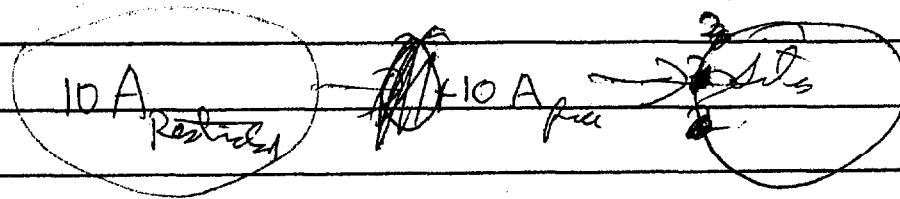
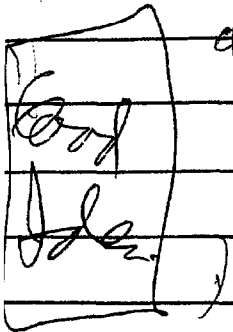
$A \rightarrow \dots$

$A \cdot B - \text{Cell 1 (axon)}$
 $A \cdot C - \text{Cell 2 (dendrite)}$
 $A \cdot D = \text{Exchange } B + D$
 $A \cdot E$

then, ~~for each residue~~ (



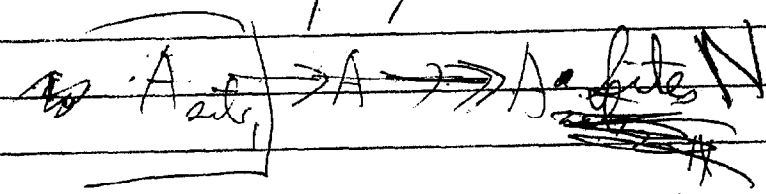
X in oxygen region may undergo different reaction. May convert sulphur to sulphuric acid to ~~release of smaller units for long time~~



Synapse Theory

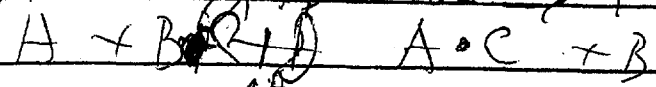
1. Nonadaptive Synapse
2. Adaptive Synapse: ^(molecular) ~~cellular~~ ~~synaptic~~ ~~plasticity~~
- ~~3. Adaptive Synapse~~
 1. Individual
 2. Population
3. All new ~~cellular~~ ^(entirely new synapses & circuits) ~~cellular~~ ~~synaptic~~ ~~plasticity~~

~~There is a cross-over in terms of molecules and synapses:~~



1. ~~Monosynaptic~~ ^{Pre-synaptic} ~~Current~~ - No effect on ~~syn.~~
2. ~~Adaptive~~ ^{Pre-synaptic} ~~Circuitry~~ ~~Change~~ ~~of~~ ~~syn.~~
 1. Make-break ~~synaptic~~ ~~plasticity~~
 2. Gen. Product (Prolif.)
3. ~~Cell-Cell Contact~~ ^{Cell-Cell Contact} ~~3) (At new cells)~~ ~~(1) cell~~ ~~recept.~~
4. ~~Site~~ ~~Core~~ ~~syn.~~
5. ~~Informal~~ ~~Structure~~ ~~Core~~ ~~of~~ ~~the~~ ~~Metab.~~
6. ~~Inhibitory~~ ~~to~~ ~~new~~ ~~cell~~ ~~trans.~~ ~~plasticity~~
7. ~~GABA~~ ~~at~~ ~~the~~ ~~synaptic~~ ~~terminal~~
8. ~~Activation~~ ~~of~~ ~~trans.~~ ~~plasticity~~ ~~on~~ ~~site~~
9. ~~Competition~~ ~~for~~ ~~site~~

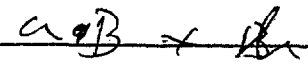
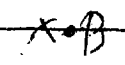
4. Exchange of Neutral $\neq K$



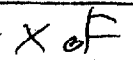
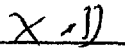
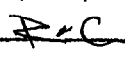
lets
 $\times A$

$\times A$

\rightleftharpoons



B_x



A

a factor - due to all A
conc.

Conclusion

~~Most~~ Long lasting effects are to
not be ignored