



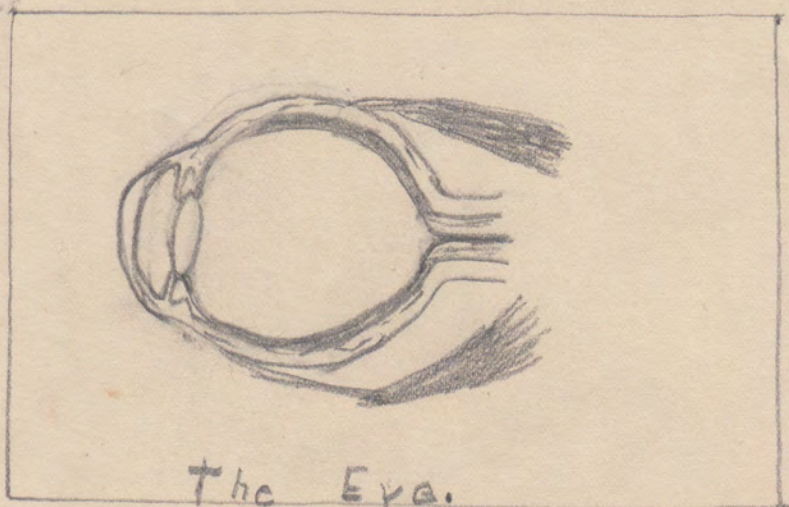
- Cere BRUM

- cere BE LLUM

Medulla AND

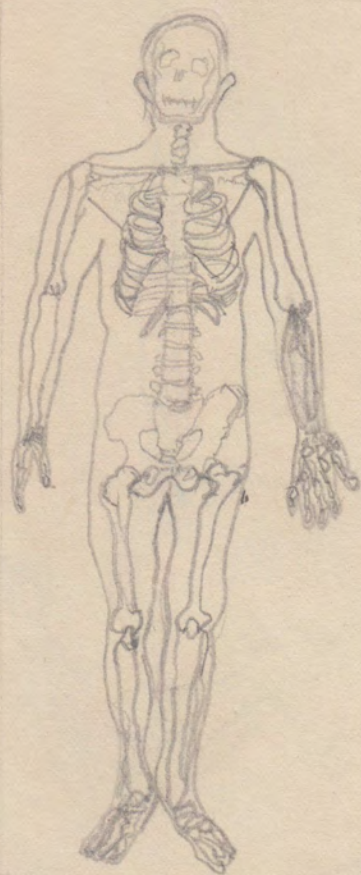
TIP OF spinal
cord

The Human Brain



The Eye.

2014.217.03B



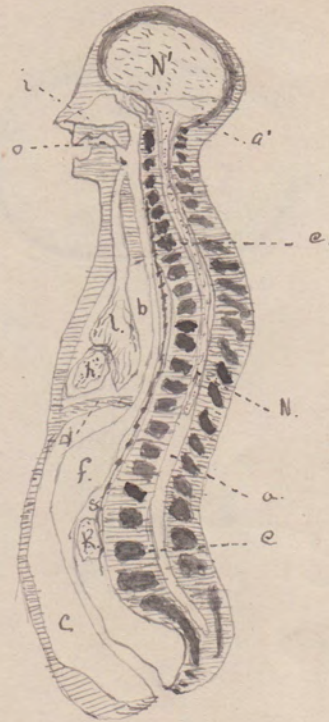
Miriam B.

THE
KEYSTONE
NOTE

BOOK



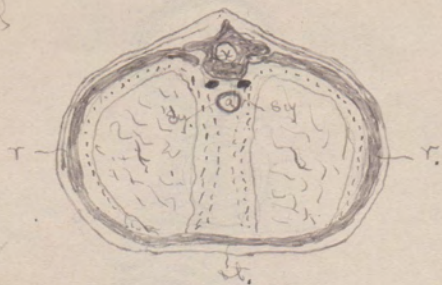
No. _____



good

Fig. 1. - Diagrammatical longitudinal section of the body. *d*, the neural tube, with its upper enlargement in the skull cavity at *a'*; *N*, the spinal cord; *N'*, the brain; *ee*, vertebrae forming the solid partition between the dorsal and ventral cavities. *b*, the pleural and, *c*, the abdominal division of the ventral cavity separated from one another by the diaphragm, *s*; *n*, the nasal, and *o*, the mouth chamber, opening behind into the pharynx, from which one tube leads to the lungs *l*, and another to the stomach, *f*; *h*, the heart; *k*, a kidney; *s*, the sympathetic nervous chain. From the stomach, *f*, the intestinal tube leads through the abdominal cavity to the posterior opening of the alimentary canal.

1. At the level
of lungs.



x. Dorsal cavity

r. Ribs

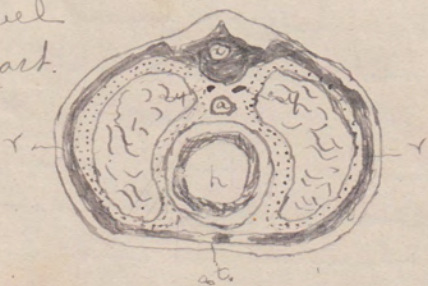
a. Gullet.

sy. Sympathetic nervous system

st. Breast bone.

u. Lungs.

2. At the level
of the heart.



x. Dorsal cavity

a. Gullet.

h. Heart.

st. Breast bone.

rr. Ribs

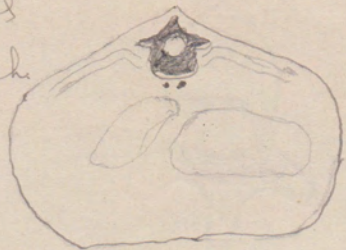
u. Lungs.

sy. Sympathetic Nervous System.

3. At
of

4. At
the

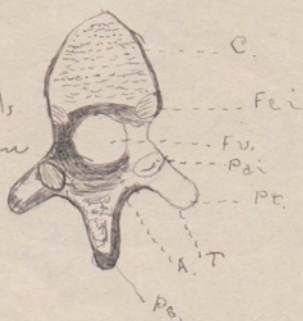
3. At the level
of the stomach



4. At the level of
the kidneys



A dorsal vertebra
seen from behind,
the end turned from
the head.



C. Thick bony mass.

A. Neural arch.

Fu. ring.

Ps. Spinous process.

Pai. Posterior articular process.

Pt. Transverse process.

Fci. Articular surface on the centrum for articulation with a rib.

Cavities.

V.

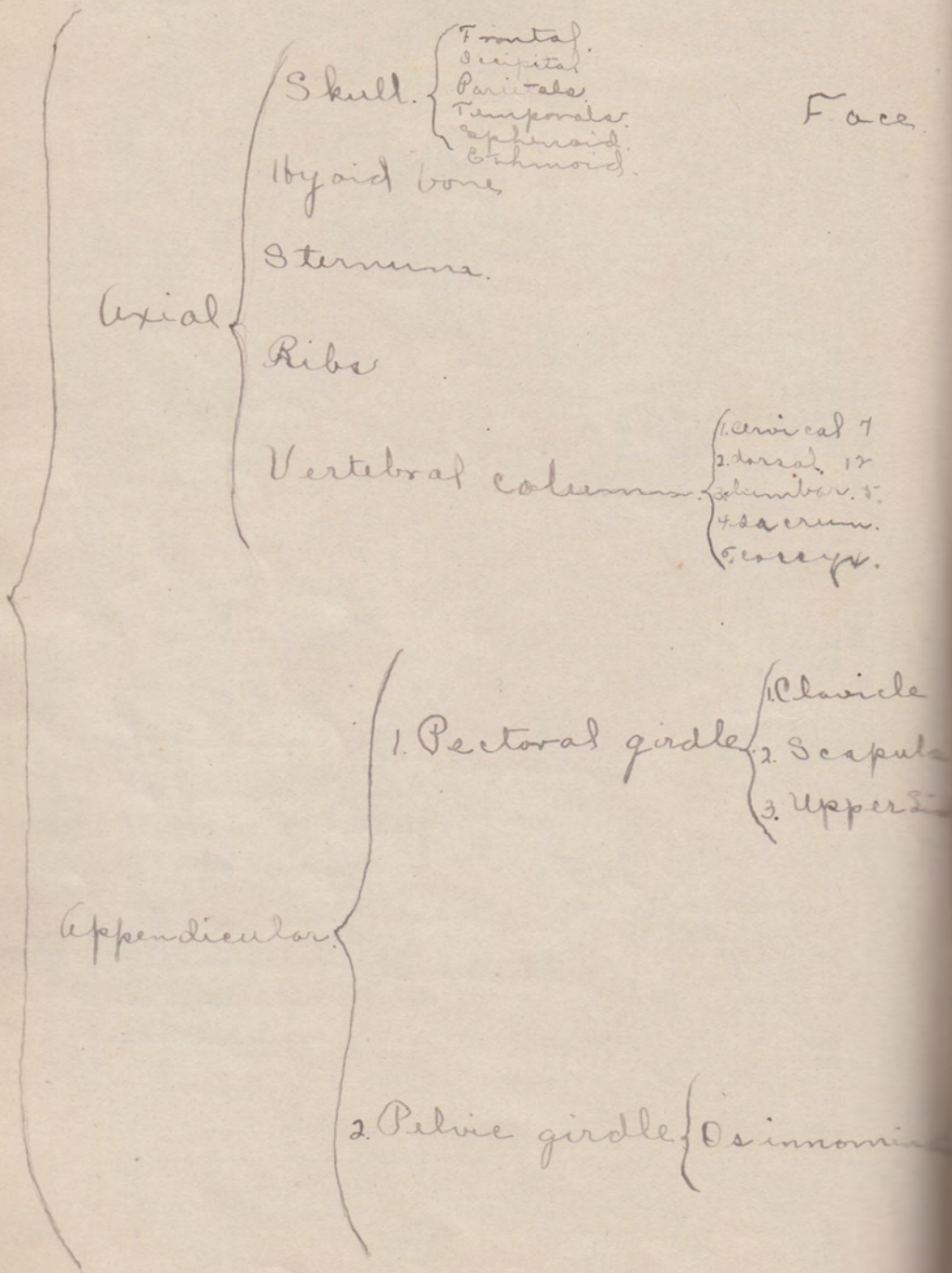
Outline of Cavities.

Dorsal {
1. Brain } Nervous System.
Spinal cord }

Cavities

Ventral {
Divisions. { heart } circulatory system.
Chest. { lungs } respiratory "
gullet } Digestive "
sympathetic n.s. } Nervous "
Abdominal. { stomach } Digestive "
intestines } Digestive "
kidneys } excretory "
sympathetic n.s. } n.s.

Outline of Skeleton.

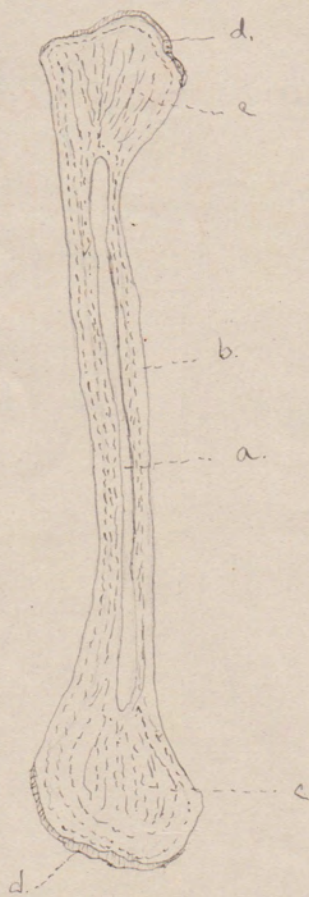


- 1. Nasal Bones. 2
- 2. Malar " 2
- 3. Sphenoidals 2
- 4. Palate Bones 2
- 5. Turbinate 2.
- 6. Upper 2, Lower Maxillary Bones 1.
- 7. Vomer. 1.

- Ear {
- 1. Malleus.
 - 2. Incus.
 - 3. Stapes.

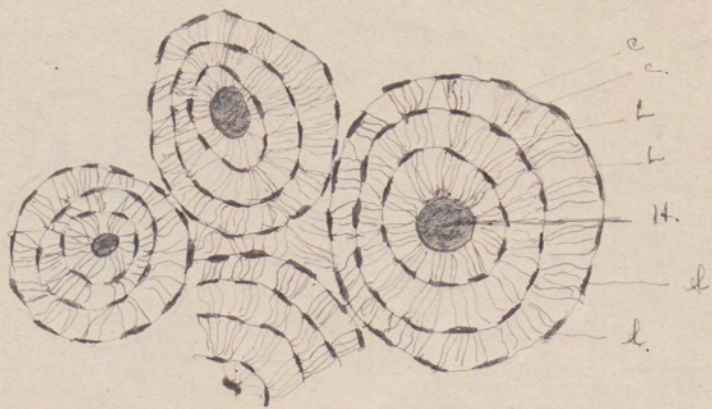
- 1. Humerus.
- 2. Radius
- 3. Ulna.
- 4. Carpals
- 5. Metacarpals
- 6. Phalanges.

- Lower Limbs {
- 1. Femur.
 - 2. Patella.
 - 3. Tibia.
 - 4. Fibula.
 - 5. Tarsals.
 - 6. Metatarsals.
 - 7. Phalanges.



Longitudinal section of the humerus.

- dd. cartilage.
- cc. Spongy bone.
- b. Hard bone.
- a. Medullary cavity.



The cross-section of a small piece of bone, highly magnified.

H. - Haversian canal.

L. - The bony plates or lamellae.

cc., - small cavities called the lacunae.

cc., - The fine tubes which radiate from each lacunae. are the canaliculi. Blood oozes through these tubes.

Outline of joints.

joints.

1. Ball and Socket. } Hip.

2. Hinge-joint } Knee.

3. Pivot { Atlas
and
axis.

4. Gliding { Tarsals
and
Carpals.

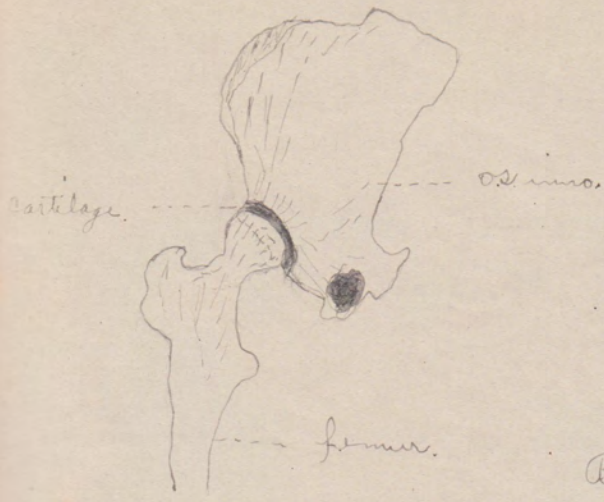
cartilage.

A. -
joint

Radius.

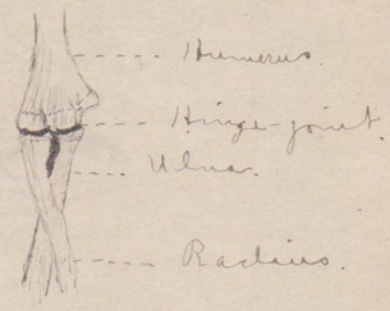
C.C.

A.



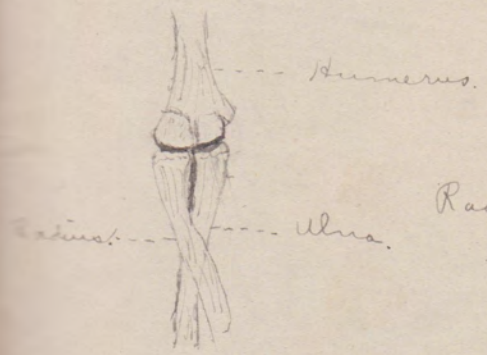
A. - Ball and socket joint at the hip.

B.

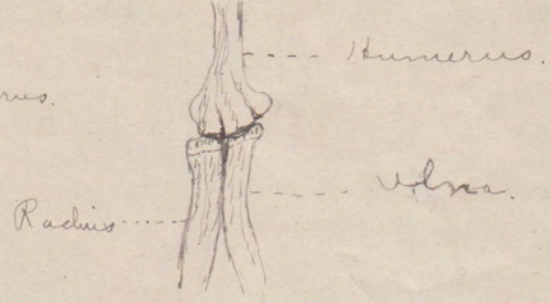


B. - Hinge-joint at the elbow.

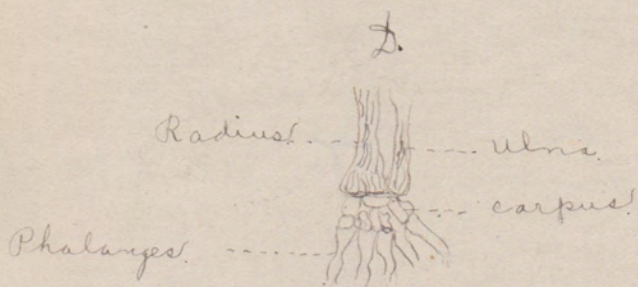
C.



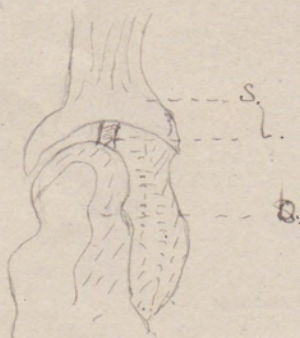
C.



C.C. Illustration of the pivot-joint, it shows how the radius can be crossed over the ulna and back again.



D. - The gliding joint at the wrist, illustrating how the carpals glide over each other.



A section showing how the ball is fastened into the hollow by a strong round ligament.

s. socket.

l. round ligament

b. ball.



illustrating
her.

A section of the socket showing the
capsular c, and round l. ligaments.

is
strong

Outline of the chemical substances
in the body.

Food substances

Organic

Hydro-carbons — fats and oils

Carbohydrates starches and

Proteids { myosin
 { fibrin
 { serum albumen
 { casein
 { gluten - syntomin.

Albuminoids ---- gelatine.

Inorganic

salt

lime

water.

Outl

Nutrition.

Outl

Outline of Nutrition.

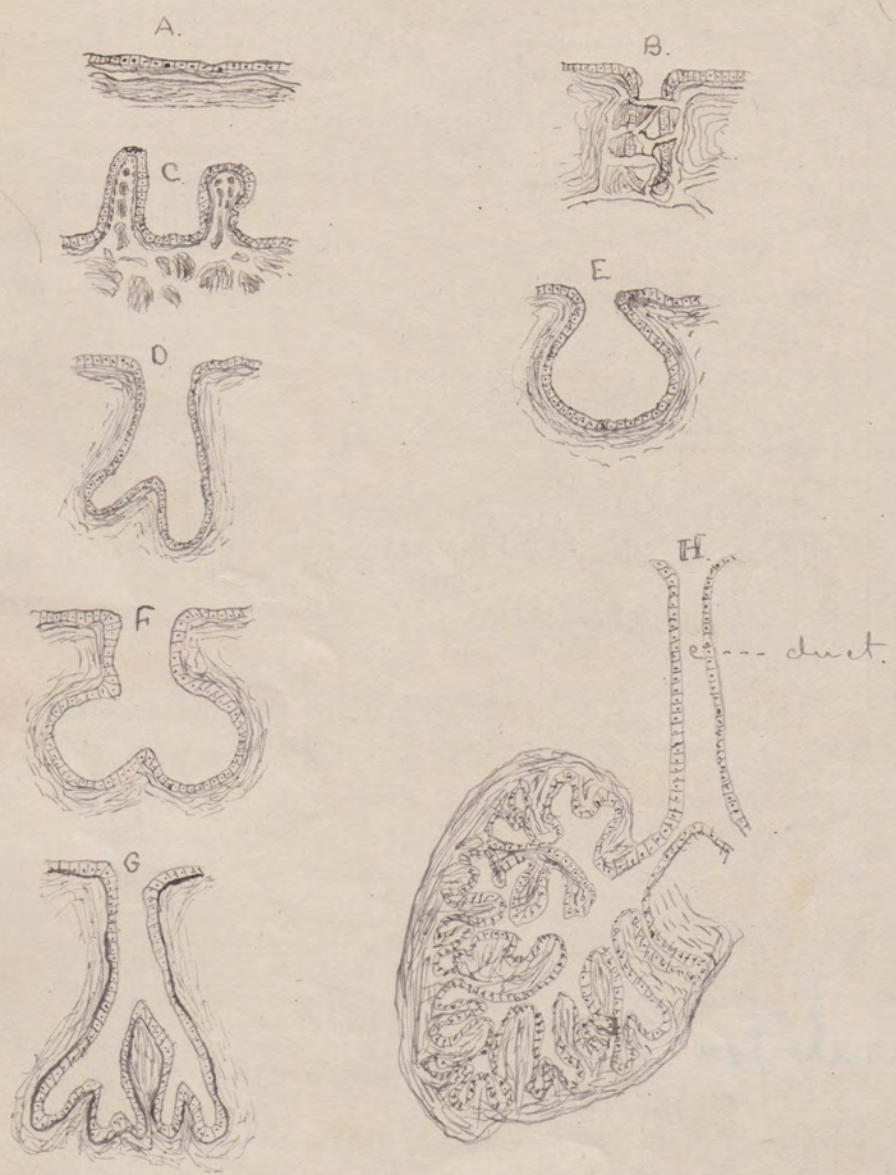
Nutrition.

Reception of food.... Alimentary canal.
Digestion " " stomach and intestines.
Absorption " " absorbents.
Circulation " " blood vessels.
Assimilation.... Tissues.
Respiration of oxygen.... lungs.
Circulation " " blood vessels.
Dissimilation of food.... tissues.
Excretion " " Lungs, skin and kidneys.

Outline of Foods.

Oxidizable { tissue-builders
force generators.
force regulators.

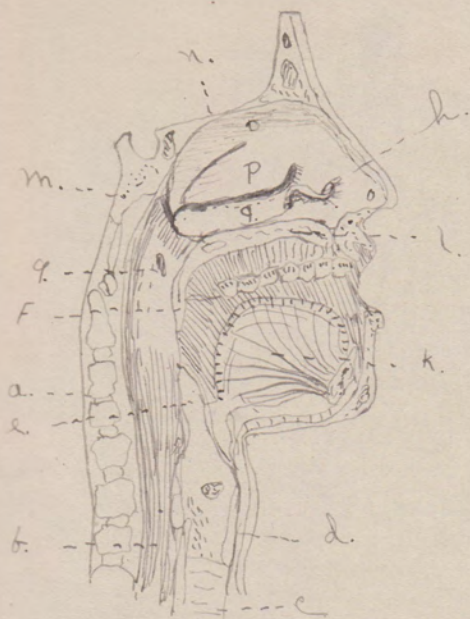
Non-oxidizable { Force regulators.
Machinery formers.



A, a simple secreting surface. B, a simple tubular gland. C, a secreting surface, increased by protrusions. E, a simple racemose gland. D. and G, compound tubular glands. F, a compound racemose gland. H, half of a highly developed racemose gland.

m. ...
 q. ...
 F. ...
 a. ...
 e. ...
 b. ...
 a. ve ...
 b. qu ...
 c. un ...
 d. l ...
 e. e ...
 f. se ...
 g. up ...
 h. to ...
 i. s ...
 m. s ...
 skull ...
 n. fo ...

The Mouth Cavity.

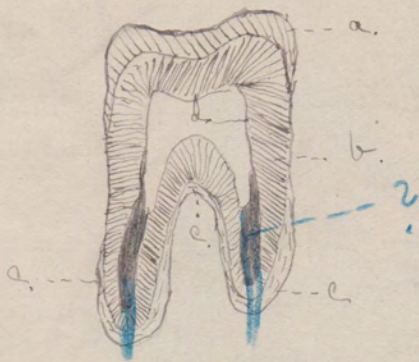


o, p, q. the turberate
bones of the outer
side of the left
nostril chamber.

- a. vertebral column.
- b. gullet.
- c. windpipe
- d. larynx.
- e. epiglottis
- f. soft palate.
- g. opening of Eustachian tube.
- h. tongue.
- i. hard palate.
- j. sphenoid bone on the base of the skull.
- n. Forepart of cranial cavity.



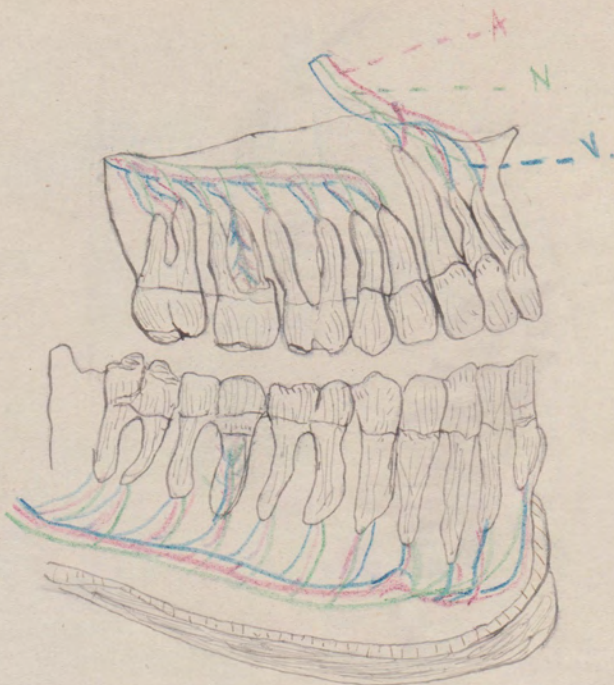
- a. - An incisor tooth.
- b. - A canine or eye tooth.
- c. - A bicuspid tooth seen from its outer side; the inner cusp is accordingly not visible.
- d. - A molar tooth.



Vertical section of a molar tooth, moderately magnified.

- a. enamel of the crown.
- b. dentine, also body of the tooth.
- c. cement.
- d. pulp cavity.

Set
A, N, V.
The
cut
blood



Section of the jaws. — Right side.

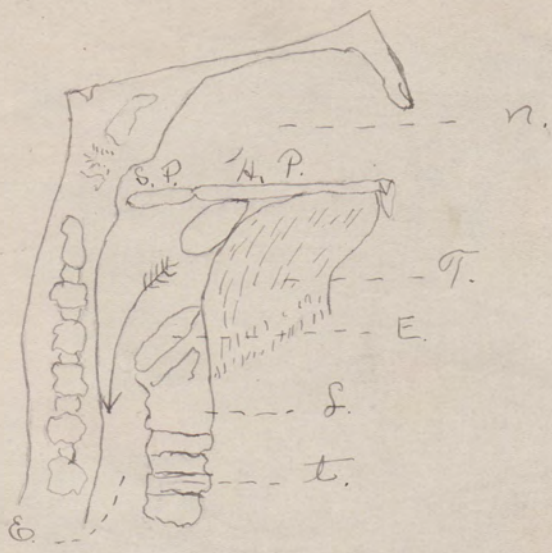
A, N, V. Arteries, Nerves, and Veins of the teeth.

The root of one tooth in each jaw is cut vertically to show the cavity and the bloodvessels, etc., within it.

— Arteries
 — nerves
 — Veins.

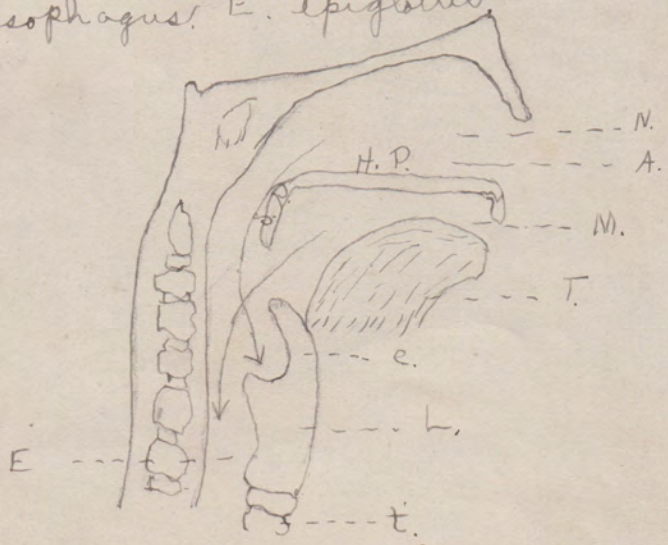
uter
 by not

derately



Drawing showing position of the soft palate during deglutition.

N, nasal cavity. S.P. soft palate, H.P. hard palate. T. tongue, t. trachea. L. larynx. E. esophagus. E. epiglottis.

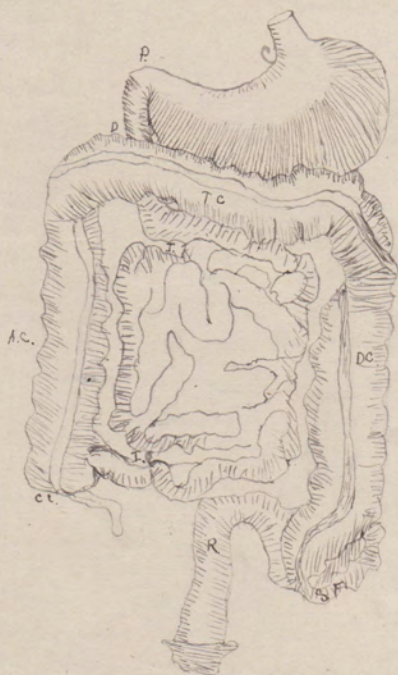


Drawing showing the passages and openings marked with arrows indicating the air- and food channels.

N. Nasal
T. Lon
G. tra
H. P. 1

c. Ca
P. Py
D. De
J.E. Co
c.c. Co
a.e.
T.c. o
p.c. s
R. A

N. Nasal cavity A. Air passage. N.M. Mouth cavity
 T. Tongue. e. epiglottis; L. Larynx;
 Tr. trachea; E. Esophagus; S.P. soft palate
 H.P. Hard palate.



- C. Cardiac end of the stomach.
 P. Pylorus " " "
 A.C. Duodenum.
 S.I. Coils of the small intestine.
 C.C. Caecum with the vermiform appendix.
 A.C. Ascending Colon.
 T.C. Transverse "
 D.C. Descending "
 R Rectum.

9

Outline of Glands

Glands	kind	Position
1. Mucous.	Simple tubular	Alimentary canal.
2. Salivary	Compound racemose	Mouth
a. Parotid.	"	In front of ears.
b. Sub. maxillary.	"	below the lower jaw.
c. Sublingual.	"	behind the Sub. maxilla.
3. Gastric	C. and S. tubular	Stomach.
4. Intestinal	Simple tubular	Intestines.
5. Crypts of Lieberkuhn	"	Small intestines.
6. Brunner	Compound racemose	Duodenum.
7. Pancreas	"	back of stomach
8. Liver	"	front of stomach

Outline of digestive secretions.

Juices	Where found	character	Changes produced
1. Saliva	Mouth	alkaline	starch to grape sugar.
2. Mucus.	Mucous membrane	.	-
3. Gastric	Stomach	acid	Changes protein into peptones Dissolves mineral salt and connective tissue.

4. Pancreatic. — Pancreas — alkaline — ^{Emulsifies fats.} acts on proteids
and starch.

5. Bile — Gall bladder — alkaline — ^{Helps to emulsify} glycocholic — ^{fats} facilitates the
passage into
the villi of
oily substances.

6. Intestinal — Intestines — alkaline — Turns proteids
into peptones.
Allows trypsin
of the pancreas
to act on proteids.

⊙ Blood

Plasma

- serum — — — — —
- Albumens
- fats and oils.
- sugar and salt.
- Carbonate of soda
- Minerals.
- fibrinogen — — — — —
- Proteids.

LF carries food for the tissues, and also takes the waste away to the lungs.

When exposed to the air it forms fibrin and causes clotting.

Corpuscles.

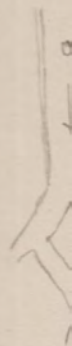
- red
- hemoglobin.
- water
- Minerals
- protein
- chlorides and fats.
- neutrophils.

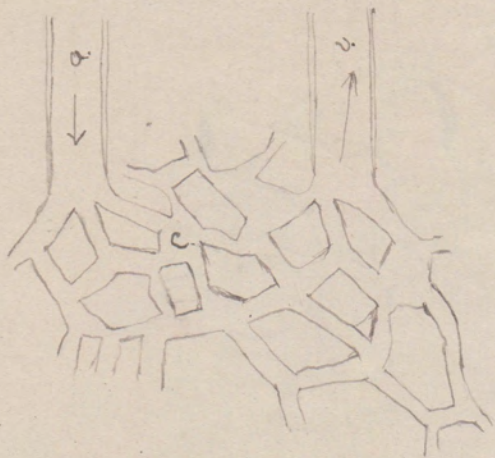
Carries oxygen to the different parts of the body.

Form new tissues and destroy bacteria.

Diag
from

Arter
a. S
b.
c. M





Arrangement of capillaries.

a. Smallest artery.

b. " vein

c. Network of capillaries.

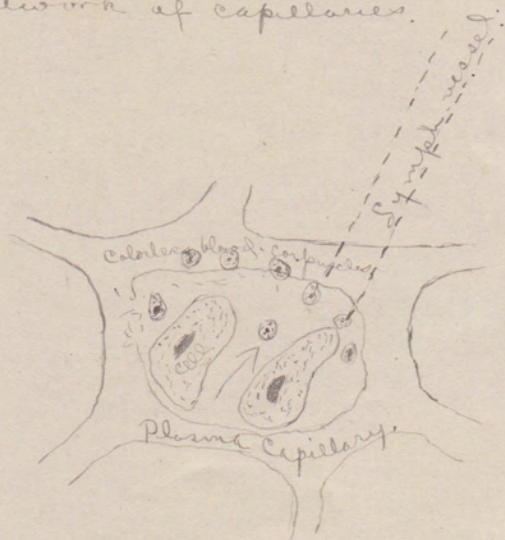
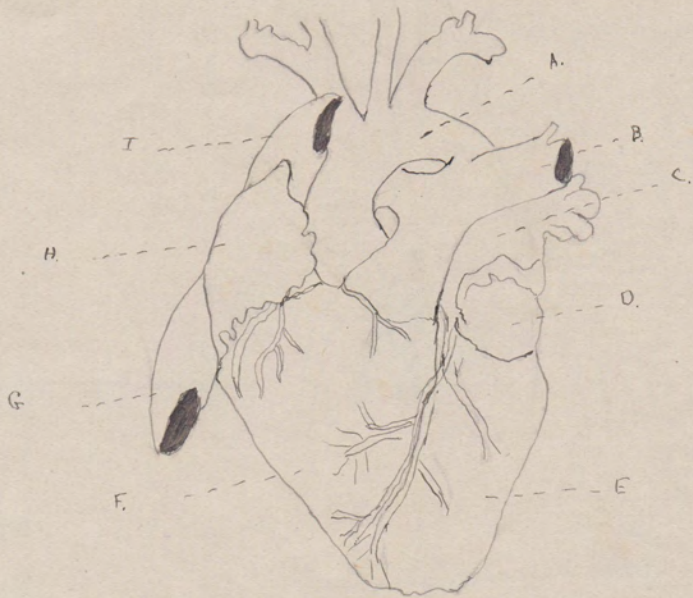


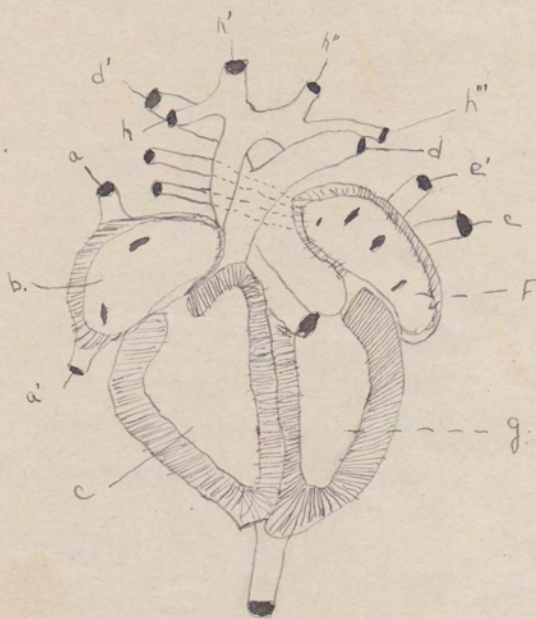
Diagram showing how food reaches the cells from the capillaries.



External view of the heart.

- A. — Aorta.
- B. — Pulmonary artery.
- C. — " veins.
- D. — Left auricle
- E. — " Ventricle.
- F. — Right "
- H. — " Auricle.
- G. — Inferior Vena Cava.
- I. — Superior " "

In
a, a
b.
c
d, d'
e, e'
F—
g—
h, h', h
the



Internal view of the heart.

a, a' — vense cavae.

b. — right auricle

c — " ventricle

d, d' pulmonary arteries.

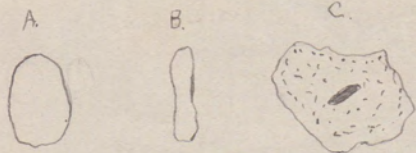
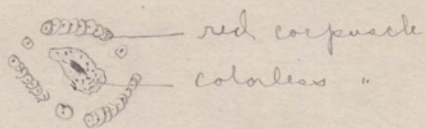
e, e' " veins.

F — left auricle.

g — " ventricle.

h, h', h'', h''' — main arteries branching off from the aorta.

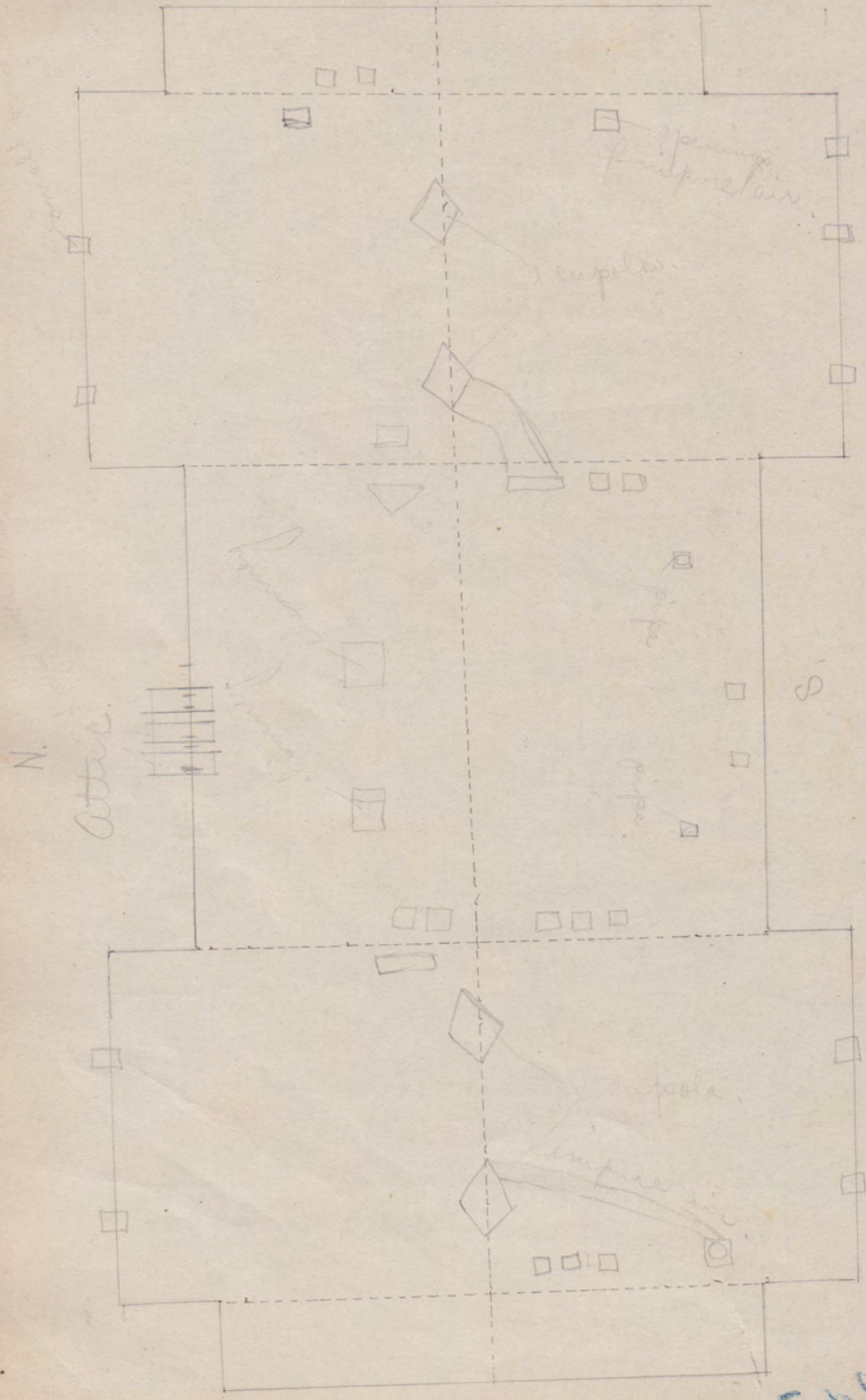
A drop of blood magnified.



- A Red corpuscle highly magnified.
B. Side view of biconcave red corpuscle.
C. Colorless corpuscle highly magnified.

A S
B R
C S
D S
E.
F
G.
H
I
J
K.
L.
M.
N.

W



N

Attic

opening front pure air

cupola

cupola

pure air

S

Explains

30 ft.

1 cu.

3 in
air t

1 cu.

one p
÷ 80

3 in
12 mi

min
The

the

2 to
it

Miss. Olson's room.

30 ft. long; 23 ft. wide; 14 ft. high;

$$1 \text{ cu. ft. } \times 30 \times 23 \times 14 = 9660 \text{ cu. ft.}$$

Since each person requires 800 cu. ft. of air to begin with, renewed at the rate of 1 cu. ft. per. min., 9660 cu. ft. will last one person as many minutes as $9660 \text{ cu. ft.} \div 800 \text{ cu. ft.}$ or 12 times \therefore 12 minutes.

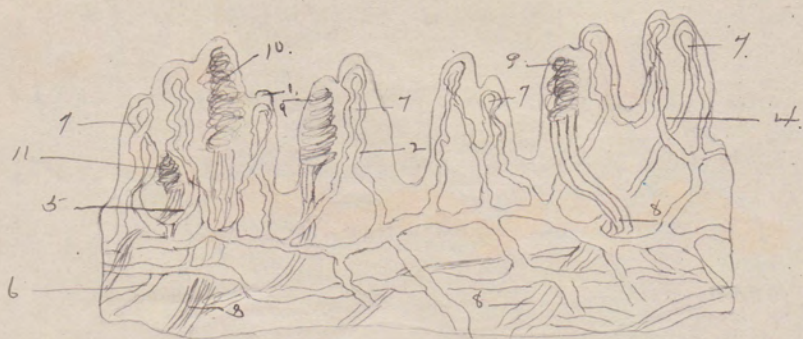
There are 26 persons in the class.

Since 9660 cu. ft. of air lasts one person 12 min., it will last 26 persons as many minutes as $12 \text{ min.} \div 26$ or $\frac{12}{26} \text{ min.}$

$$\text{Then } \frac{26}{26} \text{ min.} \div \frac{12}{26} \text{ min.} = 2 + \text{times. } \therefore$$

the air must be changed at the rate of 2 times per minute, in order to keep it pure.

Papillae of the skin of the palm of the hand.



- 1, papillae with two loops of blood vessels.
 2, " " a tactile corpuscle.
 4, 5, large, compound papillae. 6, network of blood-vessels ^{beneath} in papillae. 7, 7, loops of blood vessels in papillae. 8, 8, nerves beneath the papillae.
 9, 9, 10, 11 tactile corpuscles.

9.—

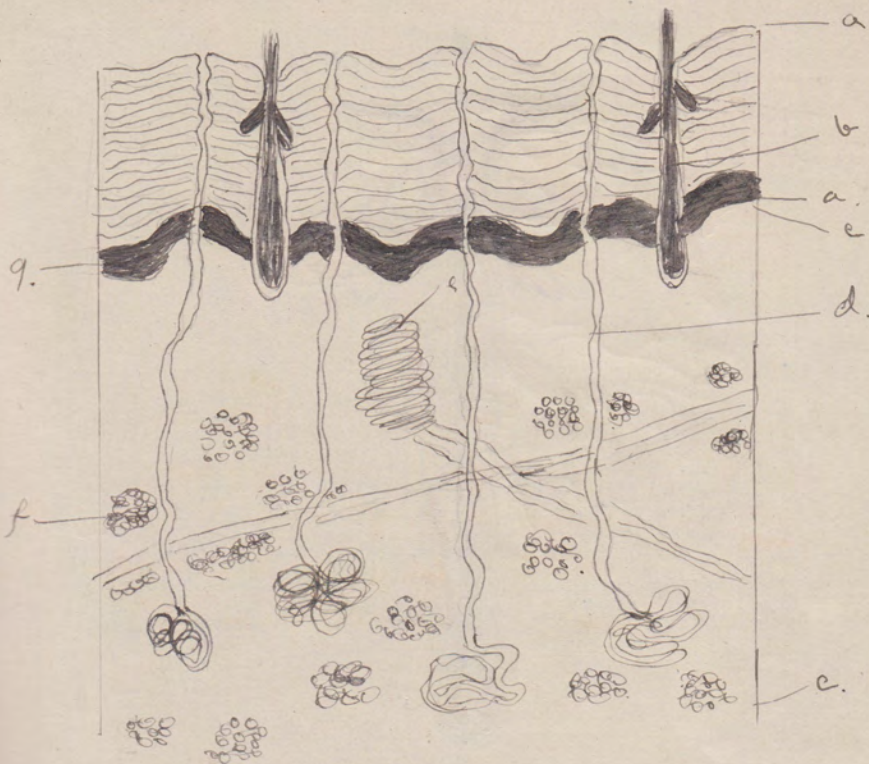
f—

a

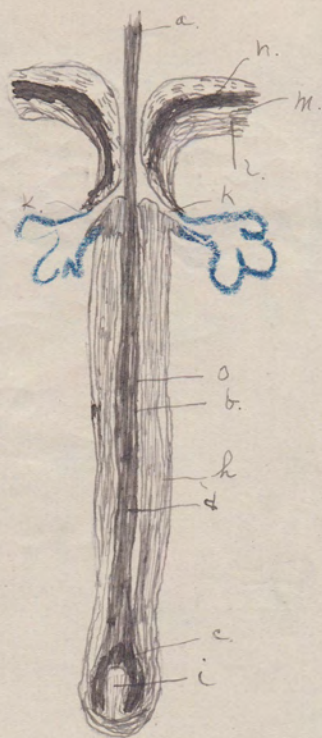
a. a.

d.

f.



A section of the skin highly magnified.
 a, a. epidermis. b. hair follicles. c, c. dermis.
 d. sweat-gland. e, nerves in the papilla.
 f. fat cells. g. layer of pigment.

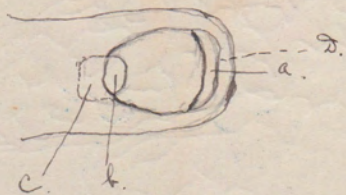


The root of hair imbedded in its follicle.
 a, stem of hair cut short; o, b, root of hair.
 c, swollen part of root which fits on i, the
~~swollen~~ dermic papilla at the bottom of hair
 follicle; n, m, l, layer of skin which turns
 into line and form the follicle; k, k, mouths
 of ducts of sebaceous glands.

D
 of d

a,
 b,
 c,
 d,
 e,
 f,
 g,
 h,
 i,
 j,
 k,
 l,
 m,
 n,
 o,
 p,
 q,
 r,
 s,
 t,
 u,
 v,
 w,
 x,
 y,
 z

Diagram of the nail which fits into a furrow
of the dermis.



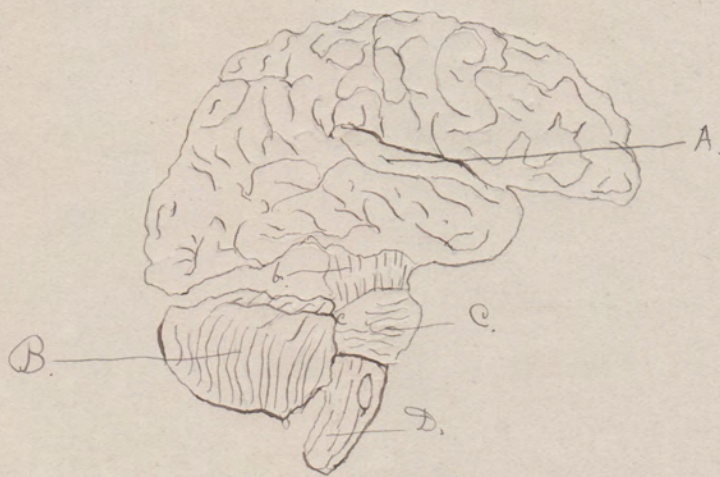
a, free edge of the nail.

b, lunula.

c. matrix, or the part of the dermis
on which the nail is formed.

d. the bed of the nail, or that part of
the dermis on which the nail rests.

Diagram showing the general parts of the brain.



A, fore-brain.

b. mid- "

B, cerebellum.

C. pons Varolii

D. Medulla oblongata.

B, C, D. together constitute the hind-brain