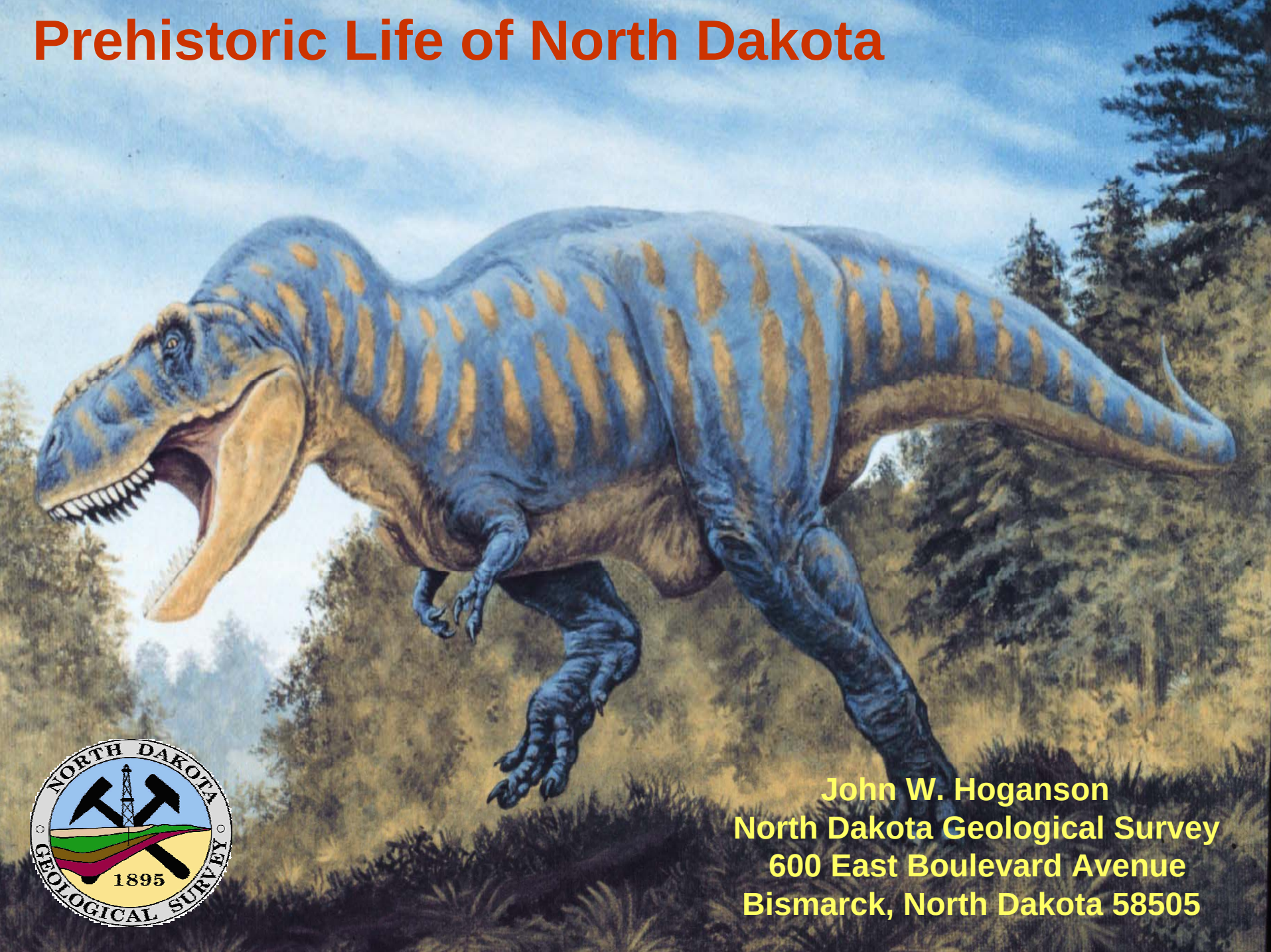
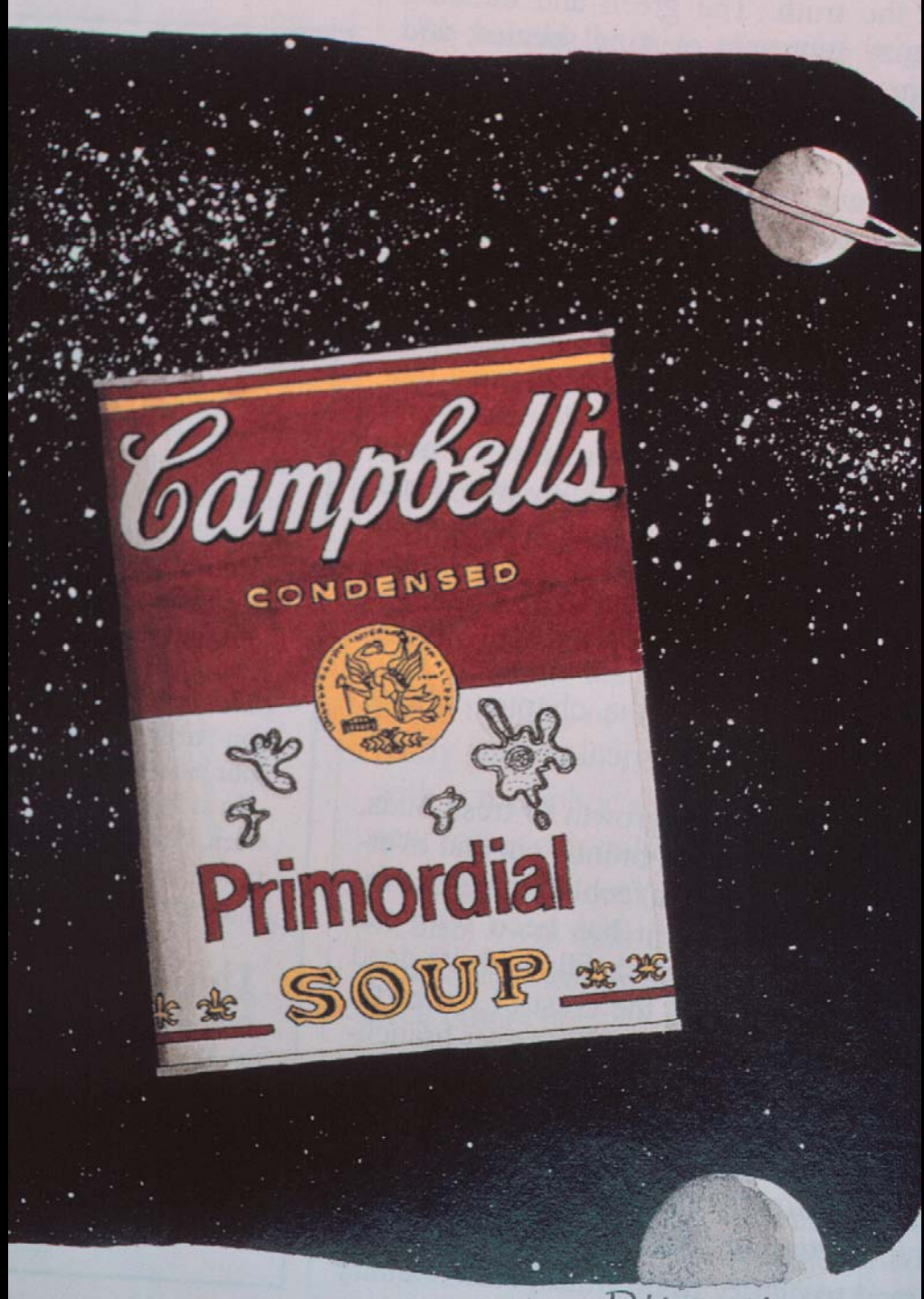
Prehistoric Life of North Dakota

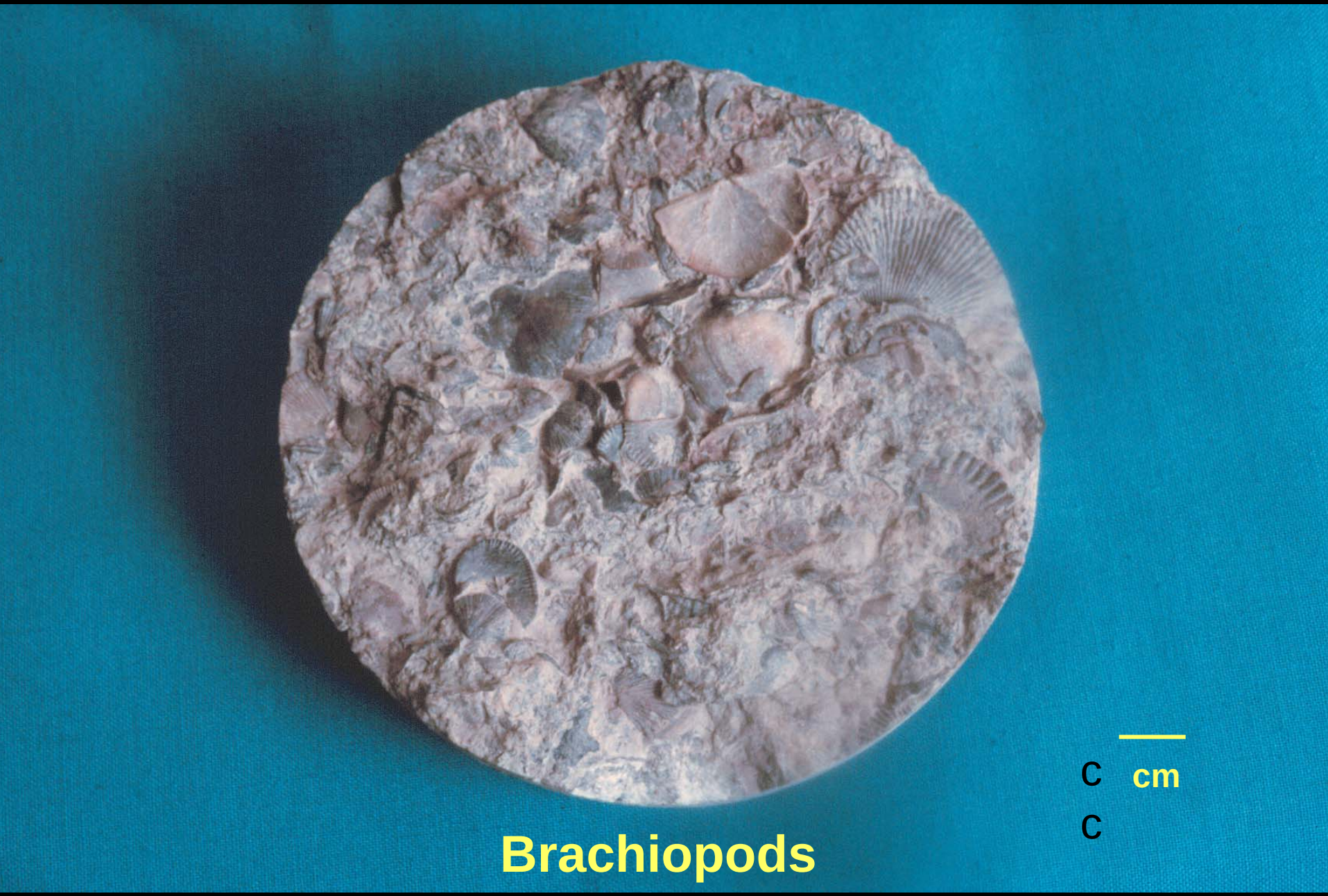


John W. Hoganson
North Dakota Geological Survey
600 East Boulevard Avenue
Bismarck, North Dakota 58505

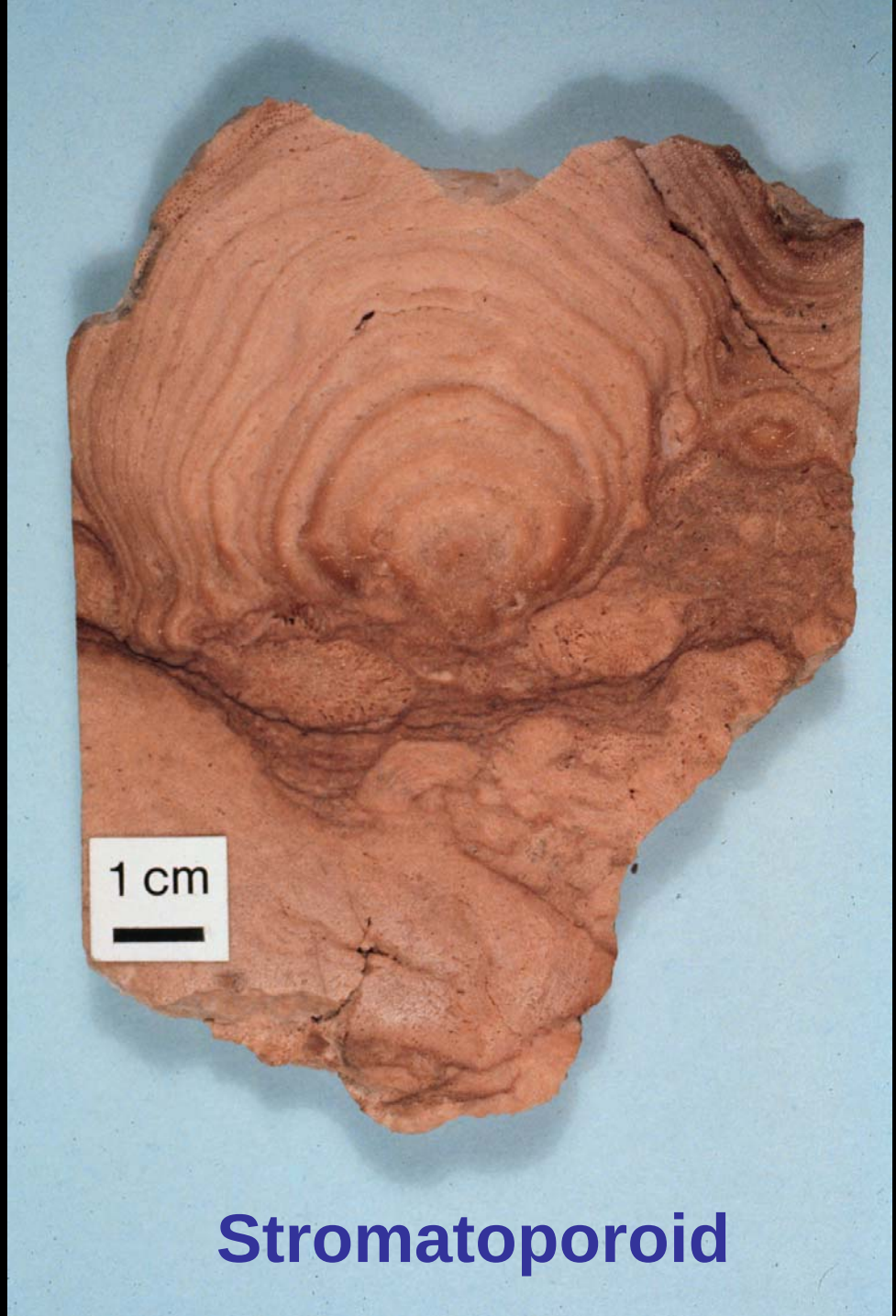
There Are Tyrannosaurs Trying On Pants in My Bedroom

Primordial Seas


Campbell's
CONDENSED
Primordial
SOUP



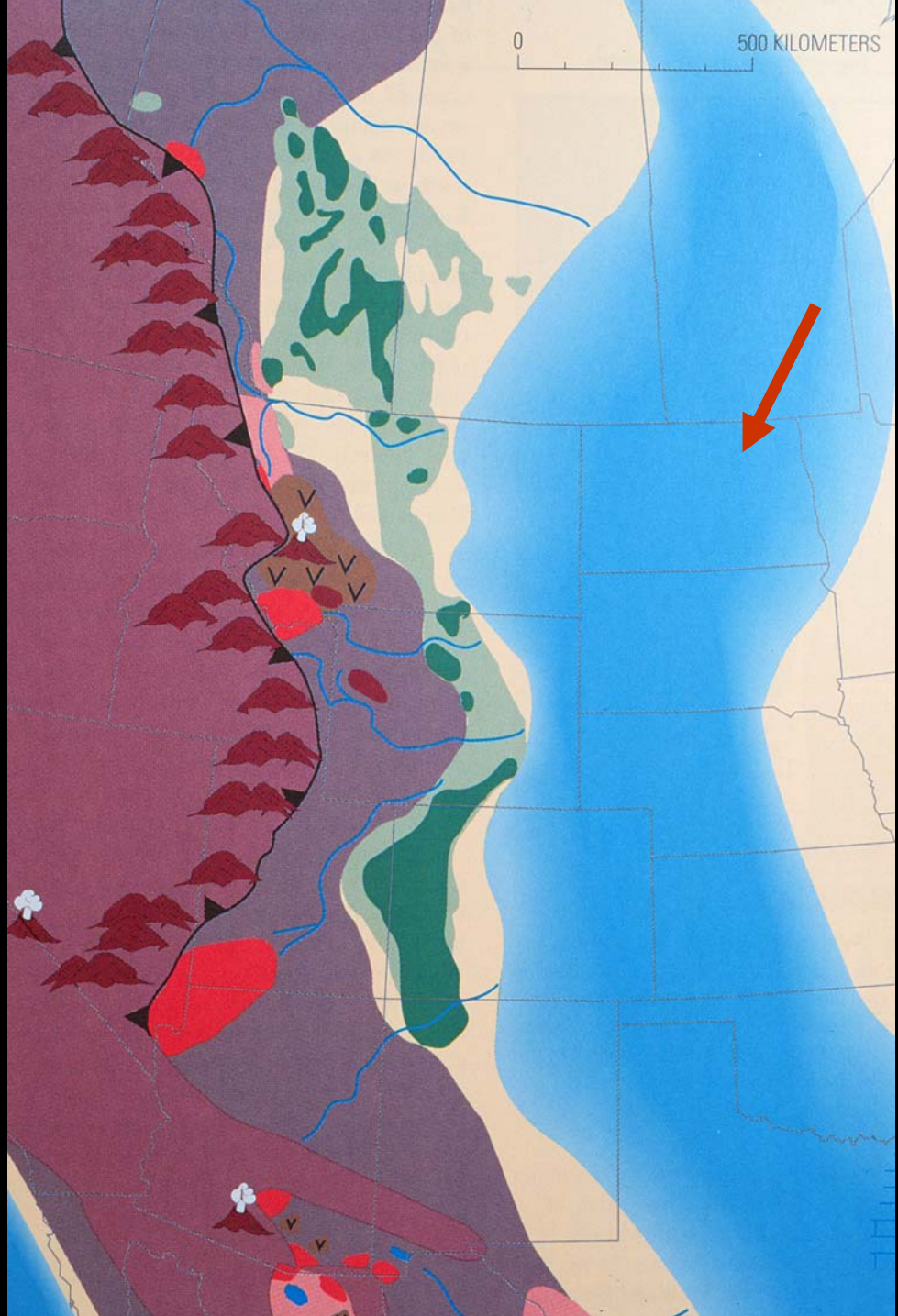
Brachiopods



Stromatoporoid

Corals

North Dakota's Underwater World


0
500 KILOMETERS

Pierre
Niobrara

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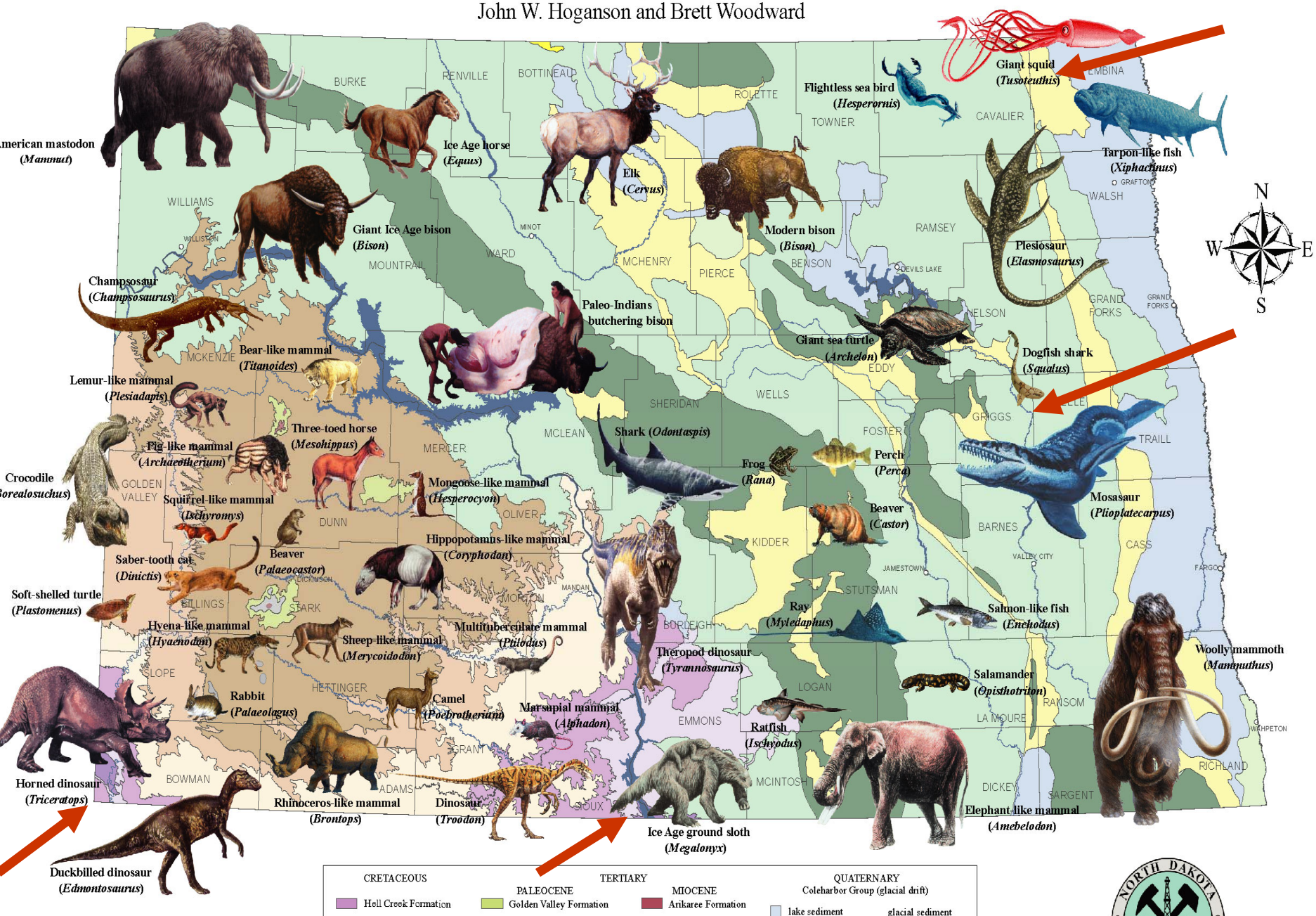
2005

PREHISTORIC LIFE OF NORTH DAKOTA

by

John W. Hoganson and Brett Woodward

North Dakota Geological Survey
Edward C. Murphy, Acting State Geologist

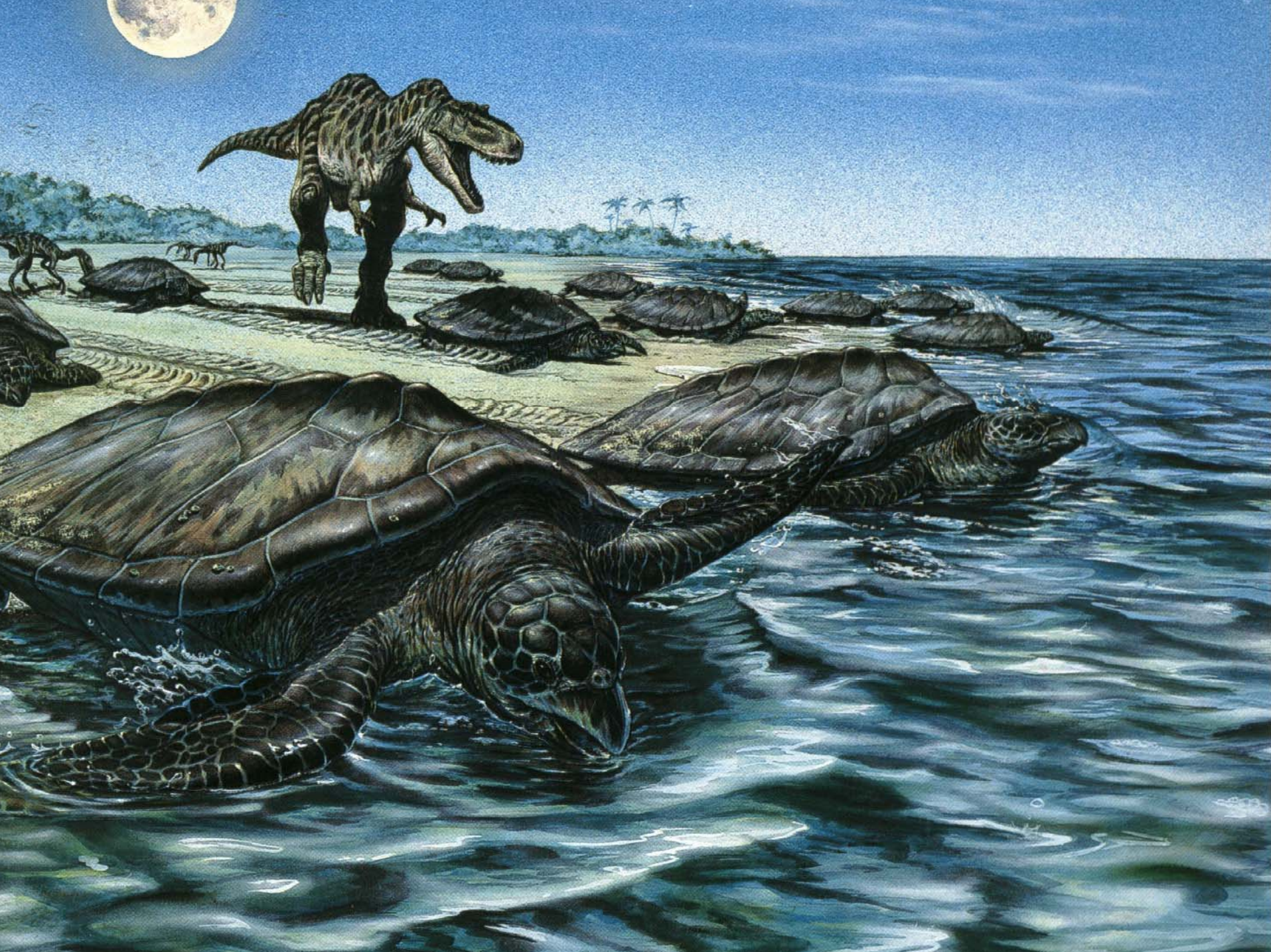


CRETACEOUS
Hell Creek Formation

TERTIARY
PALEOCENE
Golden Valley Formation
MIOCENE
Arikaree Formation

QUATERNARY
Coleharbor Group (glacial drift)
lake sediment
glacial sediment

M
PROFESSIONAL
COATINGS



Gastropod, *Euspira*

Bivalve, *Inoceramus*

Corals

Echinoid, sea urchin

Shrimp claw, *Callianassa*

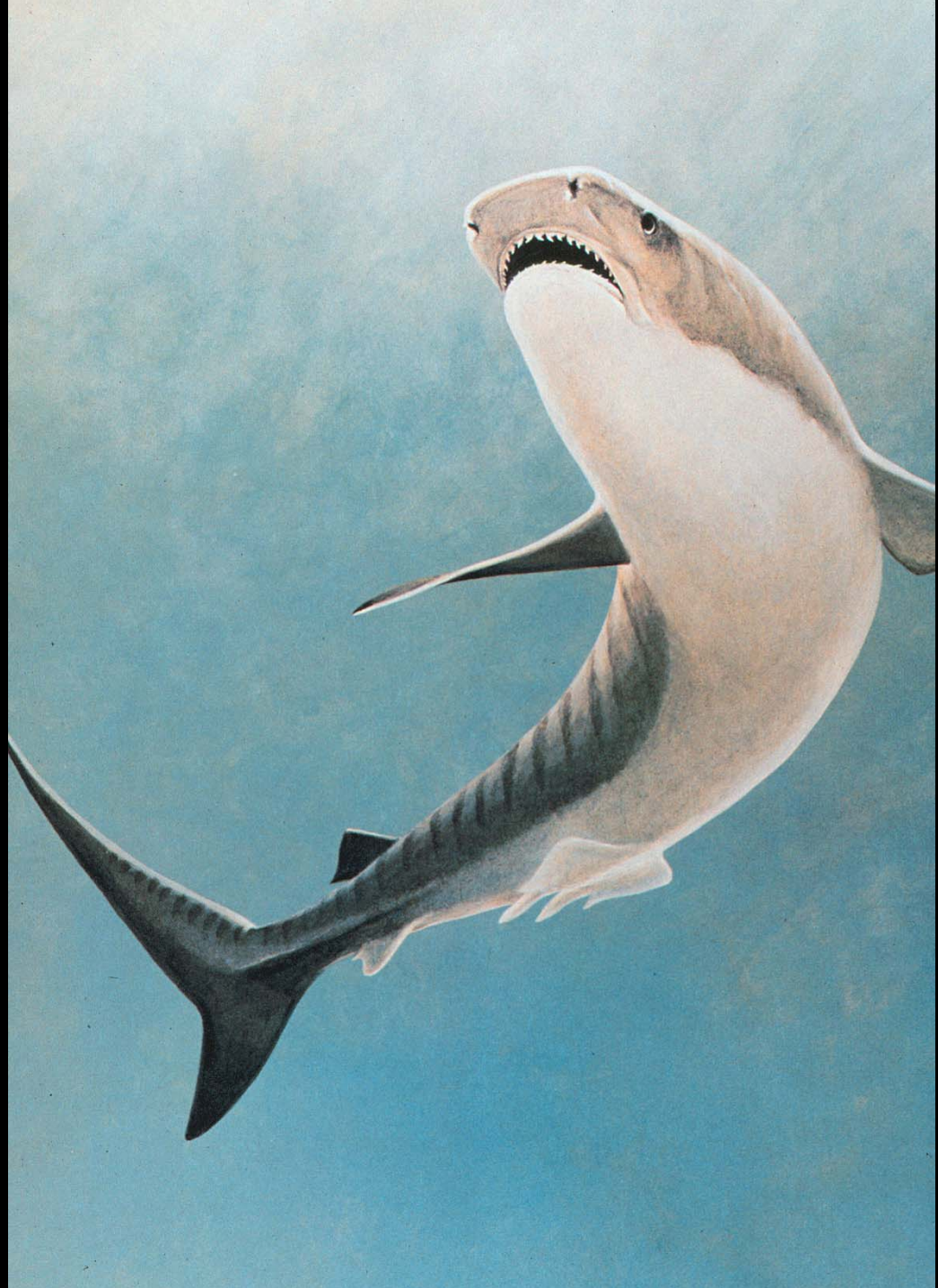
Cephalopod, *Baculites*

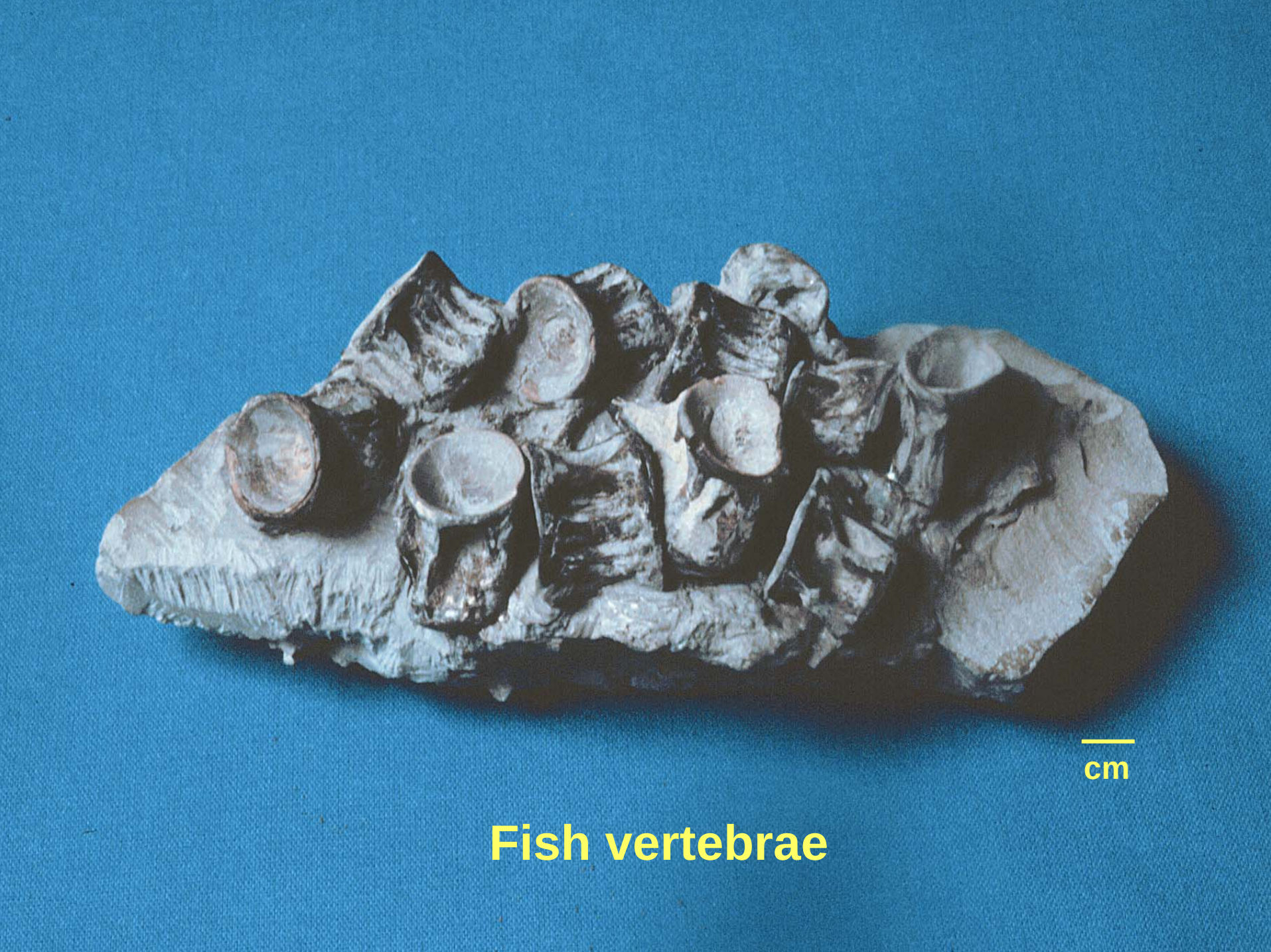
Cephalopod, *Didymoceras*

Cephalopod, *Solenoceras*

Cephalopod, *Jeletzkytes*

Shark tooth, *Squalicorax*





Fish vertebrae

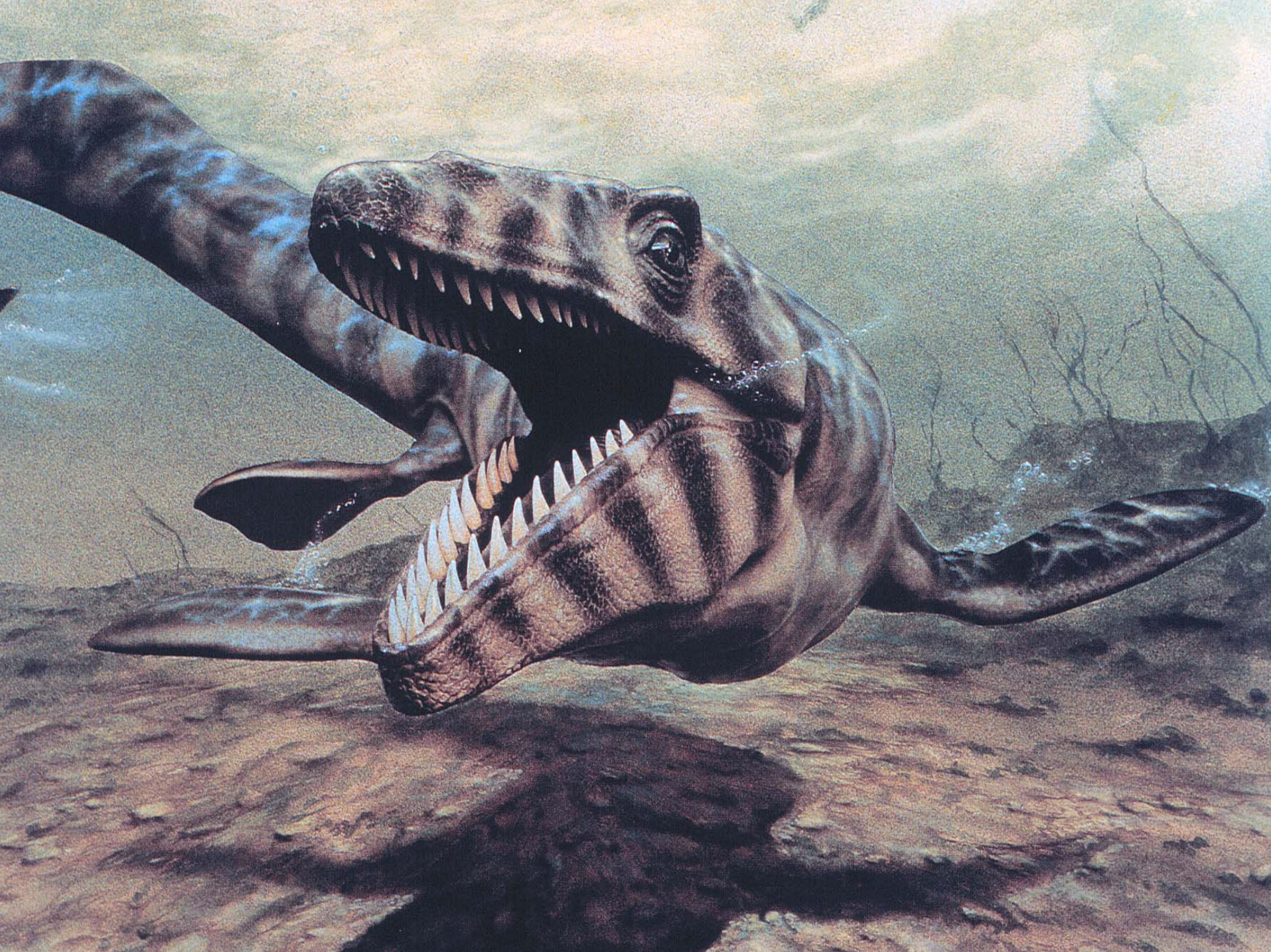
© D.W.Miller

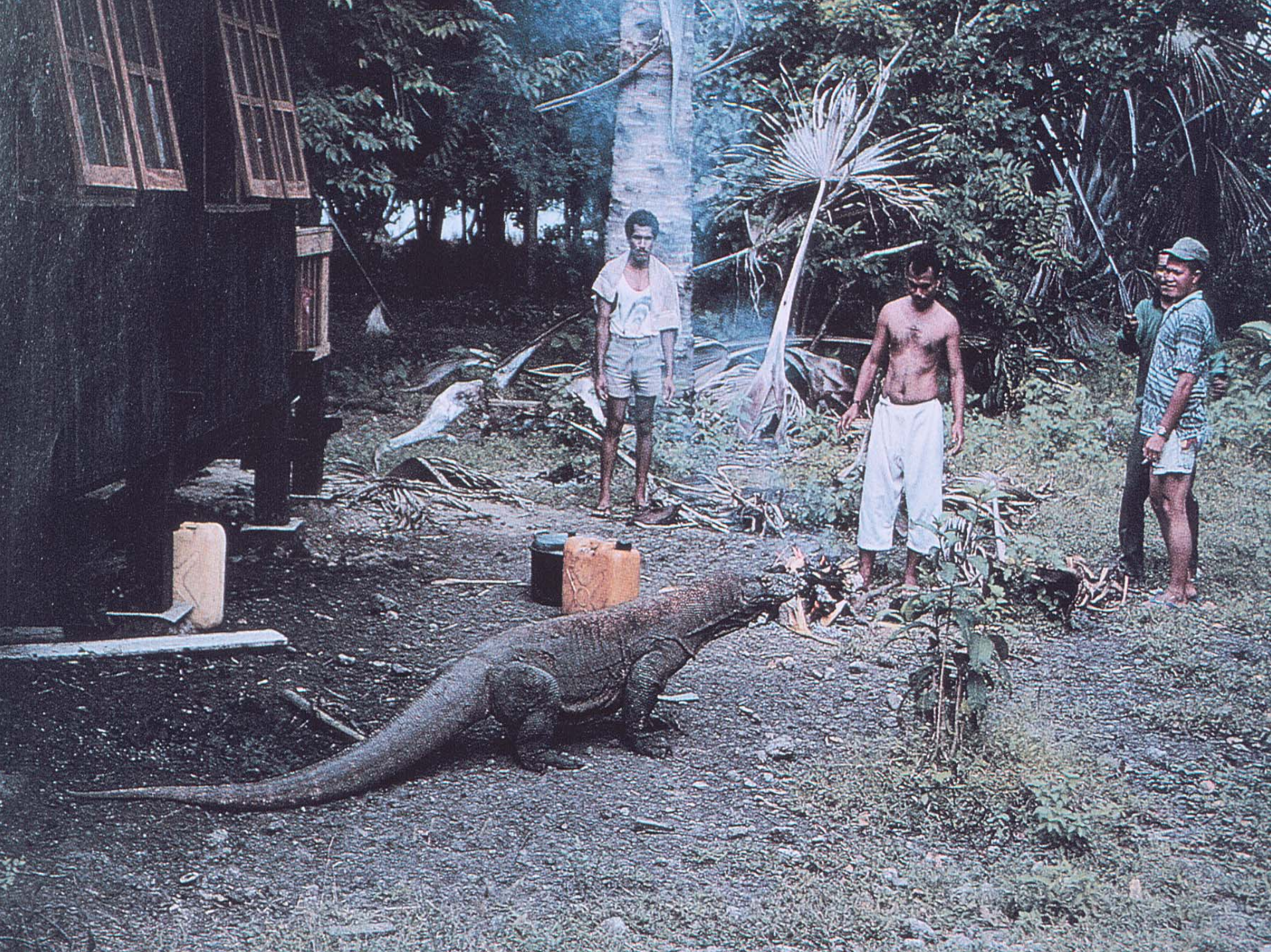
Tarso-metatarsal, *Hesperornis*

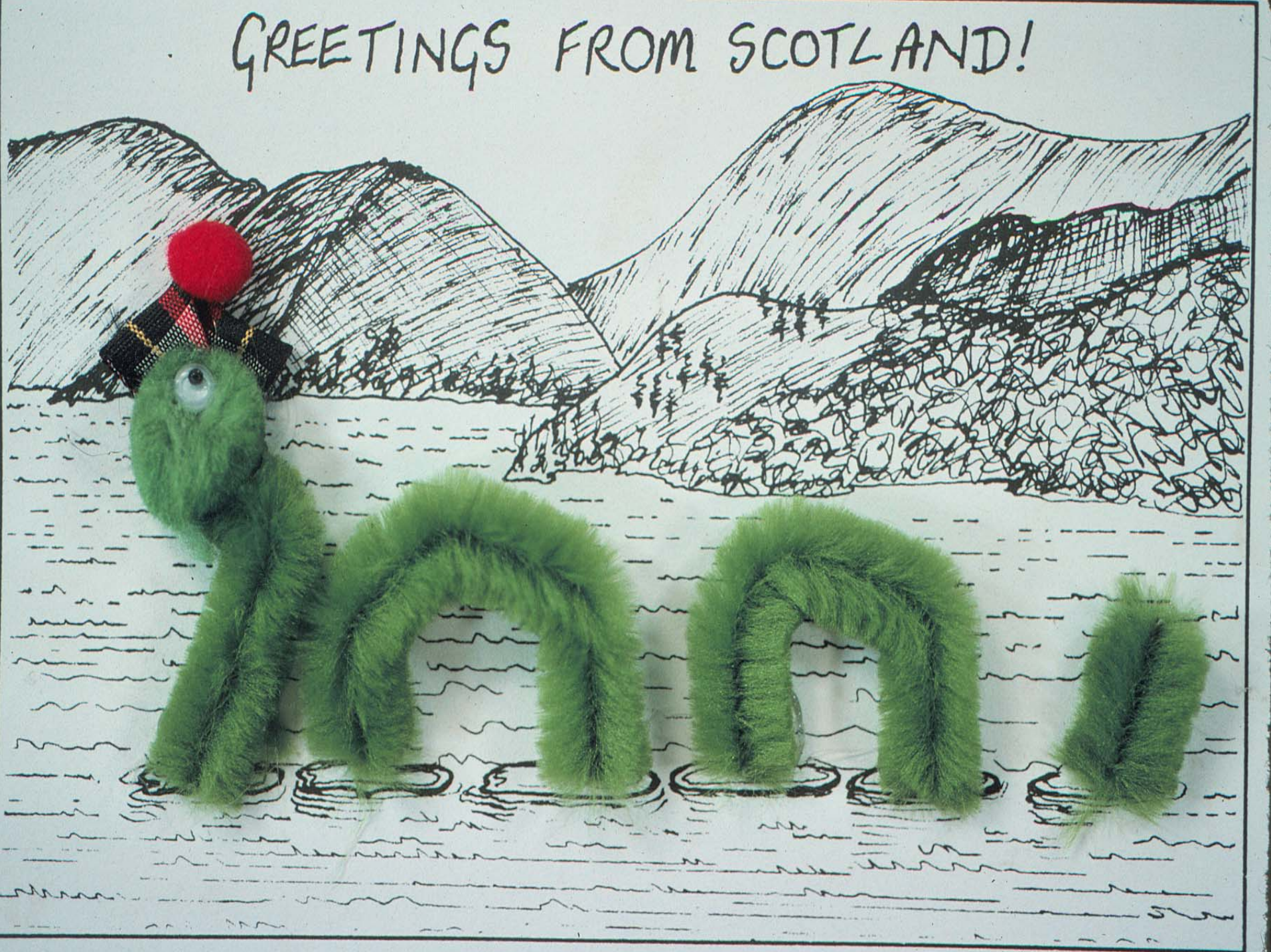
Dan Varner

Paleocene Plant Fossils
Johnsrud Collection

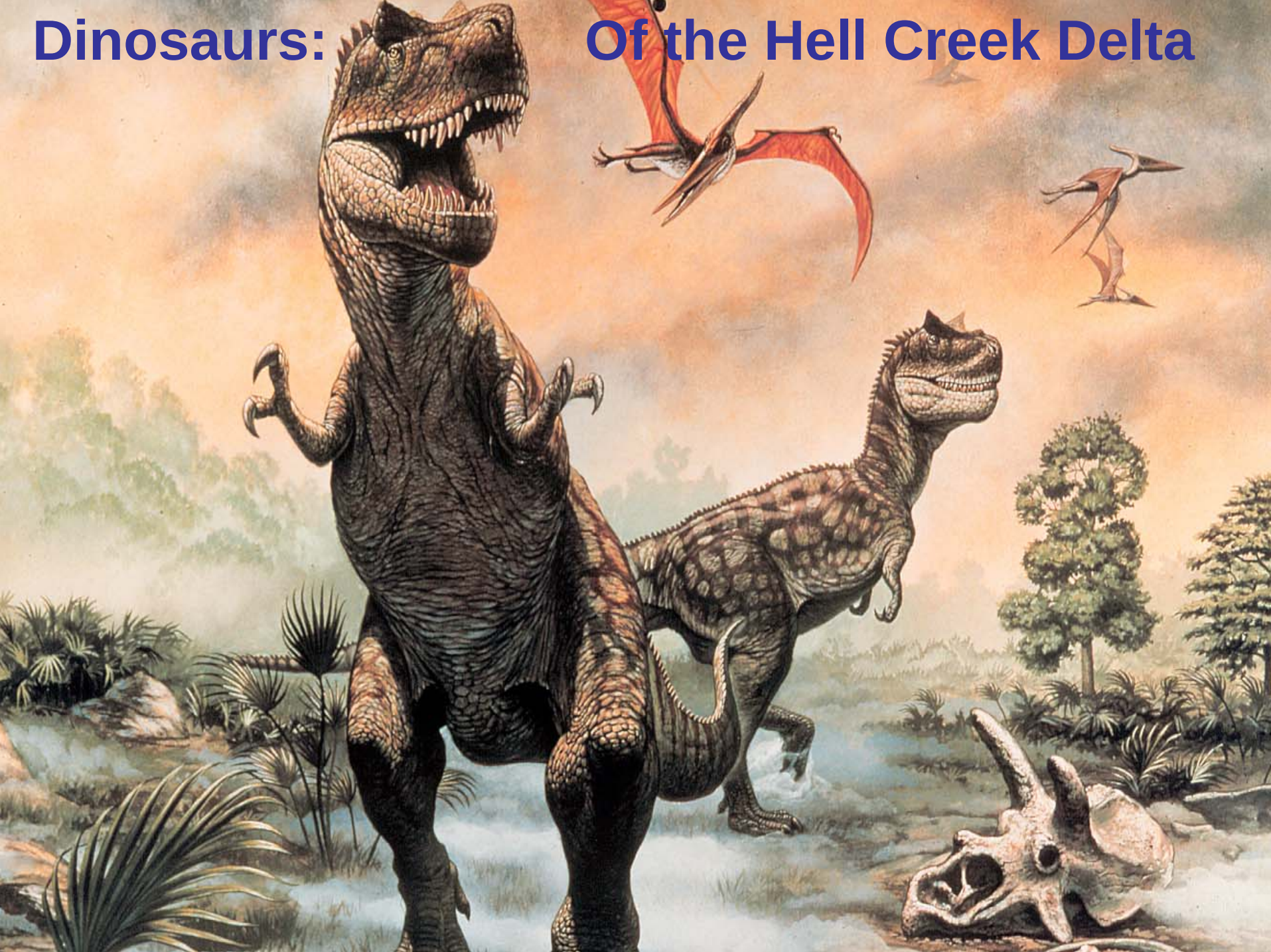
Hesperornis
(BIG BIRD)
CLIMATE: SUBTROPICAL
AS EVIDENCED BY OUR FOSSILS OUR STATE SHOULD BE NAMED: "TROPIC OF DAKOTA."
NORTH DAKOTA PALEONTOLOGY
Mosasaur
(MARINE LIZARD)
CLIMATE: SUBTROPICAL
Thayne Olson
2001 The Forum






GREETINGS FROM SCOTLAND!

Dinosaurs: Of the Hell Creek Delta



MANITOBA
Manicouagan Crater
QUEBEC
ONTARIO
NEW BRUNSWICK
P.E.I.
N.S.
MAINE
WASHINGTON
Columbia Embayment
OREG.
IDAHO
MONTANA
NORTH DAKOTA
WESTERN INTERIOR SEAWAY
AMERICA
MINN.
WISCONSIN
MICH.
WYOMING
SOUTH DAKOTA
Skeletons and Trackways
Acres of fossils lie exposed in the rock formations of Montana, Wyoming, Colorado, Utah, and Alberta, Canada, long the best known sources of dinosaur remains in North America. Excavations elsewhere on the continent have also revealed dinosaur fossils, adding data on these extinct creatures. Fossilized bones convey body structure. Fossilized footprints, called trackways, add information about posture, speed, and social behavior.
NEBRASKA
IOWA
NEW YORK
MASS.
R.I.
CONN.
Appalachian Mountains
PENNSYLVANIA
N.J.
UTAH
COLO.
Rocky Mountains
KANSAS
OHIO
IND.
ILL.
MD.
DEL.
MISSOURI
W. VA.
VA.
Sierra Nevada
CALIF.
ARIZONA
NEW MEXICO
KENTUCKY
TENN.
N.C.
OKLAHOMA
ARK.
Mississippi Embayment
S.C.
MISS.
ALA.
TEXAS
LA.
GA.
FLA.
Sierra Madre Occidental
MEXICO
Some scientists
osaurus may
d crushed
Alamosaurus 69 ft
Platecarpus 20 ft
Elasmosaurus 32 ft
Tylosaurus 29 ft
Xiphactinus 16 ft
Archelon 15 ft

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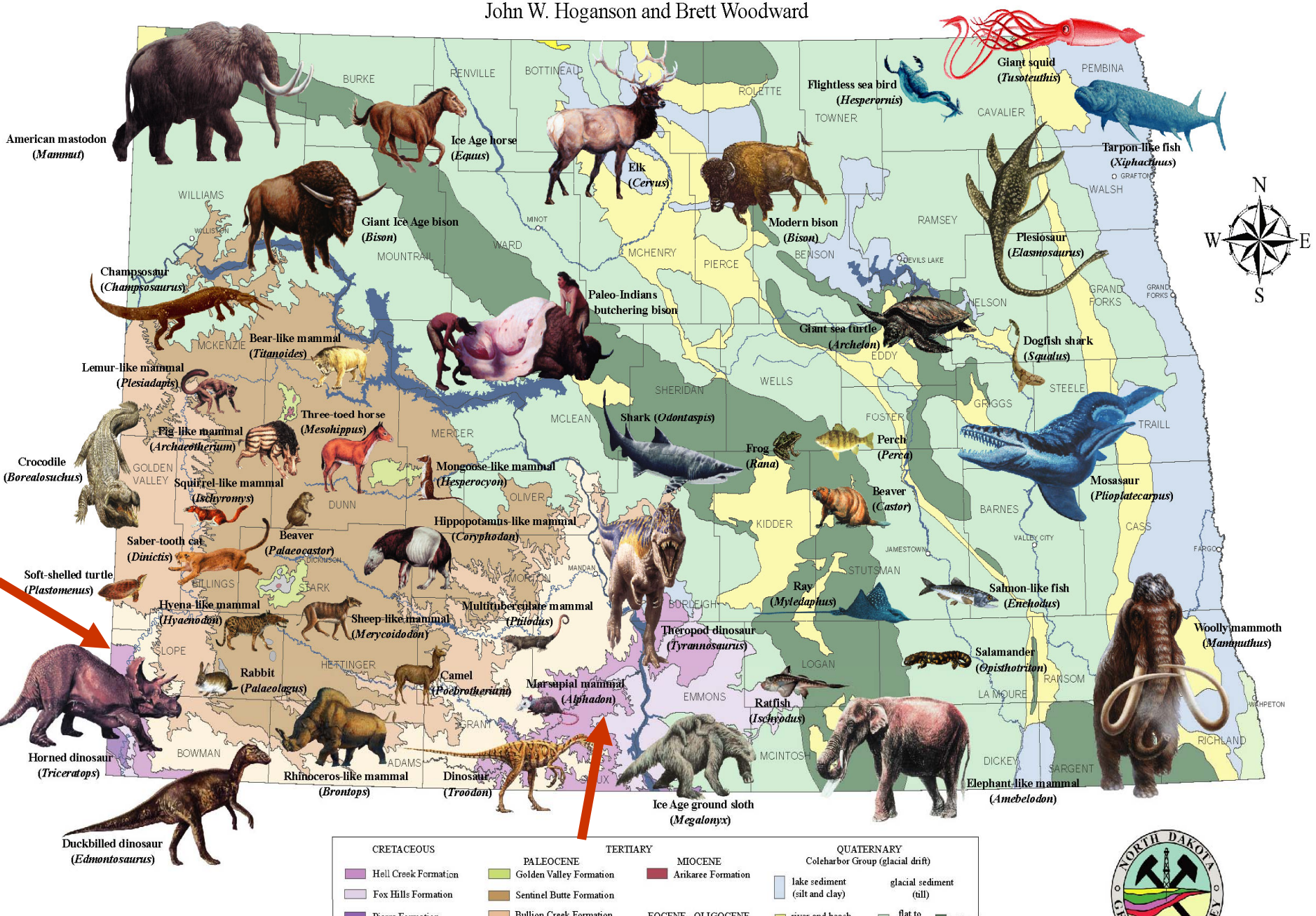


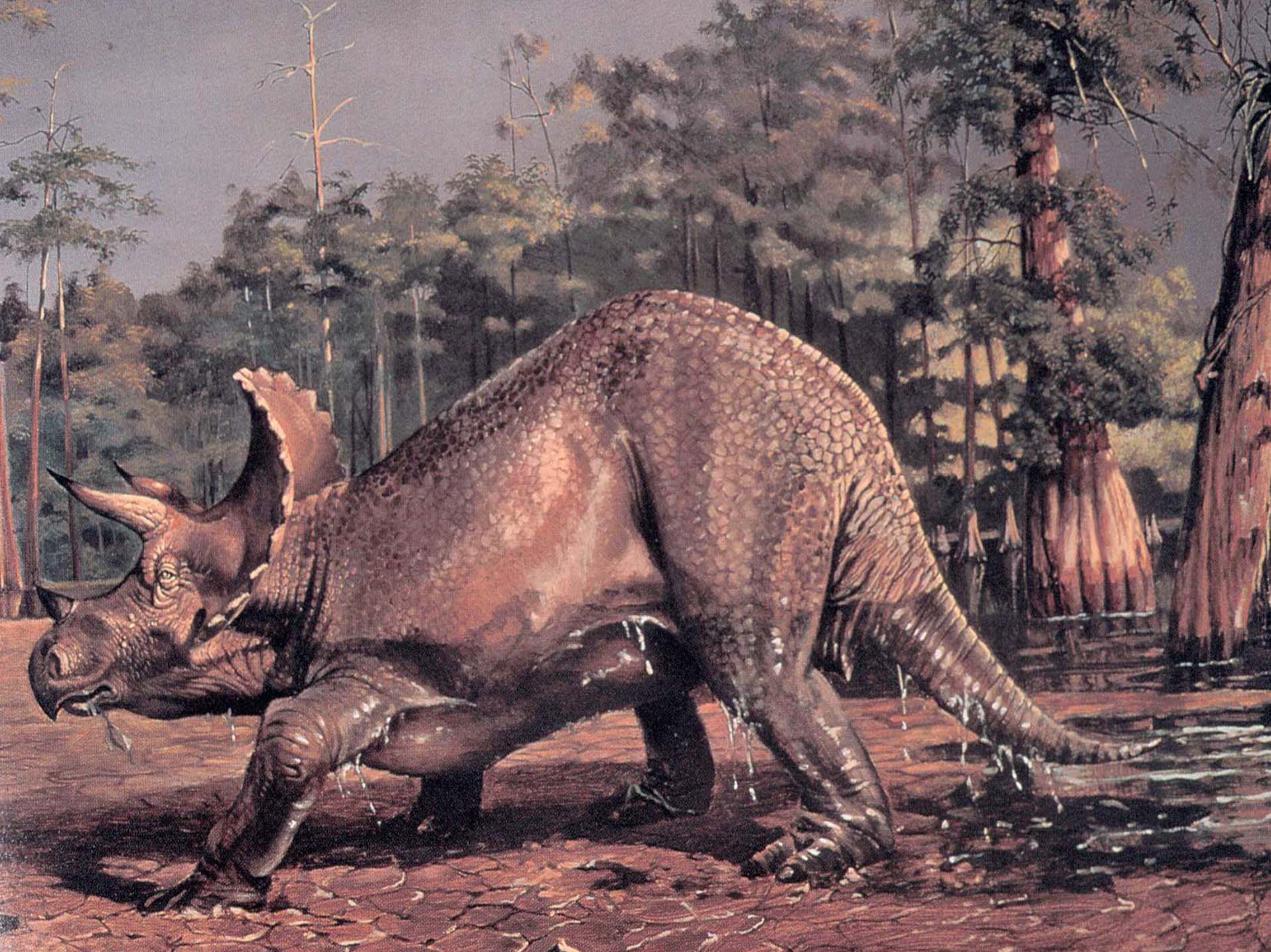
CRETACEOUS
- Hell Creek Formation
- Fox Hills Formation

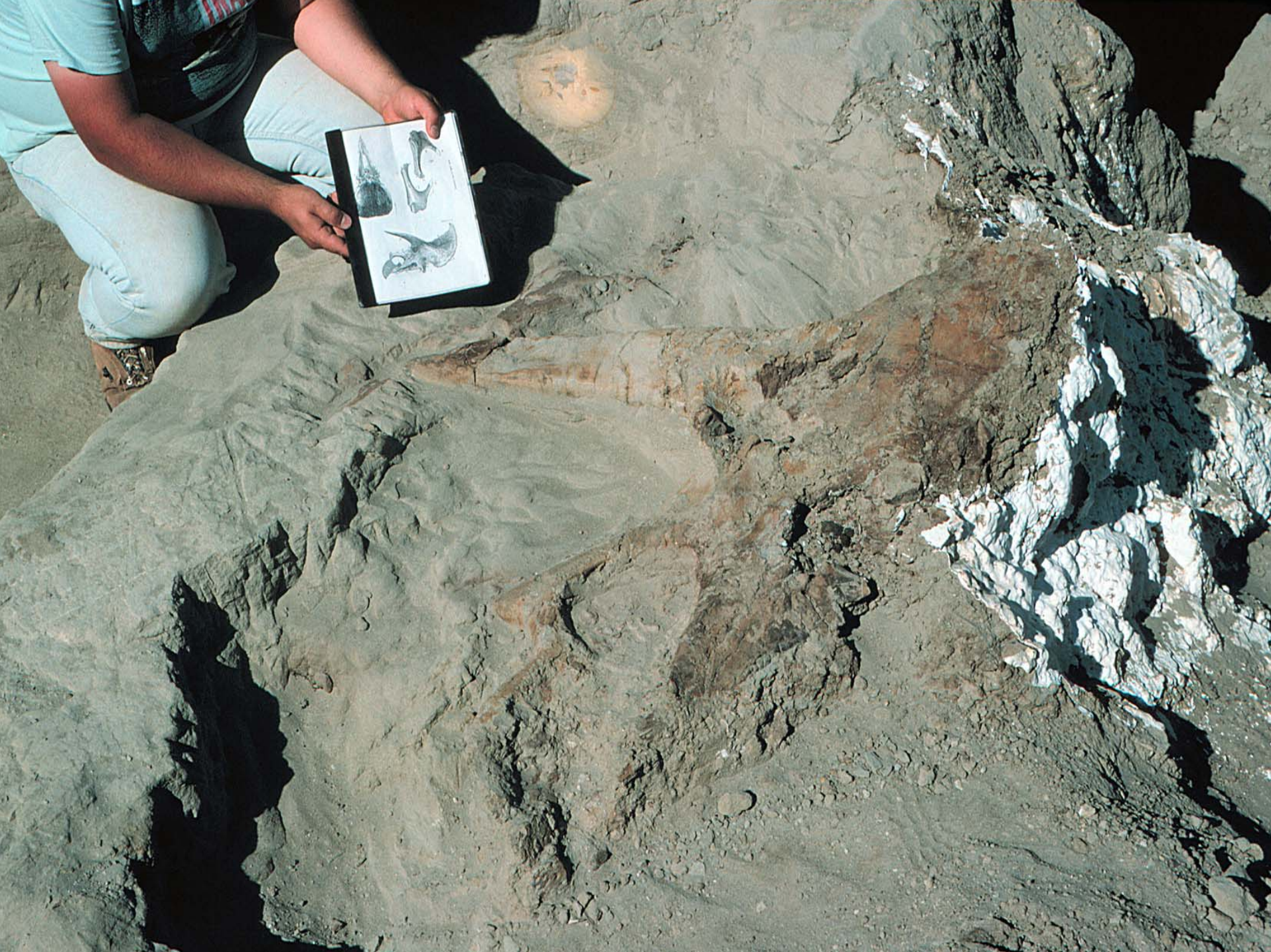
TERTIARY

PALEOCENE
- Golden Valley Formation
- Sentinel Butte Formation

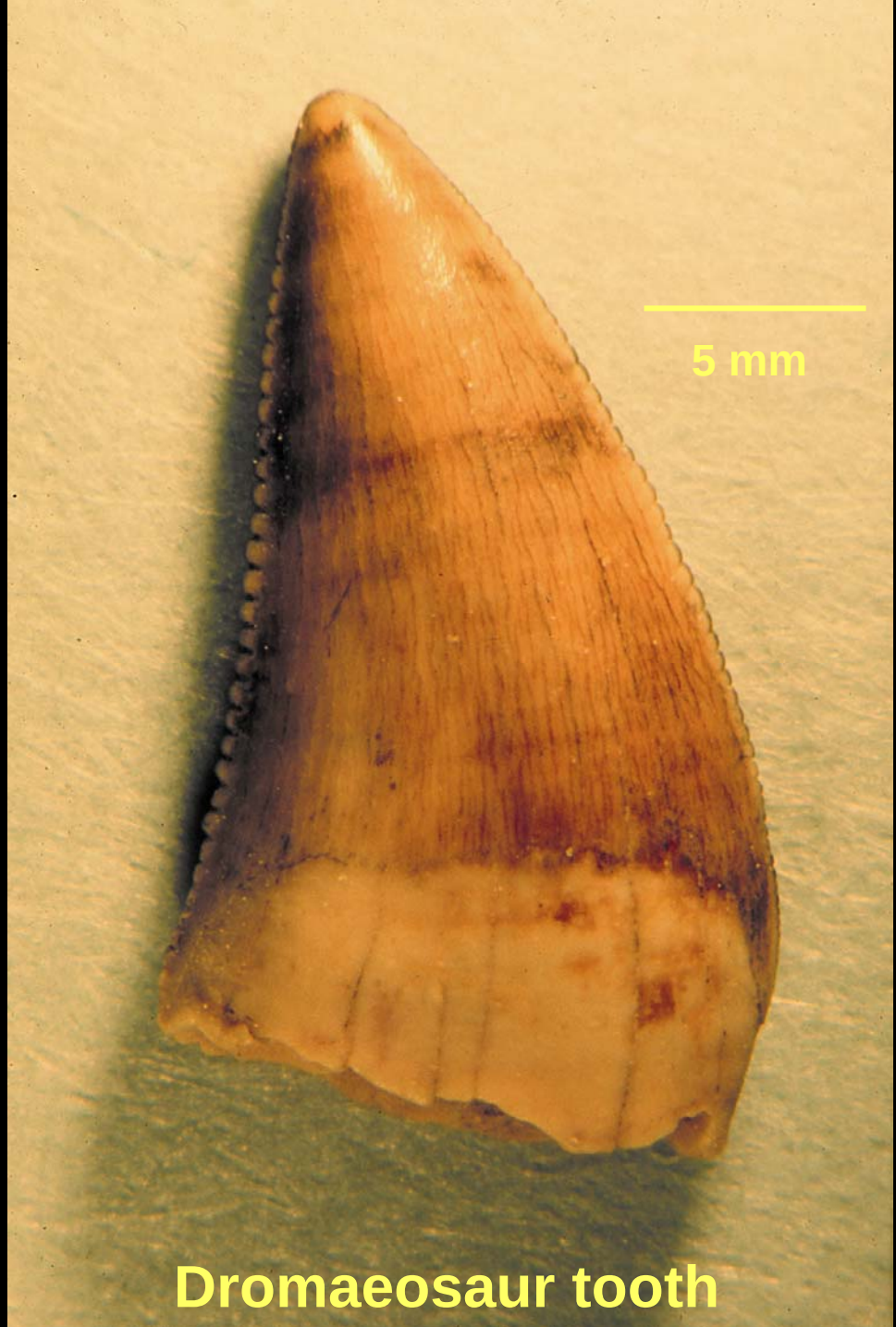
MIOCENE
- Arikaree Formation

QUATERNARY
Coleharbor Group (glacial drift)
- lake sediment (silt and clay)
- glacial sediment (till)





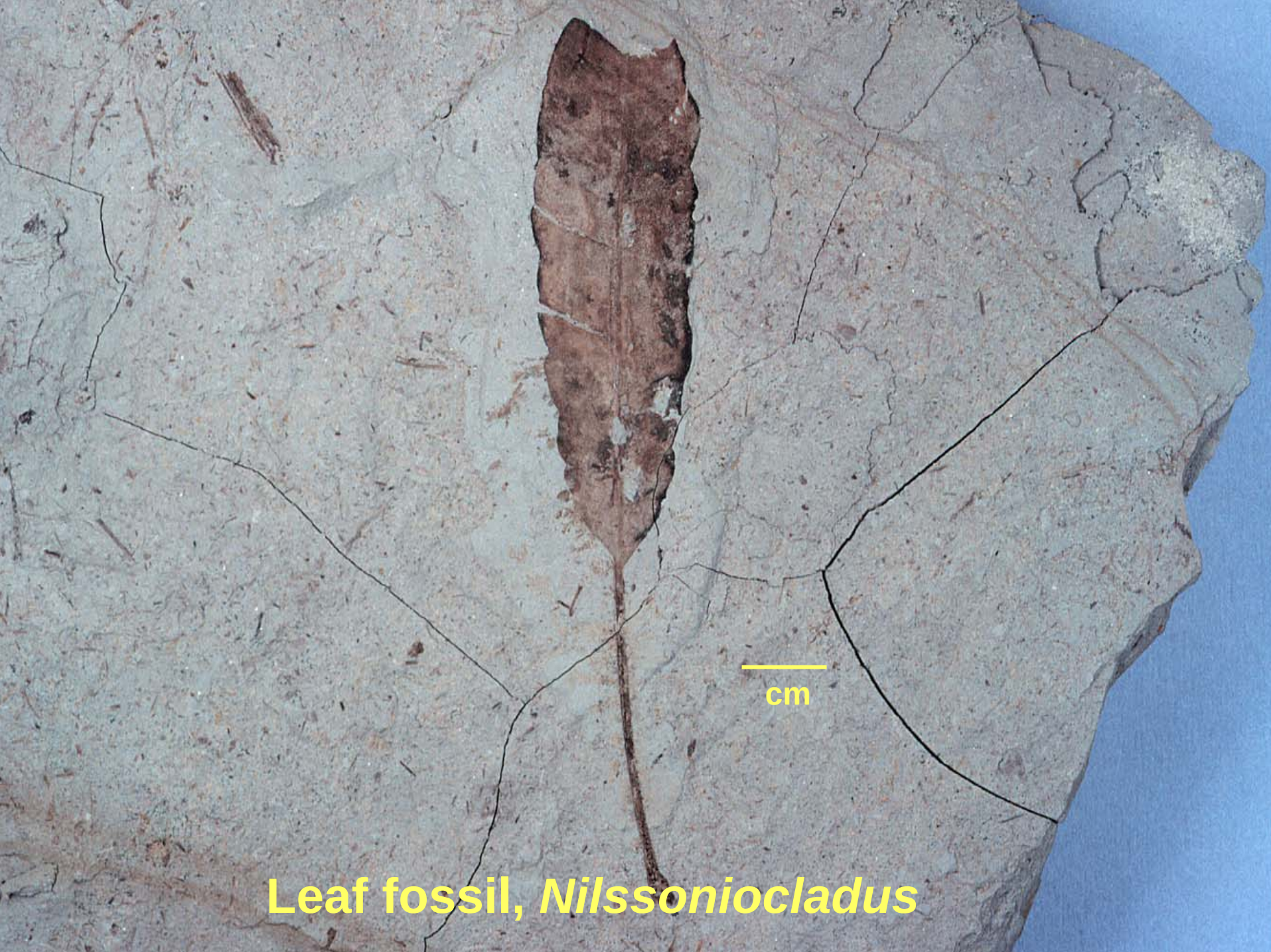
Reynolds



Dromaeosaur tooth

***Tyrannosaurus rex* tooth**

Coprolite

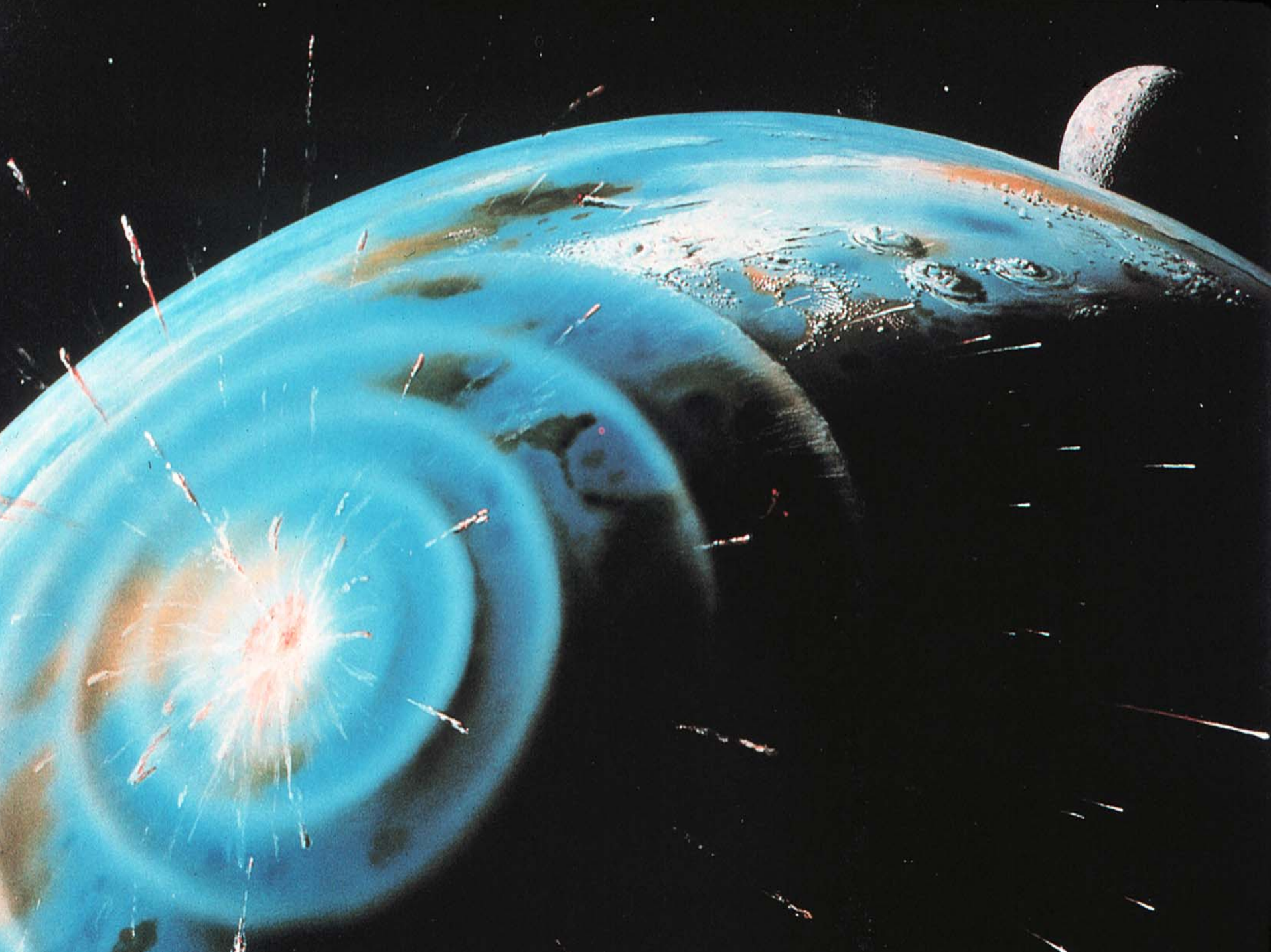


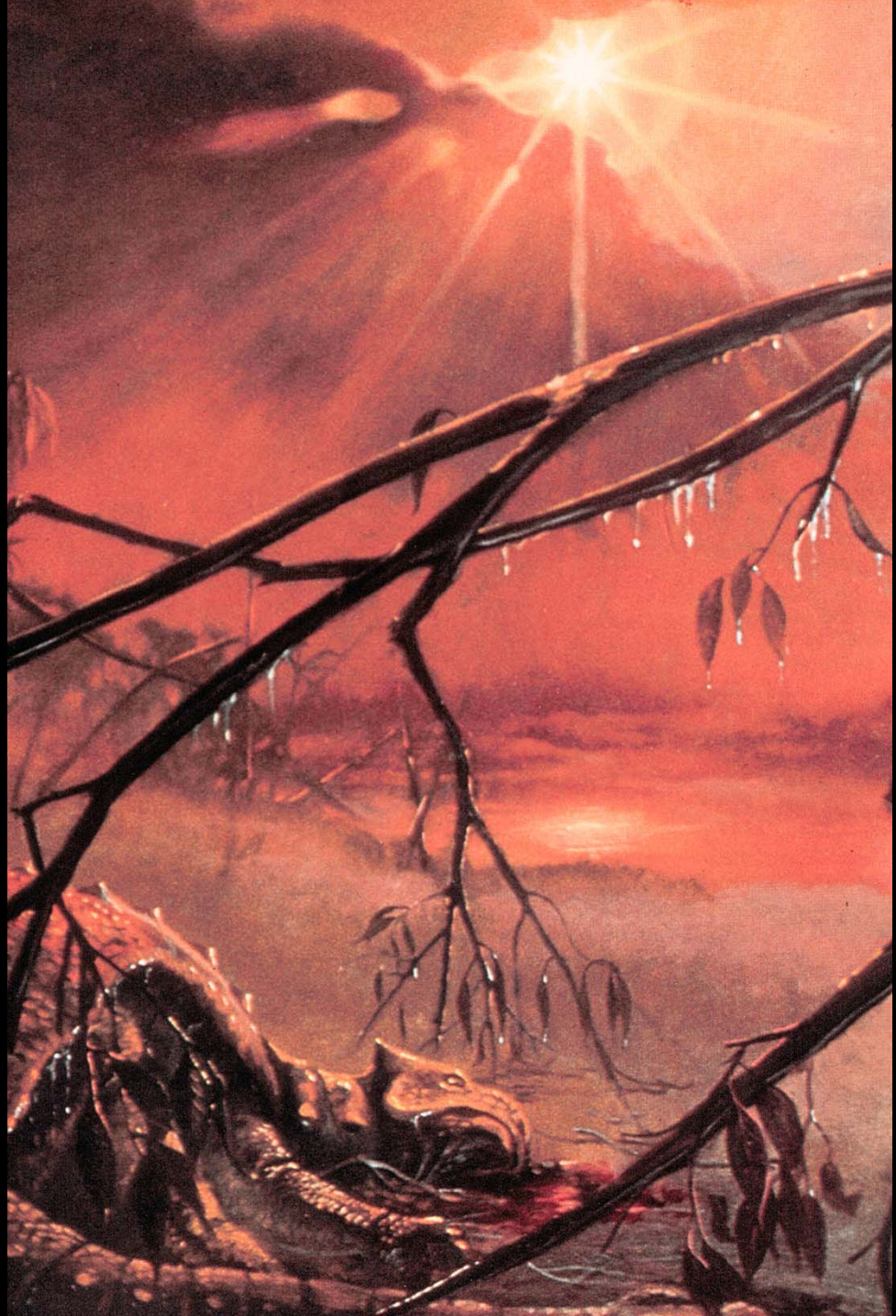
Leaf fossil, *Nilssoniocladus*

Leaf fossil, *Liriodendrites*

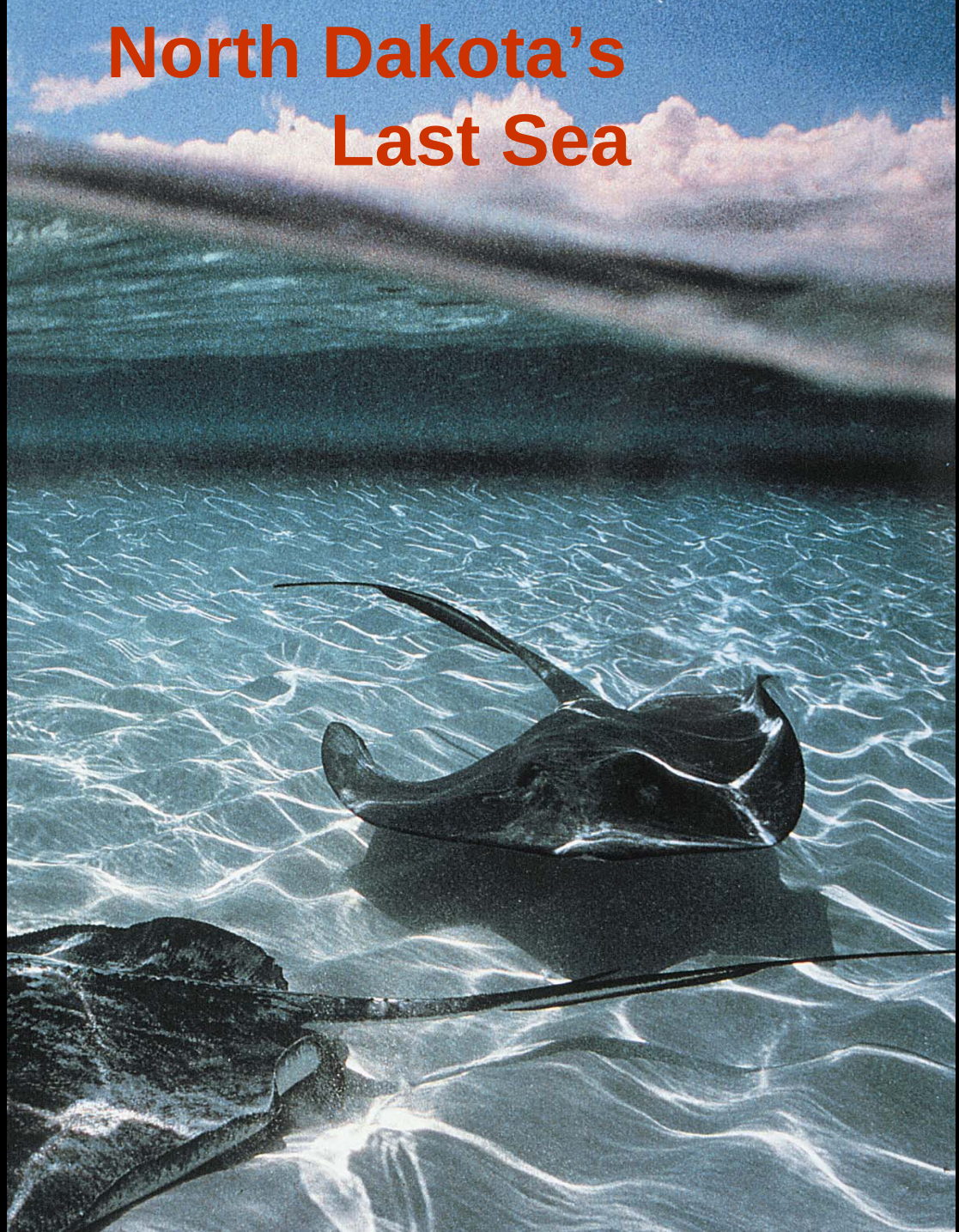
Fossil conifer cone, “*Sequoia*”

Fossil tree sap, amber





North Dakota's Last Sea



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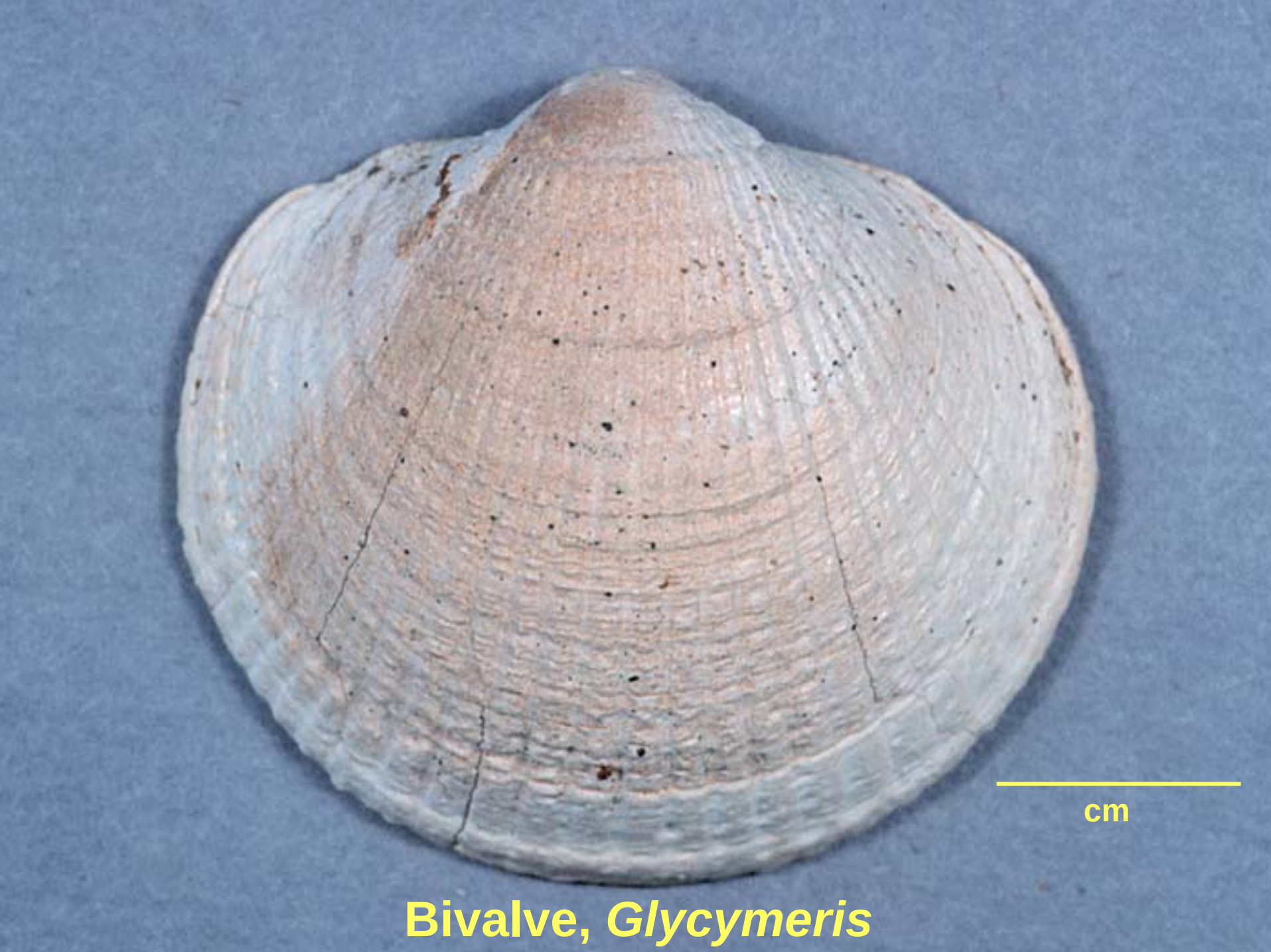
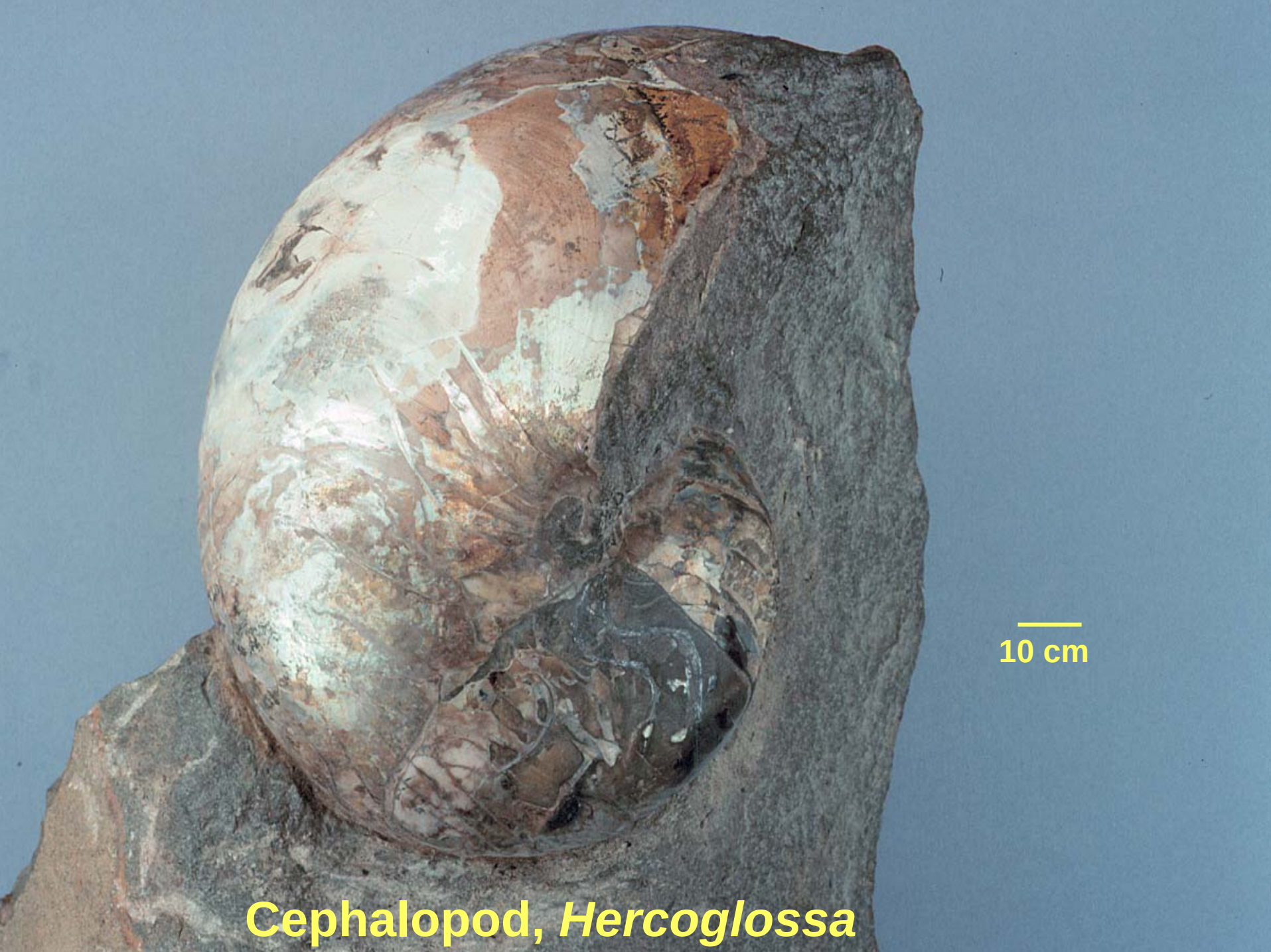
Gastropod, *Semitriton*



Bivalve, *Glycymeris*

Corals, *Paracyathus*

Crab, *Camarocarcinus*

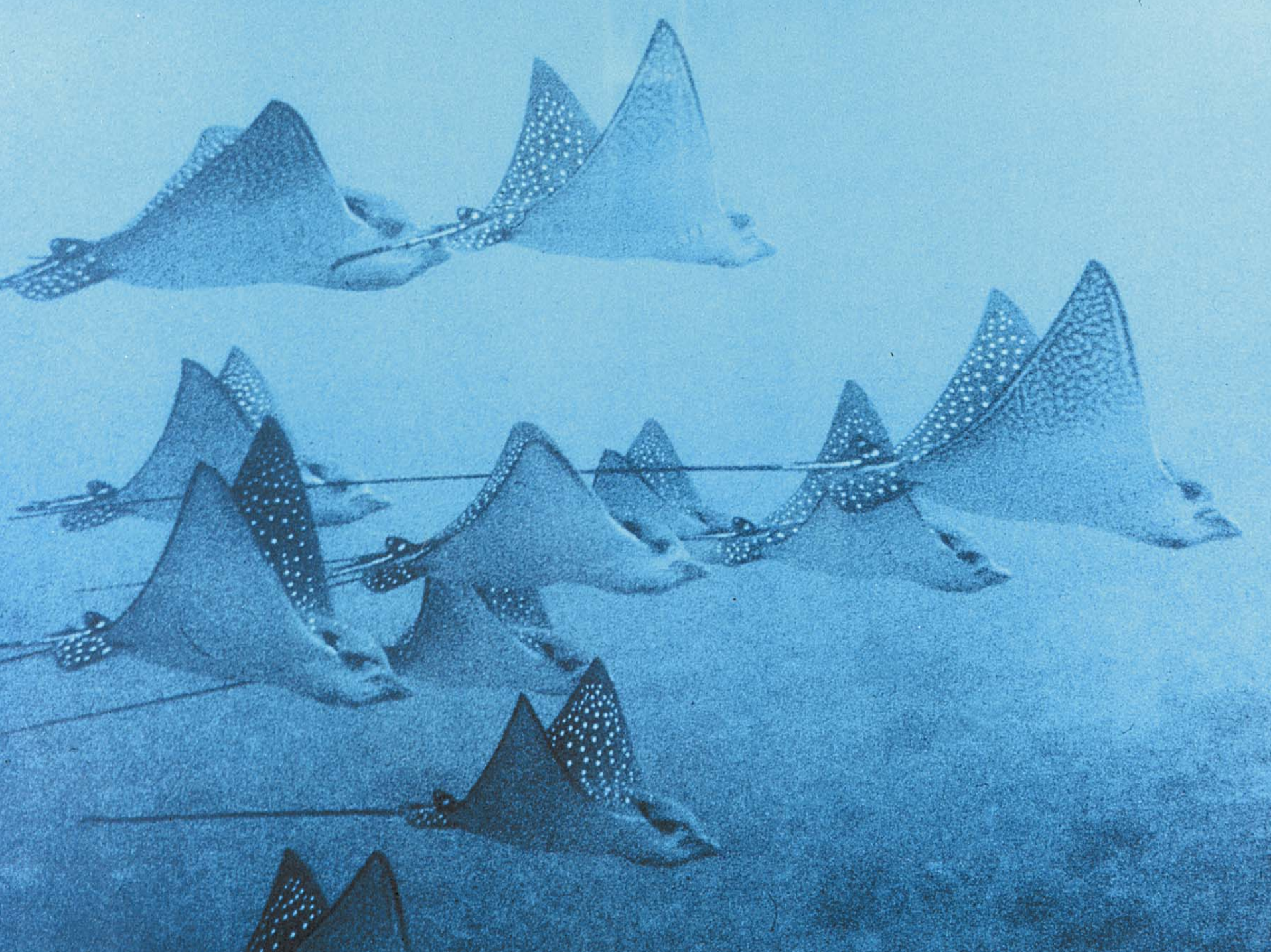


Cephalopod, *Hercoglossa*

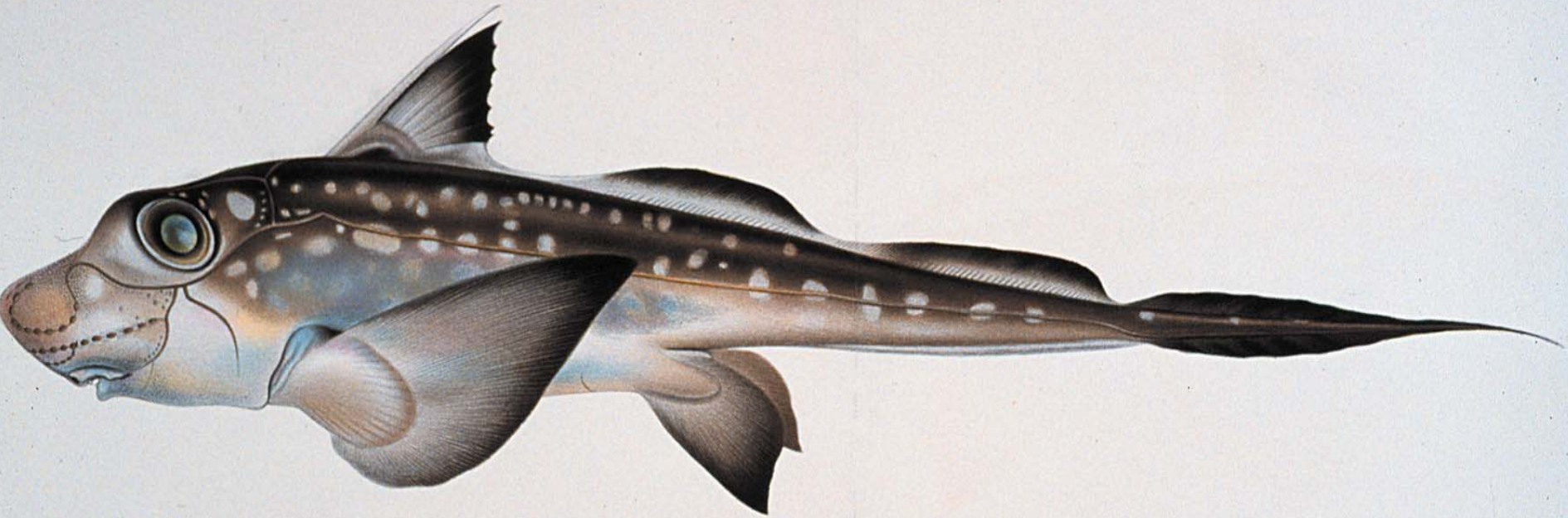
Shark teeth, *Carcharias*

RICHARD ELLIS • 1994 ©

Eagle ray teeth, *Myliobatis*?



Chimaeroid dental plates, *Ischyodus*



***Teredo*-bored petrified wood—North Dakota's State Fossil**

North Dakota Everglades

Sentinel Butte
Bullion Creek

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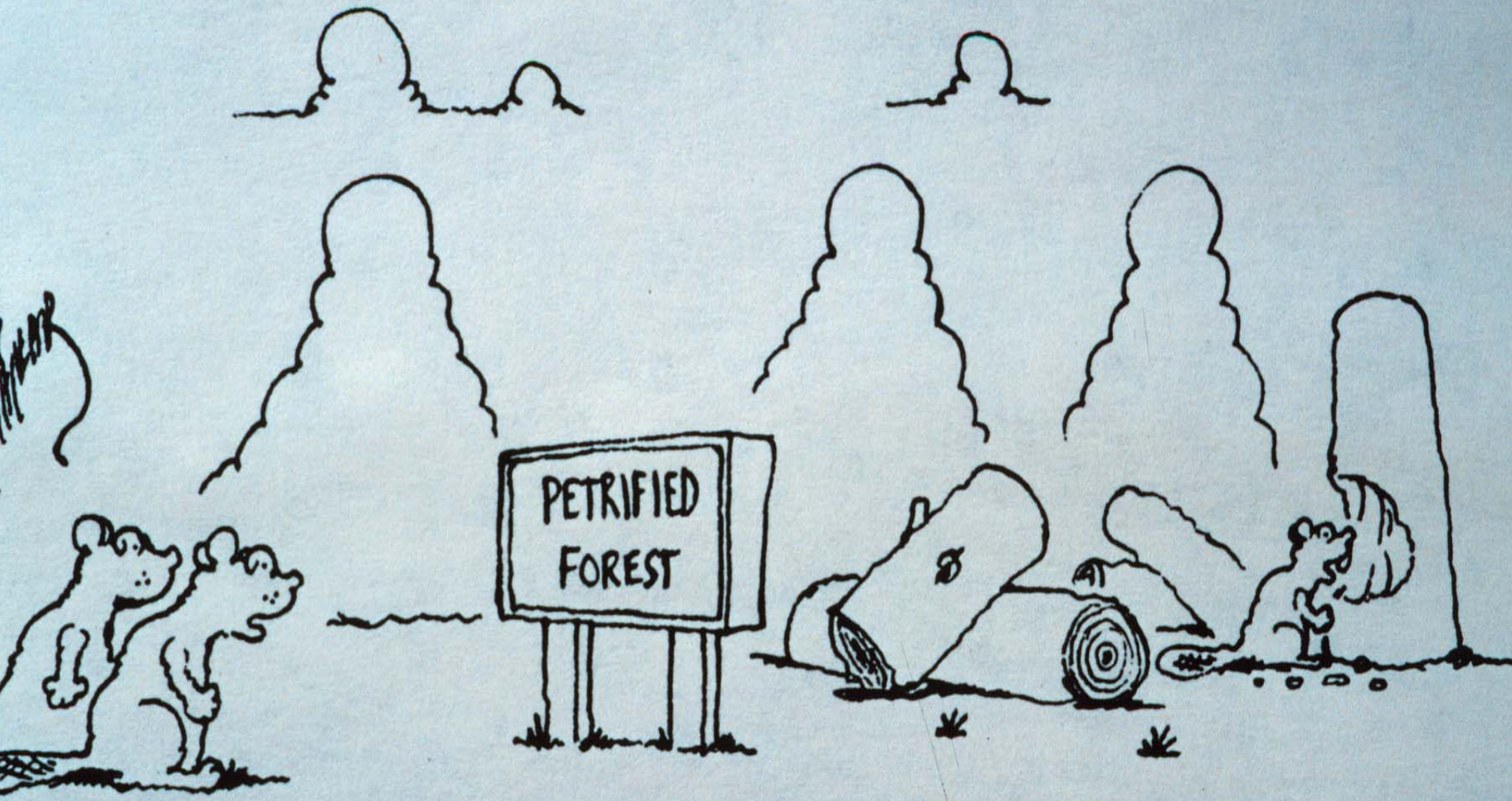
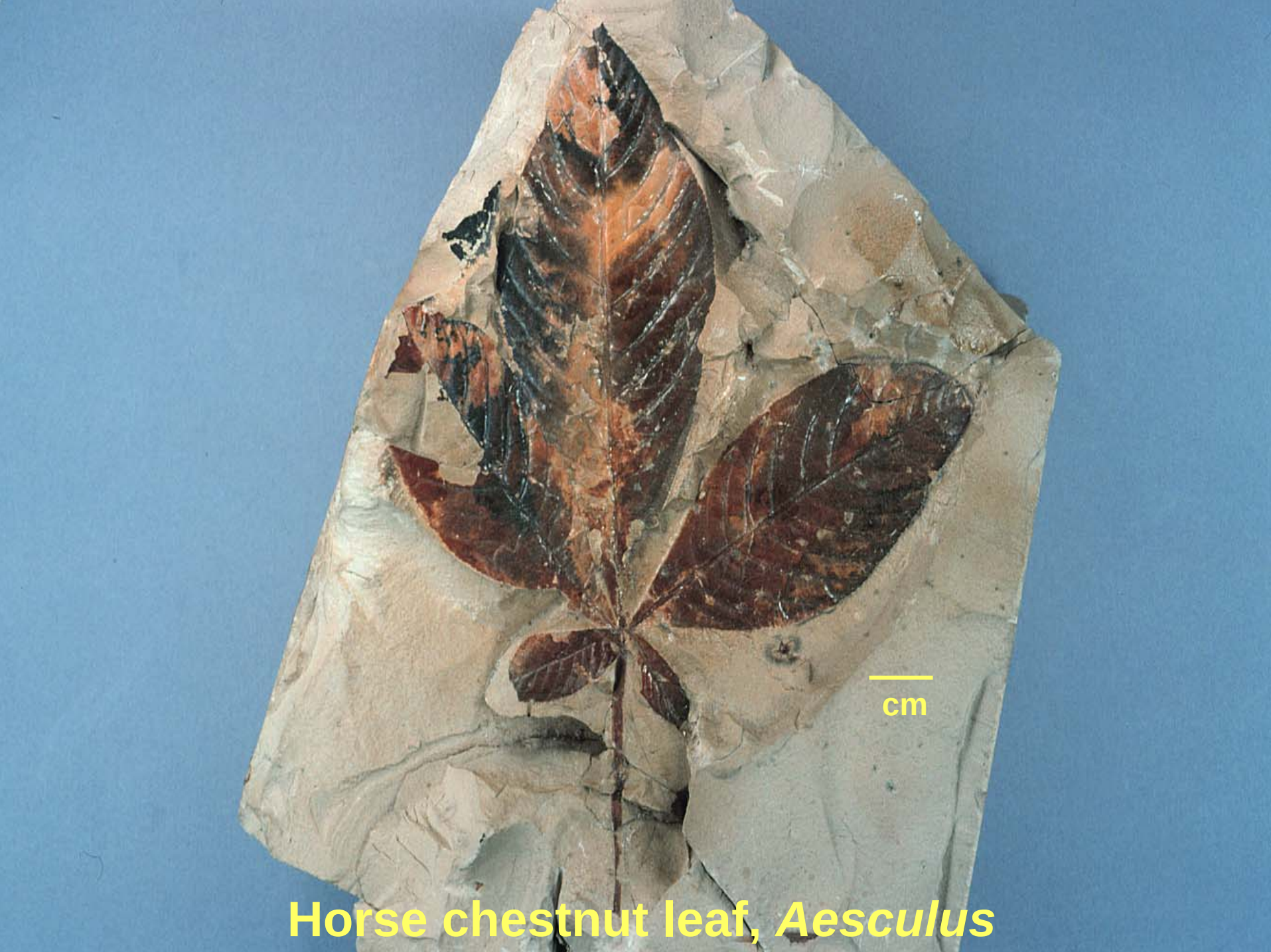
Edward C. Murphy, Acting State Geologist



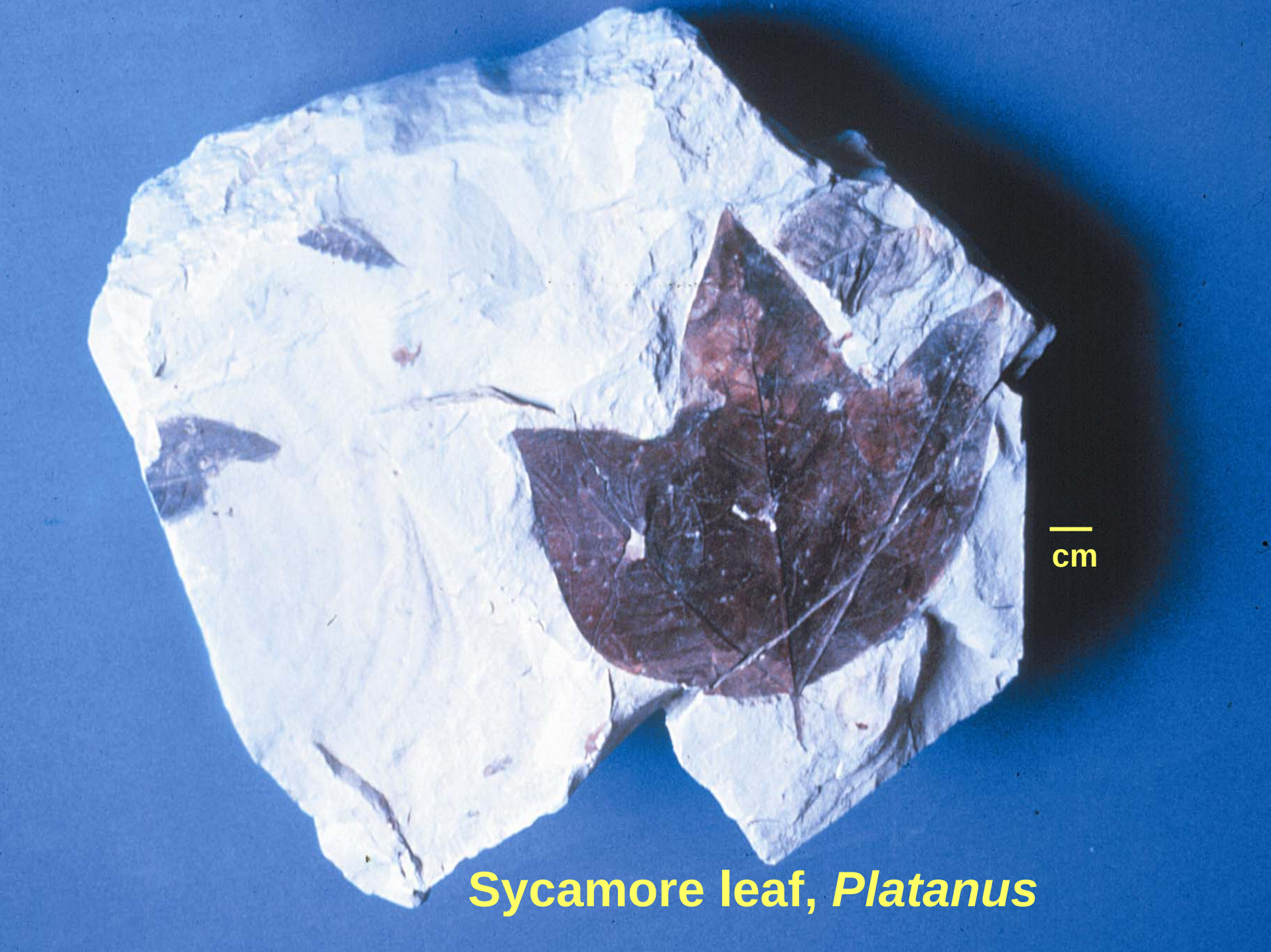
"I think Bob is on steroids."

GROVE

BORSHEIM



Horse chestnut leaf, *Aesculus*



Sycamore leaf, *Platanus*

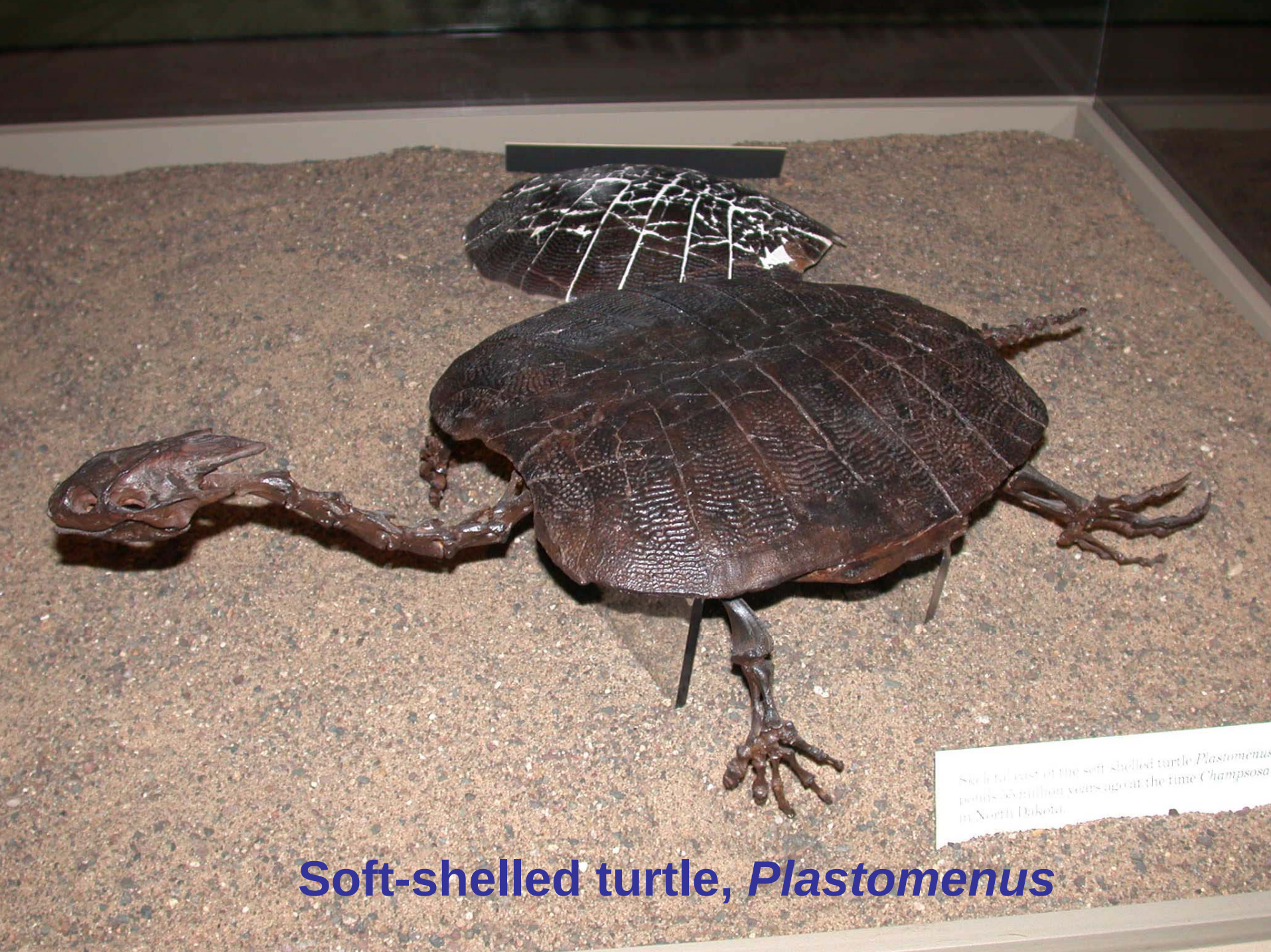
Maidenhair tree leaf, *Ginkgo*

Walnut catkin, *Platycarya*

Angiosperm samara, "*Acer*"

cm
m
Fossil flower

Unionid bivalves (mussels) & Gastropods, *Campeloma*

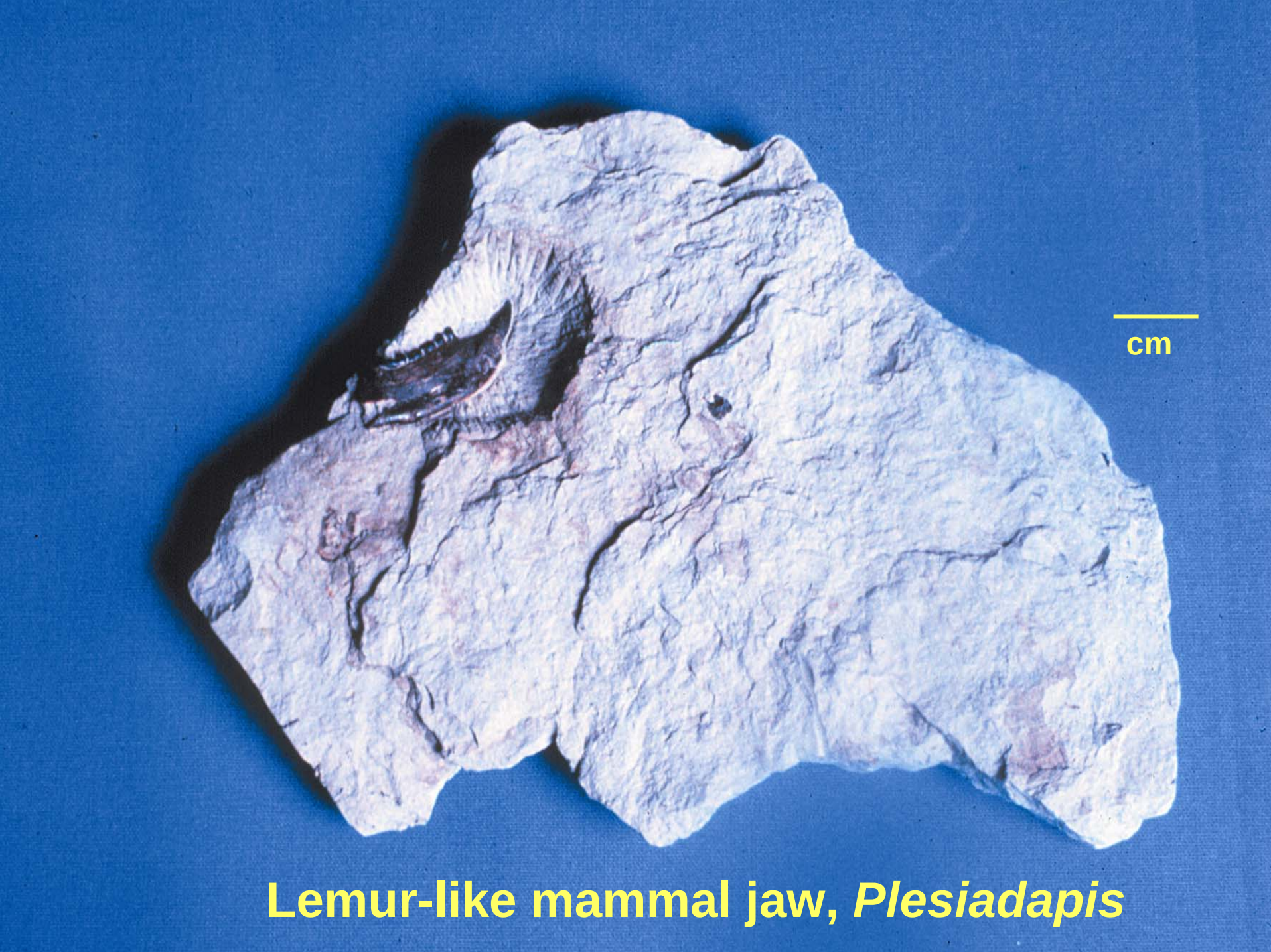


Soft-shelled turtle, *Plastomenus*

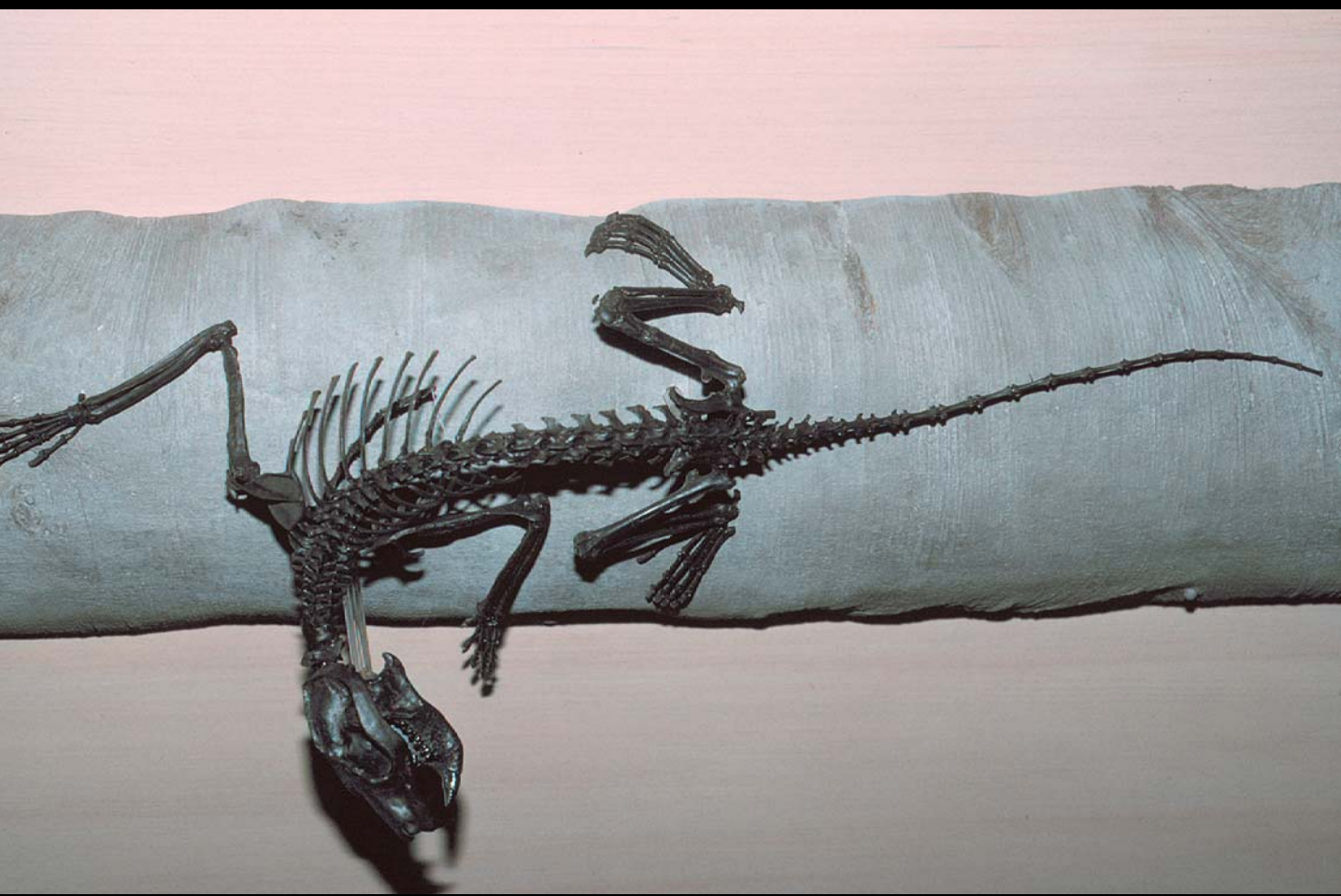
Crocodile jaw, *Borealosuchus*

Champsosaurus gigas

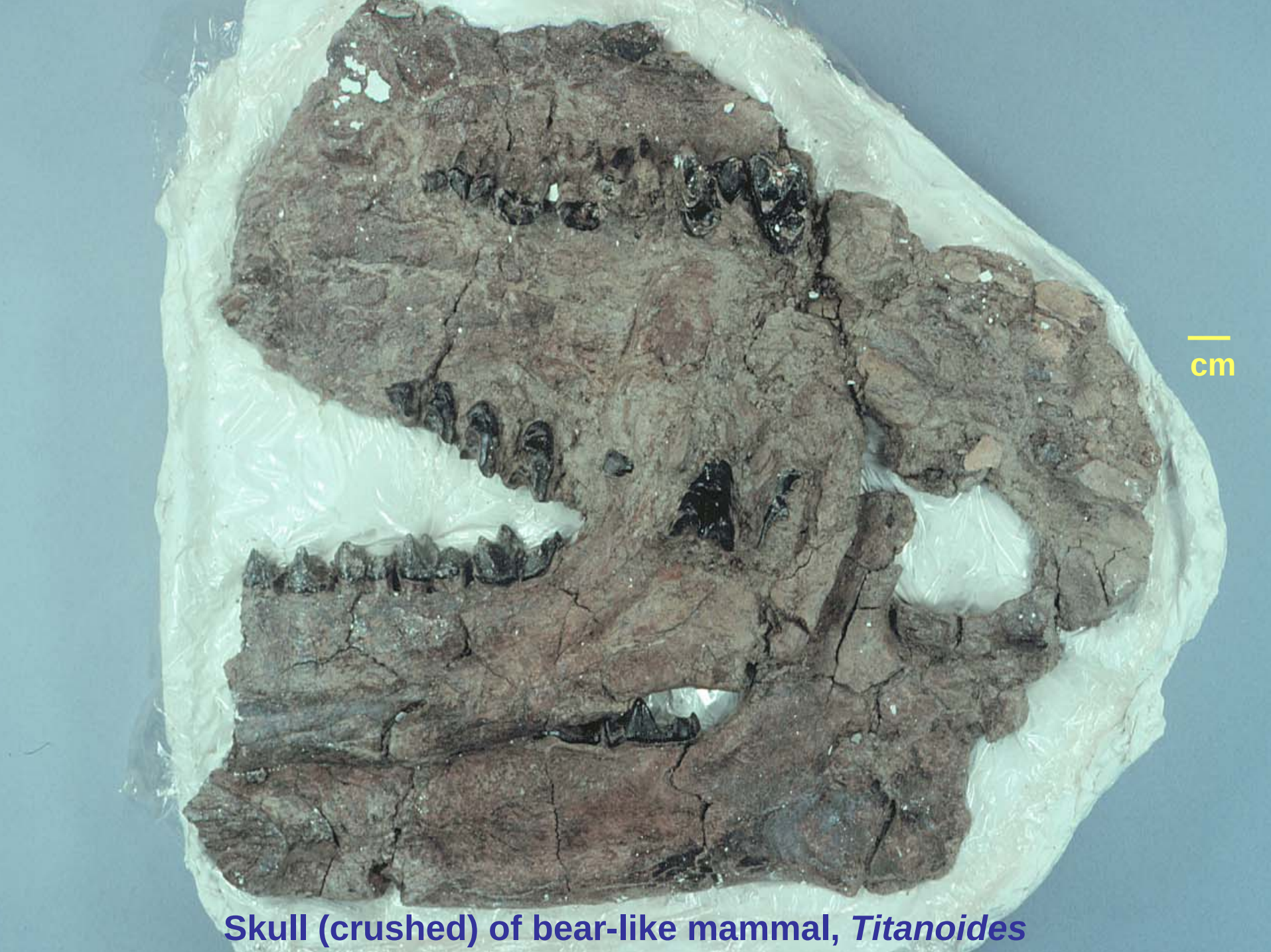
'96 10 30



Lemur-like mammal jaw, *Plesiadapis*



PLESIADAPIS



Skull (crushed) of bear-like mammal, *Titanoides*

North Dakota Savanna

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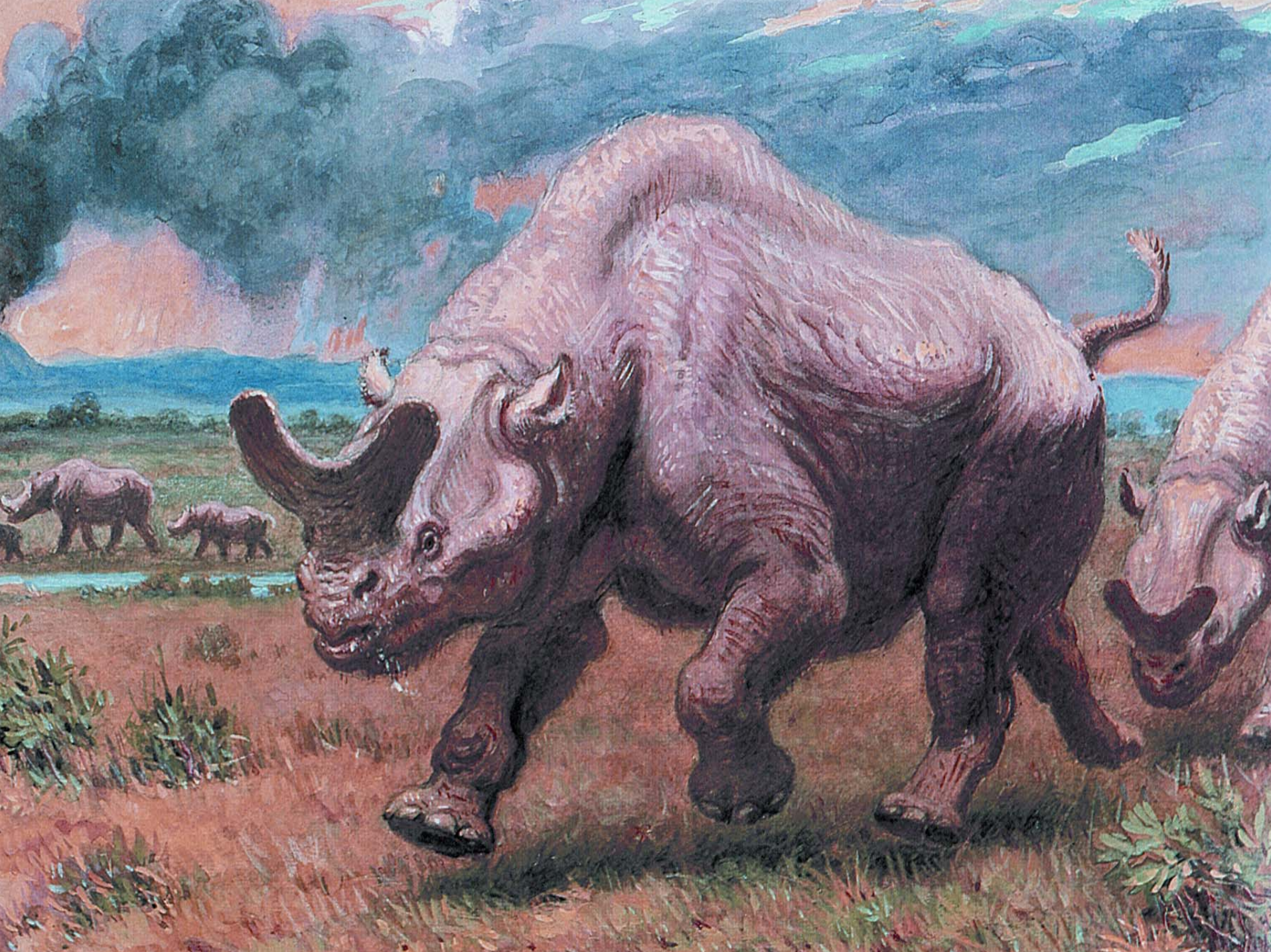
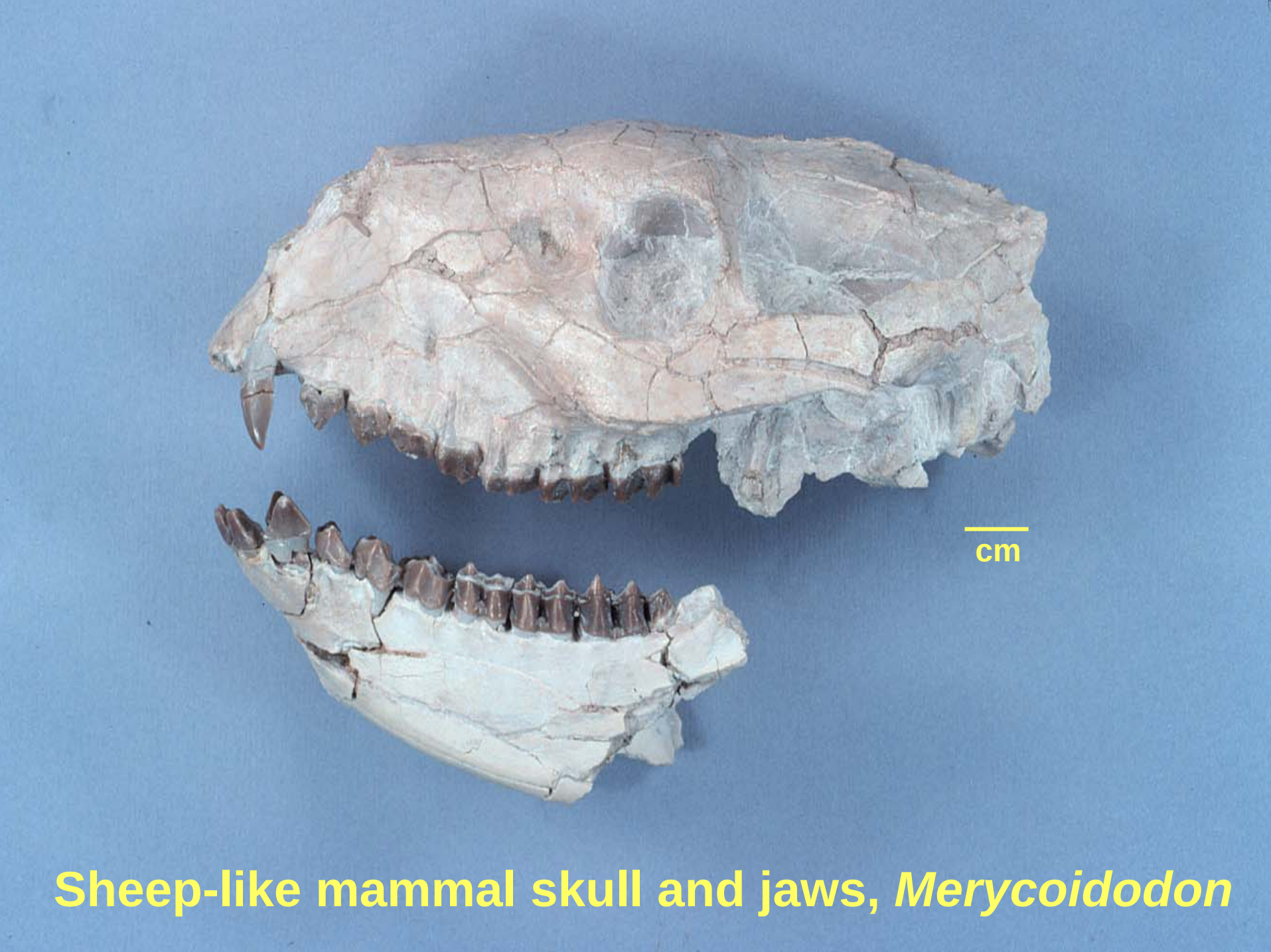
CRETACEOUS	TERTIARY			QUATERNARY	
	PALEOCENE		MIOCENE	Coleharbor Group (glacial drift)	
Hell Creek Formation	Golden Valley Formation		Arikaree Formation	lake sediment (silt and clay)	glacial sediment (till)
Fox Hills Formation	Sentinel Butte Formation				
Pierre Formation	Bullion Creek Formation	EOCENE–OLIGOCENE		river and beach	flat to

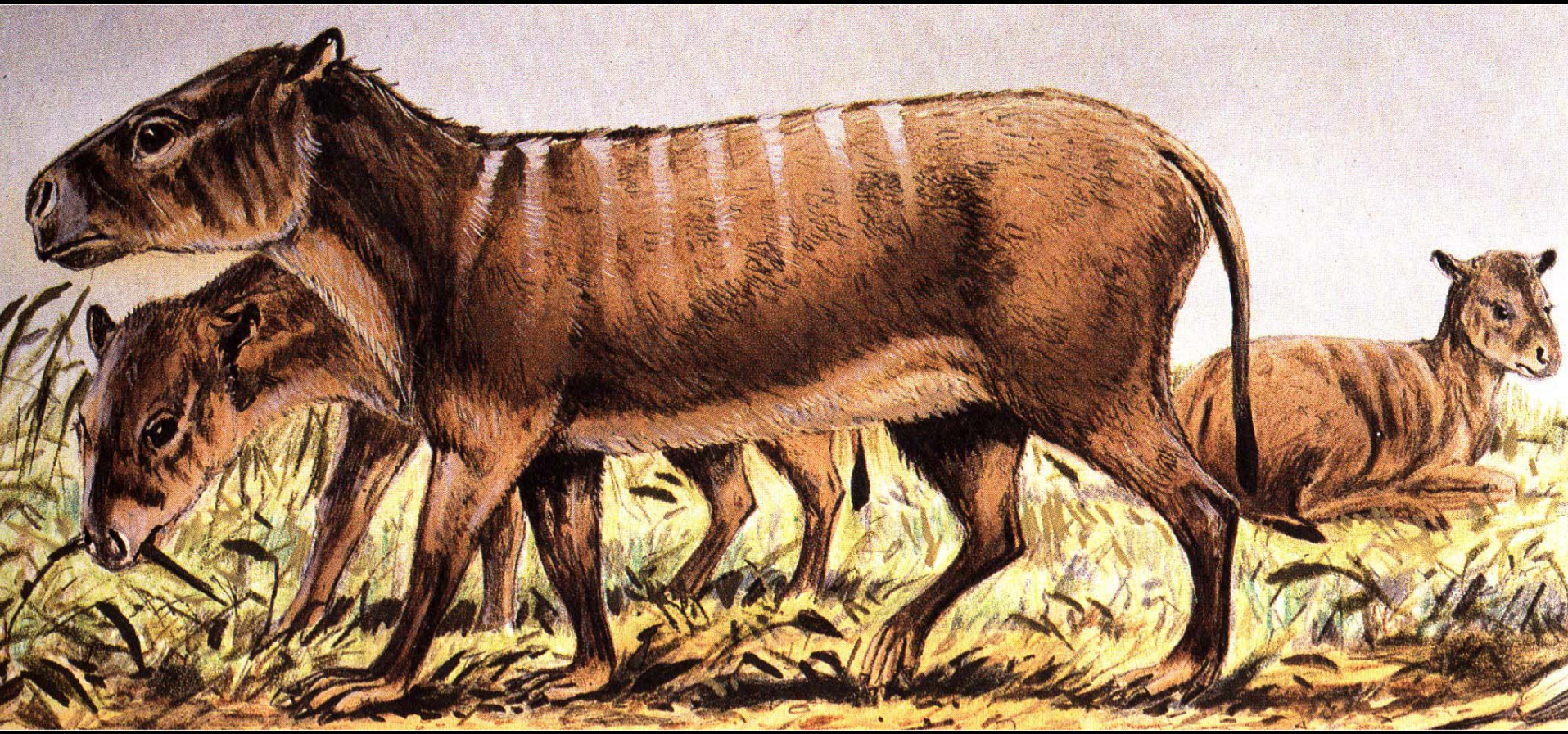
Rhinoceros jaw, *Subhyracodon*

Titanothere jaws, *Brontops*?

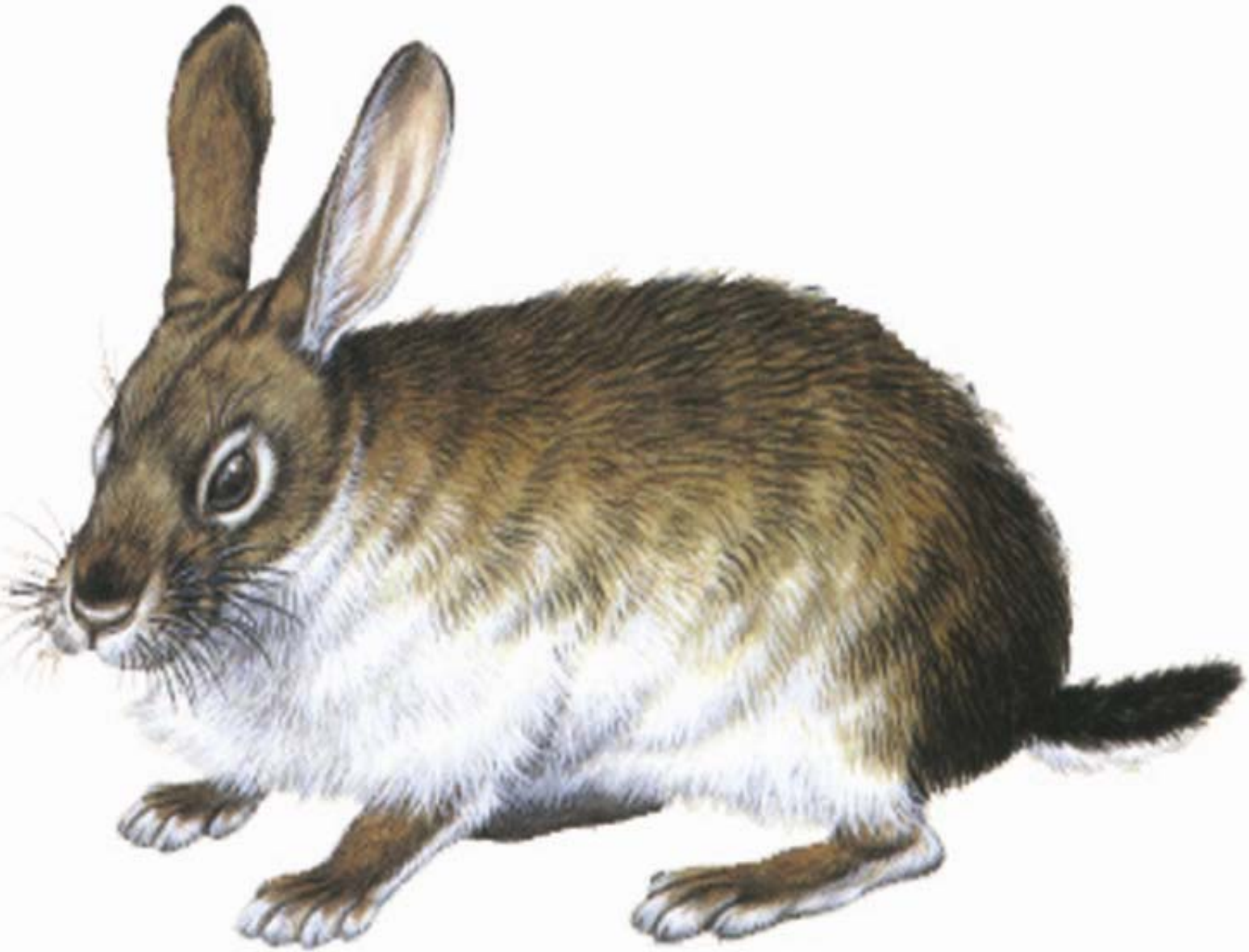


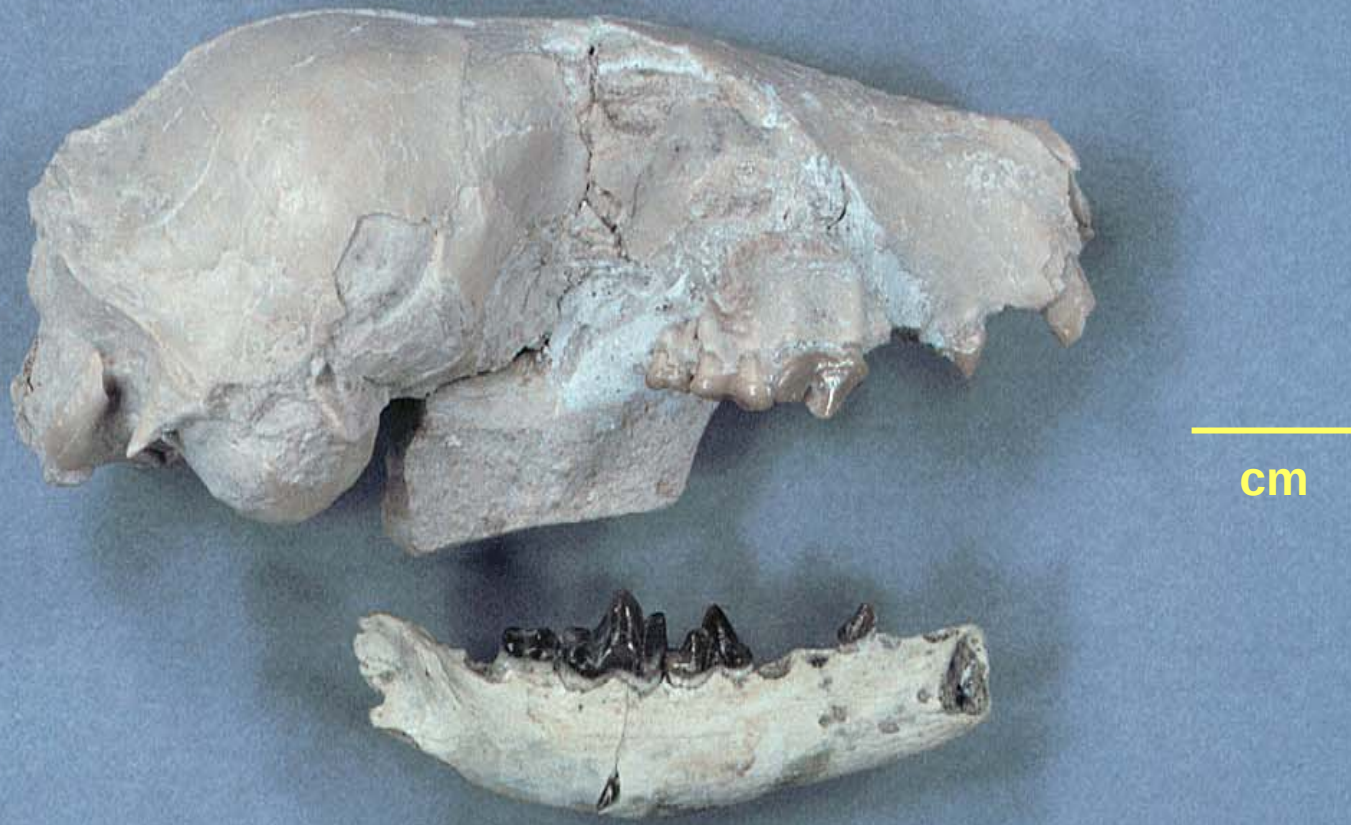


Sheep-like mammal skull and jaws, *Merycoidodon*



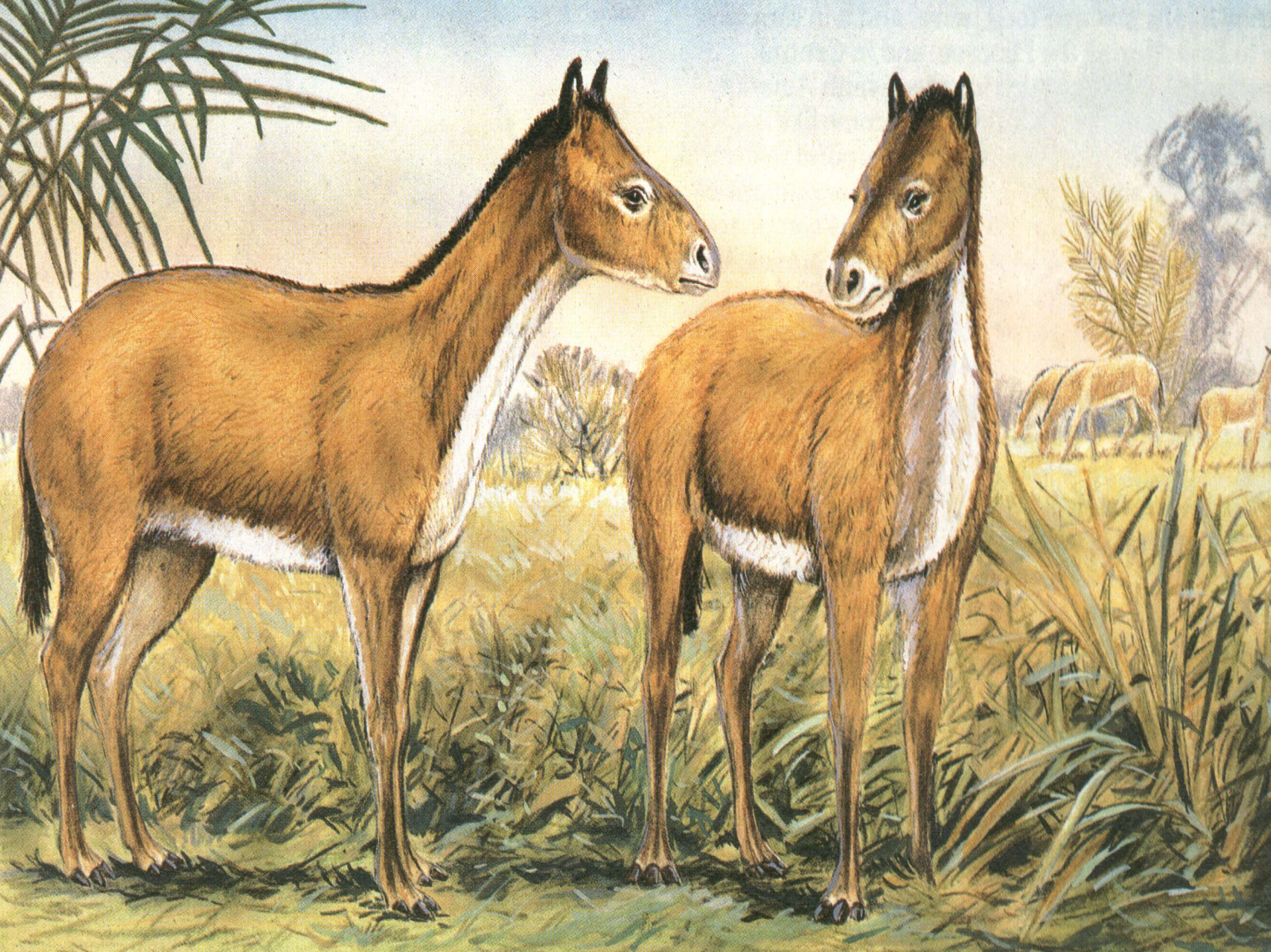
Rabbit skull and jaws, *Palaeolagus*

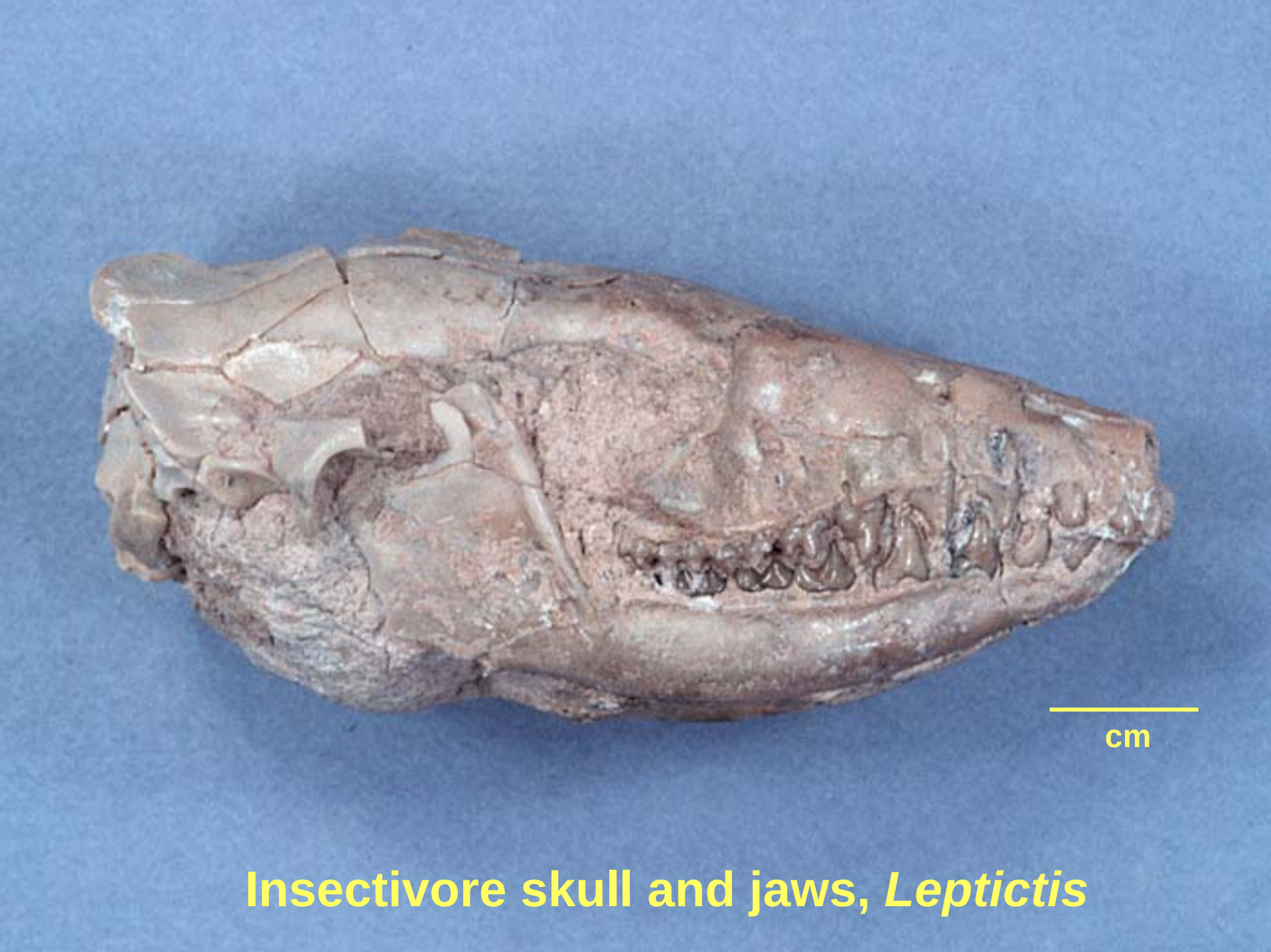




Mongoose-like mammal skull and jaws, *Hesperocyon*

Three-toed horse skeleton, *Mesohippus*





Insectivore skull and jaws, *Leptictis*

Saber-tooth cat skull, *Dinictis*

Soft-shelled turtle skull, *Trionyx*

Tortoise shell, *Stylemys*

Fish skeleton, *Plioplarchus*

Terrestrial gastropods, *Skinnerelix*

The Great Ice Age

The Late Wisconsinan Glaciation
(About 18,000 Years Ago)

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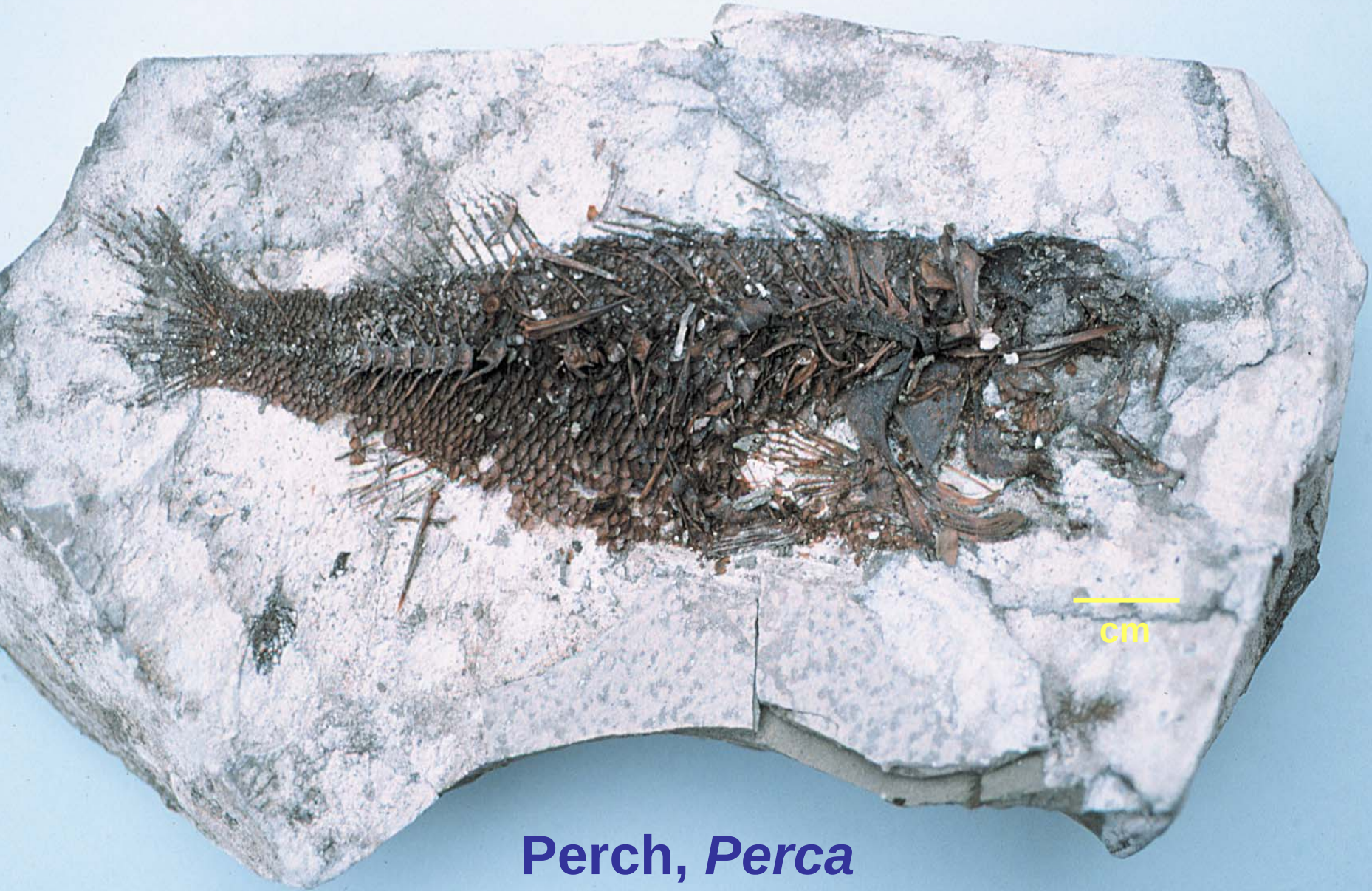
CRETACEOUS	TERTIARY	QUATERNARY

Glacial drift
Sentinel Butte

Spruce cone, *Picea*

Bivalve (mussel), *Amblema*

Beetle, Coleoptera



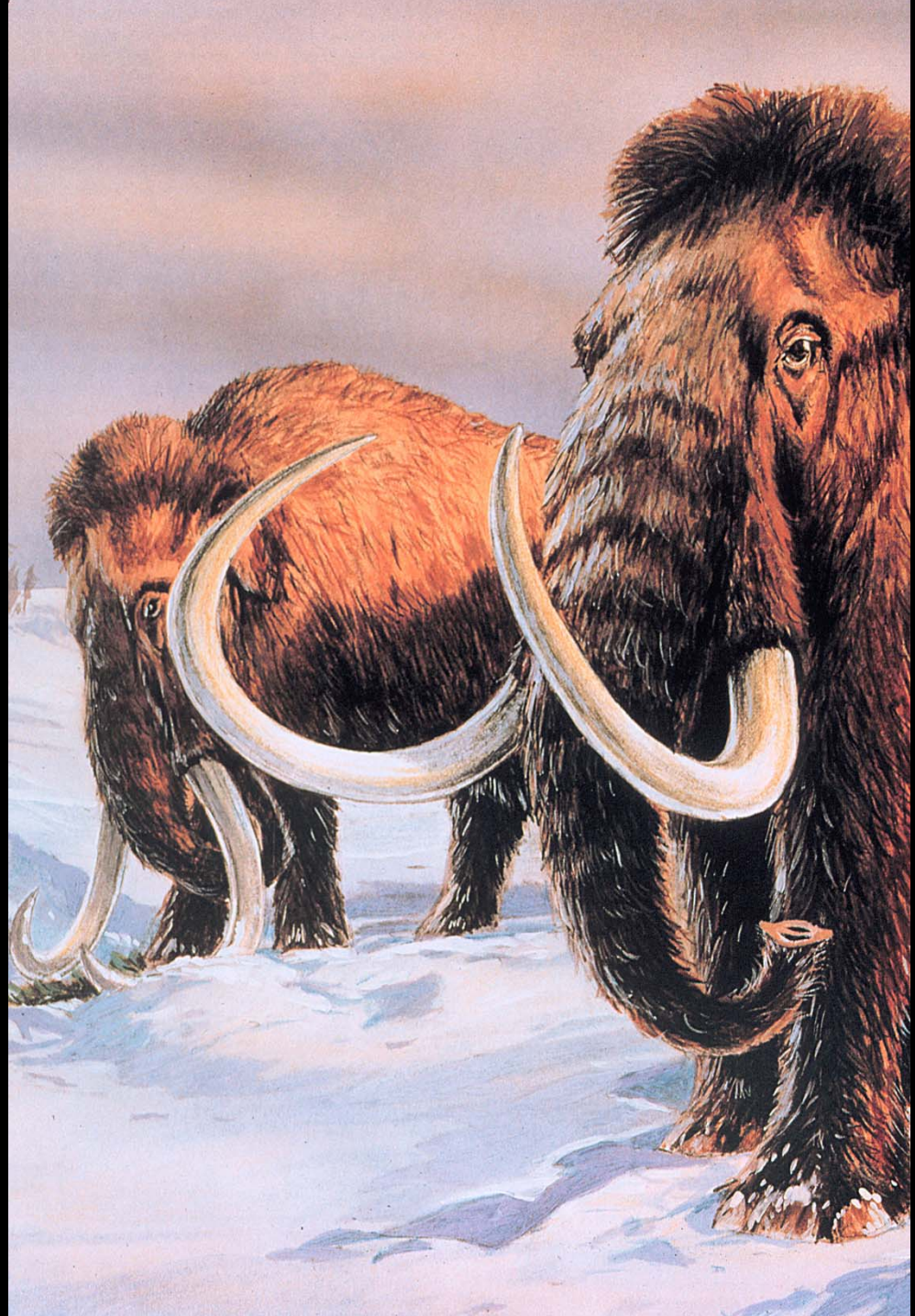
Perch, *Perca*

Frog skeleton, *Rana*

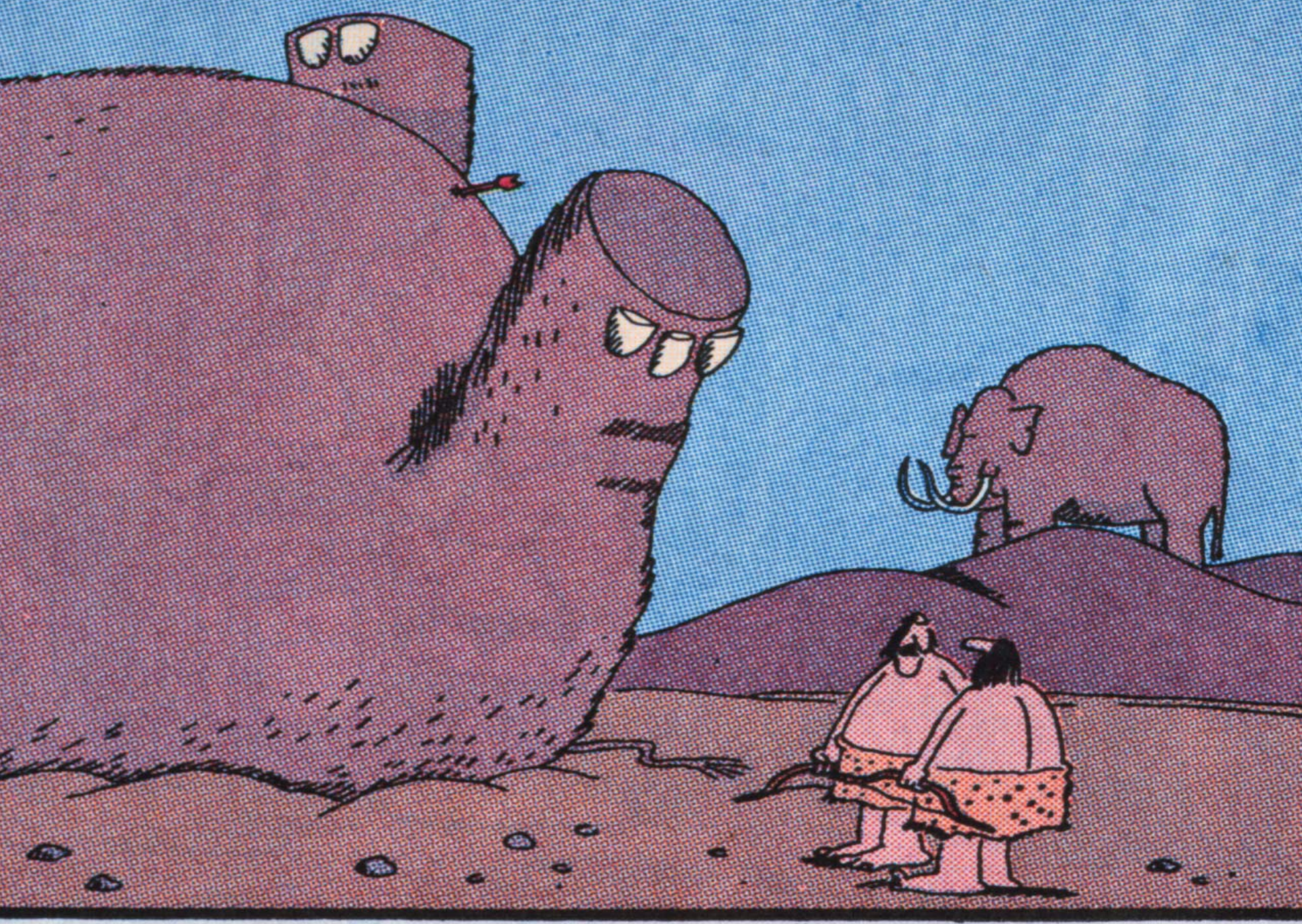
Bison latifrons

Jefferson's ground sloth claw, *Megalonyx*

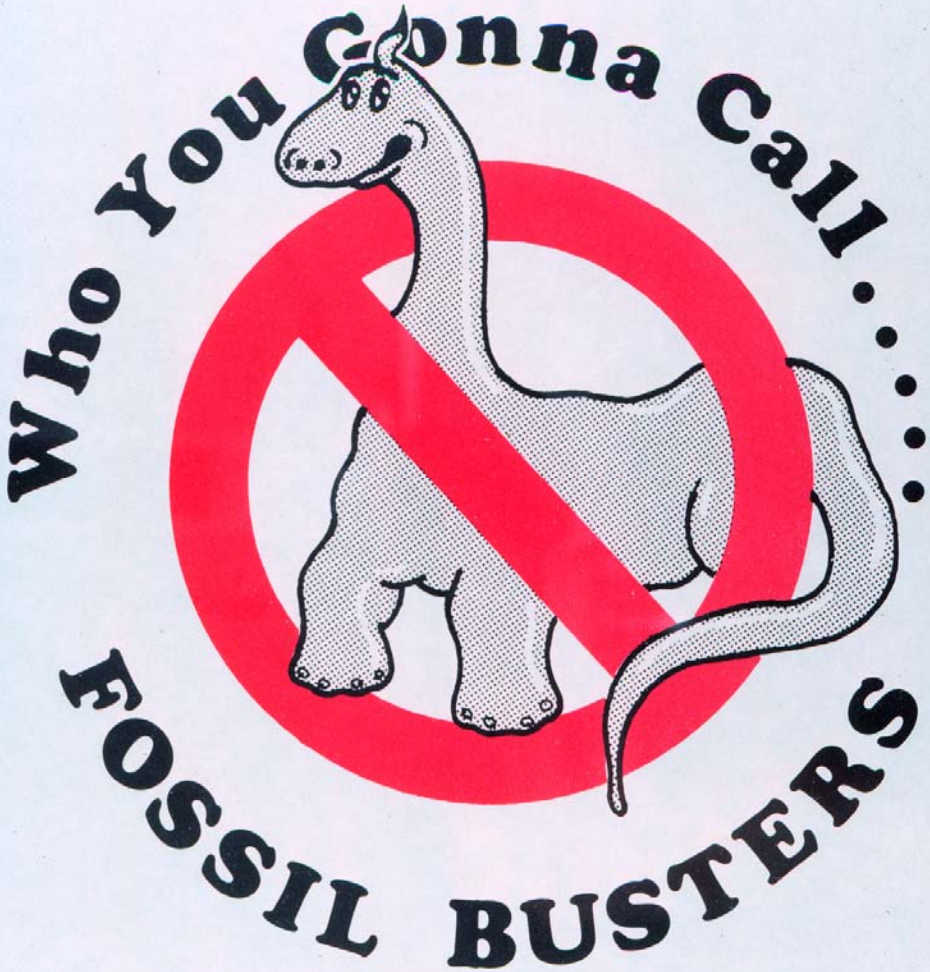
Woolly mammoth tooth, *Mammuthus*



THE FIRST PEOPLE
North Dakota Prehistory
ROCK CAIRNS:
Stone Guides across the Land
IN THE BEGINNING



"We should write that spot down."


Who You Gonna Call....
FOSSIL BUSTERS