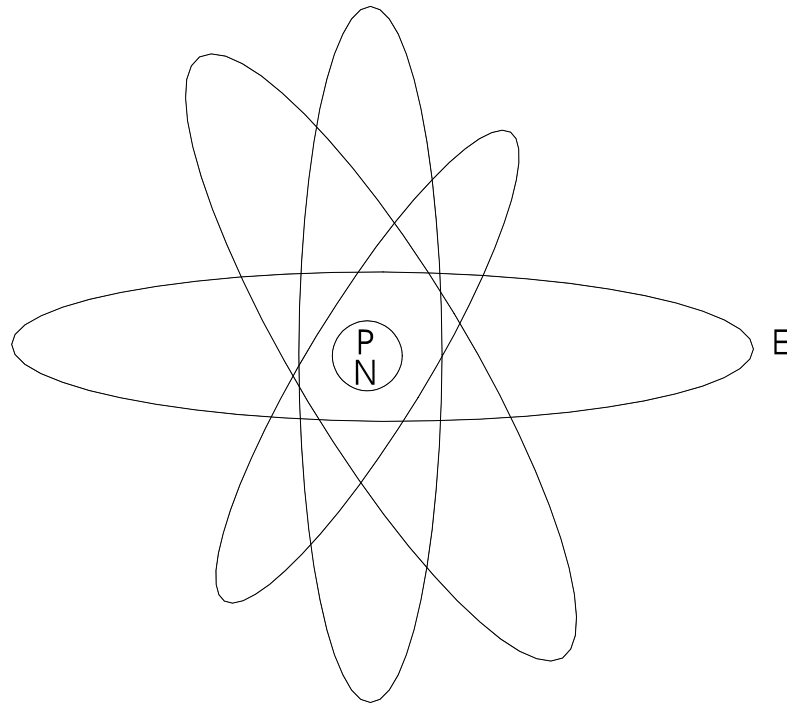


# **Genetics**

The Finger Prints of God

# Atoms



Click on an element for more information

1													18																			
1 1 H												1 2 He																				
2												2 5 B	2 6 C	2 7 N	2 8 O	2 9 F	2 10 Ne															
2 3 Li	2 4 Be											3 13 Al	3 14 Si	3 15 P	3 16 S	3 17 Cl	3 18 Ar															
3													4				5		6		7		8		9		10		11		12	
4 19 K	4 20 Ca	4 21 Sc	4 22 Ti	4 23 V	4 24 Cr	4 25 Mn	4 26 Fe	4 27 Co	4 28 Ni	4 29 Cu	4 30 Zn	4 31 Ga	4 32 Ge	4 33 As	4 34 Se	4 35 Br	4 36 Kr															
5 37 Rb	5 38 Sr	5 39 Y	5 40 Zr	5 41 Nb	5 42 Mo	5 43 Tc	5 44 Ru	5 45 Rh	5 46 Pd	5 47 Ag	5 48 Cd	5 49 In	5 50 Sn	5 51 Sb	5 52 Te	5 53 I	5 54 Xe															
6 55 Cs	6 56 Ba	*	6 72 Hf	6 73 Ta	6 74 W	6 75 Re	6 76 Os	6 77 Ir	6 78 Pt	6 79 Au	6 80 Hg	6 81 Tl	6 82 Pb	6 83 Bi	6 84 Po	6 85 At	6 86 Rn															
7 87 Fr	7 88 Ra	**	7 104 Rf	7 105 Db	7 106 Sg	7 107 Bh	7 108 Hs	7 109 Mt	7 110 Ds	7 111 Rg	7 112 Uub	7 113 Uut	7 114 Uuq	7 115 Uup	-	-	-															

\* LANTHANIDE SERIES

6 57 La	6 58 Ce	6 59 Pr	6 60 Nd	6 61 Pm	6 62 Sm	6 63 Eu	6 64 Gd	6 65 Tb	6 66 Dy	6 67 Ho	6 68 Er	6 69 Tm	6 70 Yb	6 71 Lu
------------	------------	------------	------------	------------	------------	------------	------------	------------	------------	------------	------------	------------	------------	------------

\*\* ACTINIDE SERIES

7 89 Ac	7 90 Th	7 91 Pa	7 92 U	7 93 Np	7 94 Pu	7 95 Am	7 96 Cm	7 97 Bk	7 98 Cf	7 99 Es	7 100 Fm	7 101 Md	7 102 No	7 103 Lr
------------	------------	------------	-----------	------------	------------	------------	------------	------------	------------	------------	-------------	-------------	-------------	-------------

# Molecules and Chemical Properties

- Simple molecules
  - Water : H-O-H or H<sub>2</sub>O
  - Carbon Dioxide: O-C-O or CO<sub>2</sub>
  - Salt: Sodium Chloride or NaCl

# Organic Compounds

- Compounds containing Carbon
  - Simple Sugar:  $C_6H_{12}O_6$
  - Simple Starch:  $C_6H_{10}O_5$

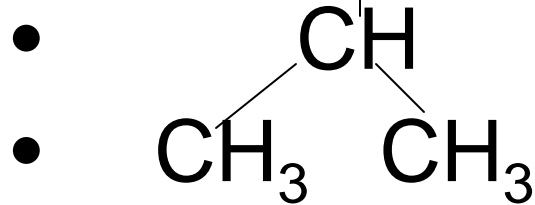
# Bio Chemicals

- Molecules that are produced by life.
  - Simple Sugar molecule:  $2C_6H_{12}O_6 (-H_2O) =$
  - Compound Sugar Molecule:  $C_{12}H_{22}O_{11} (-H_2O) =$
  - Starch:  $(2)C_6H_{10}O_5 (-\# H_2O) =$
  - Cellulose:

# Amino Acids: The Building Blocks of Life

- Amino Acids are a group of nitrogenous organic compounds that serve as units of structure in the assembly of polypeptides and proteins, the picture puzzle pieces of living tissue.

# Amino acids



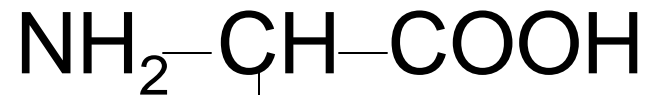
- 

- Valine

- RNA

- Code: GUG, GUA,

- GUU, GUC



Glutamic Acid

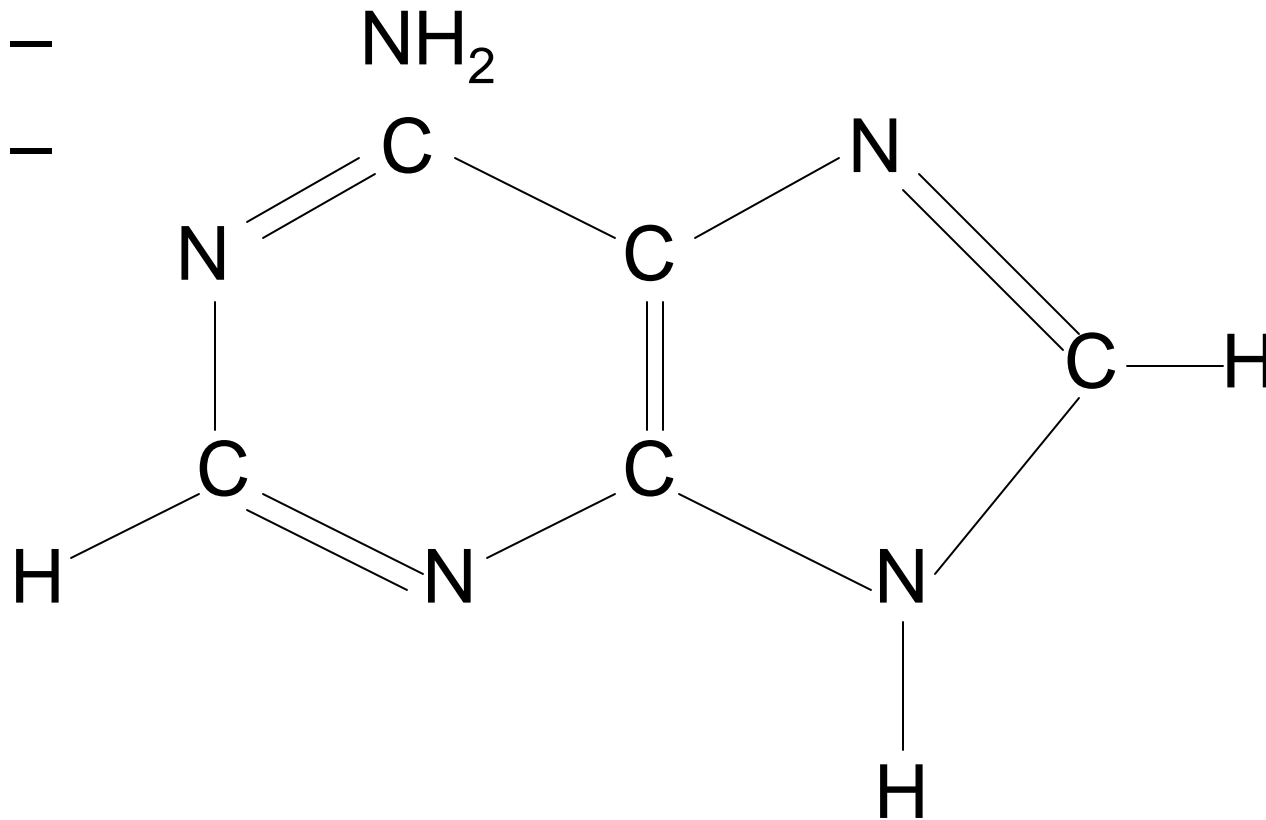
GCG, GCA



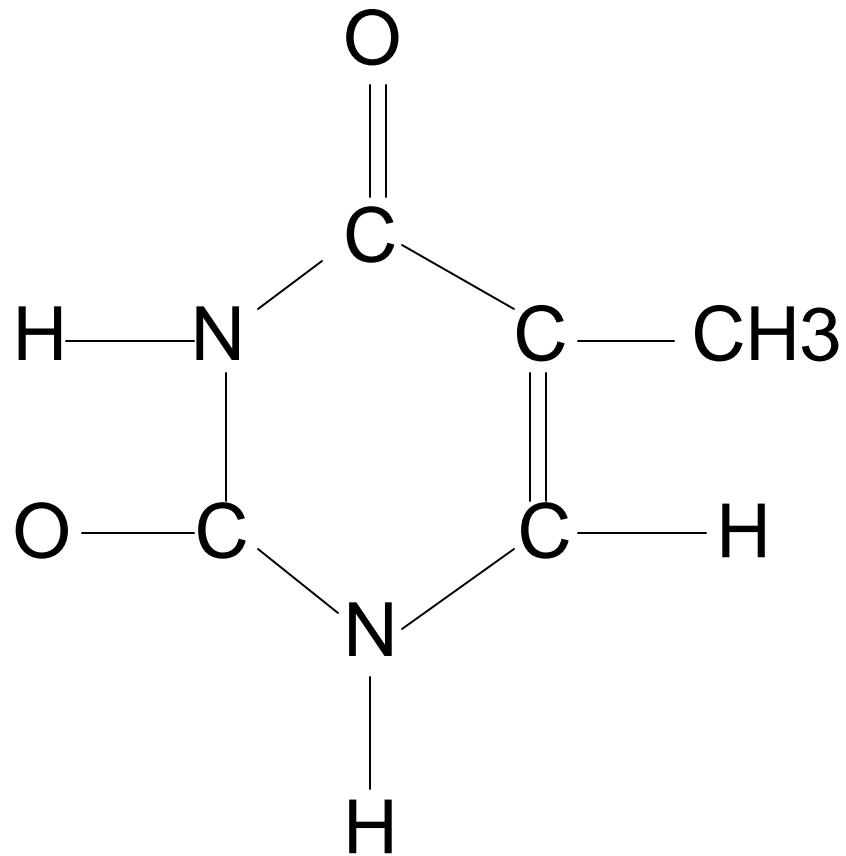
# Nucleotides and DNA

- In order for the amino acids to be placed to make living tissue and be usable for the chemistry of life, a code system for the assembly and position of the amino acids is contained in each cell. This code system is DNA (deoxyribo nucleic acid). It consists of molecules called nucleotides assembled in specific sequence. DNA is a form of a complex double binary mathematical formula that dictated the formation of any developing living organism.

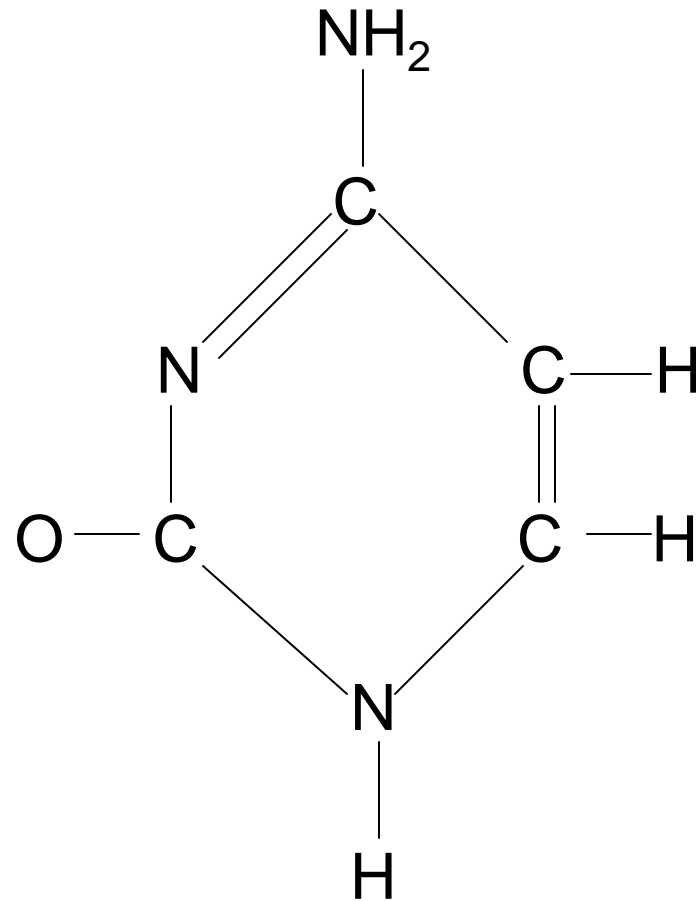
# Adenine



# Thymine

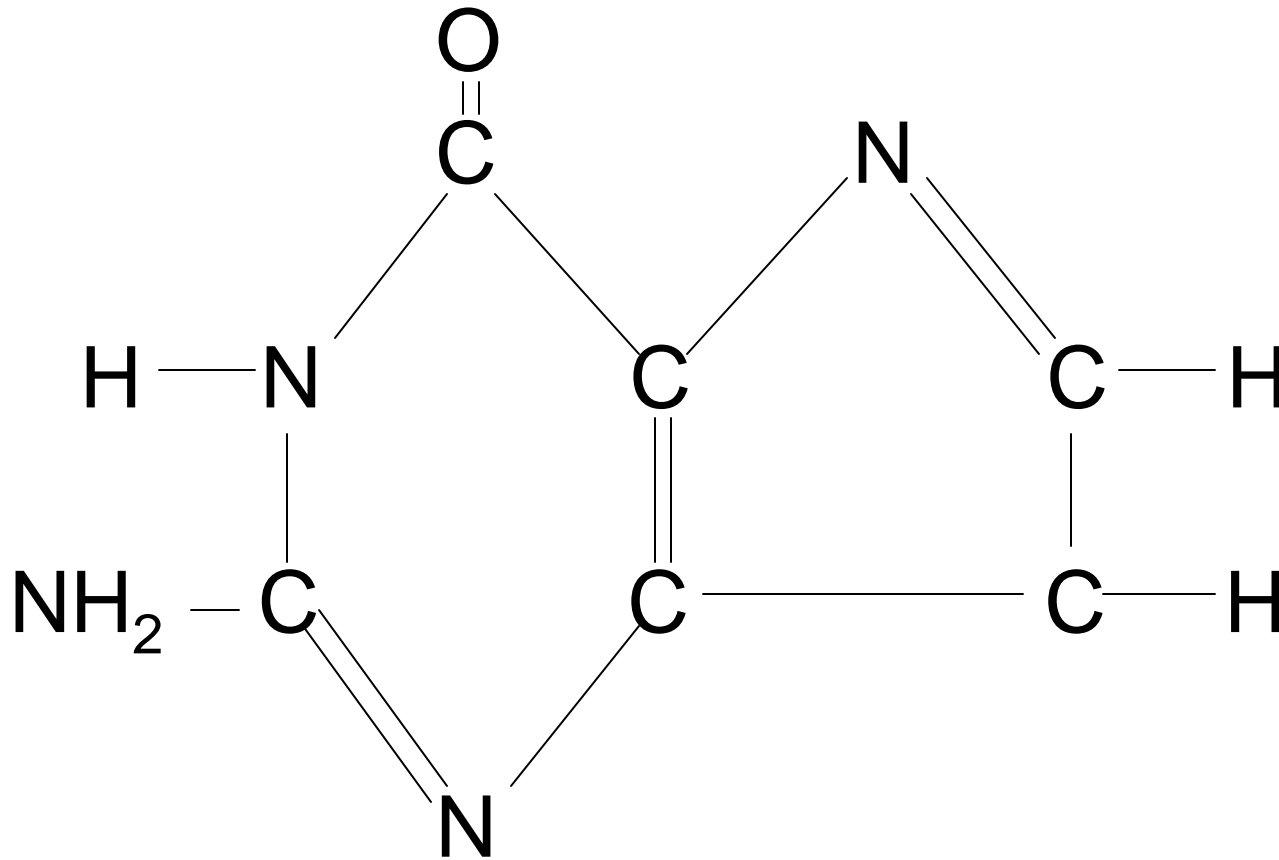


# Cytosine

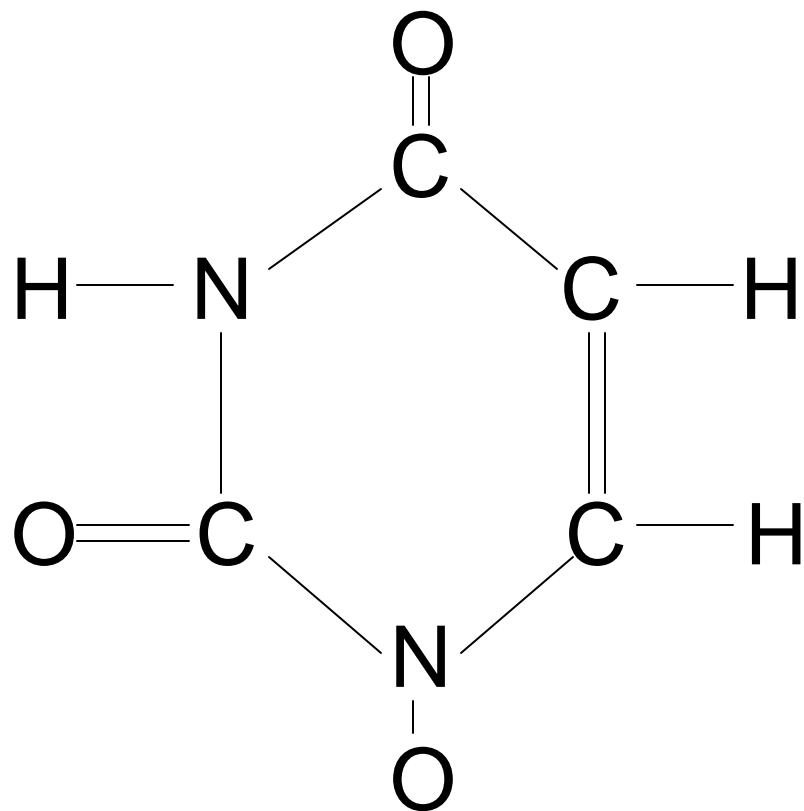


- 
- 
- 
- 
- 
- 
-

# Guanine



# Uracil



•

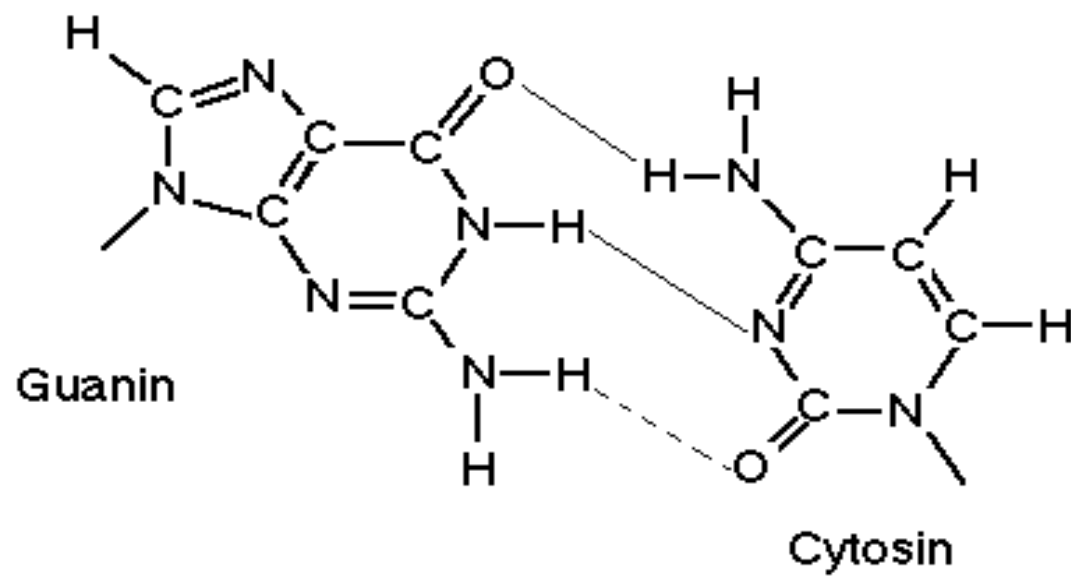
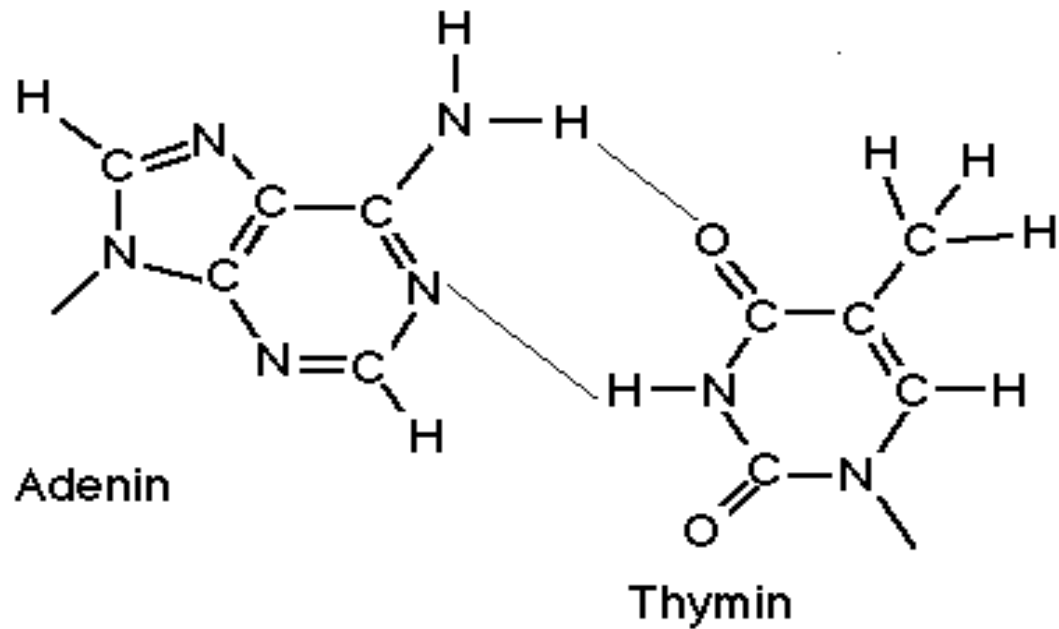
•

•

•

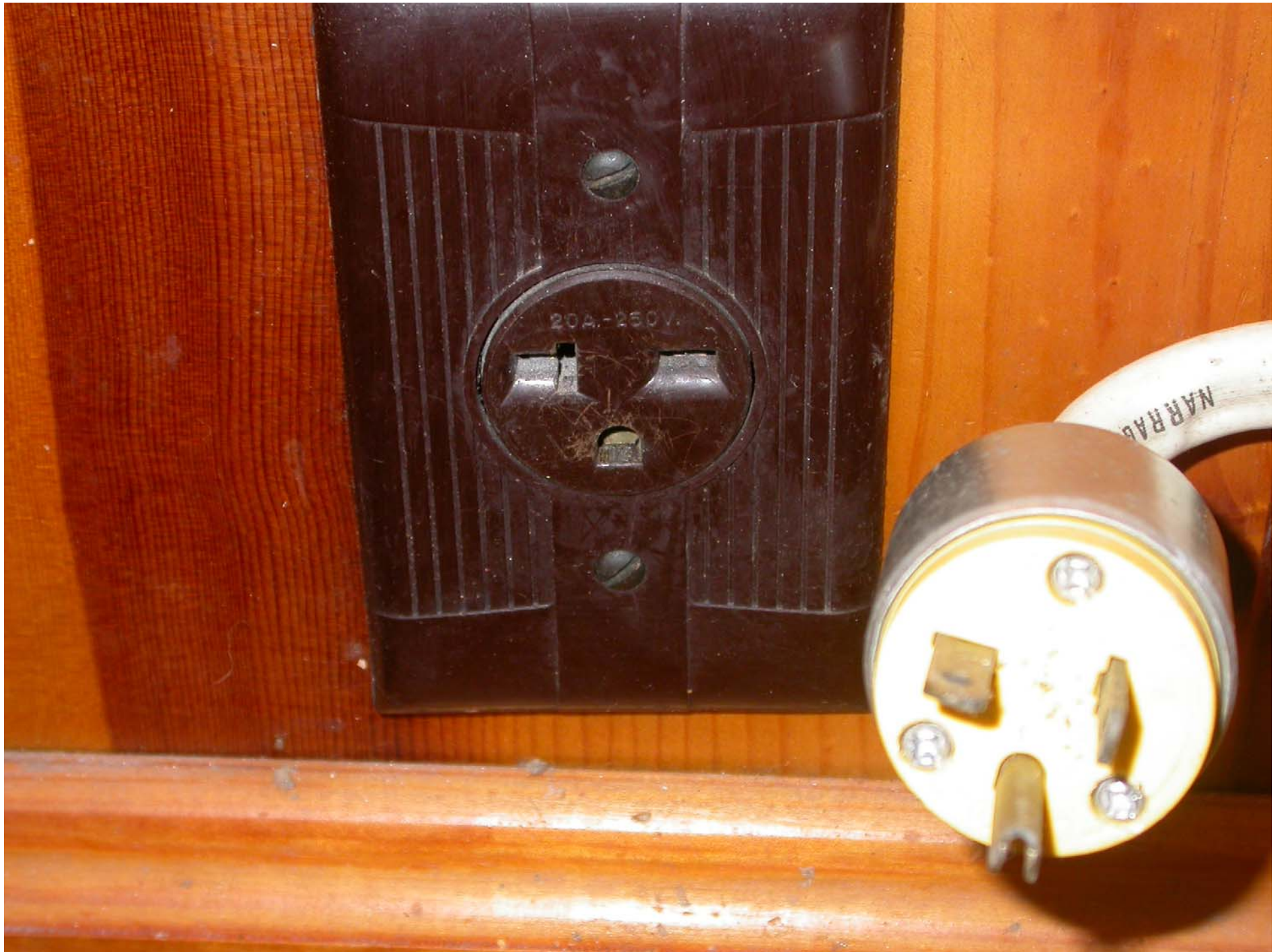
•

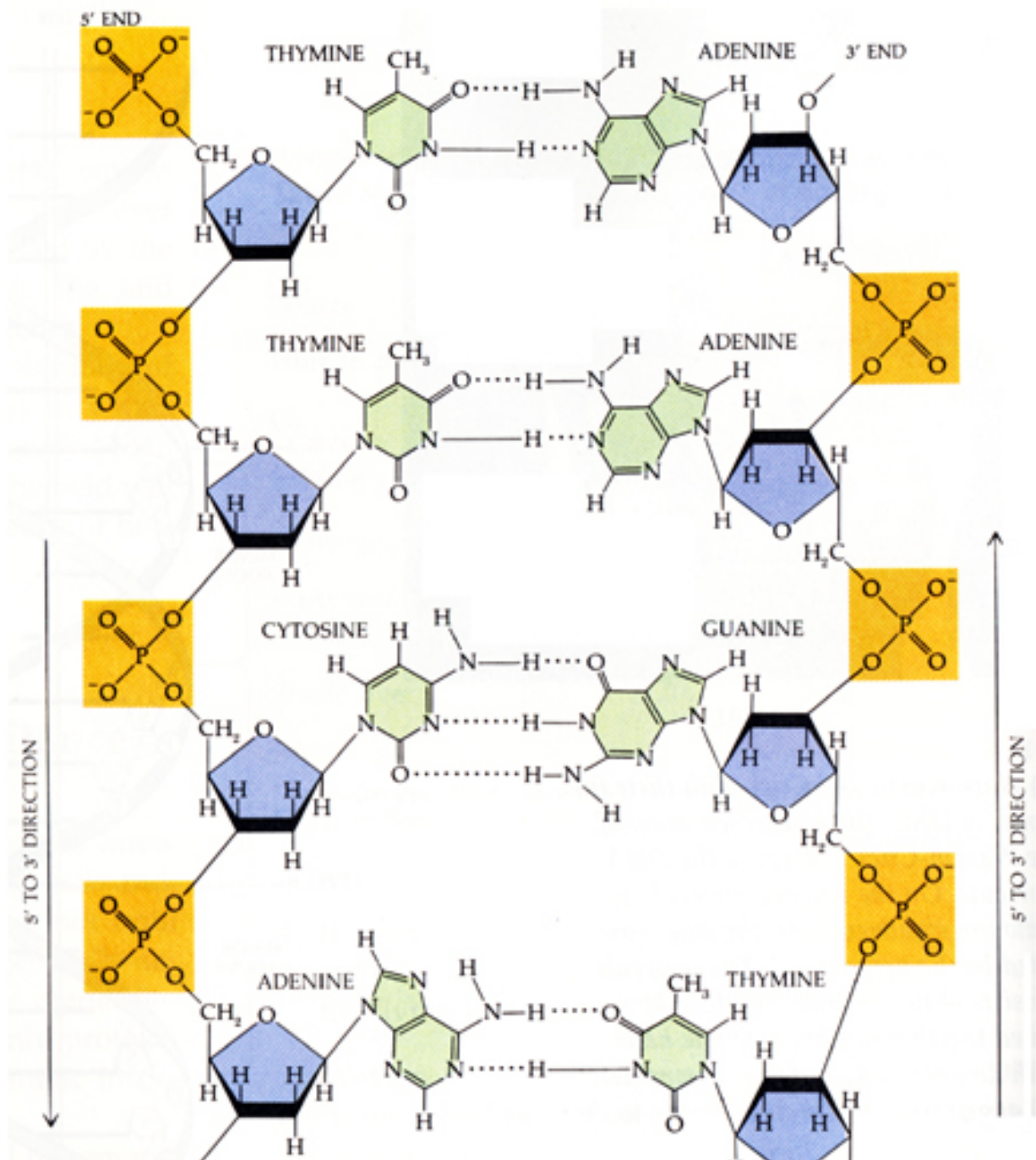
•

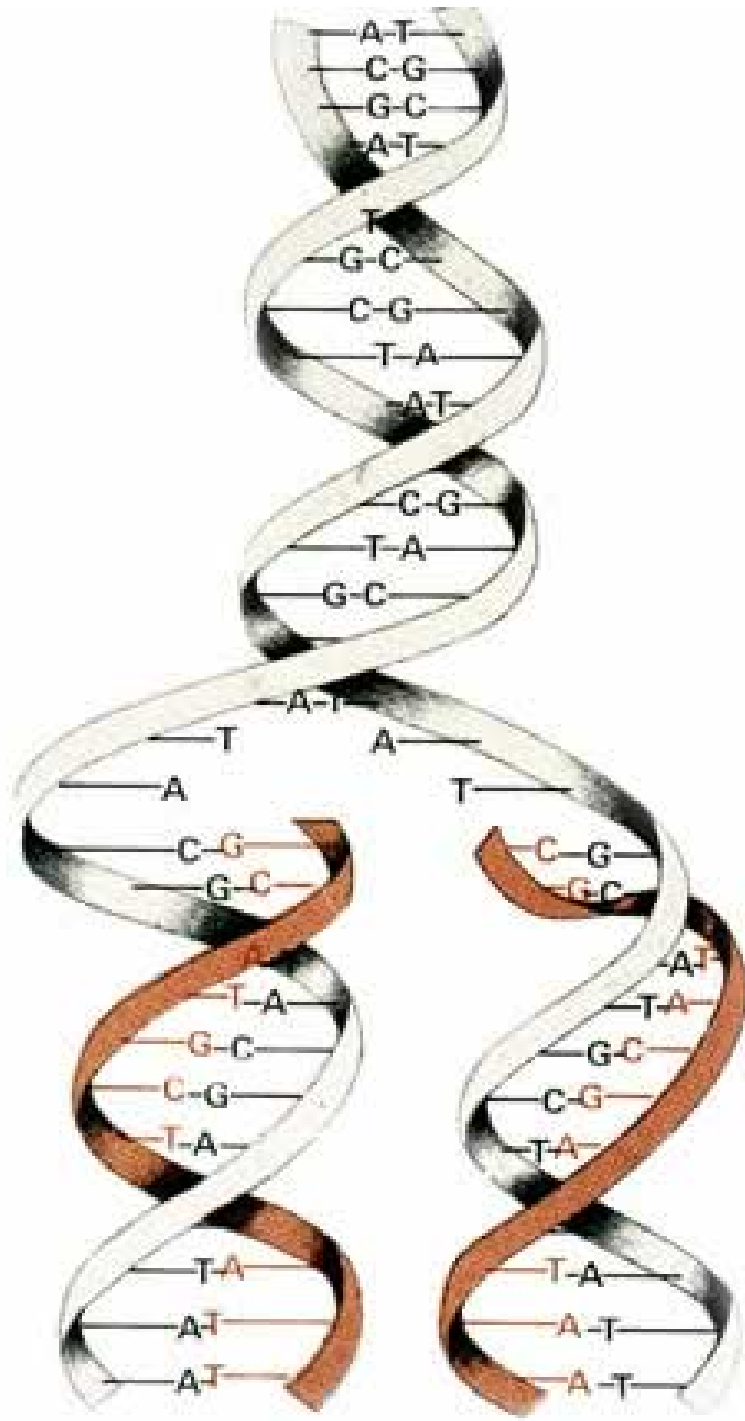


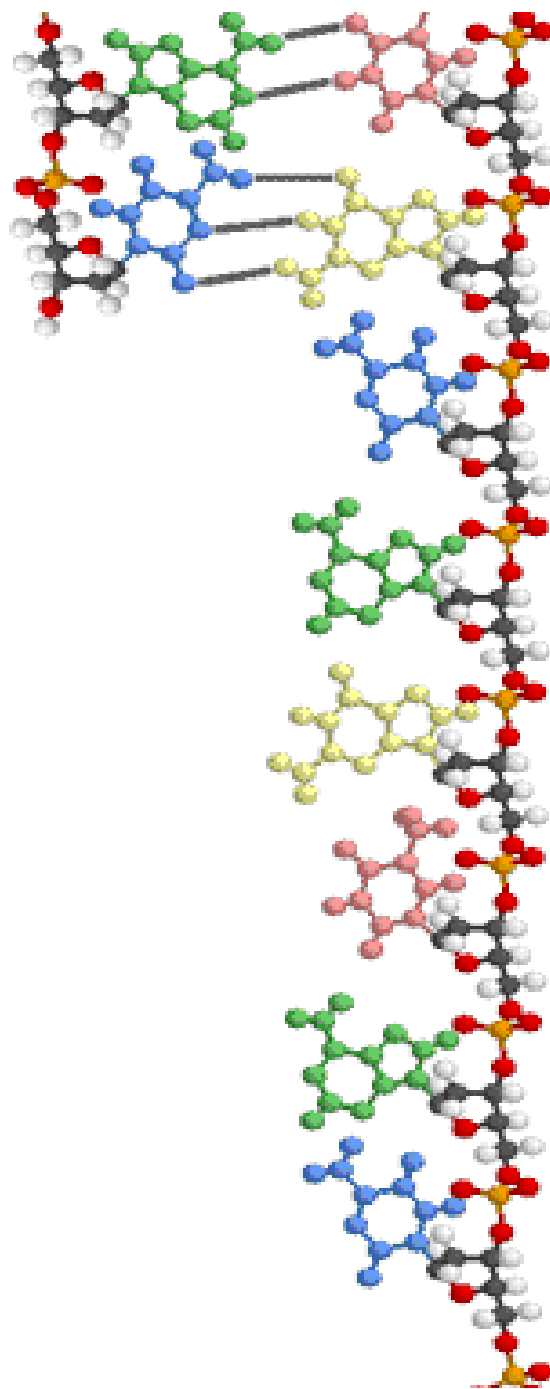
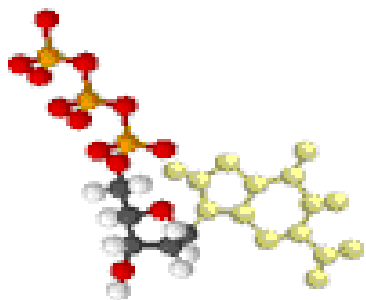


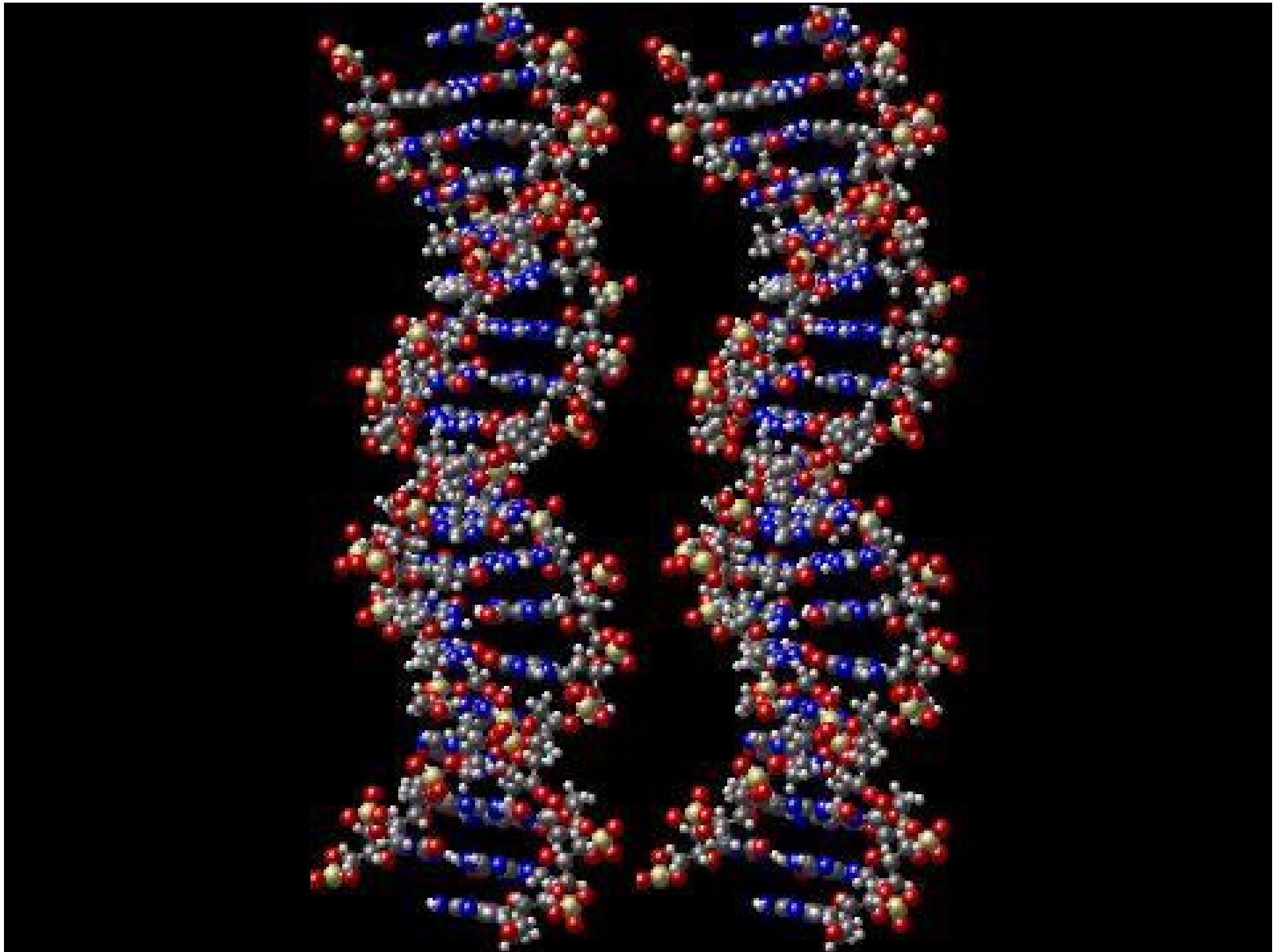


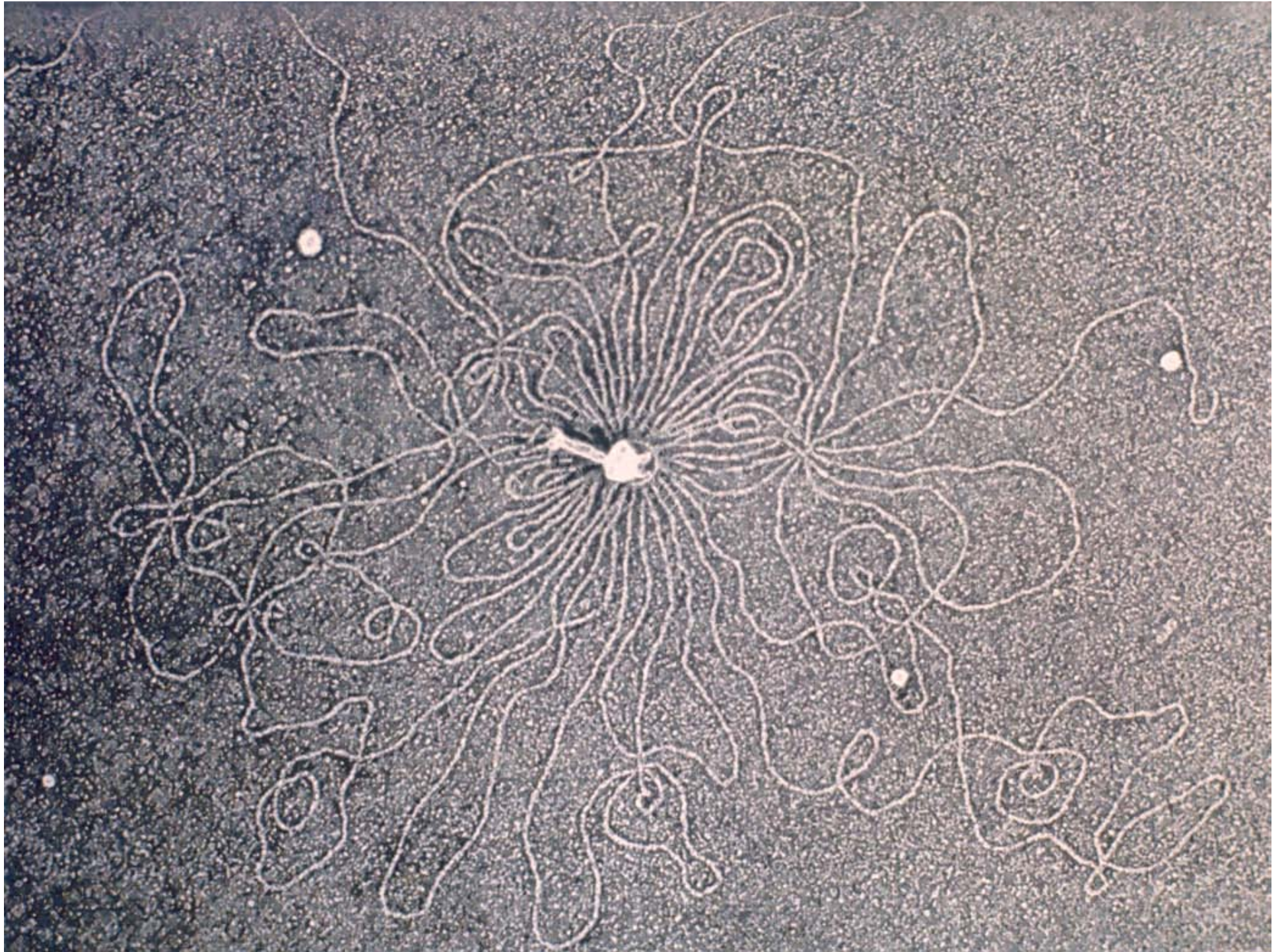








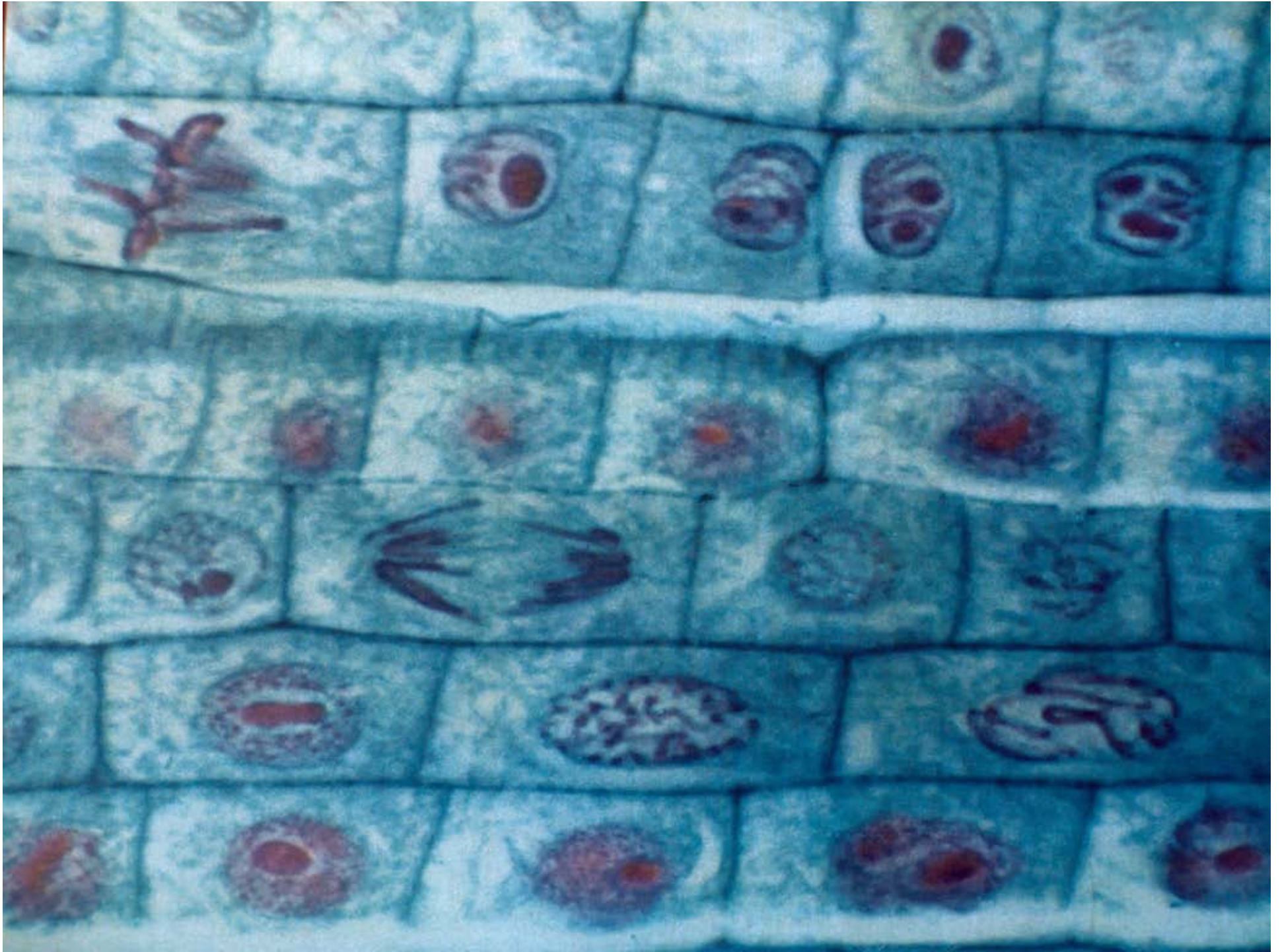




- "Some biologists believe that the first organisms resembled viruses... Viruses do not carry on the complex chemical activities of cells, and they cannot even reproduce, unless they manage to get inside a cell." (McElroy & Swanson, 1968, p. 14). Viruses, in order to reproduce, must take over the ribosomes and other complex protein synthesizing organelles of complex cells in order to perpetuate their kind. Viruses or virus like proto-life had to have complex cells already available in order to survive.

- . McElroy and Swanson state:
- "The several processes and structures involved must be coordinated in time and place if the cell is to divide successfully. One mistake, and the daughter cells will be abnormal. They may die" (McElroy and Swanson, 1968, p. 175).





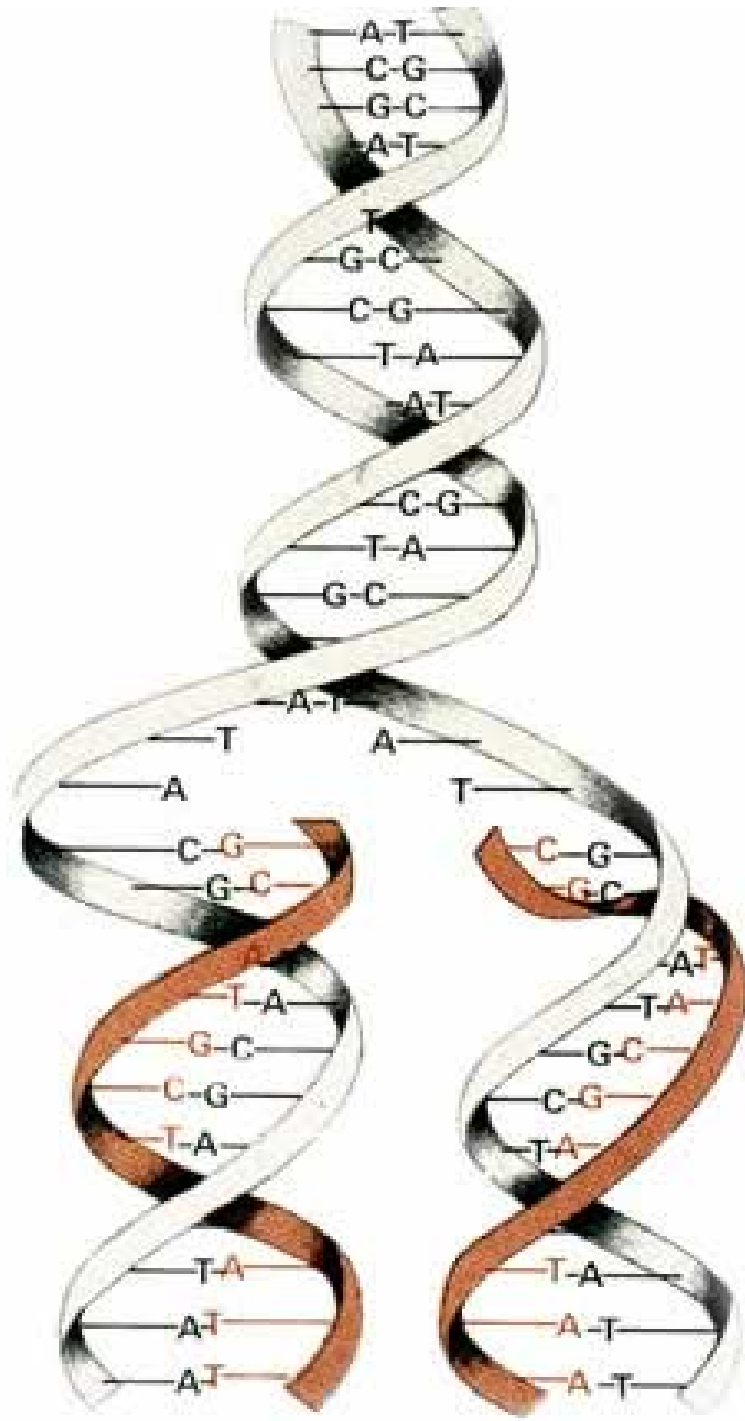
# The Myth of Spontaneous Generation

- a. Much emphasis is given in the teaching of evolution that simple primitive life sprang into being through simple life like molecules which were supposed to have increased in complexity until they became cells and finally multi-cellular organisms. On the other hand, the scientific fact is that life can only come from life, and all cells are descendants of pre-existing cells. Swanson states
- "Cells originate through the division of pre-existing cells... Nor can life be originated anew, it is only spawned from pre-existing life... Life in a cellular form can only come from pre-existing life which also has a cellular form" (Swanson, 1965, p. 63).

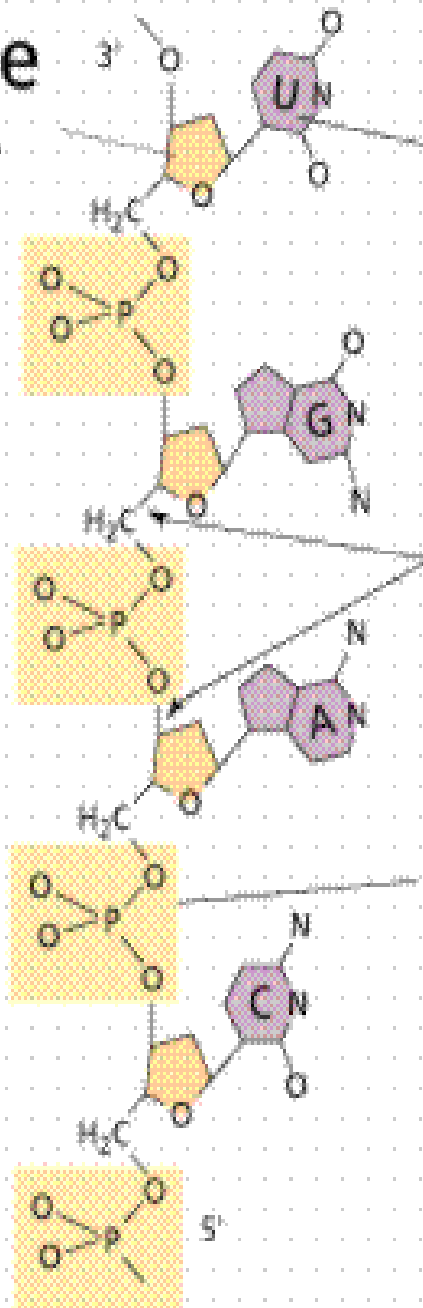
- Concerning the fact that the heredity messengers must be found in every reproducing cell in the organism Bonner and Mills further emphasize:
- "The cellular elements that carry hereditary information must be present in every reproducing cell. In addition, to account for the fact that like faithfully begets like, these elements must be capable of reproducing or dividing accurately" (Bonner & Mills, 1964. p. 3).

- Bonner and Mills, in discussing the reproduction of chromosomes, state:
- "Since chromosomes carry the hereditary information, we would expect them to be accurately reproduced and transmitted in an orderly and precise way. They are. Sometime during the life history of a cell, in the time between cell divisions, an exact copy of each chromosome is synthesized. When cell division is triggered, a sequence of events occurs which results in the formation of two cells with identical sets of chromosomes" (Bonner & Mills, 1964, p. 5).

- Bonner and Mills also, in emphasizing the importance of the genes state.  
"Alterations of a single gene can result in the loss of ability to form a specific essential compound" (Bonner & Mills, 1964, p. 32). They also state "Organisms with deletions are characteristically unable to undergo 'reverse mutation'-Mutation back to the original phenotype" (Bonner & Mills, 1964, p. 57).



Ribose  
sugar

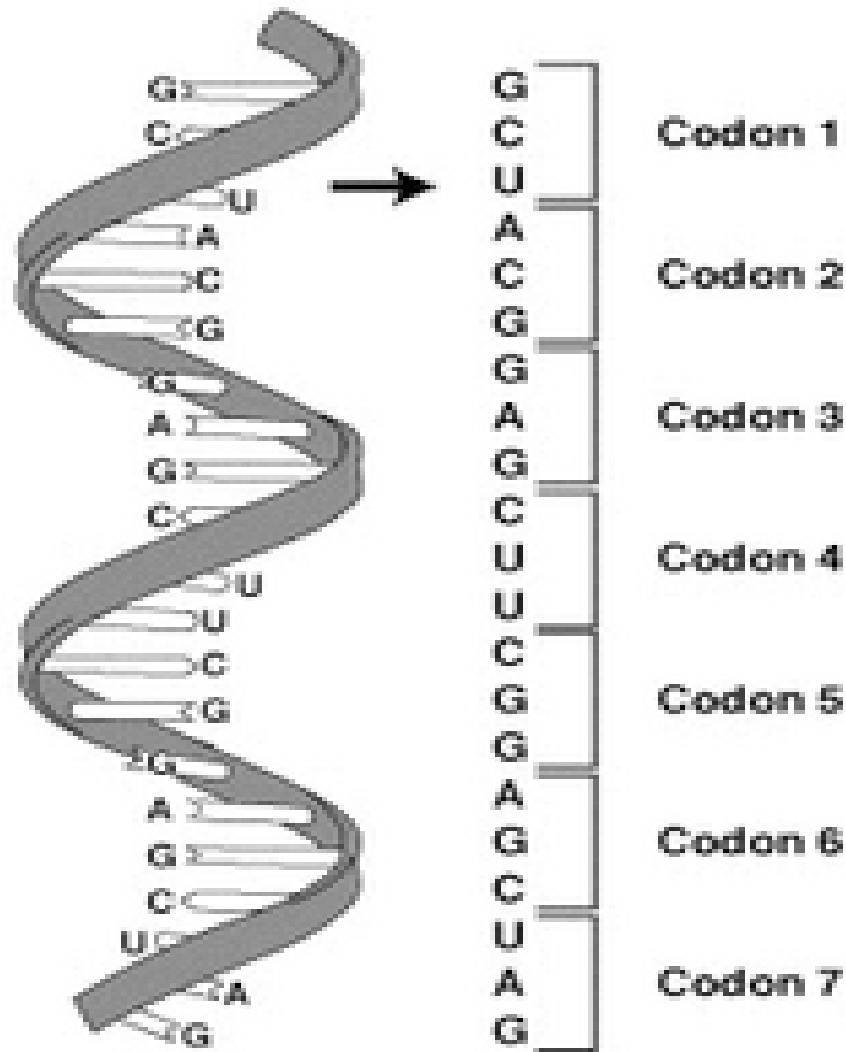


Base

RNA  
(single-stranded)

Phosphodiester  
linkages

Phosphate  
group

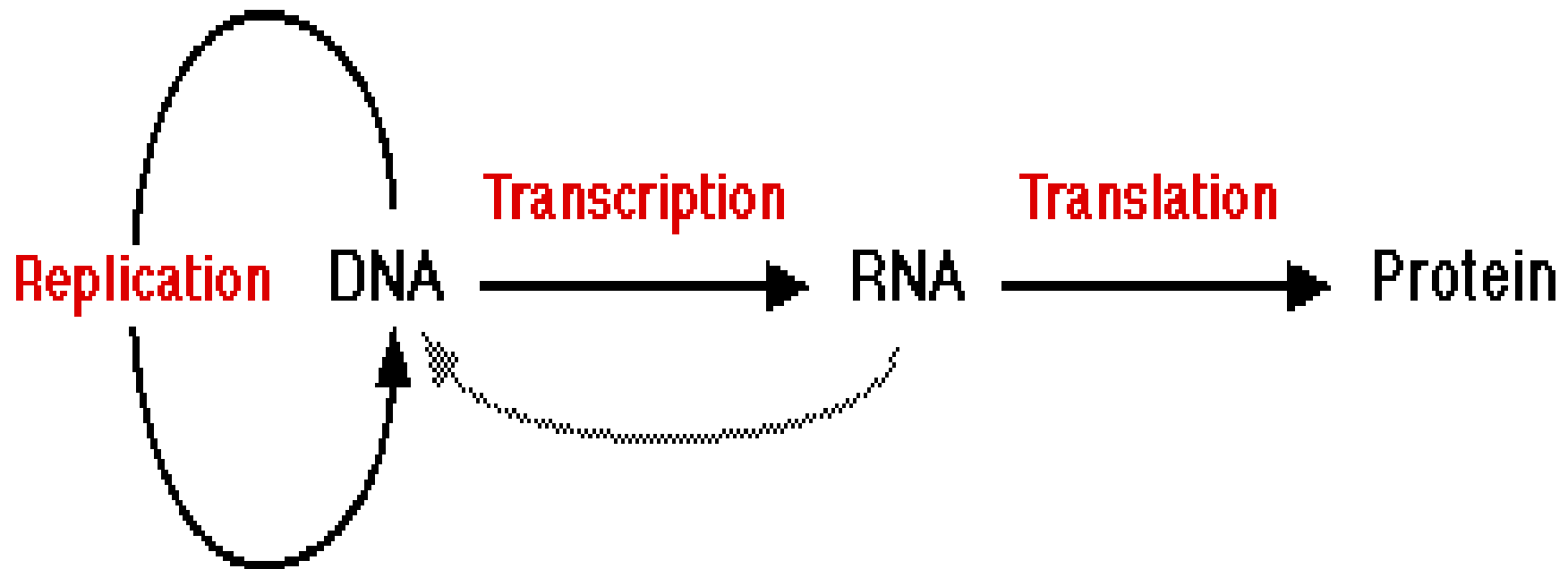


**RNA**

Ribonucleic acid



# The Central Dogma of Molecular Biology



**Transcription** is carried out by **RNA polymerase**

**Translation** is performed on **ribosomes**

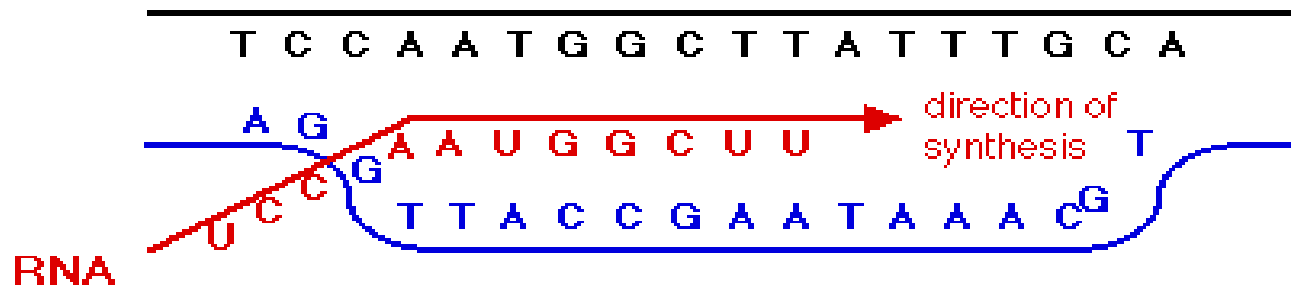
**Replication** is carried out by **DNA polymerase**

Reverse transcriptase copies RNA into DNA

## Transcription of RNA from DNA

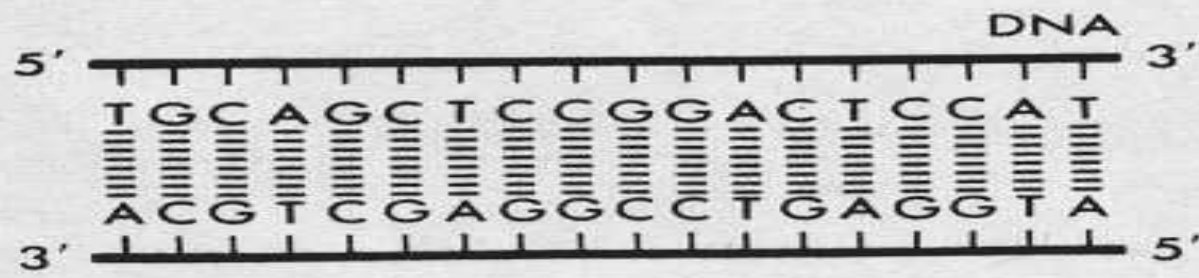


- The bottom strand of the DNA molecule above is the template for RNA synthesis.
- RNA polymerase makes a copy of the DNA sequence but substitutes uridine (U) in place of thymine (T).

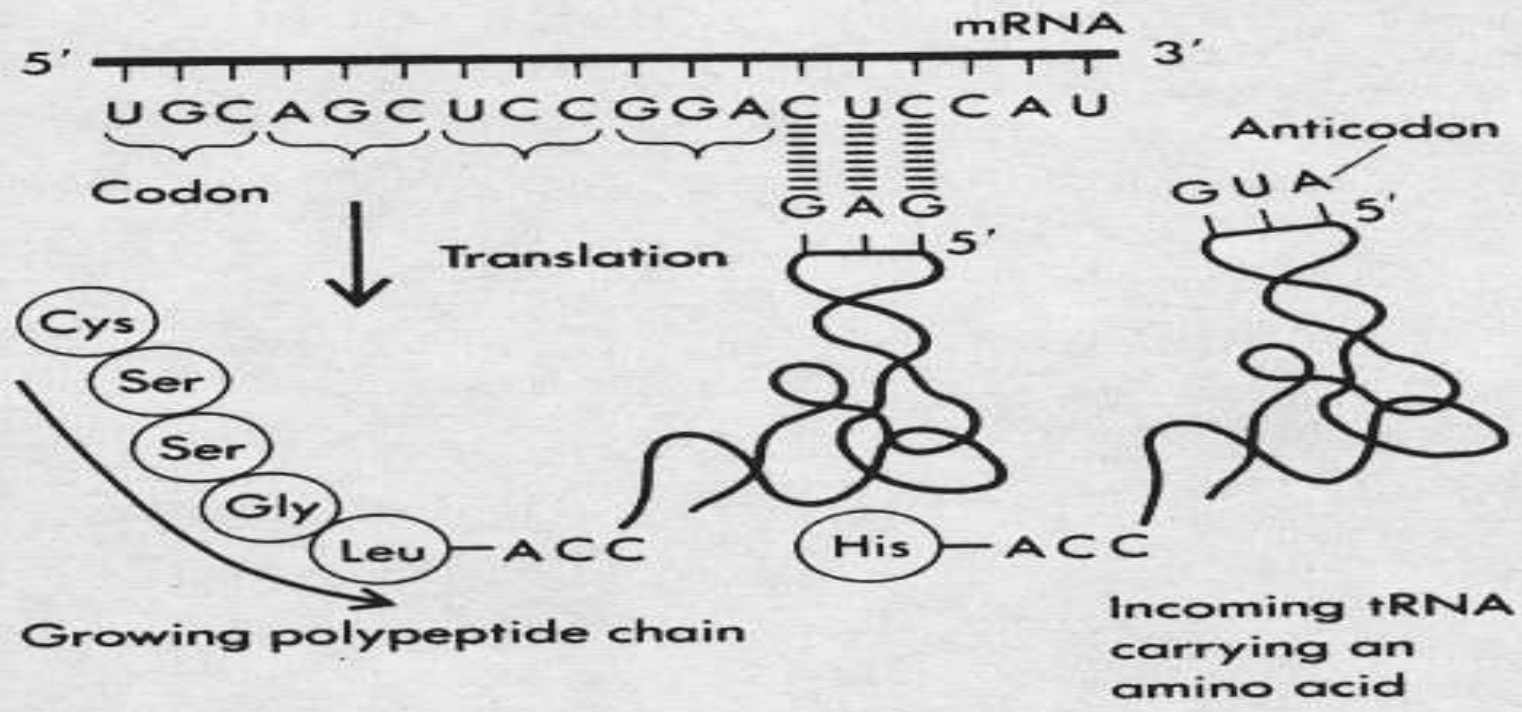


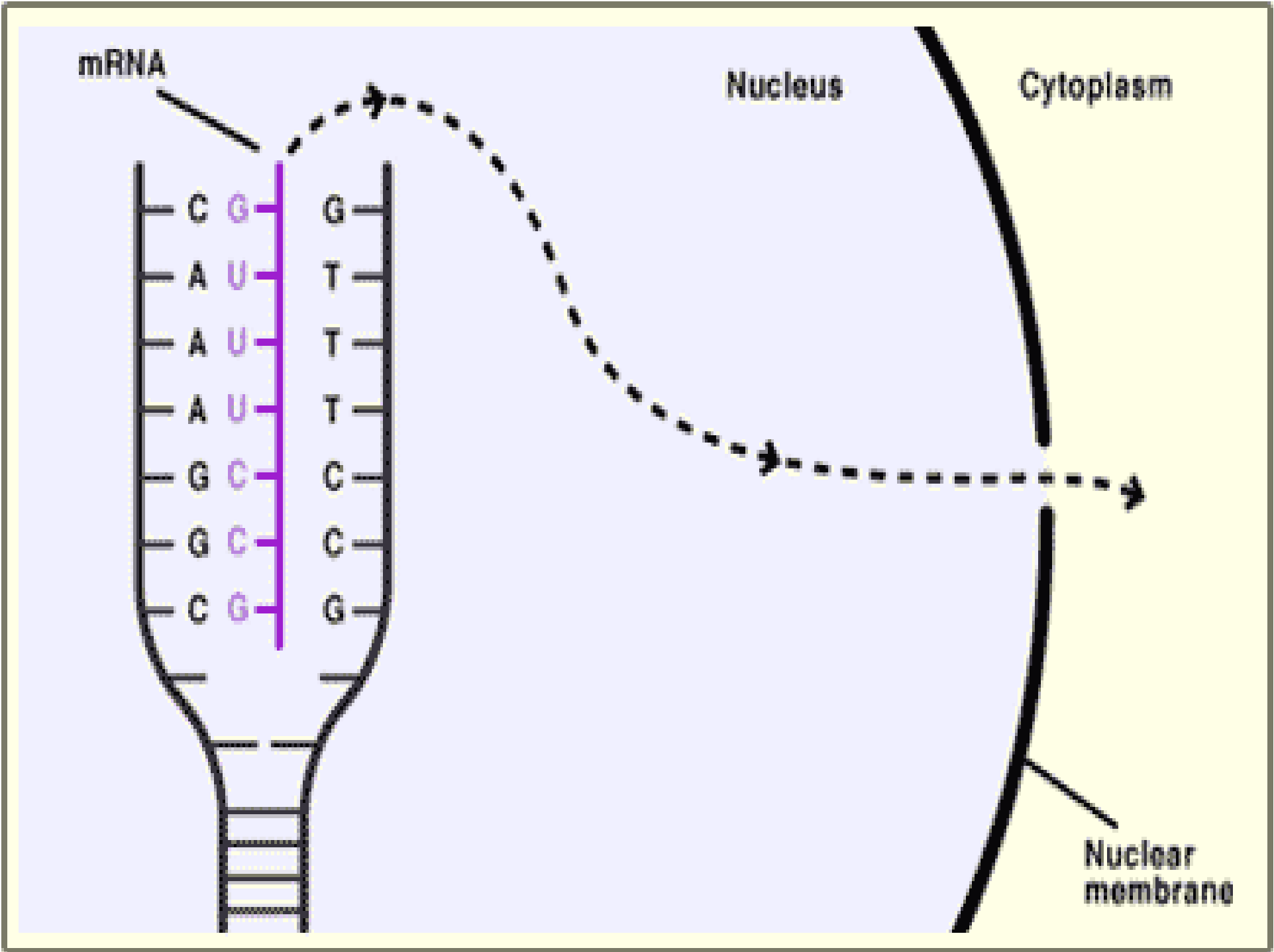
- The bottom strand of the DNA duplex is used as the template to synthesize RNA. However, the sequence of bases in the RNA is the same as in the top strand of the DNA, with U in place of T.





↓ Transcription





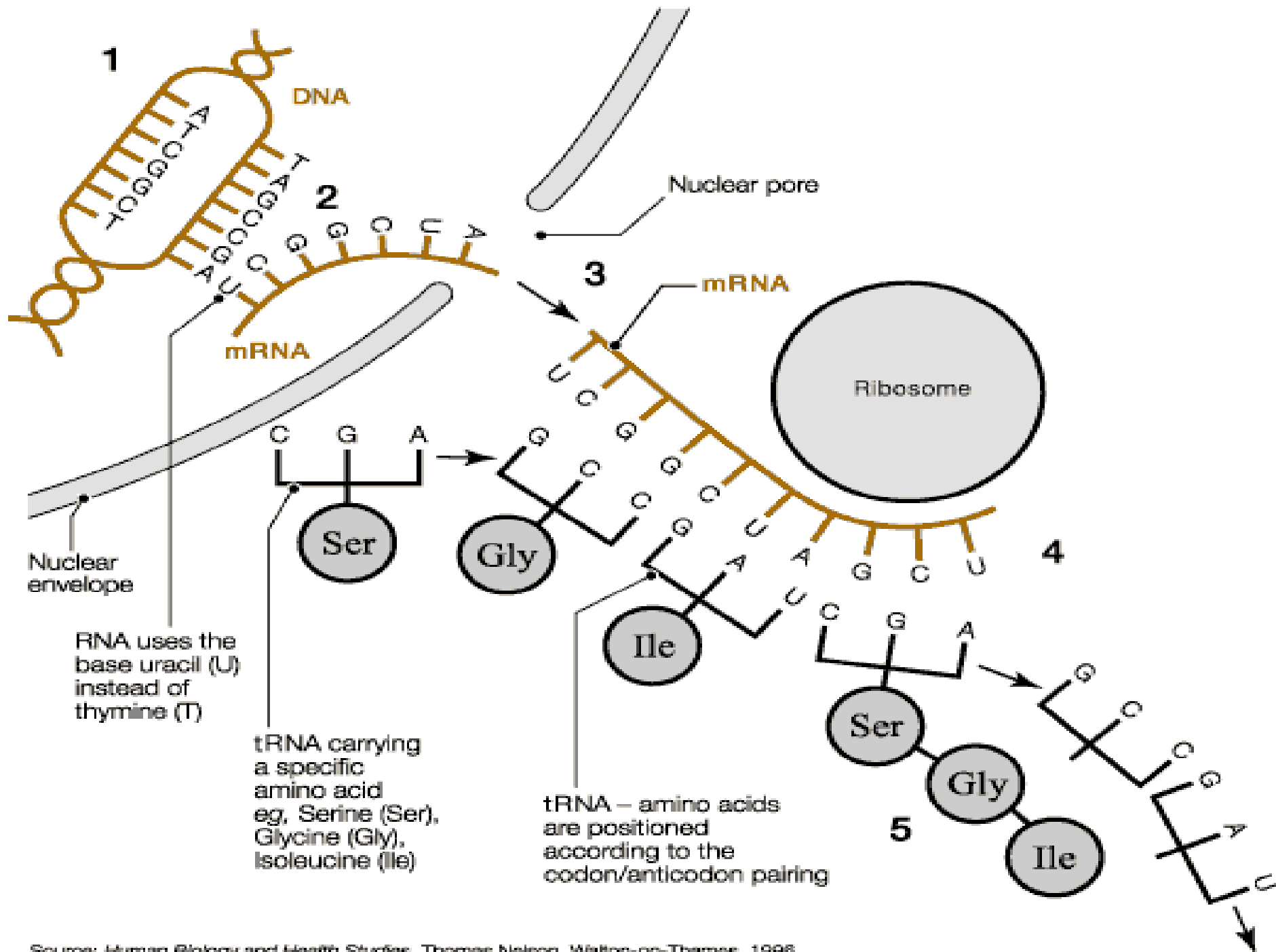
# Amino Acids

- Amino acids are the building blocks of life. They are assembled through the instructions of your DNA to form specific peptides that become picture puzzle pieces of proteins, which become picture puzzle pieces to a successively larger picture puzzle that is finally you.



# The Genetic Code

	U	C	A	G	
U	<p><b>UUU</b> <u>Phenyl</u>alanine</p> <p><b>UUC</b> <u>alanine</u></p> <p><b>UUG</b> <u>Leucine</u></p> <p><b>UUA</b> <u>Leucine</u></p>	<p><b>UCU</b> <u>Serine</u></p> <p><b>UCC</b> <u>Serine</u></p> <p><b>UCA</b> <u>Serine</u></p> <p><b>UCG</b> <u>Serine</u></p>	<p><b>UAU</b> <u>Tyr</u>osine</p> <p><b>UAC</b> <u>Tyr</u>osine</p> <p><b>UAA</b> <b>Stop</b></p> <p><b>UAG</b> <b>Stop</b></p>	<p><b>UGU</b> <u>Cys</u>teine</p> <p><b>UGC</b> <u>Cys</u>teine</p> <p><b>UGA</b> <b>Stop</b></p> <p><b>UGG</b> <u>Tryp</u>tophan</p>	<p><b>U</b></p> <p><b>C</b></p> <p><b>A</b></p> <p><b>G</b></p>
C	<p><b>CUU</b> <u>Leucine</u></p> <p><b>CUC</b> <u>Leucine</u></p> <p><b>CUA</b> <u>Leucine</u></p> <p><b>CUG</b> <u>Leucine</u></p>	<p><b>CCU</b> <u>Pro</u>line</p> <p><b>CCC</b> <u>Pro</u>line</p> <p><b>CCA</b> <u>Pro</u>line</p> <p><b>CCG</b> <u>Pro</u>line</p>	<p><b>CAU</b> <u>Hist</u>idine</p> <p><b>CAC</b> <u>Hist</u>idine</p> <p><b>CAA</b> <u>Glut</u>amine</p> <p><b>CAG</b> <u>Glut</u>amine</p>	<p><b>CGU</b> <u>Arg</u>inine</p> <p><b>CGC</b> <u>Arg</u>inine</p> <p><b>CGA</b> <u>Arg</u>inine</p> <p><b>CGG</b> <u>Arg</u>inine</p>	<p><b>U</b></p> <p><b>C</b></p> <p><b>A</b></p> <p><b>G</b></p>
A	<p><b>AUU</b> <u>Iso</u>leucine</p> <p><b>AUC</b> <u>Iso</u>leucine</p> <p><b>AUA</b> <u>Iso</u>leucine</p> <p><b>AUG</b> <u>Meth</u>ionine</p>	<p><b>ACU</b> <u>Thr</u>eonine</p> <p><b>ACC</b> <u>Thr</u>eonine</p> <p><b>ACA</b> <u>Thr</u>eonine</p> <p><b>ACG</b> <u>Thr</u>eonine</p>	<p><b>AAU</b> <u>Asp</u>aragine</p> <p><b>AAC</b> <u>Asp</u>aragine</p> <p><b>AAA</b> <u>Lys</u>ine</p> <p><b>AAG</b> <u>Lys</u>ine</p>	<p><b>AGU</b> <u>Ser</u>ine</p> <p><b>AGC</b> <u>Ser</u>ine</p> <p><b>AGA</b> <u>Arg</u>inine</p> <p><b>AGG</b> <u>Arg</u>inine</p>	<p><b>U</b></p> <p><b>C</b></p> <p><b>A</b></p> <p><b>G</b></p>
G	<p><b>GUU</b> <u>Val</u>ine</p> <p><b>GUC</b> <u>Val</u>ine</p> <p><b>GUA</b> <u>Val</u>ine</p> <p><b>GUG</b> <u>Val</u>ine</p>	<p><b>GCU</b> <u>Ala</u>nine</p> <p><b>GCC</b> <u>Ala</u>nine</p> <p><b>GCA</b> <u>Ala</u>nine</p> <p><b>GCG</b> <u>Ala</u>nine</p>	<p><b>GAU</b> <u>Asp</u>artic acid</p> <p><b>GAC</b> <u>Asp</u>artic acid</p> <p><b>GAA</b> <u>Glut</u>amic acid</p> <p><b>GAG</b> <u>Glut</u>amic acid</p>	<p><b>GGU</b> <u>Glyc</u>ine</p> <p><b>GGC</b> <u>Glyc</u>ine</p> <p><b>GGA</b> <u>Glyc</u>ine</p> <p><b>GGG</b> <u>Glyc</u>ine</p>	<p><b>U</b></p> <p><b>C</b></p> <p><b>A</b></p> <p><b>G</b></p>



Source: *Human Biology and Health Studies*, Thomas Nelson, Walton-on-Thames, 1996

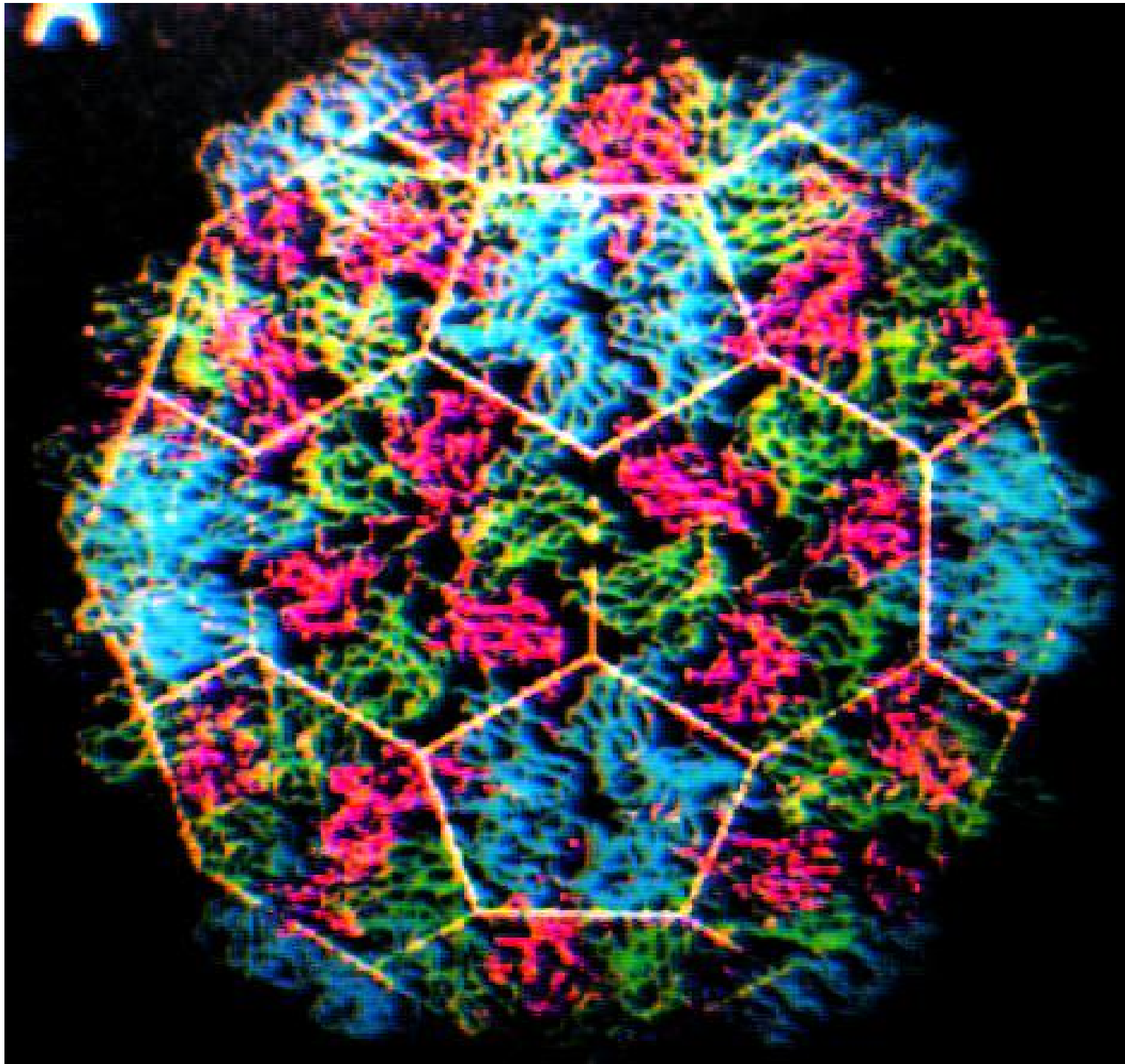


# The Processes of Life

- Proto-proteins and Polypeptides
- The Assembling of Proteins
- The Functions of Proteins
  - The Building Blocks of Living Structures
  - Organic Catalysts

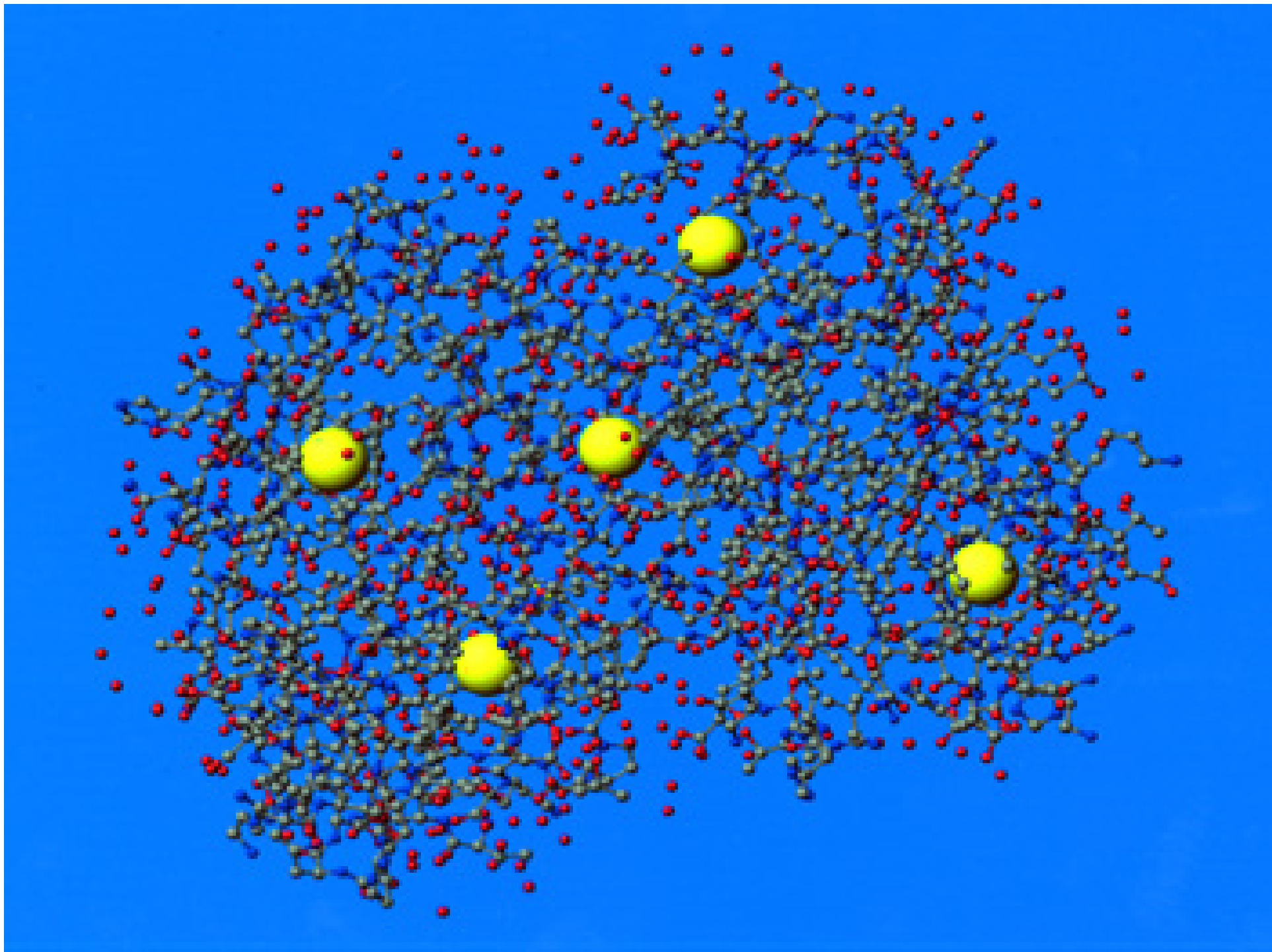
# Enzymes as Organic Catalysts

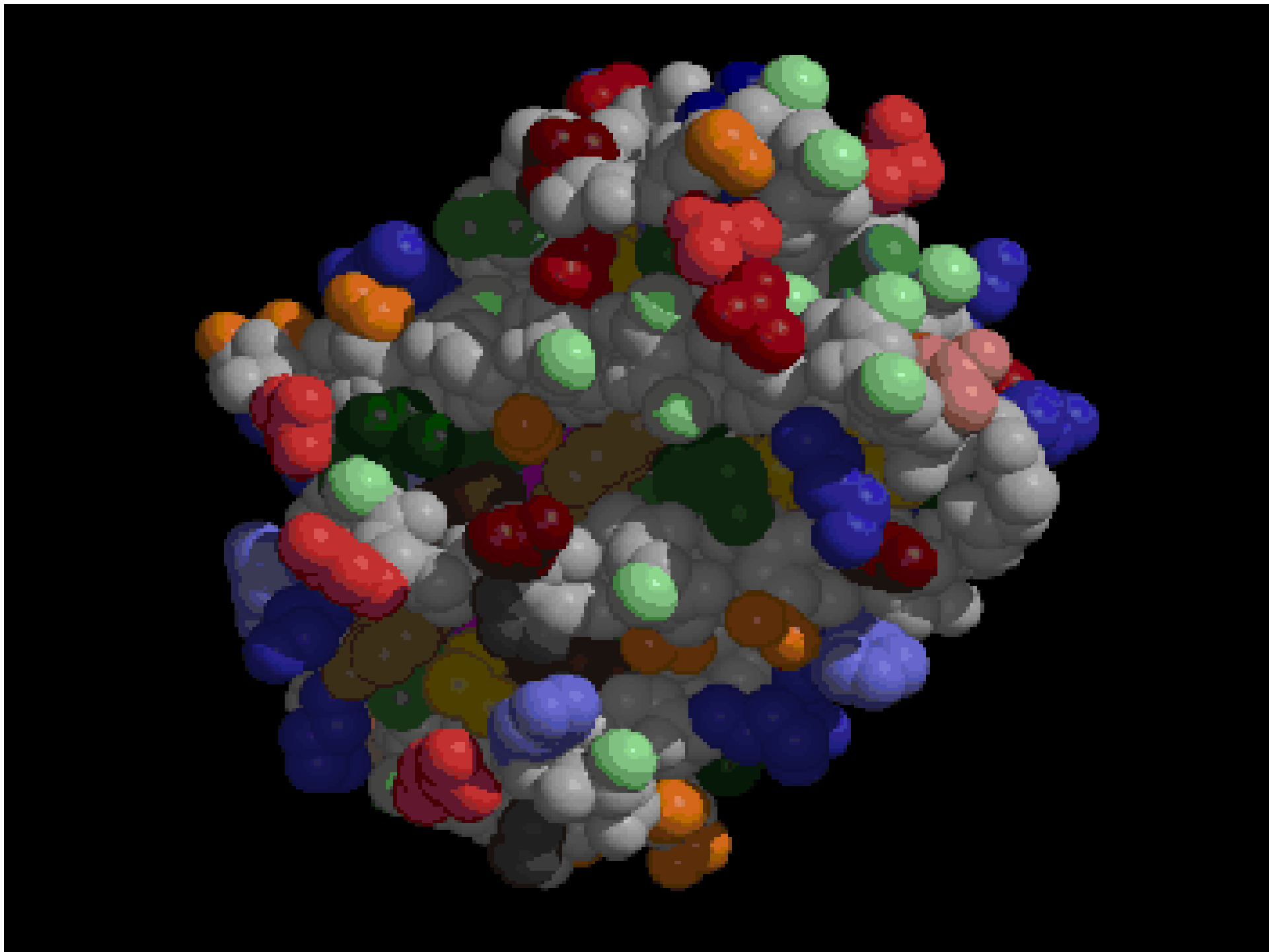
- "For every essential chemical reaction that occurs in a living cell, there is a specific enzyme capable of speeding up that step. Without enzymes, these chemical reactions would not take place fast enough at normal temperatures to sustain life... Enzymes are intimately associated with all life processes such as muscle contraction, nerve conduction, excretion and absorption." (McElroy & Swanson, 1968, p. 228).



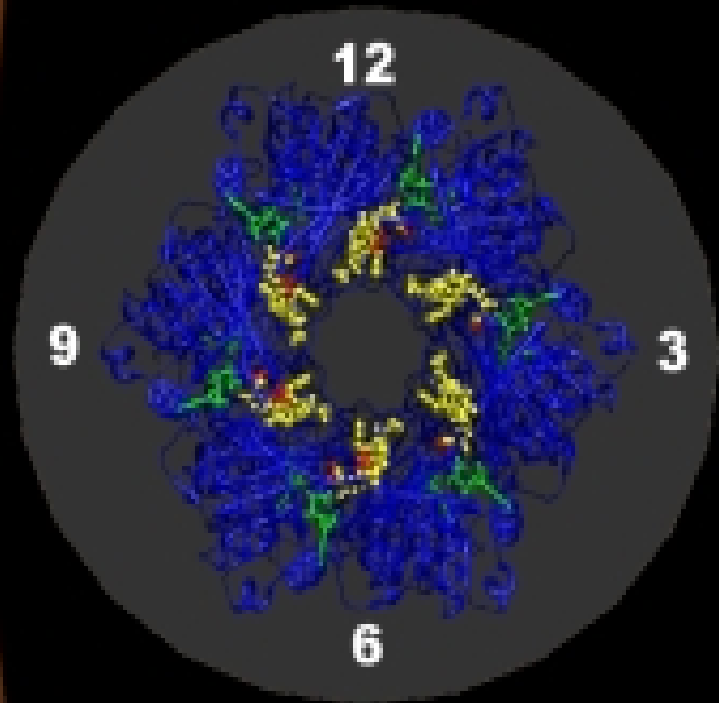
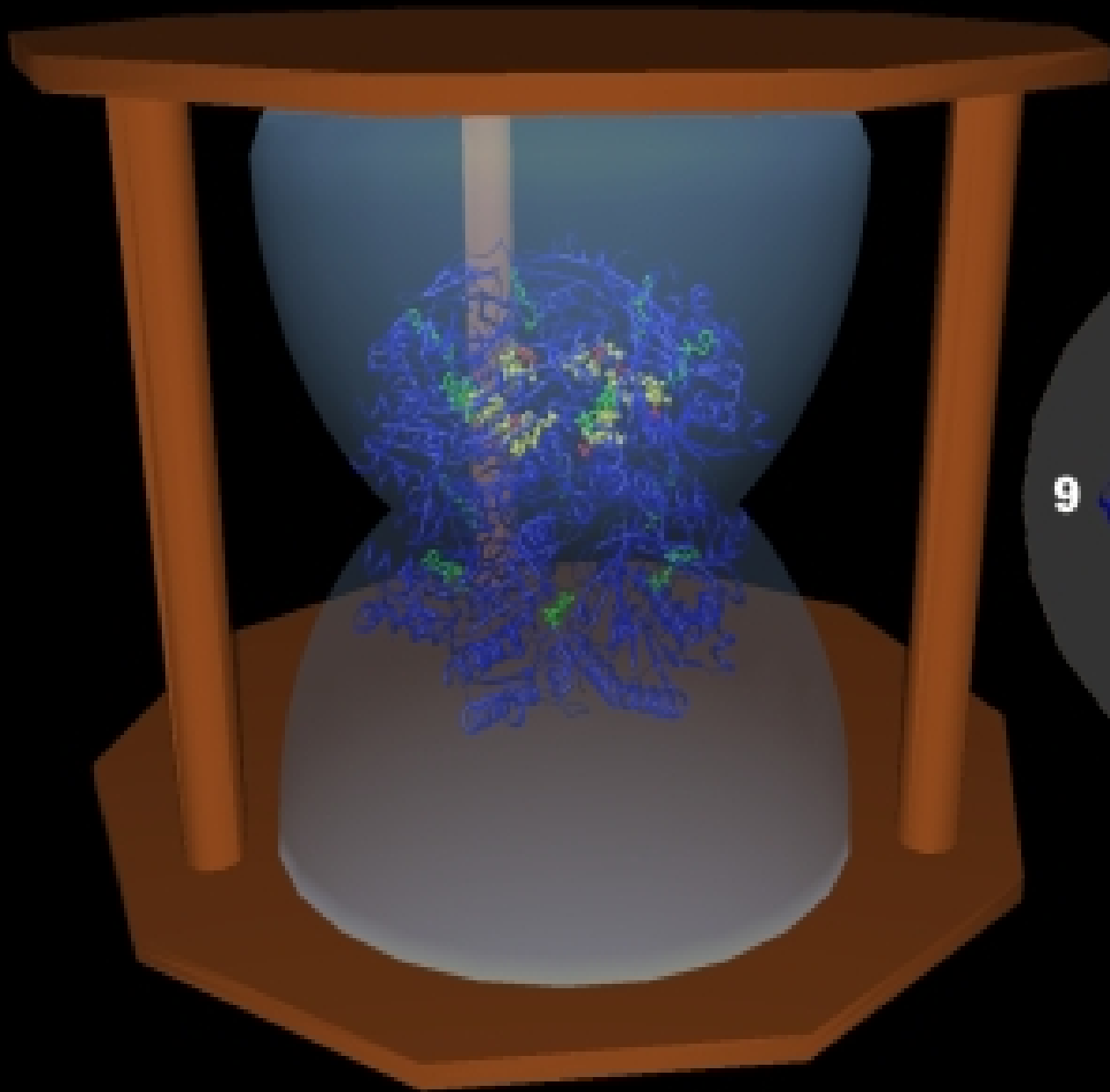
# Catalytic Activity In Life

- Breaking down complex molecules into their component molecules (digestion).
- Causing the assembly of component organic molecules into more complex organic molecules (starch to cellulose).
- The altering of unusable organic molecules into usable molecules (sucrose to glucose).
- The assembly of specific organic molecules which become the building blocks for the construction of membranes, organelles, cells, tissues, organs, systems, and organisms.





- [hemoglobin](#) molecule, which transports oxygen in blood
- consists of 4 chains of [amino acids](#) twisted together
- each chain contains 146 amino acids
- life on Earth is based on 20 different kinds of amino acid
- thus, number of different ways of making a chain of 146 amino acids from 20 different building blocks is 20 multiplied by itself 146 times, because one can place any one of 20 amino acids at each position in the chain --->  $20^{146}$  or about  $10^{190}$ !
- if you take the fastest ever built Teraflop (trillion operations per second) computer and start constructing combinations at random for as long as Universe has existed, which is  $10^{18}$  seconds, you get only  $10^{30}$  combinations ---> chance alone cannot lead to LIFE





# The assembly of proteins

- In order to assemble the proteins to form living cells, they must be placed in the proper position with other proteins and lipids to form membranes, which in turn form organelles within cells. The proteins become picture puzzle pieces to specific membranes that perform specific functions within the processes of life. These are assembled according to the specific dictates of DNA, the master molecule for each specific species of living beings.

# The purpose of membranes

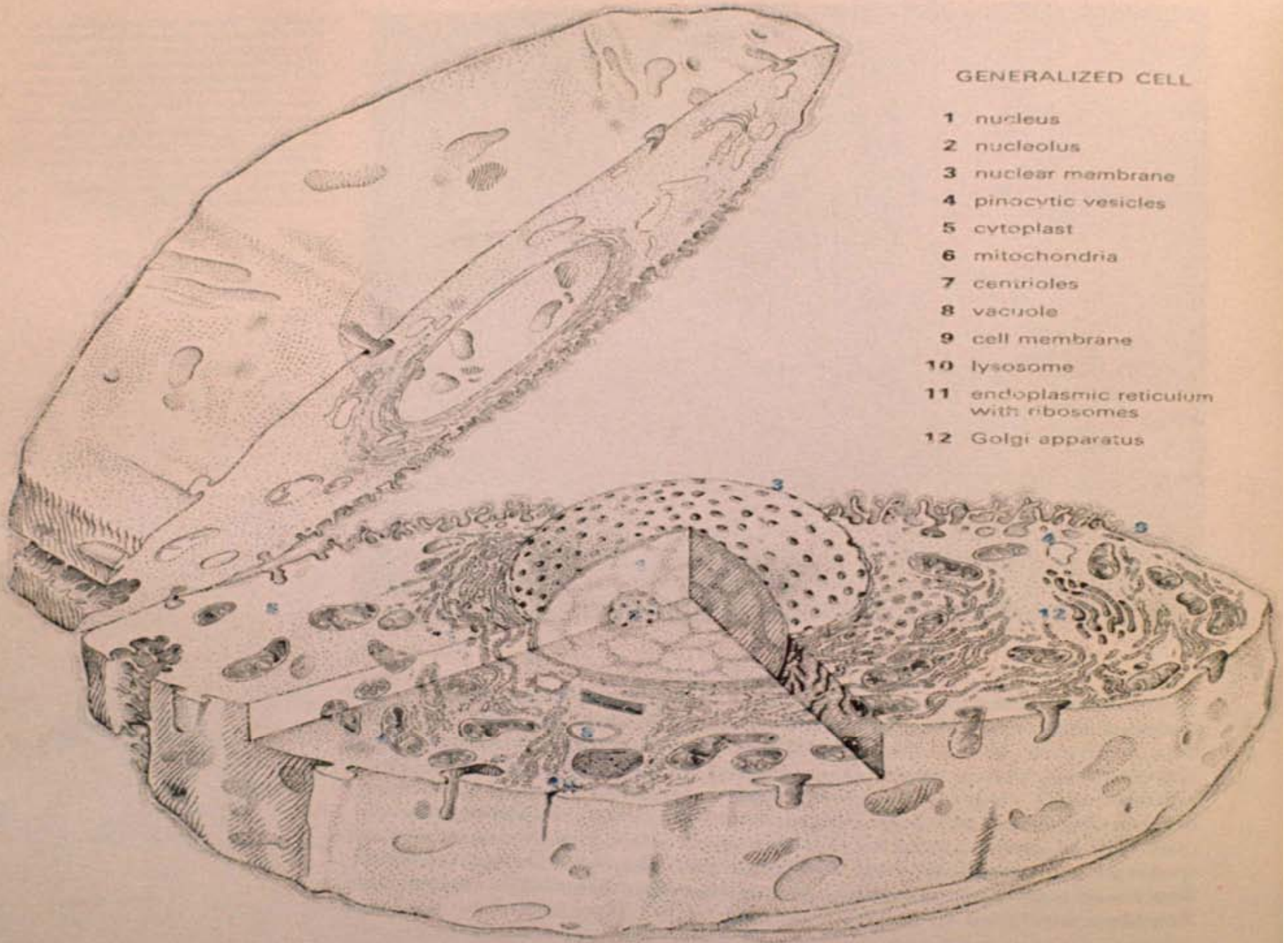
- Membranes are assembled to either become part of the organelle structures within cells, or to perform specific functions within the chemistry of life. Each membrane is specific and has a position within the machinery of the cell, or it contains biophysical enzymes that perform genetically dictated chemical functions within the cells.

# The formation of organelles

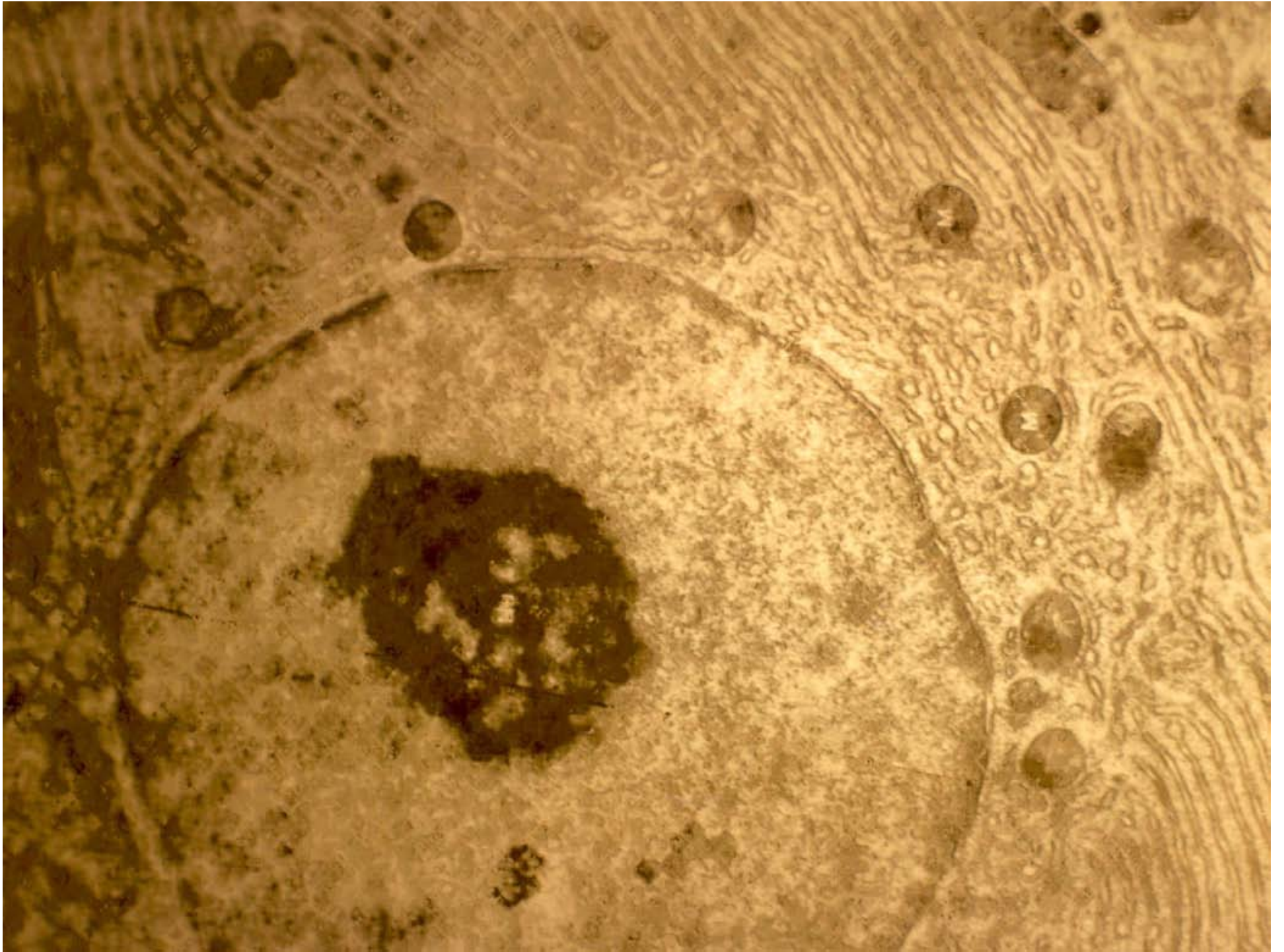
- The membranes then are assembled to form exceedingly small nano-machines called organelles. These organelles perform specific life functions and become the picture puzzle pieces that form the cell.

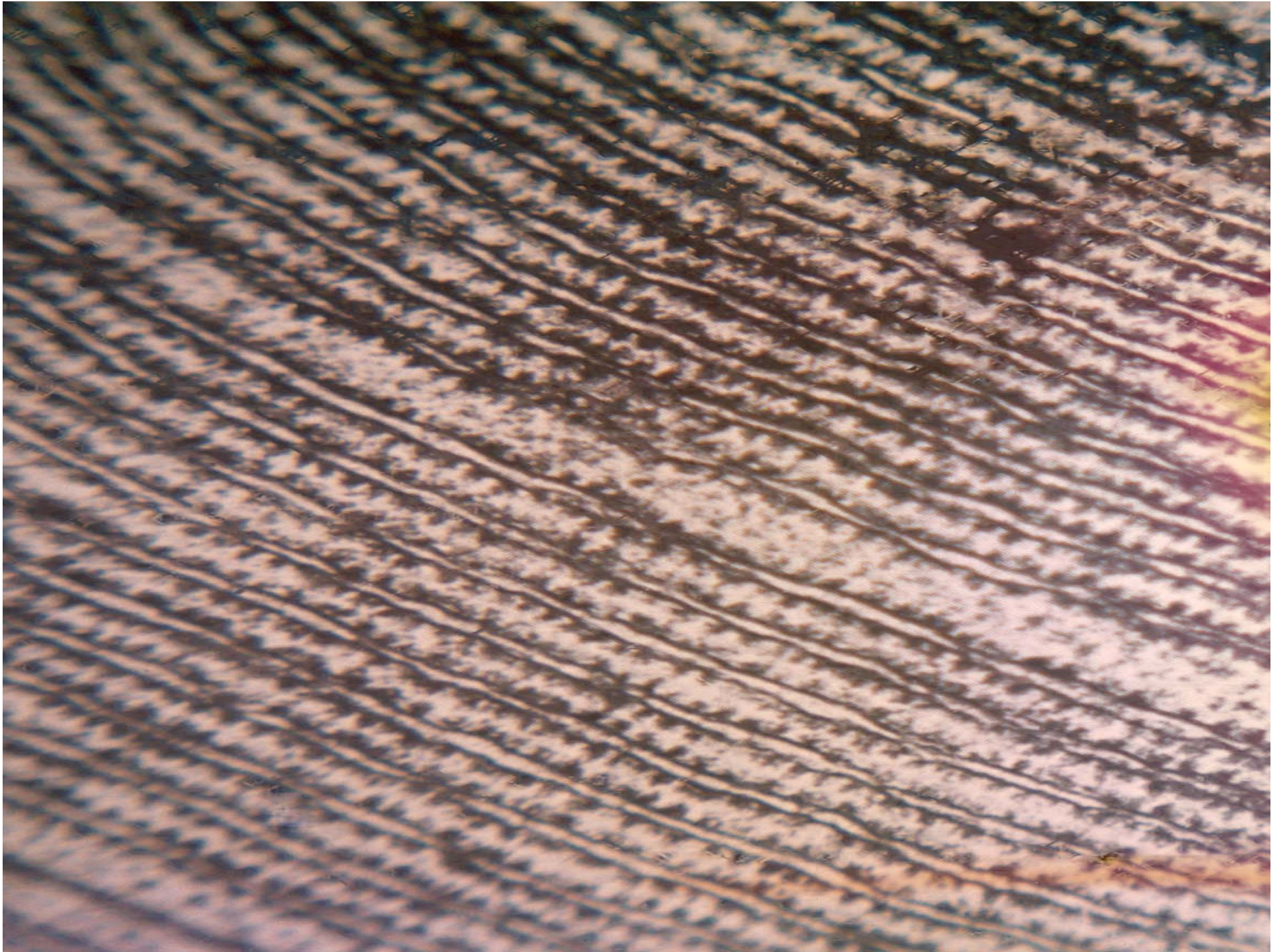
### GENERALIZED CELL

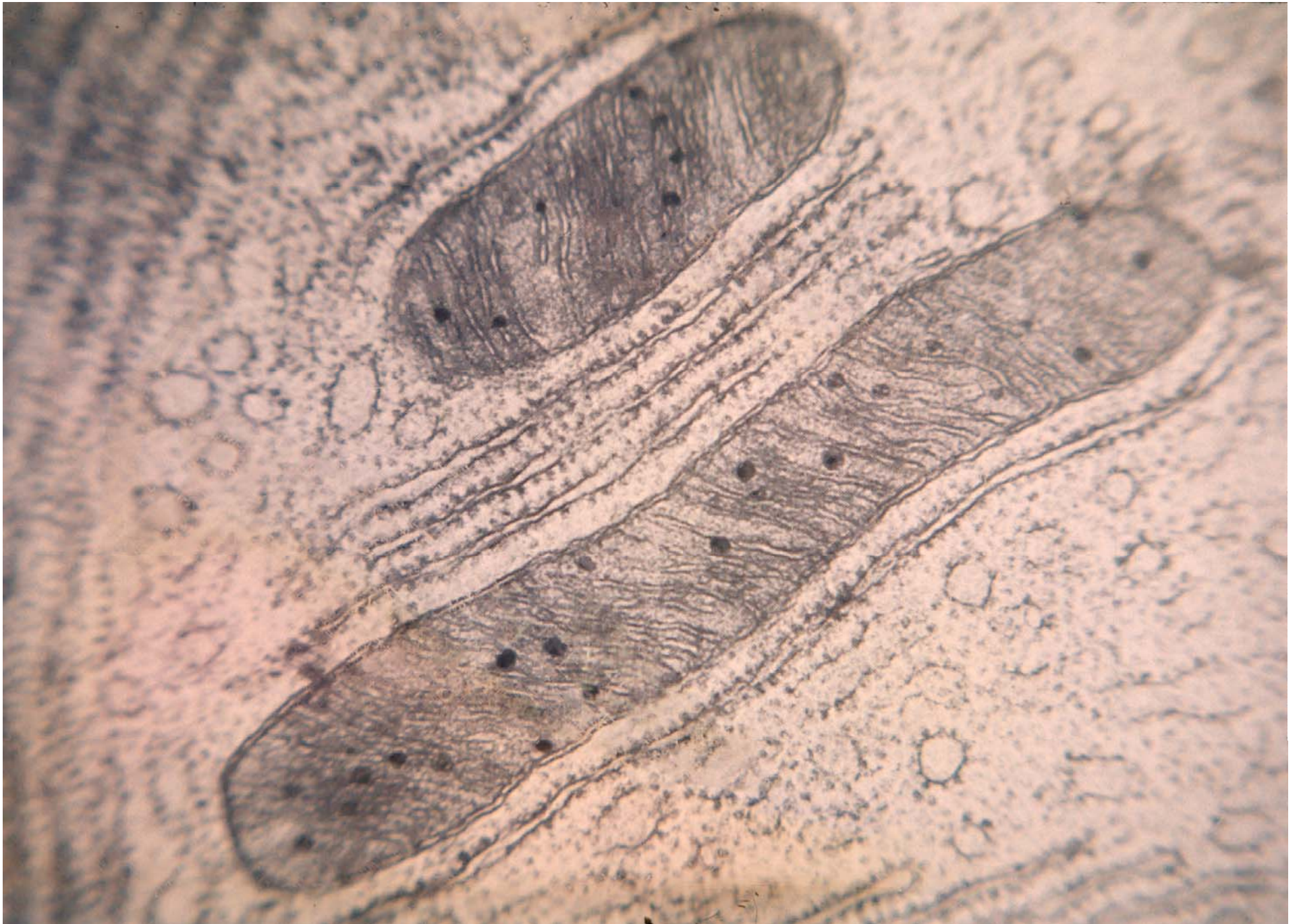
- 1 nucleus
- 2 nucleolus
- 3 nuclear membrane
- 4 pinocytic vesicles
- 5 cytoplasm
- 6 mitochondria
- 7 centrioles
- 8 vacuole
- 9 cell membrane
- 10 lysosome
- 11 endoplasmic reticulum with ribosomes
- 12 Golgi apparatus



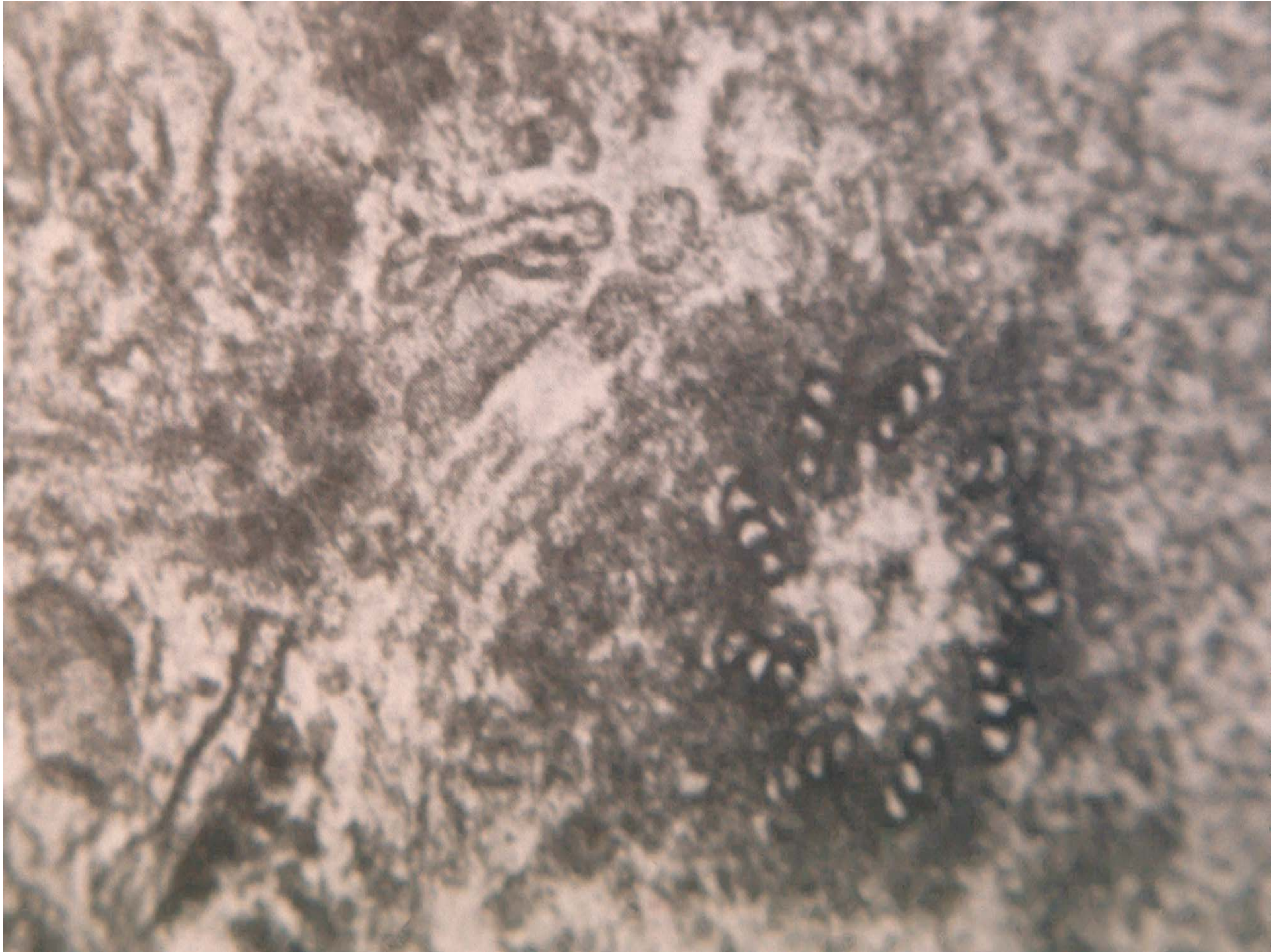






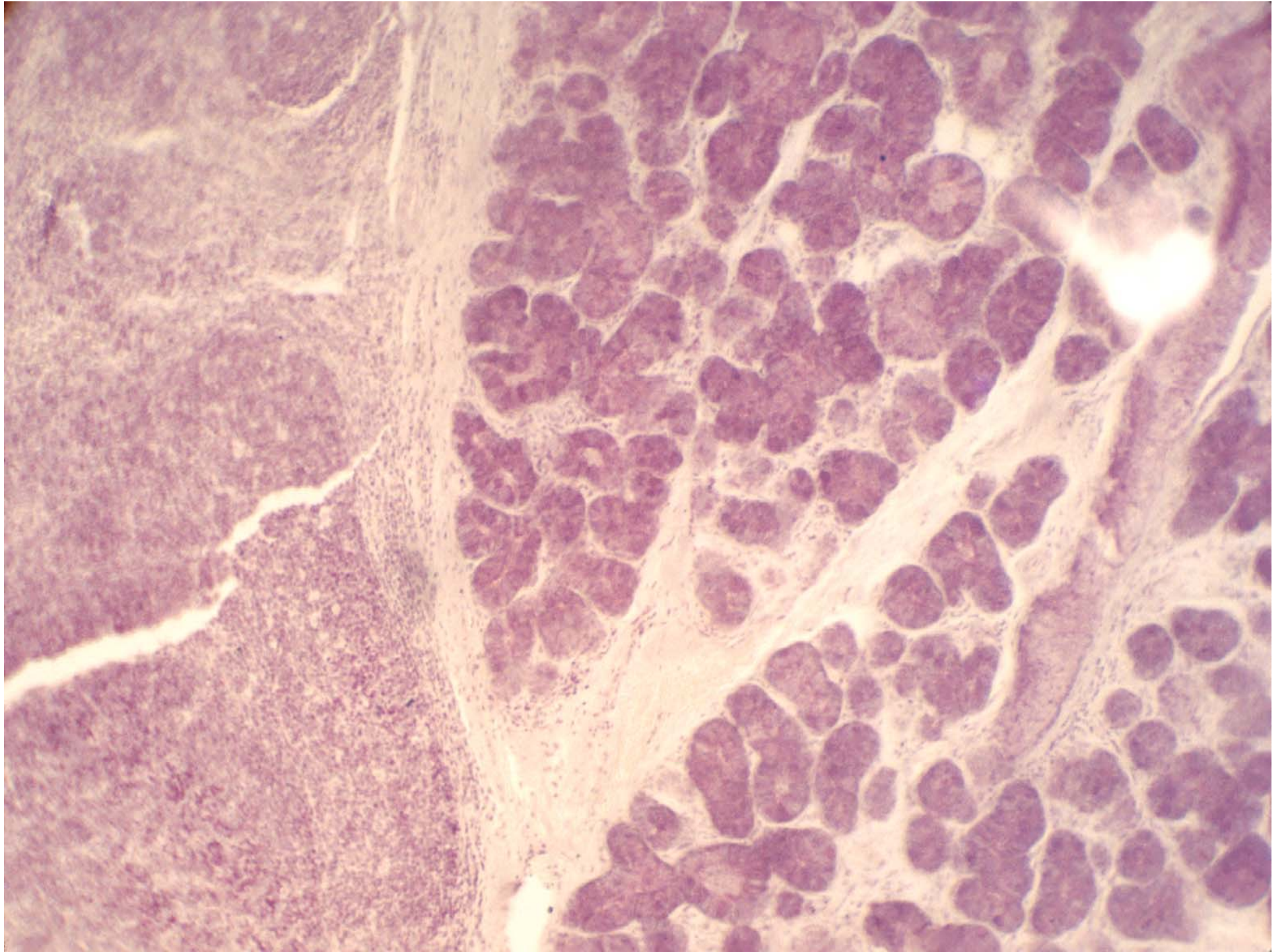


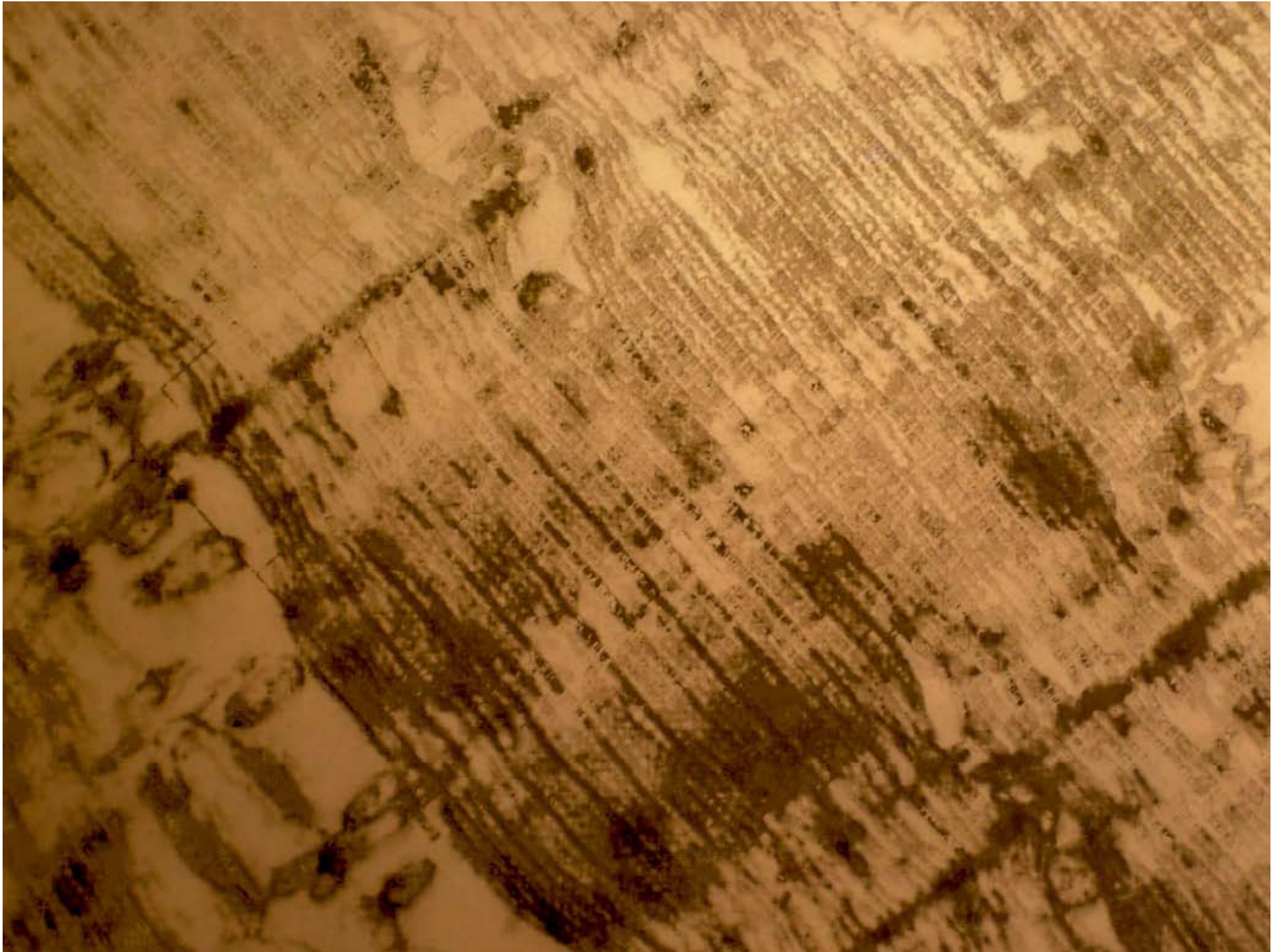


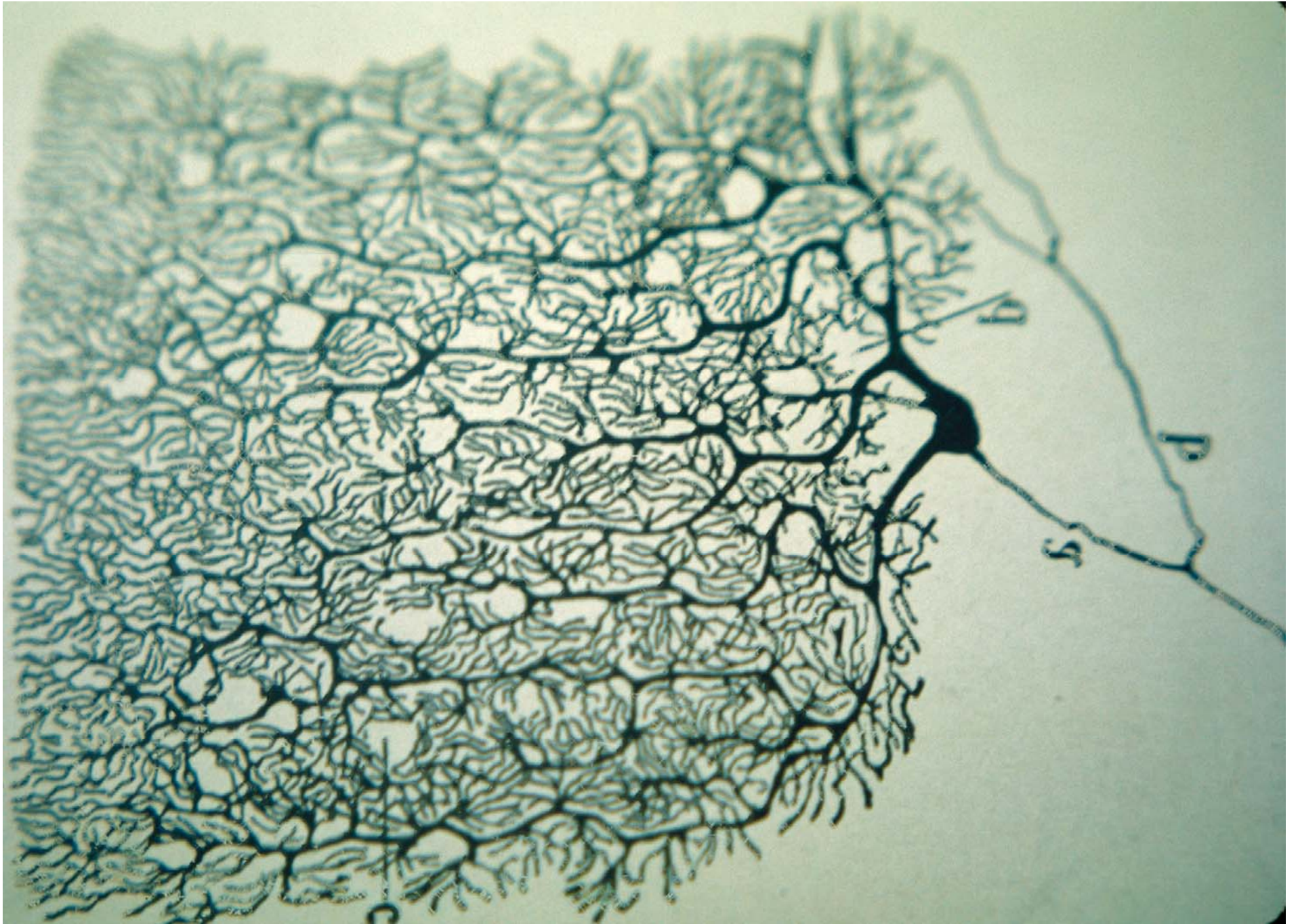


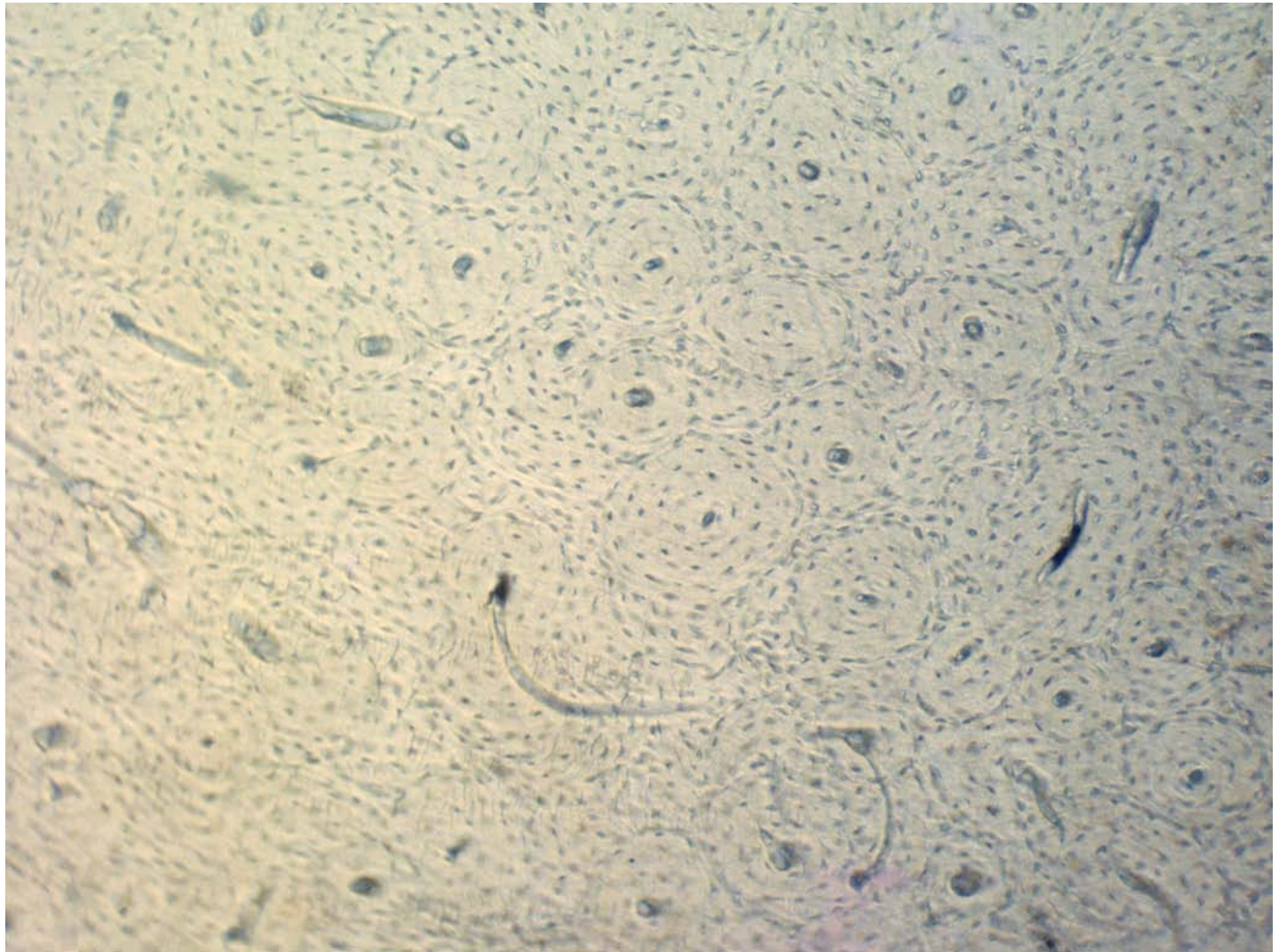
# From cells to tissues

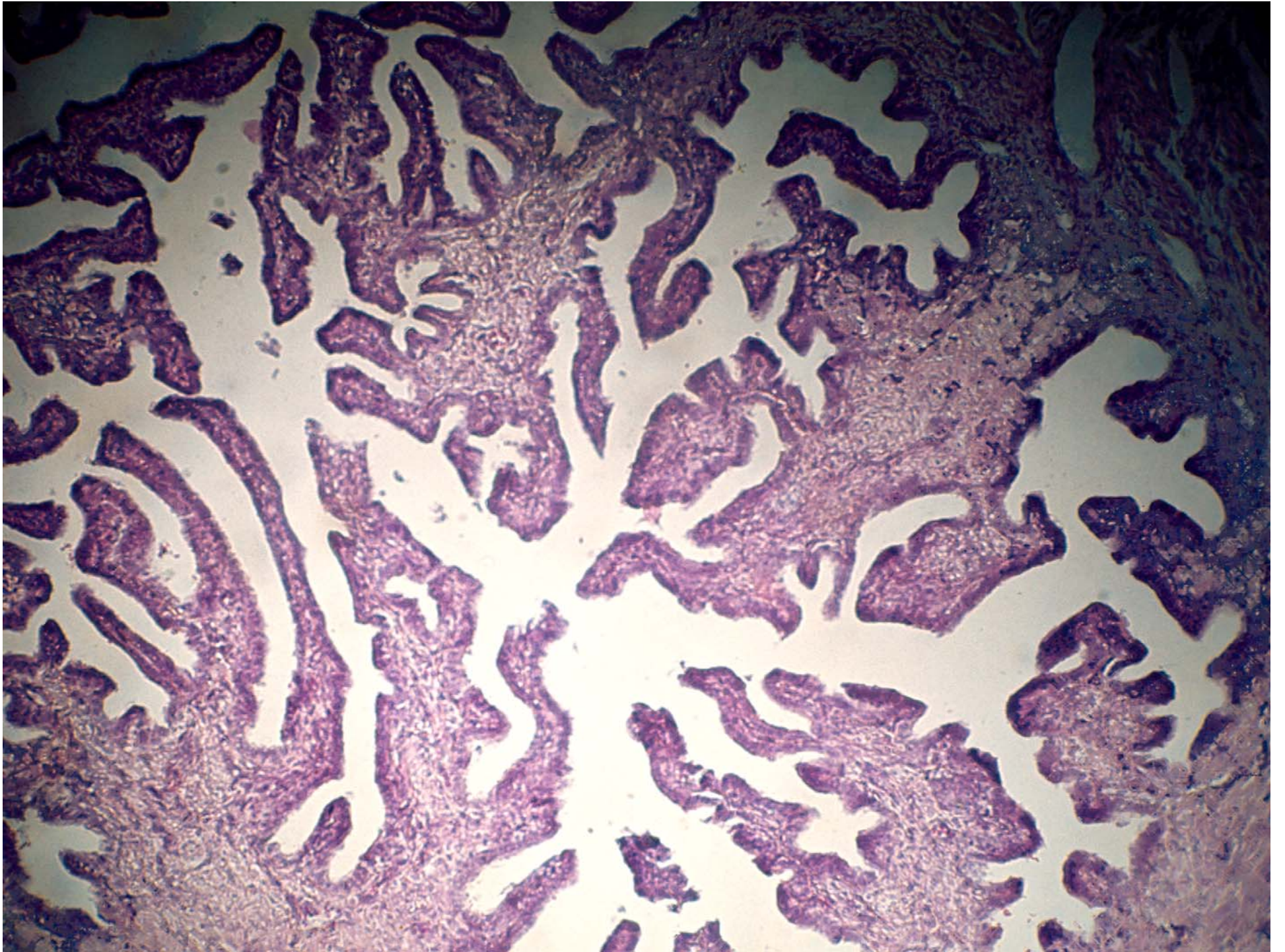
- Cells differentiate in using the genetic code to form specific functions in advanced organisms, forming tissues that perform the specific usage in the body. These cells therefore become the specific picture puzzle pieces to the tissues, each tissue designated for the specific specie by the DNA from which it is coded.

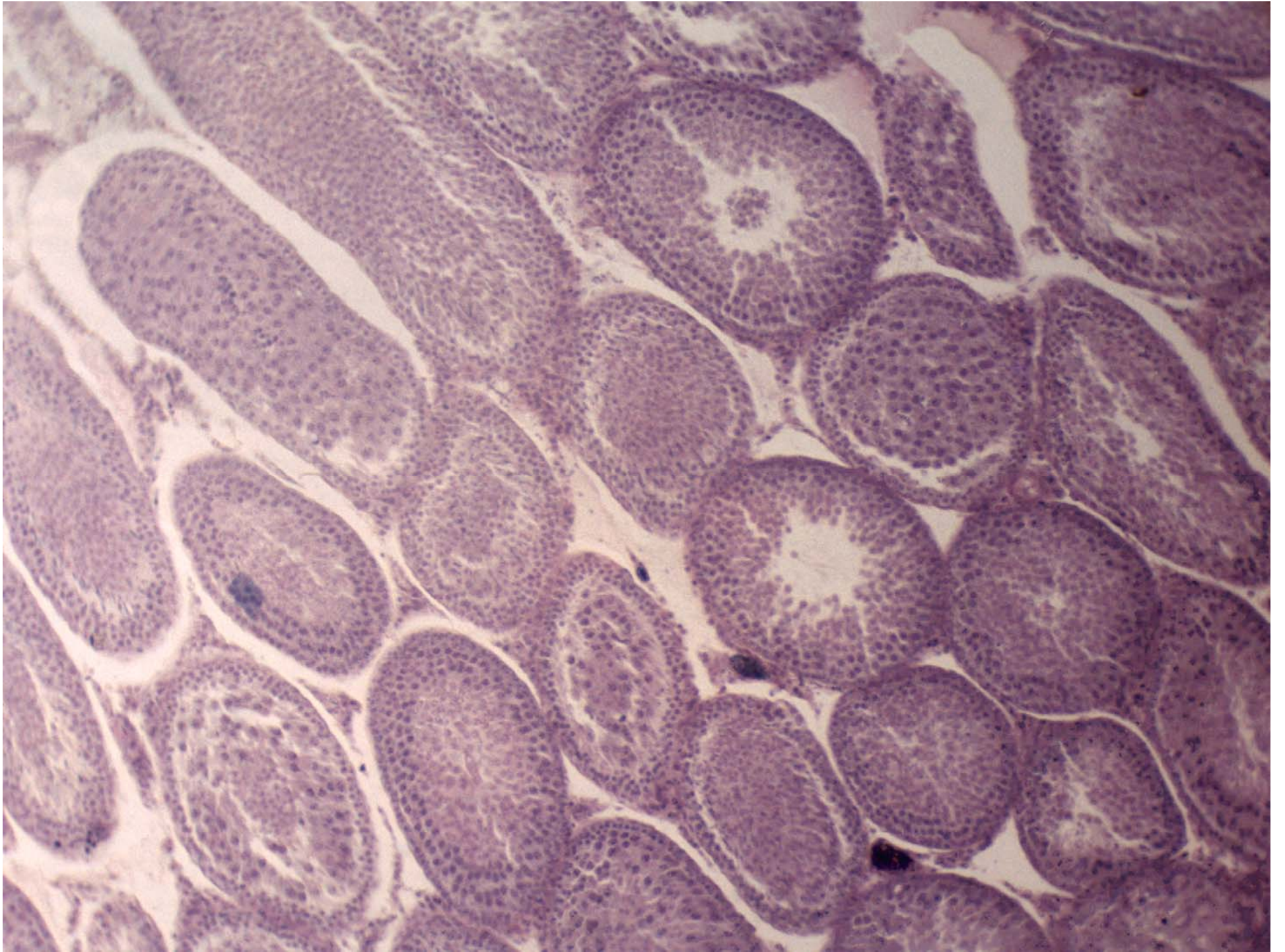






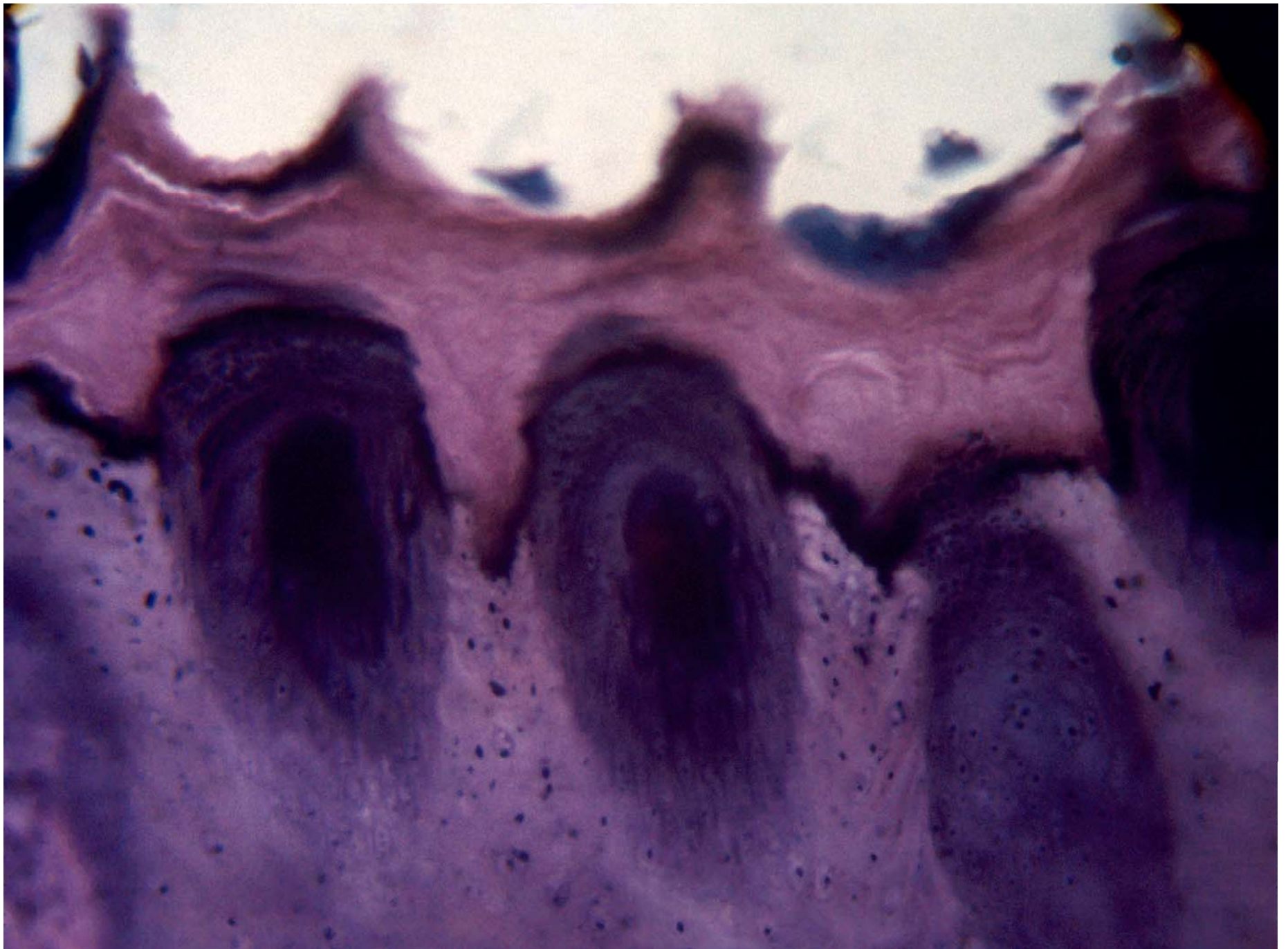


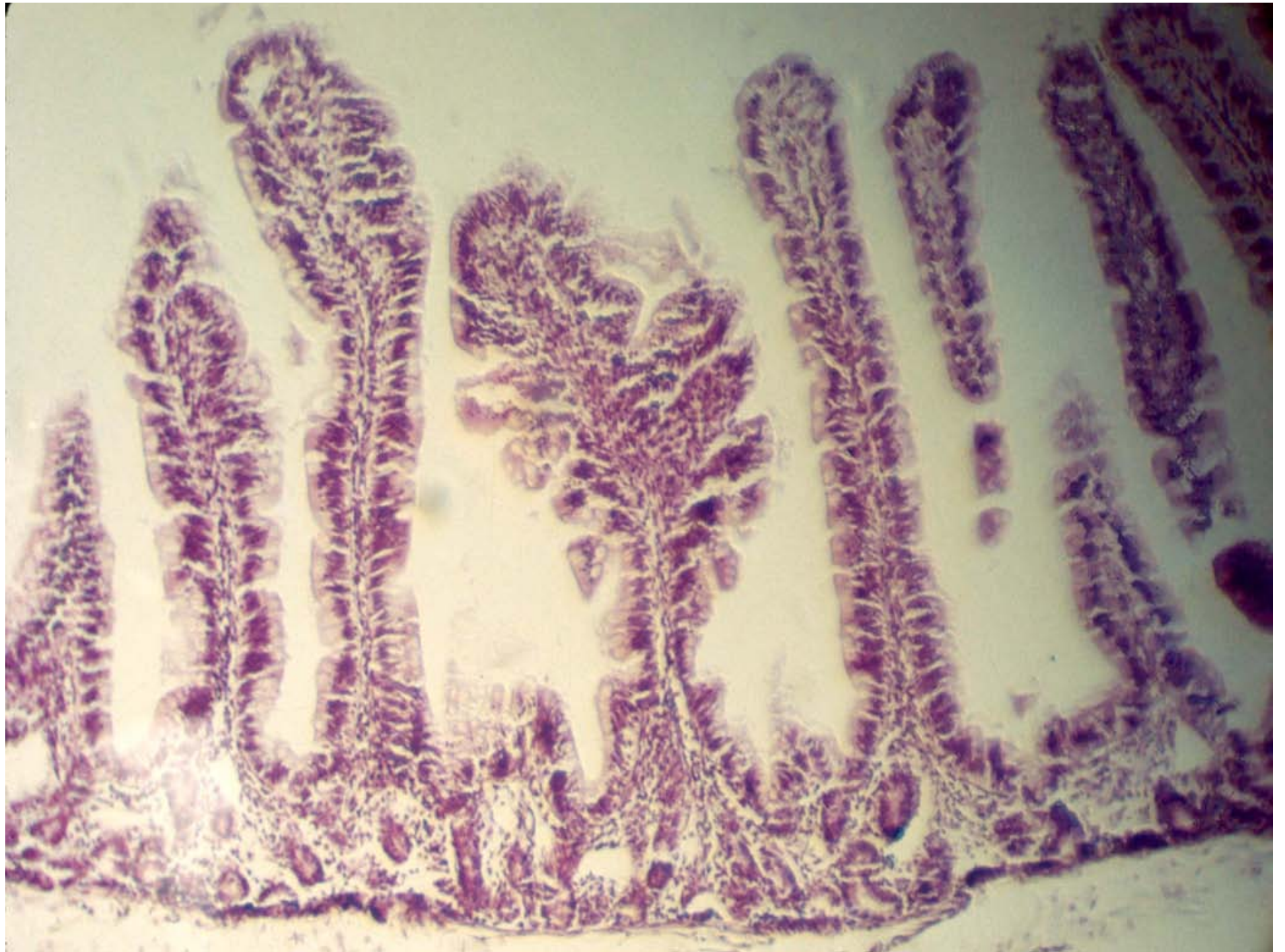




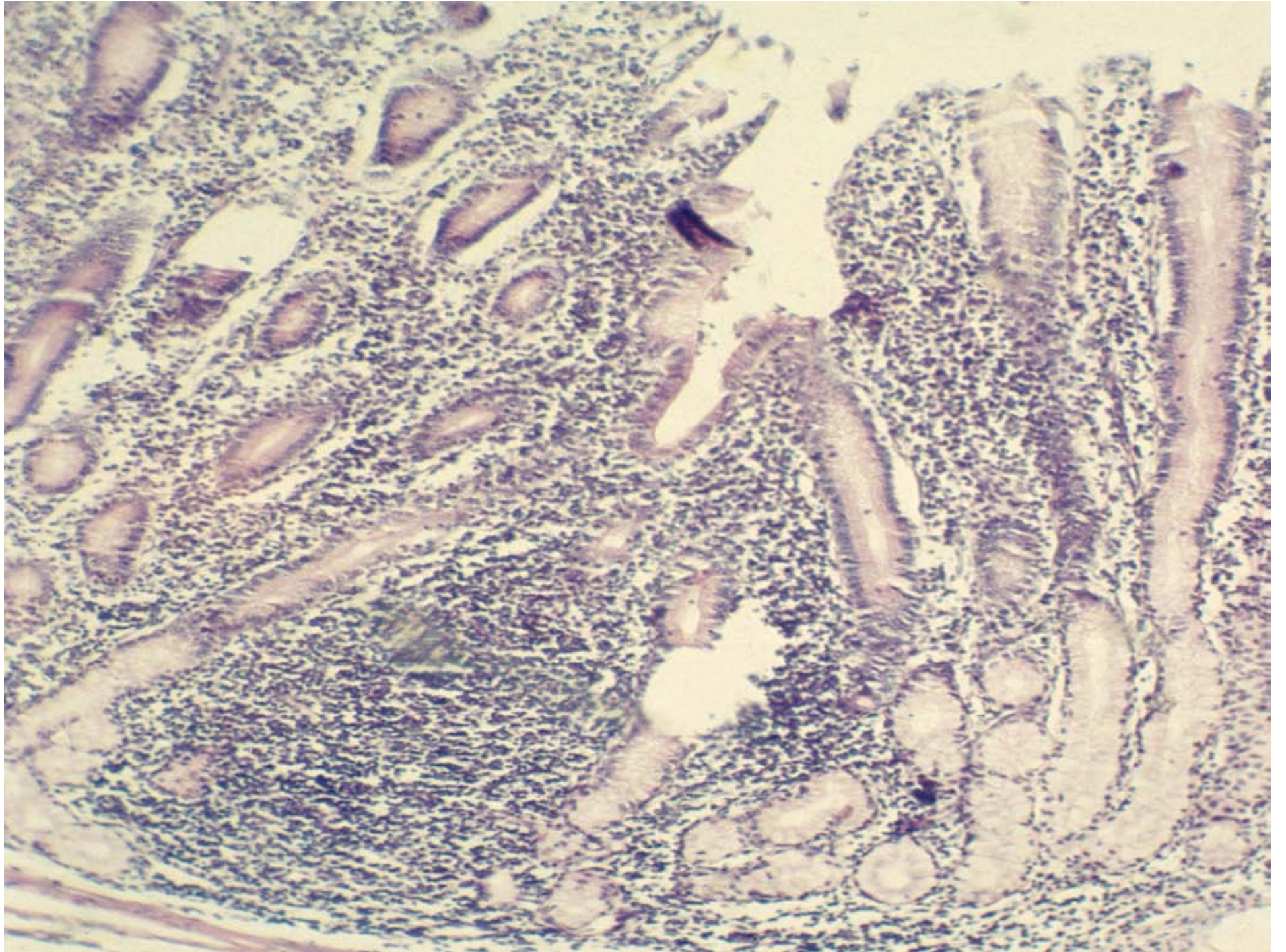


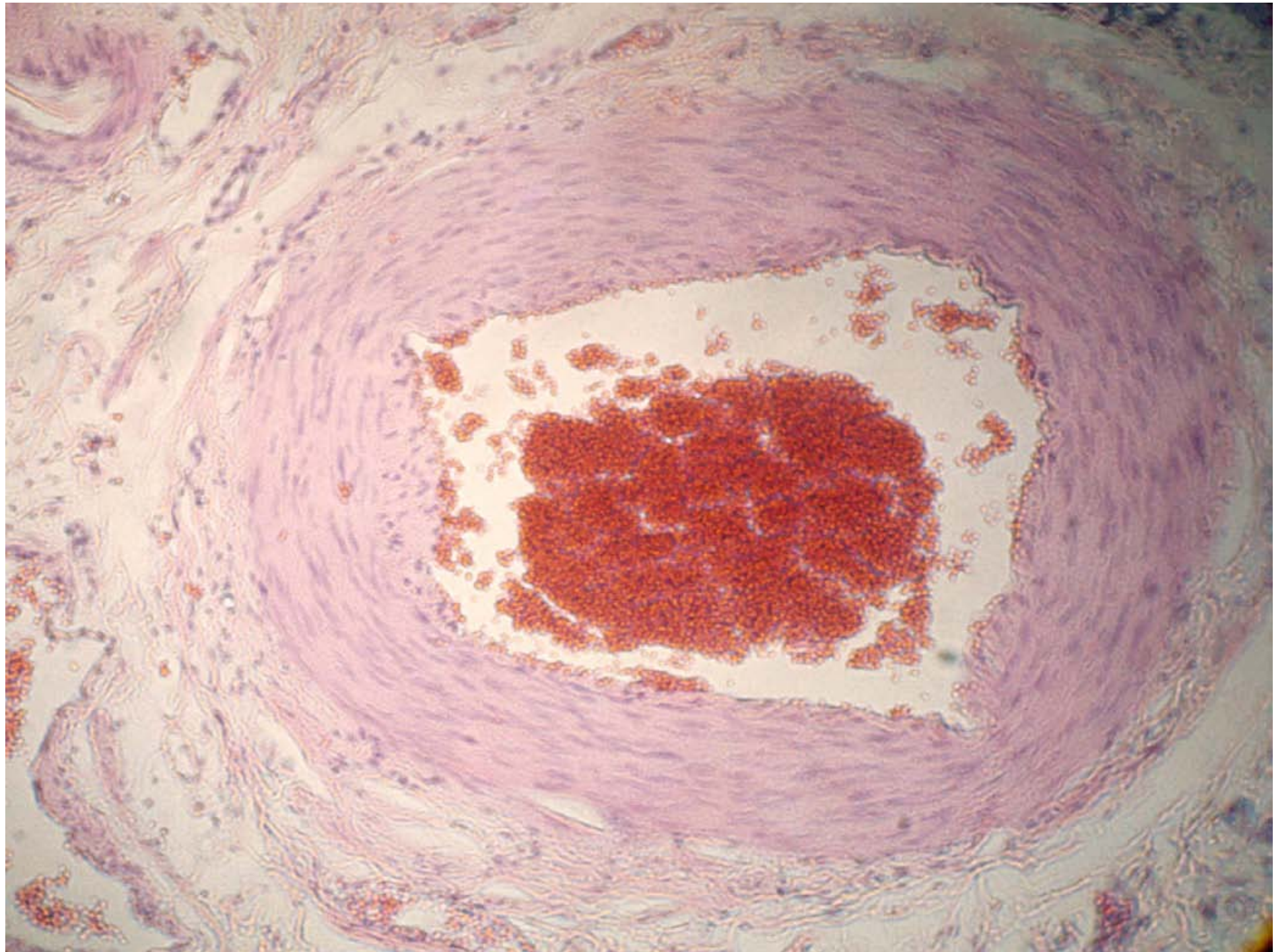


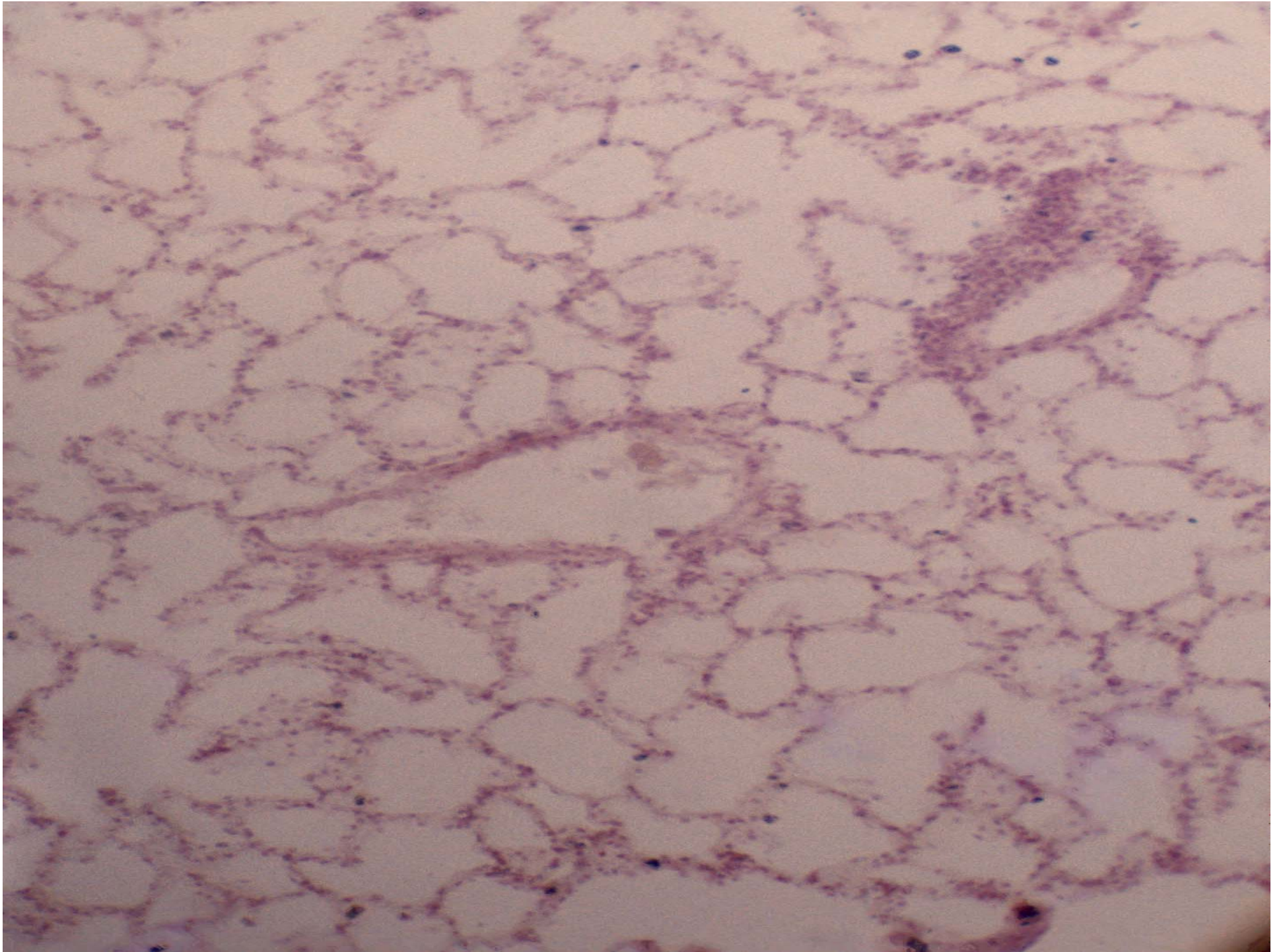












# From tissues to organs

- As you probably guessed, the tissues become the next picture puzzle pieces for the organs which are specifically shaped and constructed for the special functions that they will be performing in the body of the organism.

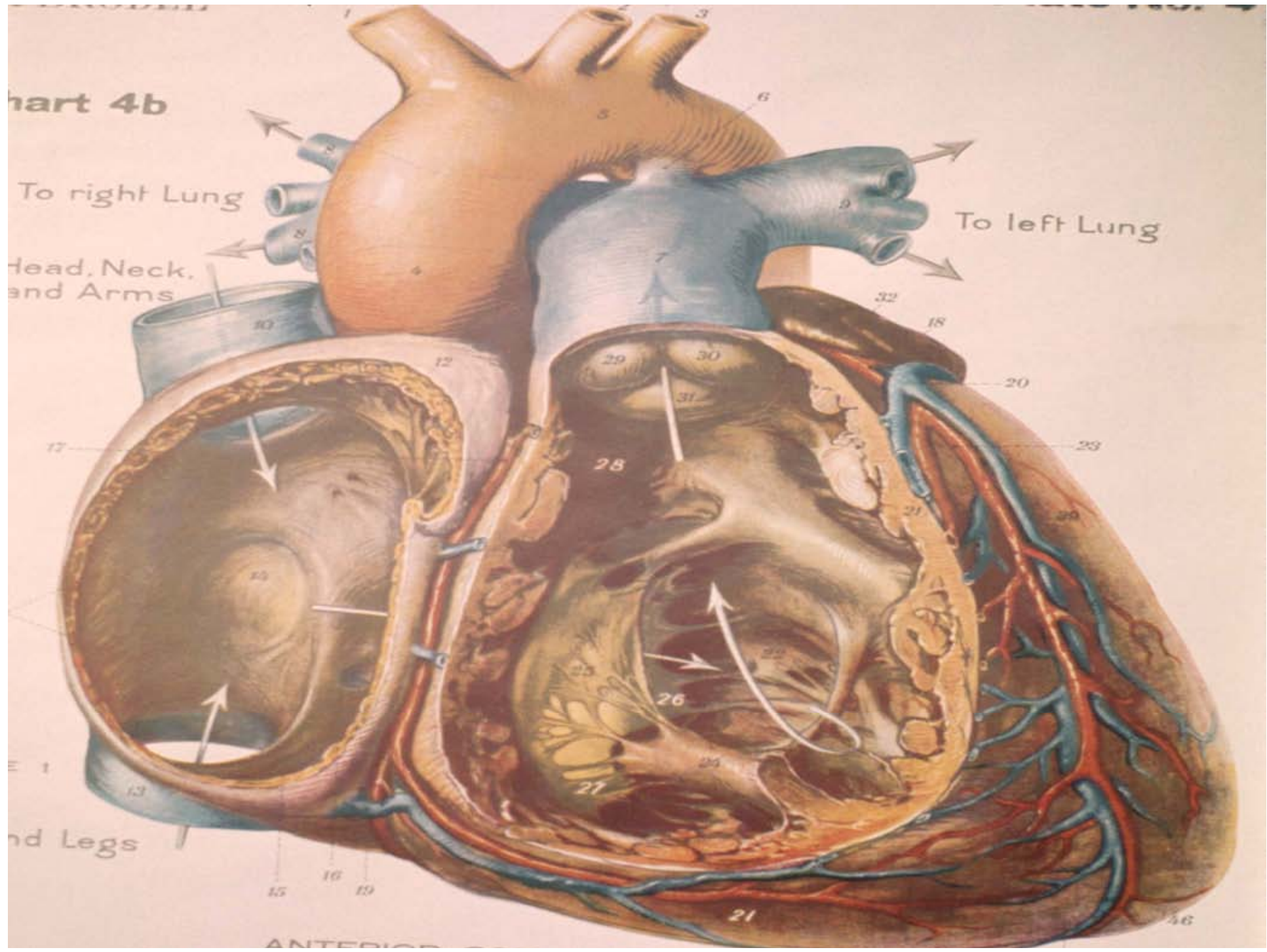


Chart 4b

To right Lung

Head, Neck,  
and Arms

To left Lung



E 1

nd Legs

15 16 19

ANTERIOR

46

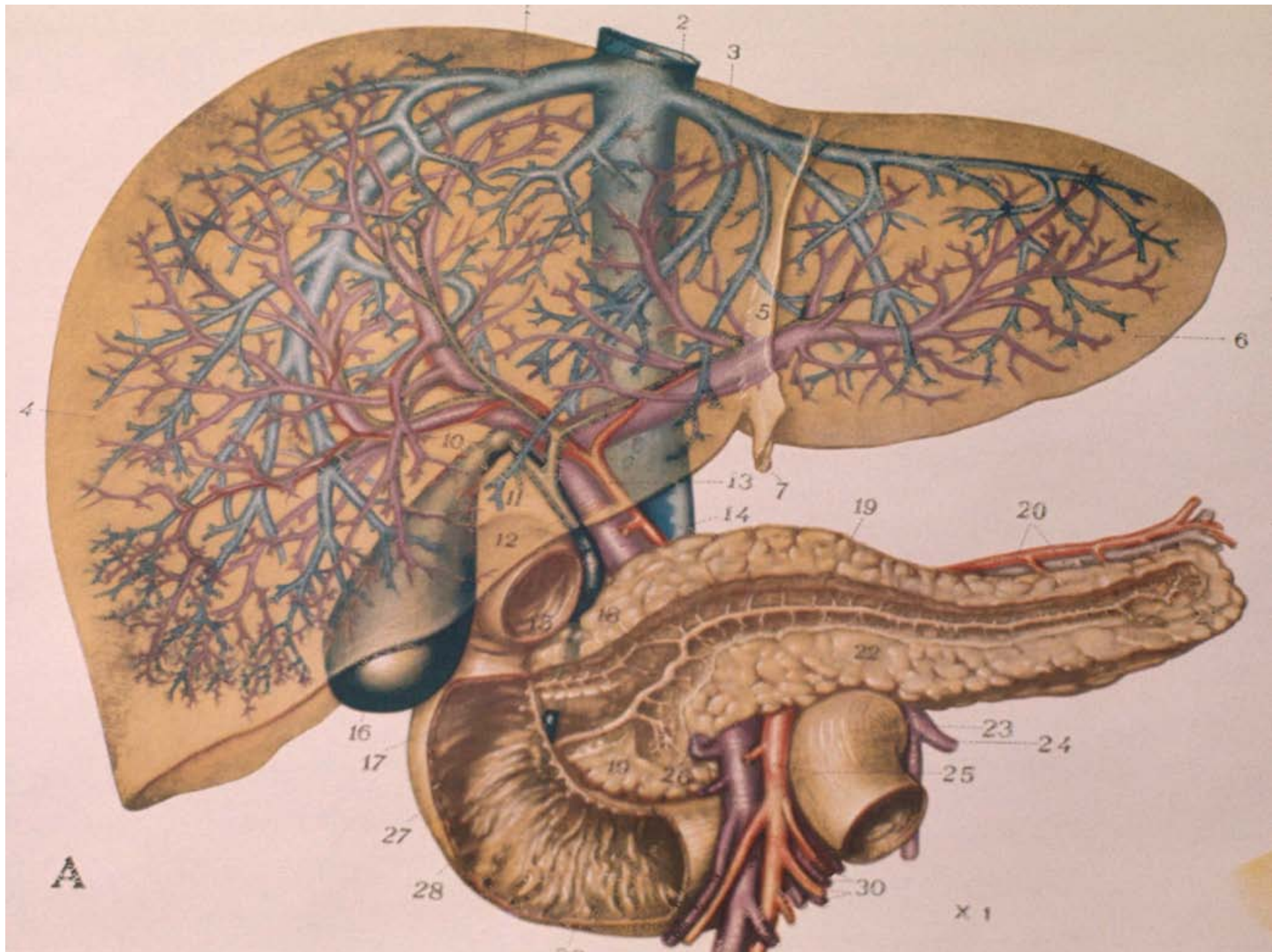


Chart 5b



FIGURE 1  
THE LEFT HUMAN EYE—HORIZONTAL SECTION

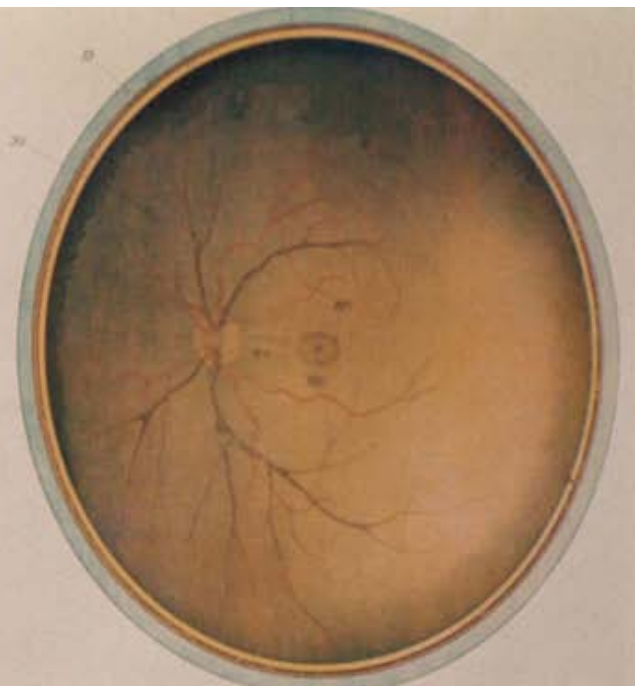
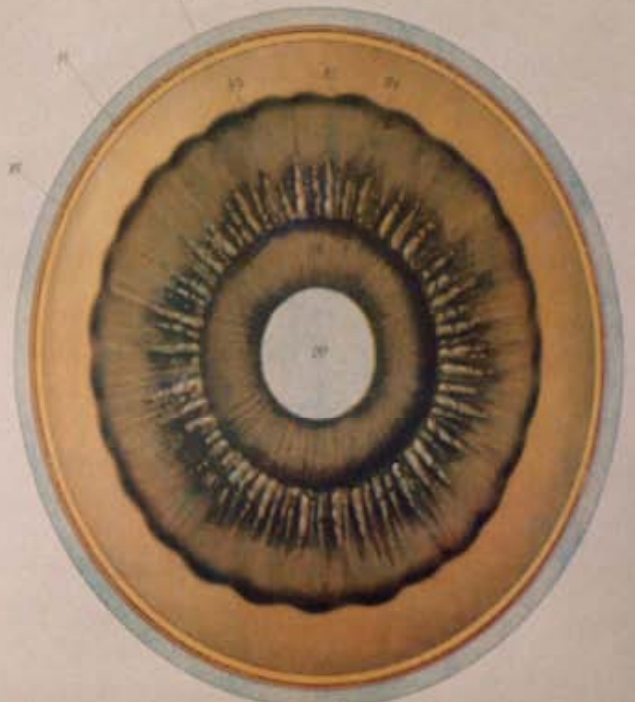


FIGURE 2 POSTERIOR HALF OF EYE—VIEWED FROM FRONT



AMERICAN FROHSE  
ANATOMICAL  
CHARTS

EDITED, REVISED  
AND AUGMENTED  
BY MAX BRODEL

Plate No. 7

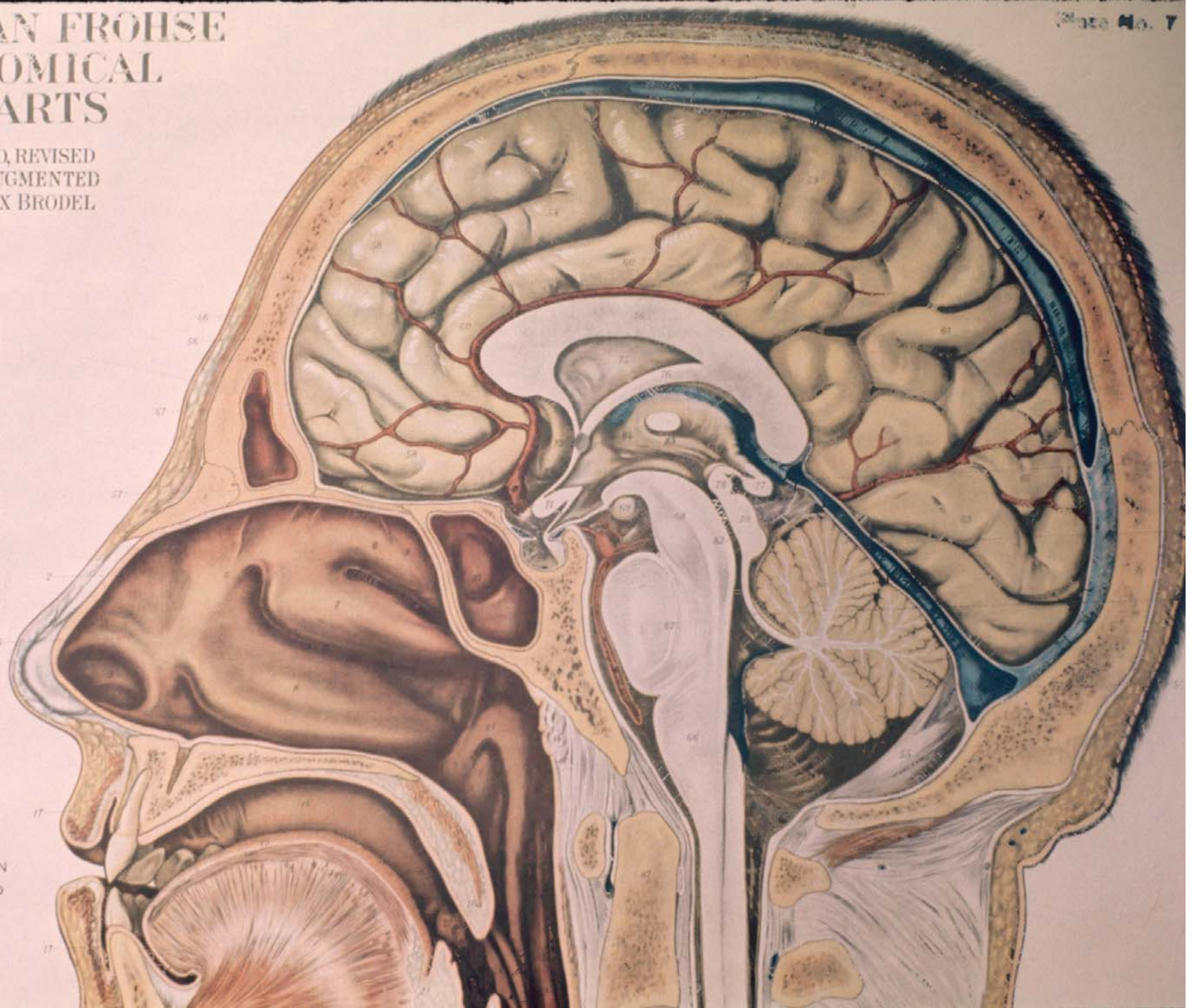


FIGURE 1  
MEDIAN SECTION  
THROUGH HEAD

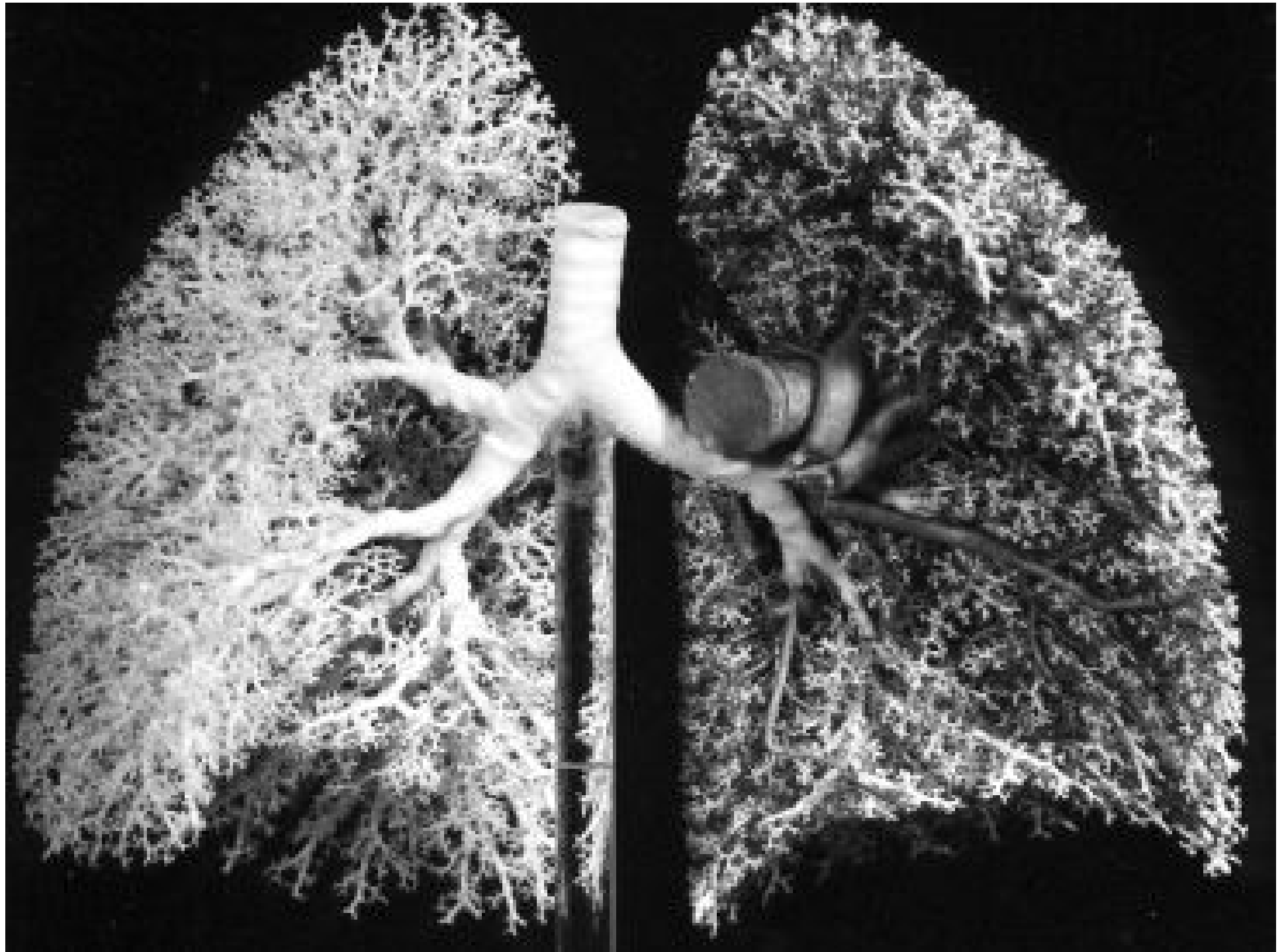
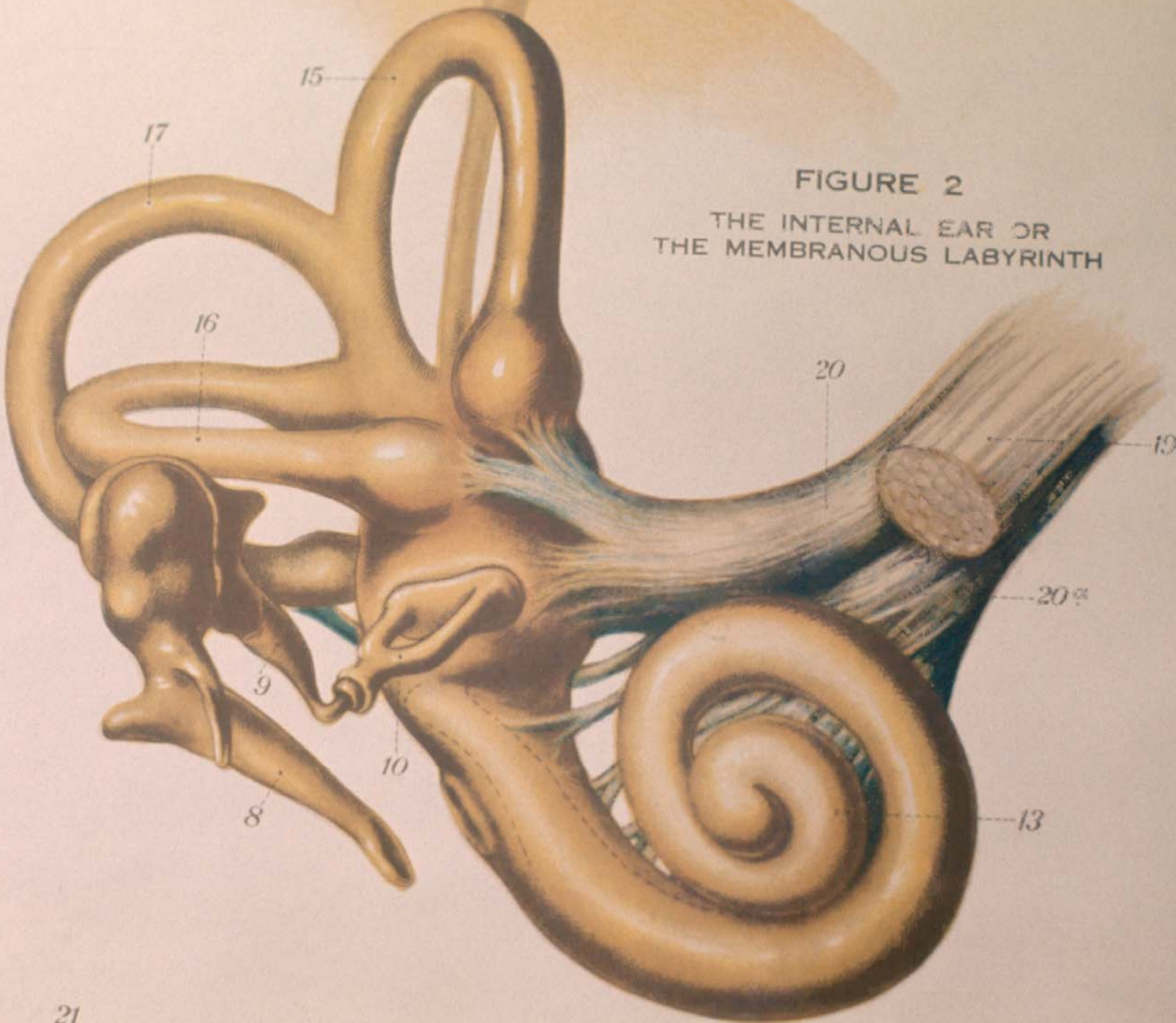
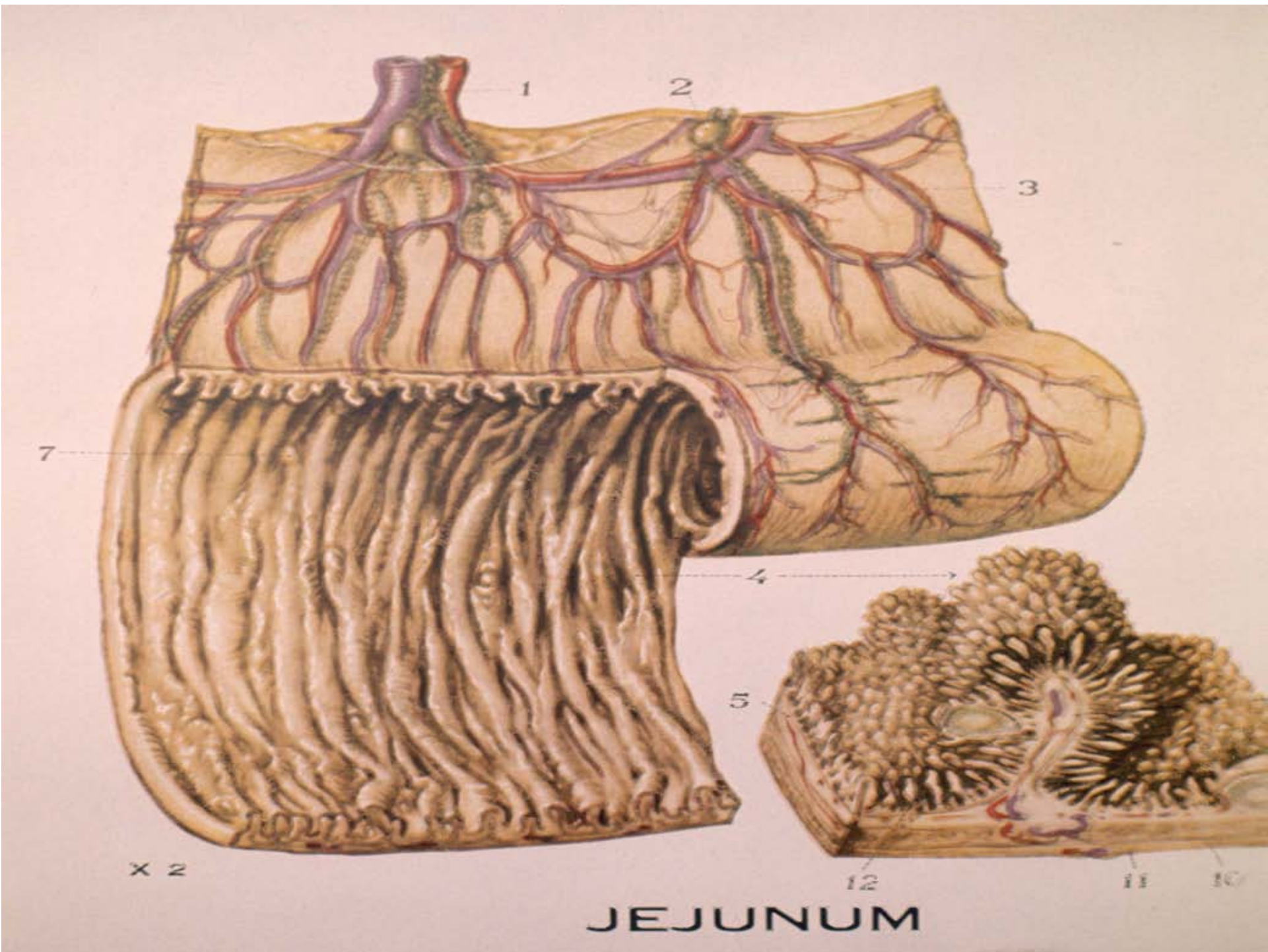
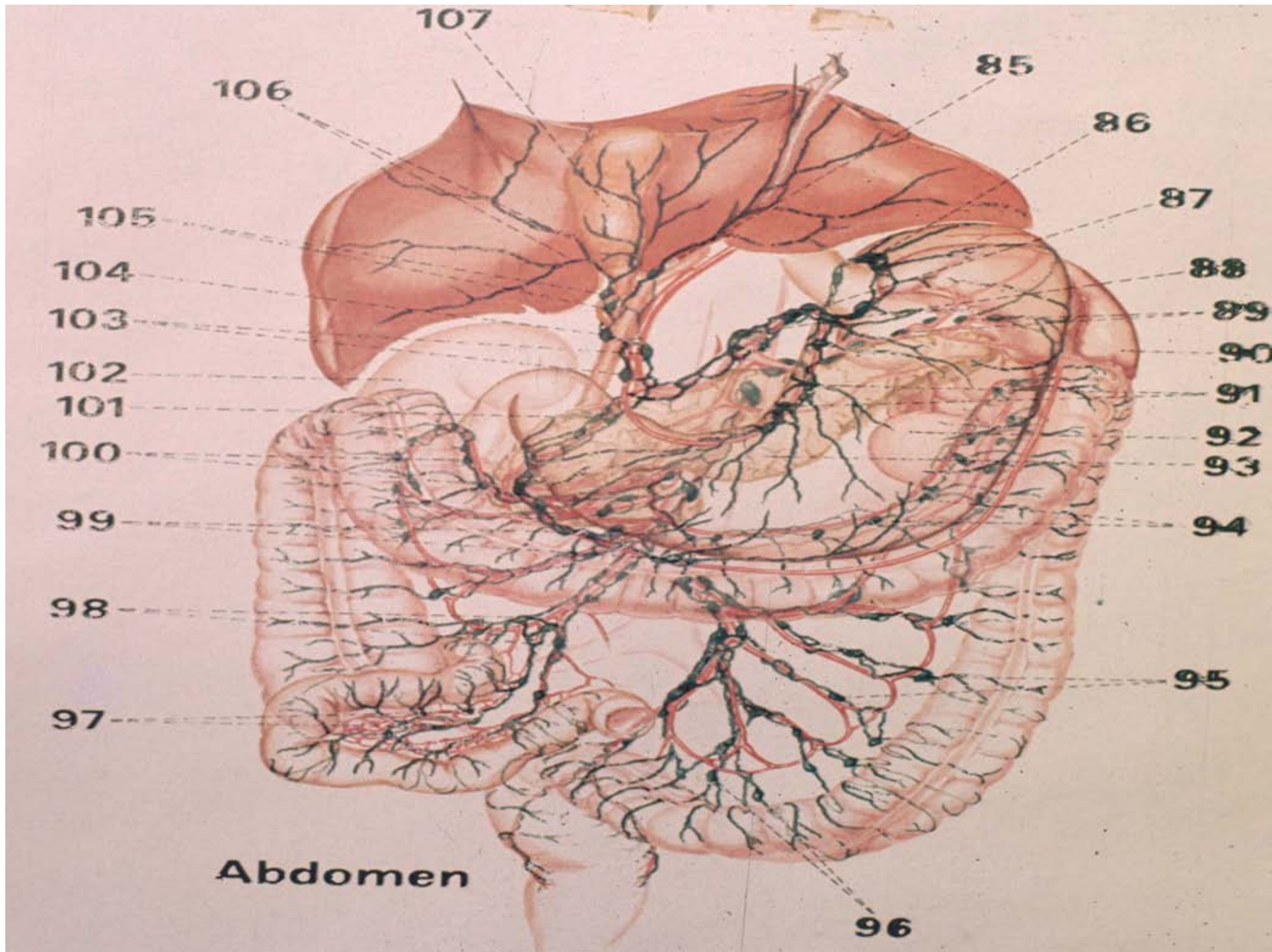


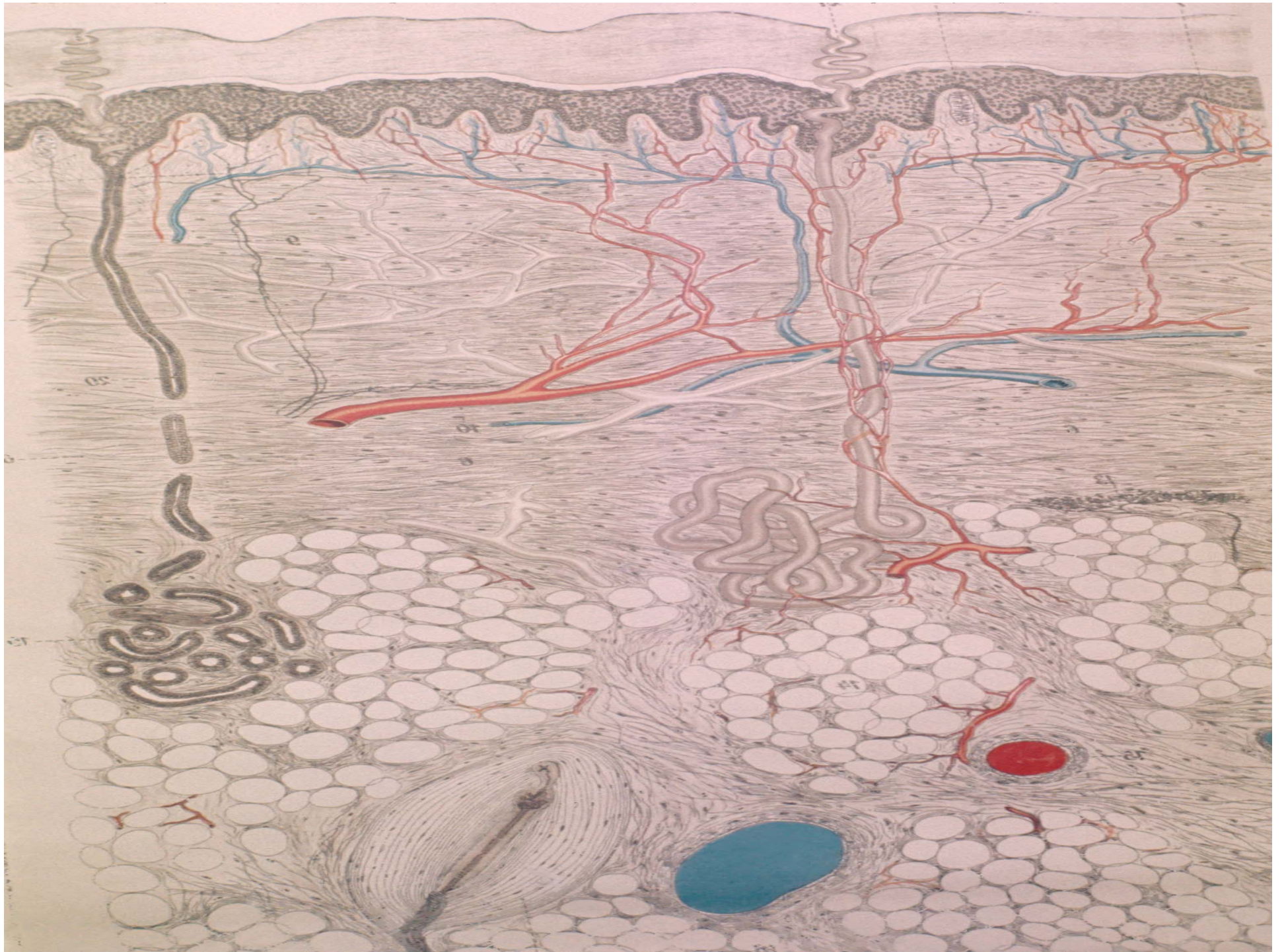
FIGURE 2  
THE INTERNAL EAR OR  
THE MEMBRANOUS LABYRINTH









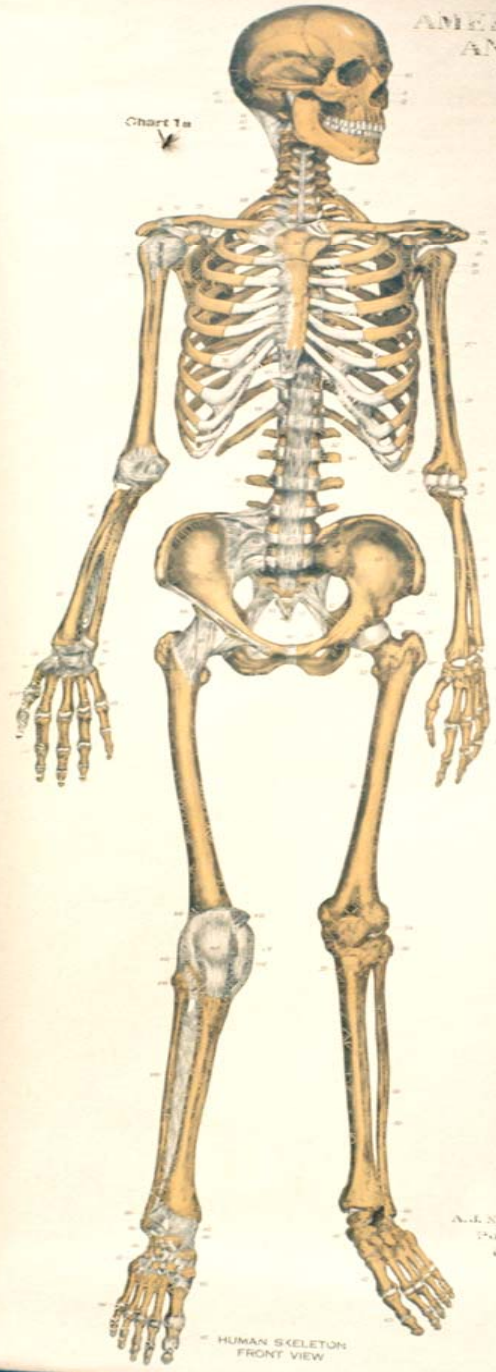


AMERICAN FROESE  
ANATOMICAL  
CHARTS

EDITED, REVISED  
AND AUGMENTED  
BY MAX ENGEL

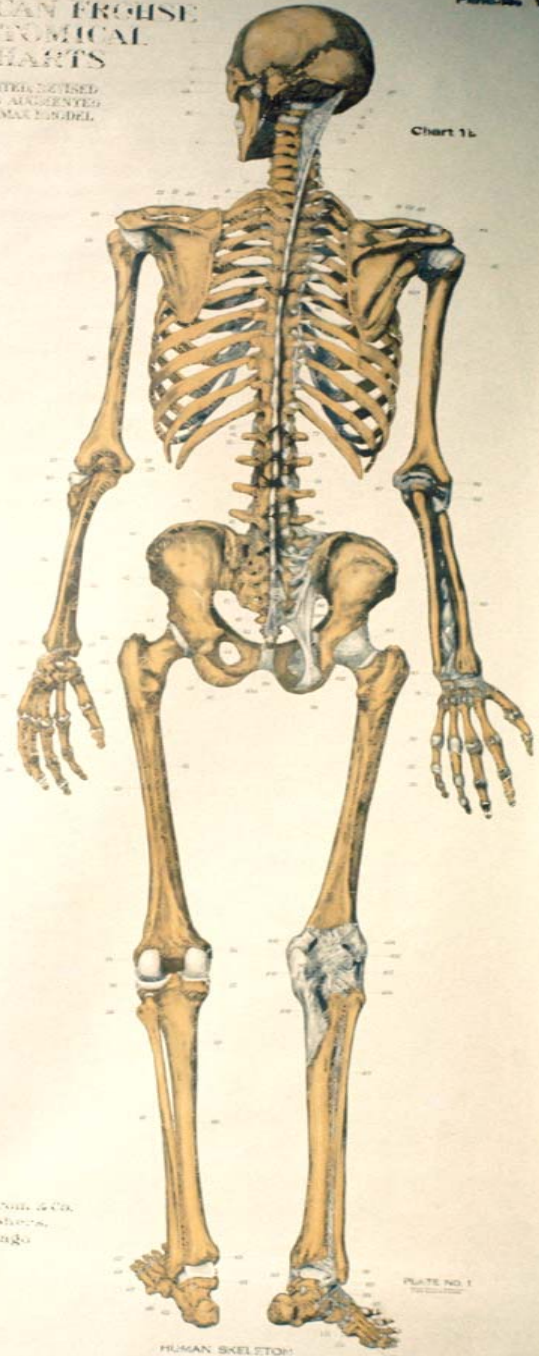
Plate No. 1

Chart 1a



HUMAN SKELETON  
FRONT VIEW

Chart 1b



HUMAN SKELETON  
BACK VIEW

A. J. NYSSE, NUR., & CO.  
Publishers,  
Chicago

PLATE NO. 1

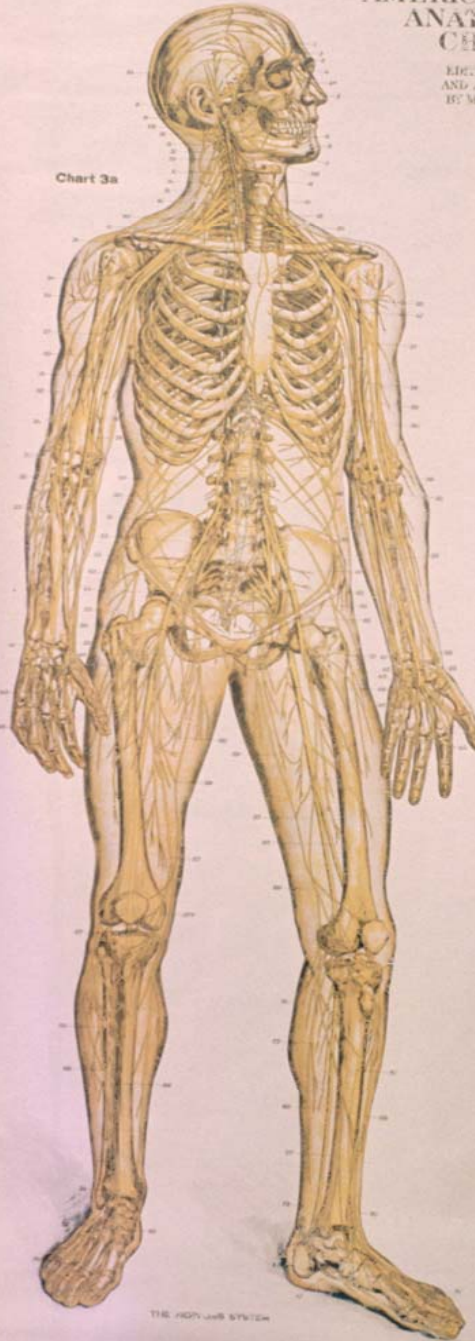


AMERICAN FROISE  
ANATOMICAL  
CHARTS

FIG. 11. REVISED  
AND AUGMENTED  
BY MAX BIRDEL

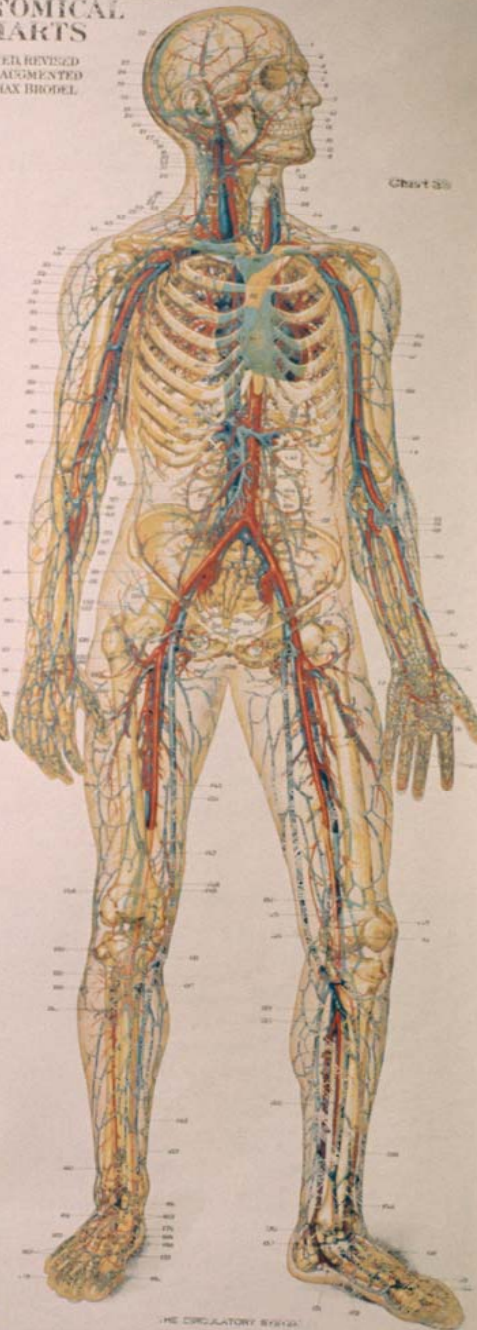
Plate No. 9

Chart 3a



THE NERVOUS SYSTEM

Chart 3b

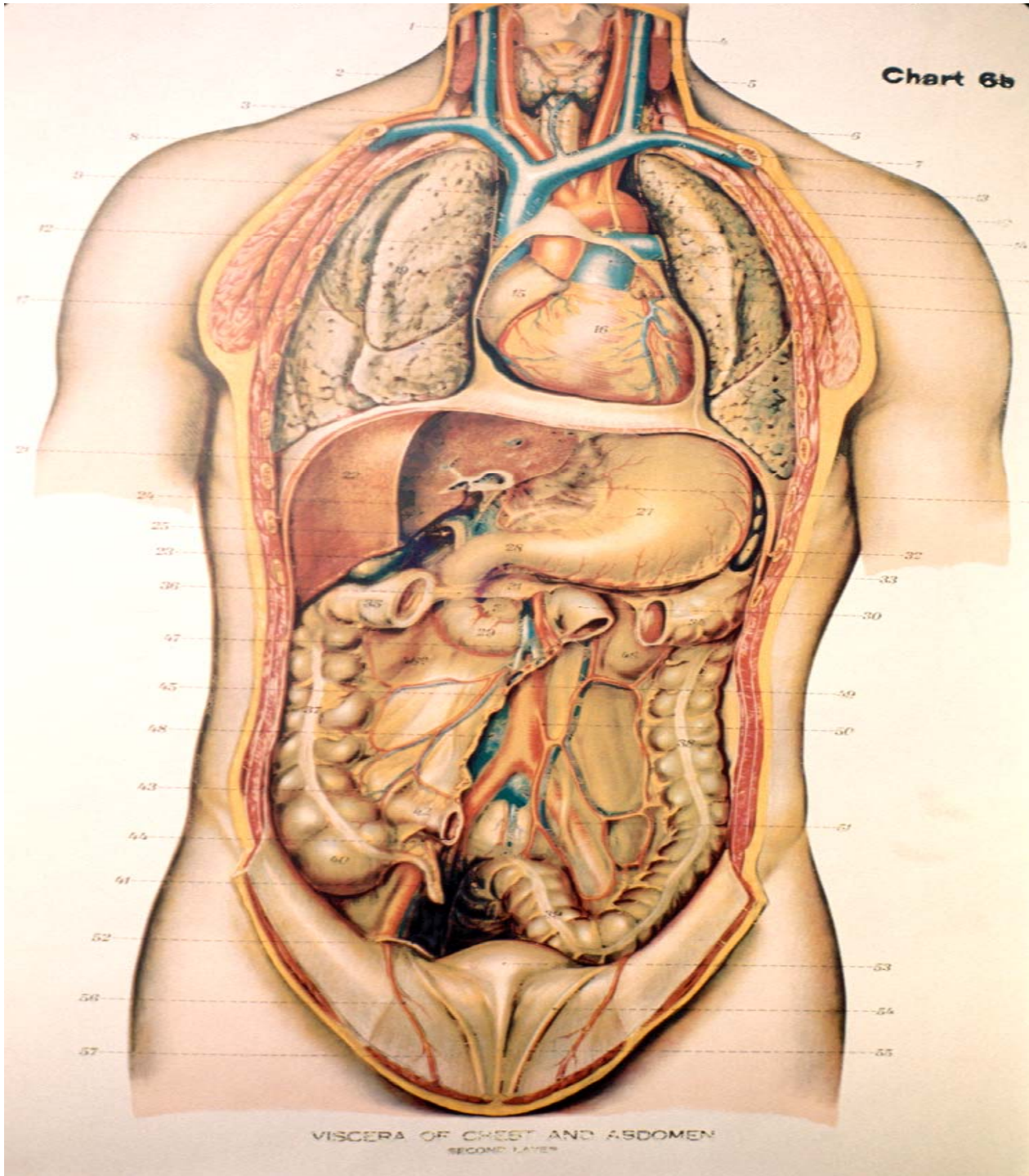


THE CIRCULATORY SYSTEM

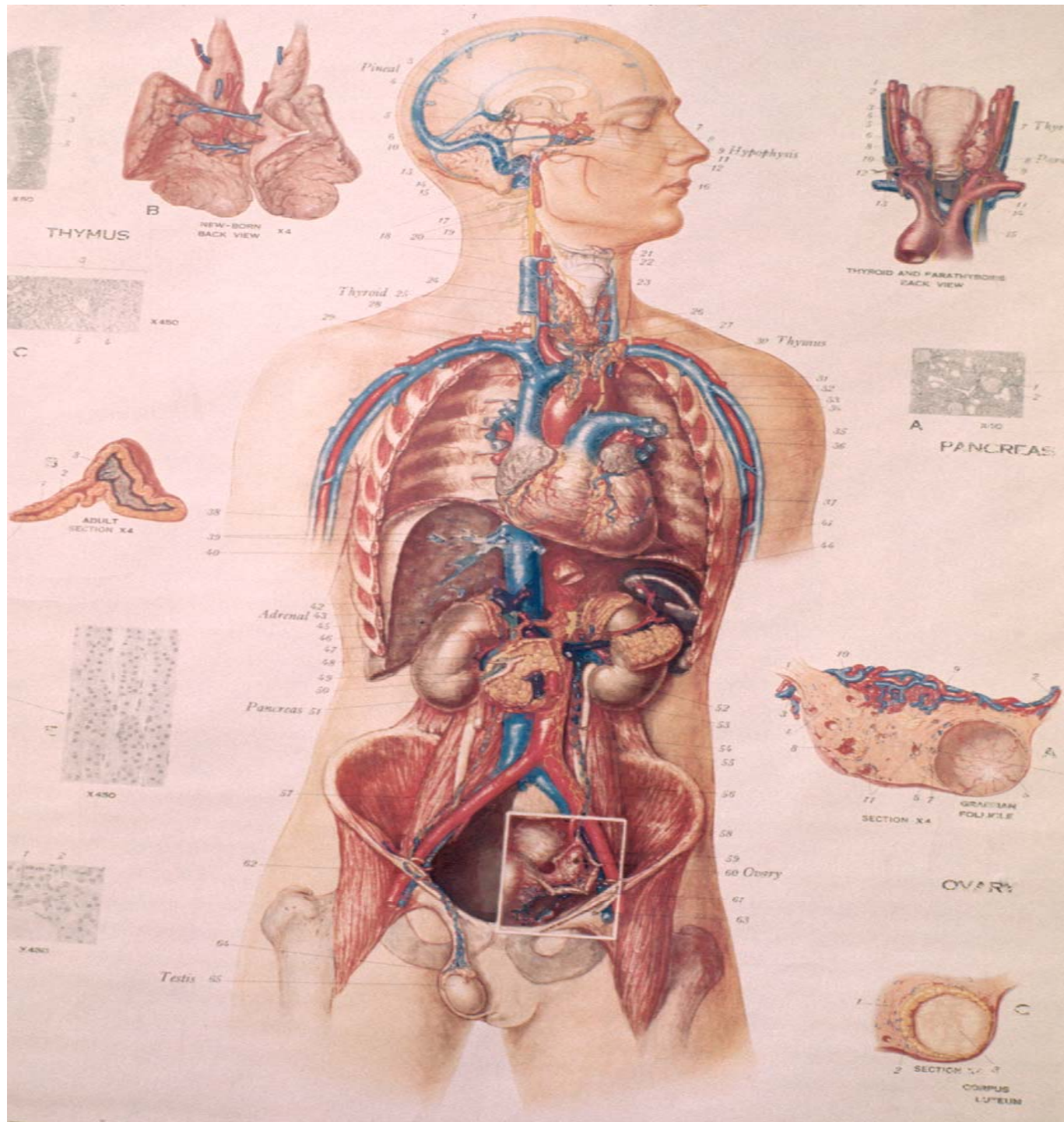
A. J. Nystrom, & Co. Publishers, Chicago.

Plate No. 9

Chart 6b



VISCERA OF CHEST AND ABDOMEN  
SECOND LAYER



# Reproduction, after its kind

- In reproduction, the DNA is copied and then the genes are mixed and the chromosomes divided to form haploid cells with mixed characteristics from both parents. These chromosomes are then divided in half to form germ cells (haploid cells), either sperm or egg (ova). In this way the specie can reproduce itself with characteristic variations, while retaining specie integrity.

# Reproduction

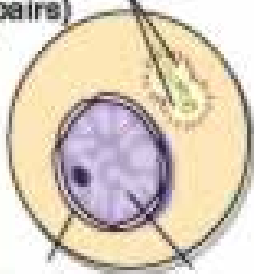
- Meiosis
- Germ Cells
- Fertilization
- Implantation
- Growth



## MEIOSIS I

### INTERPHASE I

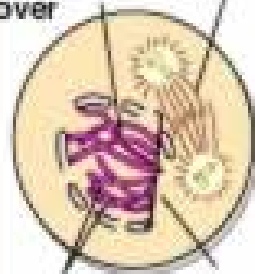
MTOCs (with centriole pairs)



Nuclear envelope Chromatin

### PROPHASE I

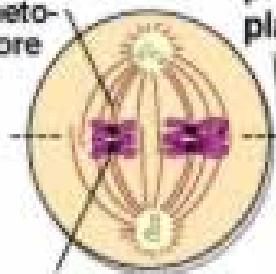
Site of crossing over



Sister chromatids Tetrad

### METAPHASE I

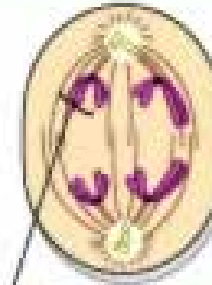
Microtubules attached to kinetochore



Centromere (with kinetochore)

Meta-phase plate

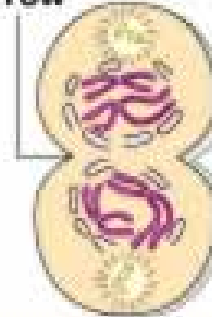
### ANAPHASE I



Sister chromatids together

### TELOPHASE I AND CYTOKINESIS

Cleavage furrow

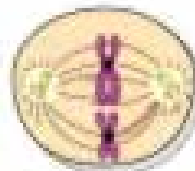
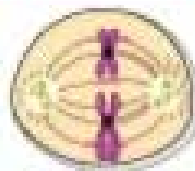


## MEIOSIS II

### PROPHASE II



### METAPHASE II



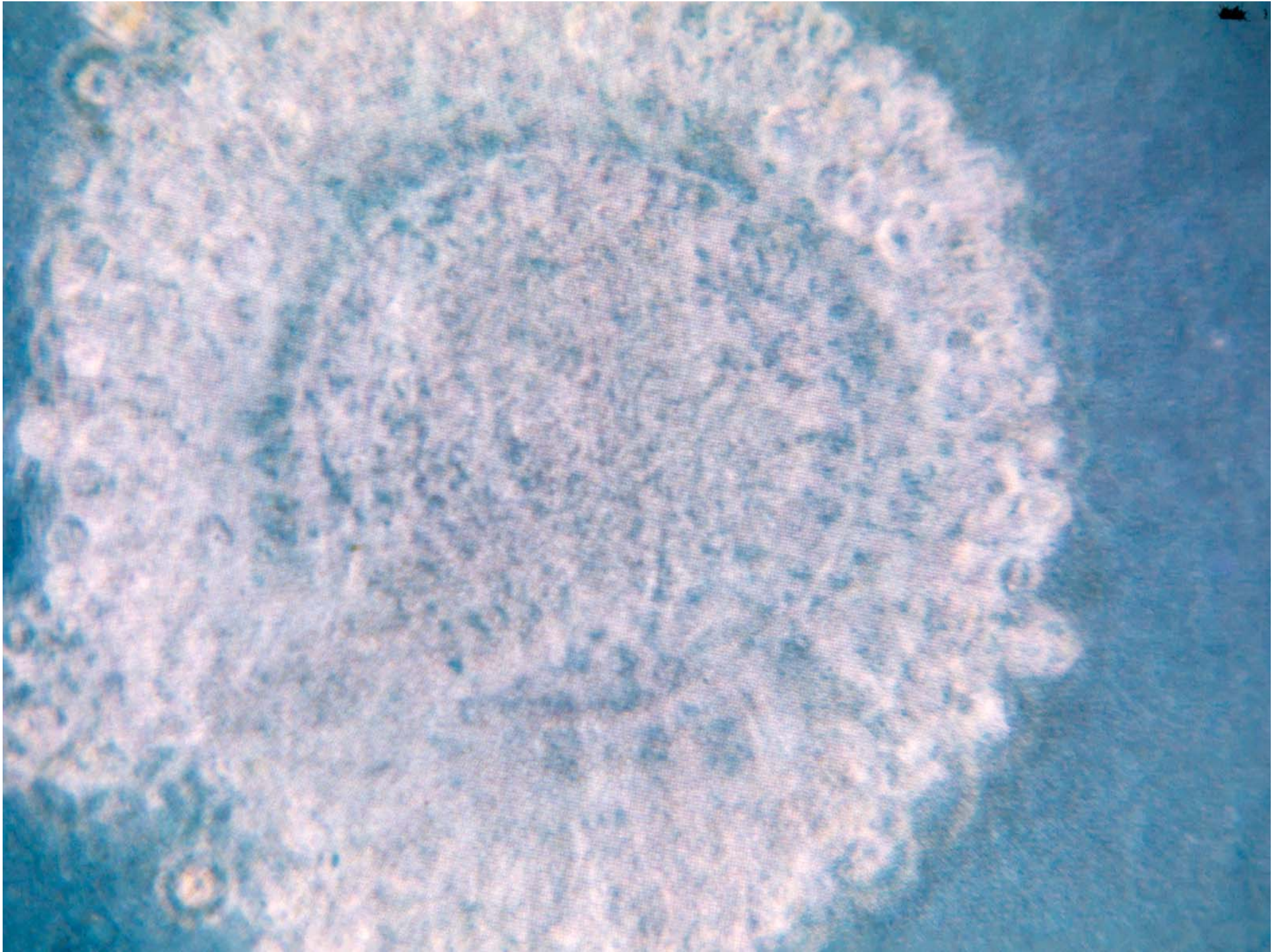
### ANAPHASE II

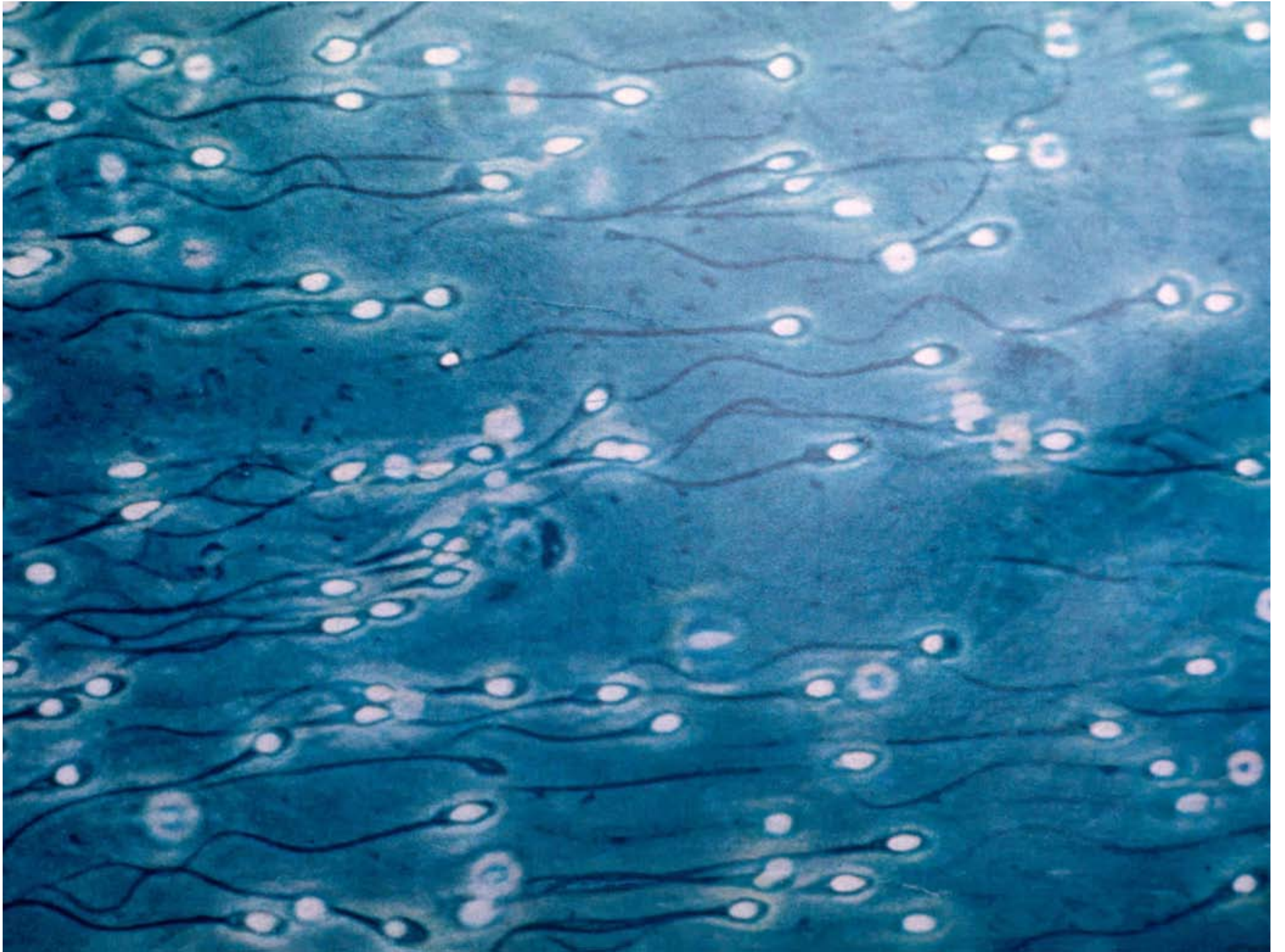


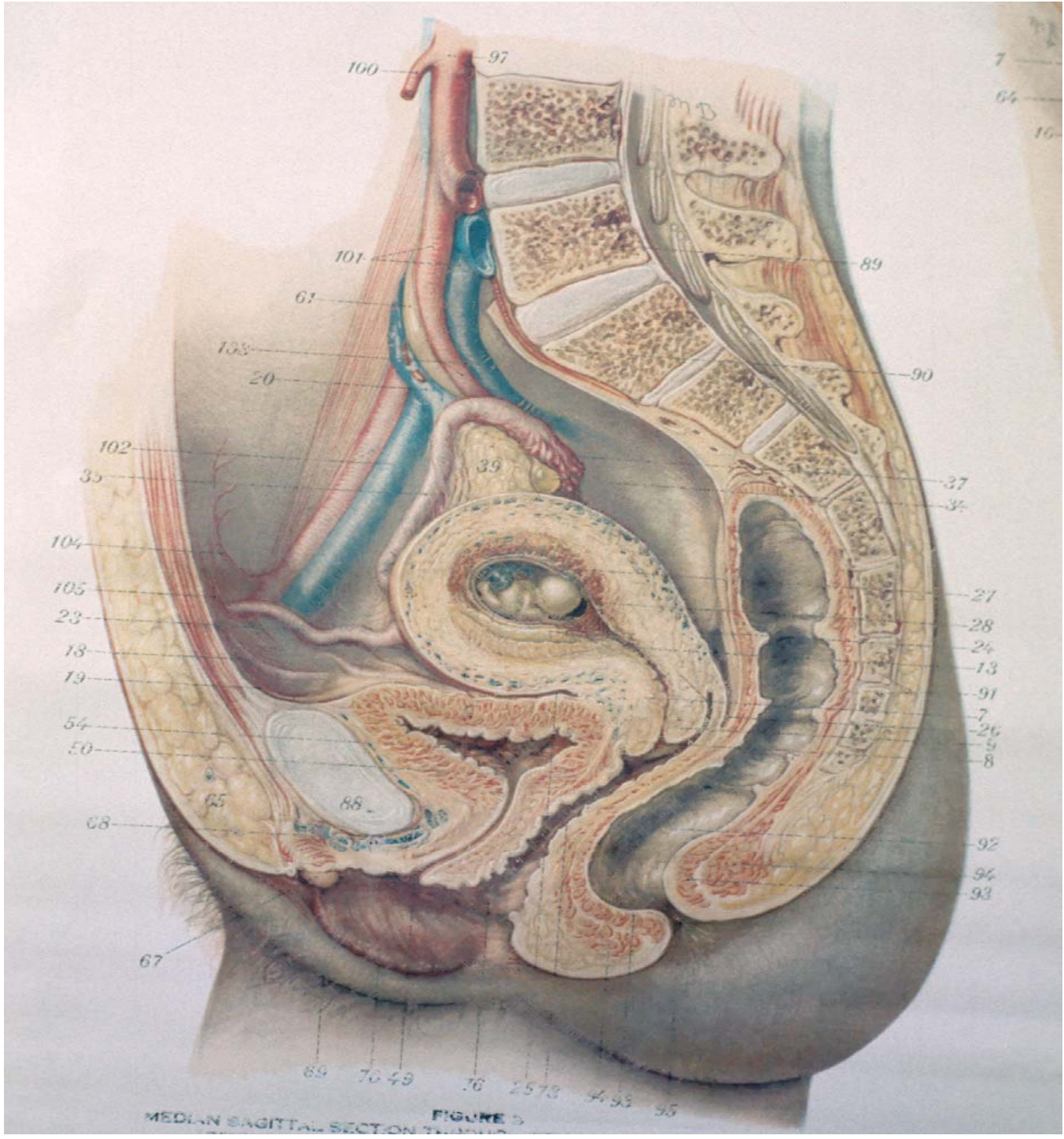
### TELOPHASE II AND CYTOKINESIS

Haploid daughter cells









MEDIAN SAGITTAL SECTION OF THE HUMAN TORSO

FIGURE 5



**DIVISION** of egg  
starts development

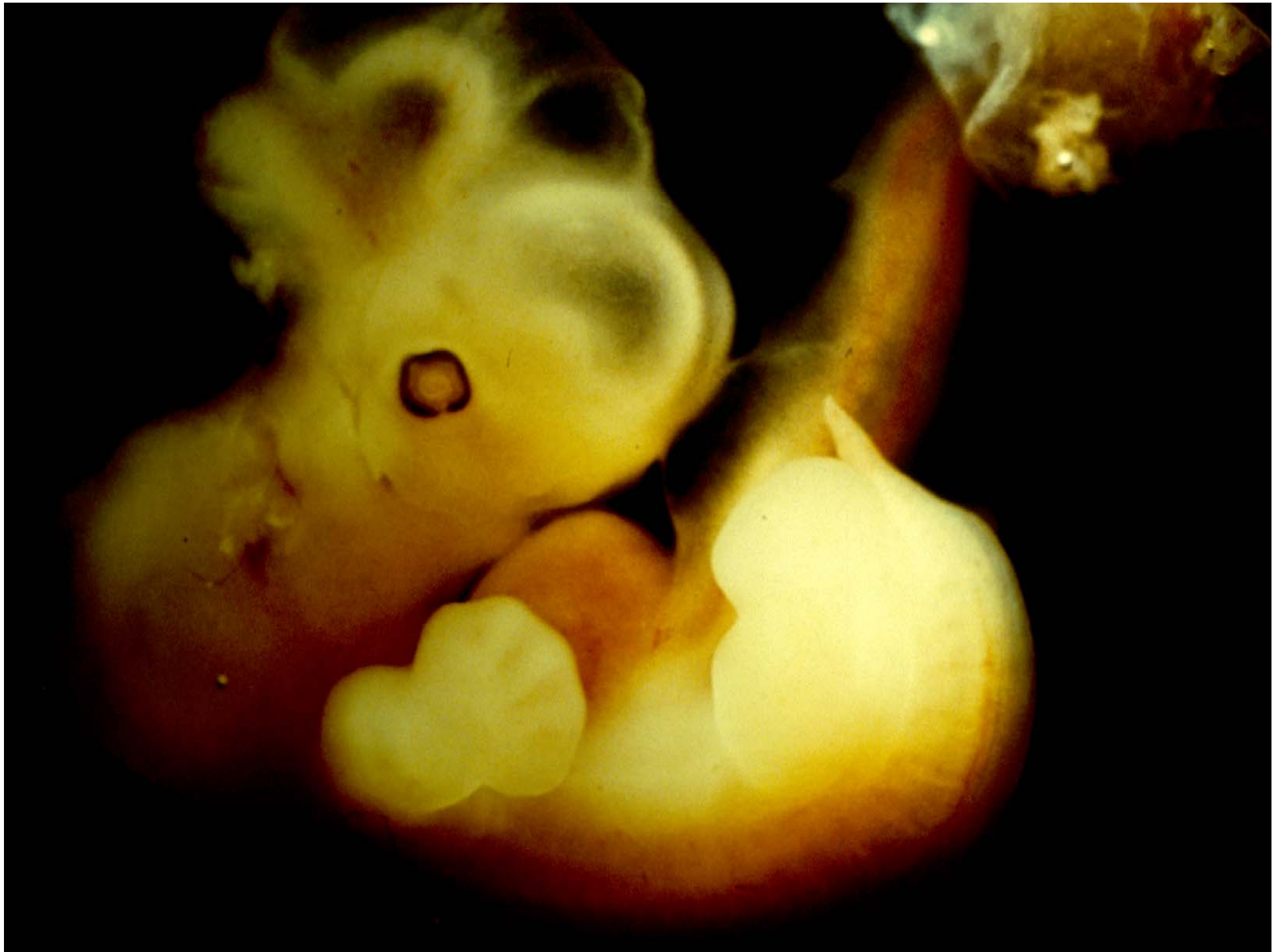


REPEATED DIVISIONS  
quickly fashion an embryo







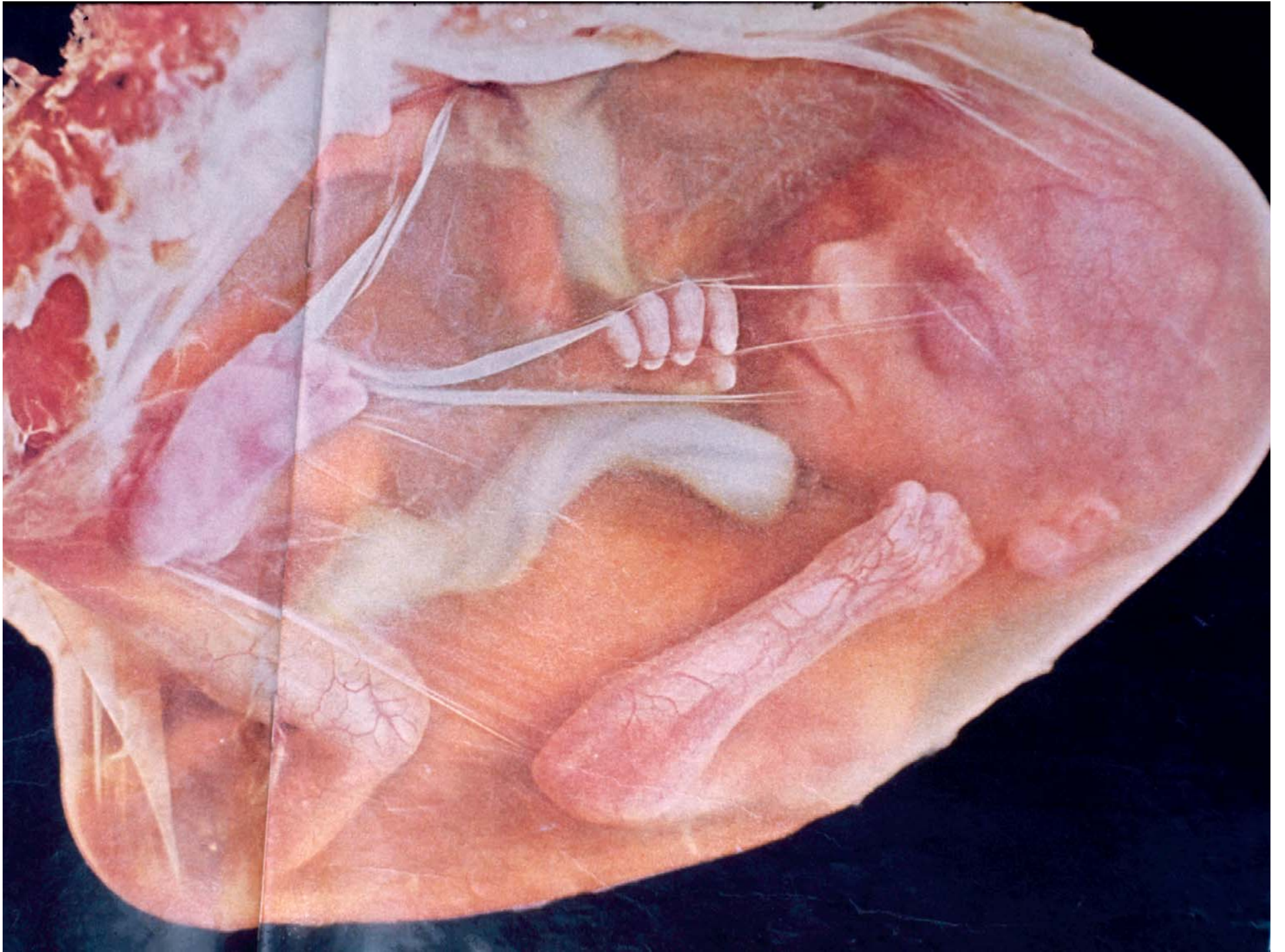


















# Mutations and degradation

- "A seemingly very grave objection to this theory of evolution may have occurred to the reader. We have mentioned mutations which produce such serious hereditary diseases as hemophilia, or such traits as piebald skin, or woolly hair. If we were to describe more examples of mutations in various organisms, it would plainly appear that most of them are harmful, or at least useless, to their carriers. But harmful mutations can only lead to degradation of the species; so how can such mutations improve the fitness of their possessors?"  
(Dunn, L. C. & T. Dobzhansky, 1956, p. 78)







THE TRUNK AND TUSKS (ELONGATED FRONT TEETH) ARE MOST CHARACTERISTIC OF THE GROUP. EVOLVED FROM THE PIG-SIZED MOERITHERIUM OF THE AFRICAN EOCENE, THE LATER PROBOSCIDEANS ATTAINED GREAT SIZE, EXCEEDED ON LAND ONLY BY CERTAIN DINOSAURS AND ONE RHINOCEROS (BALUCHITHERIUM).



MOERITHERIUM (PIG-SIZED PROBOSCIDEAN WITH TUSKS ONLY IN THE EOCENE AND AN EXTENSIVELY USED MEMBER OF THE PROBOSCIDEAN CLADE IN THE EOCENE AND WITH THE TUSKS ONLY IN THE EOCENE)



THE LARGEST PROBOSCIDEAN WAS MAMMOTH, WHICH LIVED IN THE LAST OF THE EOCENE, THE EARLY PLEISTOCENE AND THE EARLY HOLOCENE. IT WAS THE LARGEST PROBOSCIDEAN THAT EVER LIVED.

THE LARGEST PROBOSCIDEAN THAT EVER LIVED WAS THE MAMMOTH, WHICH LIVED IN THE LAST OF THE EOCENE, THE EARLY PLEISTOCENE AND THE EARLY HOLOCENE. IT WAS THE LARGEST PROBOSCIDEAN THAT EVER LIVED.

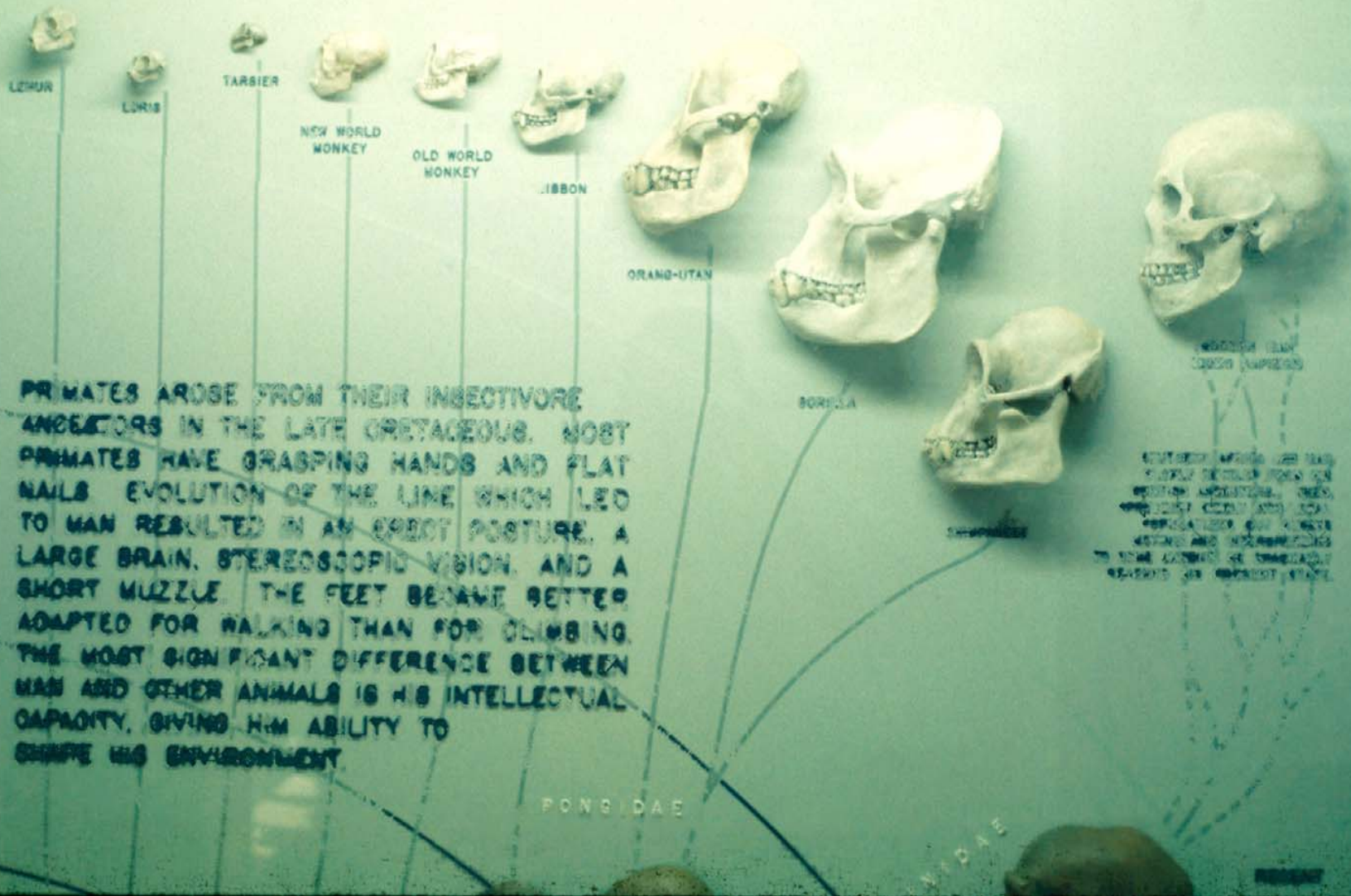


MAMMOTH



WOOLLY MAMMOTH

# MOST PRIMATES, TROPICAL FOREST DWELLERS, ARE USUALLY SCARCE AS FOSSILS.



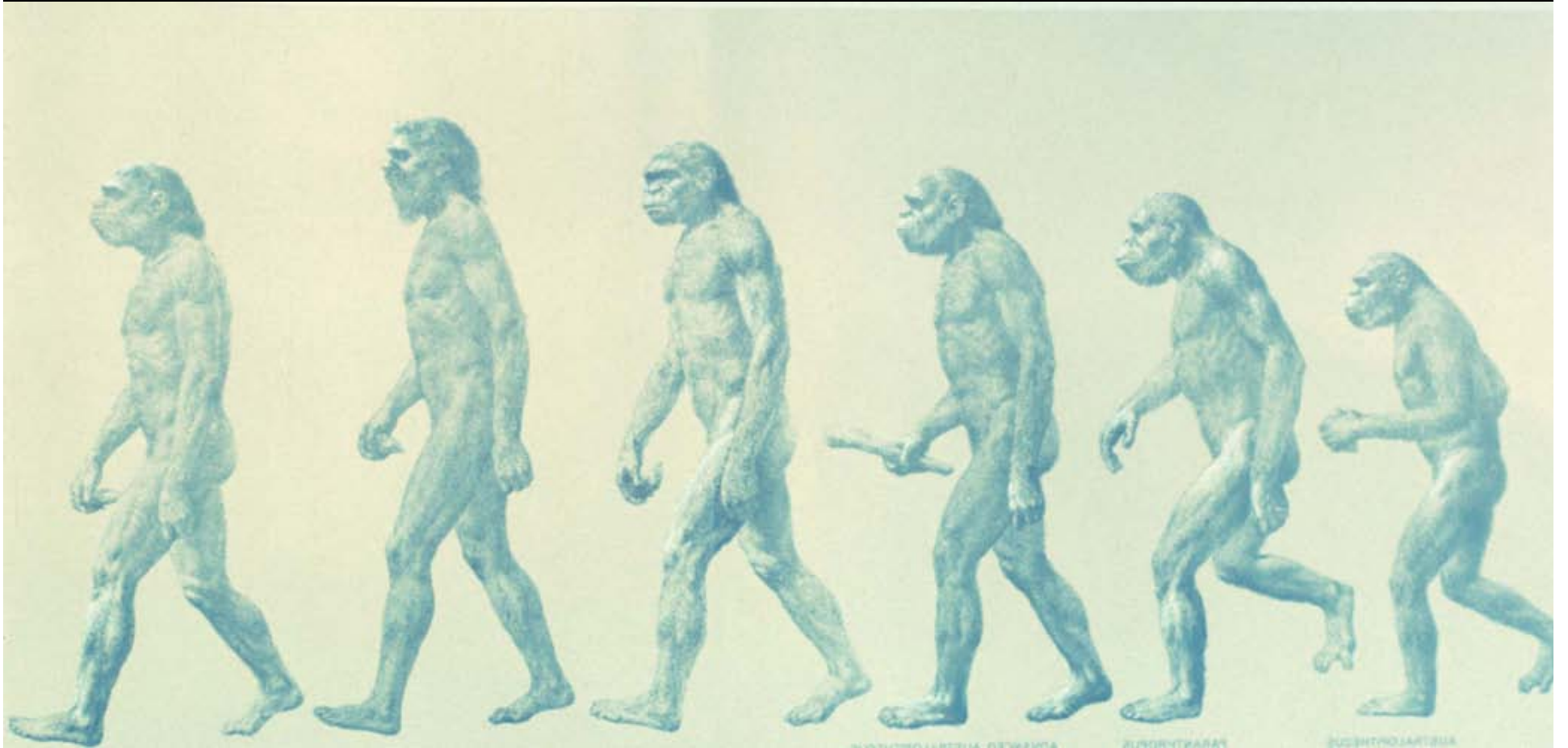
PRIMATES AROSE FROM THEIR INSECTIVORE ANCESTORS IN THE LATE CRETACEOUS. MOST PRIMATES HAVE GRASPING HANDS AND FLAT NAILS. EVOLUTION OF THE LINE WHICH LED TO MAN RESULTED IN AN UPRIGHT POSTURE, A LARGE BRAIN, STEREOSCOPIC VISION, AND A SHORT MUZZLE. THE FEET BECAME BETTER ADAPTED FOR WALKING THAN FOR CLIMBING. THE MOST SIGNIFICANT DIFFERENCE BETWEEN MAN AND OTHER ANIMALS IS HIS INTELLECTUAL CAPACITY, GIVING HIM ABILITY TO CHANGE HIS ENVIRONMENT.

EVOLUTION OF THE HUMAN SKULL FROM ANCESTRAL PRIMATES. THE SKULL BECAME LARGER AND MORE UPRIGHT. THE MUZZLE BECAME SHORTER AND THE BRAIN CASE ENLARGED. THE SKULL BECAME MORE UPRIGHT AND THE MUZZLE SHORTER.

PONGIDAE

HOMINIDAE

HOMO



# The Specificity of DNA

- Directs the placing of the amino acids to form the **structure** of the proteins which become the picture puzzle pieces to the rest of the structure of the life form being produced.
- Directs the construction of the proteins that will be **catalysts** acting in the processes of life.



# Evolutionary Explanations

- In nature, mutations of genetic blueprints occur by natural causes.
- Blind, Random mutations gradually change the nature of the succeeding organisms.
- Although most of the mutations are destructive or useless, they occasionally improve the genetic inheritance of the organism.
- This gradually causes a movement from the simple organisms to complex organisms.
- All forms of life have been produced through this process.

- "From time to time, possibly due to ionizing radiation, increased temperature, or the effects of certain chemical substances, accidents occur that alter the structure of DNA molecules. Of course, if the DNA molecule is able to replicate, the altered structure is passed on to the new DNA molecules that are formed. While genetic variations are usually unfavorable or even fatal, very occasionally a change occurs that confers a decided advantage on the organism. If the organism reproduces, the change may be passed to the offspring. Hence groups of organisms can change in time. There is always the possibility of improvement of life through variation in the structure of DNA molecules. (Otto & Towle, 1969. p. 50).

# DNA Mutations Are Normally Lethal

- . The nuclear physicist, Grebe indicates:
- "A mutation in one human DNA code to the extent of the reversal of only one amino acid, in its proper location, has been found to be lethal. Evolution demands many such dislocations, but any dislocation of only one nucleotide in the DNA code is usually fatal, rather than a mechanism for evolutionary development." (Grebe, 1965).

# Gene Recombination

- Genes are occasionally but rarely recombined on the chromosomes through:
  - 1. Deletion
  - 2. Duplication
  - 3. Translocation
  - 4. Inversion

# The Results of Gene Recombination

- Gene recombination causes marked differences and changes in the resulting organism, both in color or form.
- Example: The horse family.
- From Eohippus to the modern horse.
- Existing species: horses, donkeys, zebras

# Darwin's Law of Natural Selection

- 1. Genetic Variations occur as natural process.
- 2. Species tend to overproduce.
- 3. More individuals means more variations.
- 4. Overproduction brings competition for survival.
- 5. The best variations survive.

# Reevaluation

- Genetic recombination does not create anything new, but shuffles existing genetic materials that already exist to produce interesting variations in living organisms.
- Darwin's laws of natural selection are true, however, they are conservative, not creative, preserving the best genetic characteristics available, and slowing down the decline of species.

# The Complicated Equation of Life

- DNA as a double binary mathematical formula
- 8,000,000,000 binary components
- Double usage from both sides



# The Time Element Needed to Produce Evolution

- Generations needed (G) = DNA X Mutation ratio X Frequency of mutations
- Time available= Sec. X Min. X Hrs. X Year X Age since the “Big Bang”
- G/Sec. = generations needed  
time available

# Generations Needed

- $8 \times 10^9$  steps in human DNA X
- $10^6$  generations between each mutation X
- $4 \times 10^5$  destructive mutations for every advantageous mutation =
- **$3.2 \times 10^{21}$**  consecutive generations to produce humankind by blind random mutations.

# Time available since the “Big Bang”

- Time available (TA) = 60 sec. X 60 min. X 24 hrs. X 365.25 Days X 6,000,000,000 Years = 189,345,600 billion seconds or
- **$1.9 \times 10^{17}$**  seconds since the “Big Bang” or since the sudden beginning of the material universe.

# Number of Generations Per Second Needed to Produce Man Today by Blind Random Mutations

Generations needed =  $3.2 \times 10^{21}$  generations

$1.9 \times 10^{17}$  seconds = 16,842

or about 17,000 consecutive generations per second to be able to have enough time to produce humankind through blind random mutation, provided that the bio-chemicals were all ready to start the assembly on the first second after the universe suddenly appeared.

# Gestation Periods

- E coli: about 15 minutes
- Mice: 18 to 21 days
- Human: 9 months
- Horses: 11 months
- Elephants: 24 months

# Remove all destructive mutations

- If every mutation were advantageous
- The Time needed=
- = Number of seconds since the Big Bang
- Number of DNA Steps X generations between mutations
  
- $1.9 \times 10^{17}$
- $(8 \times 10^9) \times (10^6) =$
  
- $1.9 \times 10^{17}$
- $8 \times 10^{15} = 23.75$  or
  
- about 24 seconds per generation.

# Remove all generations between mutations

- The Time needed=
  - Number of seconds since the Big Bang =
  - Number of DNA Steps X ratio of Mutations
    - $\frac{1.9 \times 10^{17}}{(8 \times 10^9) \times (4 \times 10^5)} =$
  - $\frac{1.9 \times 10^{17}}{3.2 \times 10^{15}} = 60$  seconds per generations
  -

# Remove both

- The Time needed =  $\frac{\text{No. of Seconds since the Big Bang}}{\text{No. of DNA steps}}$
- 
- $T = \frac{1.9 \times 10^{17}}{8 \times 10^9} =$
- $2.4 \times 10^7$  seconds per generation or roughly nine months,



# The Mathematical Code for Life

- As previously mentioned, life is encoded in a massive double binary mathematical formula encoded in DNA molecules which are specific molecular assembly data for the structure and function of individual types of animals and plants. With mankind and many other families of animals and plants the code consists of over 8 billion steps. DNA is thus like an 8 billion component computer directing the structure of every function of life.

# Shooting the Computer to Improve It

- The DNA genetic code consists of over eight billion specific steps that give explicit instructions concerning how each molecule should be assembled in putting together a living organism. To say that life came into being through random changes in the master informational molecule, DNA, by random collisions of cosmic rays or other random environmental change agents, and to imply that all forms of life are the product of accidental collisions of matter is to be compared with the statement that we could reasonable expect that we could get improvements in an 8 billion component computer by shooting it with a machine gun.

- If we claimed that this would improve the computer we would be considered insane. Such an argument is irrational. To consider this type of mutation as a possible creative source for improving or developing species from simple to complex is similar to shooting an eight billion component computer with a machine gun and hoping to improve the computer.

# Going South and the Shotgun Analogy

- Let's say that you were walking to the North Pole from the South Pole. You travel 1,500 miles north and take a step backward. You travel another 1,500 miles north and take a step backwards. Eventually you would reach the north pole if there were no complications. However, let's say that there are four hundred thousand landmines for every step you take spread out over your route and they were set to kill you. Let's also say that you had no way of detecting these landmines, and that each step that you took was random and without planning where you would step. Would you reasonably expect to reach the north pole?

- Considering that there are 8 billion double binary steps in our DNA molecular mathematical formula, that there are approximately 1 million generations between mutations, and that the vast majority of these mutations are destructive or lethal, the probability that you would reach the north pole with this arrangement would be a much greater probability than that you could develop the complexity of the mechanisms of genetics and the mechanics of life that exist through blind, random mutation.

# The Mendellian Laws of Genetics

- The Mendellian laws of genetics are as follows.
- - a. Only physical characteristics based on genetic factors are inherited.
  - b. Wide and numerous variations are latent in natural species.
  - c. Combinations of genes produce the variations in individuals. These variations come from
    - (1) pairing of recombined parental genes.
    - (2) inversions of genes and parts of chromosomes on the normal chromosome.
    - (3) translocations of genes to different locations on the chromosome.
    - (4) duplications of genes on the same chromosome.
    - (5) deletions of genes from chromosomes.
    - (6) breakage of chromosomes.
    - (7) chemical changes on the DNA molecule.

# Albert Szent-Gyorgyi

- Dr. Szent-Gyorgyi was the director of research at the Institute of Muscle Research, Marine Biological Laboratories, Woods Hole, Mass., and Nobel Prize winner for his research. He, as an evolutionist, wrote an article, **New Light on Living Matter**, for the *Medical World News*, Feb. 14, 1964, p. 130-132, in which he stated,

- Related to the study of riboflavin, vitamin B2, Dr. Szent-Gyorgyi states, “which means that the whole molecule is not a crude structure built of elementary building blocks, but a most refined and complex machine of excessive subtlety, built with a precision that far surpasses the precision of any machinery built by man.”



- “If we are ever able to find out all the qualities of the molecule, we will probably find that this is the only molecule that can fulfill the specific function of riboflavin in its interactions with other molecules and chains of molecules.”

- “What frightens me is the enormous complexity and precision that has been thrown into relief for the first time by quantum mechanics. I find it difficult to believe that such an enormously complex system could have been built by blind, random mutation.”

# Isaac Asimov

- Testing the "blind chance" presupposition of the creative process of producing all of nature through random collisions of matter in motion, Isaac Asimov, a scientist and an evolutionist, stated:
- "To test the blind-chance hypothesis, let's set up the simplest possible analogy. Suppose we had marbles of six different colors and suppose we took a few million assorted marbles and threw them helter-skelter into a box. Suppose each marble were coated with a kind of cement which would make it stick firmly to any other marble it happened to touch. Having thrown them into the box, pull the whole sticking-together mess out. What are the chances that, just by luck, just by the blind workings of chance, all the colored marbles have so arranged themselves that a pattern equivalent to that of a perfect nucleotide (a single step in the DNA molecule) is the result?" (Astounding Science Fiction: Apr., 1957, *Only a Trillion: Collections, 1957*).

- “For those of you who have read my article, 'Hemoglobin and the Universe' (Collections: Only a Trillion, 1957), may be able to make a shrewd guess as to what the answer to that one is. For those of you who have not, I will only say that the chances are more infinitesimal than you or I can imagine. So infinitesimal, that if the known universe were crammed with nothing but people, and each person performed the test twenty times a second,- a hundred times a second, a thousand times a second, what's the difference!- for a billion years- or a trillion or a trillion trillion- the chances of any one of those humans coming up with a perfect nucleoprotein pattern at any instant in all that time is still infinitesimal." (Asimov, Isaac, "The Unblind Workings of Chance", Astounding Science Fiction, Apr., 1957; *Only a Trillion: **Collections**, 1957.*

# Micro Evolution vs. Macro Evolution

- Horses,
- Elephants
- Birds
- Humans

Recent

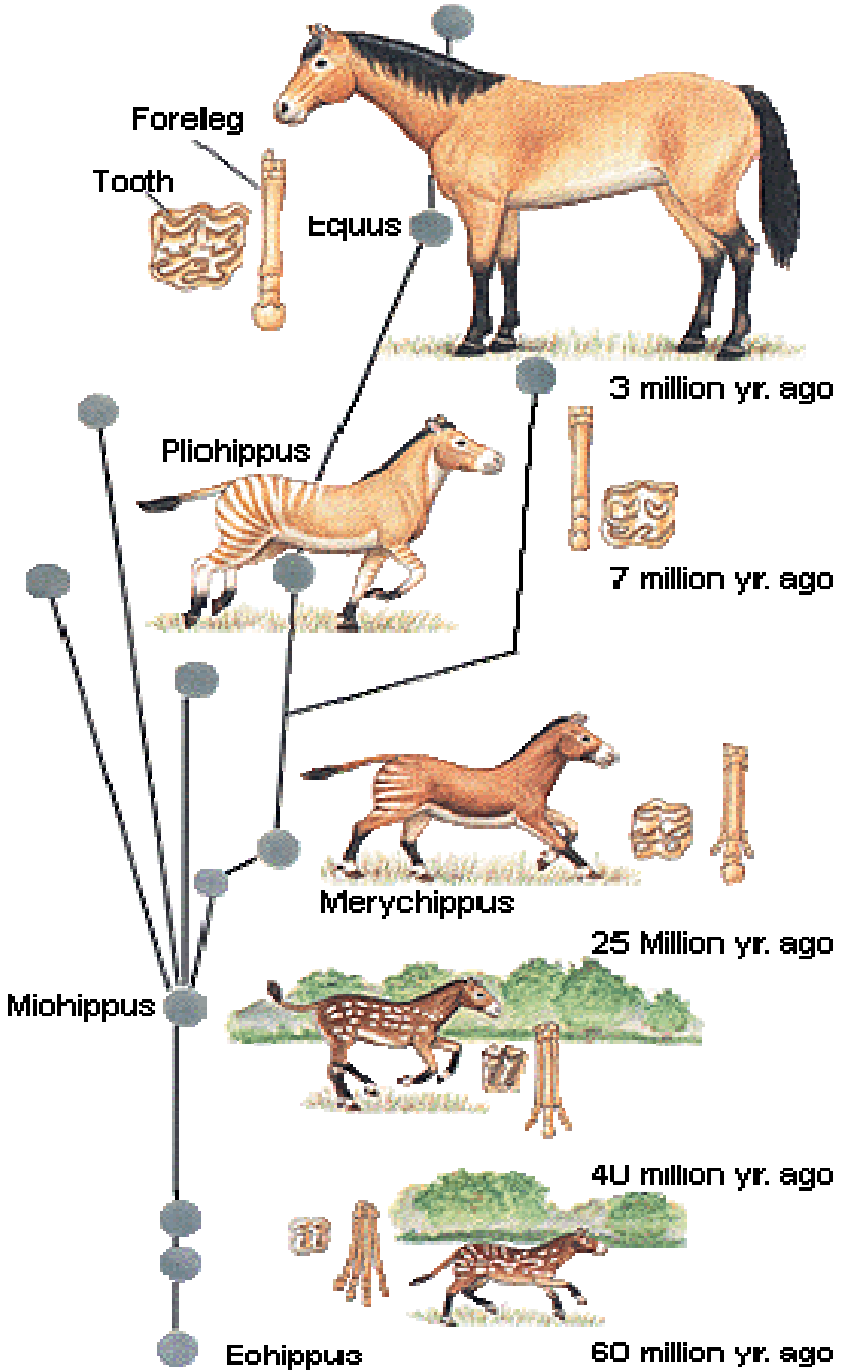
Pleistocene

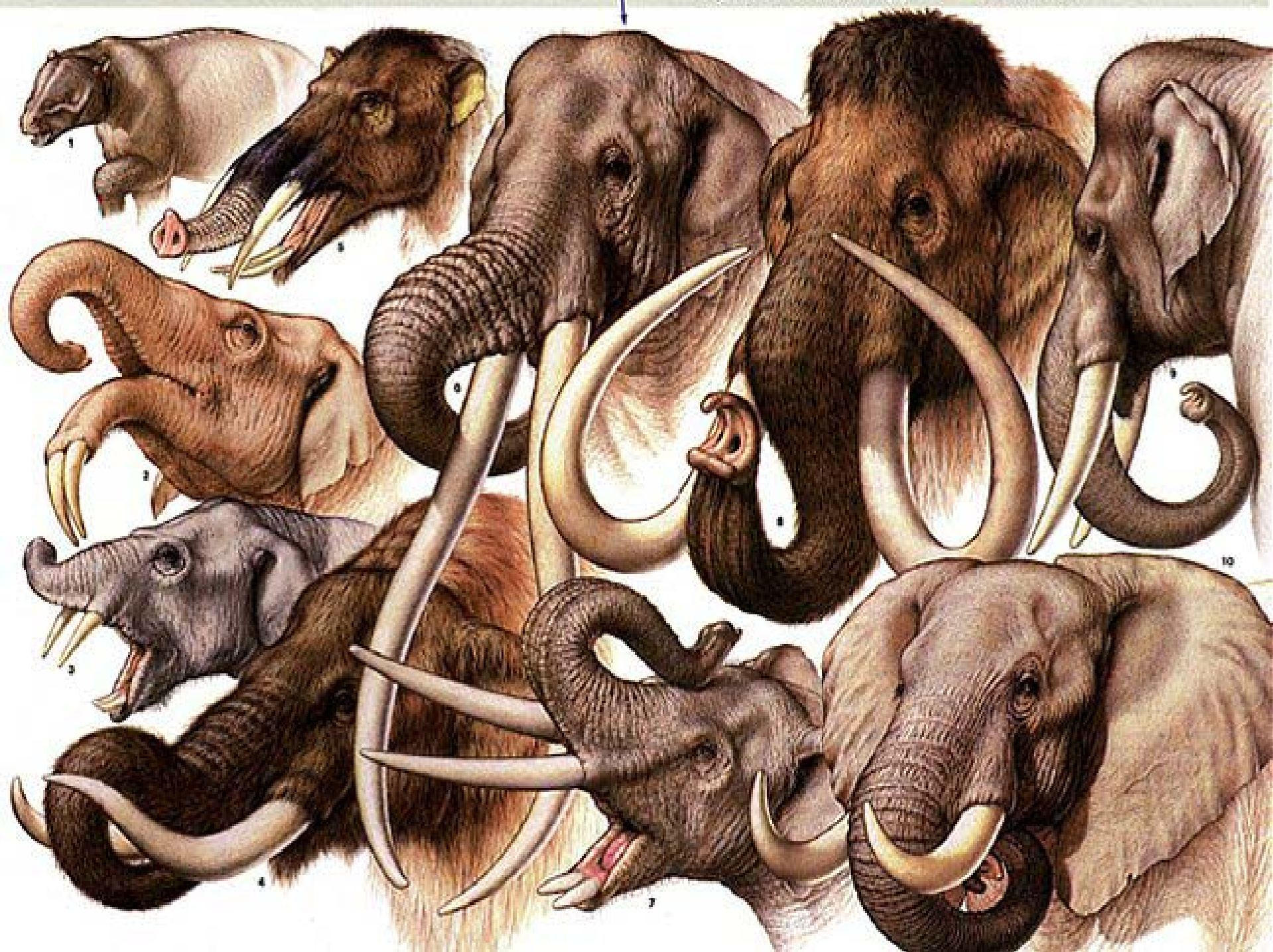
Pliocene

Miocene

Oligocene

Eocene





# TWO LIVING (*Stegodon*) MAMMOTHS

FILMED IN NEPAL, INDIA REGION IN MARCH, 1996



# The "Micro" Evolution of elephants

The lineage of elephants traces back some 55 million years. Ancestors gave rise to various branches as well as to the direct line leading to living elephants. Early proboscideans originated in Africa and southwest Asia and migrated via land bridges to every continent except Antarctica and Australia.

developed in Africa during the early Oligocene, proboscideans had prominent tusks and trunks that allowed them to eat leaves from treetops.

*Gomphotherium* (5) roamed Eurasia and Africa during the late Oligocene.

*Stegodon* (6), once deemed the progenitor of modern elephants, lived near African and Asian lakes and rivers during the mid-Miocene.

Remains of *Moeritherium* (1), dated from 50 million years BP, were found in North Africa. This hog-size creature had two small tusks in each jaw.

*Deinotherium* (2) apparently originated in Africa during the late Eocene. Lacking upper tusks, its lower jawbone curved backward to reveal tusk-like front teeth used for digging.

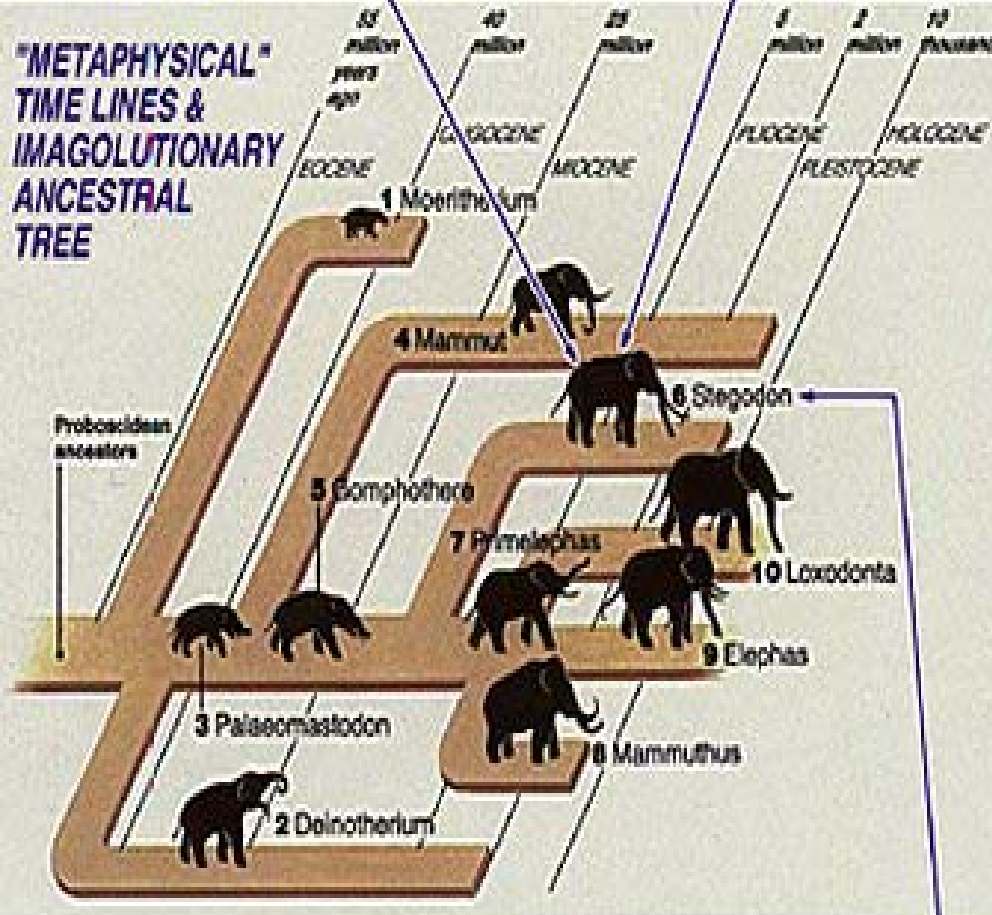
Four tusks appeared again in *Palaeomastodon* (3) from North Africa at the end of the Eocene. It began the main line to today's elephants.

By the time *Mammuth* (4)

The last four-tusker, *Primelephas* (7) was the immediate ancestor of the extinct *Mammuthus* (8), which lived in Africa, Eurasia, and North America during the Pliocene and Pleistocene, and today's *Elephas* (Asian elephant) (9) and *Loxodonta* (African elephant) (10).

Changes in climate and food supply—and perhaps overhunting in the Pleistocene—caused widespread extinctions, leaving modern elephants as the only survivors.

"METAPHYSICAL" TIME LINES & IMAGOLUTINARY ANCESTRAL TREE









# BIRDS OF THE GARDEN

OF THE UNITED STATES AND CANADA

NUMBER 1











*Supporting Responsible Private Ownership and Conservation*





Boston terrier



beagle



dalmatian



Sheltie sheepdog



Scottish Fold



Chihuahua



red chow



Alaskan Malamute





# Conclusions

- 1. The study of science is often a study of forensics where the observable data can lead to a clear understanding of what actually occurred.
- 2. It is possible to derive understanding through a careful study of observed facts leading to evidence for the unobserved.
- 3. Some spiritual truth can be found through material evidence.

- 4. The complexity of life demonstrates that life itself and the forms of life cannot have evolved through random mutations.
- 5. Life did not just happen by random collisions of matter.
- 6. Life is assembled from 20 amino acids through the direction of an eight billion component double binary mathematical formula.
- 7. There is not enough time since the universe came into being to produce life by accidental collisions of matter.
- 8. Life must have been designed and created by an intelligent and powerful Creator.

**What do you think the evidence supports; random evolution or intelligent design?**

# Albert Einstein

- "My religion consists of a humble admiration of the illimitable superior spirit who reveals himself in the slight details we are able to perceive with our frail and feeble minds. That deeply emotional conviction of the presence of the superior reasoning power, which is revealed in the incomprehensible universe, forms my idea of God." (Barnett, p. 109).

# What have we tried to do:

- 1. Build a man from the basic elements
- 2. Show the mechanisms of heredity
- 3. Evaluate the evidence for evolution
- 4. Reach some conclusions concerning organic evolution
- 5. Demonstrate intelligent design
- 6. Identify God as the Creator

I believe the evidence supports the existence of an intelligent designer- creator. The 8 billion step double binary mathematical formula found in DNA designating where each amino acid is positioned in each protein for each organism demonstrates intelligent design.

- **We call Him God**

# Religion, Science and Decisions

- **Religion:** People tend to believe what they have been taught as truth. Most do not ask for evidence that what they believe is true.
- **Science:** The investigation of evidence that indicates reality. The evidence is that there is an intelligent designer-creator.
- **Decisions:** The spiritual aspect of application for the evidence discovered and the alignment and belonging of the individual in harmony with the evidence discovered.

# And God Created

“Bara”: Creation and Genetics

- “Asa”: formation and variation



# The Bible tells us

- That God is the intelligent designer-creator of the heavens and the earth.
- That God loves us and wants to be our friend.
- That the human race is perverse and destructive.
- That He loves us so much that He became flesh and paid for our perversity by His death.

# Romans 1:18-20

- “For the wrath of God is revealed from heaven against all ungodliness and unrighteousness of men, who suppress the truth in unrighteousness; because that which may be known of God has shown it to them, for the invisible things of Him from the creation of the world are clearly seen, being understood by the things that are created, even His eternal power and Godhead; so that they are without excuse.”

## Hebrews 11:6

- “But without faith it is impossible to please **God**; for the one who comes to God is obligated to believe that He exists, and that He is one who rewards those who diligently seek Him.”

# John 1: 1-3, 14

- In the beginning the Word already was in existence, and the Word already existed with God, and the Word already existed as God. . .
- All things were made by Him; and without Him not anything came into existence that He did not make.
- And the Word was made flesh, and lived among us, (and we saw His glory, the glory of the only Begotten of the Father,) full of grace and truth.

# John 3:16

- “For God so loved the world, that He gave His Only Begotten Son, that whosoever believes in Him should not perish, but have everlasting life.”

# Where do we go from here?

- 1. We have looked at the astro-physical evidence for sudden creation.
- 2. We have investigated the significance of the genetic equation of life.
- 3. We will look at the significance of the fossil record.
- 4. We will investigate the evidence for the ancestry of mankind.
- 5. We will investigate the authority of the Bible from a scientific, historical, and mathematical perspective.
- 6. We will investigate the historicity of Jesus Christ.
- 7. We will investigate the Biblical and historical claims for the Deity of Jesus Christ.

# To believe, or to trust?

- We must recognize that we do not have any need to apologize for our believing in God or accepting Christ.
- We must also distinguish the difference between believing about Christ and trusting Christ as Savior.
- Salvation comes from trusting Christ. John 1:12 states, “But as many as received Him, to them He gave the authority to be the children of God, to those who believed (trusted) in His name.”
- Where do you stand?

# Bibliography

- Asimov, I., ***Only a Trillion***: Astounding Science Fiction: Apr., 1957, **Collections**, 1957.
- Asimov, I., ***The Unblind Workings of Chance***, Astounding Science Fiction, Apr., 1957; *Only a Trillion*: **Collections**, 1957.
- 
- Bonner, David M. & Mills, Stanley E. Heredity. Englewood Cliffs, N. J.: Prentice Hall, Inc., 1964.
- Barnett, Lincoln. The Universe and Dr. Einstein. New York, N. Y.: Mentor. p. 109..
- Dunn, L. C. & Dobzhansky, T. Heredity, Race and Society. New York, N. Y.: Mentor Books, 1956).
- (Grebe, J. ***Creation and the Flood***, Bible-Science Newsletter. Nov. 15, 1965).
- McElroy and Swanson, Foundations of Biology., Englewood Cliffs, N. J.: Prentice Hall, Inc., 1968.
- Otto, J. & Towle, A., Modern Biology. New York, N. Y.: Holt, Rhineheart & Winston, 1969.
- Sczent-Gyorgii, A., ***New Light on Living Matter***, for the Medical World News, Feb. 14, 1964.
- Swanson, Carl P. The Cell, Englewood Cliffs, N. J.: Prentice Hall, Inc., 1965).