

3/27/69

# ① First Talk at Howard Genetic Neural Codes.

## 1. ~~Info~~ Biochemistry

1. Flow of Material
2. Energy
3. Info.
  - 1. M.D. Binding
  - 2. Info processing by genetic apparatus  
Neural.

2. Info retrieval from genes. Intriguing vs common between all  
Problem.

## 1. E. coli

3.  $\sim 1.5 \times 10^6$  molecules of protein / ~~chromosome~~
2.  $\sim 3,000$  kinds of protein
1.  $\sim 400$  AA / protein
4. 20 min generation time.
5.  $500 \times 10^6$  AA ordered in protein

2. How is info stored & retrieved?

1. Memory resides in specific molecules
2. Amt of info E. coli  
Man.
3. Linear Tap, 4 kinds of characters  
↓ transcript

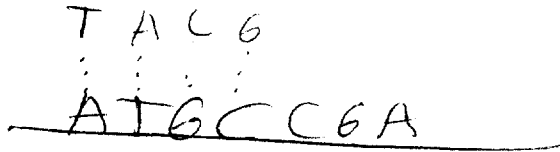
3. Coding Problem

RNA-  
 ↓ Transcribe  
 Protein  
 ↓ Fold  
 3 dimensional Protein

E. coli

(2)

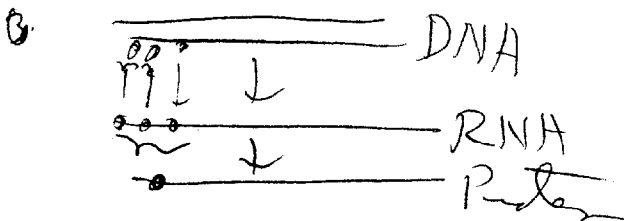
#### 4. Template function



1. <sup>1</sup> ~~Molecule~~ <sup>bind</sup> - selected
2. Relative Position
3. Relative Timing

Template & Clock.

#### 5. Turing Machine Principles



7. Few  $\text{H}^+$  kinds of units, vary sequence  
Diversity & Complexity

8. Capital investment -  $\geq 50\%$  of cost, E. coli  
Efficiency - speed,  $\geq 20\%$  of cost, Neurospora

1.  $20 \times 10^6$  AA/sec/cell.

2. Serial vs Parallel operations

1. Serial operations

2. Nouns & Verbs.

3. Many sequential operations. Independent  
occurrences

3.  $\sim 15,000$  ribosomes/cell, Genetic R.E.

4. Polymers.

5. 1 message read many times.

9. Reliability

10. Accuracy

(3)

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Thoughts on info. flow Genetic vs Neural info processing for Howard University till

1. ~~Thoughts~~

1. Origin vs Evolution

A. Genetic code originated in 1st cells evolved

1. <del>Genetic code</del>	3 x 10 <sup>9</sup> yrs.	} - Evolution	Frequency of <del>Genetic</del>
2. <del>Genetic code</del>	0.6 x 10 <sup>9</sup>		
3. <del>Genetic code</del>	0.5		
4. <del>Genetic code</del>	0.18		

- 2. Universality - ~~Universal~~ molecular recognition steps, protein synthesis
- 3. Code fixed. Base mechanism
- 4. Genetic Code must have originated ~~early~~ ~~early~~
- 5. ~~neural code~~

B. Neural Code - Info Processing

1. Evolved after ~~genetic~~ ~~code~~

1. Genetic Code ~ 600 x 10<sup>6</sup> yrs ago  
 Precollaboration Promoter Chemistry 3000-400 x 10<sup>6</sup> yrs. ~~Genetic~~ ~~code~~ ~~evolved~~ ~~in~~ ~~1st~~ ~~cells~~ ~~of~~ ~~fish~~ ~~in~~ ~~multicellular~~ ~~organisms~~ ~~from~~ ~~single~~ ~~cell~~ ~~organisms~~ ~~in~~ ~~400~~ ~~x~~ ~~10~~ ~~6~~ ~~yr~~

2. Chemistry of ~~neural~~ ~~code~~

3. Origin of ~~neural~~ ~~code~~  
 Molecular mechanisms must have been selected from population of precursor mechanisms.

1. Mech. Enzymes - Molecular Interest

2. Molecular mech. Amplification

1. Amt. of catalyst - Hormones
2. Efficiency of catalyst
3. 1. activate - Hormones  
2. inhibit - Hormones

3. Amt. of substrate
  1. building block
  2. Effect - energy supply

4. Cell excitation & growth

4. ~~Reliability~~  
~~1. Hacking Backdoor~~

10. ~~\_\_\_\_\_~~

11. Selective expression of info.

12. ~~\_\_\_\_\_~~ - Memory Mech.

- 1. Genetic
- 2. Immunology
- 3. Mind.

- 1) Instructive theories
- 2) Selective "

Linda Delbock ext. SM.

13. Evolutionary Biological Cycle

Gen → Mind