

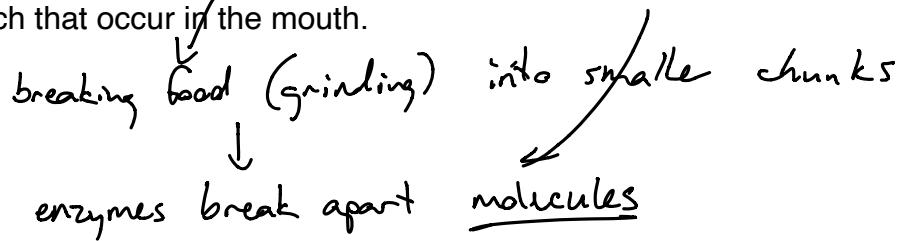
Digestion Lab

IB Biology HL (see 6.1)

Name: MR KEY
Mark: 7

A. Mouth Cavity

- Look at your pig's mouth (oral) cavity, and figures from the dissection guide
 - Look at pictures and/or models of the human oral cavity
1. Compare and contrast physical (mechanical) digestion and chemical digestion. Give examples of each that occur in the mouth.



2. Identify and give the function(s) of:

a) teeth chewing
grinding
biting.

b) salivary glands → secrete saliva

salivary amylase → breaks down starches

c) tongue → taste
meshing food against hard palate
forming bolus

d) pharynx

swallowing

B. Swallowing

3. What is the name for the chewed ball of food ready for swallowing?

bolus

4. To be swallowed, food must be moist. What structures in the mouth area are responsible for *moistening and lubricating* the food?

salivary glands

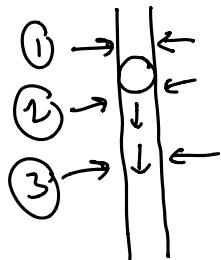
5. a) Name the tube that connects mouth to stomach

esophagus

- a) Name the process by which food travels to the stomach

peristalsis

- b) Explain how this process works.



successive circular muscles contract
in sequence to force food down.

C. Stomach

6. What major muscle separates the *thoracic cavity* from the *abdominal cavity*?

diaphragm

7. The stomach's main job is to *store food* and gradually release it into the small intestine. However, it also aids digestion in 2 ways. Describe the two digestive processes that occur in the stomach.

→ mechanical → muscular walls
→ chemical → secretes gastric juice
acidic (HCl)
breaks down molecules
kills stuff!
pepsin (ogen)
protein digestion

D. Liver

8. a) The liver produces bile as an aid to digestion. Bile is not an enzyme, but an emulsifier. Outline the role of bile in digestion.

→ breaks down fats into fat droplets

E. Pancreas

9. a) Where does the *pancreatic juice* perform its function?

small intestine (duodenum)

- b) How does it get there?

pancreatic duct

(gaffer tape)

10. Pancreatic juice contains many enzymes and NaHCO_3 . What does sodium bicarbonate do?

neutralize stomach acid

↳ don't burn your guts.

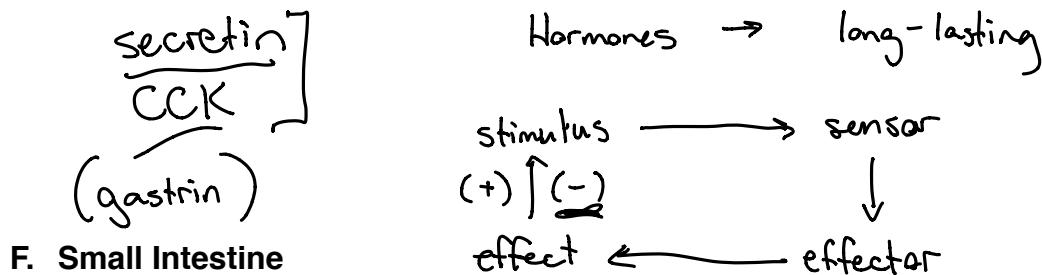
↳ turn off pepsin → protects your own proteins from being digested.

11. List the 3 digestive enzymes (or classes of enzymes) found in pancreatic juice. What food substance does each work on? What is the end product for each? At what pH does it work?

Enzyme	Acts On	End Product	optimum pH
pancreatic amylase	starch	maltose	7
lipase	fat droplets	f.a. + glycerol	8
trypsin	polypeptide chains	dipeptides	8

12. Exocrine secretions, such as these enzymes, are produced in the exocrine structures of the pancreas, called *acini*. Draw a representative diagram of an exocrine gland, showing the structure of an acinus.

13. How is the secretion of pancreatic juice controlled?



14. a) How long is the small intestine in a human?

7 m

b) How long is the large intestine in a human?

1.5 m

c) What is the first part of the small intestine called?

duodenum

d) What structure is at the junction of the small and large intestines?

appendix

15. List the enzymes of the small intestine and their functions.

Enzyme	Acts On	End Product
peptidases	dipeptides	a.a's
nucleases	DNA / RNA	nucleotides

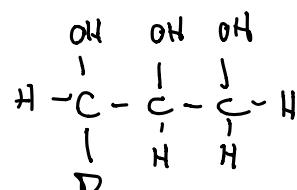
Enzyme	Acts On	End Product
maltase/lactase/sucrase	disaccharides	monosaccharides

16. Where specifically are these enzymes found in the small intestine?

surface of intestinal wall \rightarrow cell membranes

17. Now that digestion is finished, food particles are small enough to diffuse through or be transported through membranes. What is the final digested product for the following?

Food	Digested End Product
Carbohydrates	glucose / monosaccharides
Protein	a.a.
Lipids	f.a. + glycerol (monoglycerides)

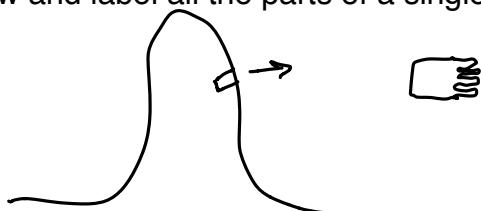


18. Refer to diagrams, slides, or models of *villi*. These line the entire small intestine. What advantage is there in having villi?

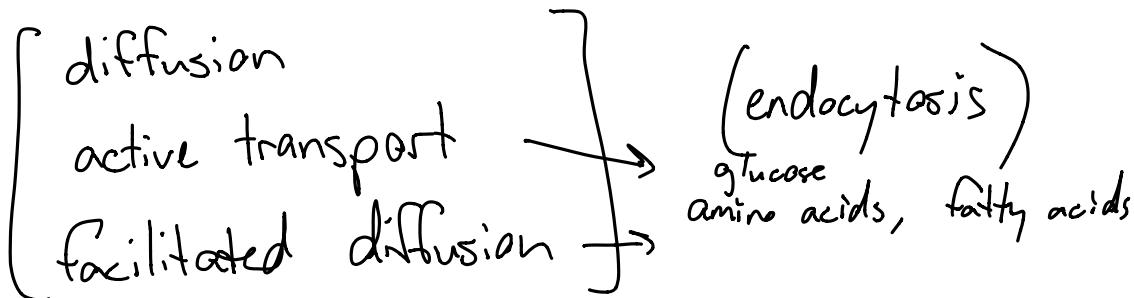
$\uparrow \frac{\text{S.A}}{\text{Vol}}$ ratio



19. Draw and label all the parts of a single villus.



20. What processes are used to transport digested food particles across the walls of villi?



21. Summarize the 2 main functions of the small intestines.

- a) (absorption)
- b) digestion

22. What is meant by *assimilation*? How is this different from absorption?

absorption → getting nutrients from intestine into blood

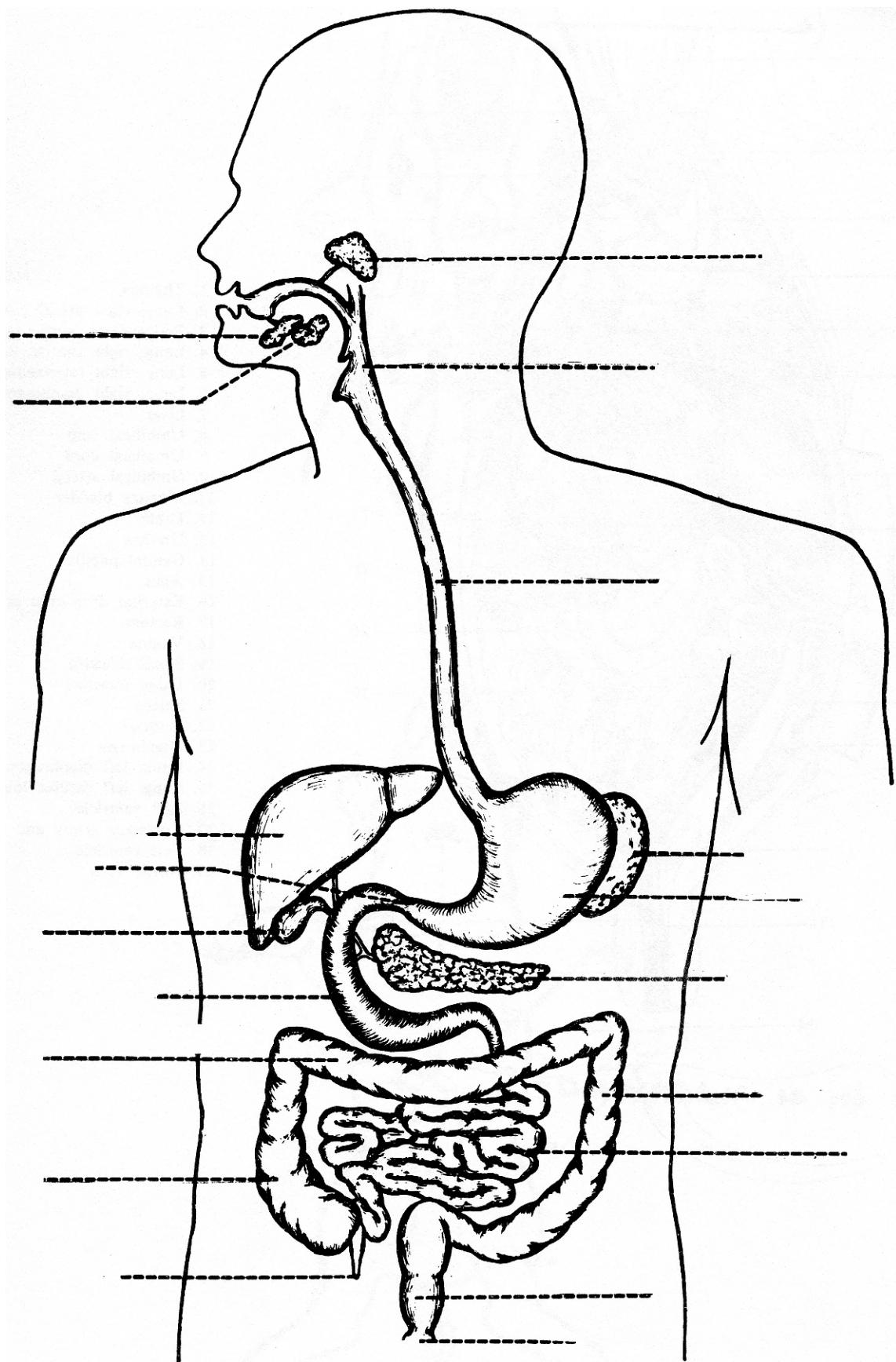
assimilation → getting nutrients from blood into body cells.

G. Large Intestine

23. What are the main functions of the large intestine?

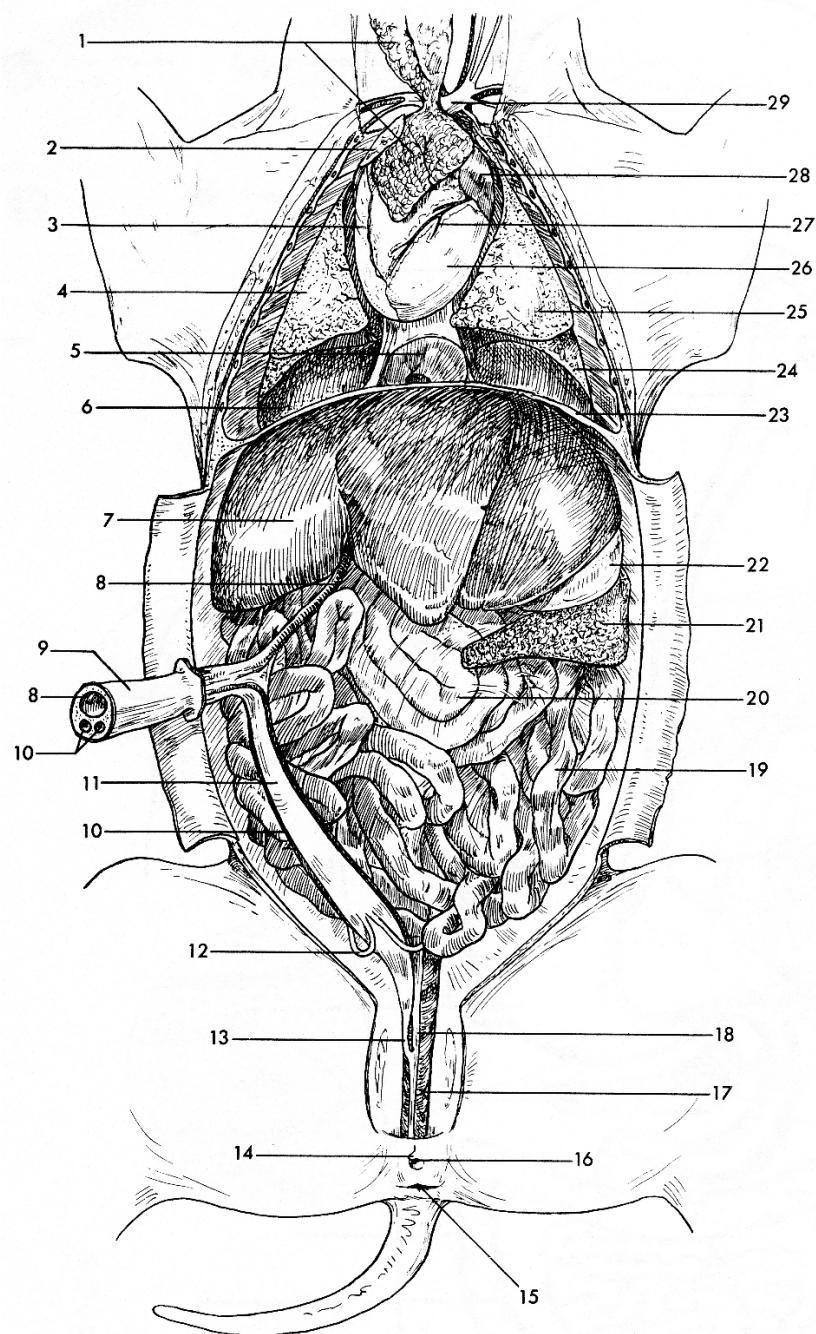
- absorption of water / salts
(Storage)
- pooping. (elimination of wastes)

sphincter

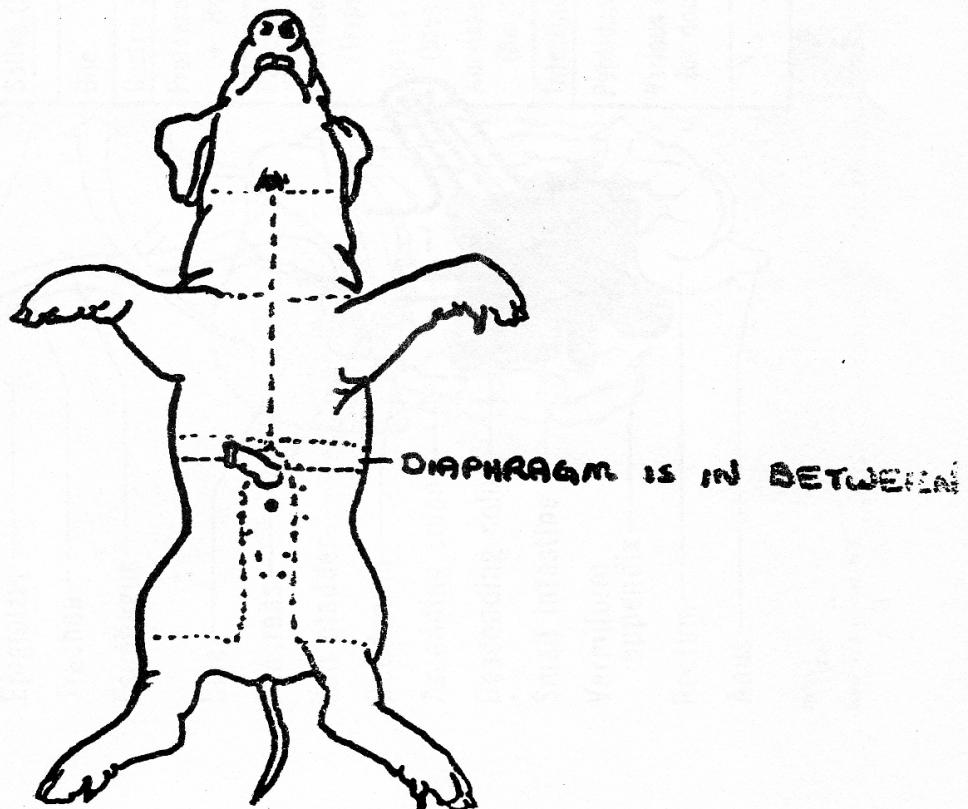
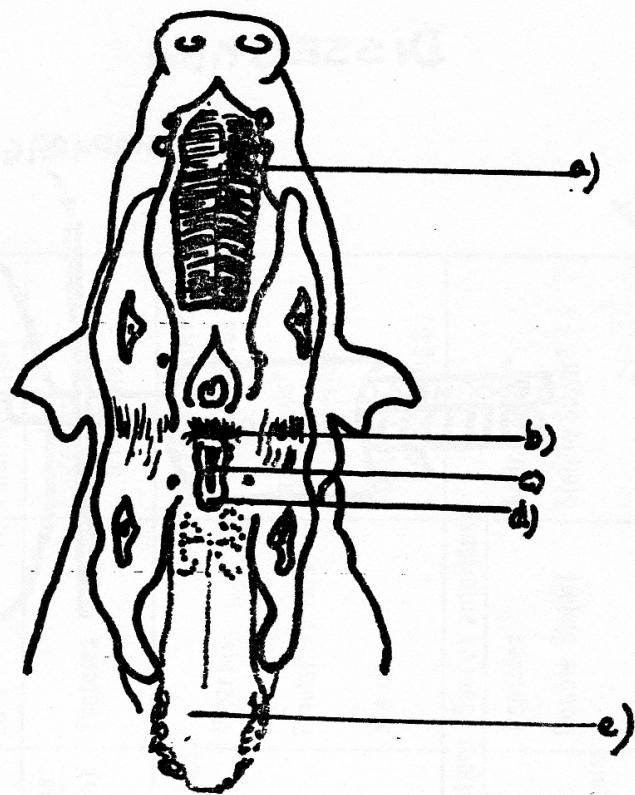


FETAL PIG ANATOMY 6.

Dissection



1. Thymus
2. Lung, right apical lobe
3. Pericardium, partly removed
4. Lung, right cardiac lobe
5. Lung, right intermediate lobe
6. Lung, right diaphragmatic lobe
7. Liver
8. Umbilical vein
9. Umbilical cord
10. Umbilical artery
11. Urinary bladder
12. Ureter
13. Urethra
14. Genital papilla
15. Anus
16. External urogenital orifice
17. Rectum
18. Vagina
19. Small intestine
20. Large intestine
21. Spleen
22. Stomach
23. Diaphragm
24. Lung, left diaphragmatic lobe
25. Lung, left cardiac lobe
26. Left ventricle
27. Coronary artery and vein
28. Left ventricle
29. Aortic arch

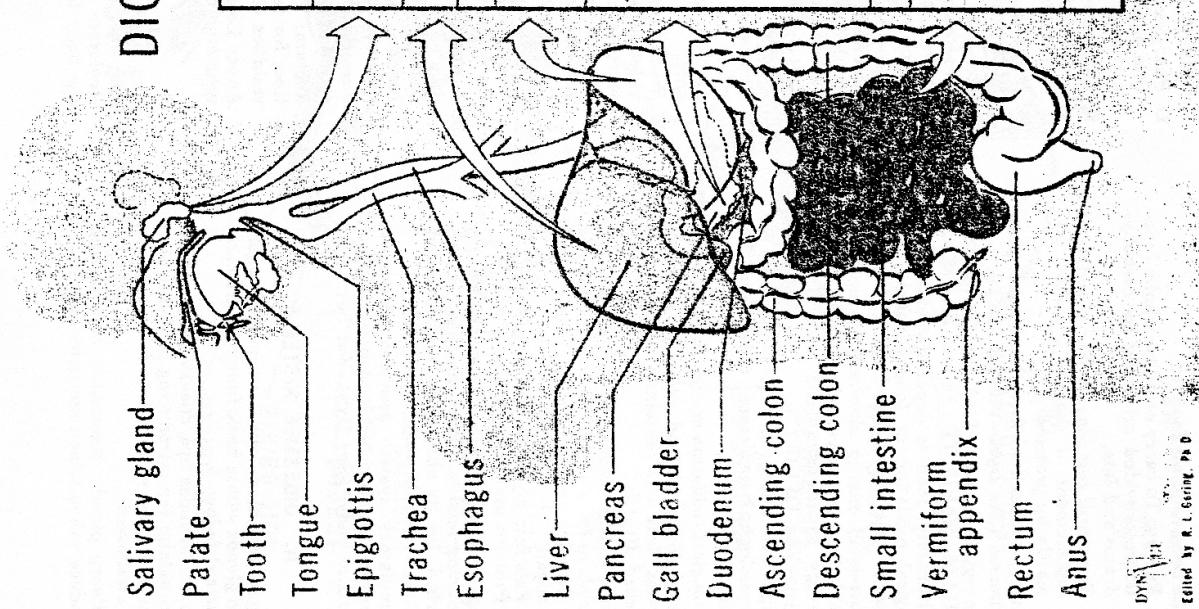


DIGESTIVE SYSTEM – GENERALIZED

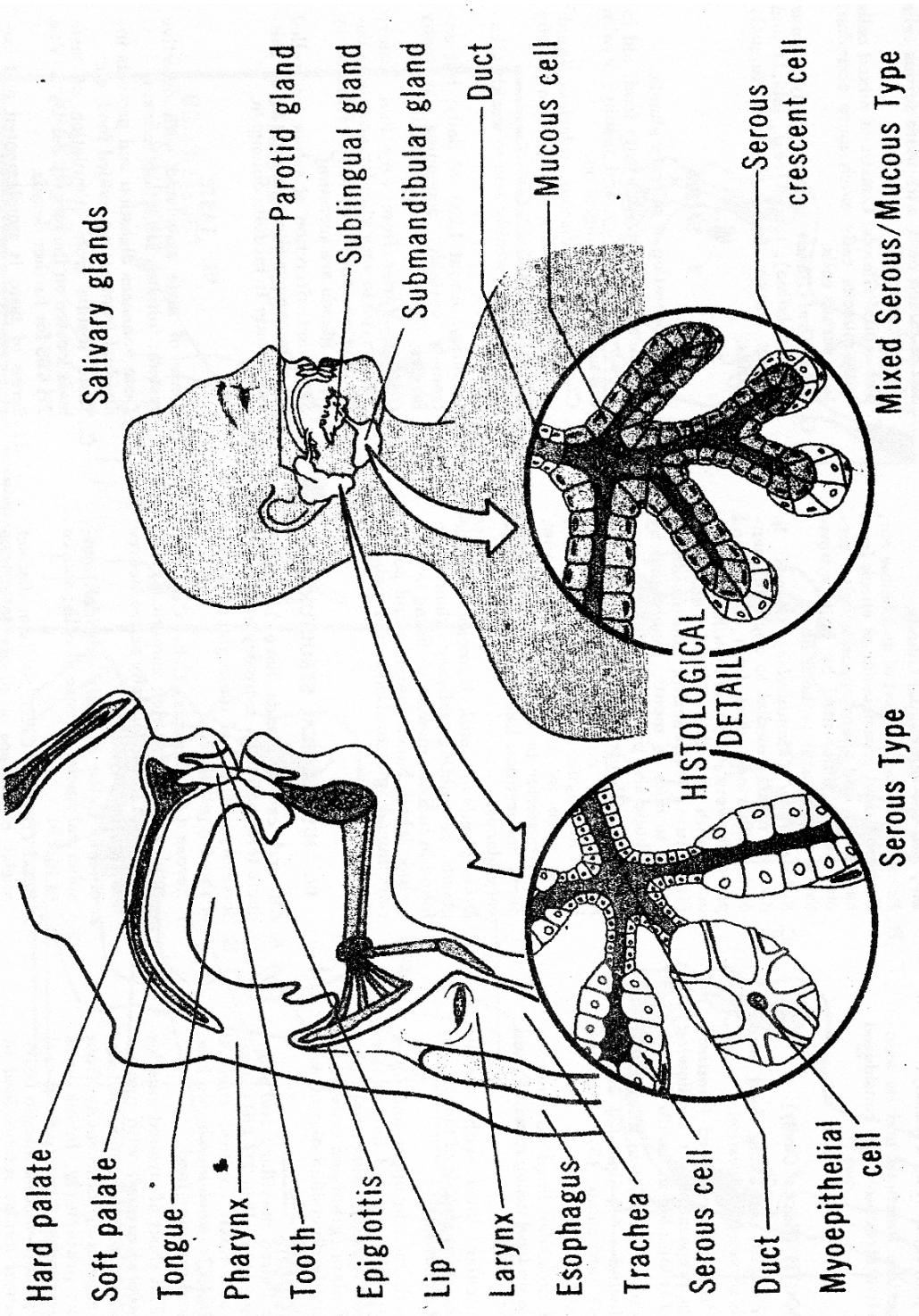
SECRECTIONS	ACT UPON	END PRODUCT
Saliva (Ptyalin)	Starches	Maltose (double sugar)
Bile	Fats	Emulsified fats
Gastric Secretions Protease (Pepsin) + HCl	Proteins	Proteoses & Peptones
Pancreatic Secretions Protease (Trypsin) Lipases (Steapsin) Amylase (Amylopsin)	Proteins Emulsified fats Starch	Proteoses, Peptides & Amino Acids* Fatty Acids* & Glycerine Maltose (double sugar)
Intestinal Secretions (Succus entericus)		
Peptidases	Peptides	Amino Acids*
Various enzymes for double sugars	Double Sugars	Simple Sugars*

***Absorbed from intestine**

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MOUTH and ASSOCIATED STRUCTURES

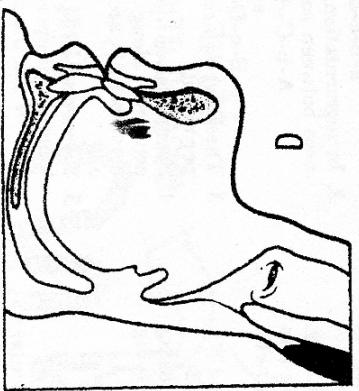
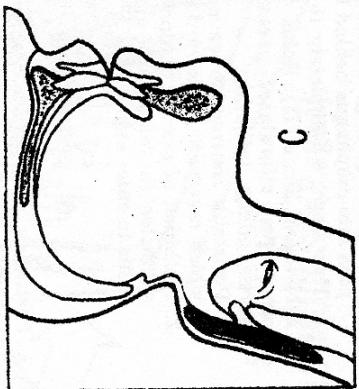
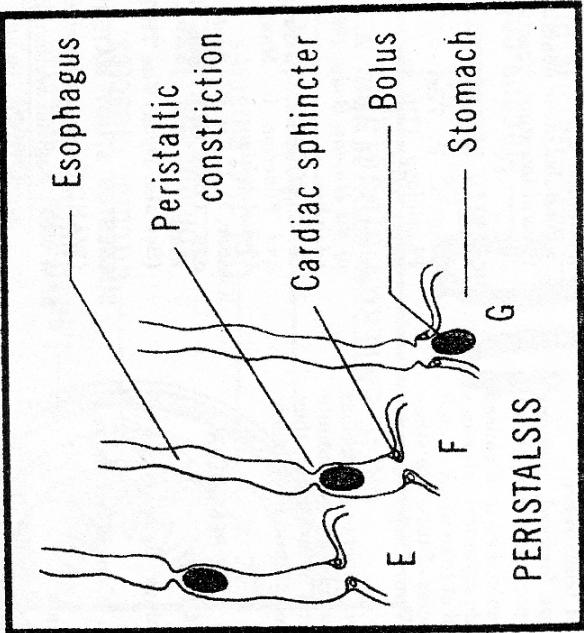
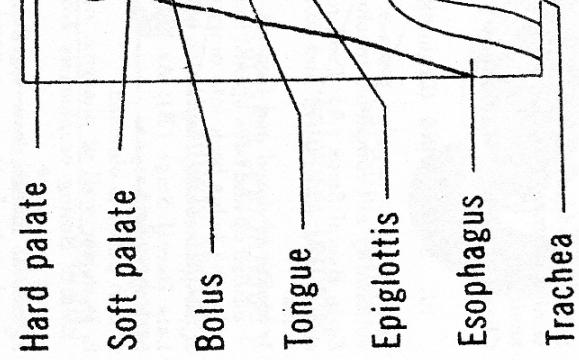


ME

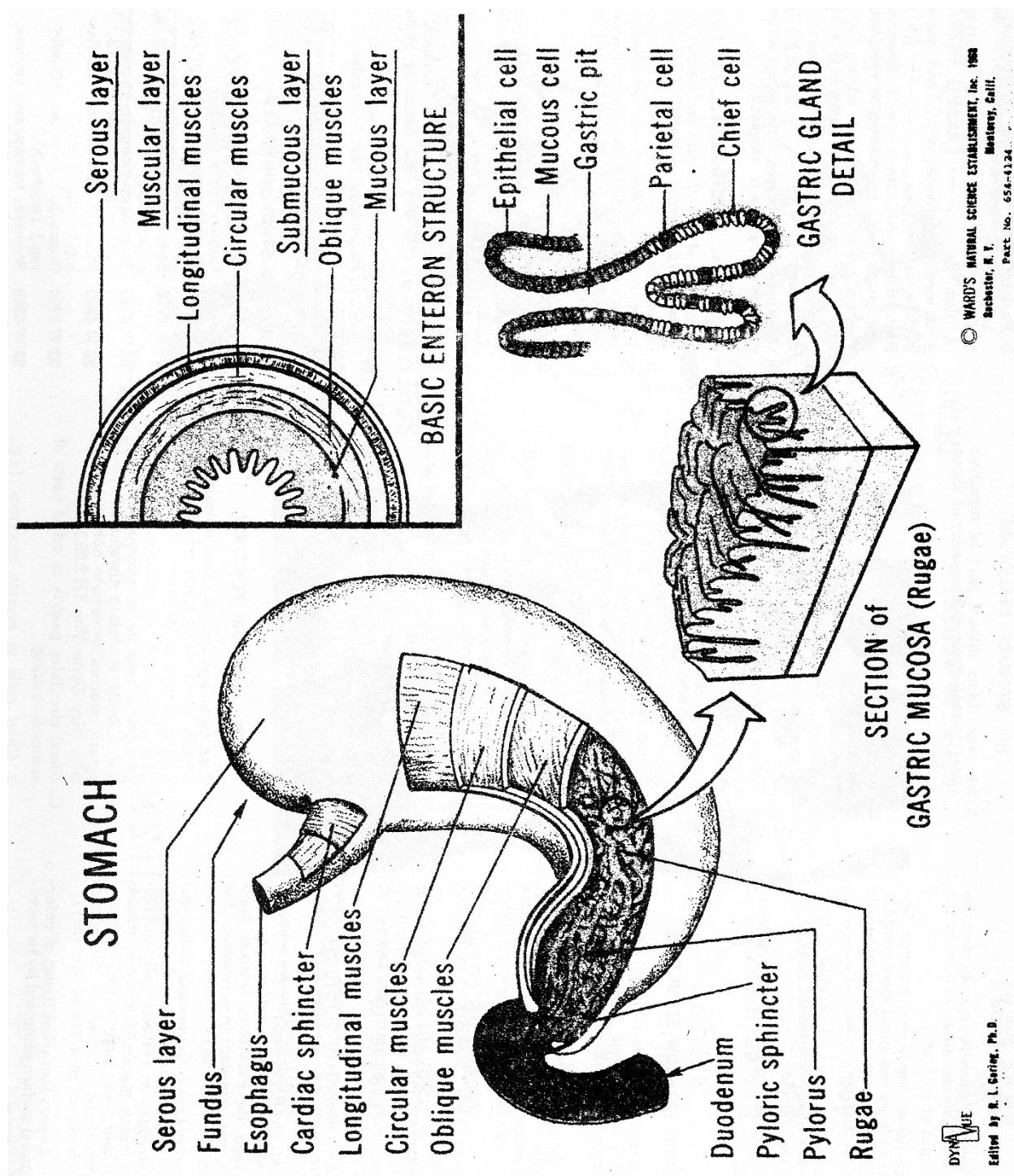
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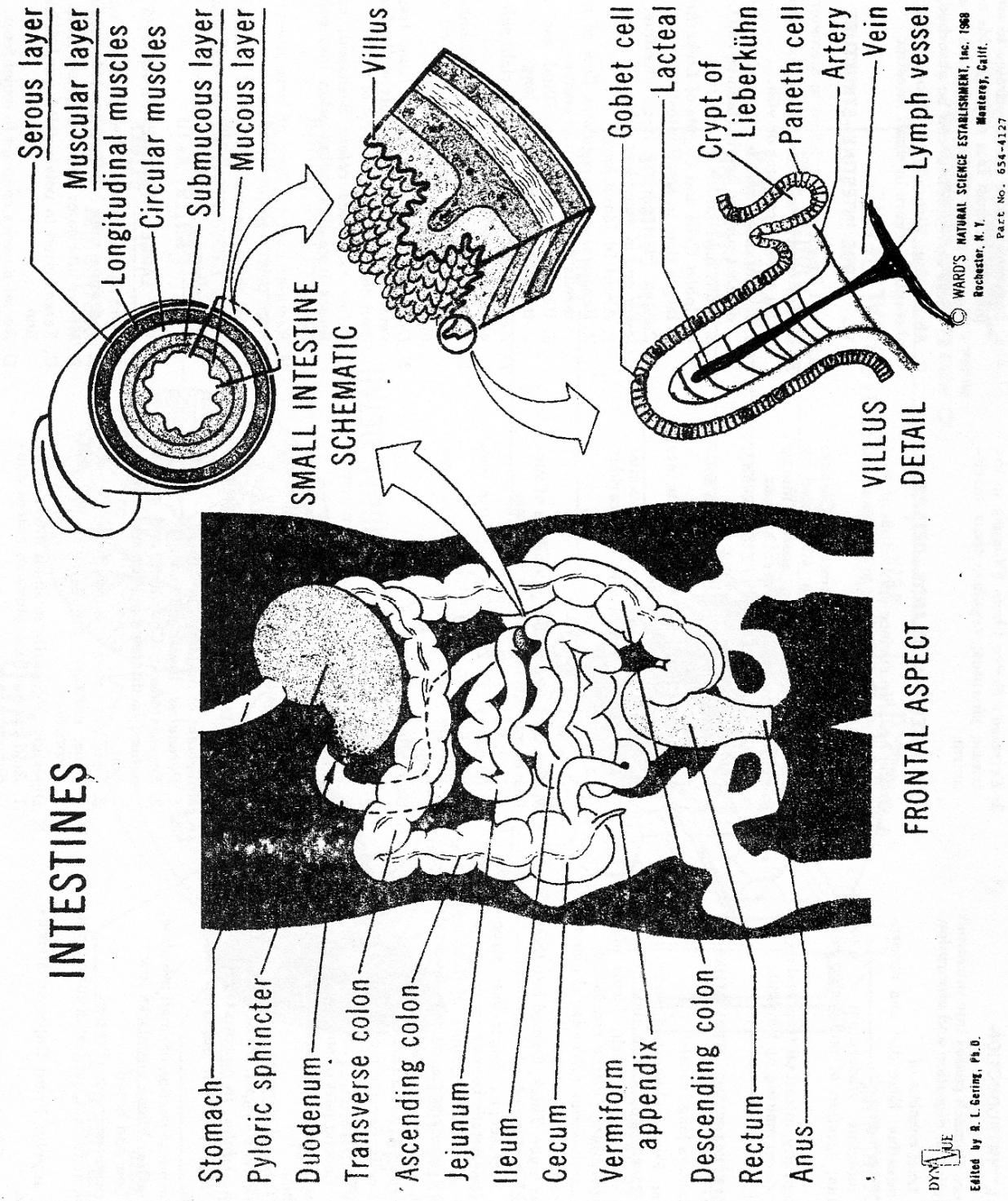
SWALLOWING and PERISTALSIS



DYNAMIC
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INTESTINES

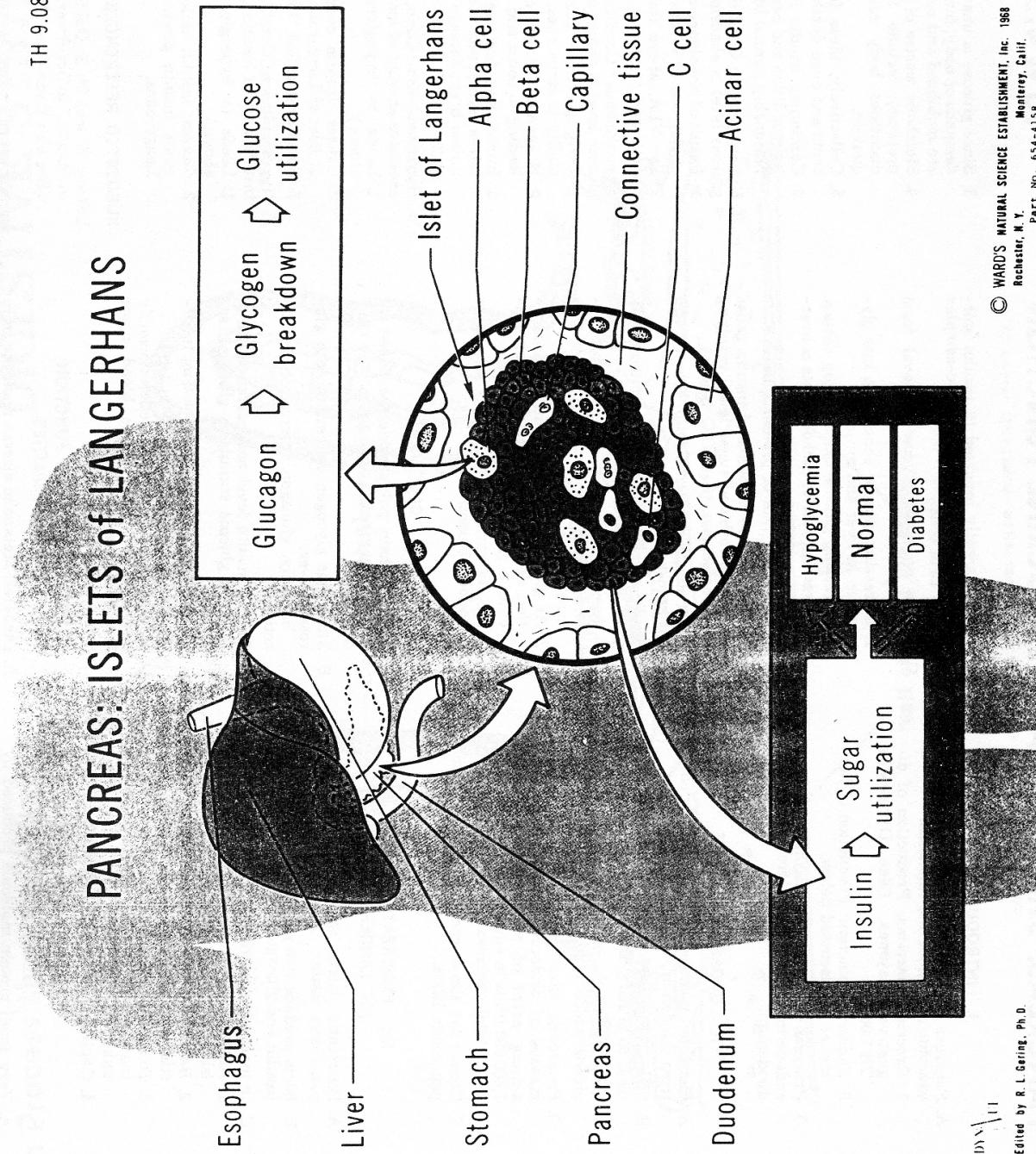


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DYN-AUF

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PANCREAS: ISLETS of LANGERHANS



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