



# Marine birds of the future

What if birds returned to the sea?



# Mythology-based creature design

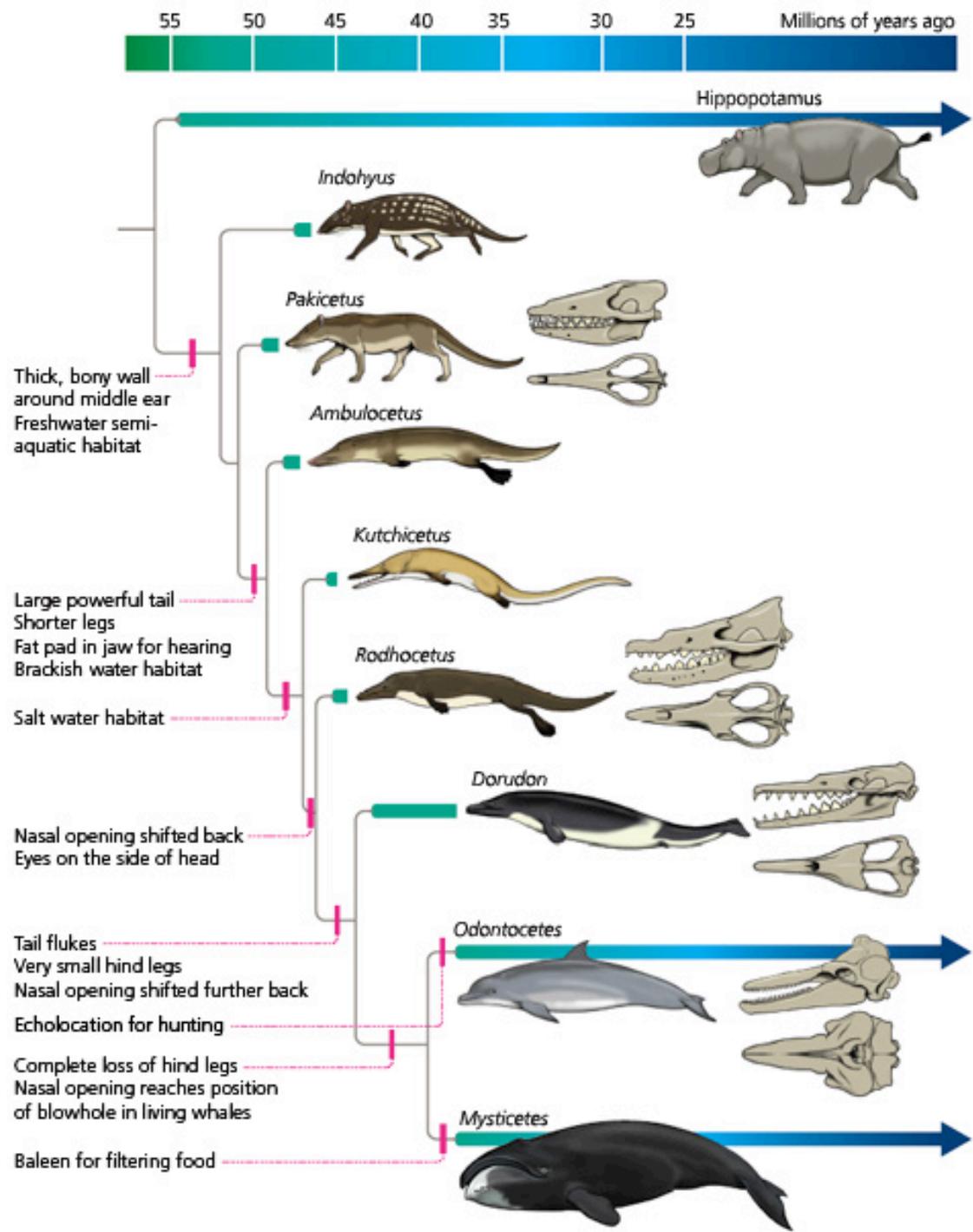
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Image: The Dragon of Bologna and other dragons by Ulisse Aldrovandi (1657), included in *1300 Real and fanciful animals: From Seventeenth-Century Engravings* (Dover, 1998).

Available at: <https://www.doverpublications.com/zb/samples/402371/art9b.htm>

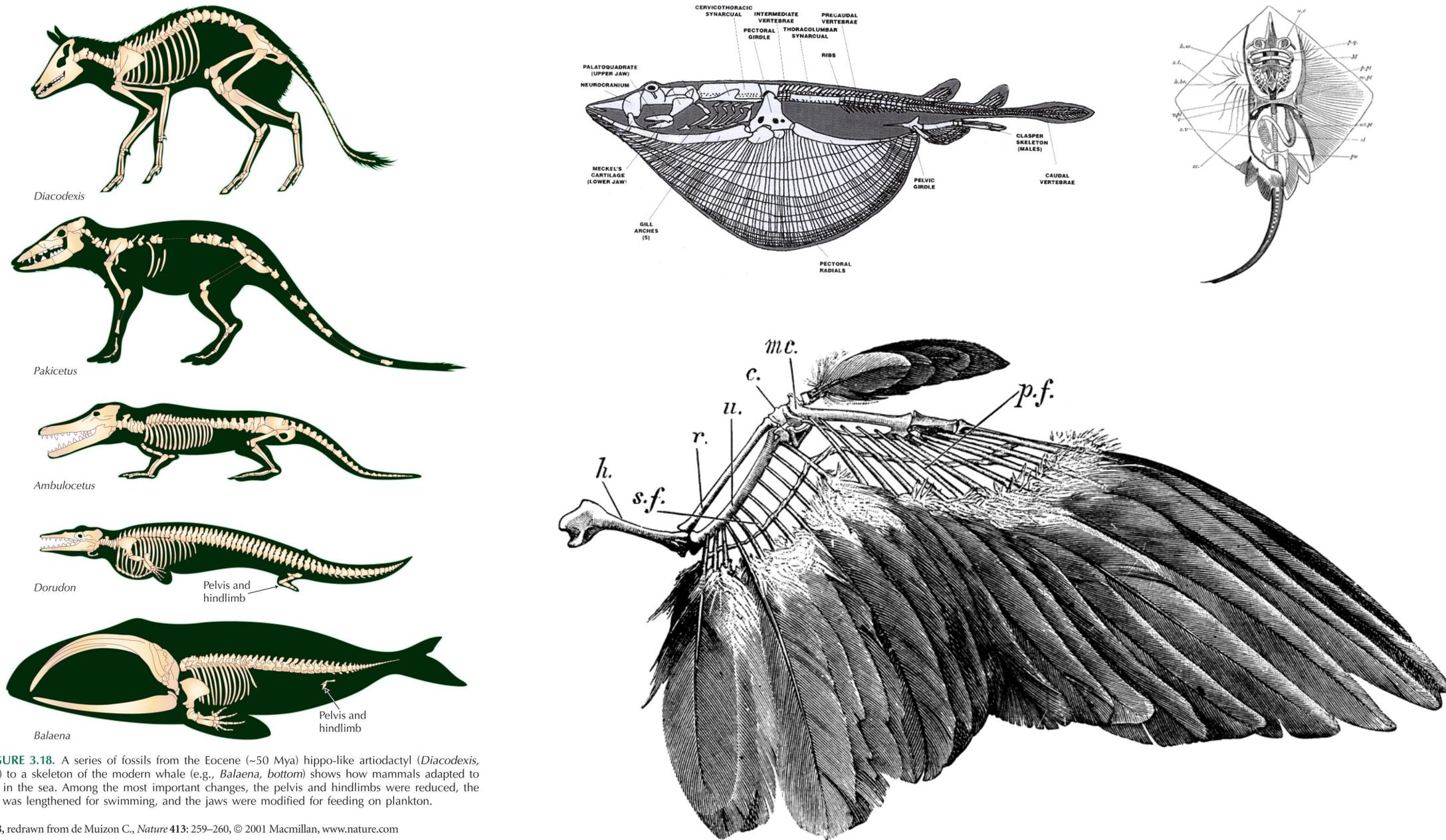




# Natural History-based Creature Design

Image: Whale phylogeny from *The Tangled Bank* (Zimmer, 2013).

Available at: [https://evolution.berkeley.edu/evolibrary/article/evograms\\_03](https://evolution.berkeley.edu/evolibrary/article/evograms_03)



**FIGURE 3.18.** A series of fossils from the Eocene (~50 Mya) hippo-like artiodactyl (*Diacodexis*, top) to a skeleton of the modern whale (e.g., *Balaena*, bottom) shows how mammals adapted to life in the sea. Among the most important changes, the pelvis and hindlimbs were reduced, the tail was lengthened for swimming, and the jaws were modified for feeding on plankton.

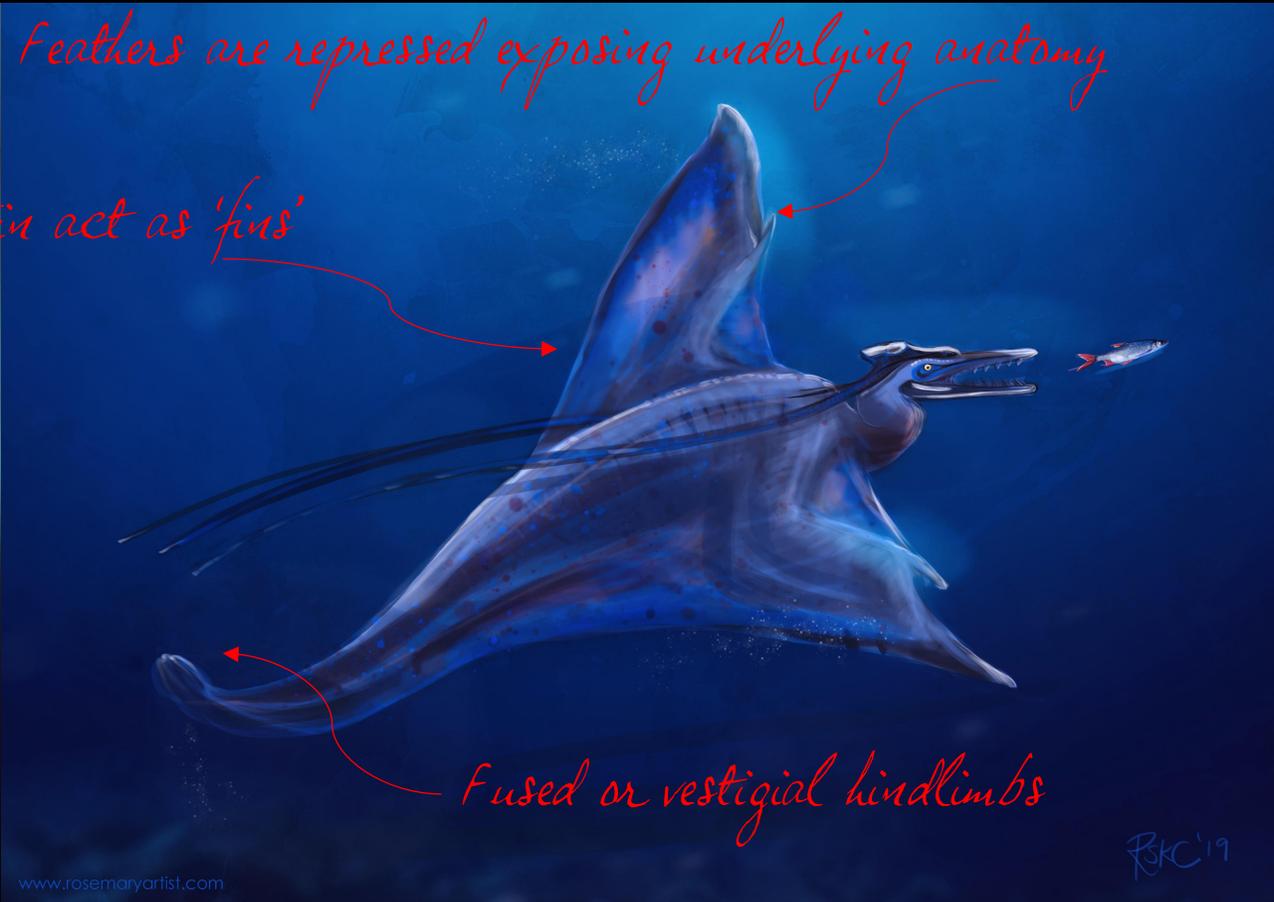






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*'Chimeric' creature design or Mythology-based creature design*

# Habitat-based Creature Design

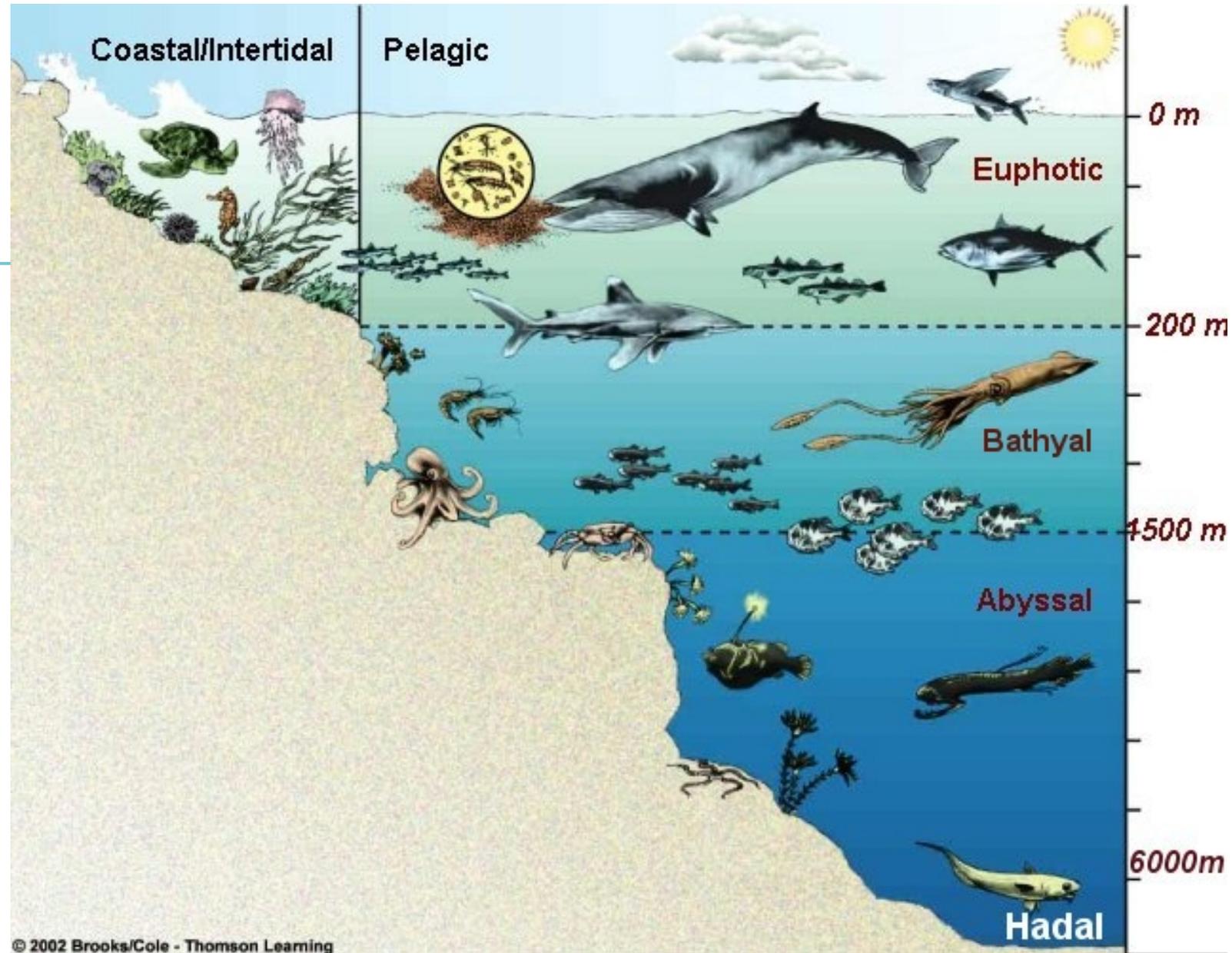
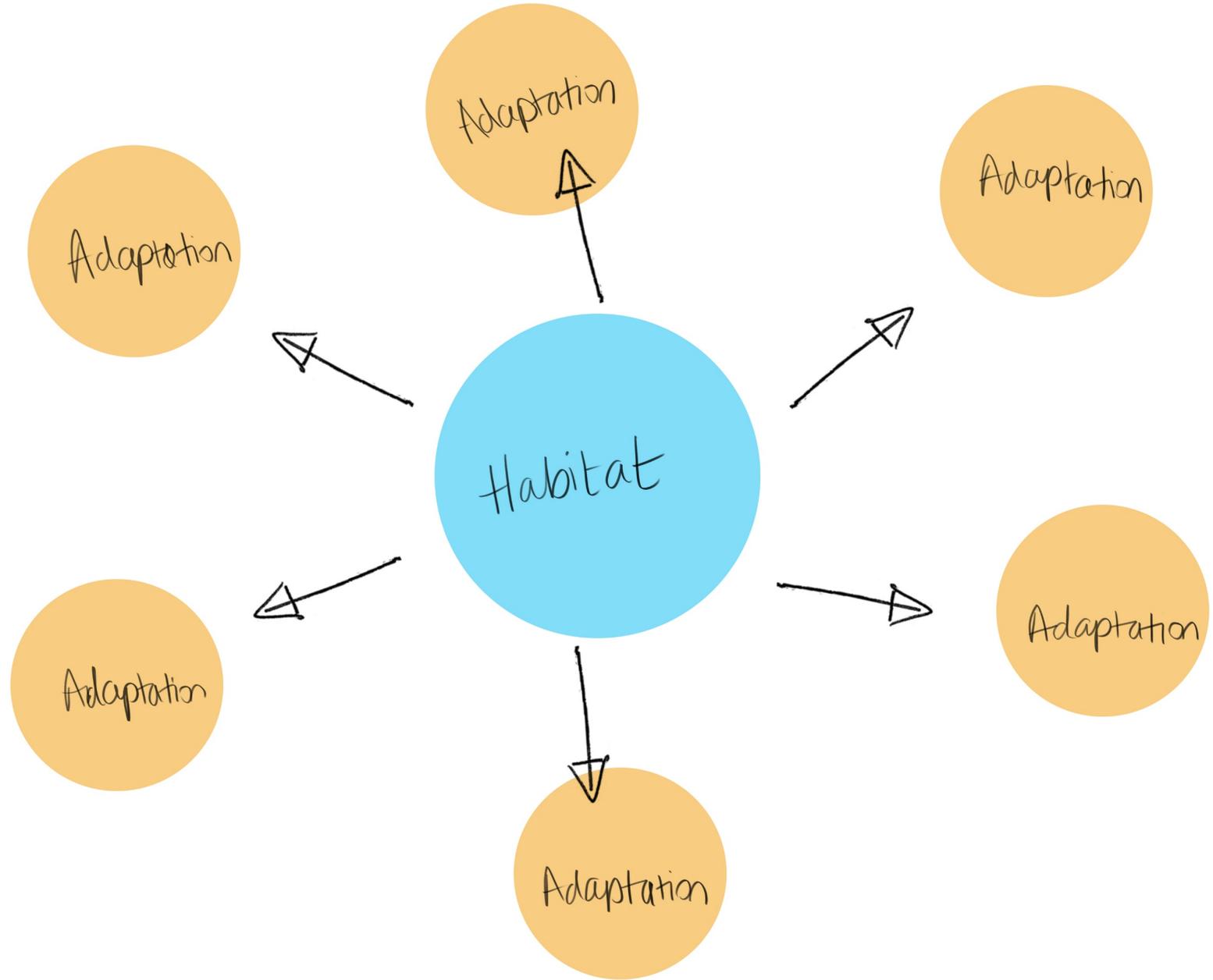


Image: Ocean zones by Thomas Learning (Brooks/Cole, 2002).

Available at: <http://parnellschool16.blogspot.com/2012/03/ocean-layers.html>





*Large, flat body shape to  
withstand deep-sea pressures*

*Wide, flexible tail for streamlined movement*

*Can change colour to camouflage*

*Bioluminescence for attracting prey  
or startling predators*





## Adaptation-based Creature Design

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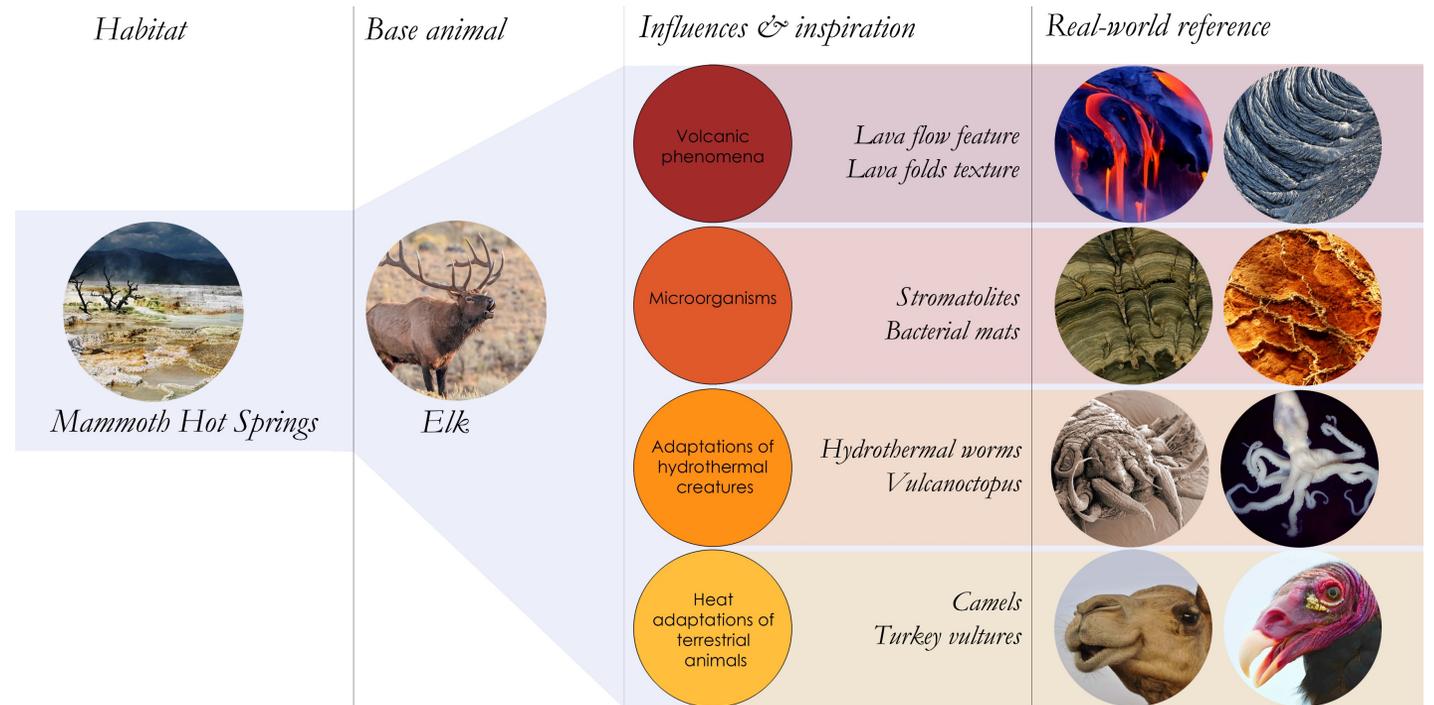


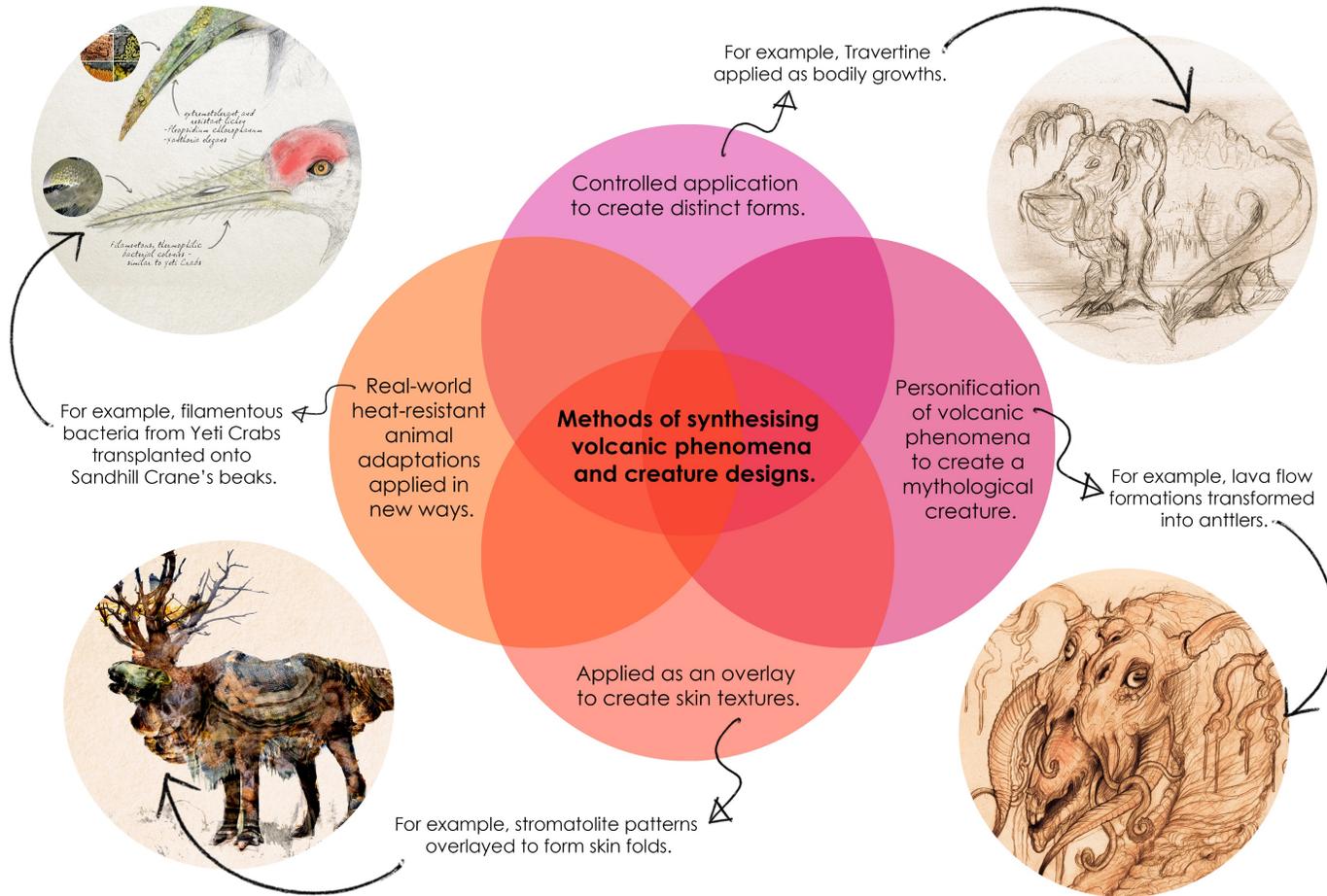


## SciArt Center Collaborative Residency: The Bridge

### SciArt Creature Design formula

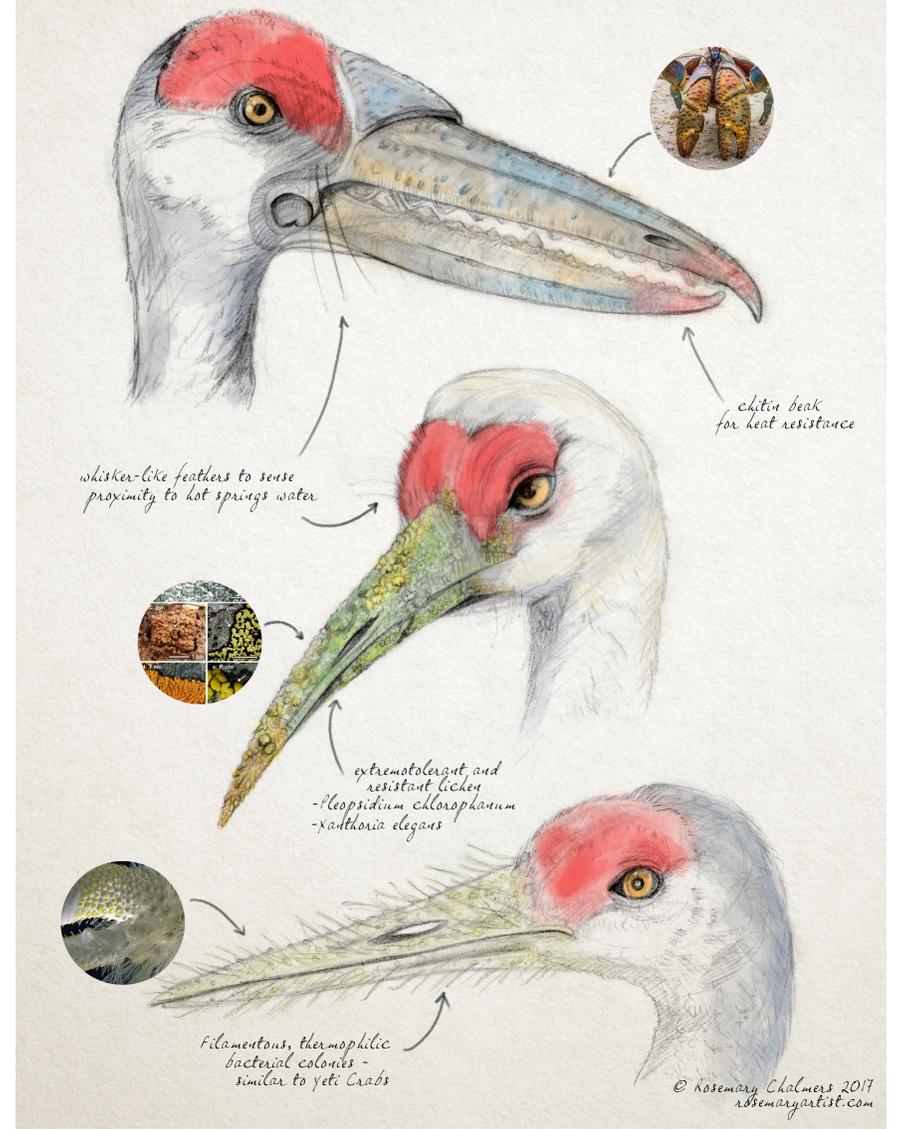
The process used to develop a fantasy creature that was believable and intrinsically inspired by volcanic phenomena.



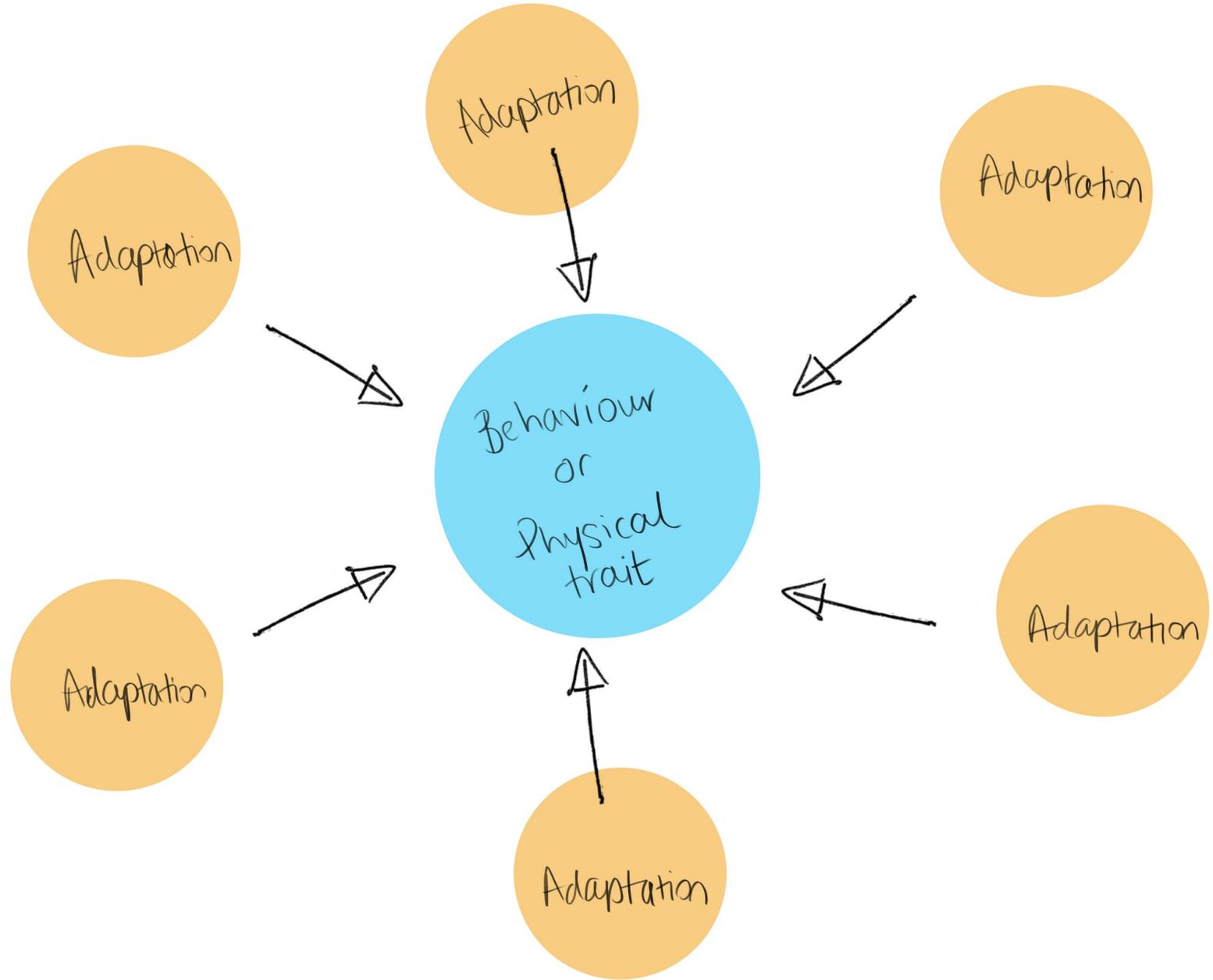


*The bridge: Experiments in science and Art // Rosemary Chalmers // [www.rosemaryartist.com](http://www.rosemaryartist.com)*

*speculation on a sandhill Crane's beak adapted to withstand the 70°C (160°F) water of Mammoth Hot Springs, yellowstone.*









Speculation on tentacle  
convergent evolution



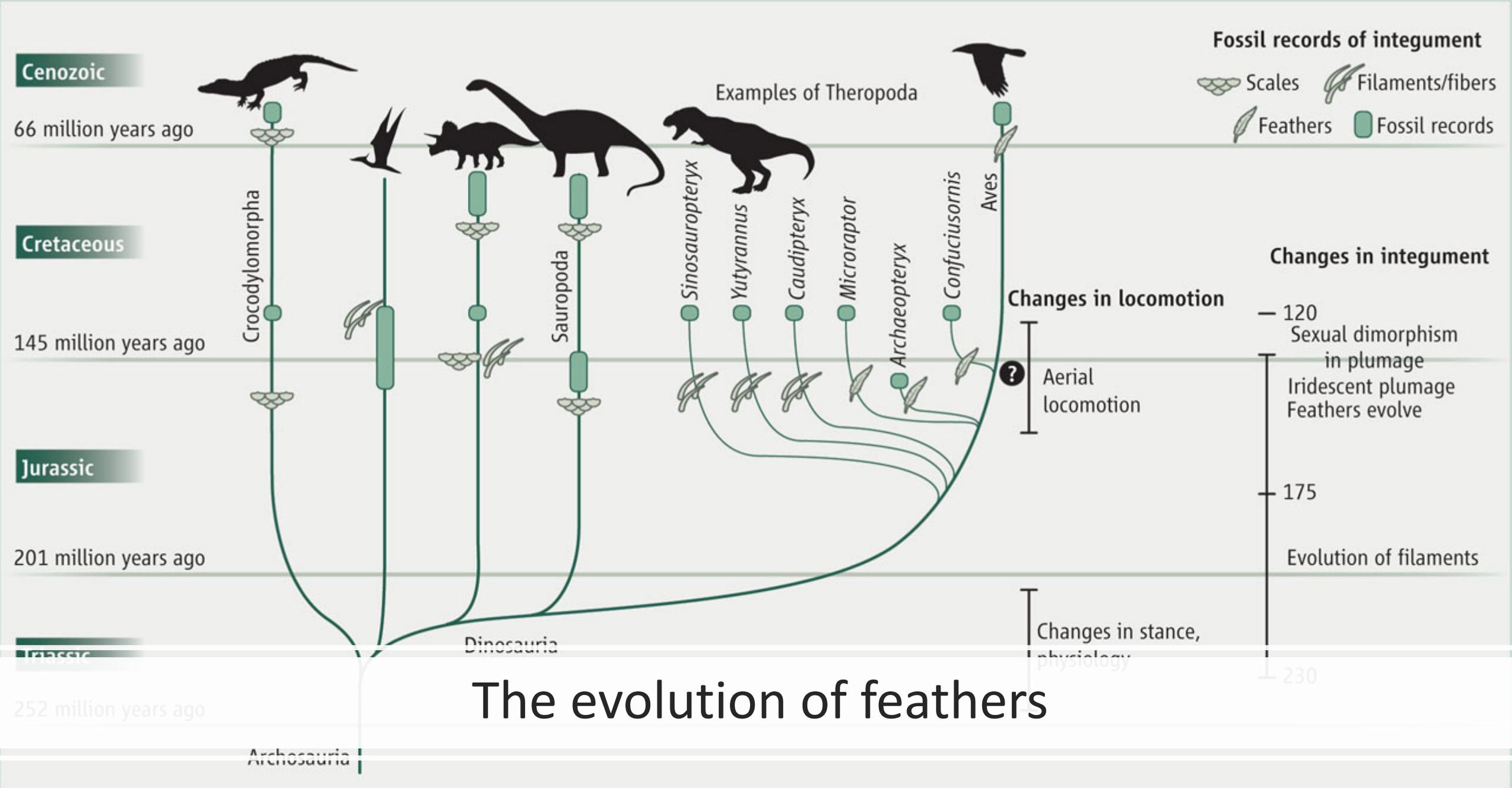


Image: Fossil records of integument from *Feathers before flight* (Clarke, 2013). Available at: [http://people.eku.edu/ritchisong/feather\\_evolution.htm](http://people.eku.edu/ritchisong/feather_evolution.htm)

# Sundews (Drosera)

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Tentacle (botanical)



Image: *South African King Sundew* by Fefferman, D (2017)  
Available at: <https://carnivorousplantresource.com/the-plants/sundews/south-african-king-sundew/>

Glandular hairs



Image: *Capensis Closeup* by "incidenceatrix" (2014). Used under licence: [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/). No changes made.  
Available at: <https://www.flickr.com/photos/incidenceatrix/12283174944/>

# Symbioses

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## 'Pom-pom' crabs and anemones



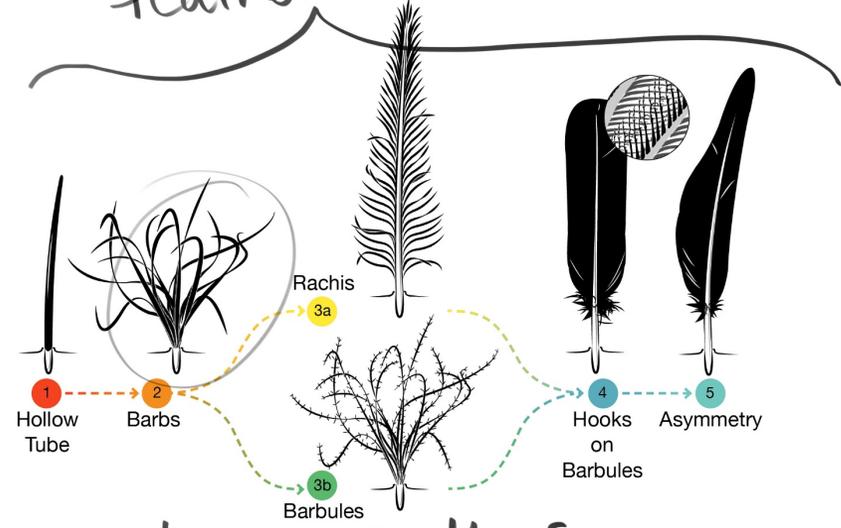
Image: *Lybia leptochelis* by Schnytzer, Y. (2017)  
Available at: <https://news.nationalgeographic.com/2017/01/crabs-anemones-pom-pom-clones-fight/>

## 'Yeti' crabs and filamentous bacteria

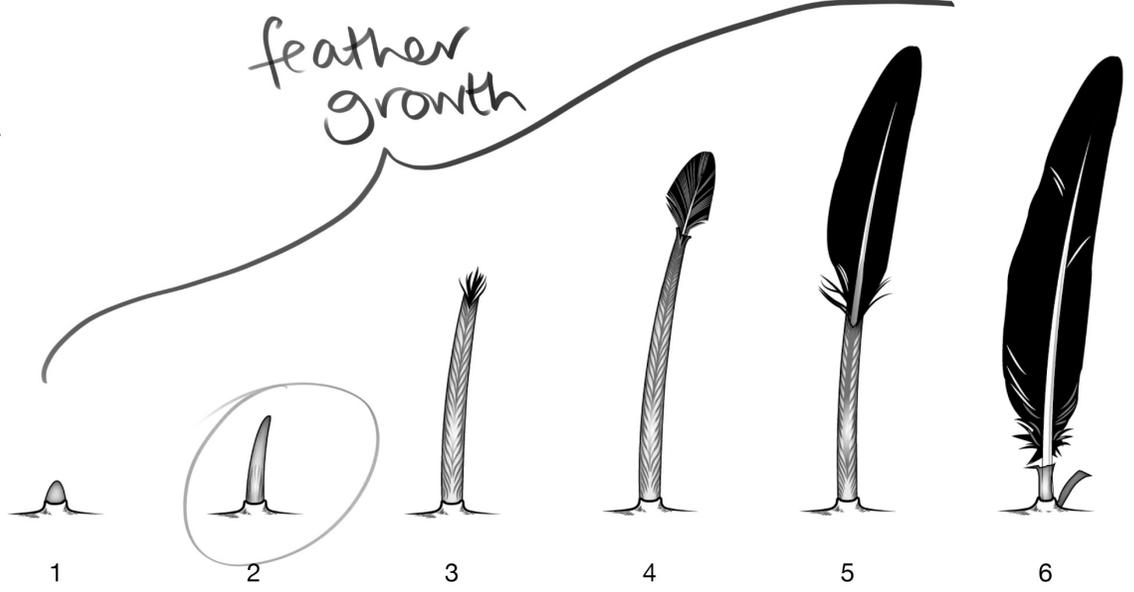


Image: *Kiwa hirsuta* by Ifremer / A. Fifis (2005)  
Available at: <https://www.mbari.org/discovery-of-yeti-crab/>

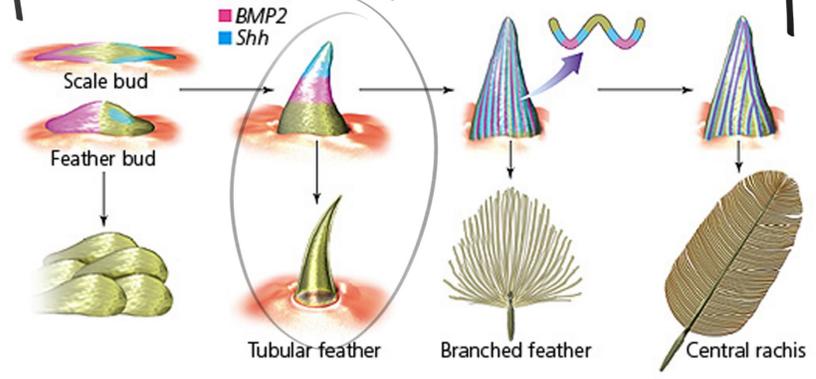
# feather evolution



# feather growth



# scales vs. feathers

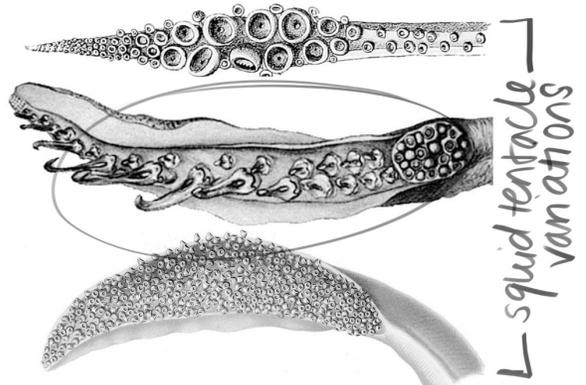


2nd stage  
scale  
vs  
feather  
evo

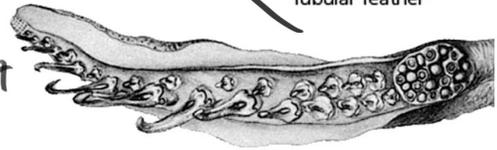
2nd stage  
feather  
growth

barb-stage  
(feather evo)

what is in between  
a scale and a  
feather?



Squid  
tentacle



flexible, oversized  
barbs/barbules

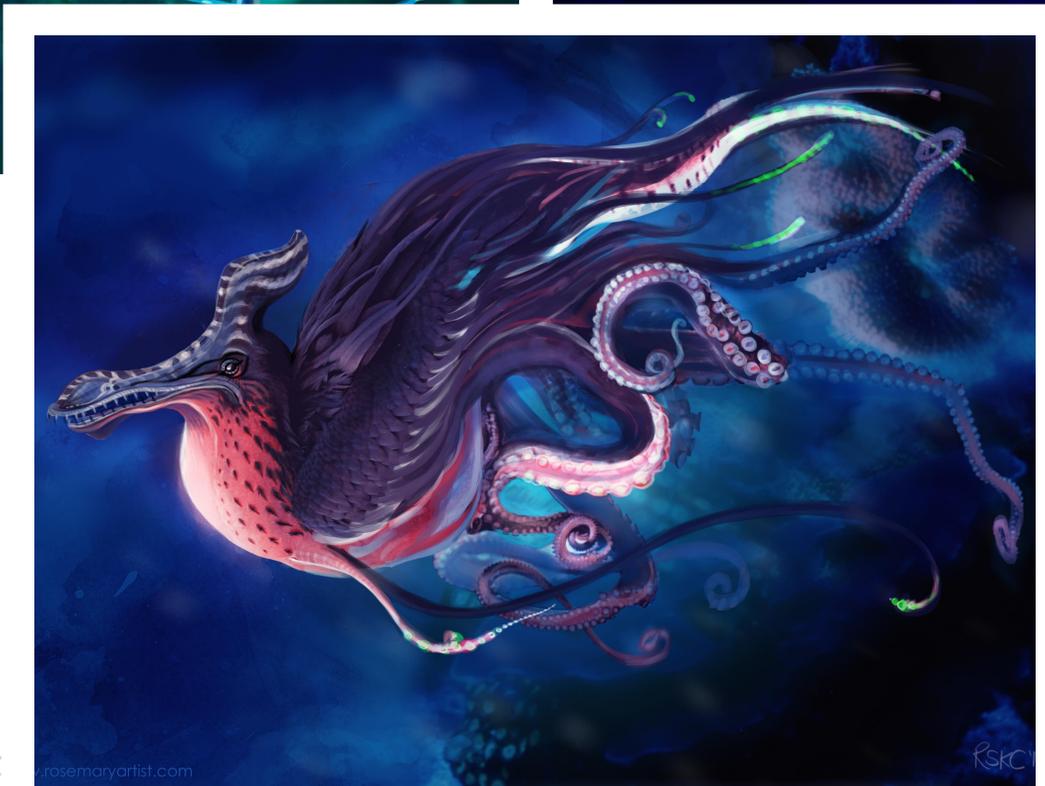
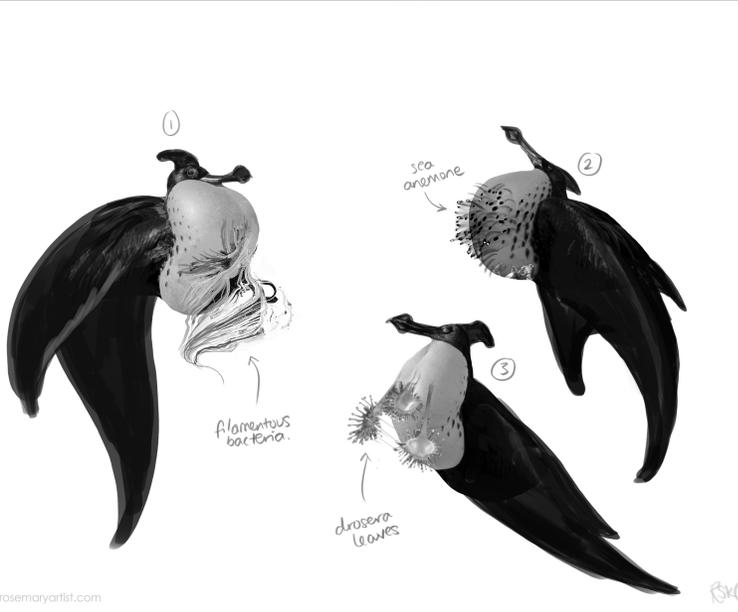
flexible, oversized  
rachis

skin









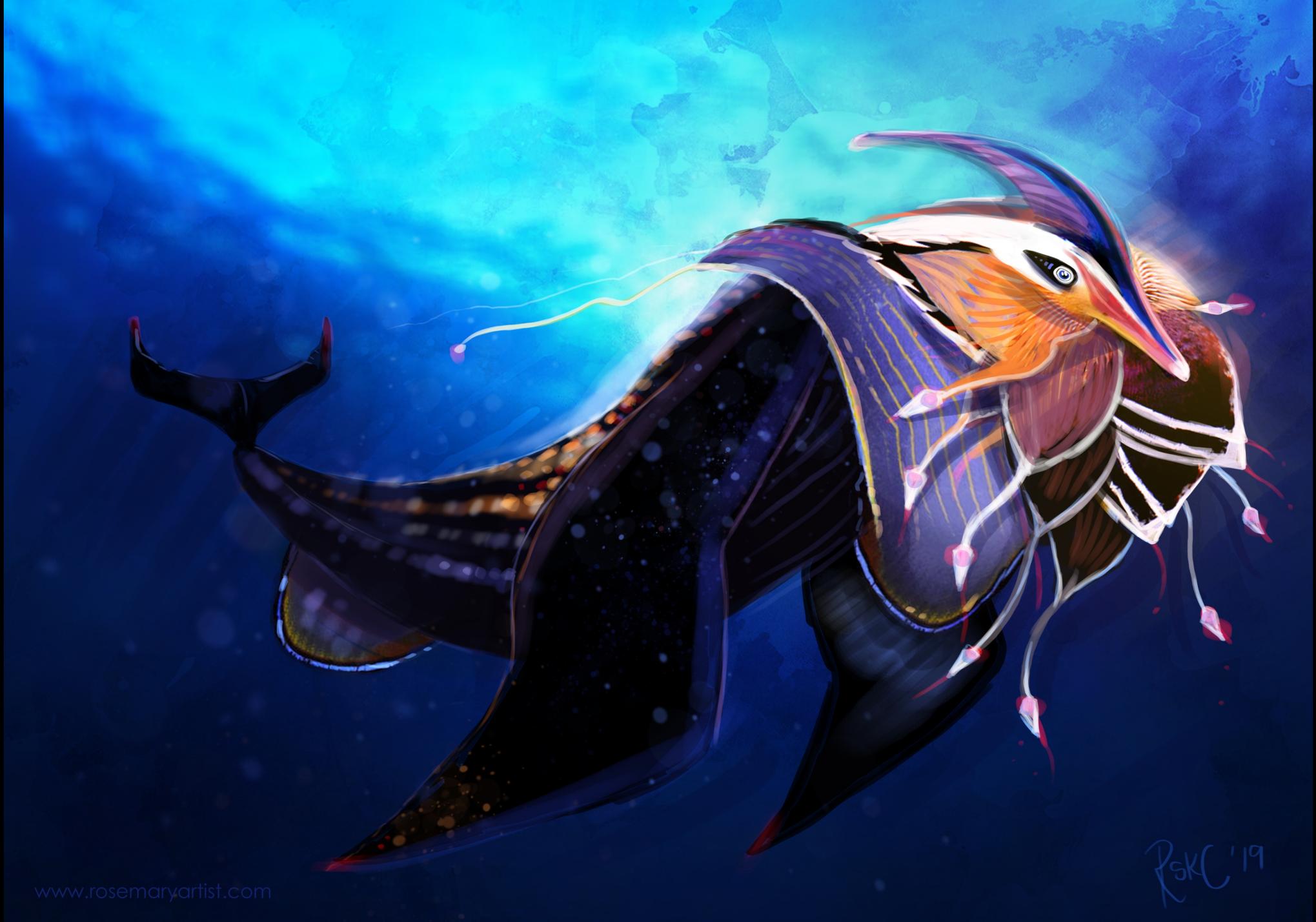


RSKC'19



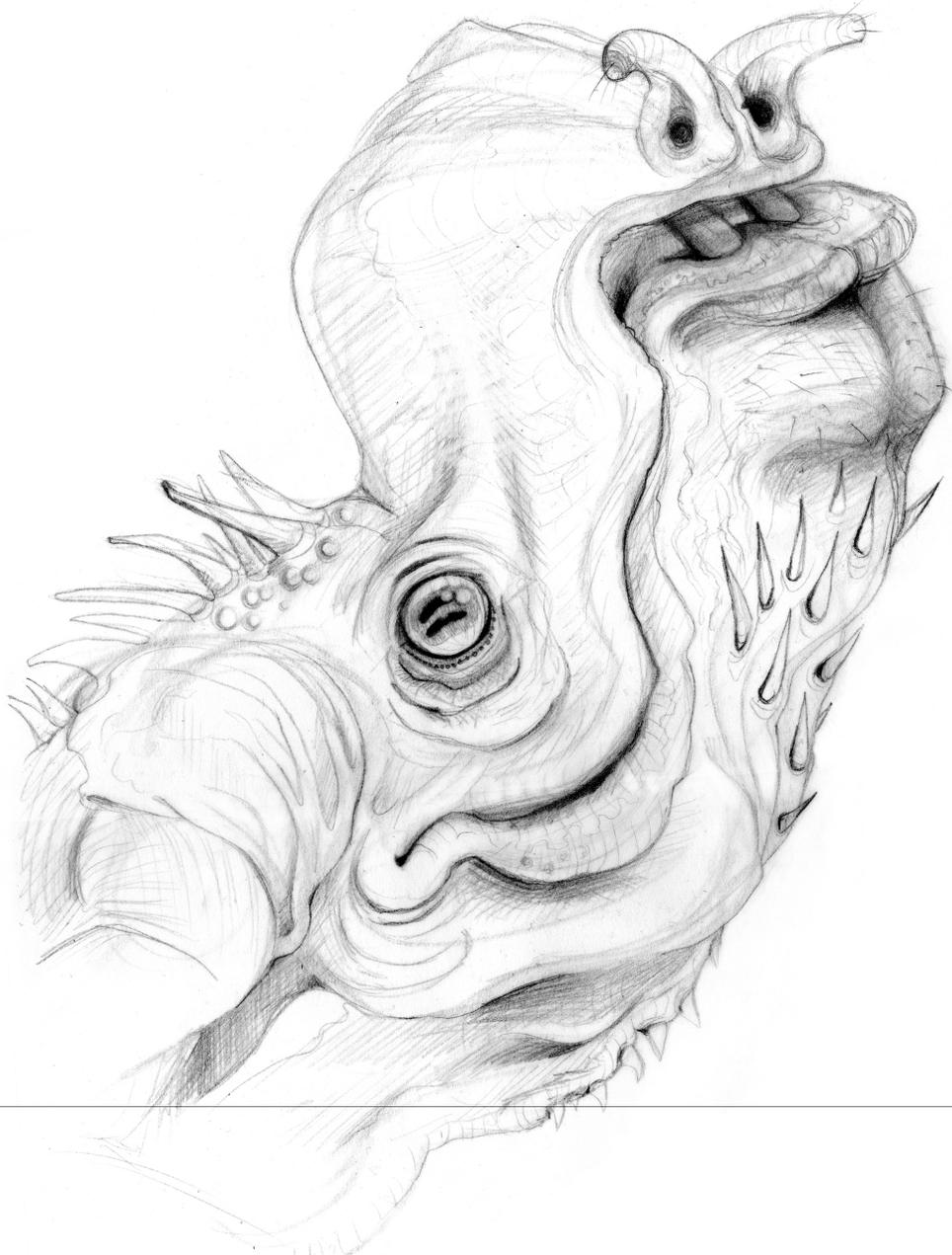






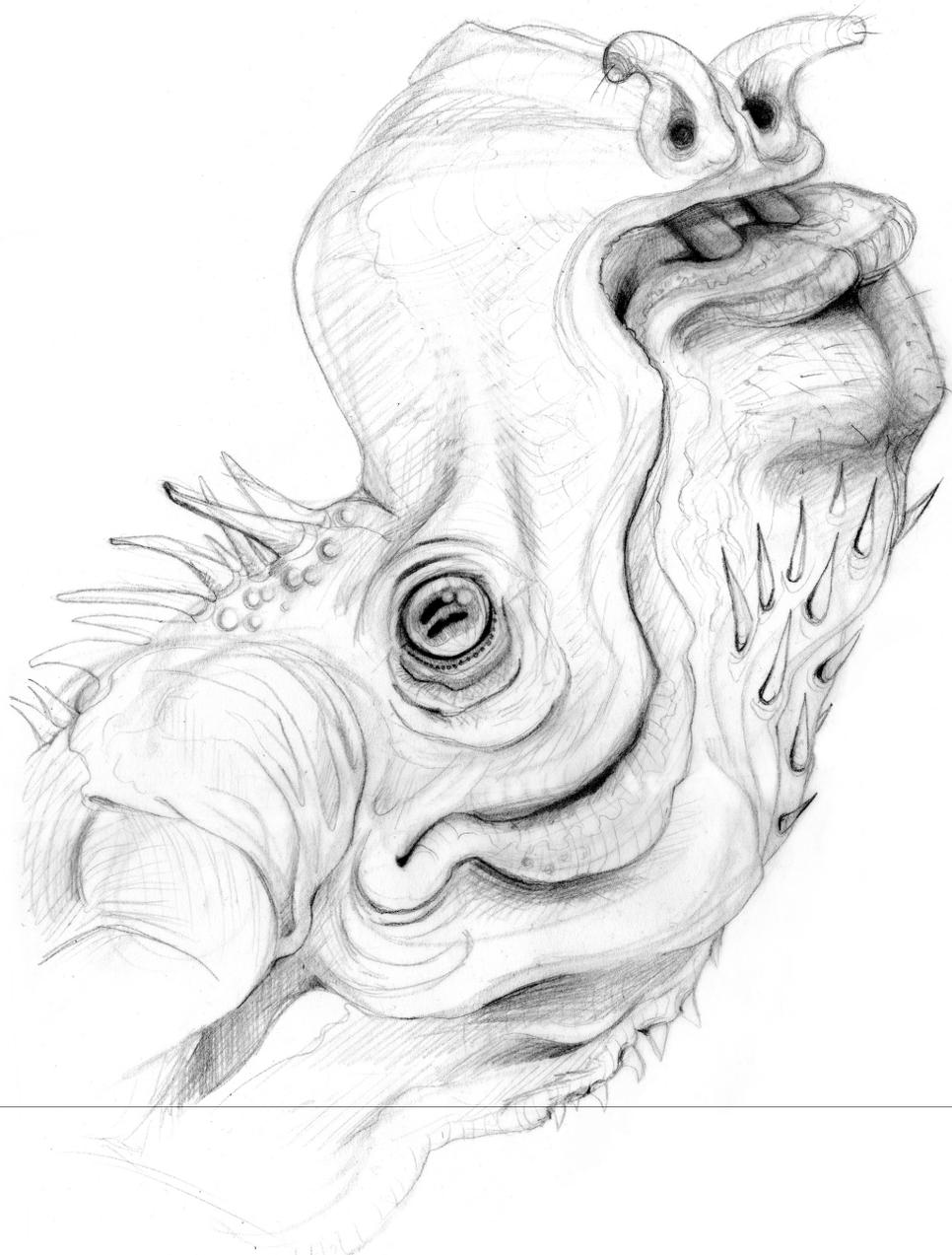
Rosemary Chalmers

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# Tooth & Claw

creature design process and believability



*Voracious Squagull*  
↙

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# Tooth & Claw

creature design process and believability



Voracious Squagull  
←

STRONG

AGILE

ALIEN-LOOKING

ATTACK/DEFEND IF NECESSARY

NOT MUCH BIGGER THAN A HUMAN

Tooth & Claw

creature design process and believability

# Initial sketches—first pass



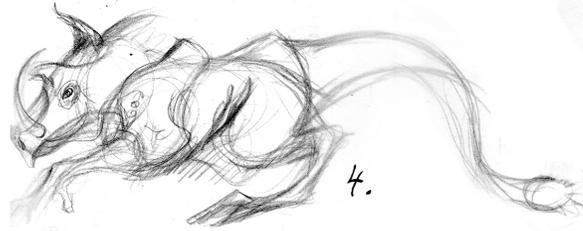
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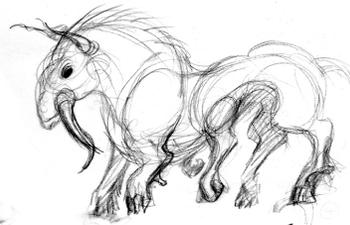
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3.



4.



5.



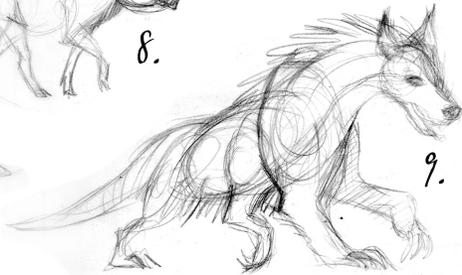
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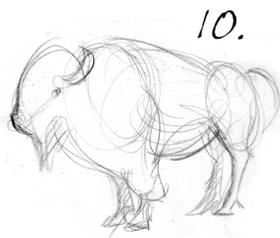
7.



8.



9.



10.



11.



12.



14.



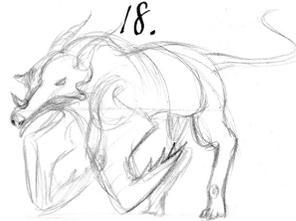
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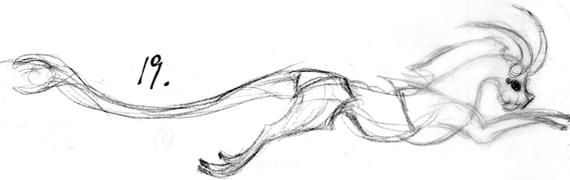
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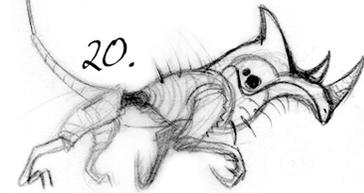
16.



18.



19.



20.



21.



17.



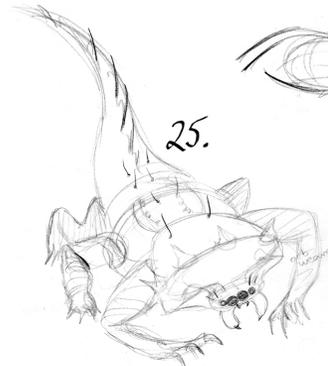
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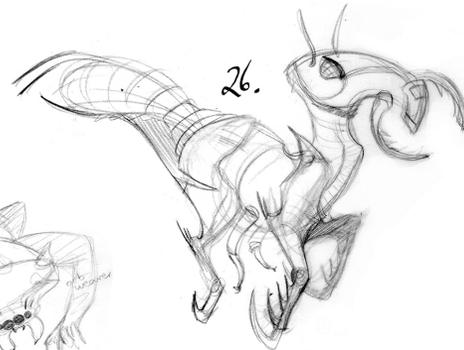
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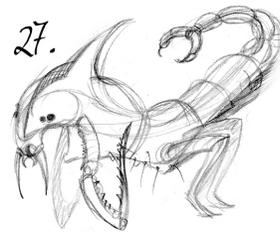
24.



25.



26.



27.



28.

# Initial sketches—first pass





# Initial sketches—second pass



# Initial sketches—second pass



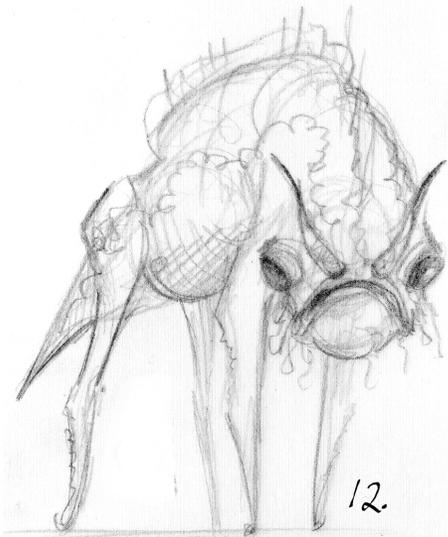
# Initial sketches—second pass



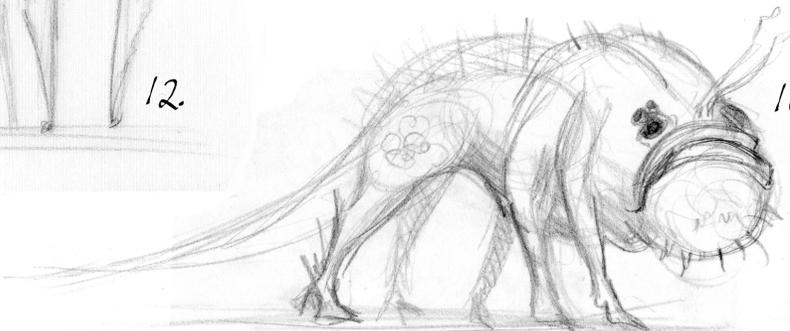
STRONG  
AGILE

ALIEN-LOOKING  
ATTACK/DEFEND IF NECESSARY  
NOT MUCH BIGGER THAN A HUMAN

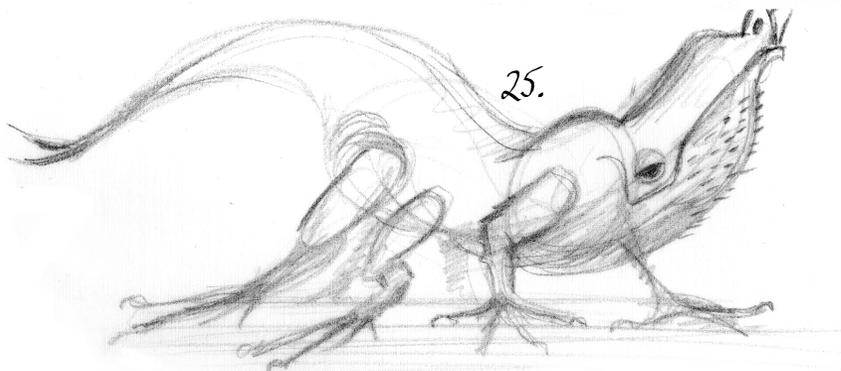
# Anatomical development



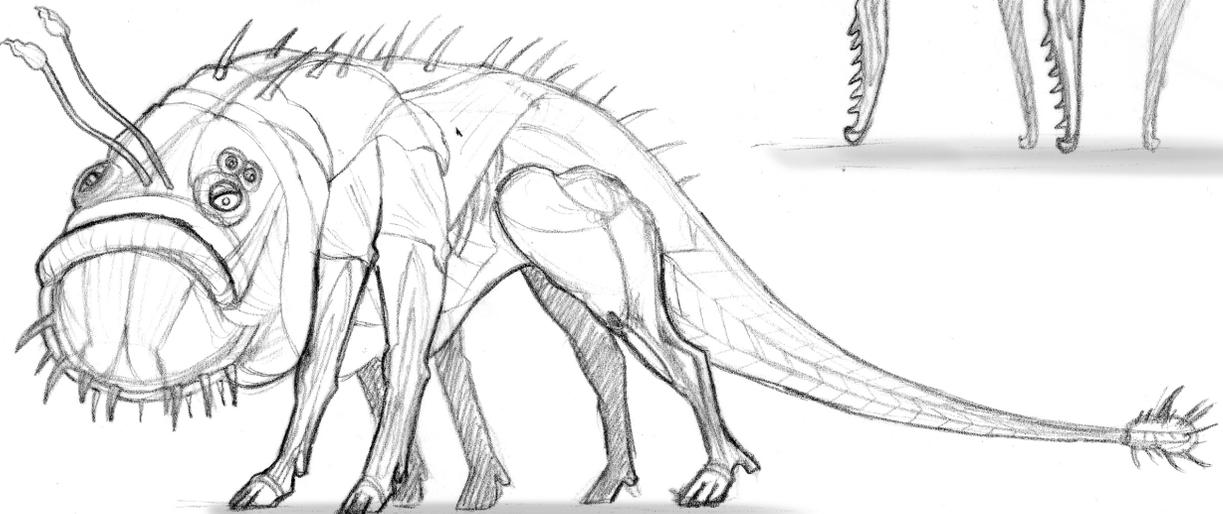
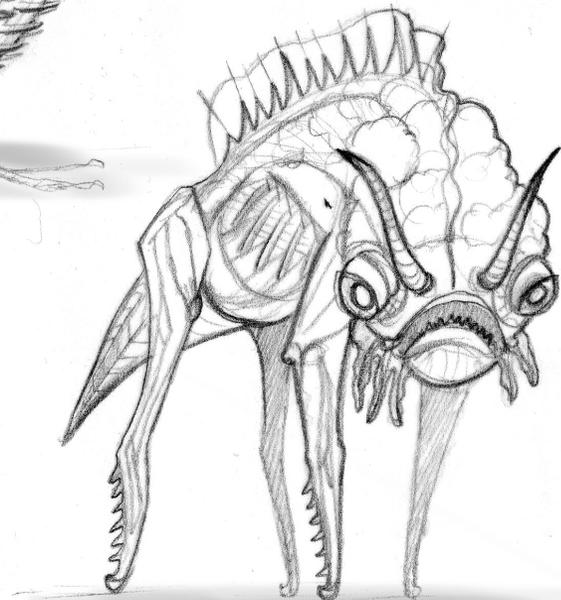
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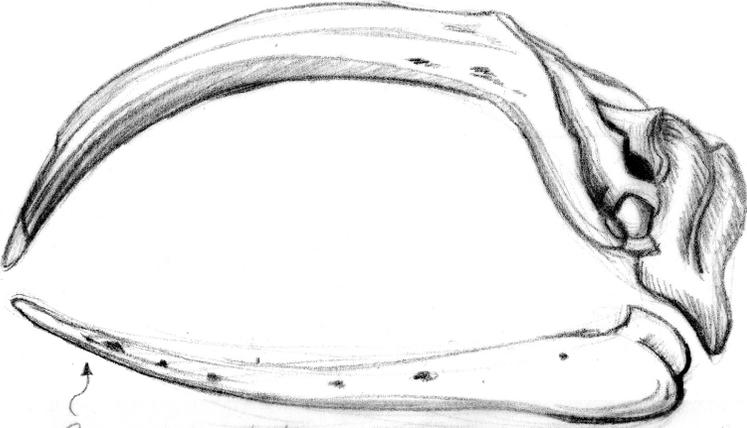
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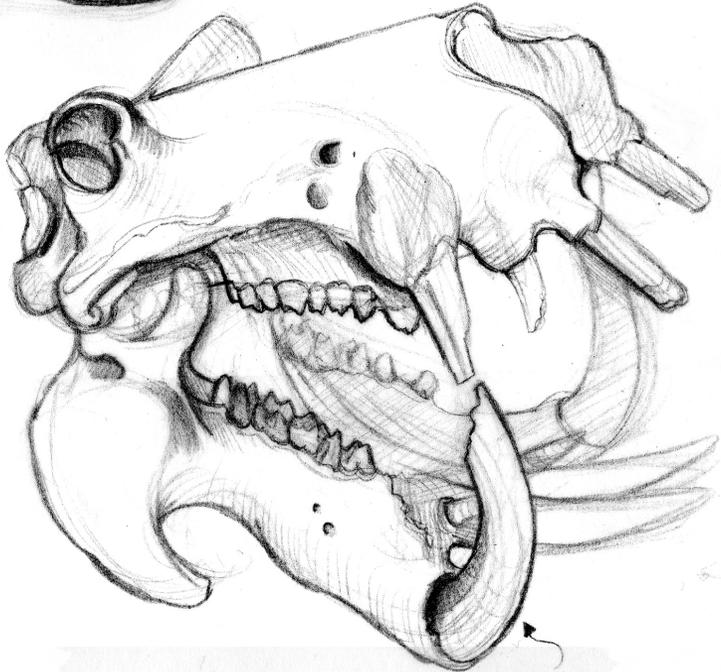
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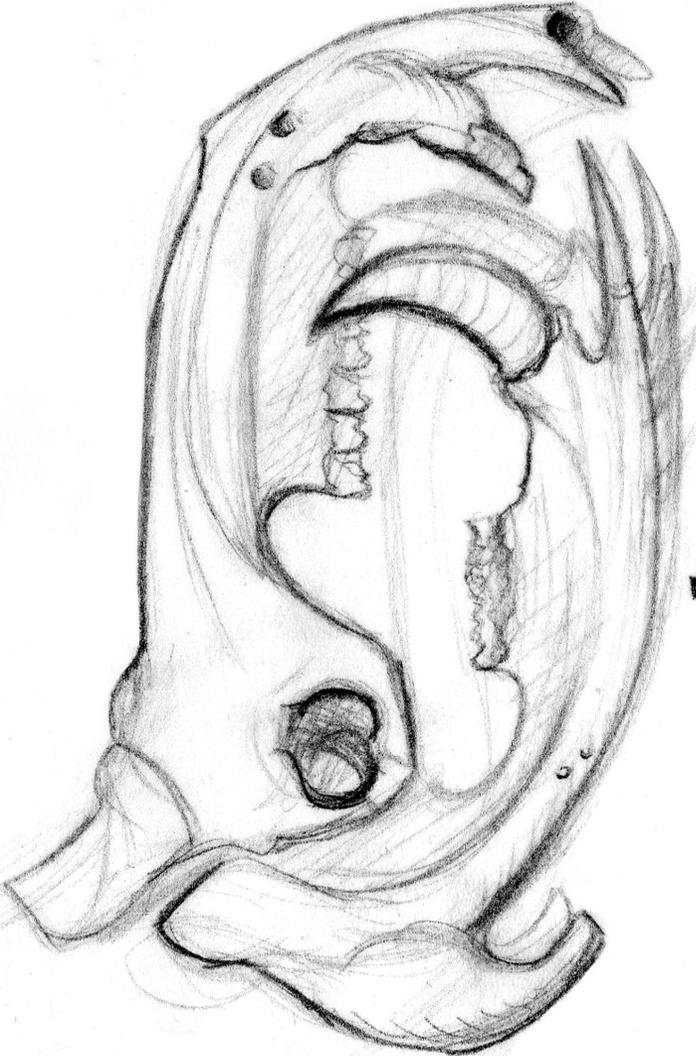
# Skull development



Right whale skull.

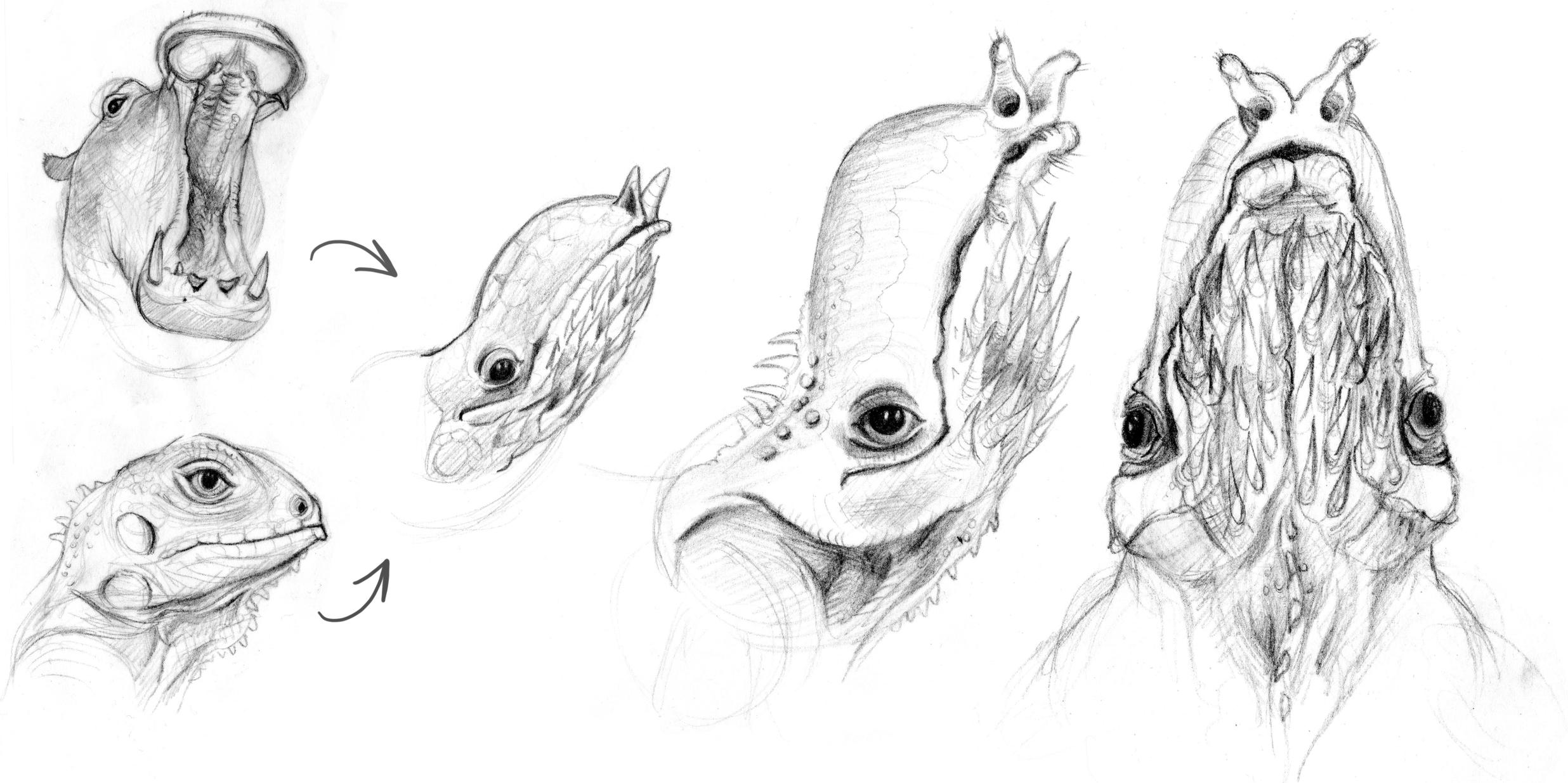


Hippo skull.



Creature skull

# Head development



# Behaviour studies



① BASKING.



③ SPRINTING.



② CLIMBING.

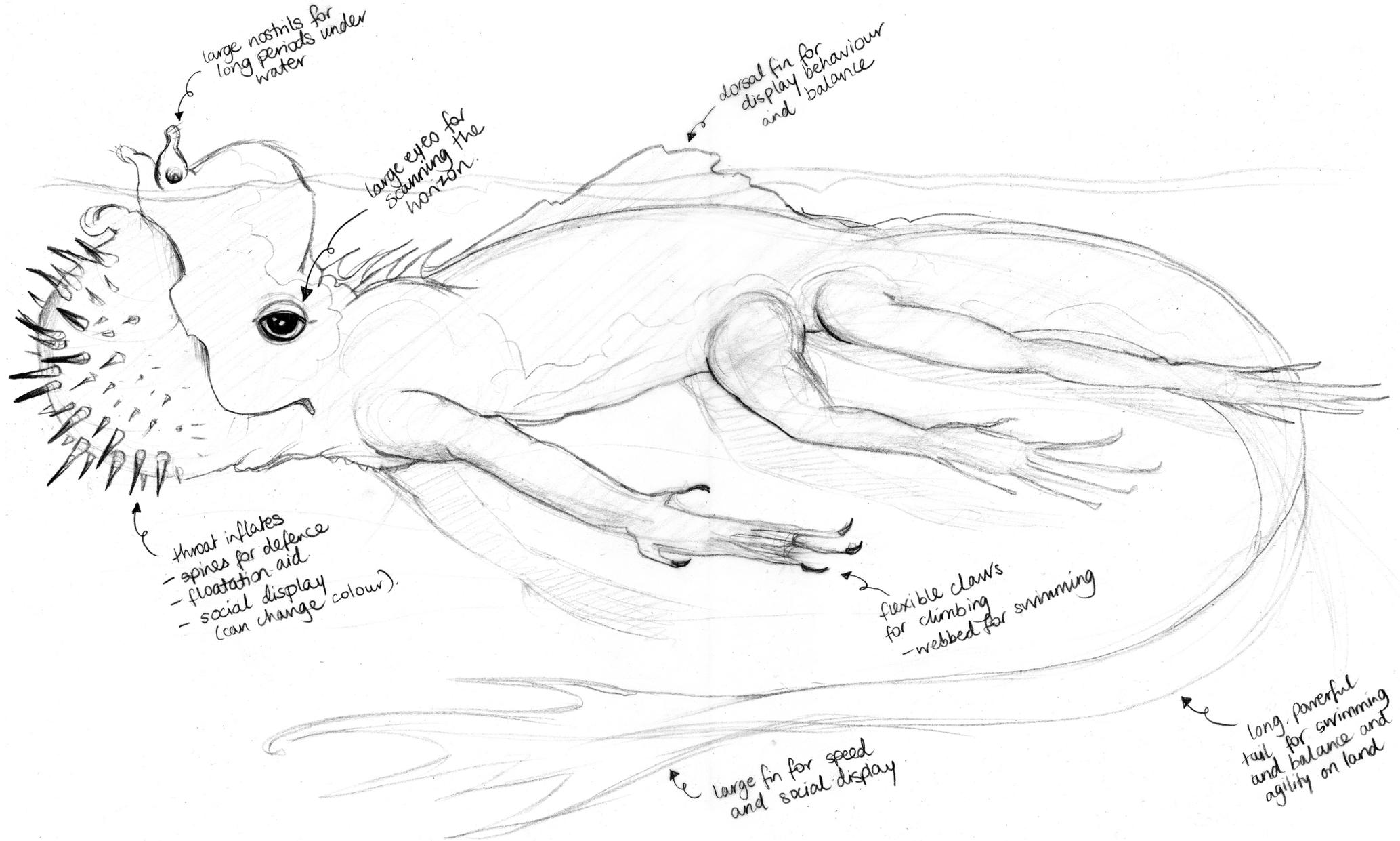


④ AGGRESSIVE



⑤ RESTING

# Adaptations



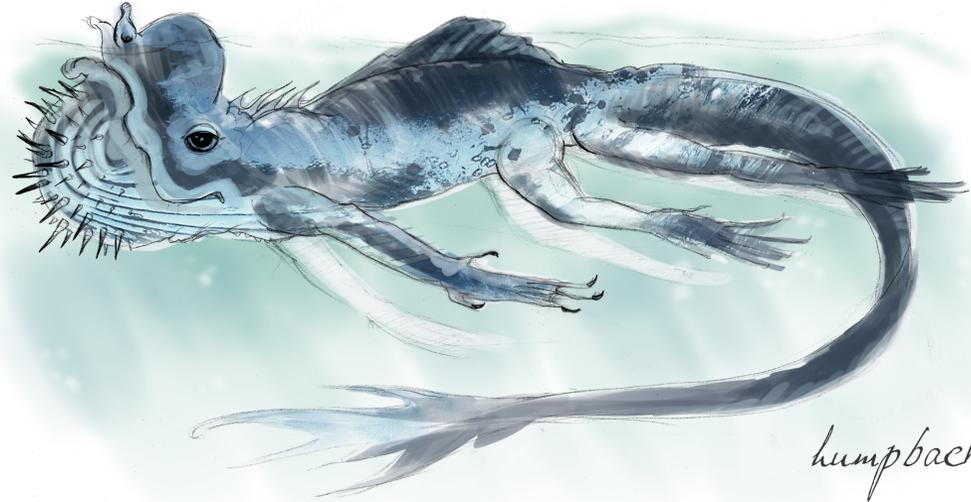
# Patterning options

A.



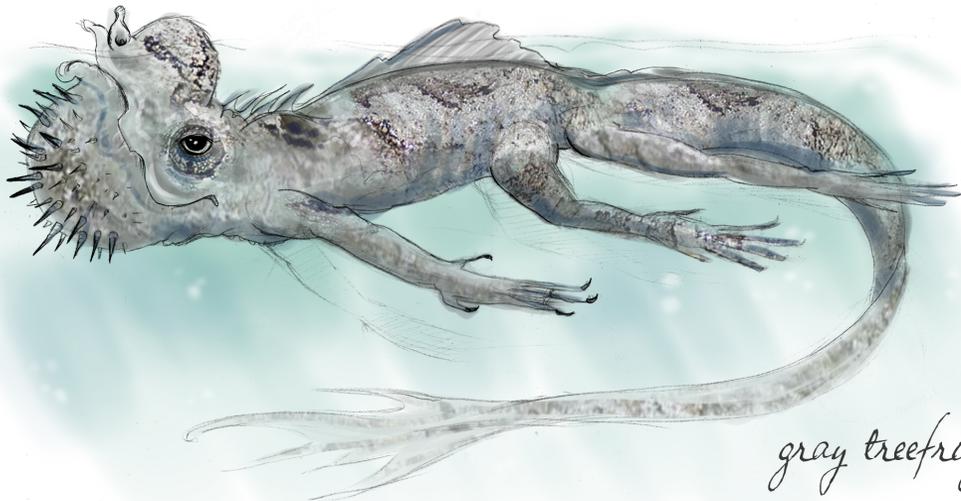
*whale shark*

B.



*humpback whale*

C.



*gray treefrog*

D.

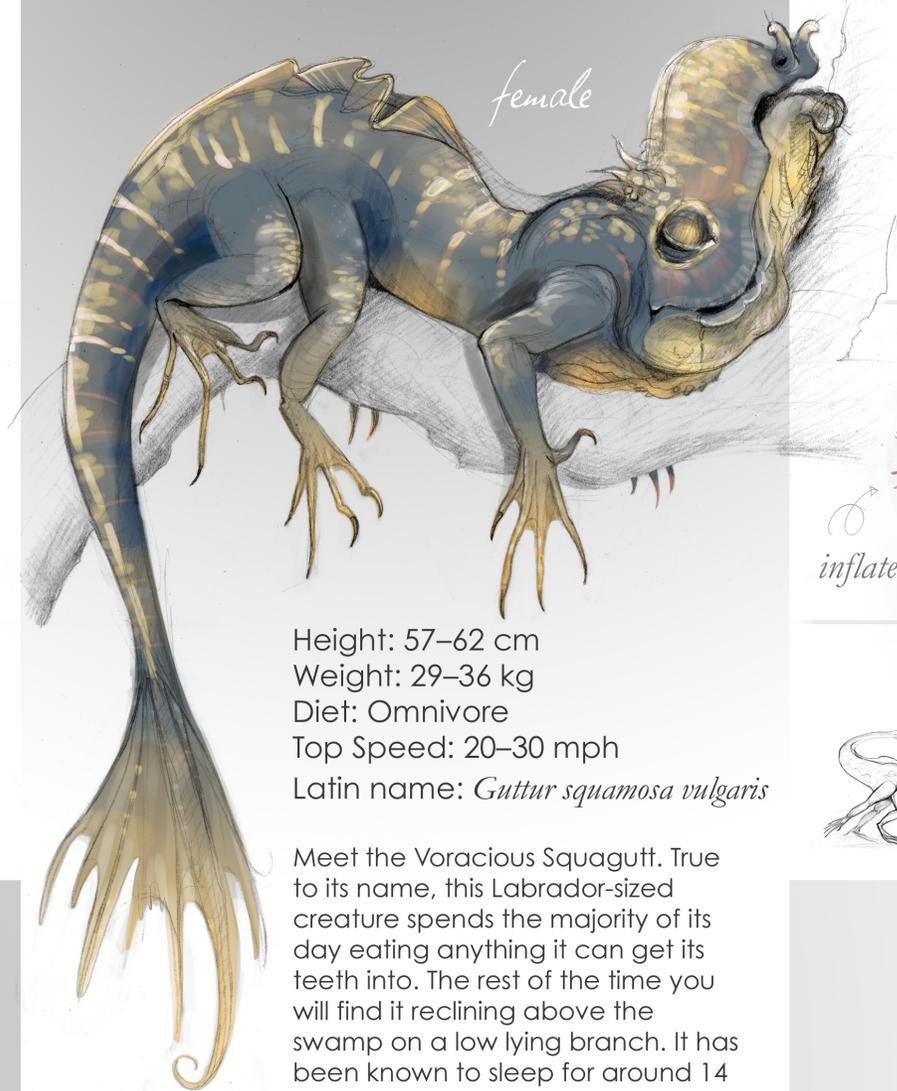


*mangrove monitor lizard*



# Voracious Squagutt

*Guttur squamosa vulgaris*



female

Height: 57–62 cm

Weight: 29–36 kg

Diet: Omnivore

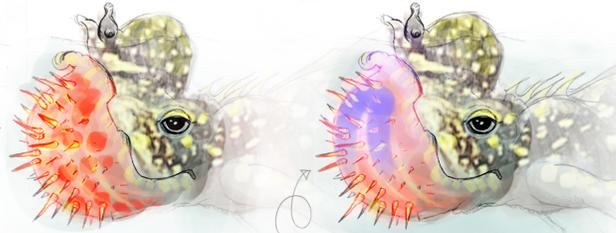
Top Speed: 20–30 mph

Latin name: *Guttur squamosa vulgaris*

Meet the Voracious Squagutt. True to its name, this Labrador-sized creature spends the majority of its day eating anything it can get its teeth into. The rest of the time you will find it reclining above the swamp on a low lying branch. It has been known to sleep for around 14 hours per day!

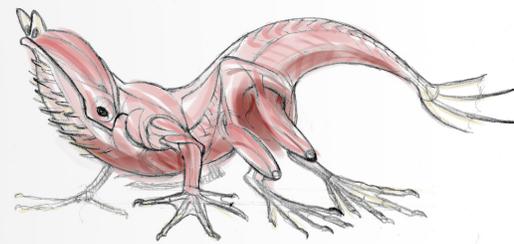


male



inflated gular

gular can change colour due to chromatophores



# The Rosemary Chalmers Method

What kind of habitat will your creature exist in?

- Think about how this would change its behaviour and physiology.
- Choose some animals from this habitat for inspiration.

What kind of adaptations will your creature possess?

- Think about how this would change its behaviour and physiology.
- Choose at least three adaptations/behaviours and associated animals for inspiration.

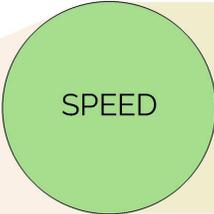
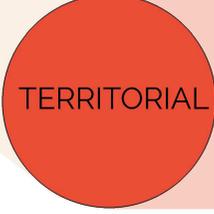
Choose a base animal for the creature's overall body shape.

- Use features from the real-world animals collected in the previous stages to systematically change the base animal.

# The Rosemary Chalmers Method

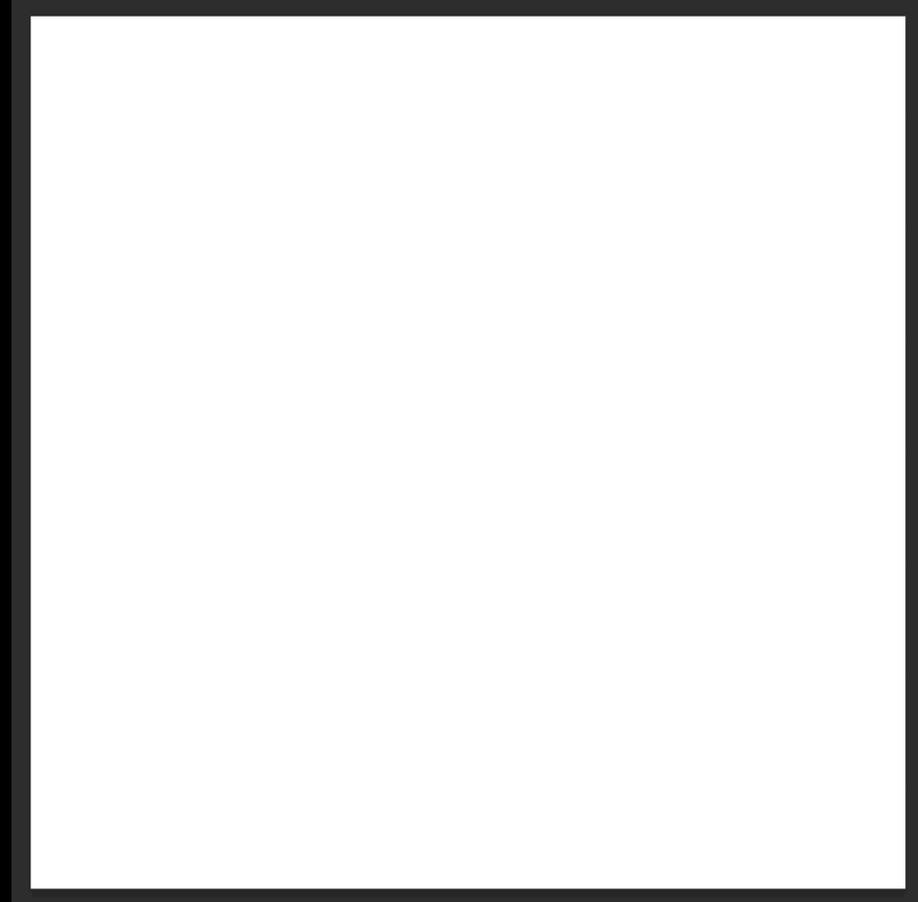
## *Creature Design formula*

A process for developing a 'backstory' for your creature in order to find the right animal reference and generate ideas.

<i>Habitat</i>	<i>Base animal</i>	<i>Adaptations &amp; Behaviours</i>	<i>Real-world animal reference</i>
 <i>Reef</i>	 <i>Green Sea Turtle</i>	 <i>Lemon Shark</i>	 
		 <i>American Crocodile</i>	 
		 <i>Nubian Ibex</i>	 

# Digital Process

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*Thank you!*



Rosemary Chalmers  
[rosemaryartist.com](http://rosemaryartist.com)

# Collaborative Drawing!

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*Chalmers, R (2019)*



*Chalmers, R (2019)*



*Chapman, J & D (2000)*