

CHARACTERISTICS OF THE CNIDARIANS

1. Body is radially symmetrical, with a mouth at one end surrounded by tentacles.
2. May be sessile (polyp) or free-swimming (medusa) as adults.
3. Body consists of two (three) tissue layers surrounding a central gastrovascular cavity.
 - A. The ectoderm consists of epitheliomuscular cells, cnidocytes, and sensory receptors.
 - B. The endoderm consists of secretory and absorptive cells and sensory receptors.
 - C. The mesoglea is an intermediate gelatinous layer that may be thick or thin.
 - D. The gastrovascular cavity has one opening (thereby making it a sac-form digestive system). Food is broken down there.
4. Cnidocytes contain filamentous nematocysts that typically are barbed and contain a toxin. These expand quickly when triggered.
5. A nerve net is present.
6. Three major classes of cnidarians will be considered (consult text for others)
 - A. Anthozoa (corals and sea anemones) - Body is "flower-like"
 - B. Hydrozoa (hydroids) - Polyp is dominant phase of life cycle. Often colonial.
 - C. Scyphozoa (jellyfish) - Medusa form is dominant.
7. Most are marine, a few are aquatic. Populations of some species seem to be increasing. Some corals are undergoing bleaching.

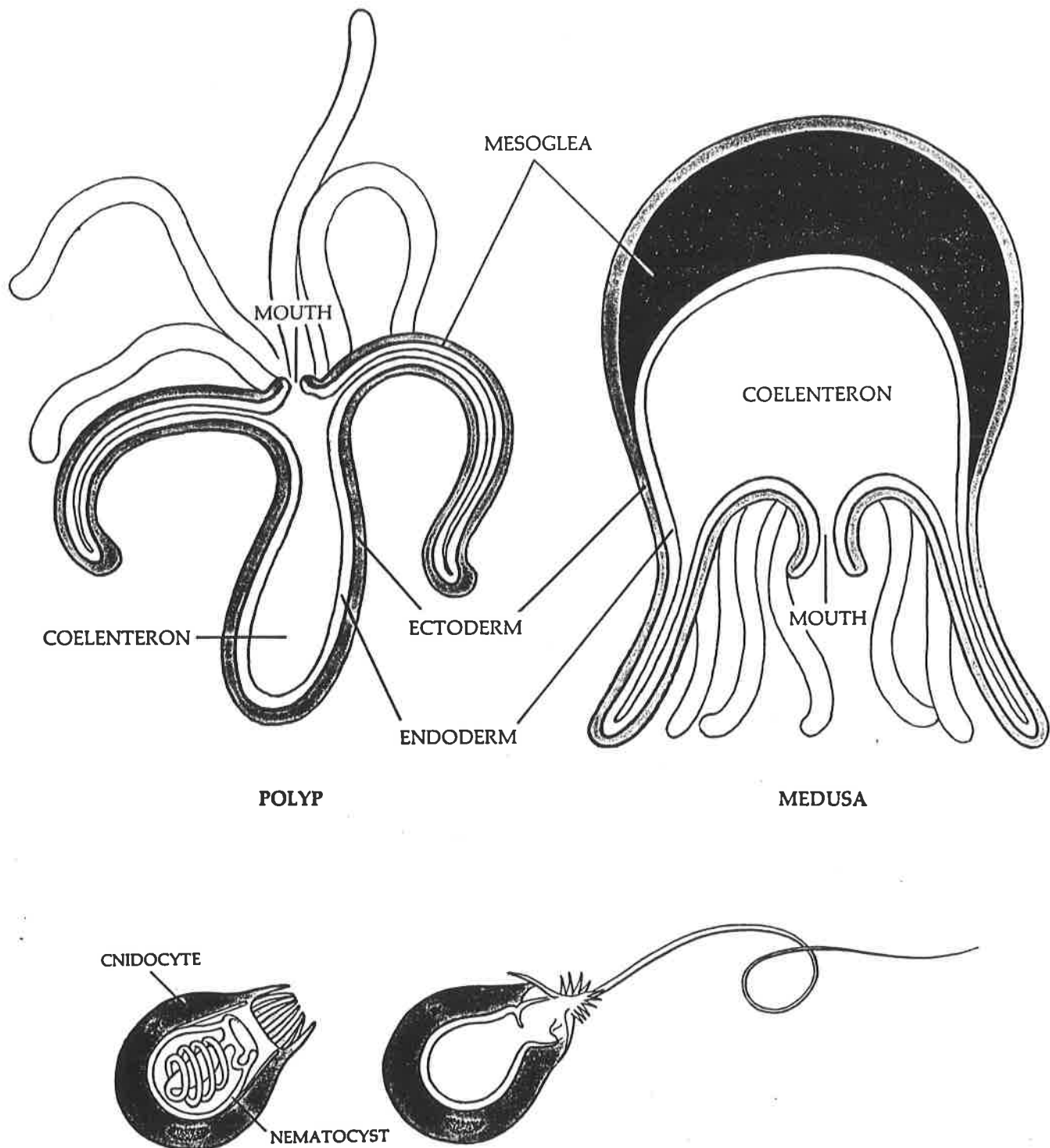
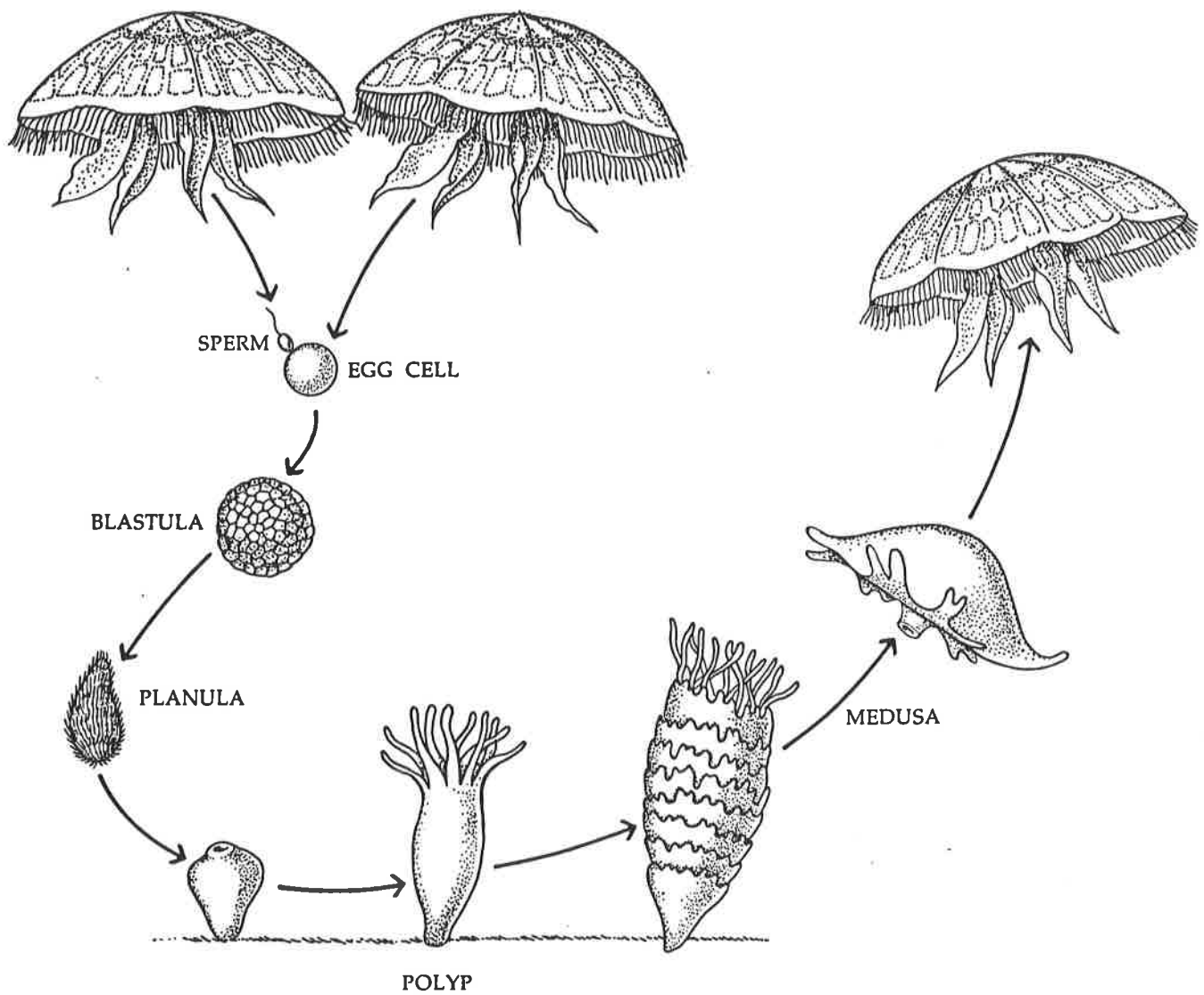


Figure 24-12, page 488
Aurelia life cycle

Curtis: BIOLOGY, Fourth Edition
Copyright © 1983 by Worth Publishers, Inc.



Obelia Hydroid Colony

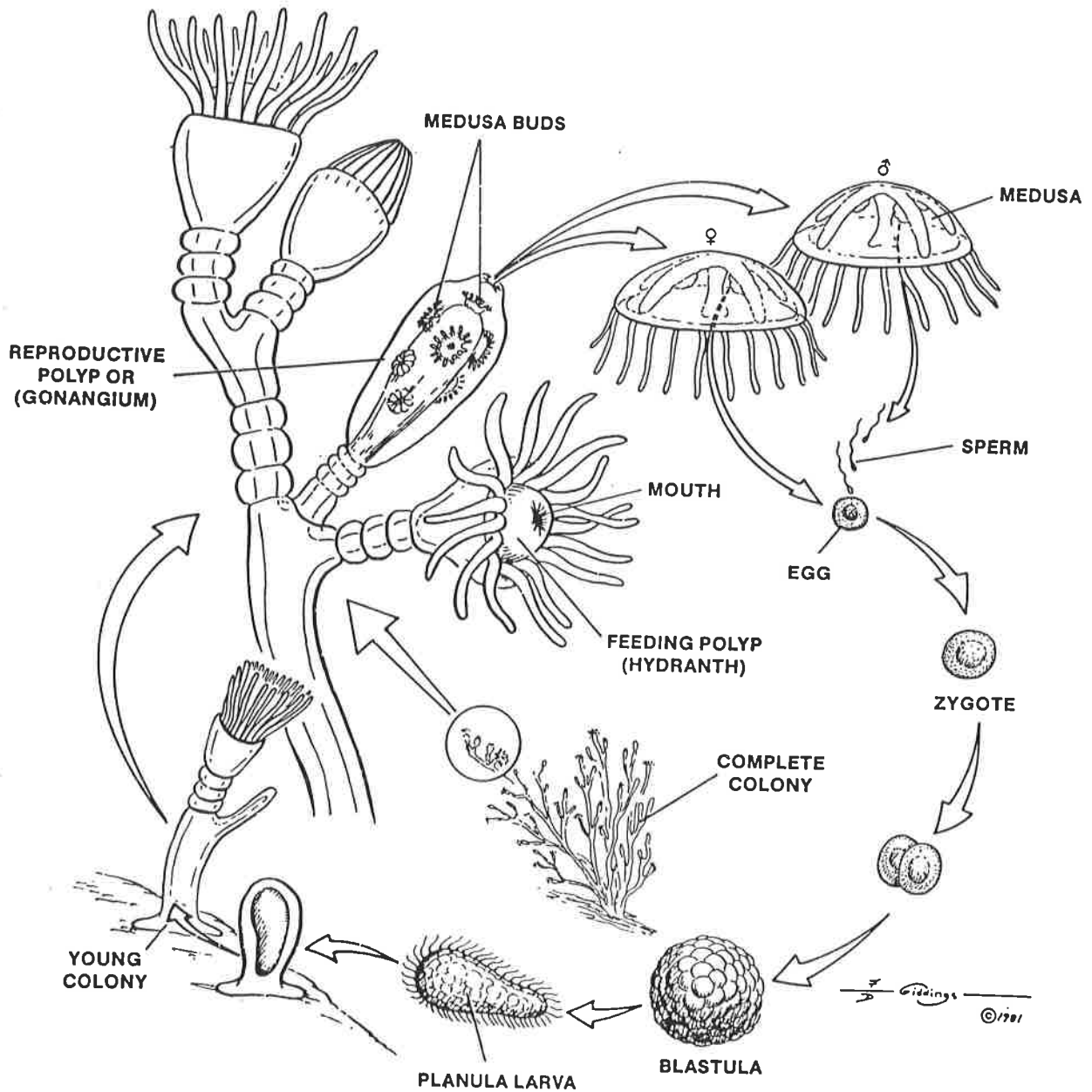
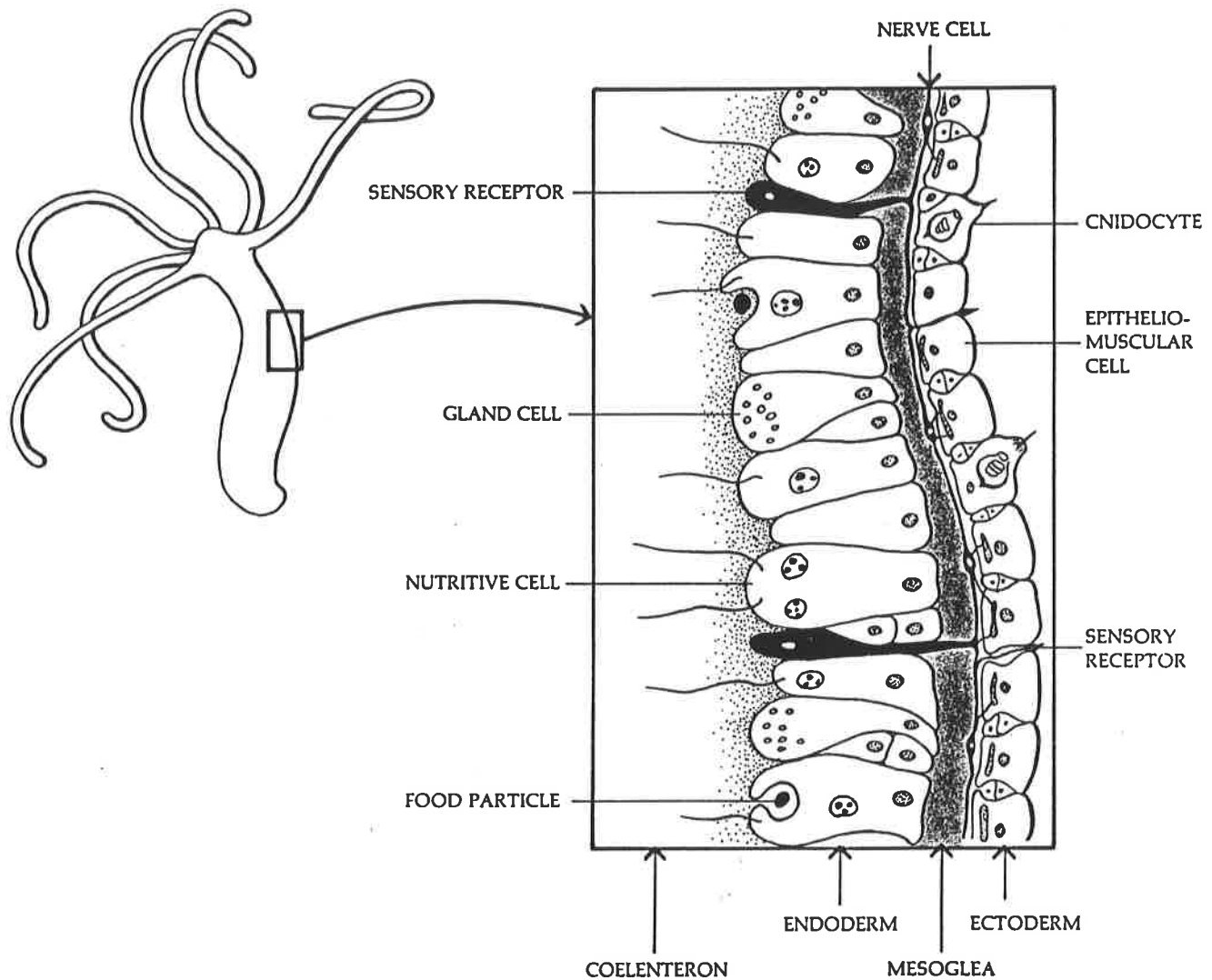


Figure 24-13, page 489
Hydra

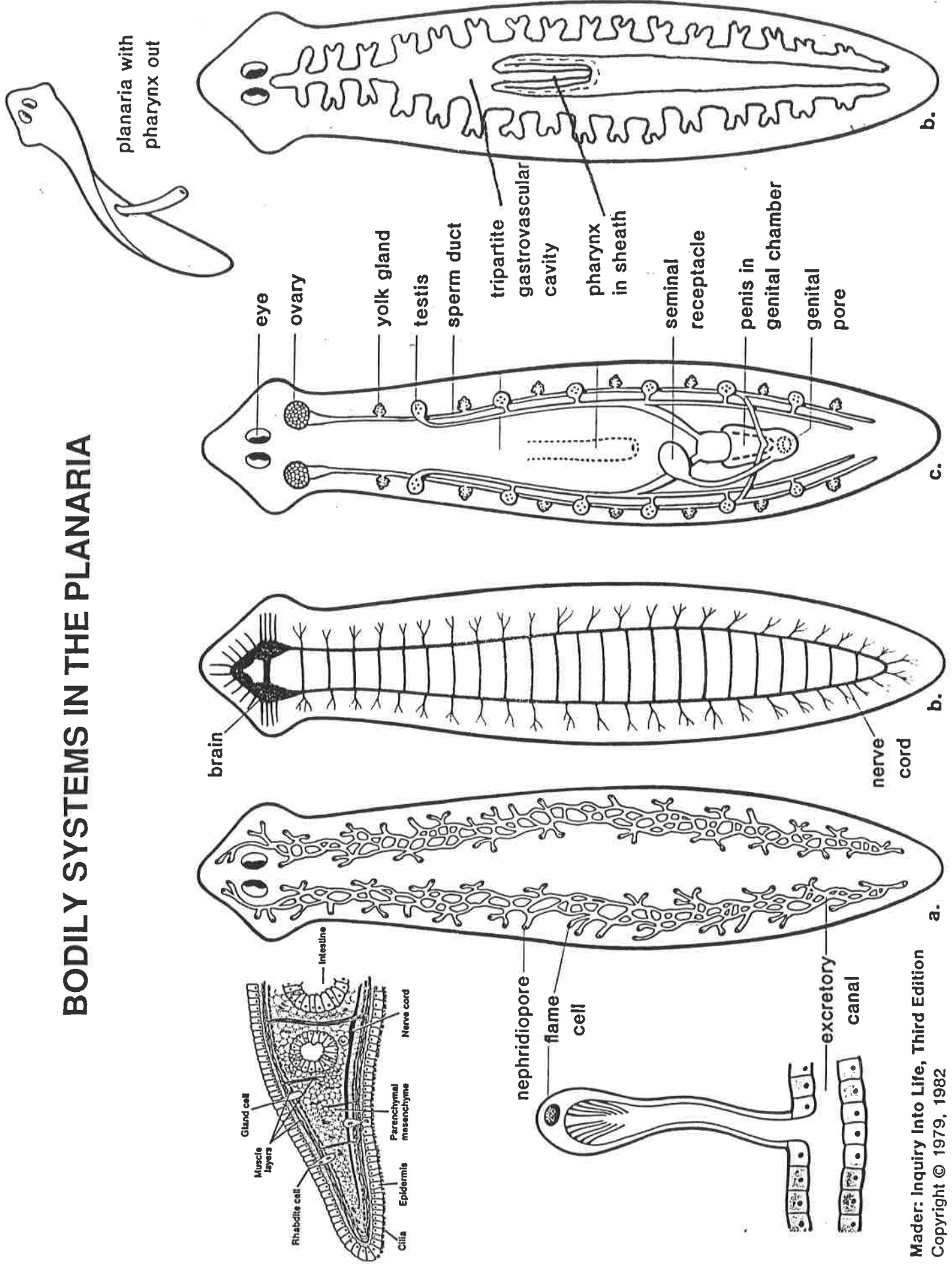
Curtis: BIOLOGY, Fourth Edition
Copyright © 1983 by Worth Publishers, Inc.



CHARACTERISTICS OF THE PLATYHELMINTHES

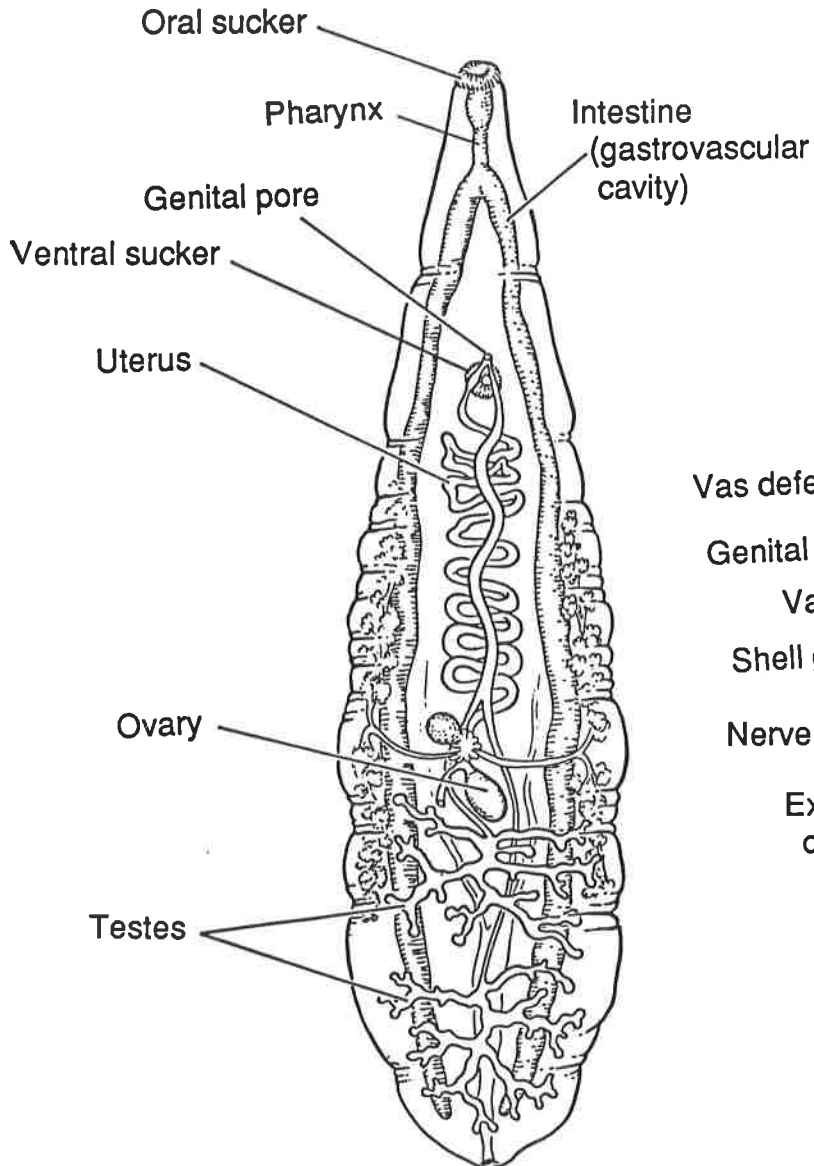
1. Body is flattened (bilaterally symmetrical), with anterior and posterior ends, and dorsal and ventral sides.
2. Body is triploblastic (consists of three tissue layers) surrounding a gastrovascular cavity (no coelom is present).
 - A. The epidermis consists of a single cell layer.
 - B. The endodermis consists of cells that secrete digestive enzymes and absorb food.
 - C. The mesoderm consists of muscles and mesenchyme tissue.
 - D. The gastrovascular cavity has one opening (thereby making it a sac-form digestive system), but is very highly branched.
3. Many have organs.
4. A nerve ladder is present, many have two eye spots consisting of light-sensitive photoreceptor cells and pigment cups.
5. An excretory system is often present, consisting of flame cells, excretory canals and nephridiopores.
6. Individuals are hermaphroditic.
7. Occur in three classes.
 - A. Turbellaria (turbellarians) - Free-living; found in freshwater, saltwater and in moist soil; feeds on small bits of organic matter.
 - B. Neodermata (parasitic flatworms) -
 - i. Trematoda (flukes) - Torpedo-shaped endoparasites that take up body fluids of host through their mouth.
 - ii. Cestoda / Cecomeromorpha (tapeworms) - Very long endoparasites; body is composed of a headlike scolex and numerous proglottid segments that absorb body fluids.

BODILY SYSTEMS IN THE PLANARIA



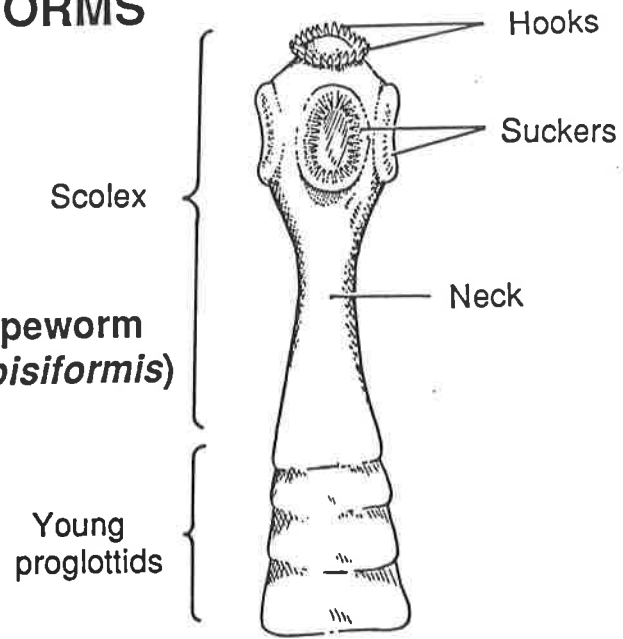
PARASITIC FLATWORMS

**Chinese liver fluke
(*Clonorchis sinensis*)**

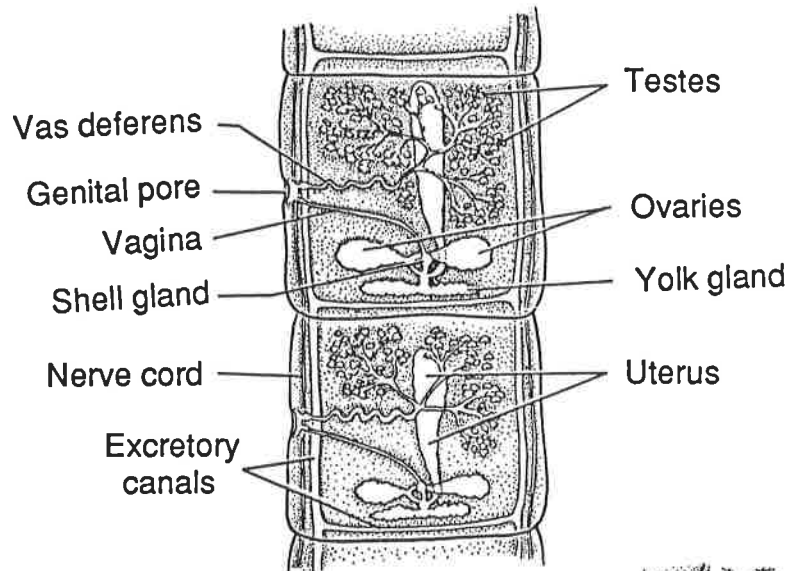


Giddings
© 1981

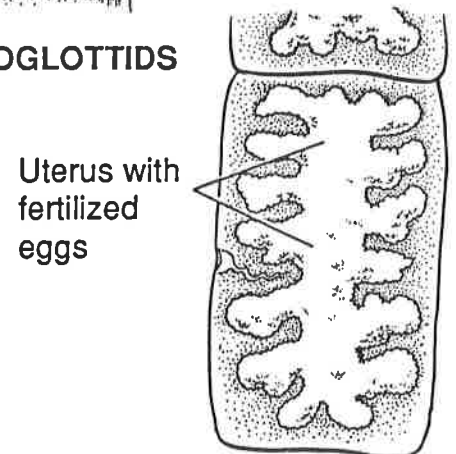
**Dog tapeworm
(*Taenia pisiformis*)**



ANTERIOR END



MATURE PROGLOTTIDS



GRAVID PROGLOTTID

CHARACTERISTICS OF THE MOLLUSKS

1. Body is composed largely of a visceral mass, an area containing internal organs such as the heart, digestive system, reproductive organs and nephridia.
2. Covering the visceral mass is a muscular or membranous mantle.
3. Many have one or more shells.
4. Most have a file-like radula in the mouth.
5. One region at the outside of the body is the mantle cavity, which is the site at which digestive wastes, metabolic wastes and gametes are shed.
6. The digestive system is a tube with organs, often consisting of a mouth, esophagus, stomach, intestine, and anus.
7. Nitrogenous wastes are removed by one or two nephridia.
8. A true coelom is present, but is highly reduced.
9. Some have a foot that is used for locomotion.
10. Three major classes of mollusks will be considered (consult your text for others):

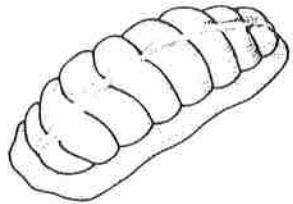
Class Gastropoda - Snails and slugs

Class Bivalvia - Bivalves (clams, mussels, and oysters)

Class Cephalopoda - Octopi and squids

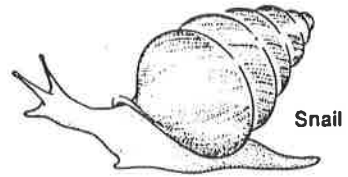
REPRESENTATIVE MOLLUSKS

(Excluding Class Bivalvia)

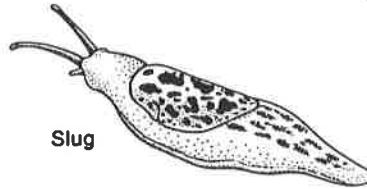


A. Polyplacophora (chiton)

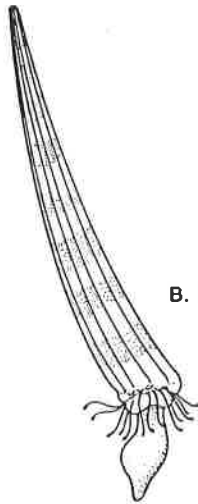
C. Gastropoda



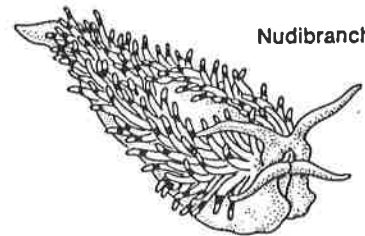
Snail



Slug

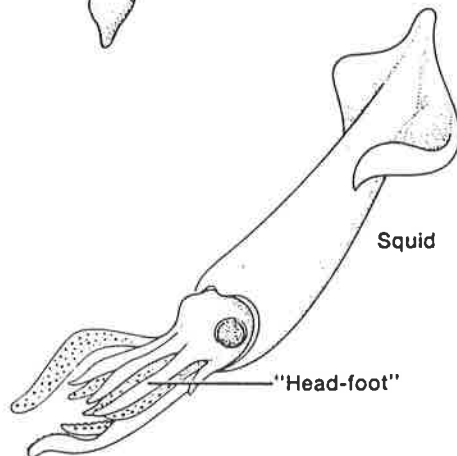


B. Scaphopoda (tooth shell)



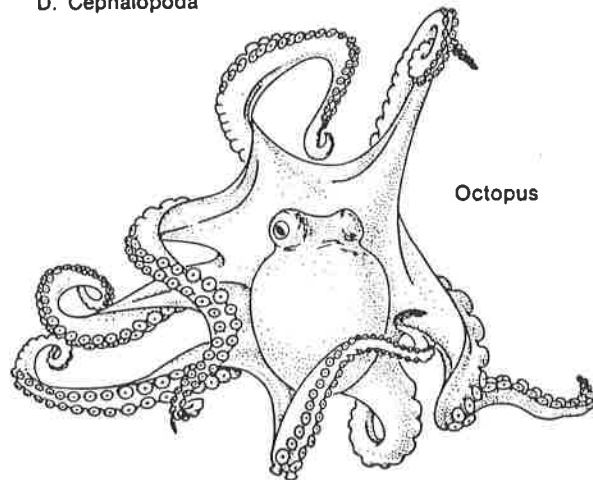
Nudibranch

D. Cephalopoda



Squid

"Head-foot"

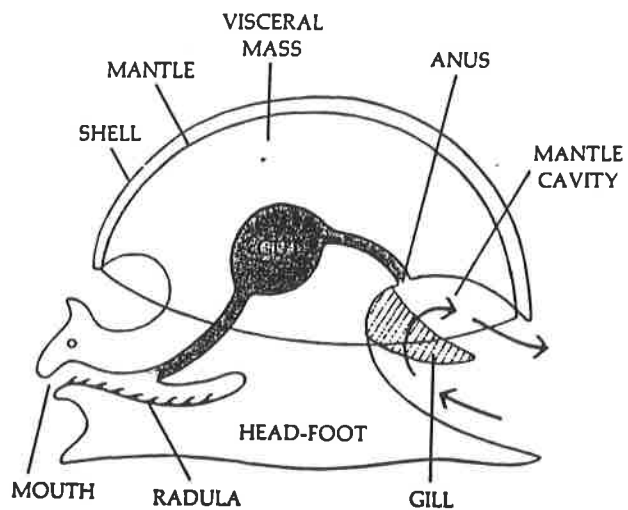


Octopus

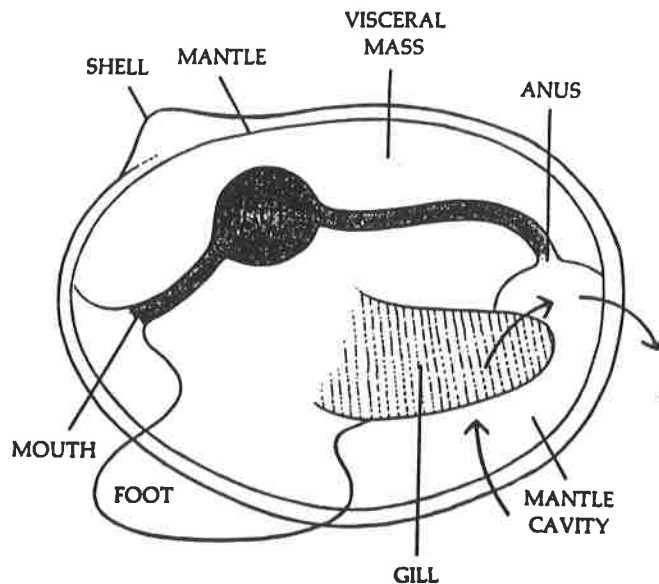
COMPARISON OF THE MAJOR CLASSES OF MOLLUSCA

<u>Character</u>	<u>Bivalvia</u>	<u>Cephalopoda</u>	<u>Gastropoda</u>
Body form	Little cephalization	Marked cephalization	Marked cephalization w/180° torsion
Degree of activity	Relatively sessile	Active swimmer	Slow crawler
Means of obtaining food	Filter feeder	Predator, w/ mouth jaws and radula	Omnivores, many scavengers w/ radula
Locomotion	Hatchet foot	Jet propulsion	Foot w/ mucus
Tentacles	None	For grasping; w/ suction cups	4; 2 with eyes
Shell	2, hinged	None, or internal	1, typically coiled
Circulatory system	Open	Closed	Open
Nervous system	3 ganglia	Well developed brain	~6 ganglia near head
Sexuality	Unisexual	Unisexual	Sequential hermaphrodite
Habitat	Mainly seashores	Open ocean	Terrestrial and marine
Organs of O ₂ exchange	Gills	Gills	Through mantle
Examples	Clams, oysters	Octopus, squid	Snails, slugs

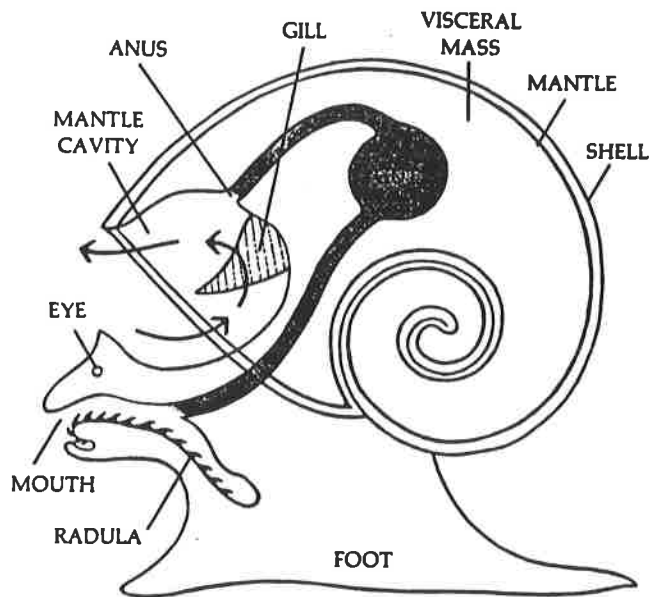
(a) HYPOTHETICAL ANCESTOR



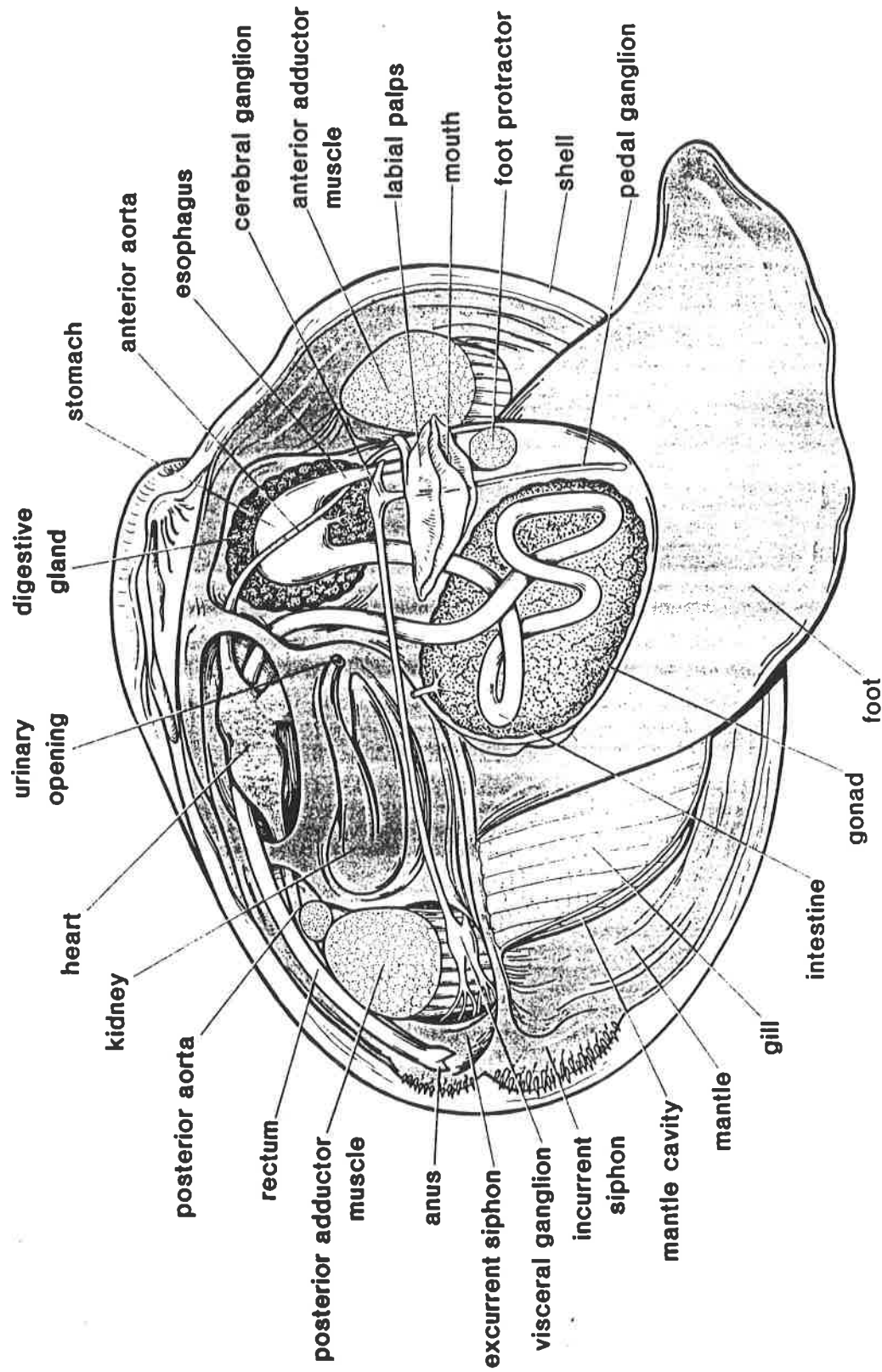
(b) CLAM (CLASS BIVALVIA)



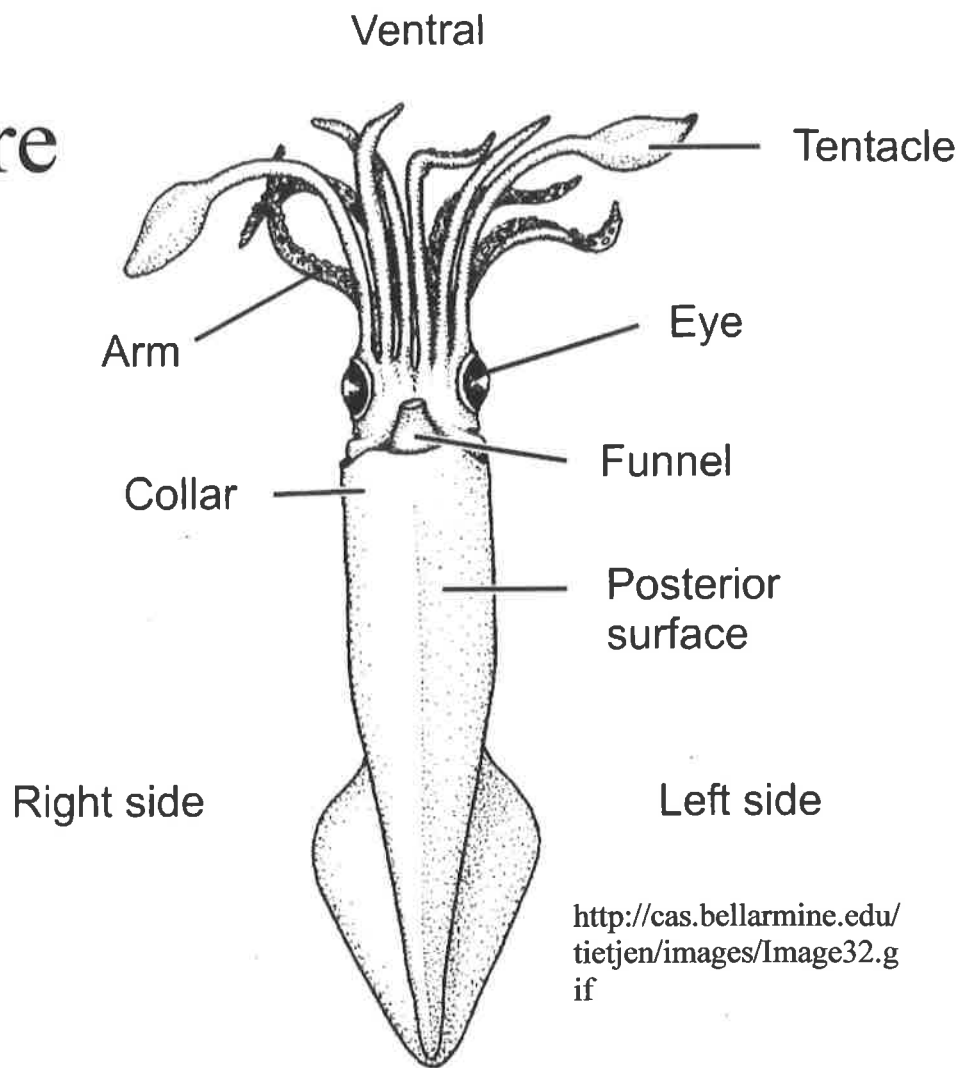
(c) SNAIL (CLASS GASTROPODA)



48 Clam Anatomy (Fig. 28.5)



Squid structure



<http://cas.bellarmine.edu/tietjen/images/Image32.gif>

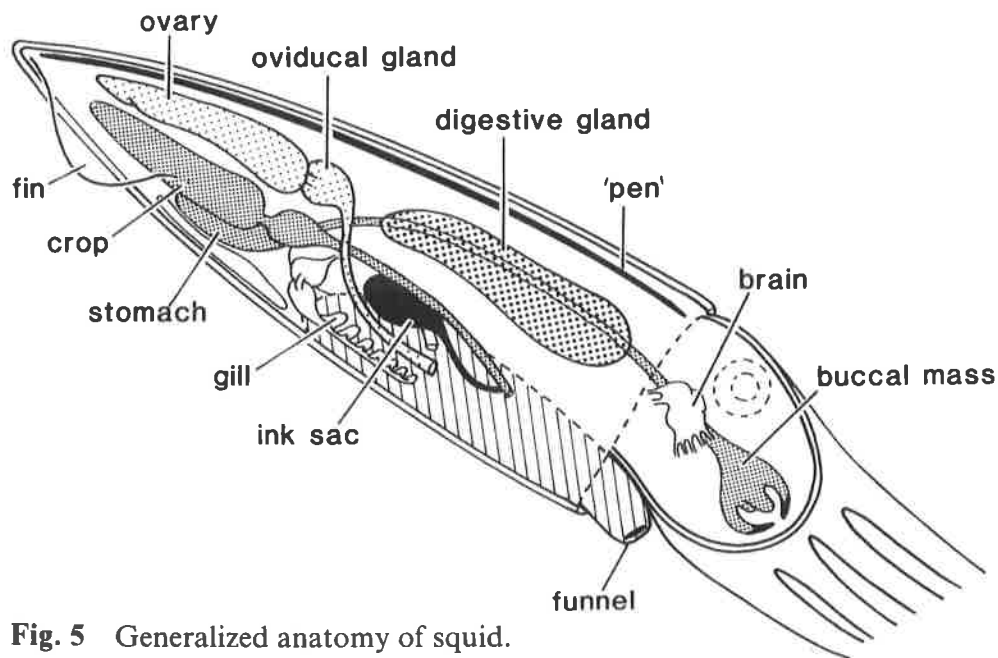


Fig. 5 Generalized anatomy of squid.

<http://www.utmb.edu/nrcc/UFAW%20squid.jpg>