Minerals, Fossils & Crystals

Virtual Museum of Geology

What we will attempt to cover

- Introduction to geology – what we should remember from school but don't
- Building and Maintaining a Geology Collection
- Paleontology – fossilization and fossils, The Geological Time Scale
- Wisconsin Geology & What to collect here

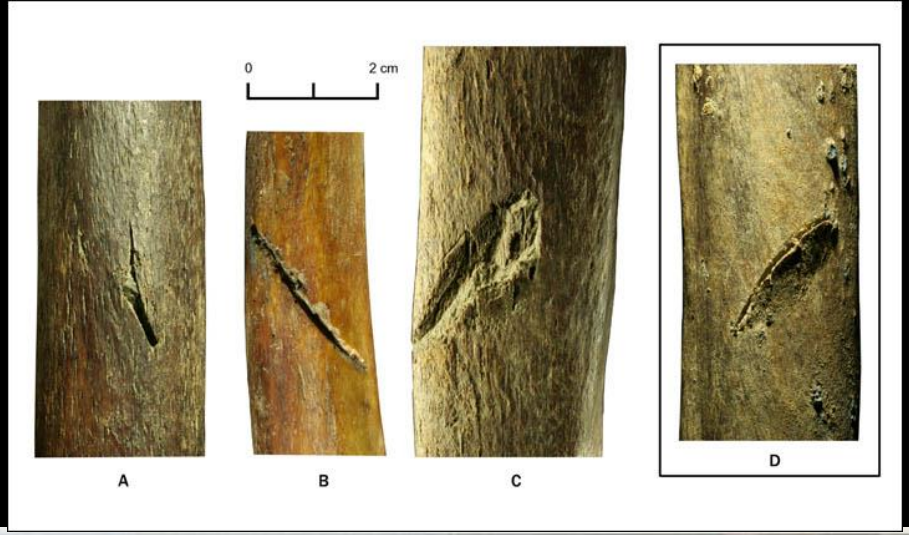
Geology

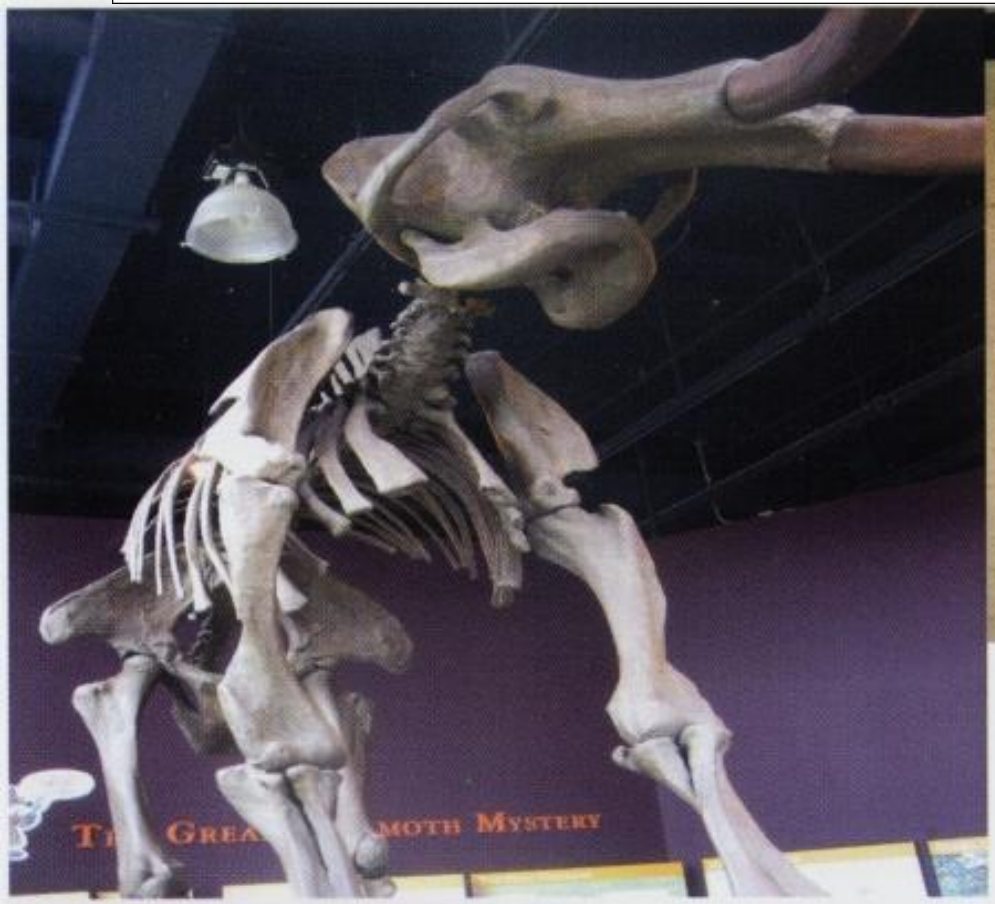
Science that deals with the Earth's physical structure, composition, history and the processes that act on it.

Geologists:

Mineralogist, sedimentologist, seismologist, petrologist, Volcanologist, hydrogeologist, paleontologist

Archaeologist?





At left :Figure 6. Hebior mammoth at the Kenosha Public Museum, Kenosha WI. Above Figure 7. Lithics from the Hebior site.

Three Main Rock Types

Sedimentary – consists of particles of sand, shells, pebbles and other material fragments. [Ex. Limestone, conglomerate, coquina]

Igneous – formed when magma cools and hardens. [Ex. Basalt, obsidian]

Metamorphic – change due to intense heat & pressure [Ex. Gneiss, marble, quartzite]

Within these categories, rocks are further subdivided – composition, texture, hardness, etc.

What makes up a rock?

MINERALS

Minerals

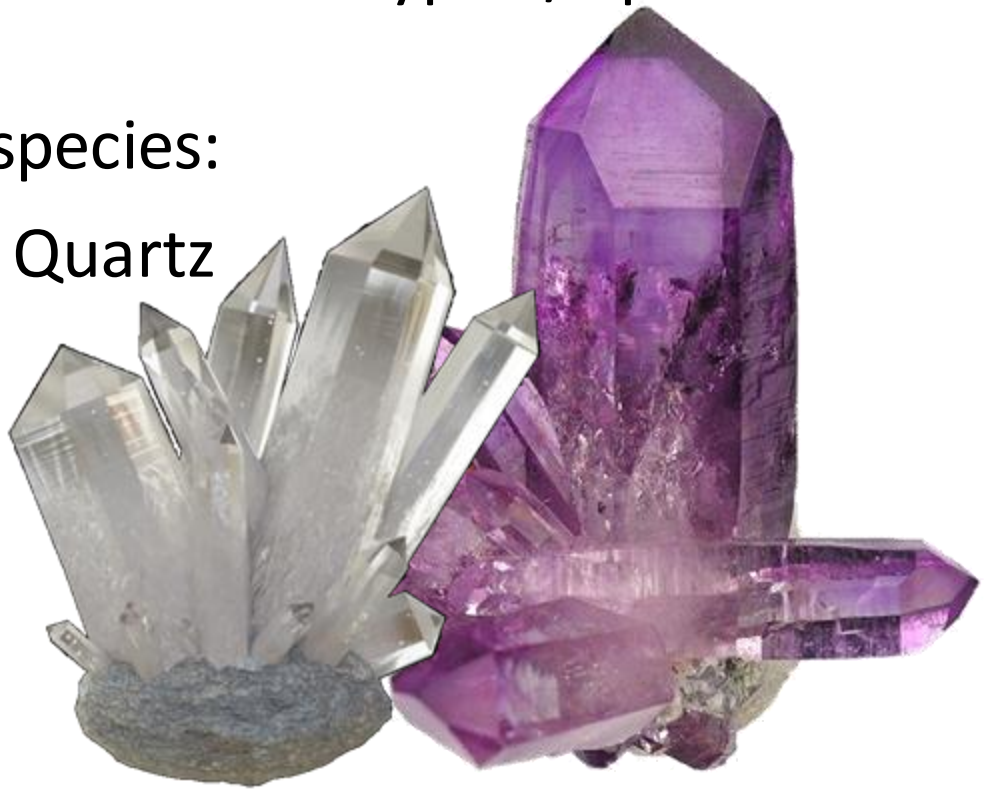
- A solid inorganic substance of natural occurrence.
  - Quartz, calcite, olivine, garnet, mica, etc.
- Classified / grouped by variety and species.
- Distinguished by chemical and physical properties: hardness, taste, smell, crystal structure, color, streak, fracture, magnetism, reaction to acid, lustre, habit, radioactivity, specific gravity, cleavage, etc.

Minerals

Currently over 5,800 known mineral types / species.

Mineral varieties within species:

Amethyst is a type of Quartz



Birthstone for February.
Irridiation and some
substitution of iron for silicon

Amethyst still exhibits most of the same properties as quartz – hardness, crystal shape, etc.

Generally, many minerals together make up a rock.

Gneiss

Sandstone

Basalt

Crystals

- Homogeneous solid substance having a natural geometrically regular form. Symmetrically arranged plane faces.
- Atoms arranged in a highly ordered structure – crystal lattice

Where do you find minerals?

All over the Earth.

…on the crust, inside the planet, etc.

In outer space…other planets, meteorites, etc.

Different minerals form in different environments

Collecting Minerals and Fossils

Why do people collect rocks?

How many here collect minerals and fossils?

- Hobby...started collecting as a kid
- For the beauty
- Interest in the natural world
- An investment
- Preservation
- Scientific study
- To pass on to the next generation
- To showcase to others
- Metaphysical properties

Cabinets of Curiosity

Frans Francken the Younger, Chamber of Art and Curiosities 1636

Where to collect...

Rock Shops

The Gem Shop
W64N723 Washington Ave
Cedarburg, WI

Steven's Rocks & Gifts
134 E. Main Street
Marshall, WI

Burnie's Rock Shop
901 E. Johnson Street
Madison, WI

Steven's On Park
636 S. Park Street
Madison, WI

Burlington Crystal Gallery
140 E. Chestnut Street
Burlington, WI

Rock Garden Rock Shop
231 Cook Street
Lake Geneva, WI

Dave's Down to Earth Rock Shop
711 Main Street
Evanston, IL

Crystal Garden Rock Shop
418 WI-50
Delavan, WI

Rock Shops continued...

Free Spirit Crystals
4763 N. 124th Street
Butler, WI

Angelic Roots Metaphysical
8612 S. Market Place
Oak Creek, WI

Peacetree Originals
4721 7th Avenue
Kenosha, WI

Purchasing off of Ebay, Etsy, Instagram, etc...

- Some of my best and worst geology purchases have been off of the web
- Be careful – fakes, scams, outrageous prices, payment security, returns, international seller pressure
- Check feedback, return policy, amount of previous sales, prices
- Buyer beware

Other ways to collect

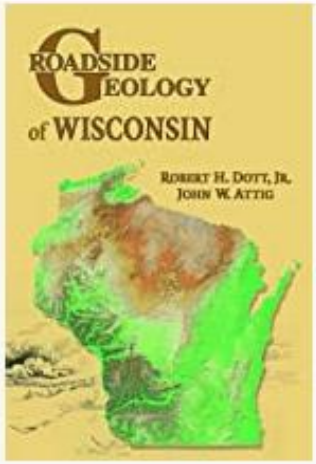
- Trading with other collectors Clubs, Instagram
- Attending Mineral & Fossil Shows

  Wisconsin Geological Society Hart Park Show – May
  Madison Gem and Mineral Club Show – November
  Des Plaines Valley Geological Society Show – April-ish
  Badger Lapidary & Geological Society Show (Janesville) - March

Collecting in the field yourself

- Research where to go
- Take a buddy
- Bring appropriate equipment: rock hammer, first aid kit, water and snacks, sun screen, insect repellant, cell phone
- No State Parks, etc. - ask permission for private land
- Backpack or something to place rocks in

Some resources for where to go



Roadside Geology of Wisconsin
by Robert H. Dott and John W. Attig | Feb 1, 2004
4.8 ★★★★★ (90)
Paperback
$20.00
prime
FREE delivery **Wed, Feb 8** on $25 of items shipped by Amazon
Or fastest delivery **Sat, Feb 4**
More Buying Choices
$9.00 (22 used & new offers)

- Internet...local geology clubs, university geology departments, research papers, social media (instagram)

As like everything else, when purchasing minerals and fossils you need to be careful.

The mineral and fossil market is filled with fakes, altered, mislabeled, unlabeled, renamed and laboratory grown specimens.

A little bit of prior education before purchasing goes a long way.


Real
or
Fake

Beautiful Amber butterfly Fossil Insects Manual Polishing

Brand New

$7.51

Was: ~~$7.99~~ **6% off**

Buy It Now

Free shipping

from China

30 sold

5Pcs Amber Fossil with Insects Samples Stones Crystal Specimens Home Decorations

Brand New

$24.95

Buy It Now

Free shipping

Almost gone

19 sold

New Find Green Phantom Quartz Crystal Cluster Mineral Specimen Healing 444g h214

Brand New

$46.90

Was: ~~$67.00~~ **30% off**

or Best Offer

Free shipping

from China

Sponsored


NPS

Mosasaur Jaws

Newildthir Follow

39 sales | 5.0 ★★★★★ (3 reviews)

In 3 carts

1pc Amber Dragonfly Fossil Insects- Museum Grade Specimen - Manual Polishing Exquisite Gift Home Decor

$24.93 ~~$27.70~~ (10% Off) Low in stock

Add to cart

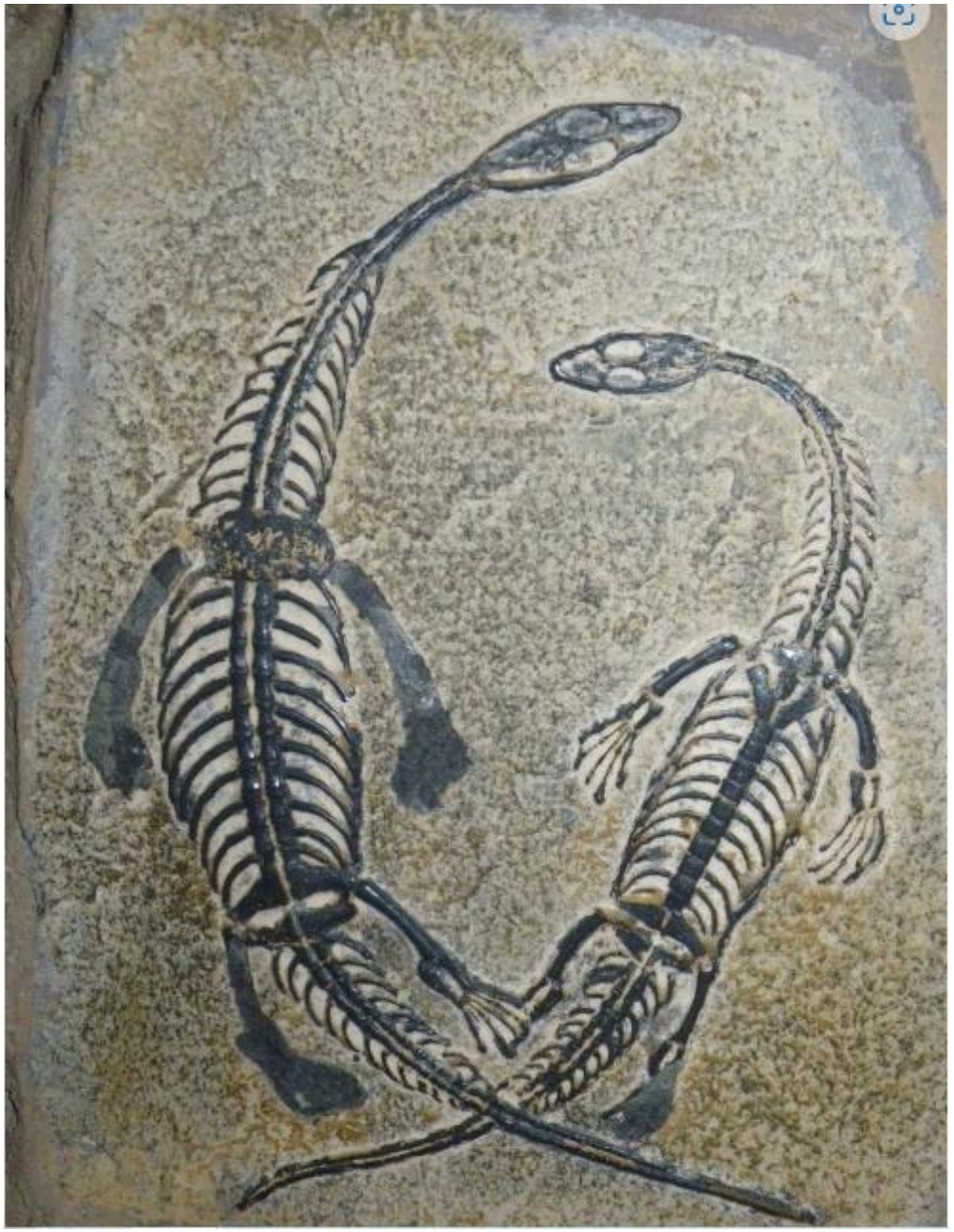
Highlights

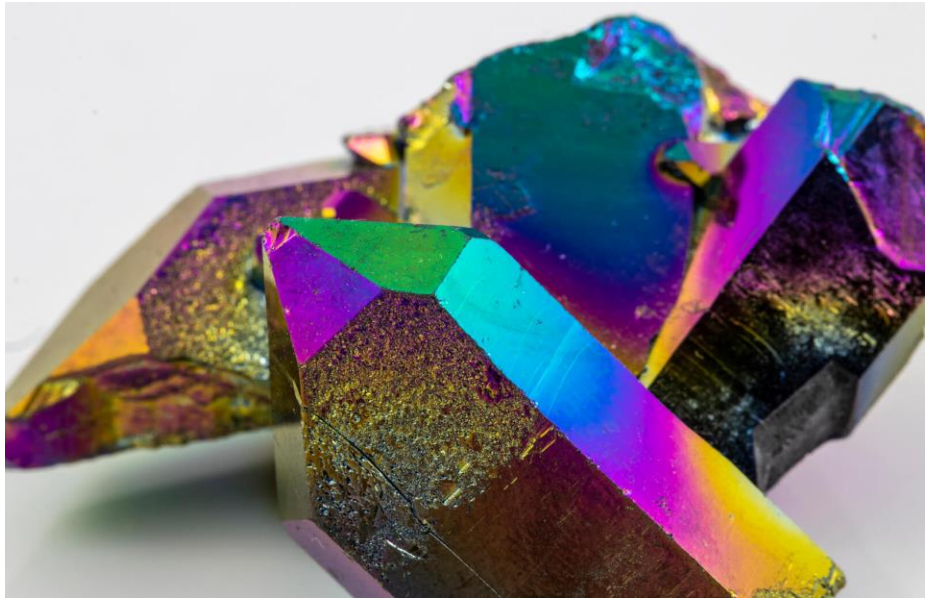
Handmade

Description

1pc Amber Dragonfly Fossil Insects- Museum Grade Specimen - Manual Polishing Exquisite Gift Home Decor

Archosaurs





Titanium Aura

Aqua Aura

Only 1 left and in 1 cart

Blue aura quartz cluster, aqua aura quartz cluster, aura crystal

$84.53 ~~$105.66~~ (20% Off) Only 1 available

Sale ends in 10 hours

Pay in 4 installments of $21.13. **Klarna.** Learn more

Add to cart

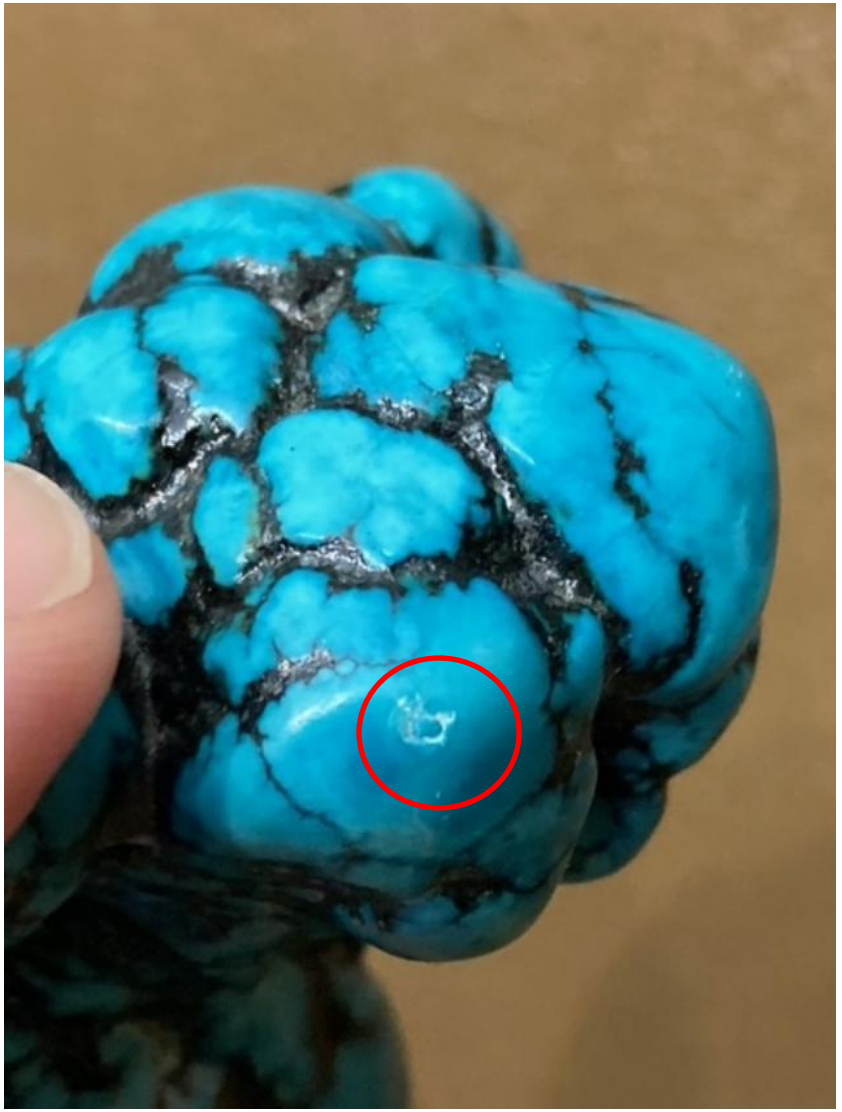
Star Seller. This seller consistently earned 5-star reviews, shipped on time, and replied quickly to any messages they received.

Arrives by Feb 10-15 if you order today.
Hooray! This item ships free to the US.

Highlights

Handmade


Turquoise



Agate Slabs

Dyed Agate Slab

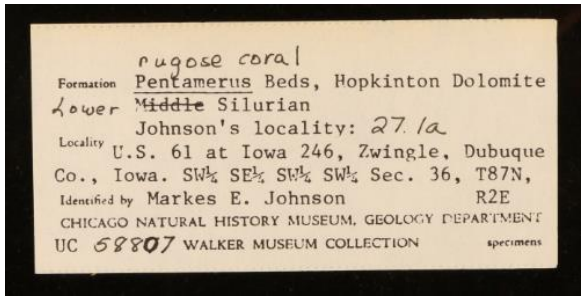
Visit

$7.99* · In stock · Brand: Kids Love Rocks

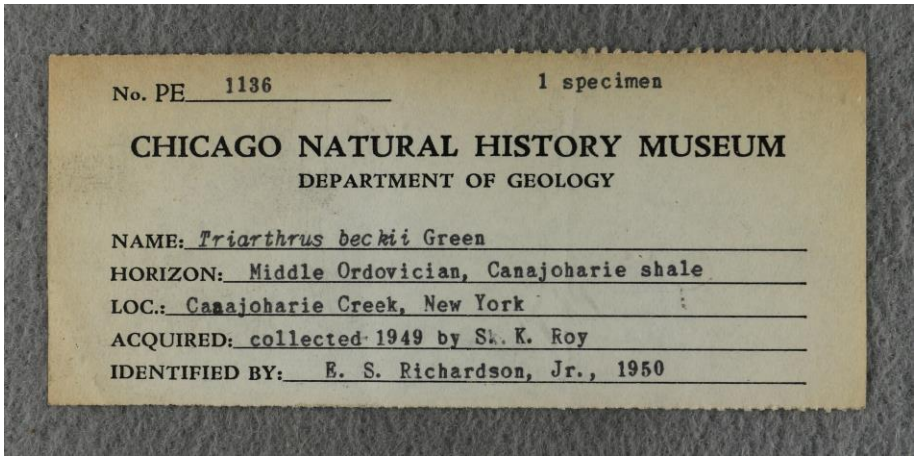
Beautiful Dyed Agate Slab assortment. Small 1" to 2" dyed agate slabs. Colors are blue, pink and purple. Display stands not included.

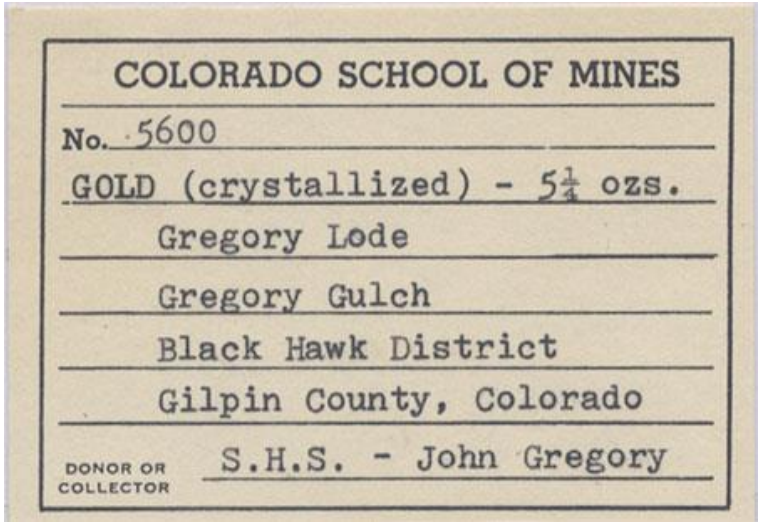
Last couple of tips about collecting

Label your specimens



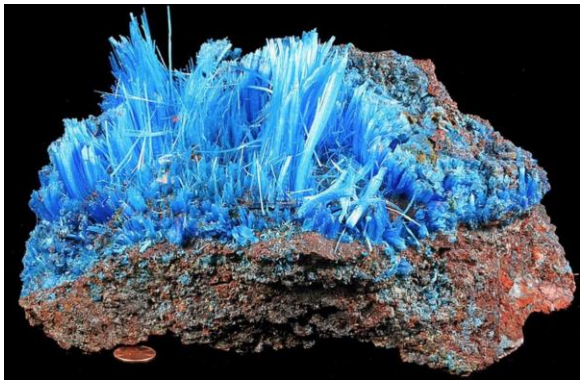
Name of Specimen
Collection Number
Location Found
When Found
Age (fossils)
Additional Information





Last couple of tips about collecting

Storage



Some specimens are sensitive to humidity

chalcanthite

Some specimens are sensitive to light

Amethyst

Some specimens are sensitive to heat

Crystals can become brittle and crack

Some specimens decompose over time

marcasite

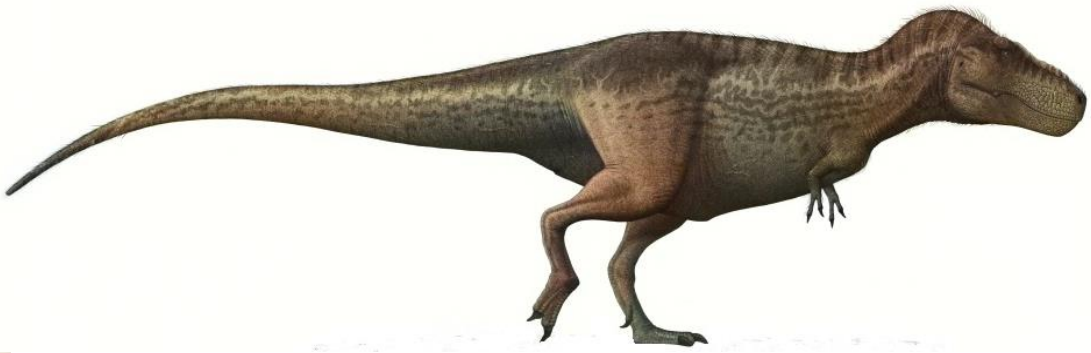
Paleontology

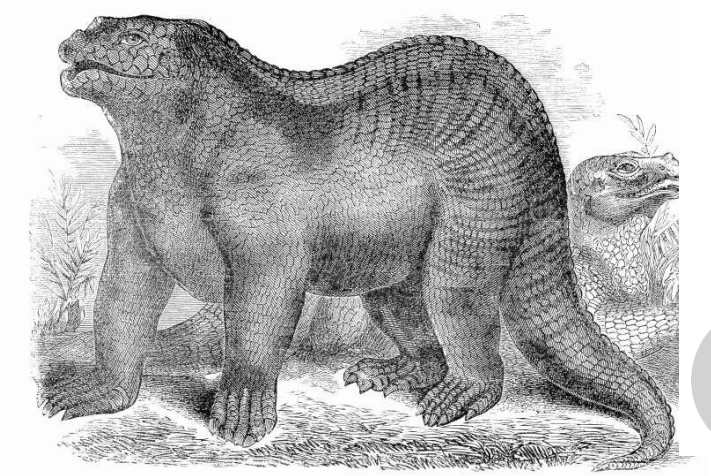
Paleontology

What is paleontology?

The study of remains and fossil traces of past life, which includes fossils, their interactions and environments.

Our knowledge of paleontology has evolved





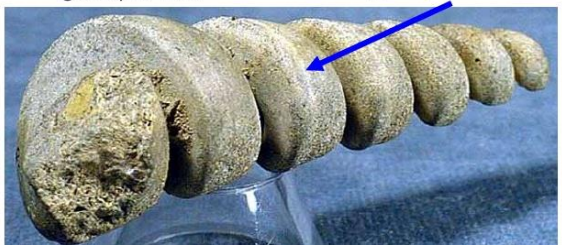
Fossilization

How do things fossilize?

Things that Commonly Fossilize

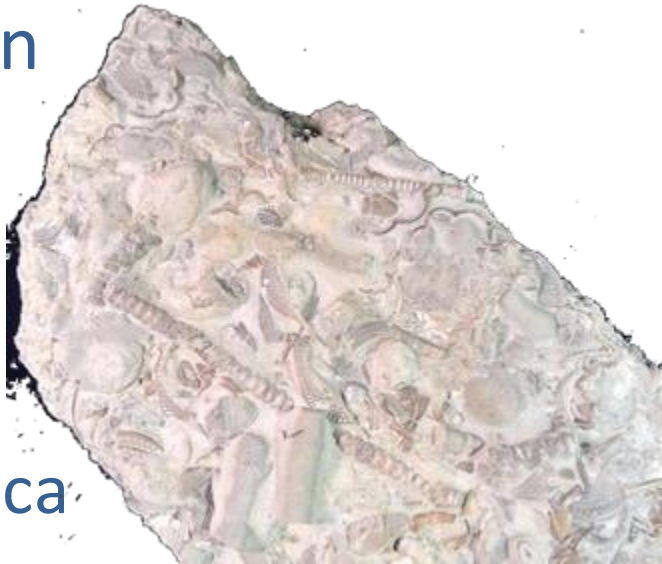
Other kinds of fossils

Molds & Casts

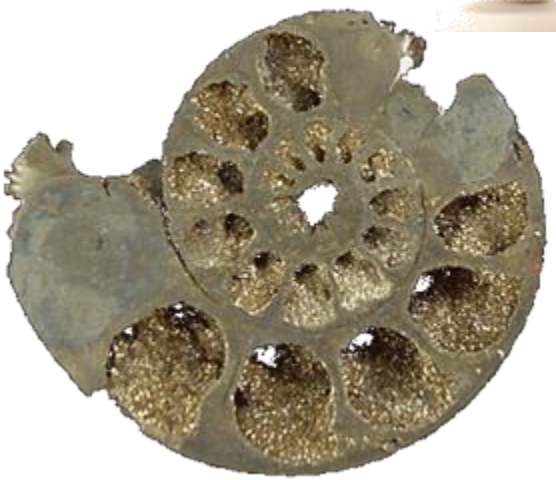


Fossilized Wood - Permineralization

Petrifaction –
replacement by silica



Uncommon Fossilization

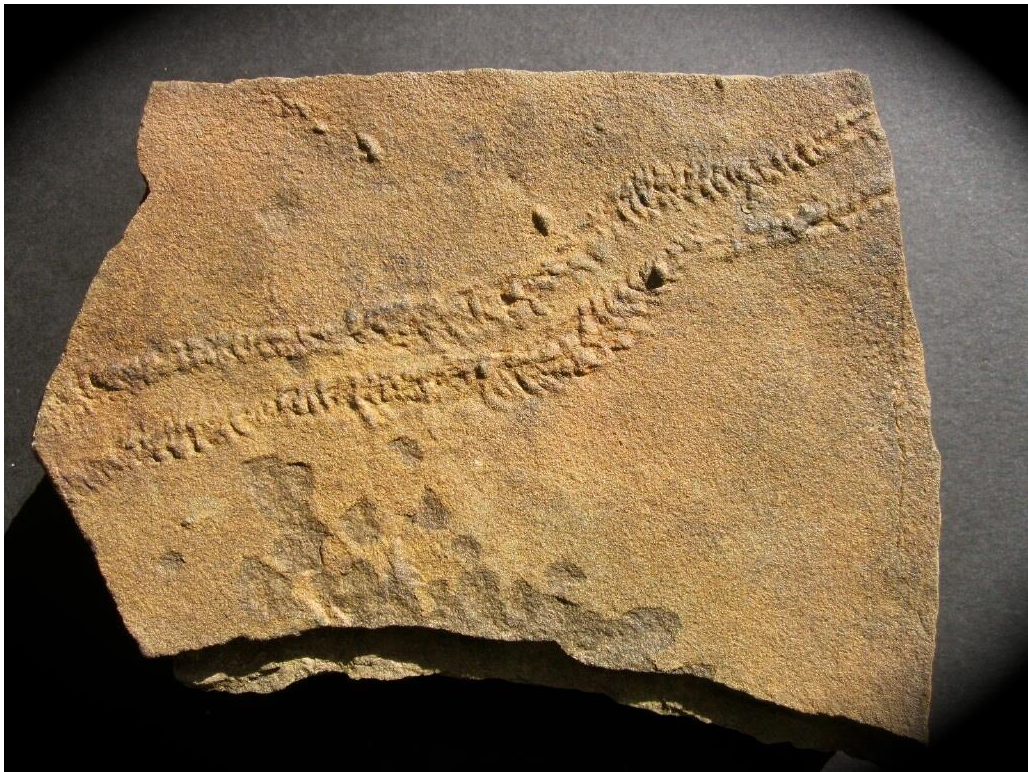


Trace Fossils (Ichnofossils)

Gives us additional information on how an organism lived.

⬅ Burrows

⬇ Cruziana – Ordovician of Morocco



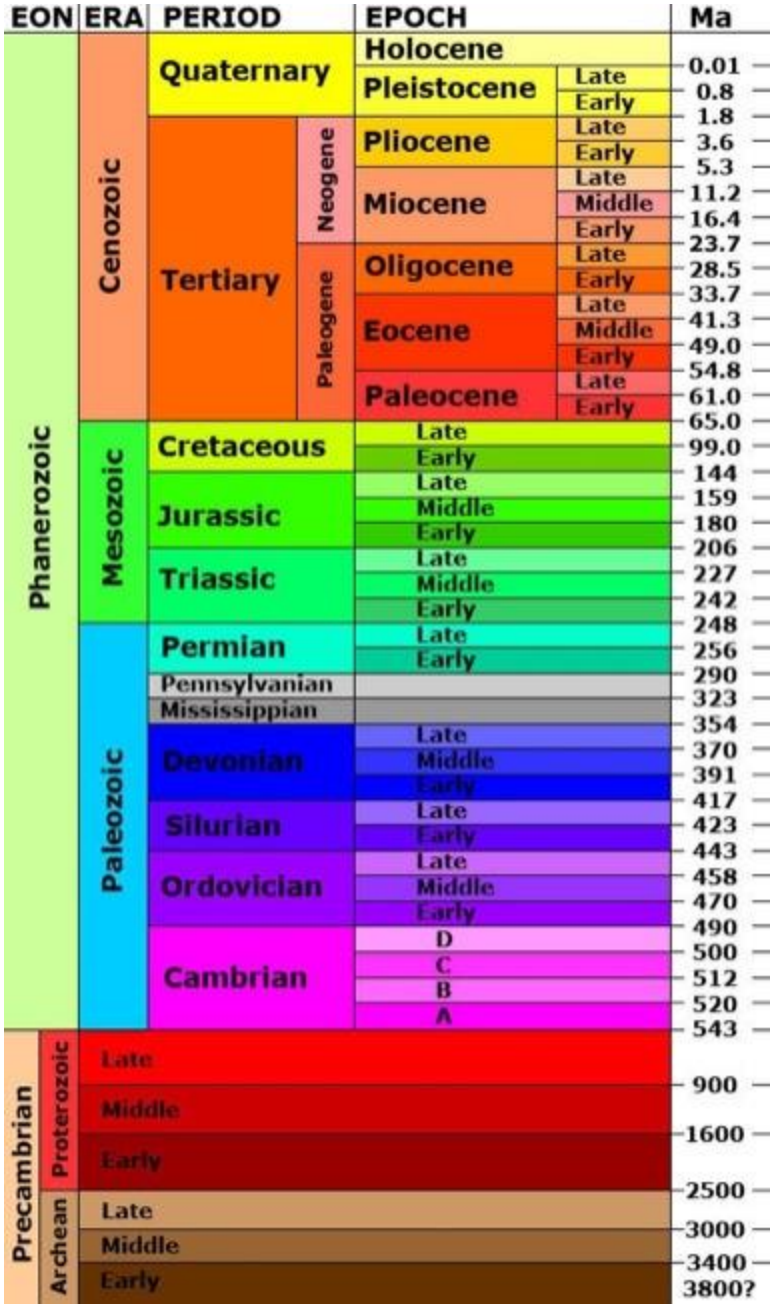
Pseudofossils

Manganese Dendrites - Germany

Septarian Nodule

Pyrite Sun Disk - Illinois

Geological Time Scale



End Cretaceous

76% of species lost

End Triassic

80% of species lost

End Permian

96% of species lost

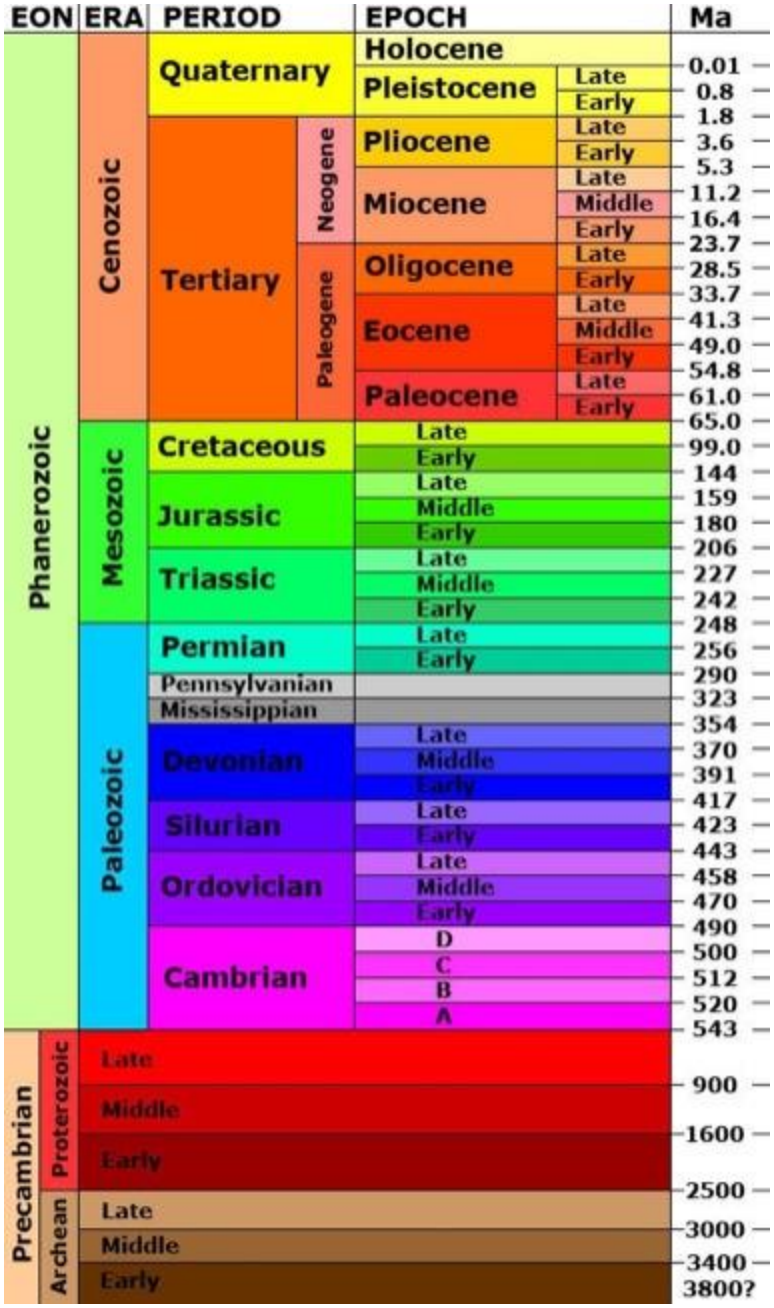
Late Devonian

75% of species lost

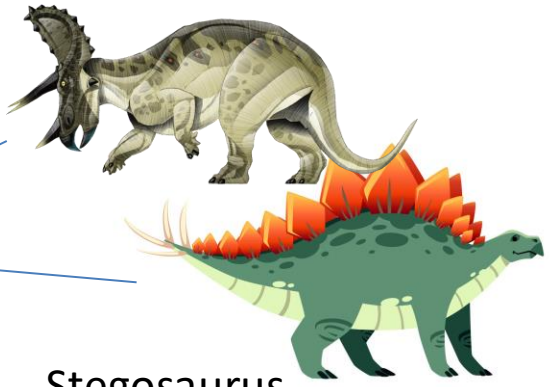
End Ordovician

86% of species lost

Geological Time Scale



Triceratops
85-66 MYA Late Cretaceous



Stegosaurus
155-150 MYA Jurassic

Coelophysis
215 MYA Triassic

Triceratops and Stegosaurus never saw each other!

Wisconsin Geology

- Proterozoic “Billion Years Old” Volcanics -

- Shallow Seas Ordovician, Silurian & Devonian -

- Glacial Period & The Kettle Moraine -

BEDROCK GEOLOGY OF WISCONSIN

UNIVERSITY OF WISCONSIN-EXTENSION

Geological and Natural History Survey

APRIL 1981
REVISED 2005

EXPLANATION

DEVONIAN
- D — dolomite and shale

SILURIAN
- Sd — dolomite

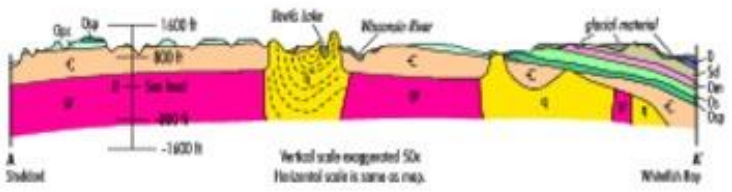
ORDOVICIAN
- Om — Maquoketa formation—shale and dolomite
- Os — Sinnipee Group—dolomite with some limestone and shale
- Op — St. Peter Formation—sandstone with some limestone shale and conglomerate
- Opc — Prairie du Chien Group—dolomite with some sandstone and shale

CAMBRIAN
- C — sandstone with some dolomite and shale

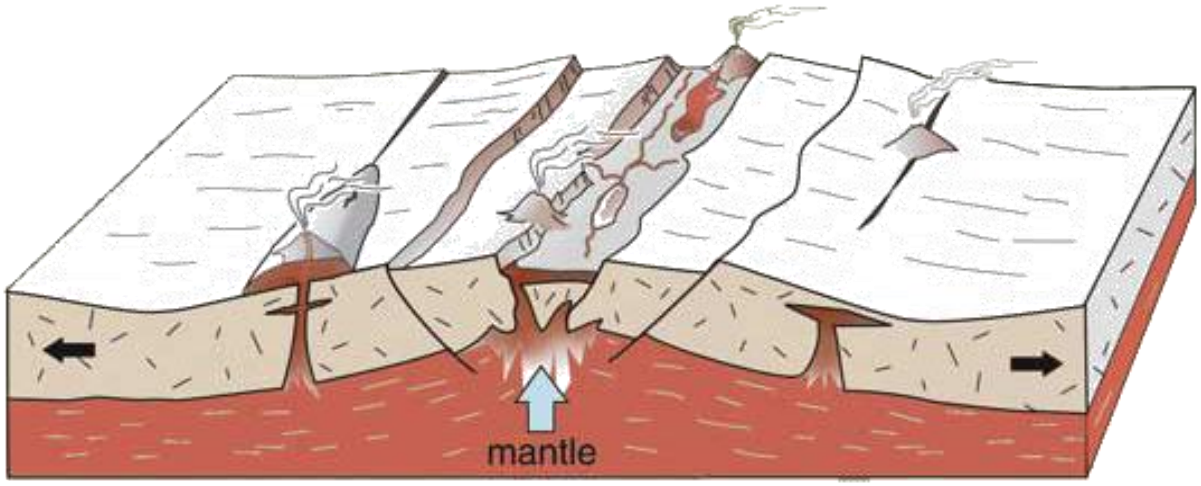
MIDDLE PROTEROZOIC
- Keweenawan rock—
  - ss, sandstone
  - v, basaltic to rhyolitic lava flows
  - i, gabbroic, anorthositic and granitic rock
- Wolf River rock—
  - g, rapakivi granite, granite, and syenite
  - a, anorthosite and gabbro

LOWER PROTEROZOIC
- q — quartzite
- granite, diorite, and gneiss
  - s, metasedimentary rock, argillite, siltstone, quartzite, greywacke, and iron formation
  - vo, basaltic to rhyolitic metavolcanic rock with some metasedimentary rock
  - gs, meta-gabbro and hornblende diorite

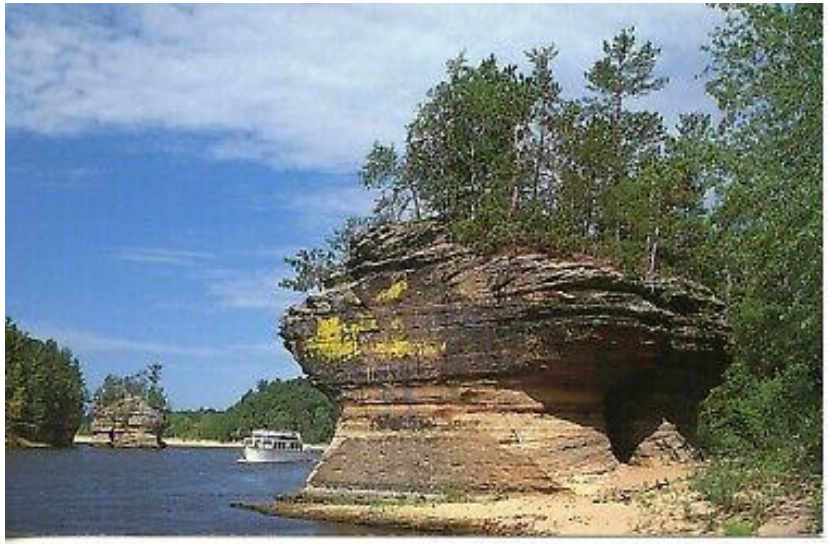
LOWER PROTEROZOIC OR UPPER ARCHEAN
- mv, metavolcanic rock
- gn, granite, gneiss, and amphibolite



Proterozoic "Billion Years Old" Volcanics



Mantle begins to push up and pull apart the crust.

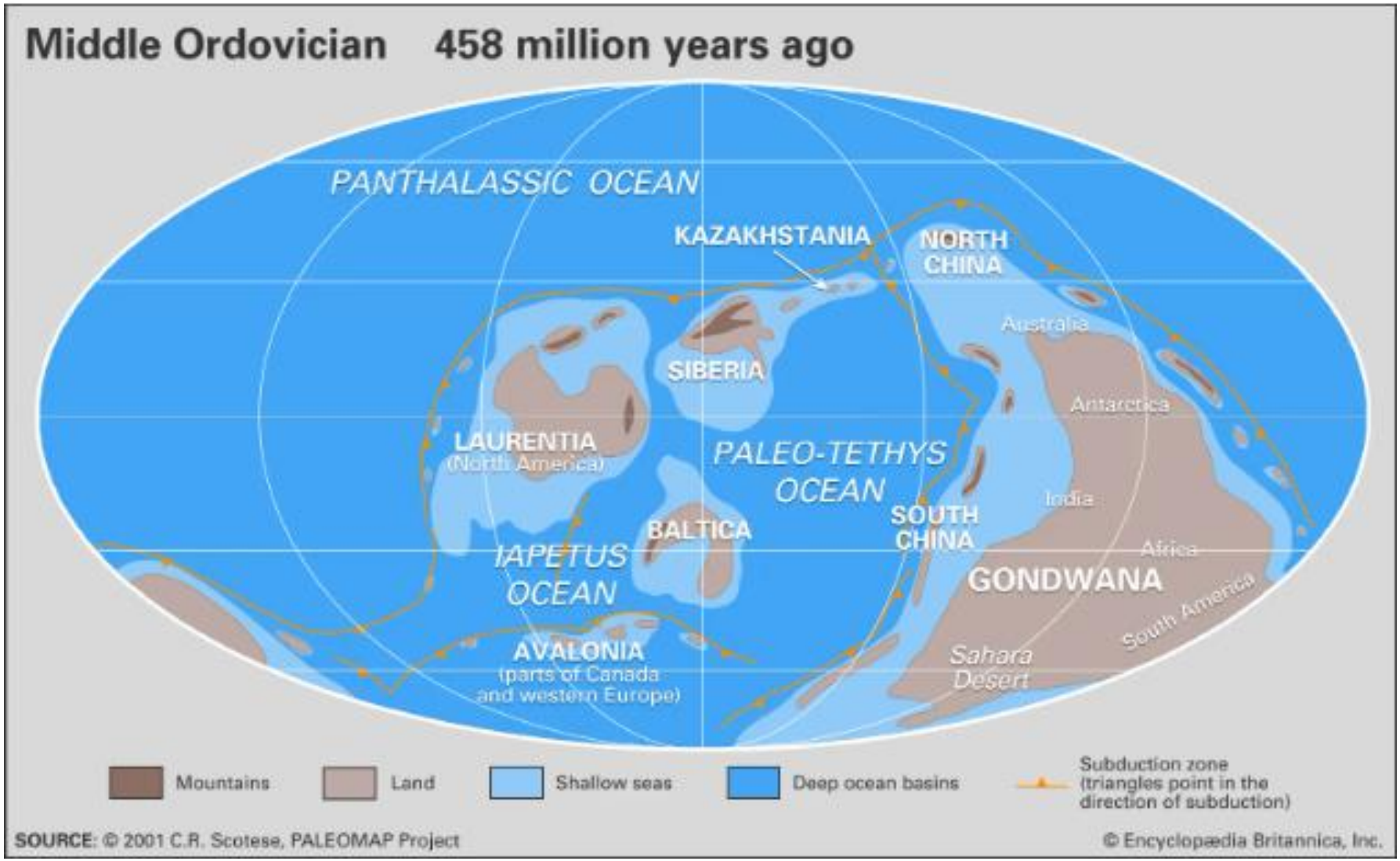


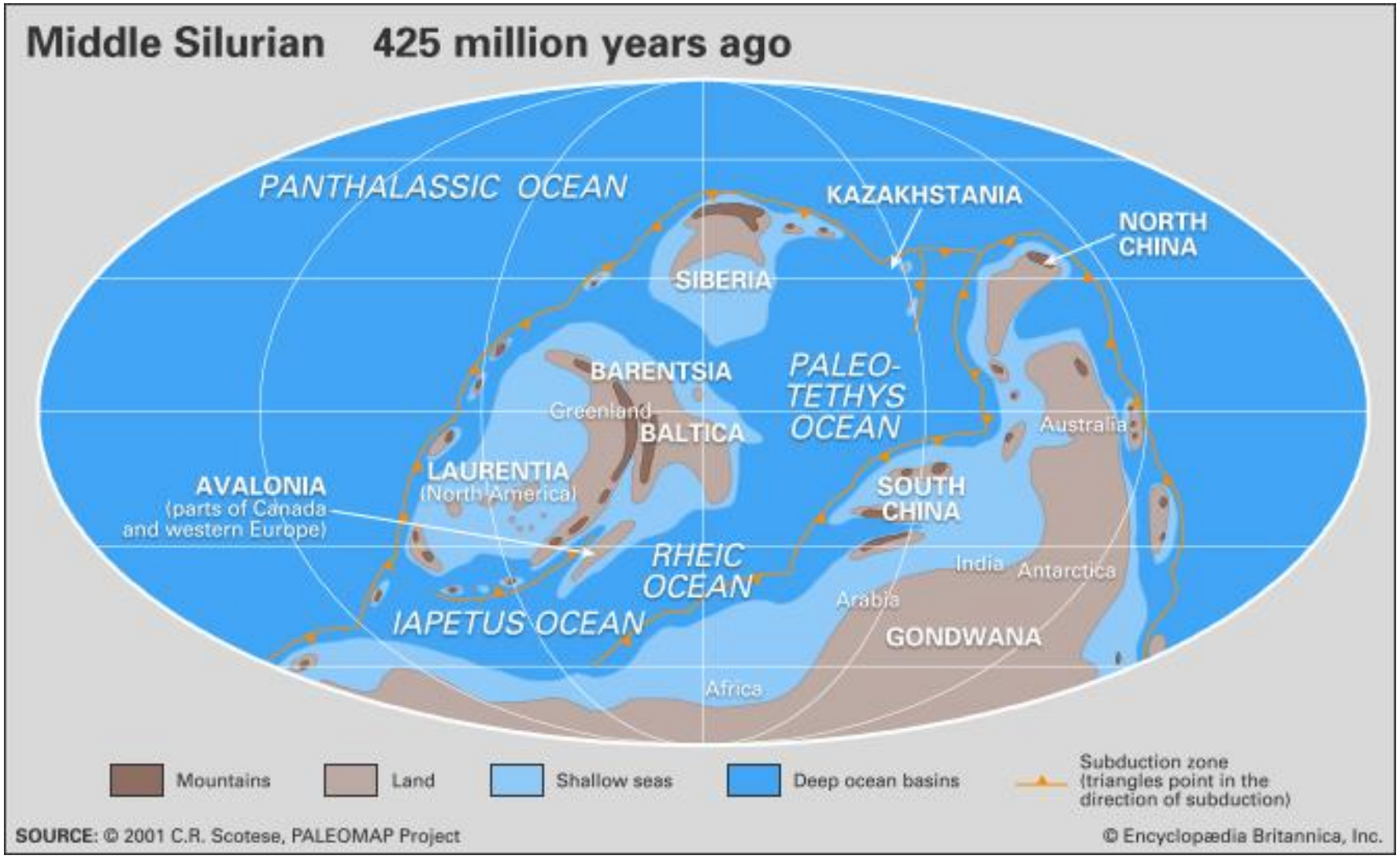
Cambrian Sandstones

Paleontological History of Wisconsin

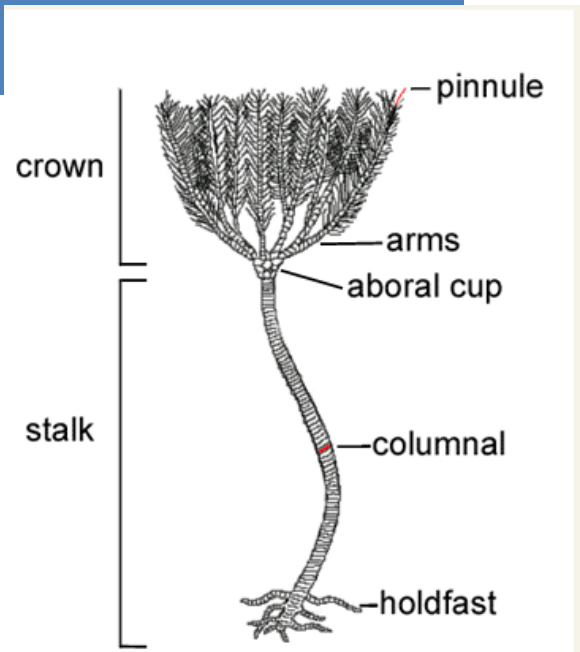
Field Museum - Chicago

Shallow Tropical Seas




Middle Silurian 425 million years ago
PANTHALASSIC OCEAN
KAZAKHSTANIA
NORTH CHINA
SIBERIA
BARENTSIA
Greenland
BALTICA
PALEO-TETHYS OCEAN
Australia
LAURENTIA (North America)
AVALONIA (parts of Canada and western Europe)
SOUTH CHINA
RHEIC OCEAN
India
Antarctica
Arabia
IAPETUS OCEAN
GONDWANA
Africa
Mountains
Land
Shallow seas
Deep ocean basins
Subduction zone (triangles point in the direction of subduction)
SOURCE: © 2001 C.R. Scotese, PALEOMAP Project
© Encyclopædia Britannica, Inc.

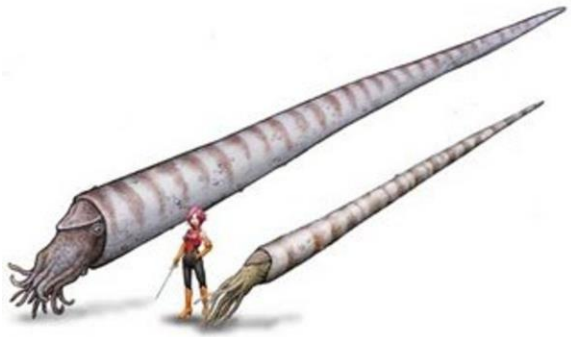
Fossils of Wisconsin's Tropical Seas



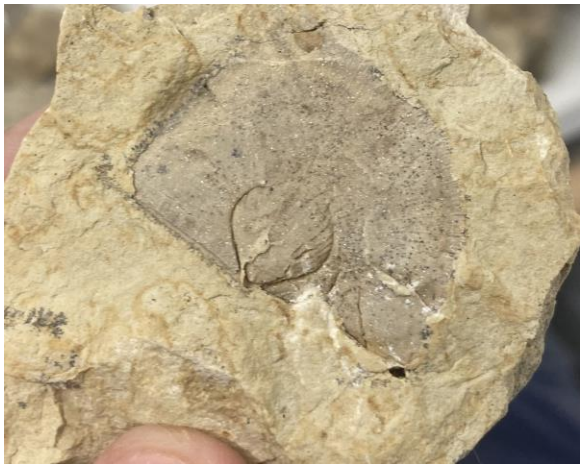
Favosites (honeycomb)

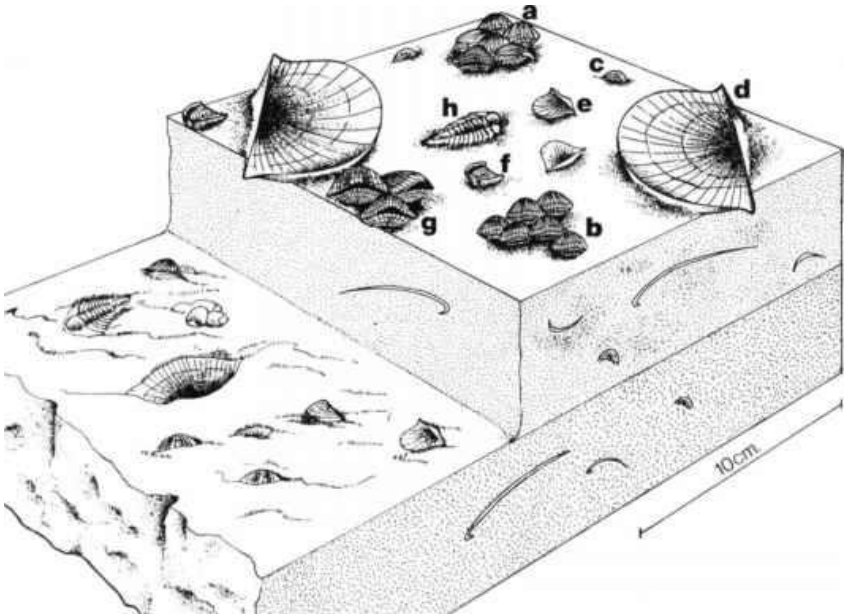
Halysites(chain coral)

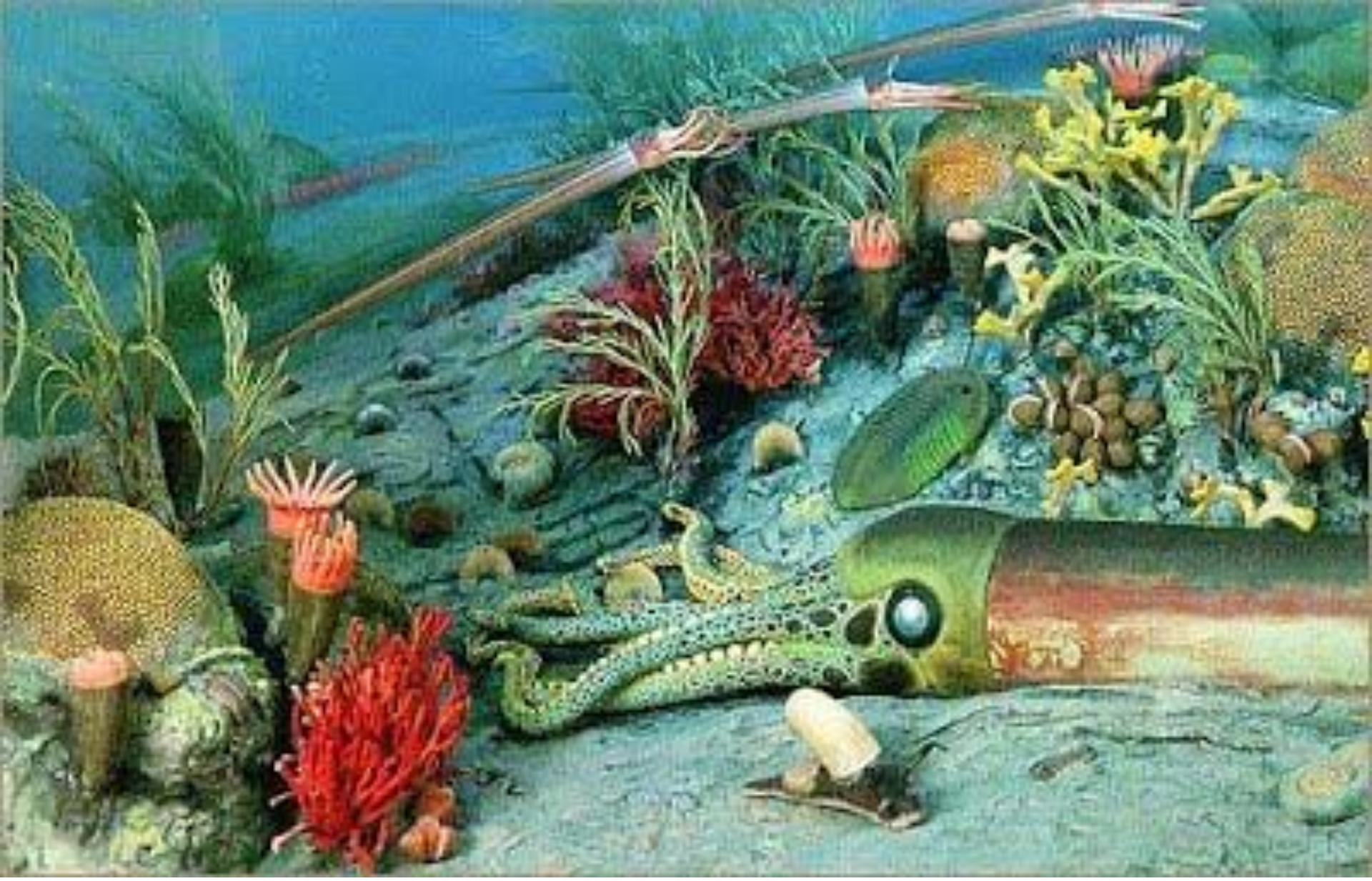
Fossils of Wisconsin's Tropical Seas



Fossils of Wisconsin's Tropical Seas

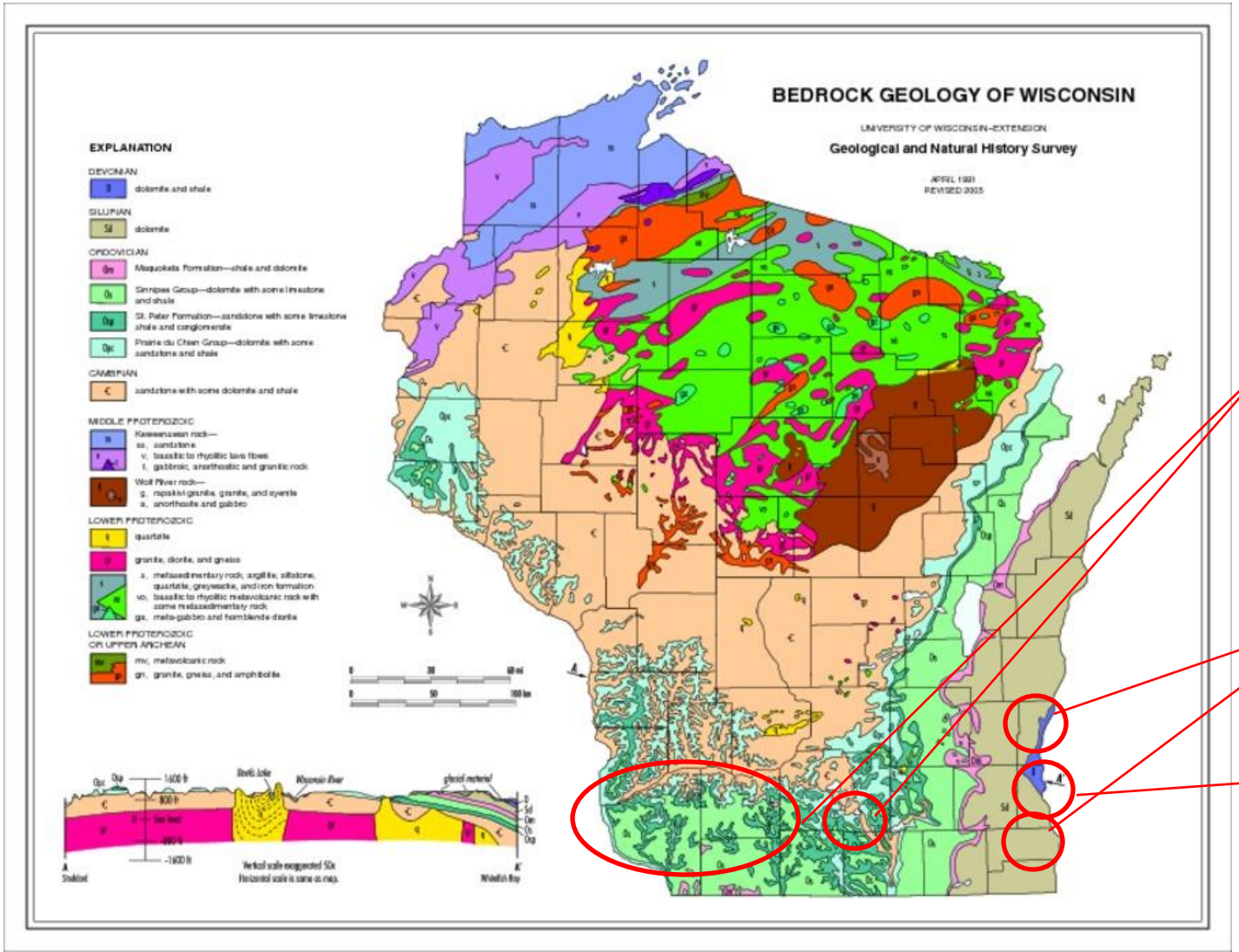






The Ordovician

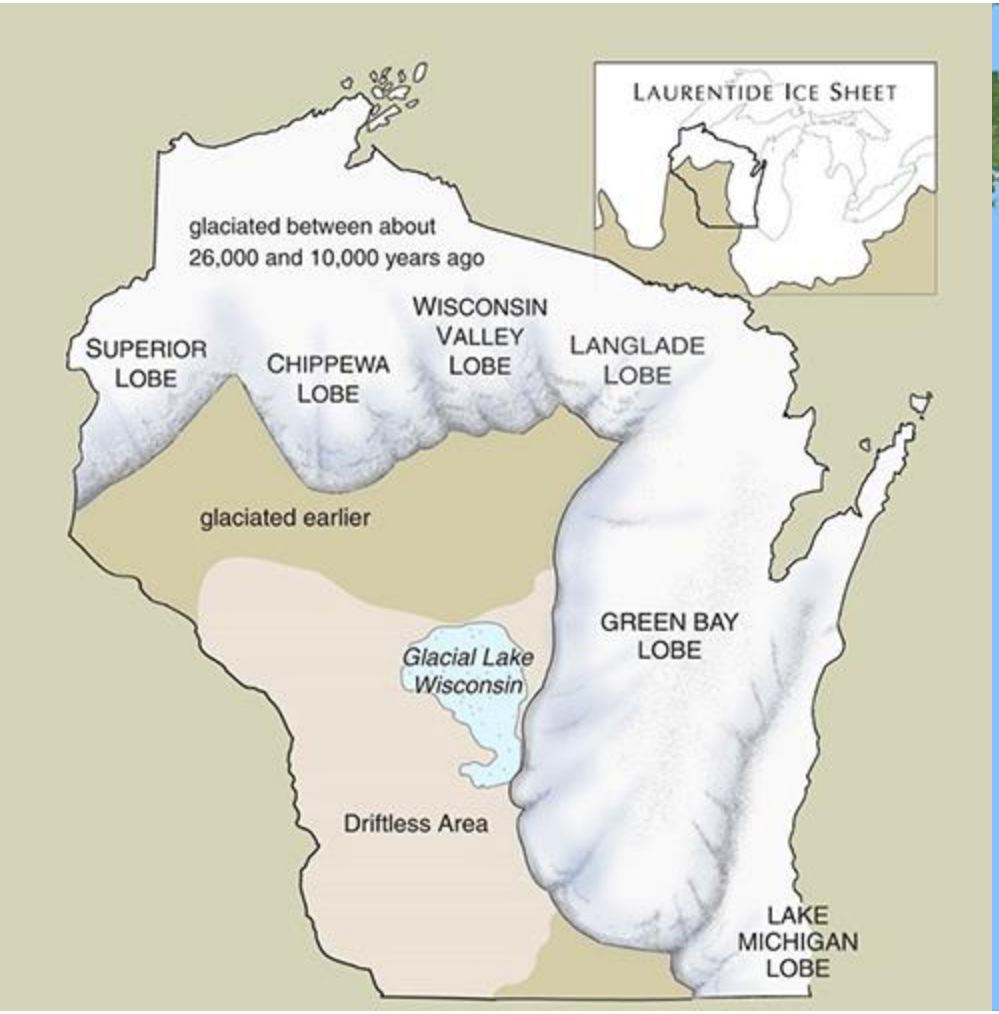
Fossil Sites in Wisconsin



Ordovician Outcrops & Roadcuts

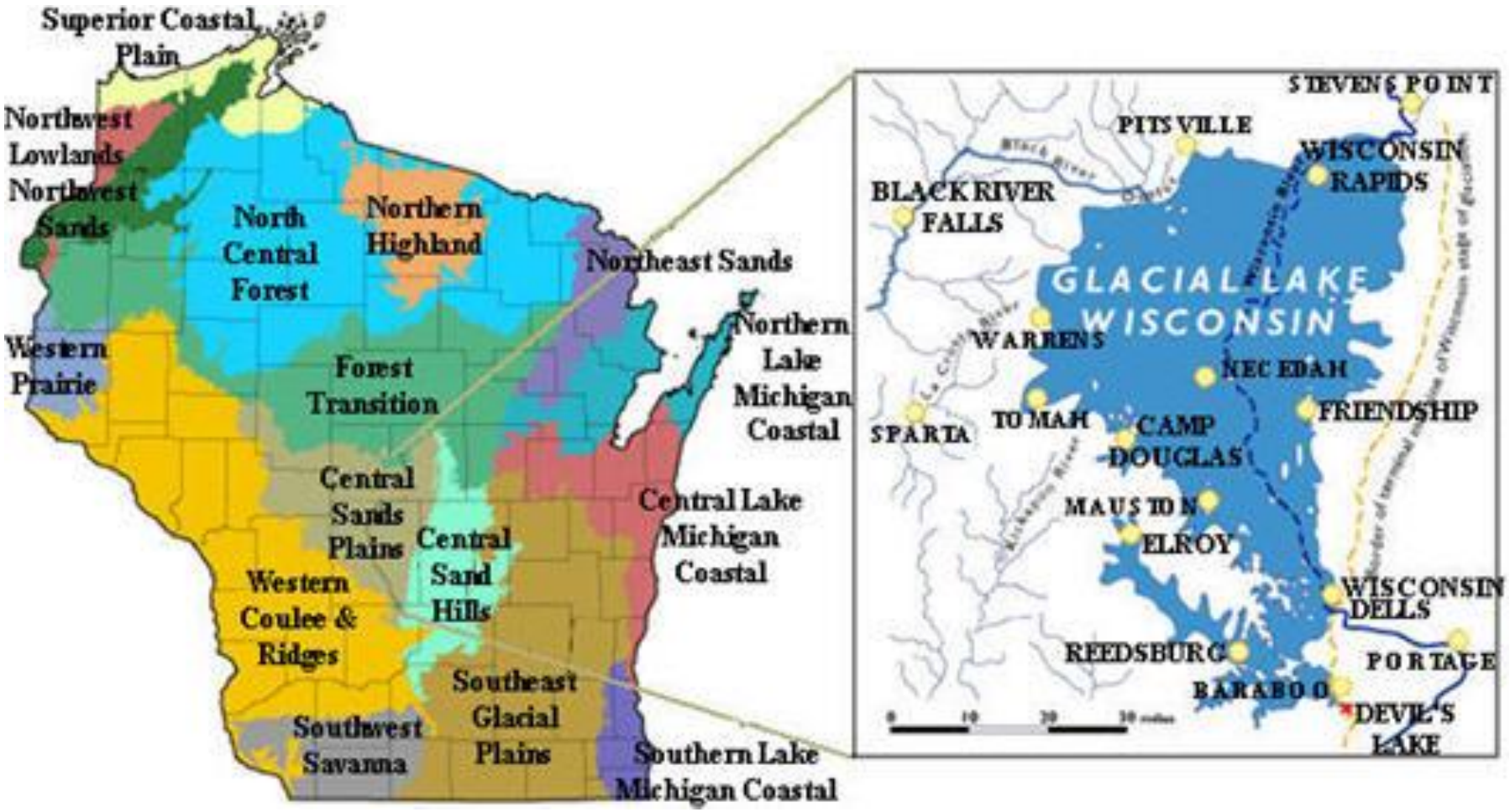
Silurian Reef Outcrops

Silurian & Devonian



Glacial Wisconsin

~ 26,000 to 10,000 years ago

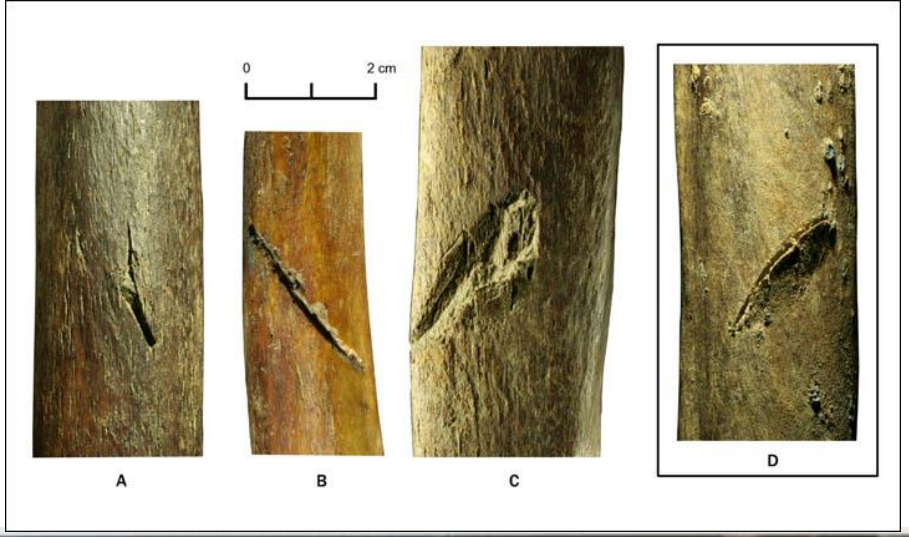


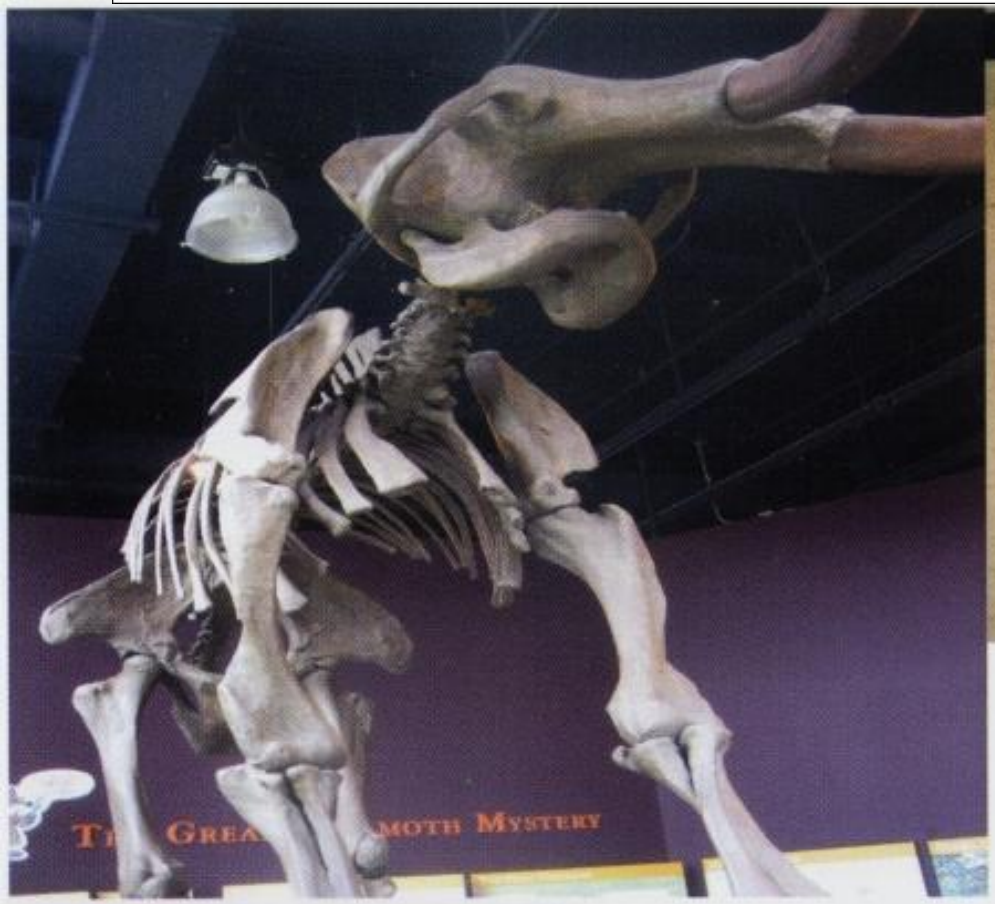
Glacial Lake Wisconsin

~ 18,000 years ago

Ice Age Megafauna

Wisconsin Glaciation ends around 10,000 years ago





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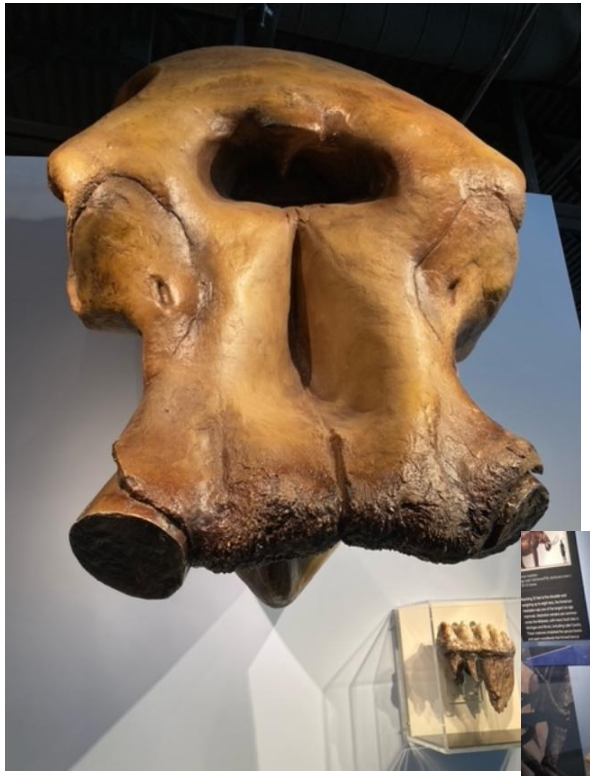
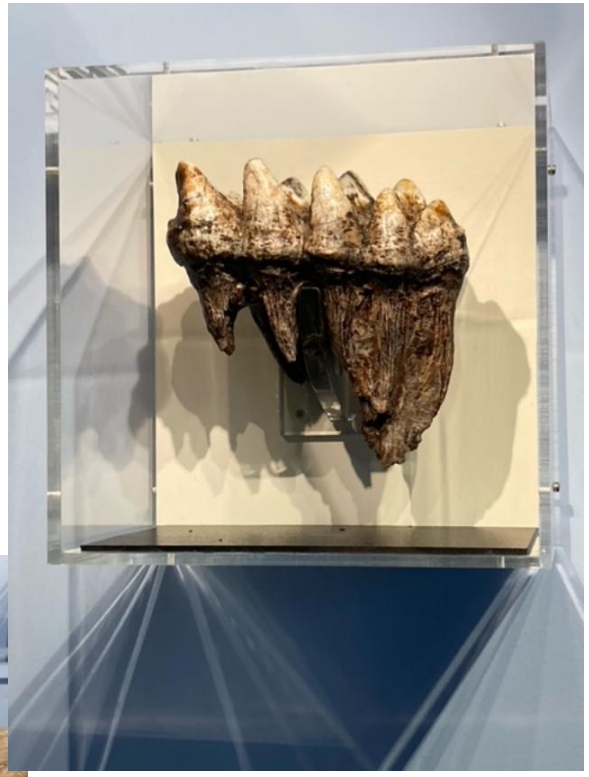
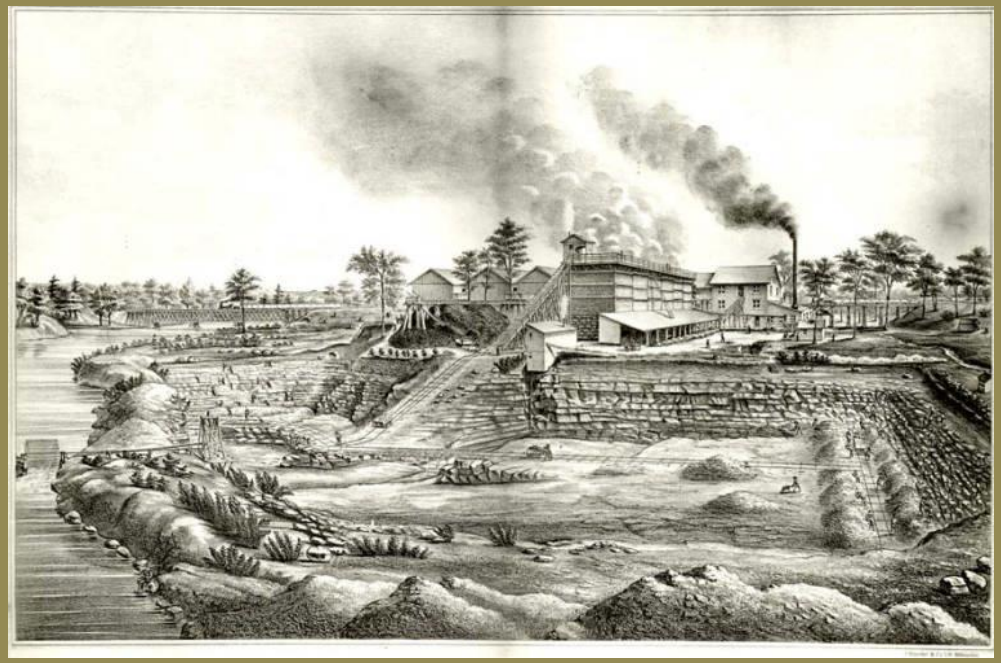


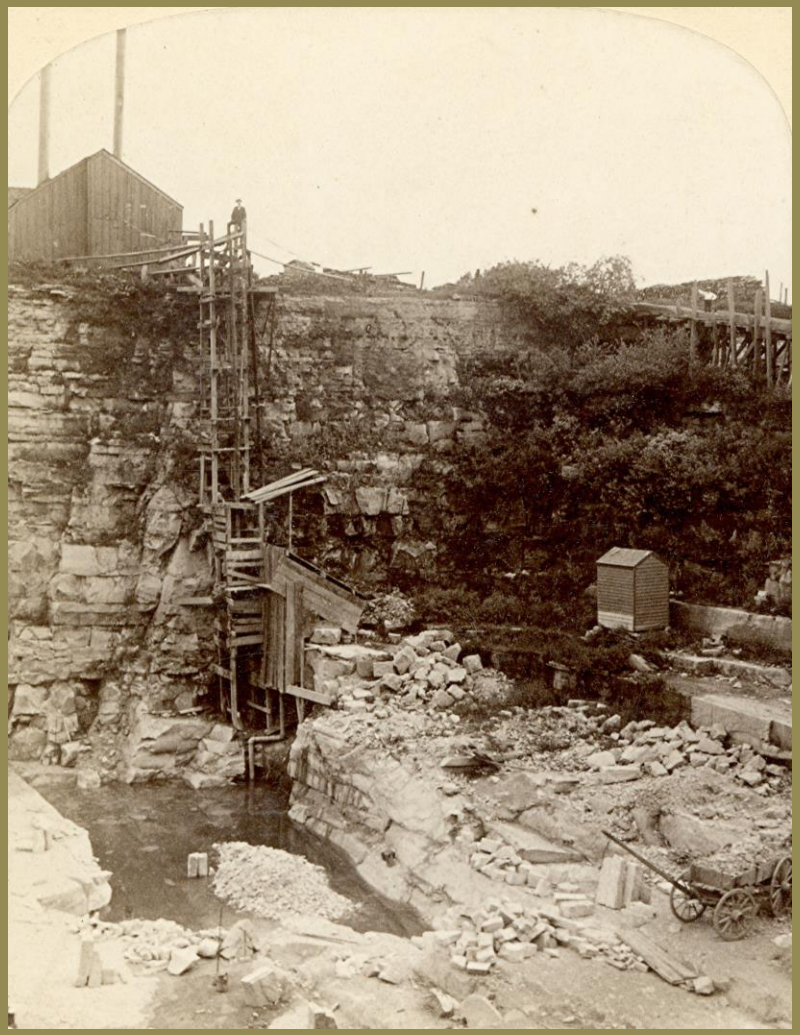



American Mastodon Leg Bone
Mammut americanum
12,000 years old
In the summer of 1920, while dredging a canal on his property in Ingleside, Herman Haring (1870 – 1932) brought up the fossilized bones of a horse. The skull was also found and hoisted several times, but each time slipped off the dredger's bucket back into the water. Further efforts to recover the skull and more bones were unsuccessful.
Above
American Mastodon Tooth
Mammut americanum
12,000 years old
This mastodon tooth was found by Lake County resident John Hart while dredging his land in Round Lake sometime between 1910 and 1930.

Mineral History of Wisconsin- Mining



Milwaukee Cement Quarry – Milwaukee Public Library collections



Hiram Story Stone Quarry circa early 1880's – American Family Field area – Menomonee Valley

Why no dinosaur fossils in Wisconsin?


B/12
Lias
Bivalves