

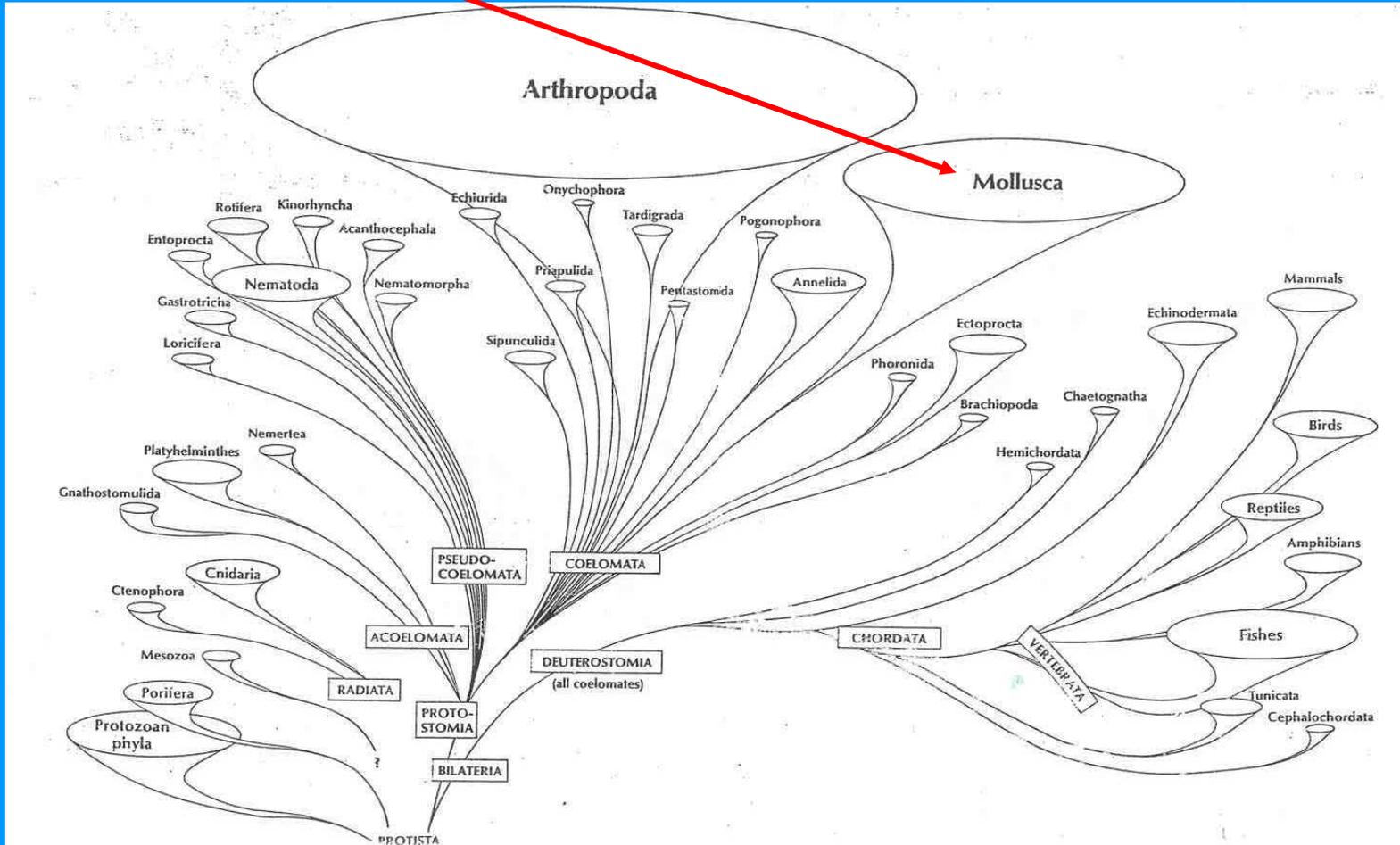
Mussel Life History & Ecological Services

An overview for the fish heads



- Information to be conversant in the fauna
- Information to be able to service information needs of others
- Information to challenge to look to a **BIGGER PICTURE** of **PROCESS**

You are here



K-P-C-O-F-G-S

Animalia, Mollusca, Bivalvia, Unionoida, Unionidae, *Genus*, *Species*

Unionid mussels

Greeks*Margaritos*

Latins*Unio*



“ **Conventional**” Life History

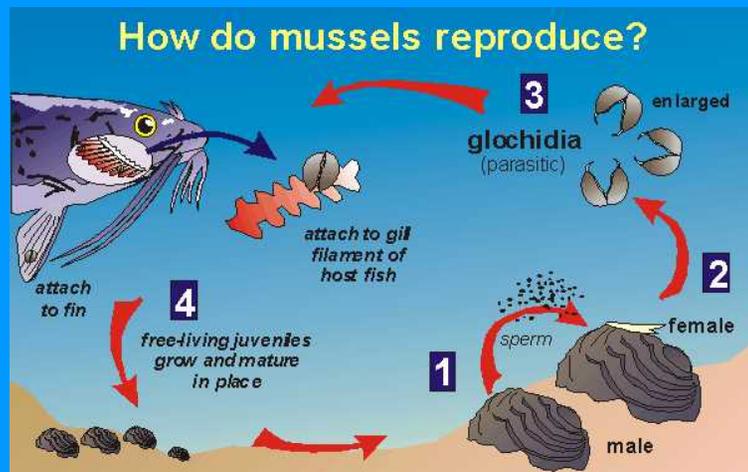
- Defining Characteristics
- Anatomical review
- Physiological review
- Reproductive review

Defining Characteristics

Pearly mussels...nacreous shells



Obligate parasitic stage in life cycle that requires a vertebrate host

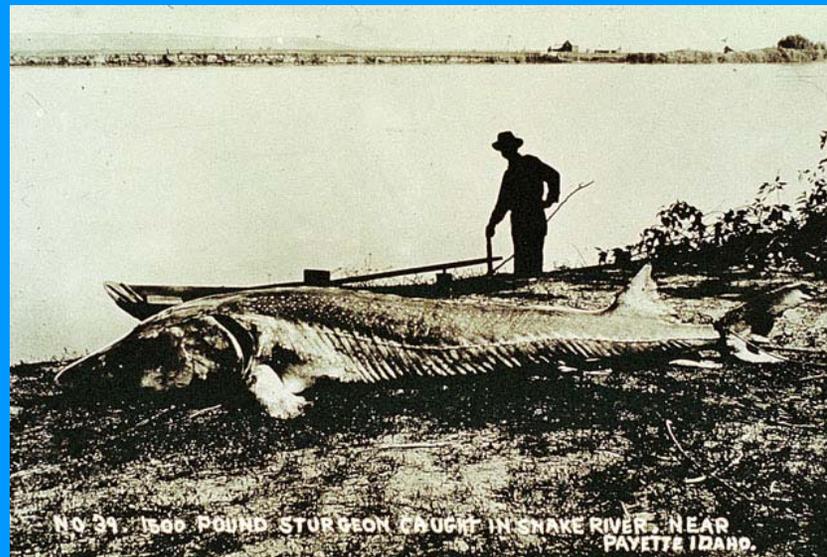


Defining Characteristics...continued

Long lived

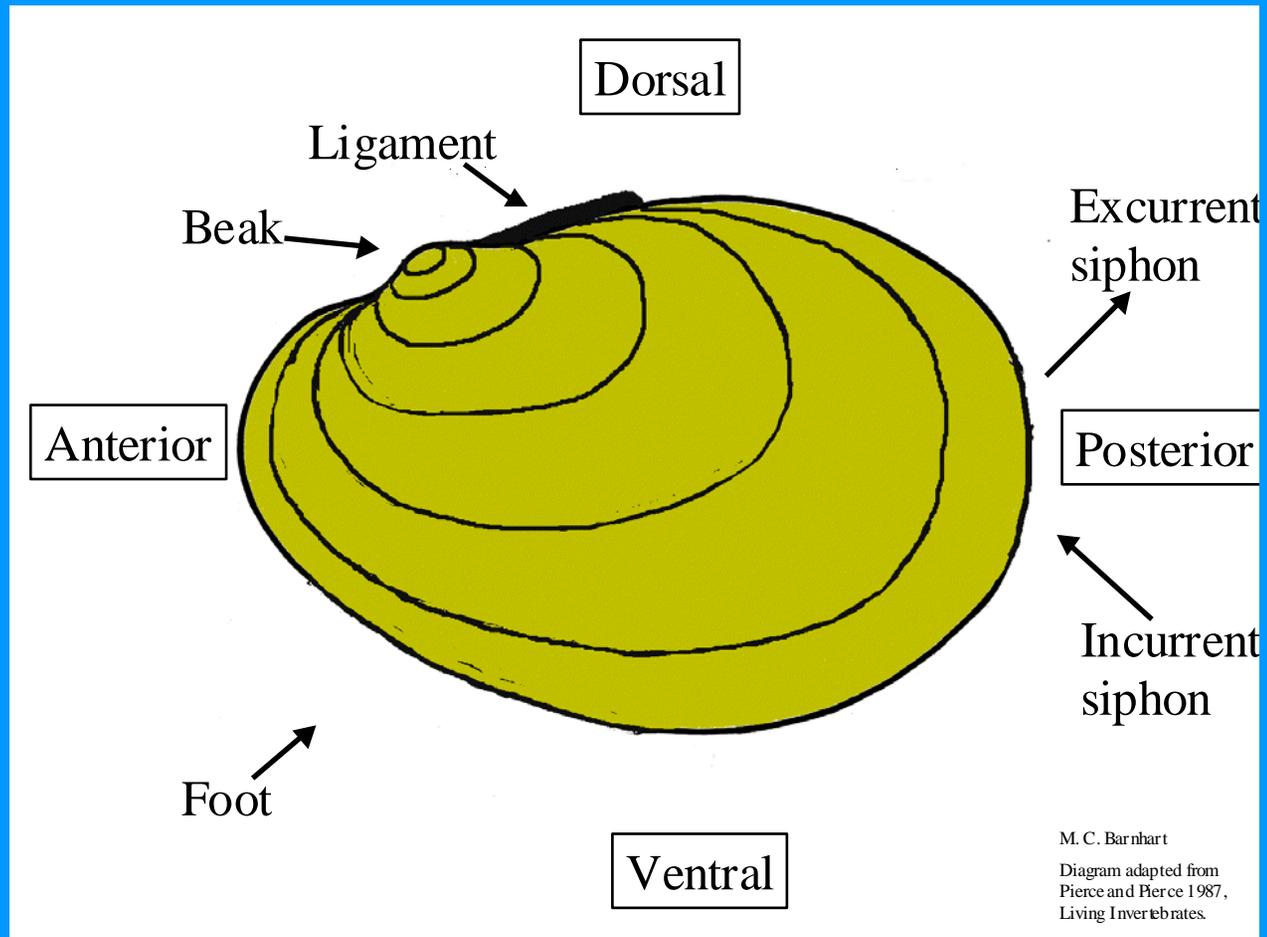
Slow growing

Late maturing



Not exactly a tight fit with human time frames

External Anatomy



More shell stuff....

Living Rocks...CaCO₃

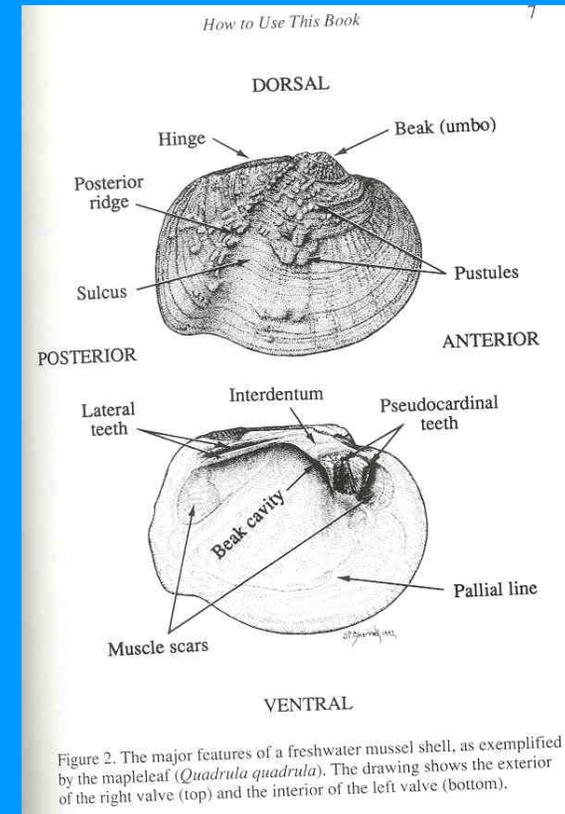
Periostracum...Prismatic layer...Peripheral nacre...Interior nacre

Exterior: tubercles, sulcus's, rays, ala

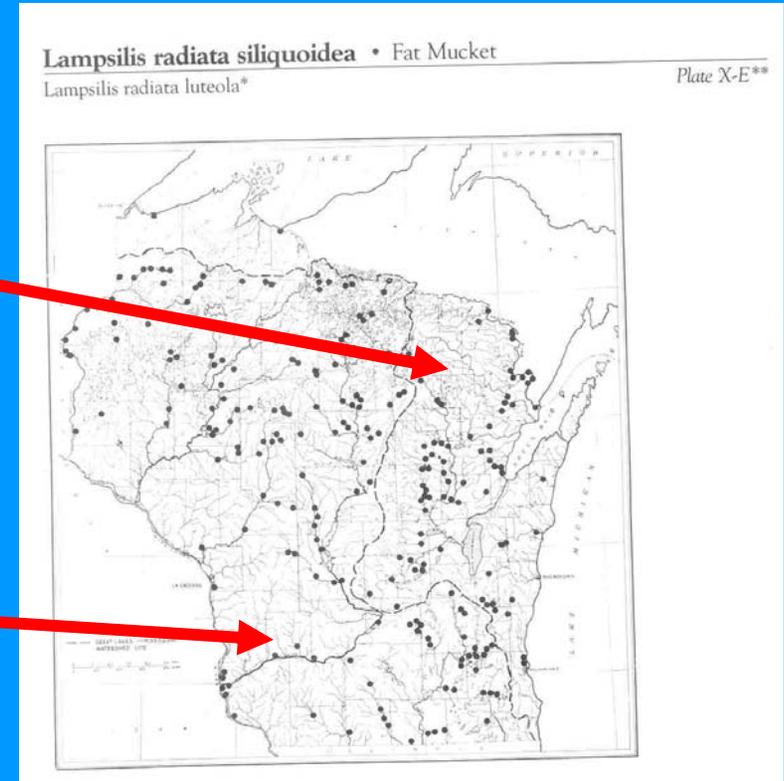
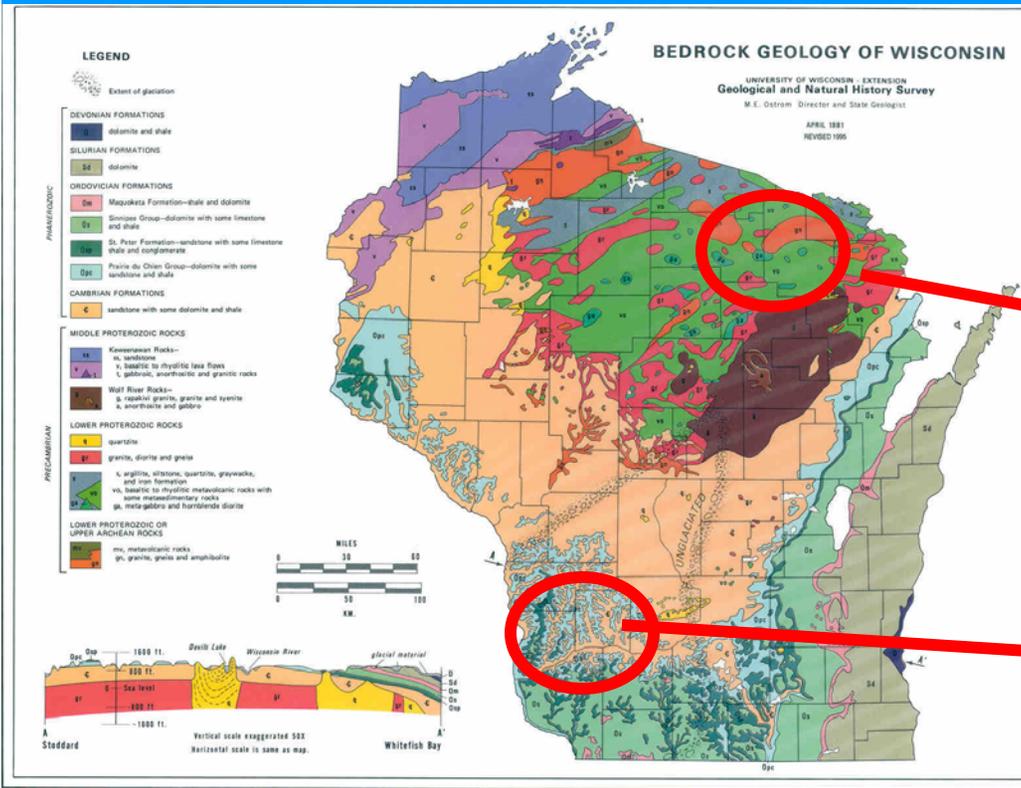
Interior : Palial Line, Cicatrices, Fossa

Dentition...4 cases

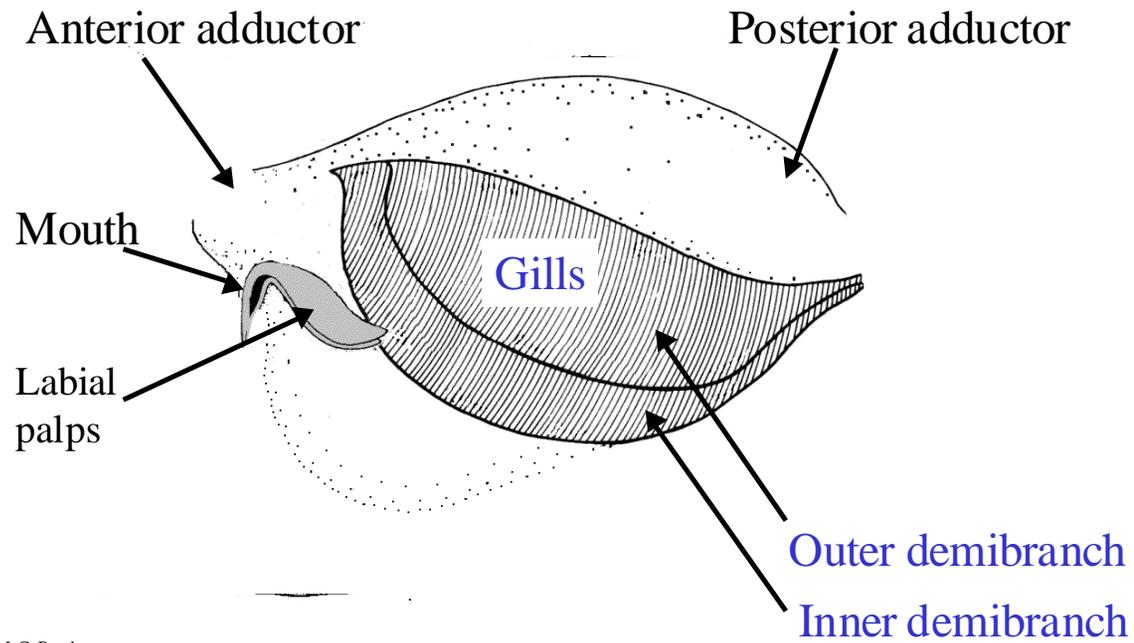
Clams Versus Mussels



The Influence of Geology and Earth Processes on Mussel Distribution

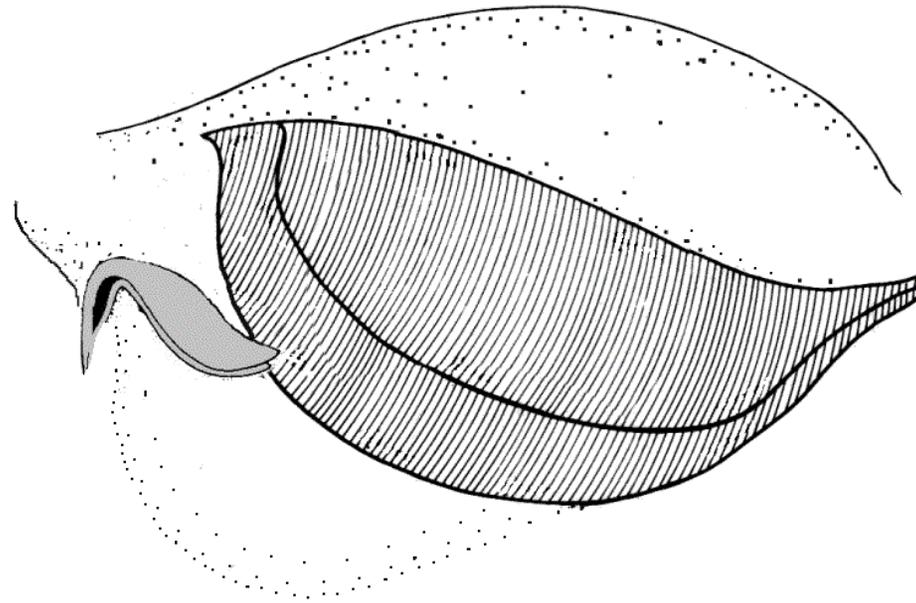


Internal Anatomy

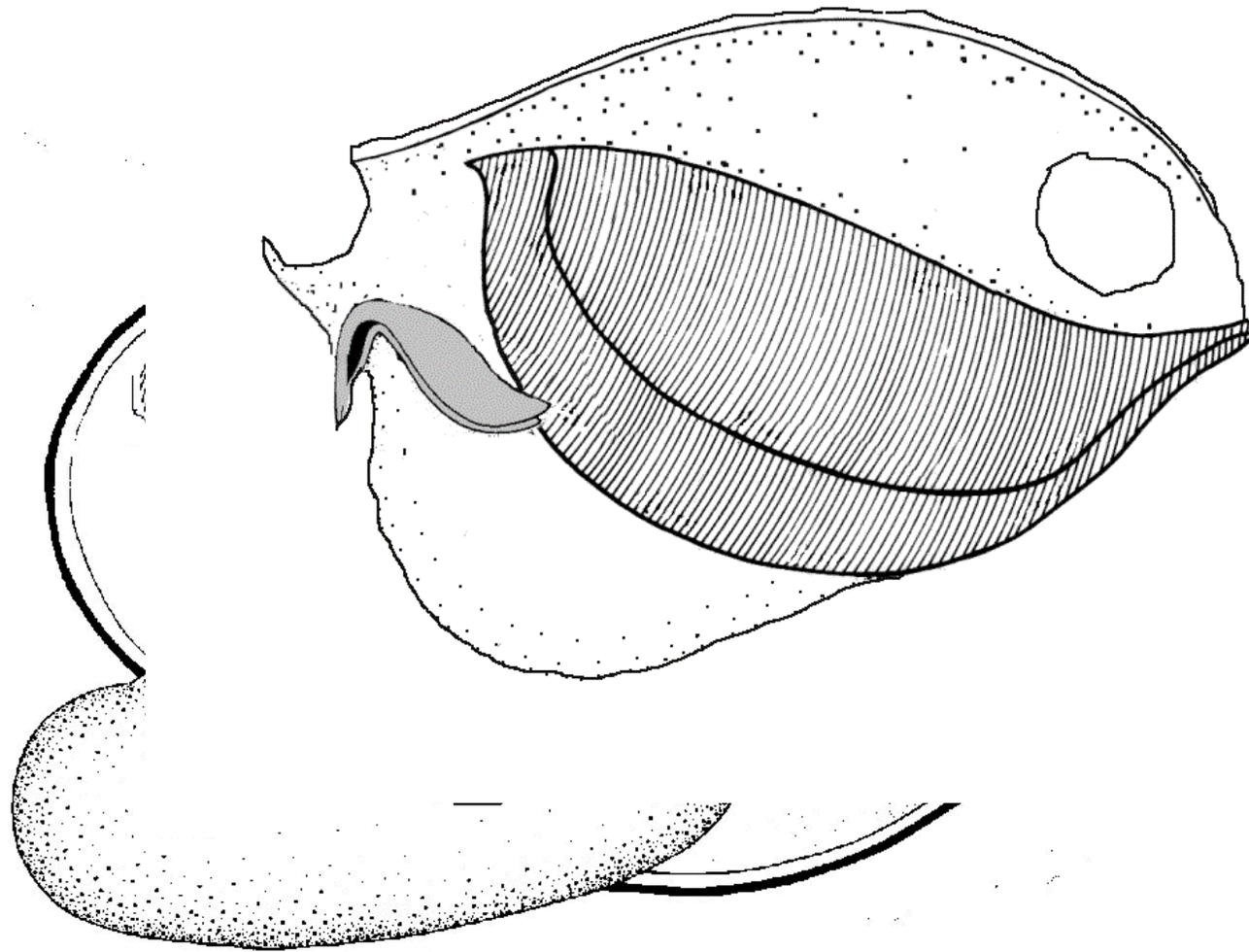


M. C. Barnhart
Diagram adapted from
Pierce and Pierce 1987,
Living Invertebrates

How things work - Feeding and excretory

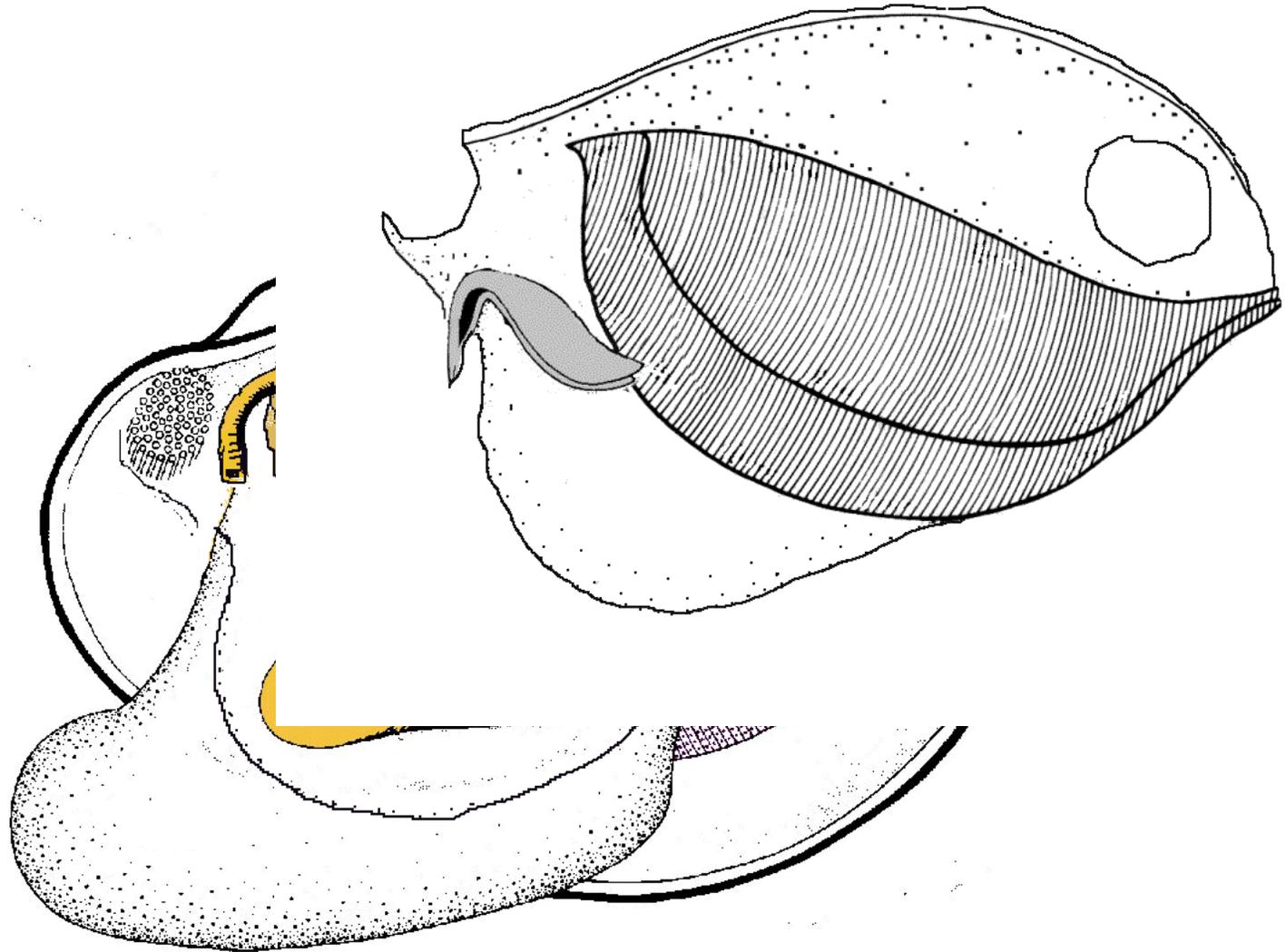


M. C. Barnhart
Diagram adapted from
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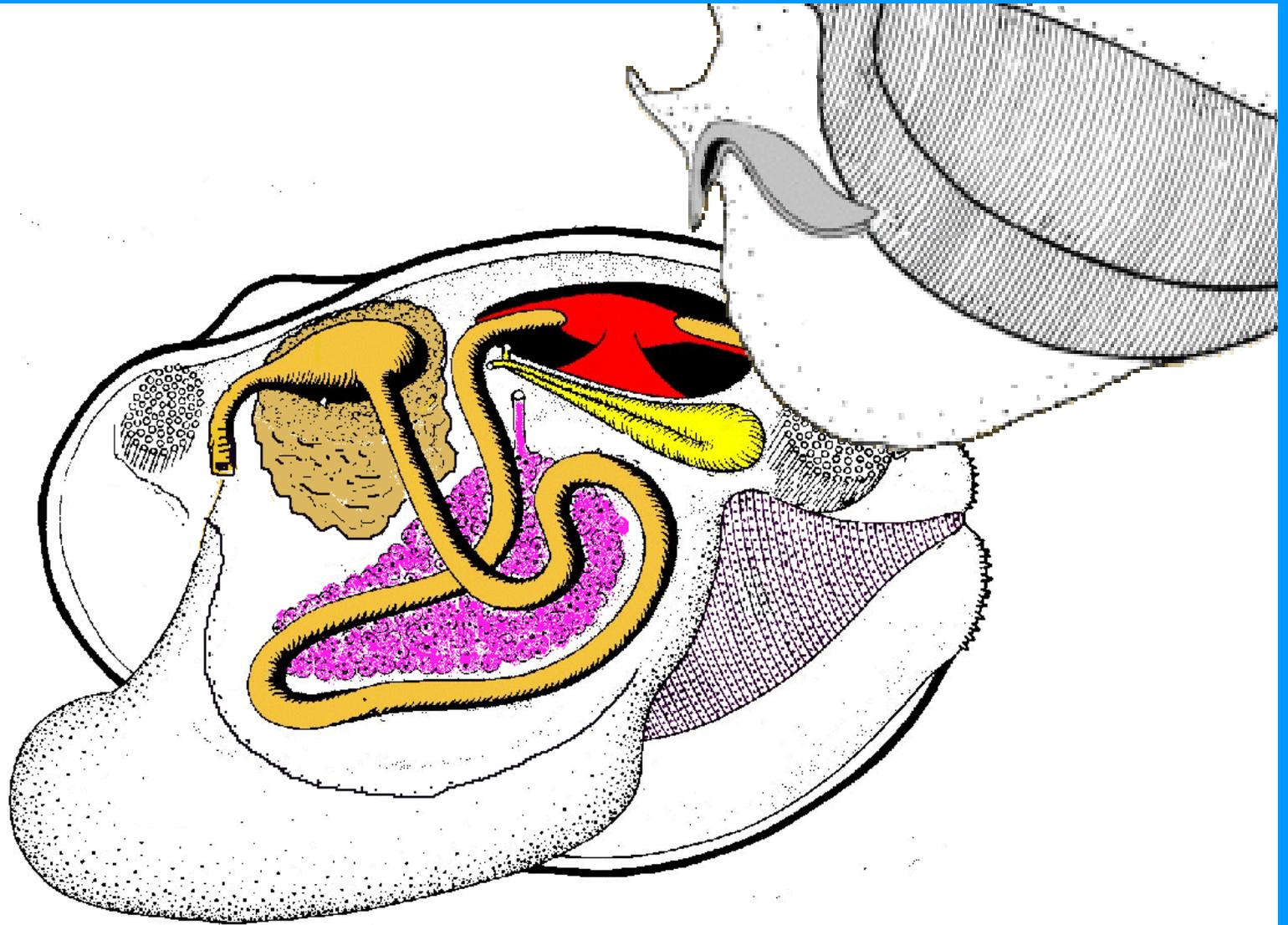
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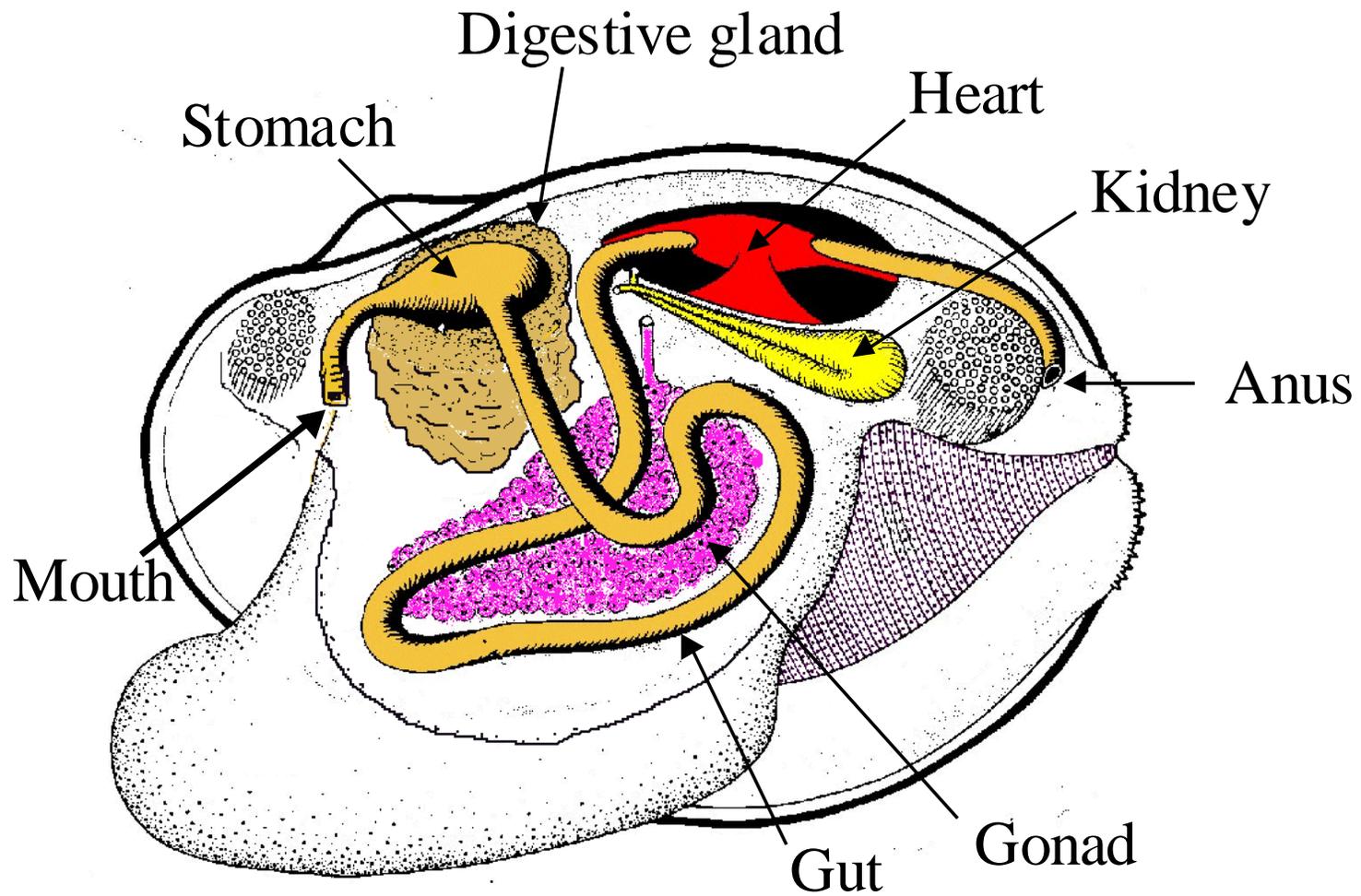
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M. C. Barnhart

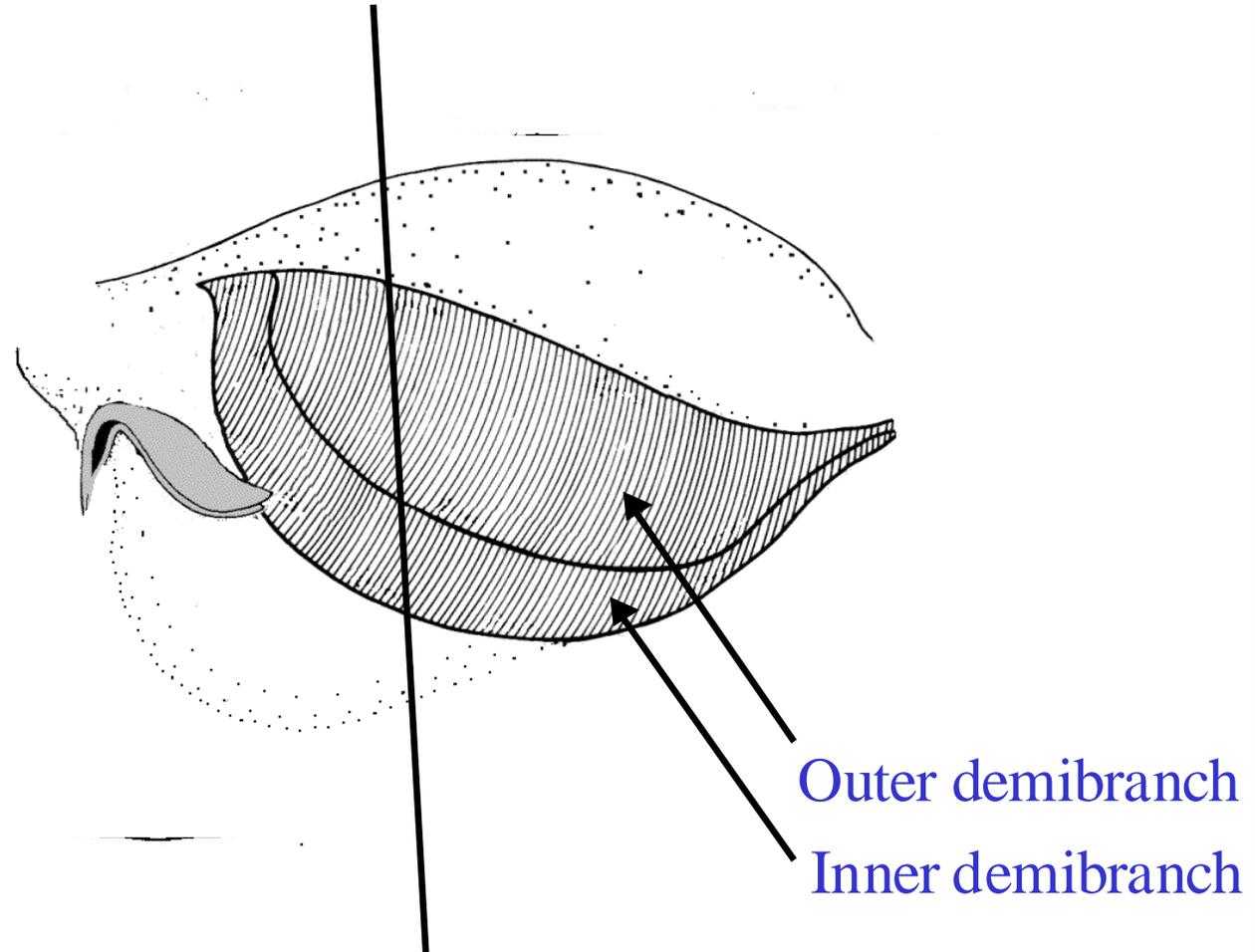
Diagram adapted from
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M. C. Barnhart

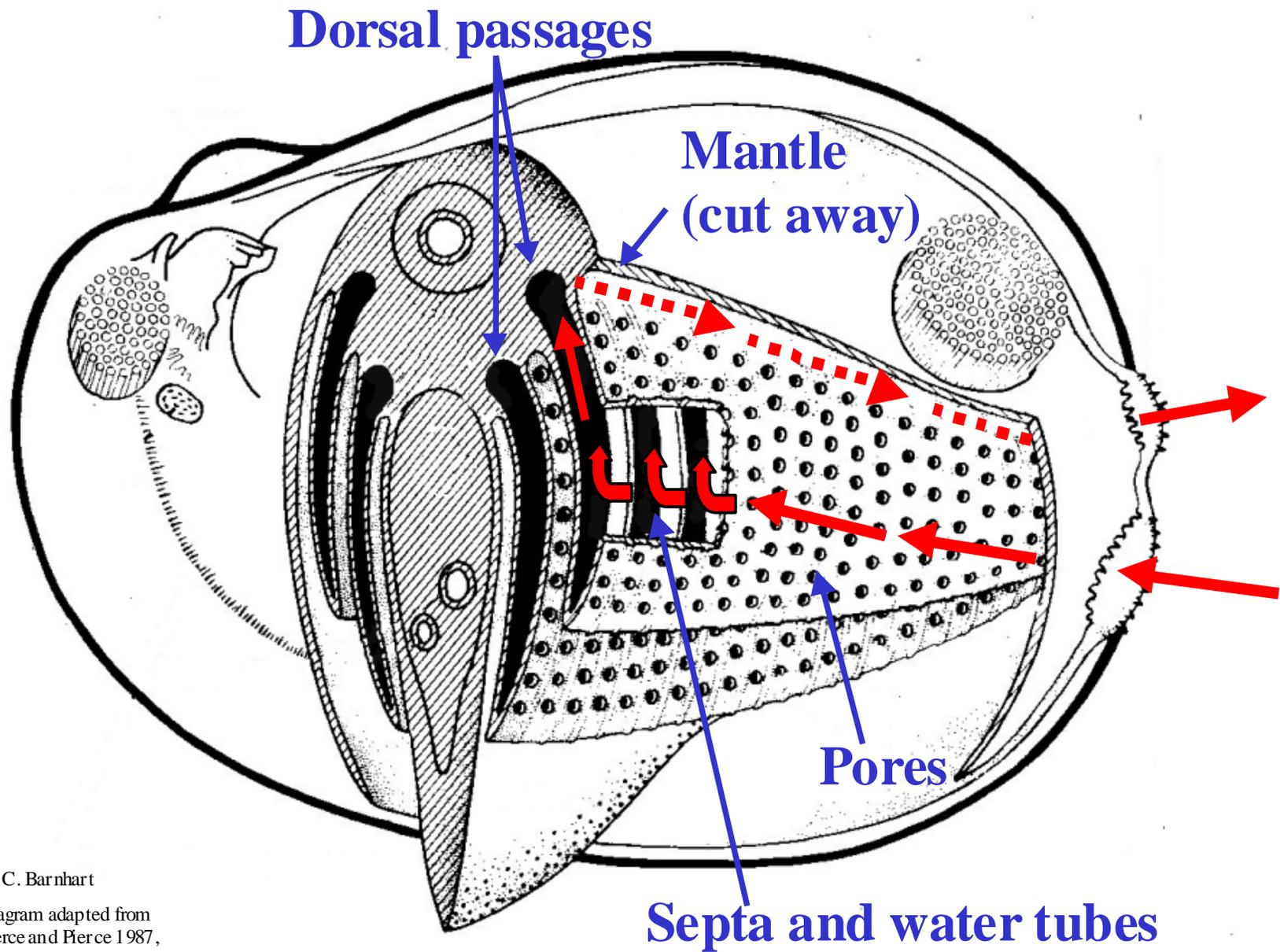
Diagram adapted from
Pierce and Pierce 1987,
Living Invertebrates.

How things work - Respiratory and Reproductive



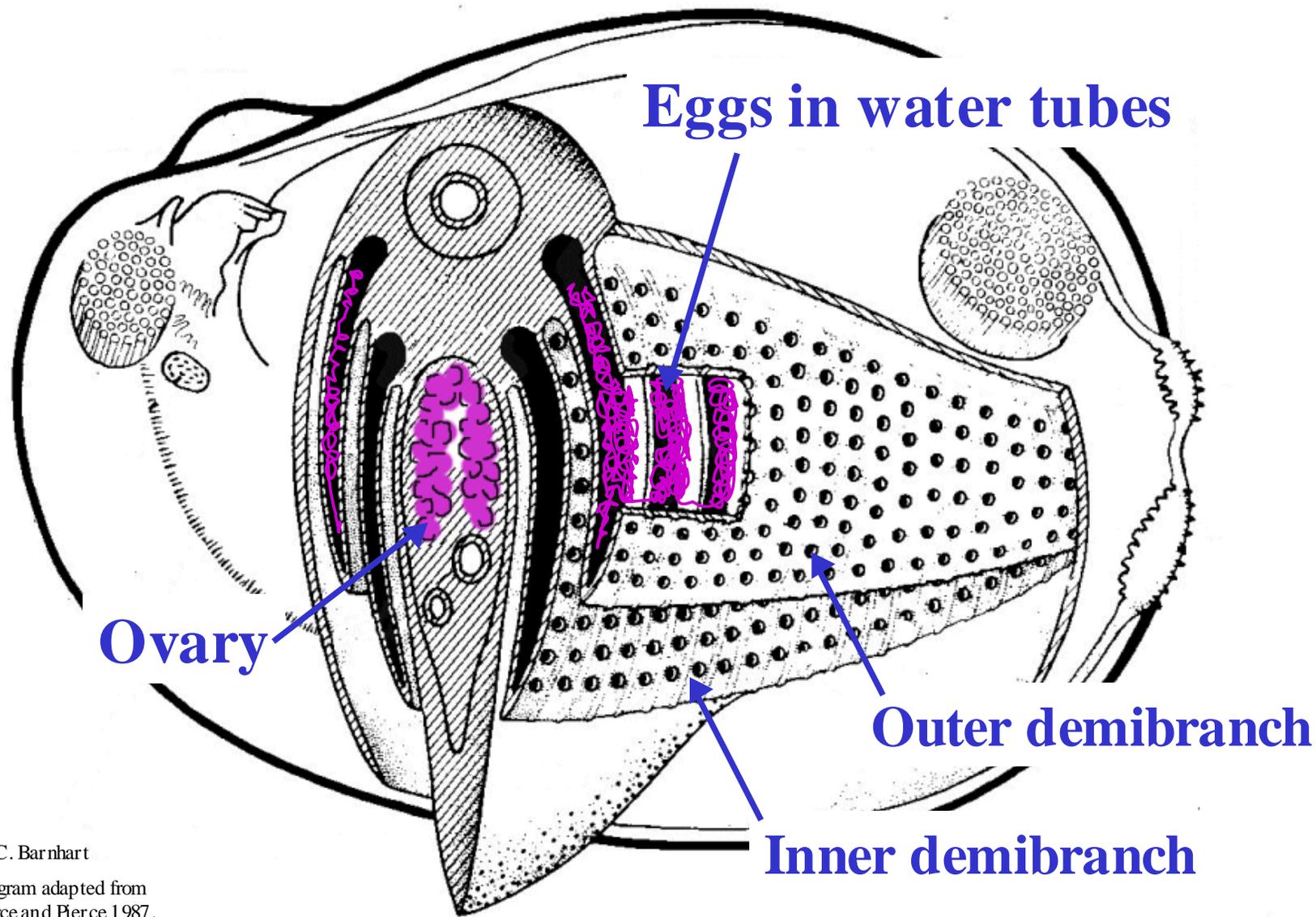
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Diagram adapted from
Pierce and Pierce 1987,
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M. C. Barnhart

Diagram adapted from
Pierce and Pierce 1987,
Living Invertebrates.

Marsupial gills of *Lampsilis*



©M. C. Barnhart

Marsupial gill of *Obliquaria*



©M. C. Barnhart



On **Fins**

Mucous “nets”

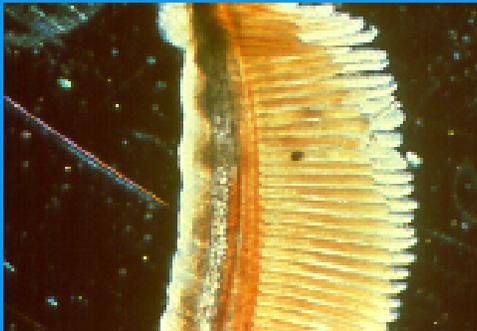


Active lure



Food item mimicry

Conglutinates

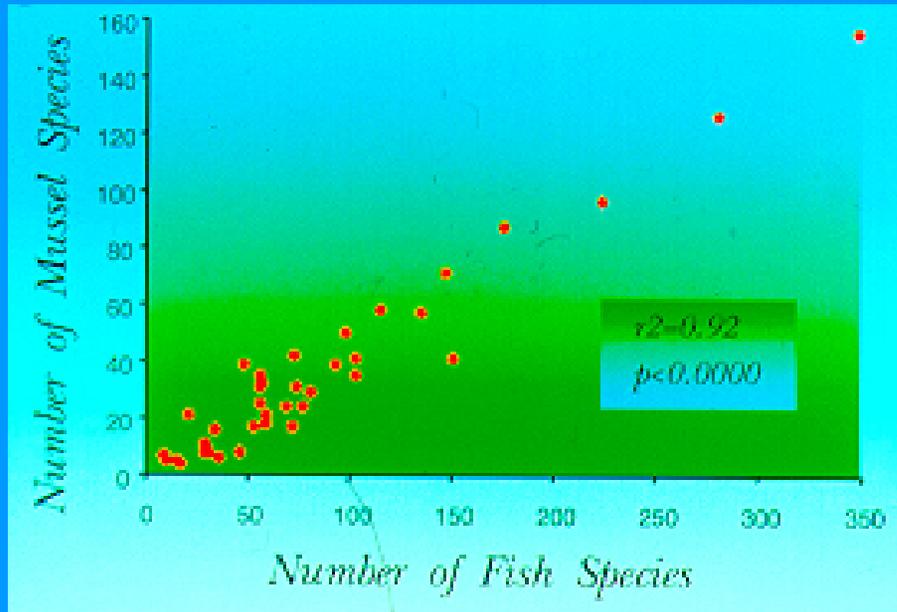


On **Gills**

Active fishing

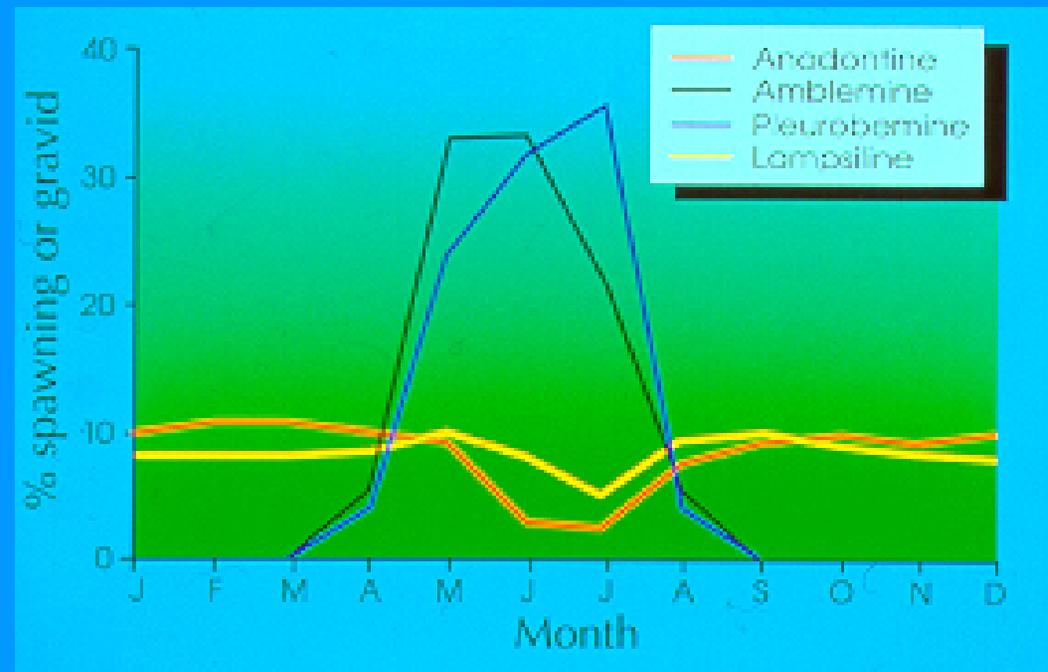
Super conglutinates





Brachyictic...short
term brooder

Tachyictic...long
term brooder

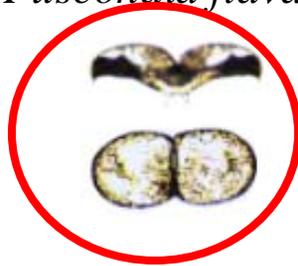


Glochidial Shapes:

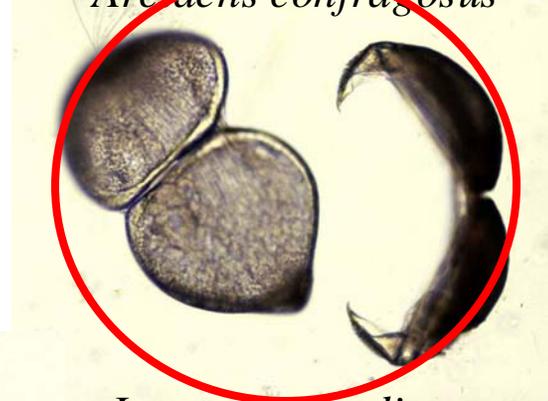
Anodontinae...Triangulate (& toothed)

Ambleminae = rounded

Fusconaia flava



Arcidens confragosus



Potamilus alatus



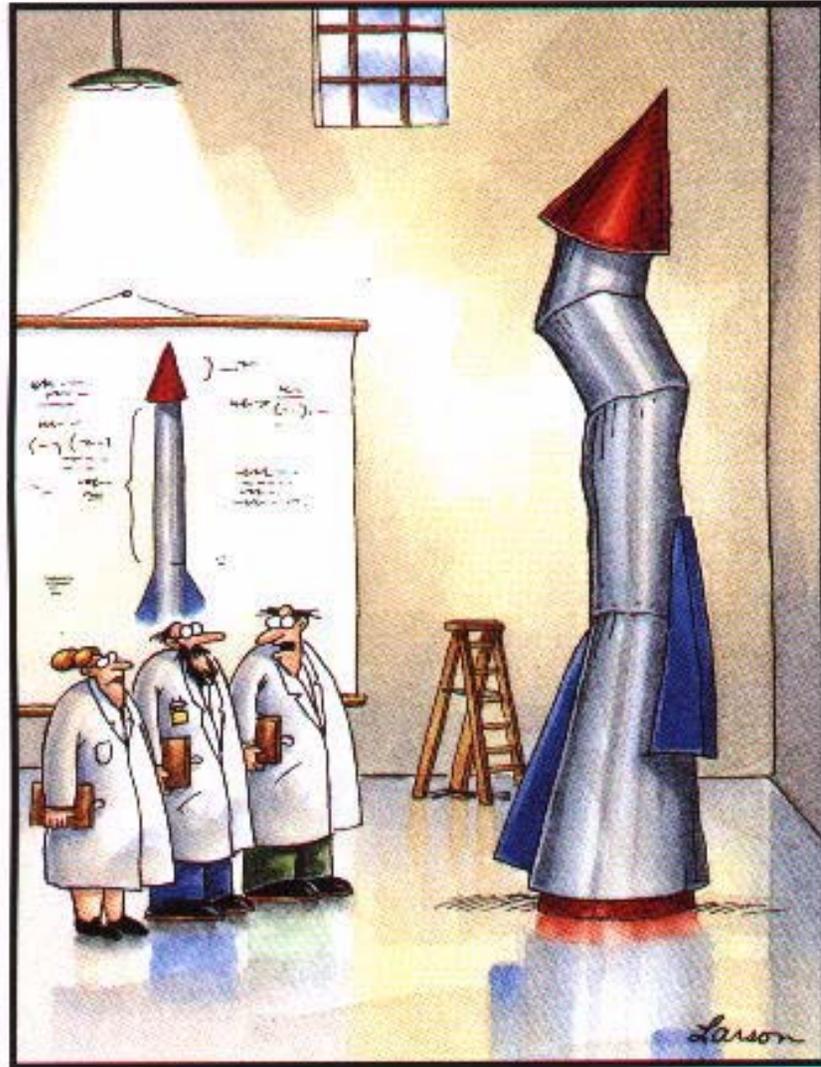
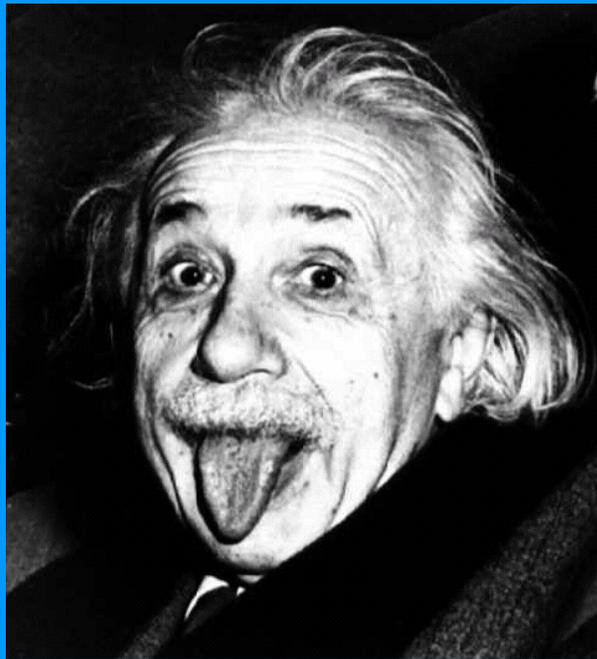
Lampsilis cardium



© M. C. Barnhart

Potamilus= Liguate or tongue -
shaped

Lampsilines = Semi- elliptical or bean shaped



"It's time we face reality, my friends. ...
We're not exactly rocket scientists."

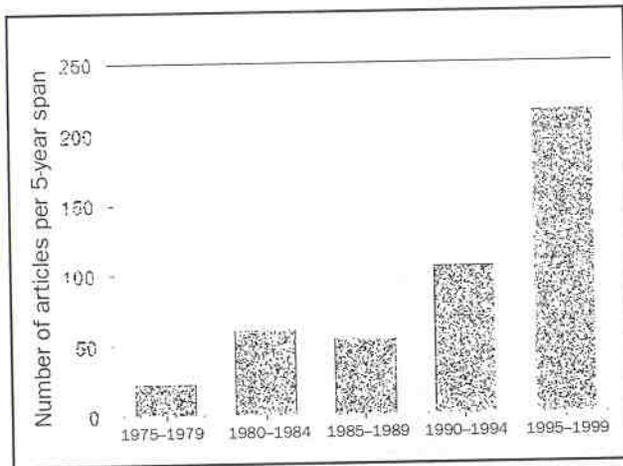


Figure 2. Number of peer-reviewed scientific articles referring in their title or abstract to unionacean mussels, 1975–1999. Data from Web of Science (30 March 2004; <http://isi10.isiknowledge.com/portal.cgi/wos>).

***From Strayer et al, Bioscience, May 2004,
Vol .54 No. 5 429-439***



3 dynamic rates of (Shell)Fisheries

Recruitment

Growth

Mortality



Fertile ground

Absolutely critical for *management* (*)

Changing Perspectives on Pearly Mussels, North America's Most Imperiled Animals

Strayer et al *in* Bioscience, May 2004, Vol 54 No. 5

Ecological Services

KURT WELKE MGR.
SATTER BLDG. 111 W. DUNN ST.
PRAIRIE DU CHIEN, WI 53821

Stream Channelization and the Preservation of Biological Variability*

DAVID H. STANSBERY
*Museum of Zoology
The Ohio State University
Columbus, Ohio 43210*

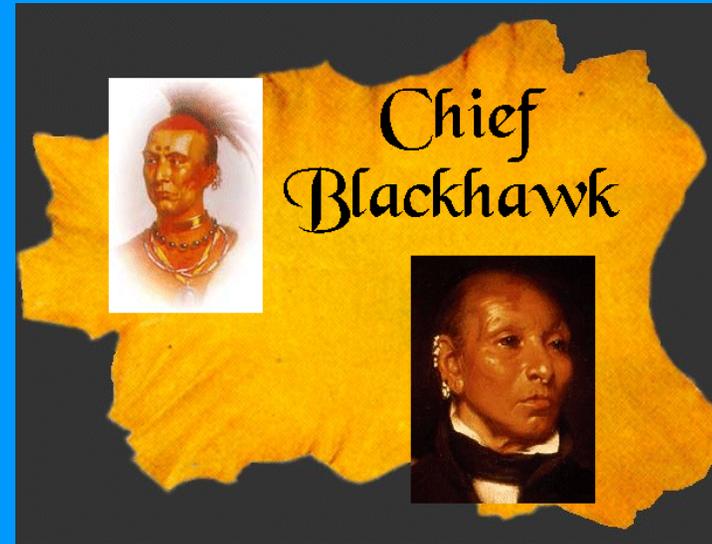
Why Naiades (Pearly Freshwater Mussels) Should Be Preserved*

DAVID H. STANSBERY AND CAROL B. STEIN
*Museum of Zoology
The Ohio State University
Columbus, Ohio 43210*

*Reprinted from STREAM CHANNELIZATION (PART 4). Hearings before a Subcommittee of the Committee on Government Operations, House of Representatives, Ninety-Second Congress, First Session, June 14, 1971: 2177-2179.



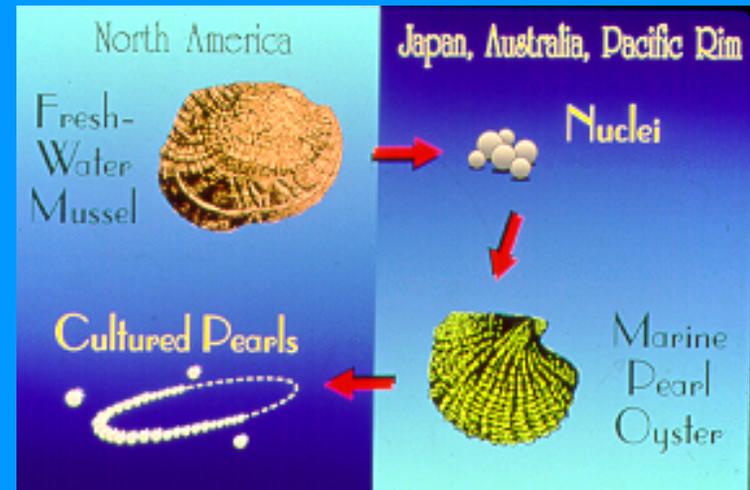
archeological



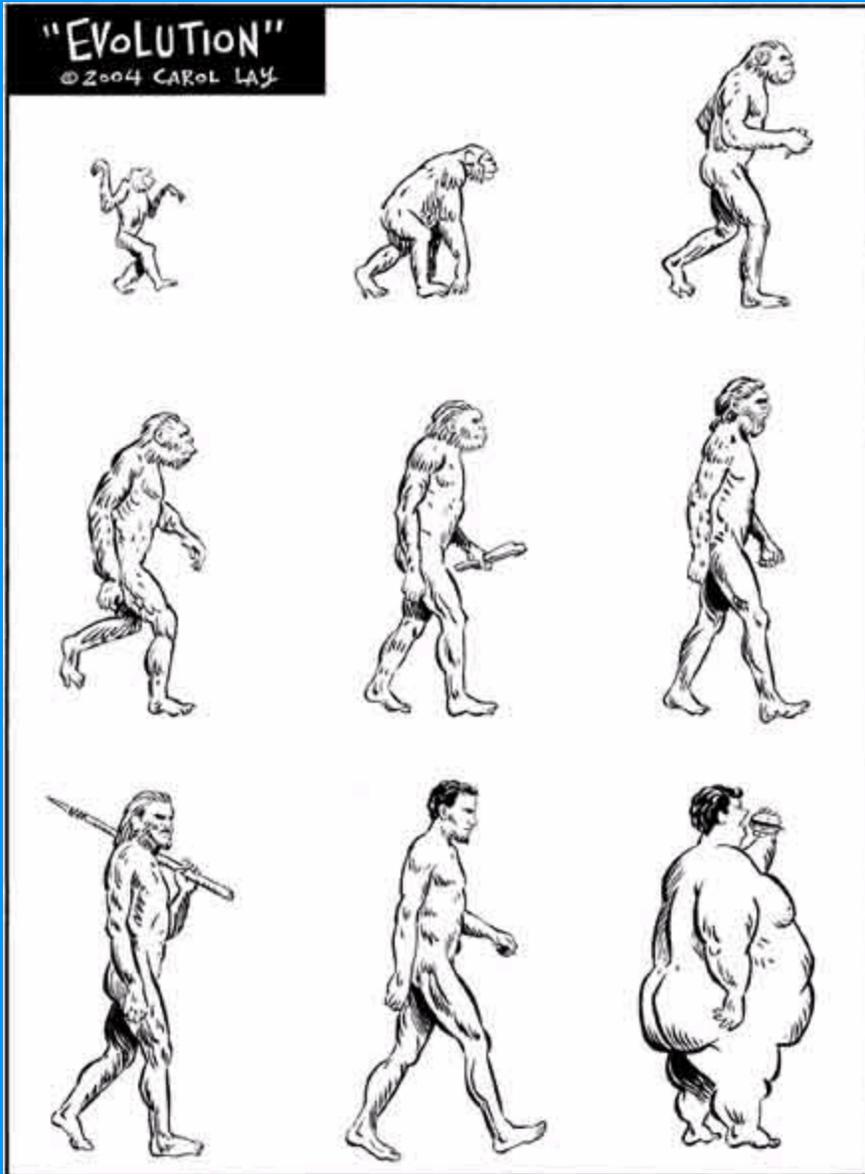
cultural



historical



economic



The Problem of Perfection

Vaughn, C.C. and C.C. Hackenkamp. 2001. **The functional role of burrowing bivalves in freshwater ecosystems.** *Freshwater Biology* (2001) 46, 1431-1446.

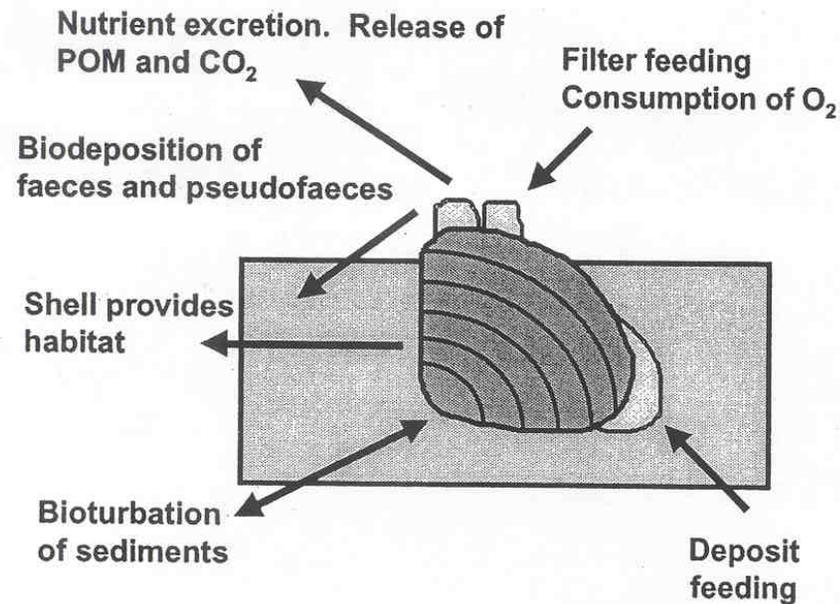


Fig. 1 Potential ecosystem functions performed by burrowing bivalves in freshwater systems.

© 2001 Blackwell Science Ltd, *Freshwater Biology*, 46, 1431-1446

Water Column Processes

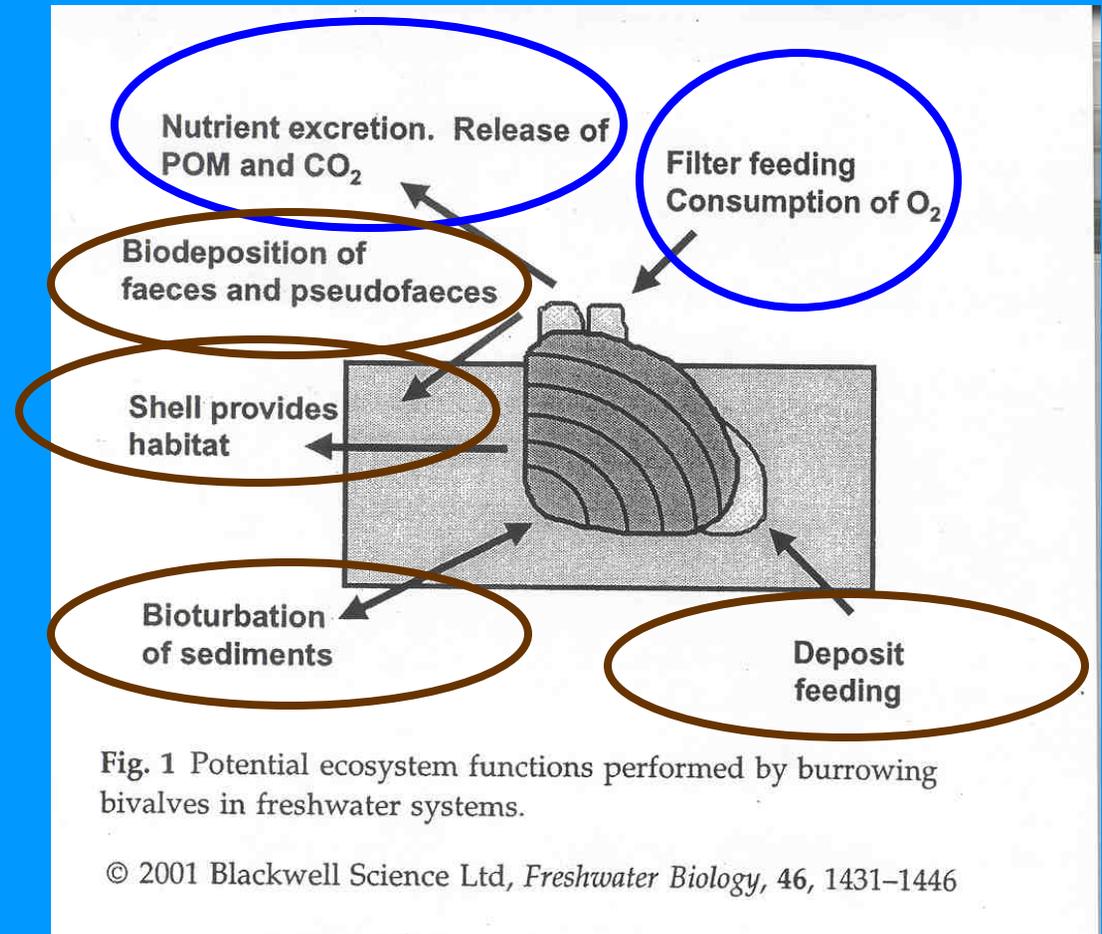


Fig. 1 Potential ecosystem functions performed by burrowing bivalves in freshwater systems.

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Sediment Processes



**Filtering of phytoplankton, bacteria and particulate organic matter
(density, temperature, particle size /conc. , flow, gill size)**



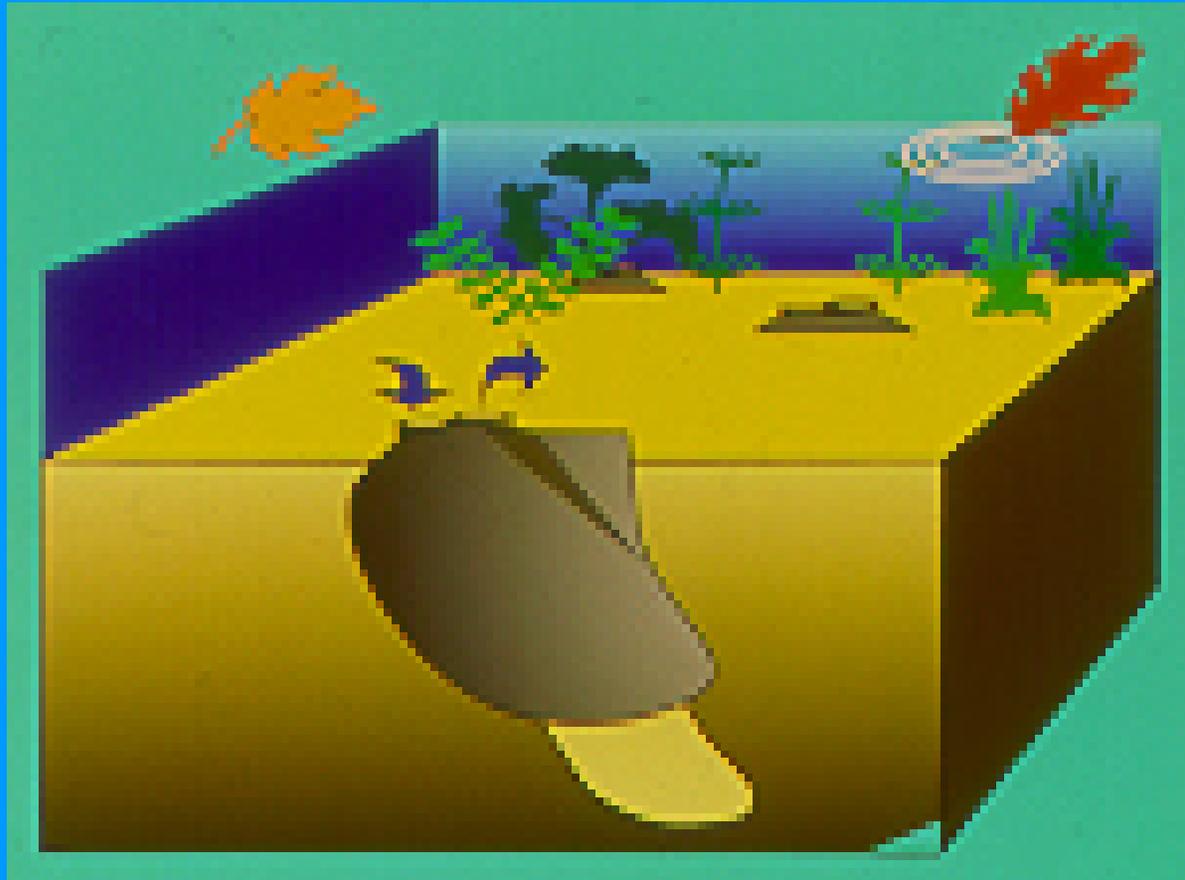
Nutrient excretion(translocate and transform) of P and N

Deposit feeding (pedal, interstitial = decrease sediment organic matter)



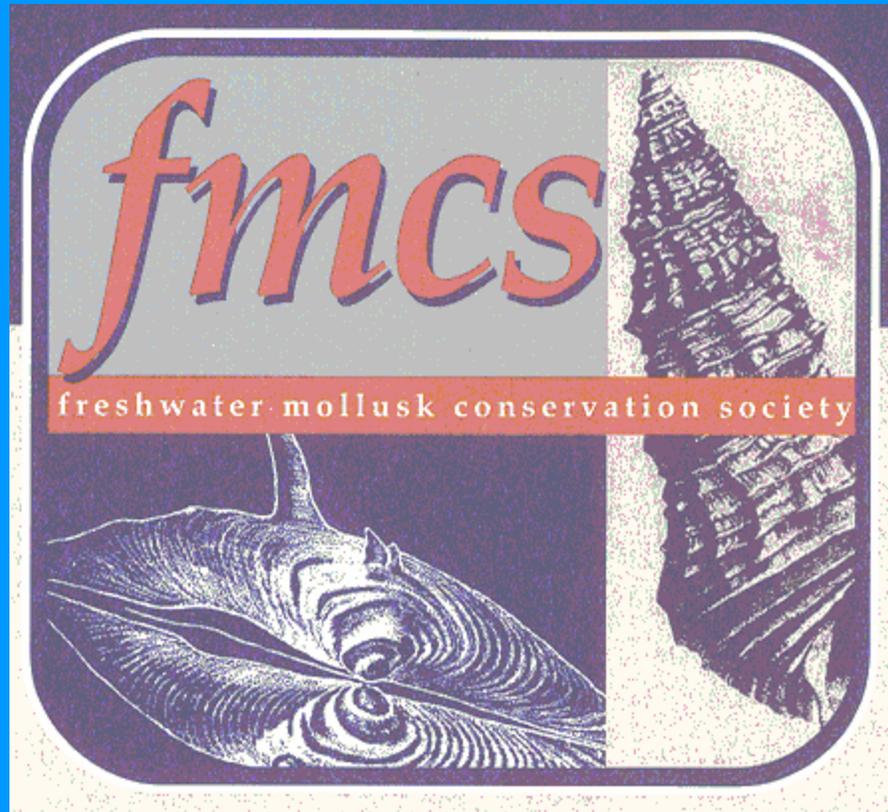
Biodeposition of faeces, pseudofaeces = sedimentation process

Bioturbation of sediments = mixing via burrowing



Habitat = algae, invertebrates, fish





<http://ellipse.inhs.uiuc.edu:591/mollusk/biblio.html>

1529 records for “Life History”

