

# Ammonites

from Mythology & Folklore to Geological Relevance

By

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July 2<sup>nd</sup> 2020



# Bath Geological Society Lecture

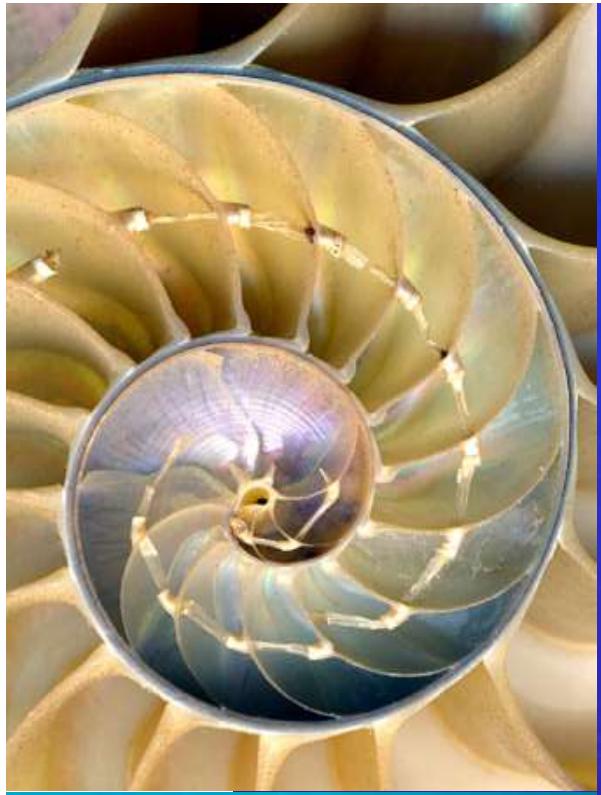
## Ammonites

- Mythology/Folklore
- Origins
- Living Organisms
- Evolution
- Extinction
- Fossilization & Preservation
- Geological Relevance

## Folklore





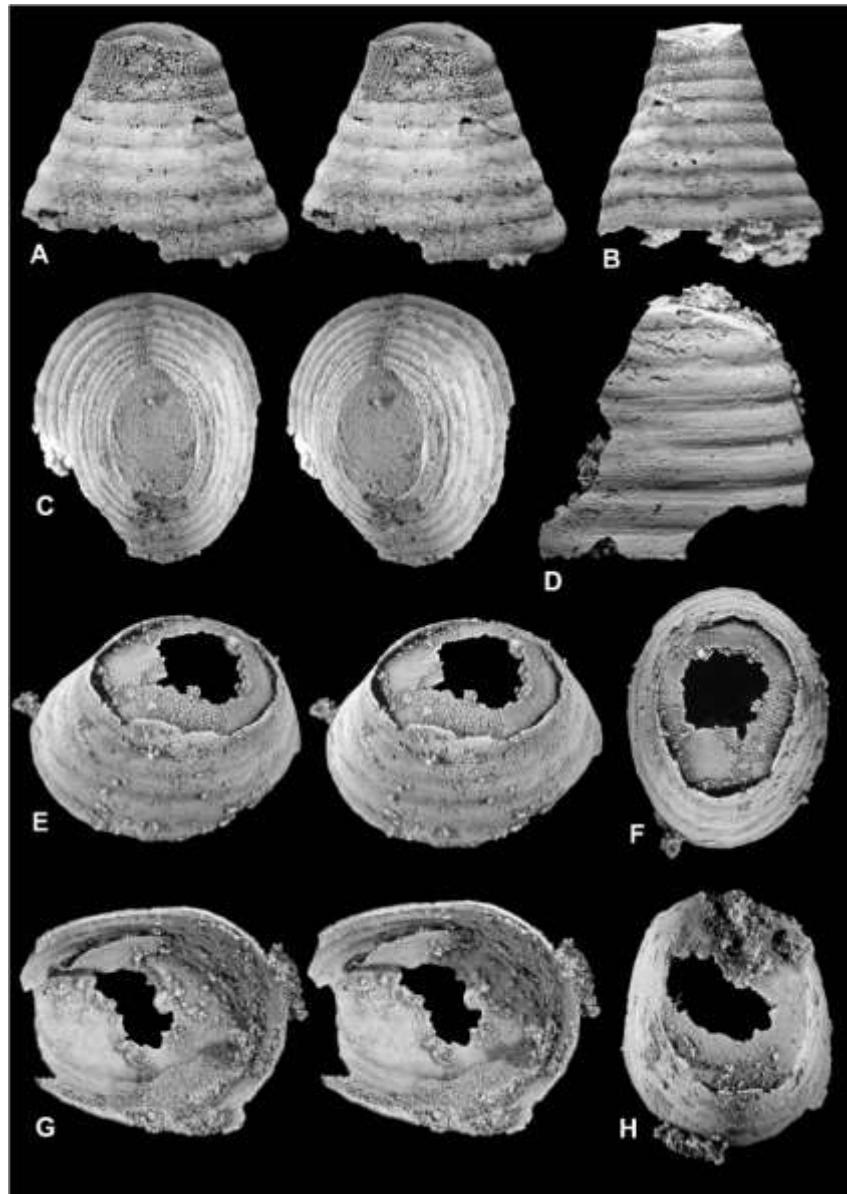


# The appearance of Cephalopod Molluscs

Lower Cambrian

*Tannuella*

Thin shells – shallow depth



# Ordovician Orthocone Nautiloid



5.0 mm

# Orthocones



# Devonian Orthocones & Goniatite

## Why go spiral?



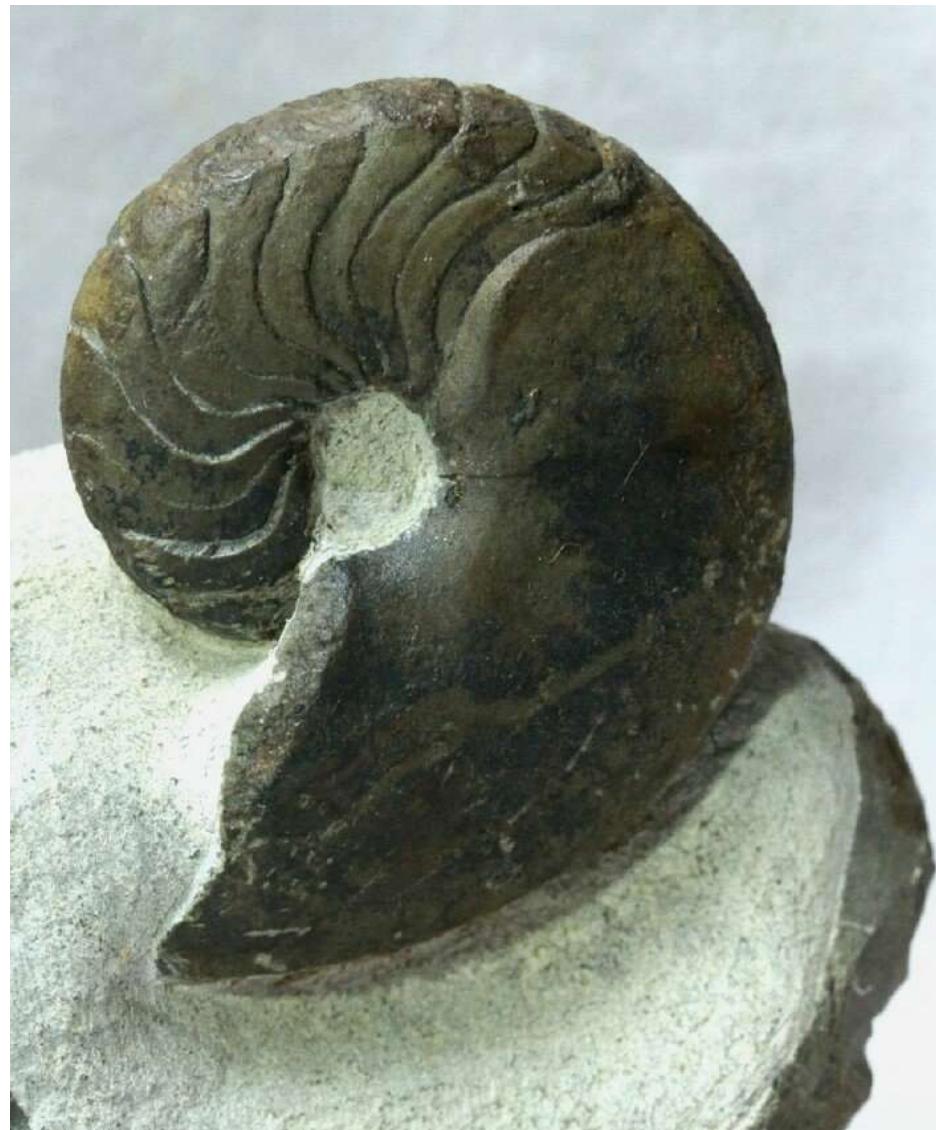
Less shell required

Stability – Centre of Mass near centre of buoyancy

More manoeuvrable



# Devonian Ammonoids



# Devonian-Carboniferous Goniatites



# Permian Ammonoids

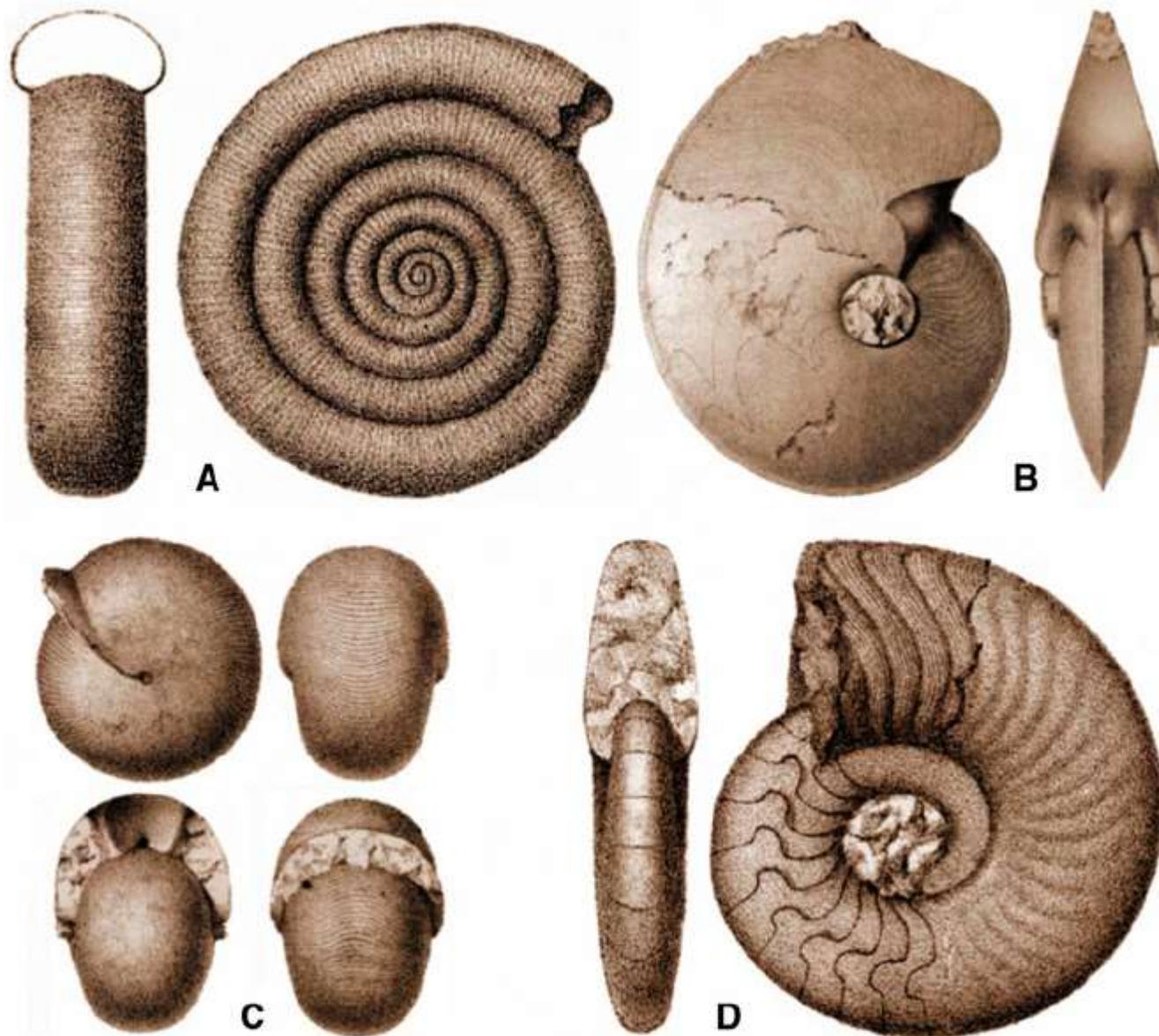


*Metalegoceras*

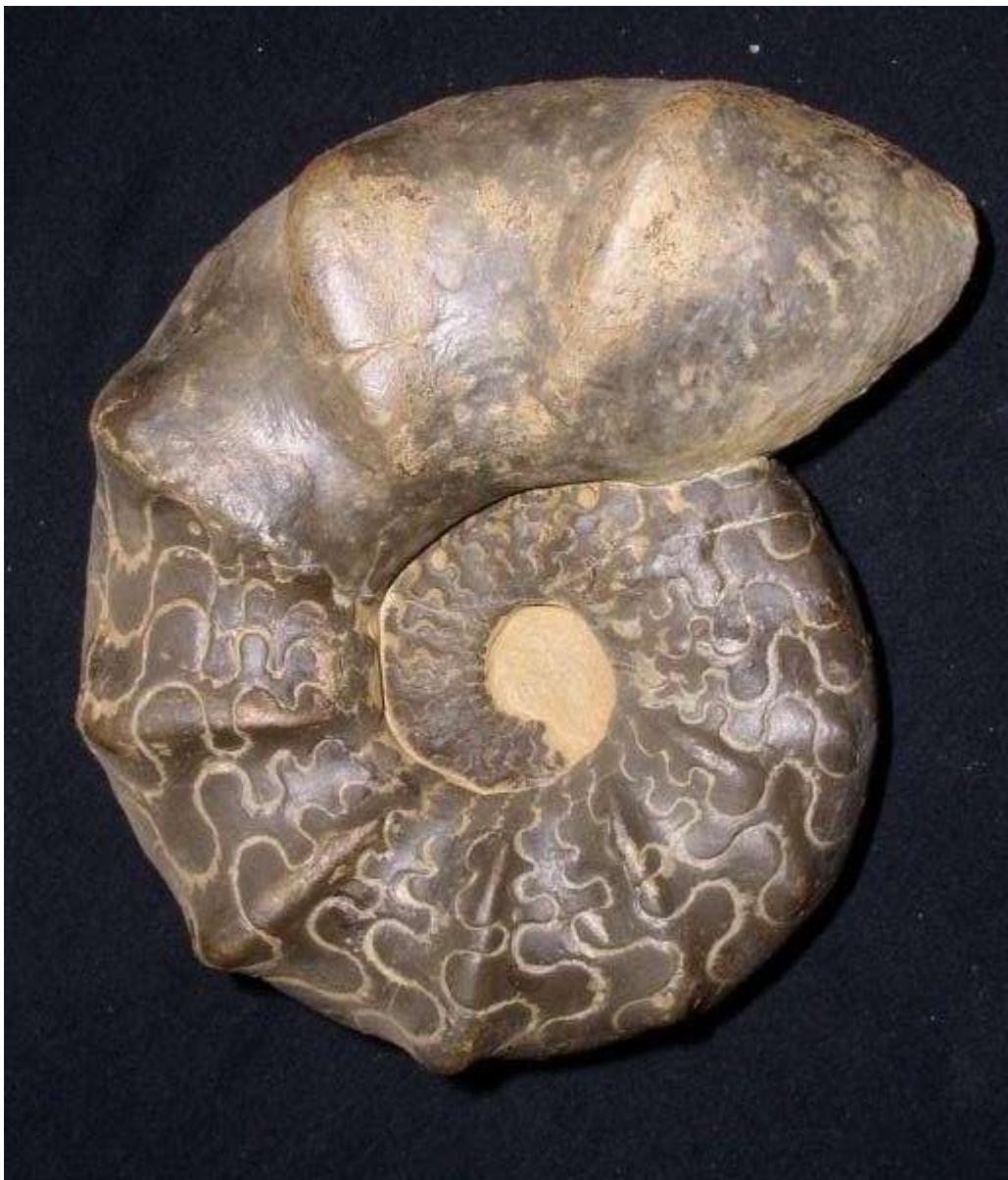


*Uraloceras*

# Range of Palaeozoic ammonoid morphology



## Triassic Ammonoids



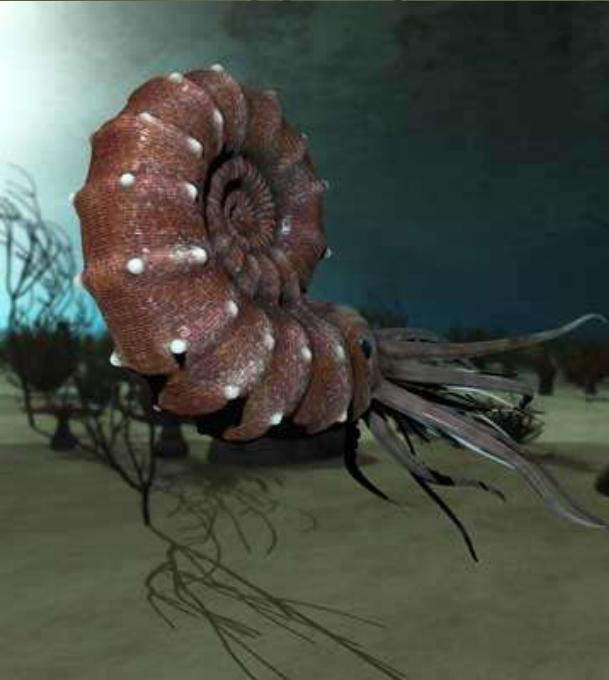
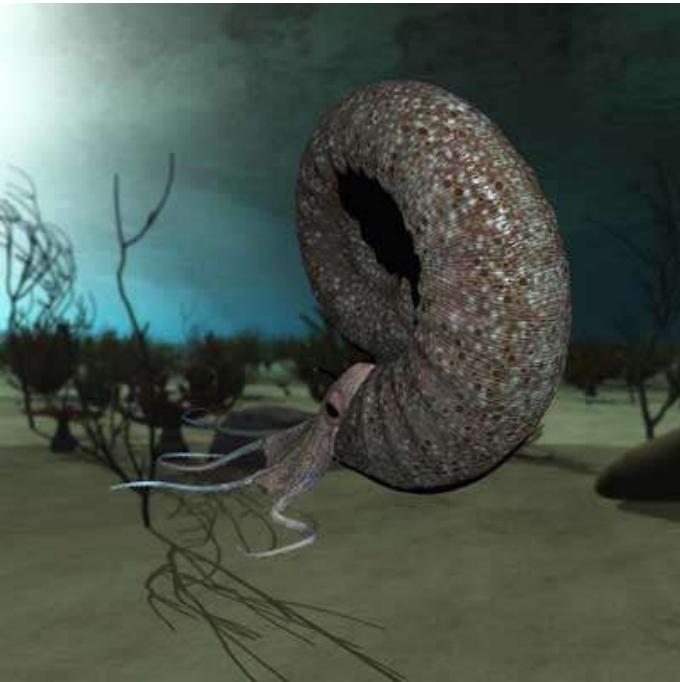
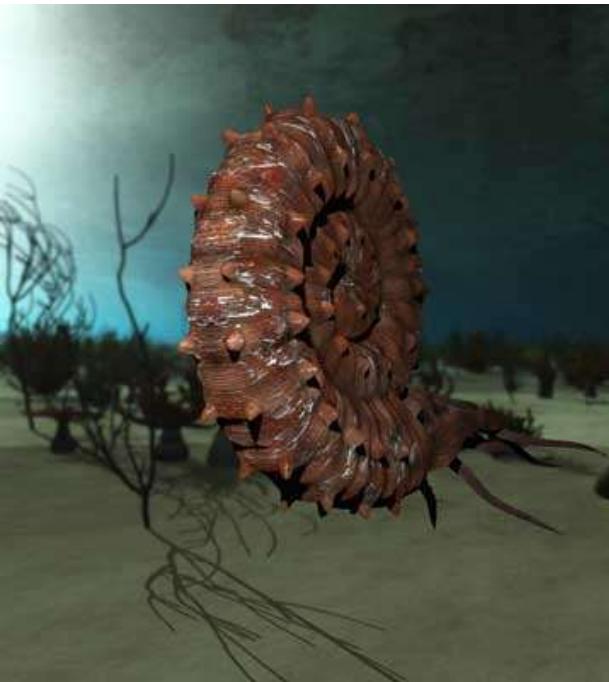
## Survivors into the Jurassic Period

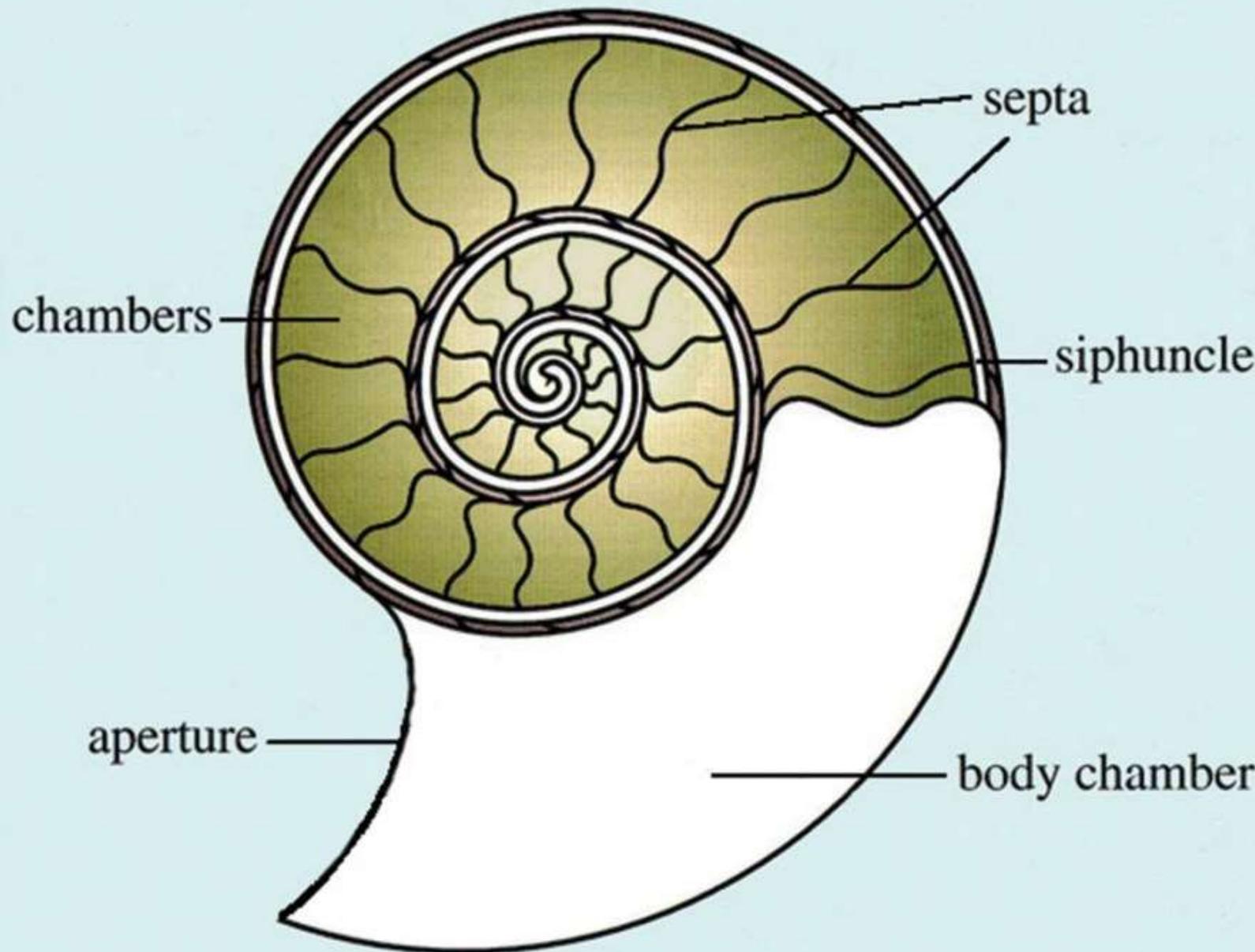


*Phylloceras*



*Lytoceras*





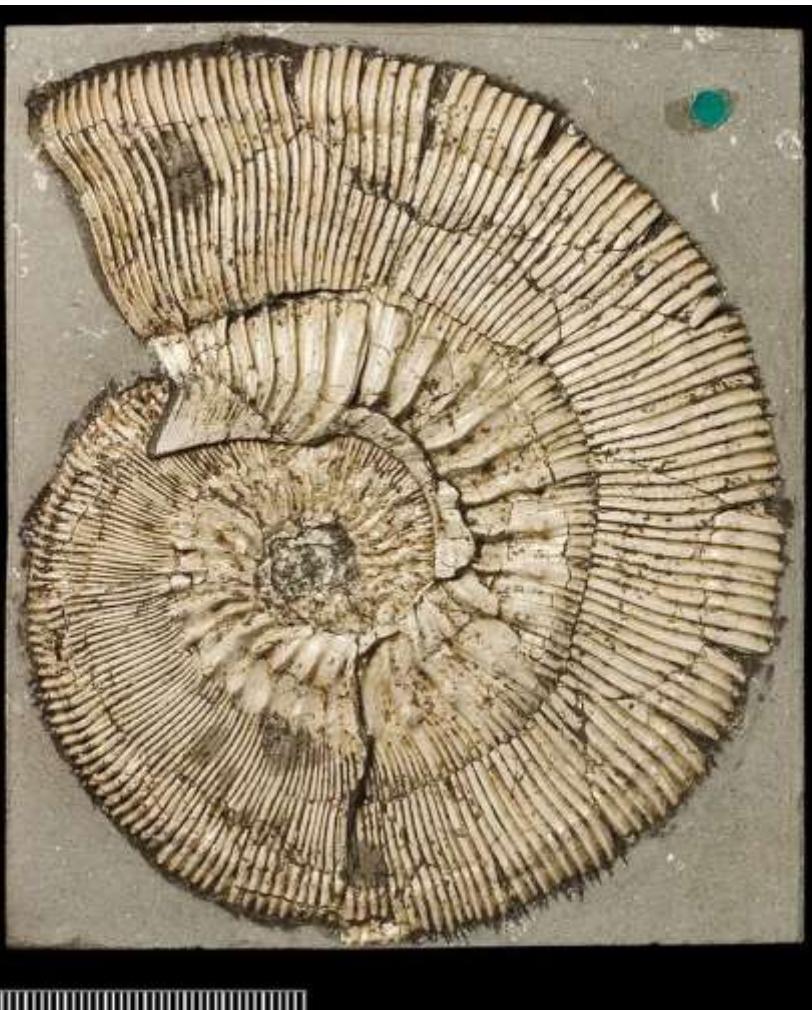
# Shell Structure



# Ammonites' life cycle



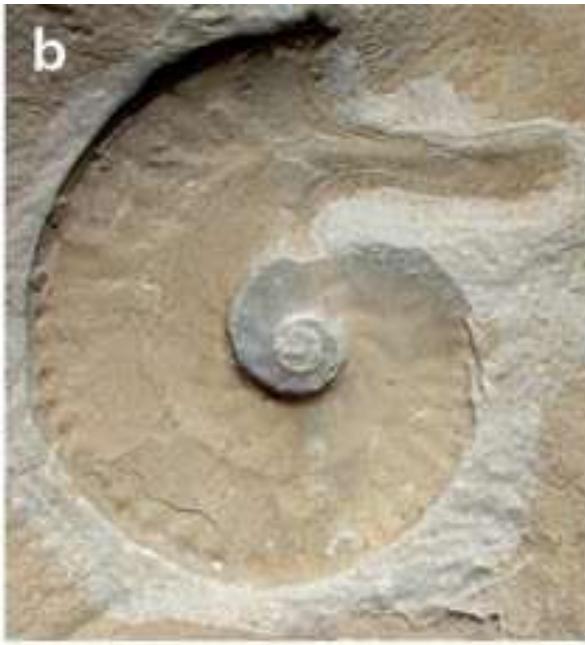
# Differentiation between the sexes (dimorphism) *Lobokosmoceras* sp



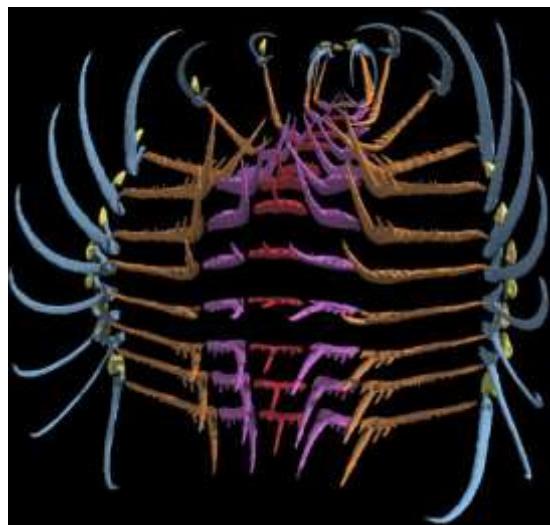
Microconch (m)

Macroconch (M)

# Adult aperture modification



# Feeding



# Living Organisms

N° MNHN A52993

Anaptichus (Corneaptichus)  
Toarcien  
Boil (Wurtemberg)

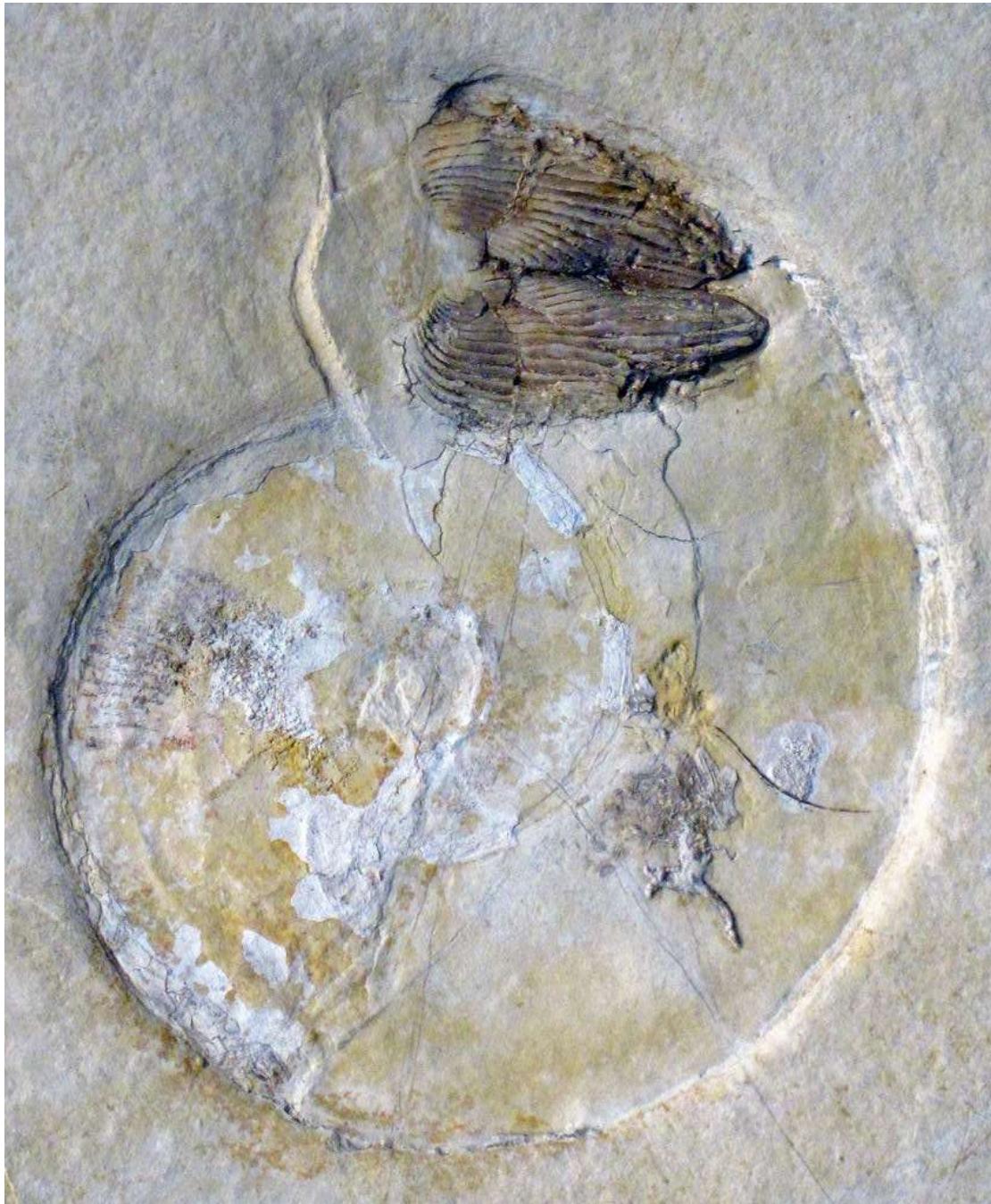
aptychus très écrasé visible sur la trace de la dernière loge d'une ammonite.



1928-6

Epaspidoceras lusitanicum  
Choffat  
Rauracien (Charente-Maritime)

échantillon montrant l'aptychus en place dans la coquille.  
N° MNHN A52991



# Jaw apparatus

A



B



C



D



Eat....or, be eaten



50 mm



*Pterodiscus moultoni*  
with ammonite rostrum from neck  
of whale

# Size Range



*Parapuzosia seppenradensis*

# Geographical Range

France

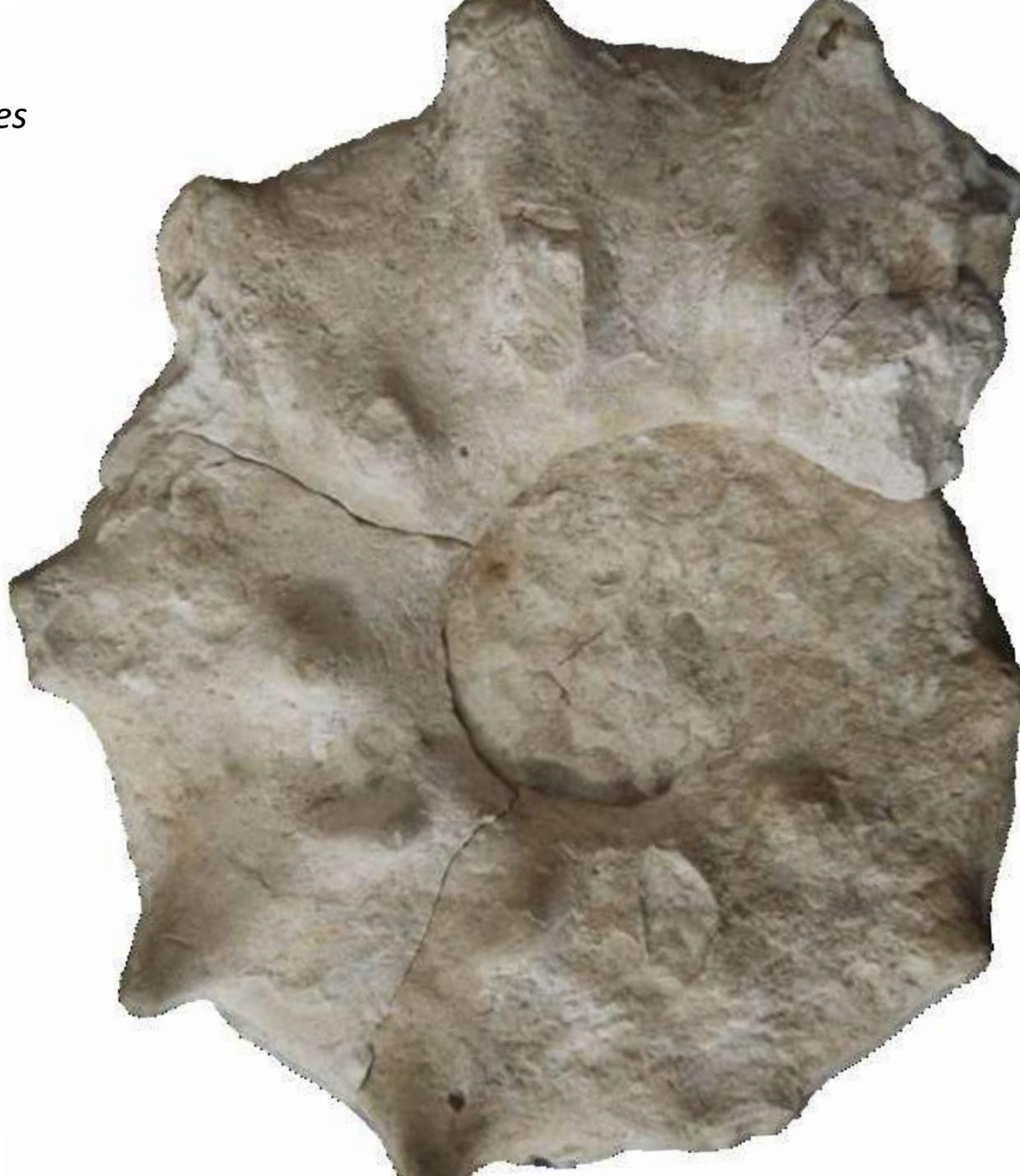


*Reinekeia aniceps*

India



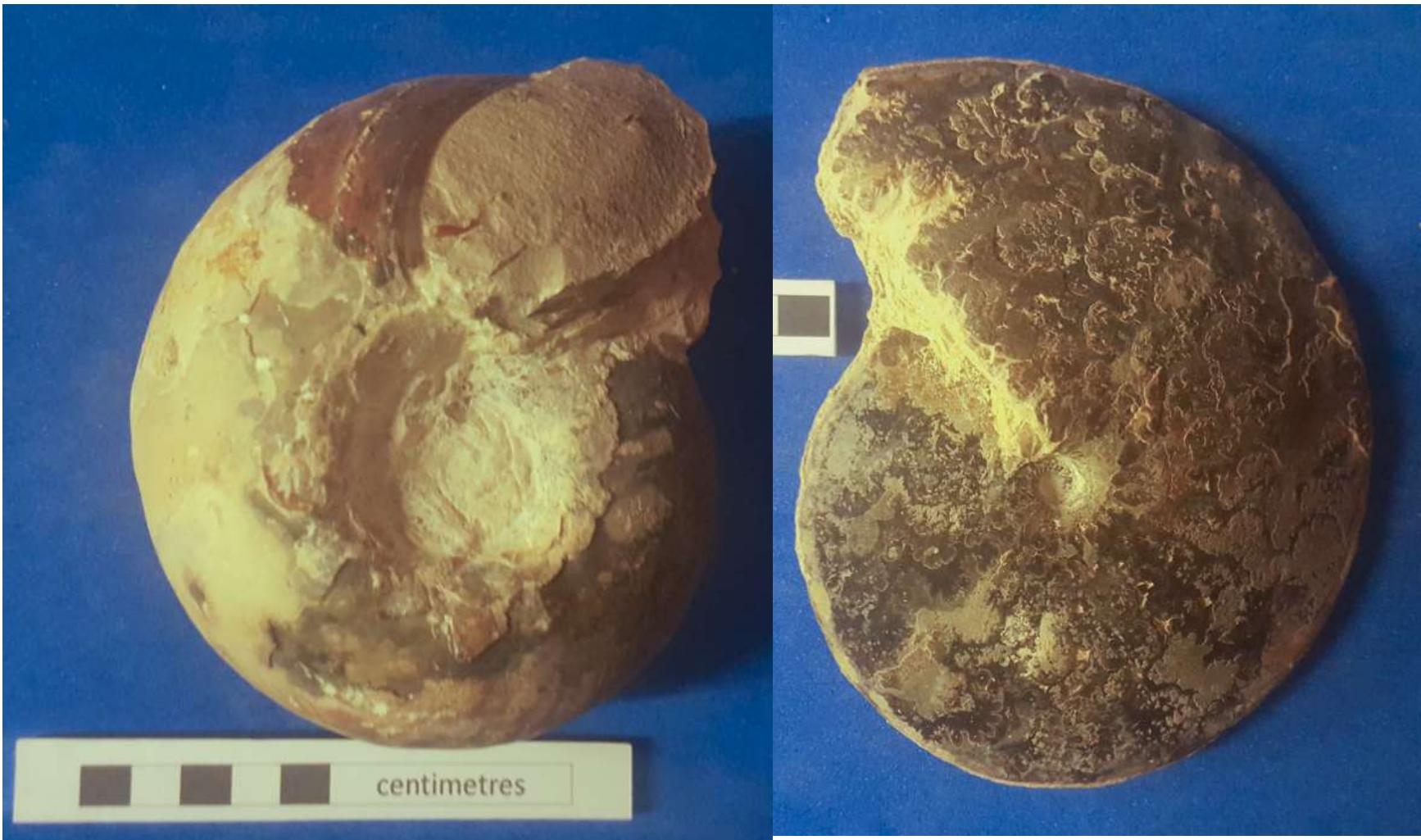
*Mamites nodosoides*



*Tragodesmoceras* – first record on East side of Atlantic



*Fagesia peroni* and *Choffaticeras segne*



# Lower Cretaceous, Agadir



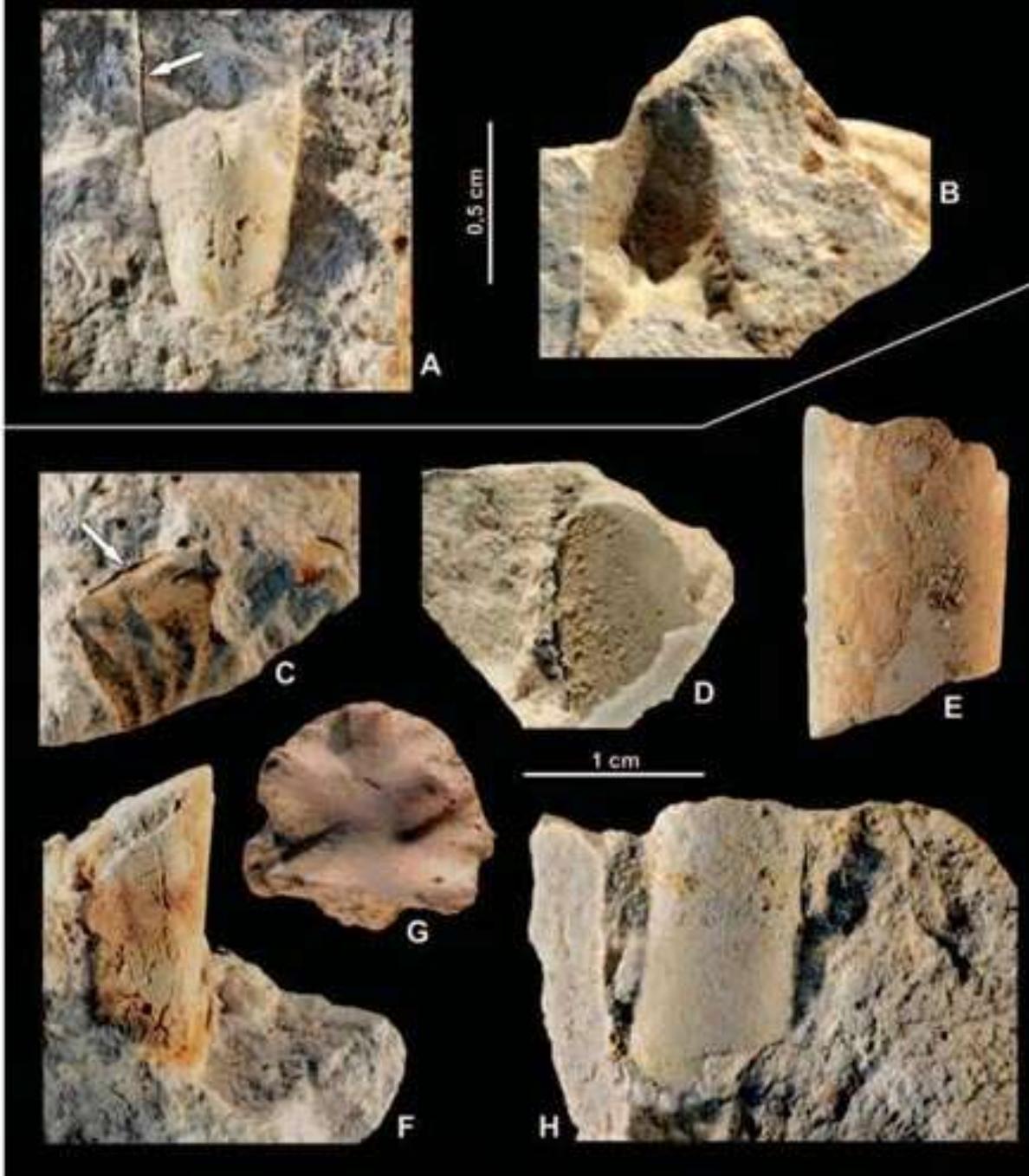
# Late Cretaceous Heteromorphs



# Extinction

65 million years ago

End Cretaceous

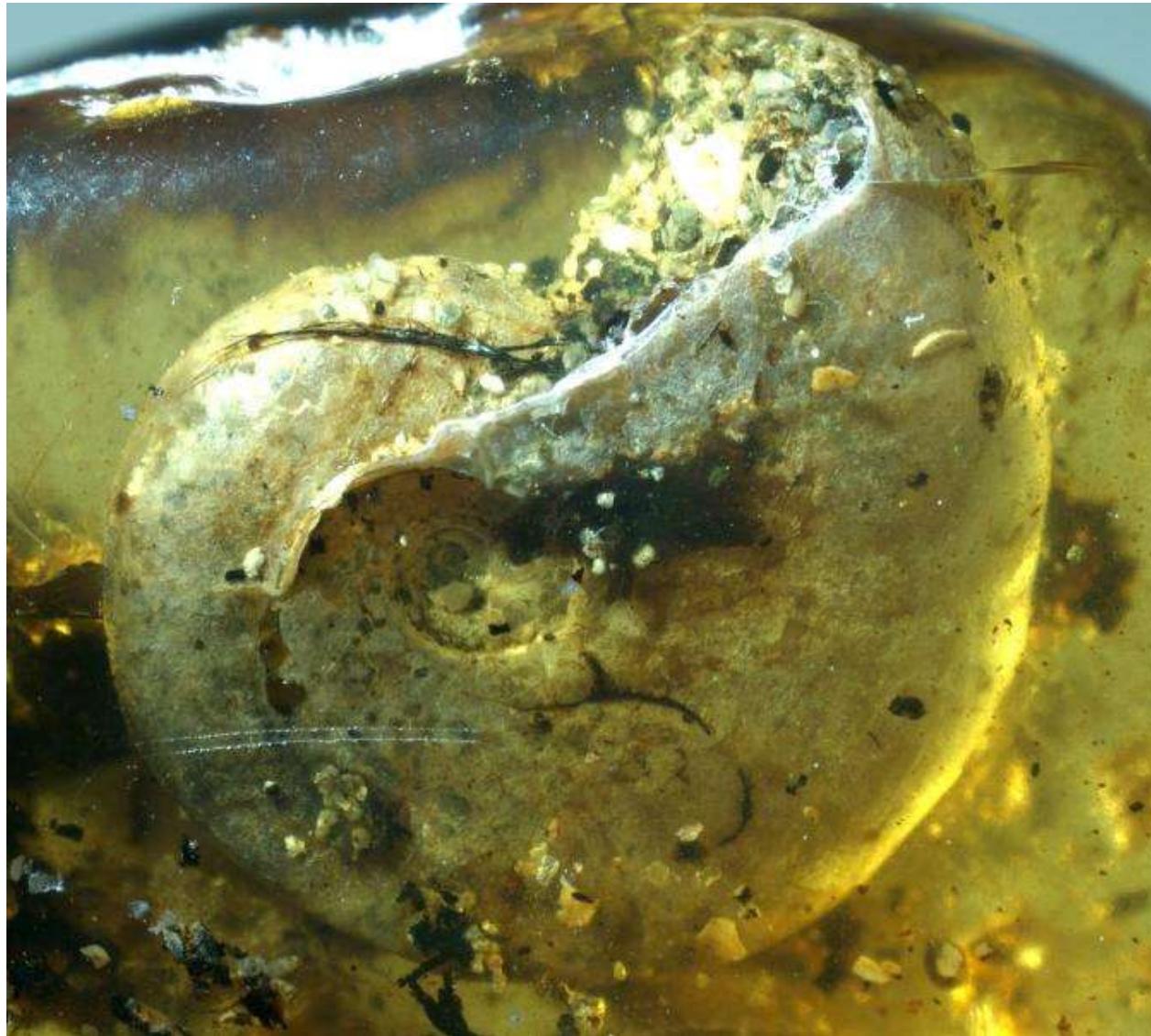


# Fossilisation & Preservation









An amber-encased ammonite juvenile belongs to the subgenus *Puzosia* (*Bhimaites*), in 99-million-year-old amber.

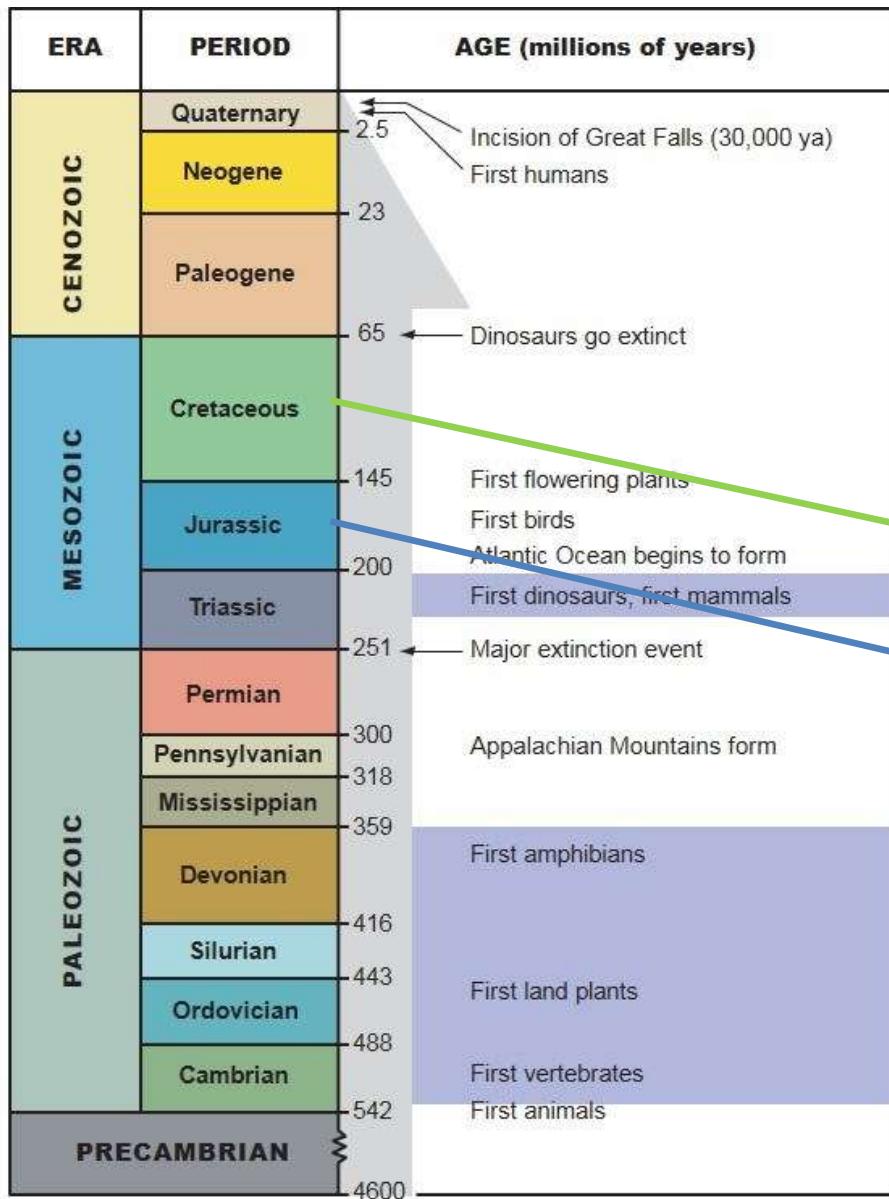




# Preparation



# Where to find Ammonites



Geologic time scale with major geologic and evolutionary events

# Dorset Coast - Lyme Regis



# Yorkshire Coast – Whitby area



# Ammonite depot







# Ammonites in Stratigraphy



Friedrich Quenstedt (1809–89)



Albert Oppel (1831–65).



Aplanatum



Macdonelli



Raricostatoides



Densinodulus



SUBZONES

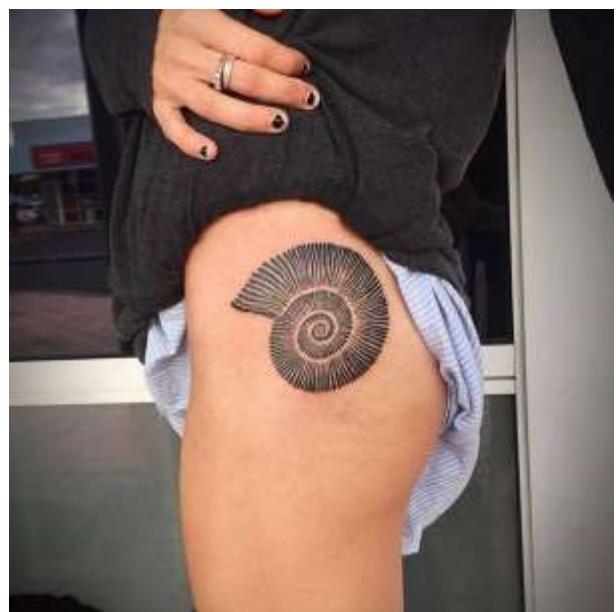
# Ammonites make excellent guide fossils for stratigraphy because:

- they evolved rapidly - ammonite species have a short duration
- they are found in many types of marine sediments
- they are relatively common
- They are reasonably easy to identify
- they have a worldwide geographical distribution
- The rapidity of ammonite evolution is the single most important reason for their superiority over other fossils for correlation
- Such correlation can be on a worldwide scale













- Spines?
- Scale on size range - smallest ammonite slide