

# Observing and Documenting Snails

## Goals

1. To develop ideas for how I'll structure the observations of, documentation of, story creation about, and explanations of different animals, behaviors
2. For SD and AR to make artifacts that bring their own tastes and interests to observing, documenting and creating stories/documentation of animals. This will be helpful for MJ to develop more/different ideas for activities she'll do during her programs

## Agenda

- **9-10:30:** Take photographs and videos of snails
- **10:30-11:00:** Cull videos and photos. Choose favorites and identify the phenomena that you find interesting.
- **11:00-1:30:** Choose one video clip/image or series of clips/images. Edit them and add explanation/framing — Based on research (using resources below and more) observations, questions, write or voice record short explanation, first person short narrative, poem, etc. that you'll put with the video/images you took.
- **1:30-2:00:** finish artifacts and send to MJ so can add to snailophilia
- **2:00-2:30:** Write down list of questions that you now have about snails that you want to answer

## Examples

- Contextualizing adaptations in film with narration—
  - Eg: David Attenborough and [star-nosed mole](#) or [leopard slug sex](#).
- Relating human and animal's experience via research and storytelling:
  - "How long did we stay with Athena? It's impossible to say. Of course, we had removed our watches before plunging our arms into the water. Once we did, we entered what we called Octopus Time. Feelings of awe are known to expand the human experience of time availability. So does "flow," the state of being fully immersed in focus, involvement, and enjoyment. Meditation and prayer, too, alter time perception. And there is another way we alter our experience of time. We as well as other animals can mimic another's emotional state. This involves mirror neurons—a type of brain cell that responds equally whether we're watching another perform an action, or whether we're performing that action ourselves. If you are with, for example, a calm, deliberate person, your own perception of time may begin to match his. Perhaps, as we stroked her in the water, we entered into Athena's experience of time—liquid, slippery, and ancient, flowing at a different pace than any clock...." Excerpt From: Sy Montgomery. "The Soul of an Octopus: A Surprising Exploration into the Wonder of Consciousness." iBooks.
- Interactive diagrams using photos/videos that you take
- Short videos/gifs with straightforward explanations of behavior

## More Photos/Videos to draw from:

[Link](#) to dropbox folder that can download of MJ's past snail photos and videos.

## Resources

Non-ocular photoreceptors:

- <http://photobiology.info/Musio.html>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4629660/>

Movement / Mucus:

- <https://cl.ly/191f233y171B>
- Adhesive locomotion: <https://cl.ly/1d2U3G472S3R>
- <https://arxiv.org/pdf/cond-mat/0608363.pdf>
- <http://www.nature.com/ololo.sci-hub.cc/nature/journal/v285/n5761/pdf/285160a0.pdf>
- [https://oup.silverchair-cdn.com/oup/backfile/Content\\_public/Journal/az/24/1/10.1093/icb/24.1.23/2/24-1-23.pdf?Expires=1501181609&Signature=cQOHCCTGv1bjHw50jyKZGXbhtjAcpeIP6TiNNxfofG43Zew1Knu~XAO4e4aUenFUBHncsRw6DNPghv58C7nUD~7T3FEQ-uS9BfRPIKxXp3VQFVq-iSd3cK9T-zz2Xn7-s-pHXi5-UBV7w1U9AU51PUDrO9AsqVDyx4dDrEiH2tj7nZCcsJfbQQauRHMEEBrix-ZazQLkdArOauTXmeWiXxF8zqqUbsrHR4DbJ-YyGQW1-SOkykIPk7s0rWUz2FHJOzwYA8bxSXRzUss26VZCkkrpwzvEePsQalKh5aWdkFf5Jo6axYXKuOIdNcph3edP4A0nhmPn2uKfJF-oZog\\_&Key-Pair-Id=APKAIUCZBIA4LVPVW3Q](https://oup.silverchair-cdn.com/oup/backfile/Content_public/Journal/az/24/1/10.1093/icb/24.1.23/2/24-1-23.pdf?Expires=1501181609&Signature=cQOHCCTGv1bjHw50jyKZGXbhtjAcpeIP6TiNNxfofG43Zew1Knu~XAO4e4aUenFUBHncsRw6DNPghv58C7nUD~7T3FEQ-uS9BfRPIKxXp3VQFVq-iSd3cK9T-zz2Xn7-s-pHXi5-UBV7w1U9AU51PUDrO9AsqVDyx4dDrEiH2tj7nZCcsJfbQQauRHMEEBrix-ZazQLkdArOauTXmeWiXxF8zqqUbsrHR4DbJ-YyGQW1-SOkykIPk7s0rWUz2FHJOzwYA8bxSXRzUss26VZCkkrpwzvEePsQalKh5aWdkFf5Jo6axYXKuOIdNcph3edP4A0nhmPn2uKfJF-oZog_&Key-Pair-Id=APKAIUCZBIA4LVPVW3Q)
- <http://jeb.biologists.org/content/jexbio/213/22/3920.full.pdf>
- [http://northernwoodlands.org/outside\\_story/article/snails-slime-is-sublime](http://northernwoodlands.org/outside_story/article/snails-slime-is-sublime)

Locomotion in mollusks, book:

- <https://books.google.com/books?hl=en&lr=&id=dqXpAgAAQBAJ&oi=fnd&pg=PA155&dq=role+of+gastropod+slime+in+shell+healing&ots=r6nkqBibNQ&sig=UUpWBN9WEyzEs1SVcypZWgguR-Y#v=onepage&q&f=false>

Tentacle Movement:

- <https://cl.ly/34120R3q3V45>

Antimicrobial properties of snail sline:

- [http://www.journalrepository.org/media/journals/BMRJ\\_8/2015/Oct/](http://www.journalrepository.org/media/journals/BMRJ_8/2015/Oct/)
- <https://www.ncbi.nlm.nih.gov/pubmed/26738399Obande1122015BMRJ21731.pdf>

Shell repair:

- [https://books.google.com/books?hl=en&lr=&id=dqXpAgAAQBAJ&oi=fnd&pg=PA289&dq=gastropod+shell+repair+chemistry&ots=r6nkqBicTT&sig=\\_9i0PIb4Y3utldCv\\_7qdrC\\_Qg9s#v=onepage&q=gastropod%20shell%20repair%20chemistry&f=false](https://books.google.com/books?hl=en&lr=&id=dqXpAgAAQBAJ&oi=fnd&pg=PA289&dq=gastropod+shell+repair+chemistry&ots=r6nkqBicTT&sig=_9i0PIb4Y3utldCv_7qdrC_Qg9s#v=onepage&q=gastropod%20shell%20repair%20chemistry&f=false)

Olfaction:

- <https://cl.ly/2t18213c321o>
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Trail following:

- <https://cl.ly/1E030o0q1Y1Z>

## MJ

How does a snail look the same gliding on the ground as gliding up a pane of glass?

Like butter...smooth./gliding.

Why are us going up and down a hill so different from a snail?

1. Size
2. Slime/adhesion
3. Lack of gate changes....?

No change in effort, seemingly.

Effort is in the slime itself

In its metabolic production

In it's molecules.

Not spending the energy on going up a hill...already spent the energy...

Does a snail notice when it's going up vs. going to the side? (proprioception?)

How does this relate to fact that they evolved from aquatic animals? In water up/down less of a thing....

If their slime is a glue, how is it also a lubricant to move with?

Why have slime? Where did it evolve from?

Adhesion

- Why can snails adhere to surfaces? Why not just stay on the ground?
- Snail slime — what allows them to adhere
- But why have slime? Snails evolved in water...
- Can slugs stick to stuff?
- What selected for slime to evolve
  - Did slime evolve from life in intertidal zone...need to be able to stick? Equivalent of what mollusks and oysters have to deal with waves?
  - Or was it something that evolved to make it more difficult to be plucked up by predators
  - Or is it locomotor?

Some gastropods and chitons (Class Polyplacophora) return to specific resting positions after feeding excursions,

Eye/tentacle retraction and protraction

One benefit of using mucus is that its adhesive properties allow snails to attach themselves firmly (adhesion is also achieved by suction, e.g. Smith, 2002) and hence can locomote on vertical surfaces and upside-down. These simple benefits allow animals to extend their habitat use into complex three-dimensional and dynamic (e.g. wave-swept) environments, and may have driven the evolution of locomotion on mucus, and hence the laying of mucus trails. Once laid, however, these trails can have other benefits to the trail-layer (see Section II) and it may be that post-deposition functions not associated with locomotion justify the high cost of mucus production.