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Fossils on the Floor: Mosaics in the Rotunda of the Nebraska State Capitol

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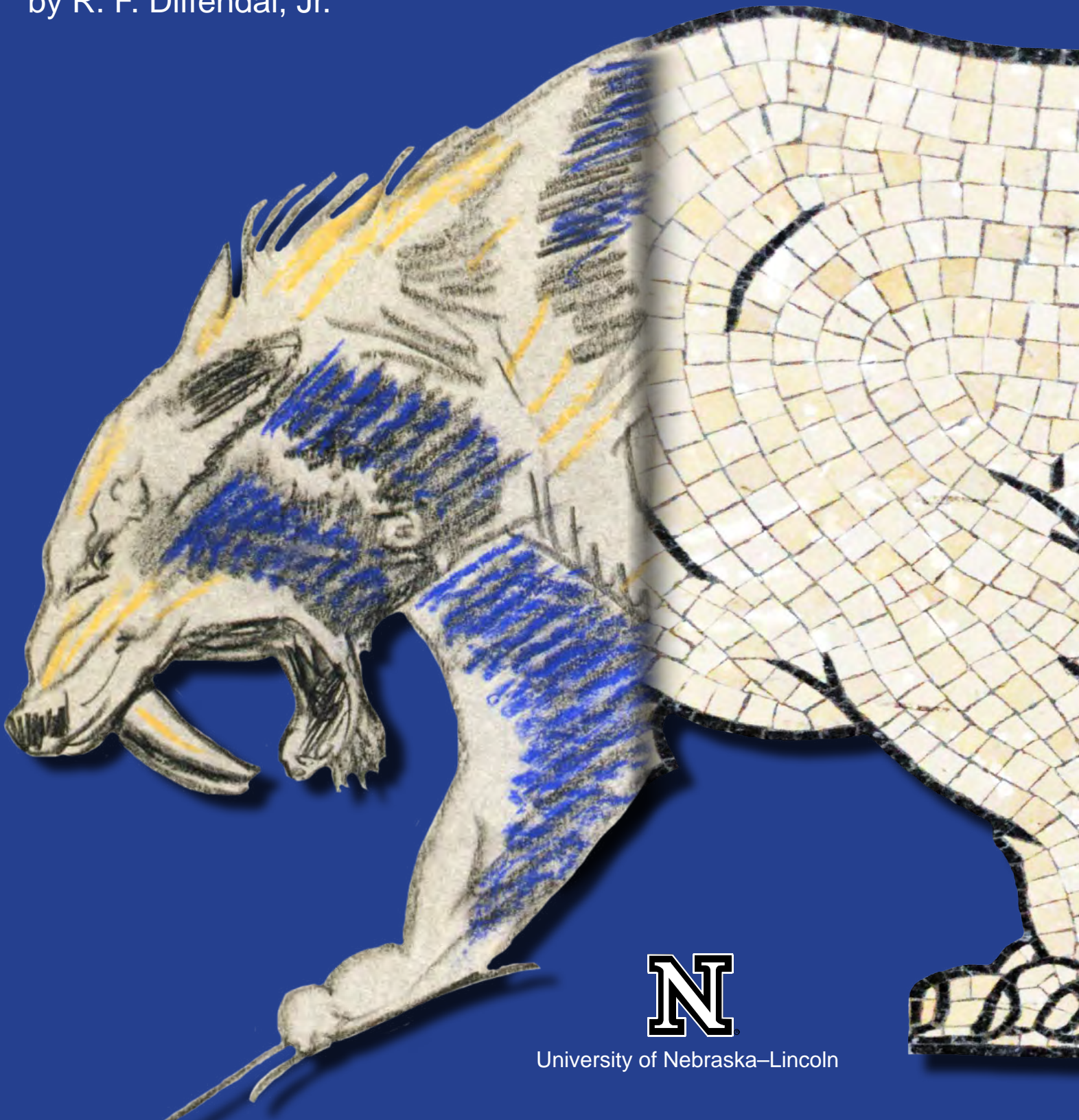
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Fossils on the Floor

Mosaics in the Rotunda of the Nebraska State Capitol

by R. F. Diffendal, Jr.



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July 2015

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Front Cover – Sabre-Toothed Cat *Smilodon* (Fossil 38). Composite of a pastel drawing by Erwin H. Barbour and a mosaic by Hildreth Meière.

Back Cover – Eurypterid *Eurypterus* (Fossil 5). Pastel drawing by Erwin H. Barbour.

Fossils on the Floor

Mosaics in the Rotunda of the Nebraska State Capitol

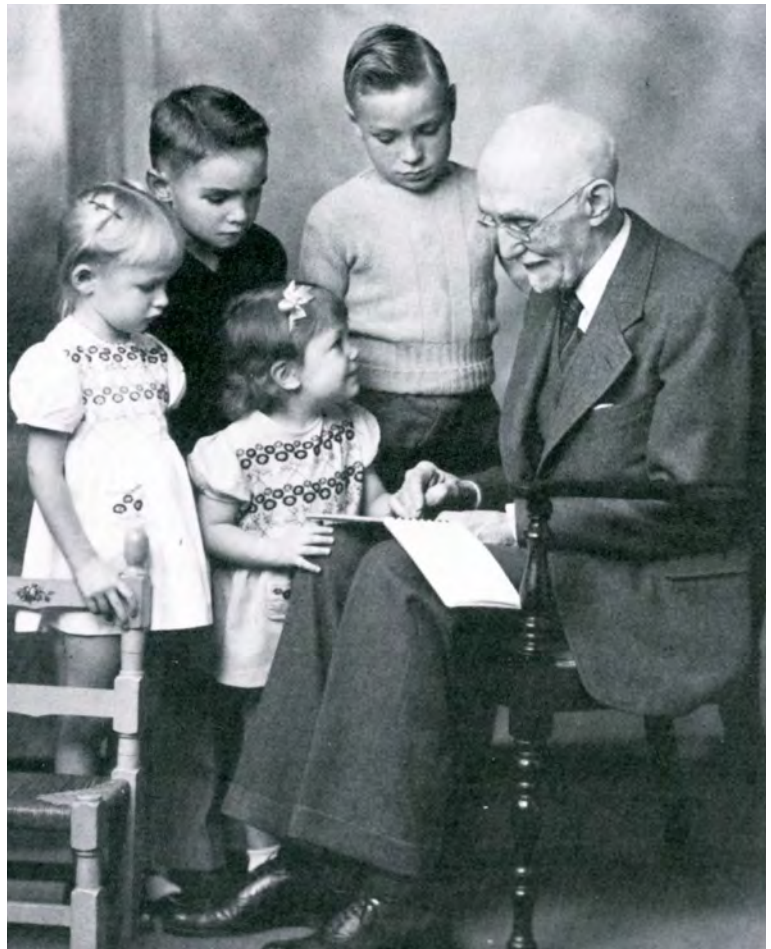
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Professor Erwin H. Barbour [bar BORE]
drawing for his great grandchildren.
Thanksgiving, 1945



Miss Hildreth Meière
[HILL dreth mee AIR]
Self-portrait, 1943

INTRODUCTION

The idea for this project arose during a field trip to the Nebraska State Capitol led by my long-time friend and colleague, Joe Hannibal, of the Cleveland Museum of Natural History, during the Geological Society of America's North-Central Section Meeting in Lincoln, Nebraska, on Saturday, April 26, 2014. One of Joe's interests is historical buildings and their building stones. He put together a very useful guidebook to the building and its decorative stones (Hannibal, 2014) that we used on our tour.

One of the many places that we visited was the State Capitol Archives, located in the basement, where the Capitol Archivist, Karen Wagner, showed us many items in the collection. The most interesting to me, a paleontologist by training, were the large drawings done in color on tissue by the famous Nebraska paleontologist, Erwin H. Barbour, in the late 1920s. These images depict many of the fossils found in the mosaics on the floor of the Capitol Rotunda. Captivated, I thought that these drawings might interest others, especially children who visited the capitol or had an interest in dinosaurs and other fossils. Thus began the start of this project that has led to a coloring and activities book for kids and to this book for people who want to know more about the mosaics and the fossils represented in them.

This guide for older kids, including adults who still have a bit of a kid in them, is a progress report on what I have learned so far about the fossil mosaics, including who chose the fossils to depict and who designed and made the mosaics. It is a progress report because I probably have not found all of the information that exists on the history of the mosaics or even all of the Barbour drawings that may exist. As with so many research

projects that I have worked on through the years, this one seemed easy to design and work up in the beginning, but has proven to be far from simple. Historical accounts are incomplete, and the ones that I have located are sometimes contradictory. At any rate, I will continue to look for more information after this book is published and will try to update it from time to time if important new information comes into my hands.

I have divided the book into several sections. First, I will tell you about the people involved in deciding which fossil plants and animals to use in the mosaics and why they chose them. I will then discuss the materials used to make the mosaics, then who picked the fossils, then the drawings made by Barbour that were submitted for possible use by the mosaic artist Hildreth Meière, then about construction of the mosaics, and a short note on the concept and design for the mosaics. Images of all of the individual animals and plants appearing in the mosaics together with the Barbour colored drawings are reproduced. A section of definitions offers information about the fossil animals and plants and the meanings of some technical words and terms used in this book. Finally, a list of books and articles will guide you to more information about the mosaics and the fossils.

Note: The sources of my information above and below are noted in geological reference style. As an example, you will see somewhere in a sentence the words "Pabian (1974)." Go to the "Selected Books..." section at the end of this book to find the complete information about that source.

To introduce younger kids to the mosaics and the fossil animals and plants represented see *Fossils on the Floor in the Nebraska State Capitol: A Coloring and Activities Book* by R. F. Diffendal, Jr., 2015, University of Nebraska–Lincoln School of Natural Resources Conservation and Survey Division, Educational Circular 23.

CREATING THE MOSAICS

The Main Participants in the Rotunda Floor Mosaics Project

Four people were principally involved in the decisions that were made on the meaning and design of the mosaics on the Rotunda floor, on which fossil plants and animals to depict there, and on the materials to use in the mosaics. Dr. Erwin H. Barbour (1856-1947), third director of the University of Nebraska State Museum (UNSM) and State Geologist of Nebraska drew images of fossil and recent animals and plants that could be used to create the mosaics at the request of Professor Hartley Burr Alexander (1873-1939) of the University of Nebraska Philosophy Department. Barbour submitted groups of drawings on tissue in soft pastels to the onsite project architect, William L. Younkin (1885-1946). He sent them on to the architectural firm of Bertram Grosvenor Goodhue Associates in New York City. Someone in that firm gave them to the artist who created the mosaics, Miss Hildreth Meière (1892-1961). She used some of the colored drawings as the basis of her drawings for the mosaics, which she produced in her studio at 200 West 57th Street in New York City, just south of Central Park in Manhattan. Barbour also made pen and ink drawings of fossil plants and animals that show a remarkable similarity to forms in the mosaics. Some of these black and white drawings appeared in his scientific publications, most did not. How Meière may have seen or obtained these black and white sketches is not known.

Materials Used to Produce the Mosaics

So much of the information on the creation of the mosaics remains cloudy today because it was never written down; because it has been lost to us, perhaps forever; or because the words used are not precisely defined. All of these reasons apply to the question of what kinds of materials were selected by Meière to use in the creation of her mosaics

of plants and animals for the Rotunda floor and where these rocks were quarried. Most accounts tell us that two kinds of marble were used, one light colored (white to pale brown) called Champville marble and one black called Belgium Black marble by the people in the cut stone trade (Table 1, page 9).

To a geologist marble is a metamorphic rock formed from the sedimentary rock, limestone, which was heated and compressed to such a degree that its original minerals, mostly the mineral calcite (calcium carbonate), were recrystallized. To workers in the stone trade marble is a word used for both the geologic metamorphic rock, but also for un-metamorphosed limestone and even for rocks like verd antique, mostly composed of the mineral serpentine, a greenish-colored rock (See Neuendorf and others, 2005). Joe Hannibal (Hannibal, 2014) reported that a geologist examined a piece of the so-called Champville marble and determined that it was technically a form of limestone. The sample of the rock upon which the geologist's opinion was based appears to have been lost so there is probably no way of checking the accuracy of the identifications.

Equally uncertain is the source of the Champville marble, which has been reported to have been quarried in France or in Italy (Table 1, page 9). I contacted geologists in France, and they have never heard of such a rock name. The same may be true of Italy. For all we know the dressed rock may have come from any source of fine-grained limestone in any country.

Who Chose the Plants and Animals Included in the Mosaics?

The original idea for the intertwining ornamental ribbon or guilloche [GHEE osh] mosaic of fossil plants and animals came after Alexander and Meière travelled to the city of Siena, Italy, in 1925 to see the cathedral there (Woodside

and Gabb, 1990). Alexander wanted to tell the story of the geologic history of life on Earth in the art work in the Nebraska State Capitol and thought that it should be shown in the mosaics on the floor of the Rotunda (Alexander, 1934). He outlined his ideas in a series of letters to Meière and to Barbour, copies of which are in the UNSM archives and the Capitol Archives. He proposed that the central part of the Rotunda floor be a circular mosaic or tondo of the “Earth-Mother” surrounded by a stylized Sun. Around this central image would be four other tondi [ton DYE] at the cardinal points of north, east, south, and west with male genii, mythical figures, representing the four classical “elements” of water (N), volcanic fire (E), air (S), and earth (W) (Woodside and Gabb, 1990). The continuous guilloche wraps around the four tondi, but appears broken at first glance. The ribbon is actually supposed to be thought by the viewer to cross over and beneath itself in four places on the floor forming a set of four counterclockwise running circles each of 360°.

Alexander proposed in letters to Meière and to Barbour, probably starting in 1927, that each of the four parts of the continuous guilloche have either an animal that resembled a plant in some ways or of a plant each set off repeatedly between a series of nine fossil animals (Alexander to Meière: May 11, 1927; October 29, 1927). Francis Mayers of the Bertram Grosvenor Goodhue Associates architectural firm in New York wrote to Barbour (November 18, 1927) that he had received some of Barbour’s “...drawings of prehistoric Nebraska animals and other forms.” Mayers wrote that he, his other associates, and Younkin and Meière had worked out how many forms were required for the Rotunda floor. They planned to divide the floor into four sections with nine animals in each, 36 total. Each animal in a section was to be separated from one another by vegetable forms, making nine repeats of those fossils for each of the four sections.

The animals in each section were generally to follow animal development through geologic

time and would ideally be native to the region of the first Nebraska Territory including present day Nebraska, Kansas, the Dakotas, and parts of Colorado and Wyoming if possible. They were to be “assorted” with respect to the four “elements” (Alexander to Barbour: January 9, 1928). Alexander also included with that letter a copy of a tracing by Meière showing the general layout of the whole work and noted that there was a small space at the end of each of the four parts for a tenth animal or something else appropriate. That eventually became a tenth repeat of the “tree” used in each part. He also sent a list of suggestions of types of animals for the border of each of the four sections (Table 2, page 10).

While the arrangement of the animals and plants somewhat follows their development through geologic time, it certainly cannot be viewed as an accurate time line of organisms from oldest to youngest geologically. I offer the reptiles of the “volcanic fire” part of the guilloche as an example that many might already know. On the floor, the order of these is first, a giant land tortoise, *Testudo*, followed by the ocean dwelling mosasaur, *Tylosaurus*, then the land dwelling plant eaters, *Diplodocus*, *Edmontosaurus*, *Stegosaurus*, and *Triceratops*. The geologic times in which these animals lived are respectively, Tertiary, Late Cretaceous, Late Jurassic, Late Cretaceous, Late Jurassic, and Late Cretaceous; clearly not in geologic order (See the geologic time scale on the inside back cover). I could add many other examples from each of the four parts of the guilloche.

Descriptions and geologic age ranges for the fossils appear in the “Definitions and Additional Information” section of this book. Try putting all 39 animal species (counting the crinoid and two echinoids near the start of the “water” part, but not the bird’s egg in the “air” part) and the three plants (the crinoid is an animal) in their true geologic order of first occurrence. Or do the same for the fossils in each of the four parts of the guilloche,

“water,” “volcanic fire,” “air,” and “earth.” See how much these arrangements differ from what is shown on the floor.

There is some empty space in the areas where the animals are depicted. Alexander wrote to Meière that she might include some small filler animal if needed, but that he preferred to leave the spaces empty. She did insert two small echinoids on either side of the starfish at the beginning of the water guilloche and used two fishes and two ichthyosaurs later in that band, something not repeated through the rest of the guilloche. She also added a bird’s egg in a space beneath and to the right of the diving bird in the air guilloche, but added no other small fillers.

How Many Drawings Did Professor Barbour Make?

The question of how many drawings Barbour made and sent to Younkin for transmittal to Meière is also an open one. We know that Barbour sent his colored drawings to Younkin in sets. The Nebraska State Capitol Archives has copies of lists of these sets, as does the archives of the University of Nebraska State Museum.

Oddly, there is one more list in the Museum archives than in the Capitol Archives; and in the files with the extra list there are two different sets designated as “5th sets.” Also, the drawings in the Capitol Archives collections include one of a tortoise that does not appear on any of the known inventory lists (Table 3, page 12). In total, Barbour sent at least 51 drawings to Meière on 47 sheets of tissue, each sheet 22" wide and from 27" to 36" long. The individual drawings were several inches smaller than the paper size used for them. Three sheets of tissue included more than one form. One sheet had drawings of two butterflies, a second had drawings of the leaves and trunks of

species of two trees, while a third had drawings of the leaves and trunks of three species of trees.

We may never know how many drawings Barbour actually produced and sent, but we do know that Meière did not use all of those on the lists (Table 4, page 14). Meière used 22 of the 51 known colored drawings. The Capitol Archives has 28 of the drawings on 24 sheets of tissue that were donated to the archives in 1982 by a descendant of Rafael Guastavino, creator of the structural terracotta tiles used in the vaulting and domes of the capitol. These drawings, which include 13 not used by Meière, are reproduced in this book.

If Meière used only 22 of Barbour’s colored drawings as models for her mosaics where did models for the remaining 21 animals and plants come from? She could have gotten ideas from other colored drawings that Barbour produced and sent, but were not recorded on the inventory lists noted above. She may have used black and white drawings that Barbour published in articles (Barbour, 1902; 1915) or sent to her in preliminary form from articles that he was preparing to publish (Barbour 1931b, Fig. 129). She also may have had access to pen and ink drawings of fossils drawn by Barbour, but apparently never published. Photographs of many such drawings, including ones of most of the plants and animals not listed in the inventories of colored drawings sent by Barbour to Younkin, are in the Archives and Special Collections of the University of Nebraska-Lincoln Libraries (Table 4, page 14).

If Meière used Barbour’s extant black and white drawings, the number of mosaic forms that required other models would be reduced to only seven or fewer. She may have gotten additional ideas for these from displays and publications at the American Museum of Natural History, which was located west of Central Park near both her apartment and her studio. She may have followed the advice of Alexander in a letter to her, dated

January 9, 1928, to contact his friend, Dr. Willard G. Van Name, of the museum's biological staff.

Construction of the Mosaics

The process of constructing the mosaics was complex (Monks, 1985; Robert C. Ripley, personal communication, 2015). The general order of the fossil forms was agreed to by all parties. Barbour had drawn some of the fossil animals in stances that would not fit well into the guilloche. Meière changed these in her base drawings to fit the dimensions of the ribbon. For example, she put the upright, bipedal duck-billed dinosaur into a four-legged stance and modified the long body of the onychophoran to resemble the curves of an "inch worm" (both in the "volcanic fire" part of the guilloche).

Meière drew her animals and plants in small segments of the continuous ribbon on brown-colored shop paper using brushes and black ink. Her drawings were all larger than those that Barbour had sent because the part of the guilloche that contains the images is about 24" wide, wider than the paper Barbour used for his colored drawings. The lengths of the larger animal mosaics range from about 40" to about 80", much longer than any of the animals that Barbour drew.

Then workmen of the De Paoli Company of New York City took Belgium Black marble tessera (tile) pieces, about 3/4" square; chipped them to fit the lines; and glued them to the shop paper over the black lines that Meière had drawn and over the background around the animals and plants [for a more complete description of this process called the "reverse" or "indirect" method see Garnett (1967) and Timmons (1977)]. The workers chipped, fitted and glued light colored Champville marble pieces with the face sides down on to the body spaces of the animal and plant mosaics and

into the two, 2" wide bands bordering the sides of the ribbon (Cunningham, 1934). The same steps were used to create each of the five tondi. Imagine the complexity of this work. Meière and the De Paoli workmen had to plan and execute the mosaics in sections face side down, in a mirror-image to their final orientation on the Rotunda floor!

Because no existing records describe the installation of these mosaics, the following account offers a best approximation (Robert Ripley, personal communication, 2015). The completed sections of the guilloche and the tondi were crated and shipped to Lincoln by rail. They were taken to the Capitol building site and partially uncrated. They were turned over and placed in a mortar bed, shop paper side up, in the correct position on the Rotunda floor. After the cementing mortar hardened, the paper was stripped off and probably discarded. Any gaps in the mortar were filled in and, after hardening, the whole work was polished to final beauty.

From Concept to Design

Late in 1927 Meière sent a rough plan (page 6) to Alexander for the design of the Rotunda floor. On this she noted the main directions (north, east, south, and west), the starting points and directions of the order of the forms around each tondo, and the geographic areas where the fossils might come from.

Younkin, in a later undated letter probably written in 1928, suggested the general plan of the subjects and the colors of marble to be used for specific purposes. He drew a sketch showing the larger central tondo, the four smaller ones, and the guilloche band shown and noting the general dimensions (page 7).

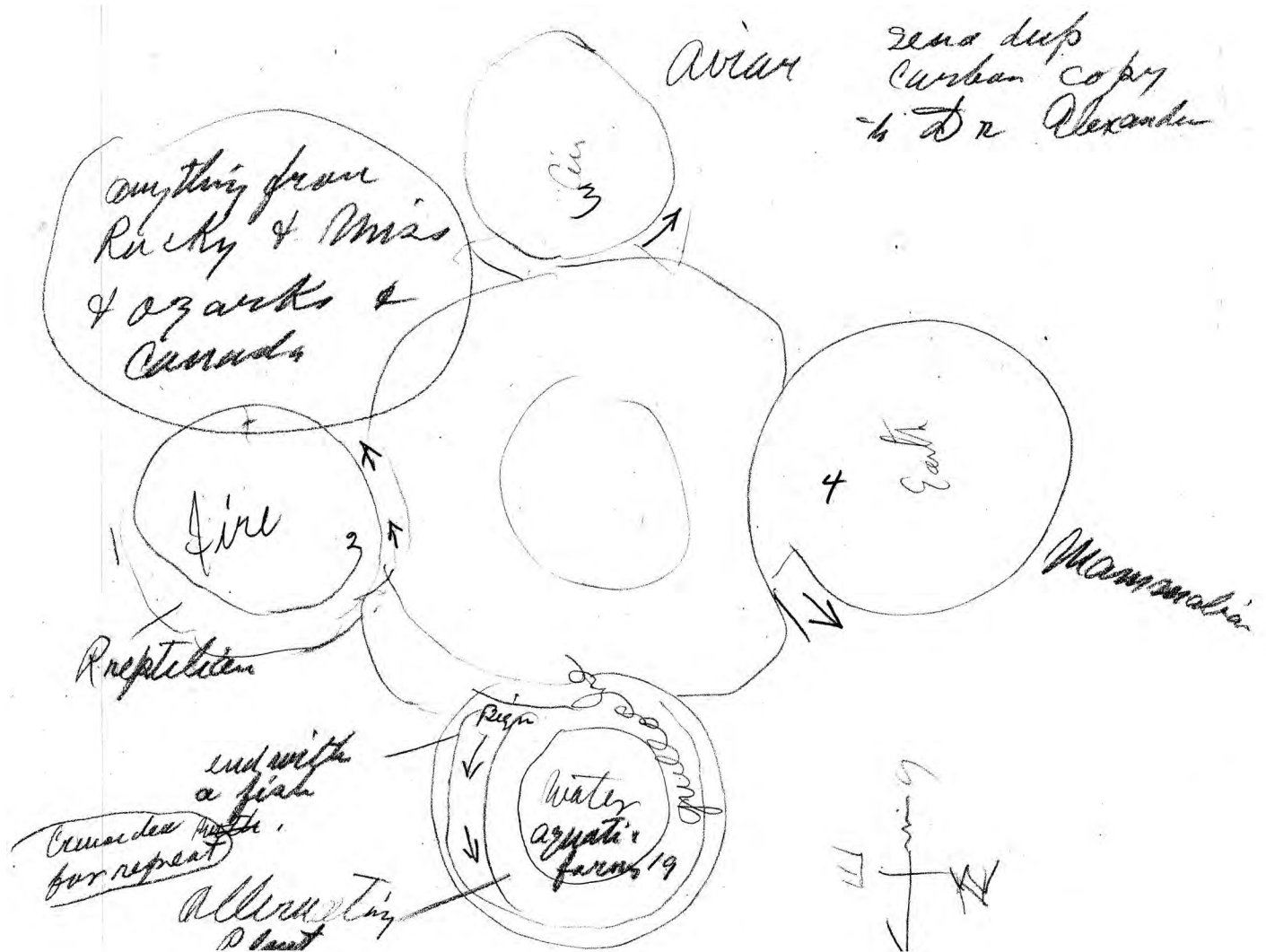
From these simple sketches came the final design for the Rotunda floor (page 8) in the

reproduction of an architectural drawing of the floor by Bertram G. Goodhue and Associates, Architects and Sunderland Brothers Co., Marble Contractors, Omaha, c. 1929.

In the course of my research for this book I contacted people in the New York City area who are in the business of mosaic production to see if they knew anything about the De Paoli Mosaic Company. Michael Magnan of D. Magnan and Company, Inc., reported that the De Paoli Company was founded in the early 1900s and closed in the mid- to late 1930s after installing

the Terrazzo flooring in the elevators of the Empire State Building (Michael Magnan, personal communication, February 14, 2015).

Magnan wanted to see a mosaic from the floor so I sent him a photo that I took of one of these. This prompted him to go online to look for more images of the Rotunda floor. He responded to me that the work was "awesome, amazing... and it looks like the Tax Payers certainly got their money's worth." (personal communication, February 18, 2015).



Meière sketch, 1927

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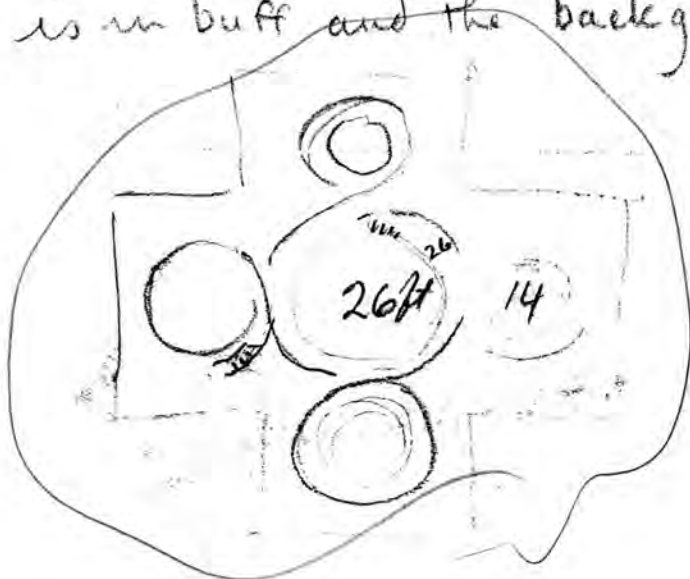
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Subjects for Procurement of Pre-historic Living
things found in Nebraska fossil deposits:

Animals - Birds - Fishes - Reptiles -

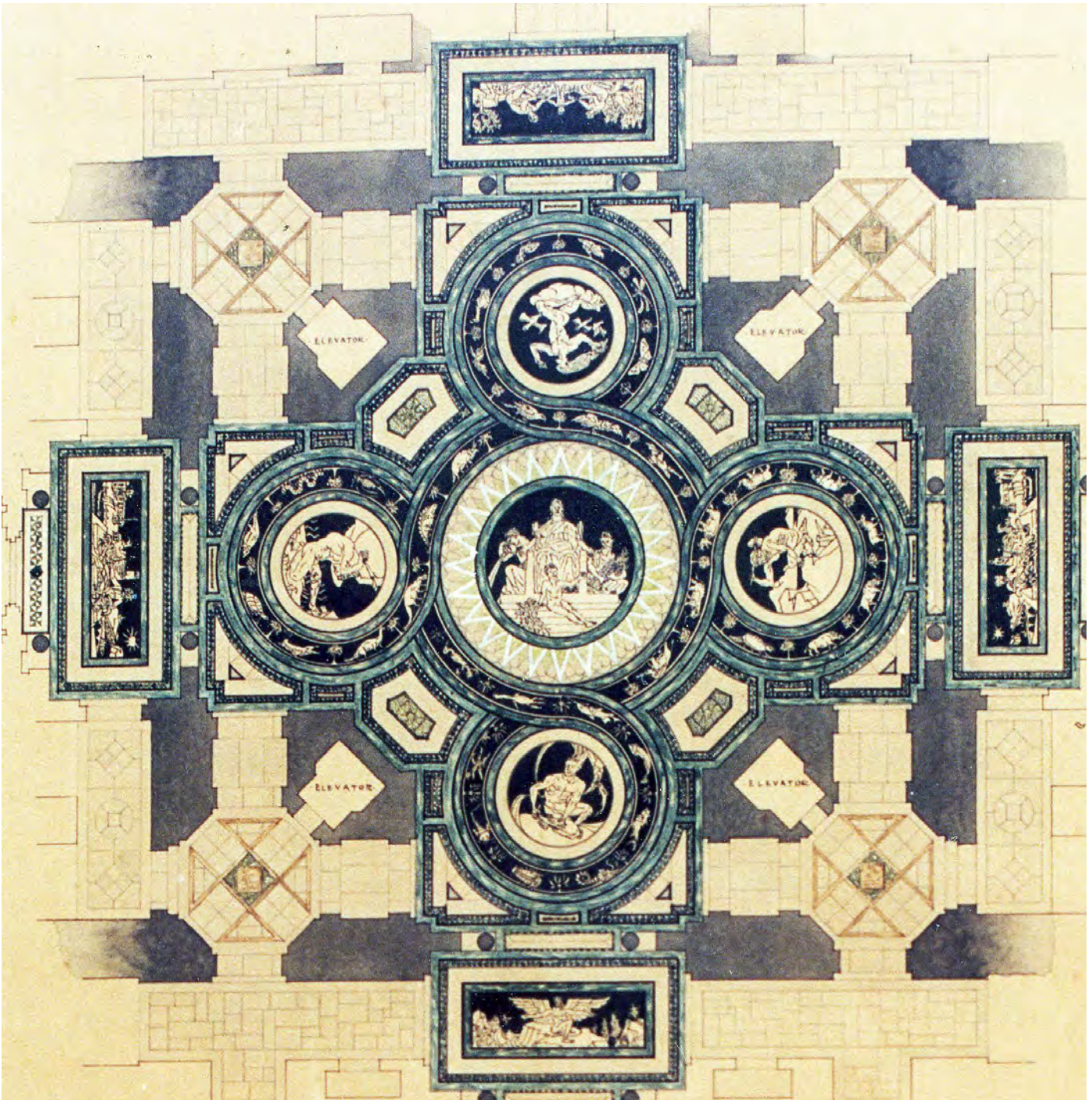
36 subjects in all, separated by 36 Trees,
bushes, plants, marine vegetation, etc.

Silhouette more important than surface detail
as these will be rendered broadly in a sort of
marble mosaic in which the body (or other form)
is in buff and the background in black.



Mr. Younkini
Capitol Commission

Henchera Coral
cells,



Final design by Bertram G. Goodhue and Associates, 1929

TABLES

Table 1
Reported Materials Used for Mosaics on the Rotunda Floor

Pabian (1974, p. 1548) - "...black and white marble..." (p. 1549) - "...white Champville marble from Italy and Belgium black marble from Belgium."

Woodside and Gabb, In Luebke (1990, p. 78) - "...white marble set against black...."

Monks (~2005, unnumbered p. 10) - "...mosaic tiles...."

Hannibal (2014, p. 41, 43, 48) - "Champville marble, a very pale orange stone, and Belgium Black marble..." (p. 48); "...Champville marble was limestone..." p. 41; "...Belgium Black marble...a Devonian/Mississippian limestone from Belgium..." p. 43; Bioul, Belgium, and vicinity (Table A1).

Karen Wagner, Capitol Archivist (Personal Communication, 11/30/2014) - "...composed of marble chips."

Jeffrey Matthews, Expert on Building Stone Types (Personal Communication, 2014) -

Three sources report the following regarding Champville marble:

1. "...a marble quarried in France."; "... a limestone, typically very light colored, and probably quarried in southern part of France."
2. "Champville marble from France is a cream-yellow color, with occasional rose coloring."
3. "...white marble from Italy." Source: U.S. Department of the Interior, National Park Service.

Note: Table 1 includes the names of two geologic periods of time, "Devonian" and "Mississippian." On the inside back cover of this book is a geologic time scale and geologic rock column that indicates the order of these units from youngest to oldest with the start and end of each unit in millions of years (Ma) before the present. Refer to this time scale and rock column when you come to a geologic age name and want to know more about the age and its relation to the whole of geologic time.

Table 2
Identifications of Fossil Types Depicted on the Capitol Rotunda Floor

<u>Alexander (1928)¹</u>	<u>Pabian (1974)</u>	<u>Monks (~2005)</u>	<u>Hannibal (2014)</u>	<u>This Book</u>
<u>The Genius of Water</u>				
Crinoid (Sea Lily)	Crinoid <i>Aesiocrinus</i>	Crinoid	Crinoid <i>Aesiocrinus?</i>	Crinoid <i>Eupachyrcinus</i>
Starfish*	Starfish	Starfish	Starfish	Starfish
Euryptid	Eurypterid	Sea Scorpion <i>Eurypterus</i>	Eurypterid <i>Eurypterus</i>	Eurypterid (number 1) <i>Eurypterus</i>
Brachiopod	Trilobite	Trilobite	Trilobite	Trilobite
Ammonite	Ammonite <i>Trachyscaphites</i>	Ammonite	Ammonite	Nautiloid <i>Goldringia</i>
Ganoid Fish	Placoderm	Fish Species # 1	Acanthodian Fish	Teleost Fish (2) ²
Teleost Fish	Ostracoderm	Fish Species # 2	Jawless Fish <i>Cephalaspis</i>	Jawless Fish <i>Cephalaspis</i>
Ichthyosaur	Ichthyosaur	Ichthyosaur (2)	Ichthyosaur (2)	Ichthyosaur (2)
Plesiosaur	Plesiosaur	Plesiosaur	Plesiosaur	Plesiosaur
Aquatic Bird <i>Hesperornis</i>	Diving Bird <i>Hesperornis</i>	Sea Bird <i>Hesperornis</i>	Swimming Bird <i>Hesperornis</i>	Swimming Bird <i>Hesperornis</i>
Sea Urchin*	Echinoid (1)	Sea Urchin (2)	Sea Urchin (1)	Sea Urchin (2)
*Sea urchins included in the proposal with Starfish as a possibility for use in the mosaic.				
<u>The Genius of Volcanic Fire</u>				
Tree Fern	Cycad-Like Tree	Fern	Tree Fern	Tree Fern
Spider/Scorpion	Eurypterid <i>Stylonurus</i>	Primitive Spider	Eurypterid <i>Stylonurus</i>	Eurypterid (number 2) <i>Ctenopterus</i>
Centipede	Annelid Worm	Centipede	Composite**	Onychophoran
Frog	Amphibian <i>Eryops</i>	Giant Amphibian	Amphibian <i>Eryops</i>	Amphibian <i>Eryops</i>
Turtle/Tortoise	Turtle	Giant Tortoise	Turtle/Tortoise	Tortoise
Lizard	Mosasaur	Mosasaur	Mosasaur	Mosasaur (number 1) <i>Tylosaurus</i>
Sauropod Dinosaur	<i>Brontosaurus</i>	<i>Apatosaurus</i>	<i>Apatosaurus</i>	<i>Diplodocus</i>
Ornithopod Dinosaur	<i>Trachodon</i>	<i>Edmontosaurus</i>	<i>Edmontosaurus</i>	<i>Edmontosaurus</i>
Stegosaur Dinosaur	<i>Stegosaurus</i>	<i>Stegosaurus</i>	<i>Stegosaurus</i>	<i>Stegosaurus</i>
Ceratops Dinosaur	<i>Triceratops</i>	<i>Triceratops</i>	<i>Triceratops</i>	<i>Triceratops</i>

**Myriapod/Onychophoran Composite—Imaginary animal combining traits of both.

Table 2 (continued)
Identifications of Fossil Types Depicted on the Capitol Rotunda Floor

The Genius of Air

Flowering Plant or Floral Spike	More Modern Tree	Flowering Plant	Stylized Magnolia	Magnolia
Butterfly or Moth	Butterfly	Butterfly	Butterfly	Butterfly (number 1) <i>Prodryas</i>
Bee or Dragonfly	Dragonfly	Dragonfly	Meganeurid or Dragonfly	Dragonfly
Pterodactyl	<i>Pteranodon</i> -like Flying Reptile	Pterodactyl Flying Reptile	Pterosaur <i>Dimorphodon</i>	Pterosaur <i>Pteranodon</i>
Primitive Bird <i>Ichthyornis</i>	Cretaceous Diving Bird and Egg	<i>Ichthyornis</i> - Laid Eggs	Cretaceous Diving Bird <i>Ichthyornis</i>	Diving Bird and Egg <i>Ichthyornis</i>
Carinate Bird - Marshbird Type	Wingless Bird <i>Diatryma</i> Eocene	Ostrich-Like <i>Diatryma</i> ?	Flightless Bird <i>Diatryma</i>	Flightless Bird <i>Gastornis</i>
Carinate Bird – Songbird Type	Meadowlark	Songbird	Western Meadowlark	Songbird Meadowlark
Carinate Bird – Hawk Type	Hawk	Falcon	Falcon or Hawk	Falcon
Carinate Bird – Owl Type	Owl	Owl	Great Horned Owl	Owl
Flying Mammal Bat	Bat	Bat	Bat	Bat

The Genius of Earth

Deciduous Tree - Tertiary Type	Deciduous Tree	Deciduous Tree	Deciduous Tree <i>Liquidambar</i>	Deciduous Tree <i>Liquidambar</i>
Edentate – <i>Mylodon</i> or Armadillo	Armadillo Glyptodont-Like	Giant Armadillo	Glyptodont	Glyptodont
Giant Hog - <i>Sus</i>	Giant Hog-Like <i>Dinohyus</i>	Giant Pig	Giant Pig-Like <i>Daeodon</i>	Giant Hog <i>Daeodon</i>
<i>Bos</i> – Bison Extinct Type	Bison	Bison	Long-Horned Bison	Giant Bison
<i>Equus</i> – Three- Toed Type ?	Horse	Primitive Horse	Three-Toed Horse	Three-Toed Horse <i>Mesohippus</i>
Carnivore – <i>Felis</i> (Sabre-Tooth), <i>Canis</i> or <i>Ursus</i>	Sabre-Toothed Tiger	Sabre-Tooth Cat	Sabre-Toothed Cat	Sabre-Toothed Cat <i>Smilodon</i>
<i>Titanotherium</i>	Uintathere	Rhino-Like # 1 <i>Titanotherium</i>	Uintathere	Titanotherie <i>Titanotherium</i>
<i>Dinothereum</i>	Titanotherie <i>Brontops</i>	Rhino-Like # 2 <i>Dinothereum</i>	Titanotherie	Uintathere
Mastadon	Mastodont	Elephant # 1	Mastodon	Mastodon
Mammoth	Mammoth	Elephant # 2	Mammoth	Mammoth

¹ – Alexander’s original 1928 Proposal included scientific names such as Echinoderm, Batrachian, and Chelonid that in some cases I have not included in this table to simplify it slightly.

² – Numbers in () are numbers of fossil images in mosaics reported by others or noted by this author.

Table 3
Lists of Sets of Colored Barbour Drawings of Fossils Sent to Meière

<u>Barbour¹ to Younkin to Meière</u>	<u>Set Number</u>	<u>Date Sent</u>
Eurypterid (number 1) ²		
Trilobite		
Crinoid Head		
Brachiopod <i>Spirifer cameratus</i> (now <i>Neospirifer cameratus</i>)		
<i>Sigillaria</i>	First Set	10/31/1927
Tree Fern		
Pine <i>Cordaites</i>		
Calamite		
<i>Lepidodendron</i>		
<i>Titanotherium</i>		
<hr/>		
Belemnite Early Squid		
Daimonelix		
Ammonite <i>Scap(h)ites</i>	Second Set	11/15/1927
Nautiloid <i>Orthoceras</i>		
<i>Pteranodon ingens</i>		
Horned Gopher <i>Epigaulus</i>		
<hr/>		
Rhinoceros <i>Teleoceras</i>		
Rhinoceros <i>Metamynodon</i>		
Rhinoceros <i>Caenopus</i> (now <i>Subhyracodon</i>)		
Cursorial Rhinoceros		
Tapir <i>Protapirus</i>		
Three-Toed Horse <i>Mesohippus</i>	Third Set	12/06/1927
Giant Ground Sloth <i>Megatherium</i>		
Oreodont <i>Promerycochaeru</i>		
Oreodont <i>Merycoidodon</i>		
Oreodont <i>Agriochoerus</i>		
Antelope <i>Dromomeryx antilopina</i>		

Table 3 (continued)
Lists of Sets of Colored Barbour Drawings of Fossils Sent to Meière

Mosasaur <i>Tylosaurus</i> (number 1)			
Ichthyosaur <i>Ichthyosaurus</i> (2)			
Dinosauria <i>Triceratops</i>			
Dinosauria <i>Stegosaurus</i>			
Dinosauria <i>Diplodocus</i>			
Dinosauria Duck-Billed Dinosaur <i>Edmontosaurus</i>			
Dinosauria <i>Tyrannosaurus</i> , Carnivorous Dinosaur	Fourth Set	01/21/1928	
Mosasaur (number 2)			
Toothed Bird <i>Hesperornis regalis</i>			
Giant Hog (Entelodon)			
Musk Ox <i>Ovibos</i>			
Proboscidean Four-Tusker			
Proboscidean Two-Tusker, Mastodon			
Proboscidean Mammoth, <i>Elephas columbi</i>			
<hr/>			
Poplar Tree <i>Populus</i>			
Willow <i>Salix</i>	All on one sheet		
Tulip Tree <i>Liriodendron</i>			
-----	Fifth Set (A)	Undated	
Sassafras <i>Sassafras cretaceum</i>	Both on one sheet		
Gum Tree <i>Liquidambar</i>			
<hr/>			
Butterfly <i>Prodryas</i>	Both on one sheet		
Butterfly <i>Barborothea</i>			
-----	Fifth Set (B)	02/10/1928	
Beetle <i>Acalyphas</i>			
Sabre-Toothed Cat <i>Smilodon</i>			
<hr/>			
<u>Not on Barbour to Younkin Lists of Drawings Sent</u>			
Tortoise		Undated	

¹ The names are written as they appear on the inventories.

² Names/numbers in () added by the author.

Table 4
Barbour's Drawings and Meière's Usage

<u>Mosaics (In Order)</u>	<u>Barbour's Drawings</u>		
	<u>Colored Drawings</u>		<u>Pen & Ink Drawings</u>
	<u>In Capitol Archives</u>	<u>Meière Used</u>	
1. Crinoid <i>Eupachycrinus</i>	x	x	x
2. Sea Urchin (number 1)			x*
3. Starfish			x*
4. Sea Urchin (number 2)			x*
5. Eurypterid (number 1) <i>Eurypterus</i>	x	x	x
6. Trilobite		x	x
7. Nautiloid <i>Goldringia</i>			x
8. Teleost Fish (2)			? ¹
9. Jawless Fish <i>Cephalaspis</i>			x
10. Ichthyosaur (2)	x	x	x
11. Plesiosaur			x
12. Swimming Bird <i>Hesperornis</i>	x	x	x
13. Tree Fern	x	x	x
14. Eurypterid (number 2) <i>Ctenopterus</i>			x
15. Onychophoran			x
16. Amphibian <i>Eryops</i>			x
17. Tortoise	x	x	x
18. Mosasaur (number 1) <i>Tylosaurus</i>	x	x	x
19. Dinosaur <i>Diplodocus</i>		x	x
20. Dinosaur <i>Edmontosaurus</i>	x	x	x
21. Dinosaur <i>Stegosaurus</i>	x	x	x
22. Dinosaur <i>Triceratops</i>	x	x	x
23. Magnolia			?
24. Butterfly (number 1) <i>Prodryas</i>	x	x	x
25. Dragonfly			x
26. Pterosaur <i>Pteranodon</i>	x	x	x
27. Diving Bird and Egg <i>Ichthyornis</i>			?

Table 4 (continued)
Barbour's Drawings and Meière's Usage

28.	Flightless Bird <i>Gastornis</i>			x
29.	Songbird – Meadowlark			?
30.	Falcon			?
31.	Owl			?
32.	Bat			x
33.	Deciduous Tree <i>Liquidambar</i>	x	x	x
34.	Glyptodont			x
35.	Giant Hog <i>Daeodon</i>		x	x
36.	Giant Bison		x	x
37.	Three-Toed Horse <i>Mesohippus</i>		x	x
38.	Sabre-Toothed Cat <i>Smilodon</i>	x	x	x
39.	Titanotherium <i>Titanotherium</i>		x	x
40.	Uintathere			x
41.	Mastodon	x	x	x
42.	Mammoth		x	x

Colored Drawings Submitted – Not Used

In Capitol Archives

Pen & Ink Drawings

43.	Ammonite <i>Scaphites</i>			x
44.	Belemnite (Early Squid)			x
45.	Beetle <i>Acalyphas</i>			x
46.	Butterfly (number 2) <i>Barborothea</i>			x
47.	Brachiopod <i>Spirifer cameratus</i> (now <i>Neospirifer cameratus</i>)			x
48.	Mosasaur (number 2)			x
49.	Rhinoceros <i>Teleoceras</i>			
50.	Rhinoceros <i>Subhyracodon</i>			
51.	Pine <i>Cordaite</i> s			x
52.	Poplar Tree <i>Populus</i>			x
53.	Willow Tree <i>Salix</i>			x
54.	Tulip Tree <i>Liriodendron</i>			x
55.	Sassafras Tree <i>Sassafras</i>			x

Table 4 (continued)
Barbour's Drawings and Meière's Usage

<u>Colored Drawings Submitted – Not Used</u>	<u>Pen & Ink Drawings</u>
<u>Current Location Unknown</u>	
56. <i>Sigillaria</i> (Plant)	x
57. Calamite (Scouring Rush)	x
58. <i>Lepidodendron</i> (Plant)	x
59. Daimonelix (Burrow)	
60. Nautiloid <i>Orthoceras</i>	x
61. Horned Rodent <i>Epigaulus</i>	
62. Rhinoceros <i>Metamynodon</i>	
63. Cursorial Rhinoceros	
64. Tapir <i>Protapirus</i>	x
65. Giant Ground Sloth <i>Megatherium</i>	x
66. Oreodont <i>Promerycochaerus</i>	x
67. Oreodont <i>Merycoidodon</i>	x
68. Oreodont <i>Agriochoerus</i>	x
69. Antelope <i>Dromomeryx</i>	
70. Dinosaur <i>Tyranosaurus rex</i>	x
71. Musk Ox <i>Ovibos</i>	x
72. Four-Tusked Elephant	x

x* – These three drawings are from Barbour (1931 b); all others indicated with “x” are from photographs of pen and ink drawings in the University of Nebraska-Lincoln Libraries, Archives and Special Collections.

?¹ – No Barbour drawings of these fossils have been found. Meière may have used other sources for these.

IN THE ROTUNDA

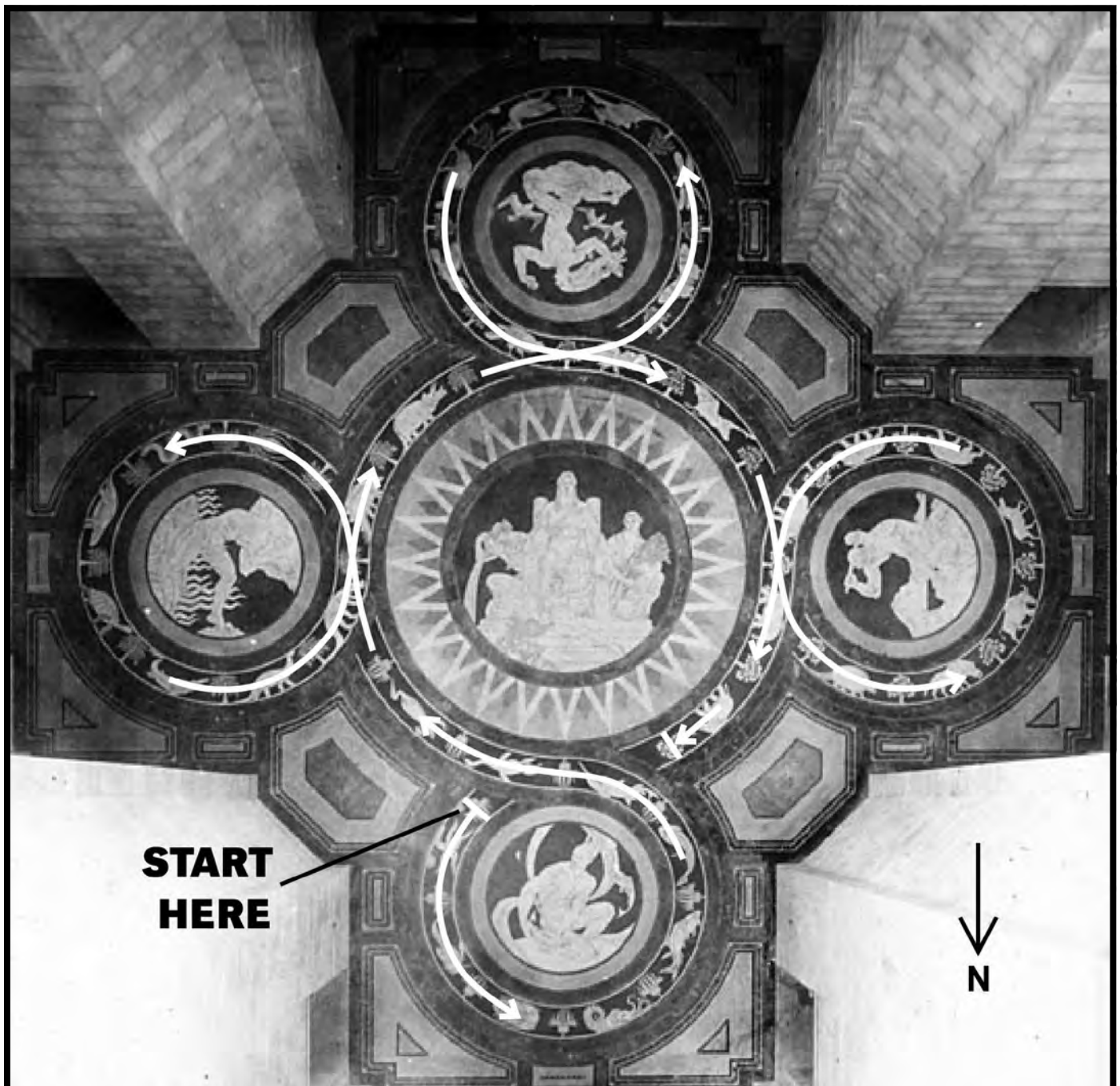
The Capitol Rotunda is located on the second floor of the building. When you visit the Capitol, go first to the third floor where balconies overlook the Rotunda. Here you can see the

whole mosaic work laid out. Then go down to the Rotunda's north side and start exploring the fossils in the mosaics beginning at the crinoid. Follow the ribbon of animals and plants.

THE DRAWINGS AND THE MOSAICS

This book follows the ribbon of mosaic pictures from the beginning to the end. The picture of the floor shows the place to start. The fossils in the mosaics created by Hildreth Meière

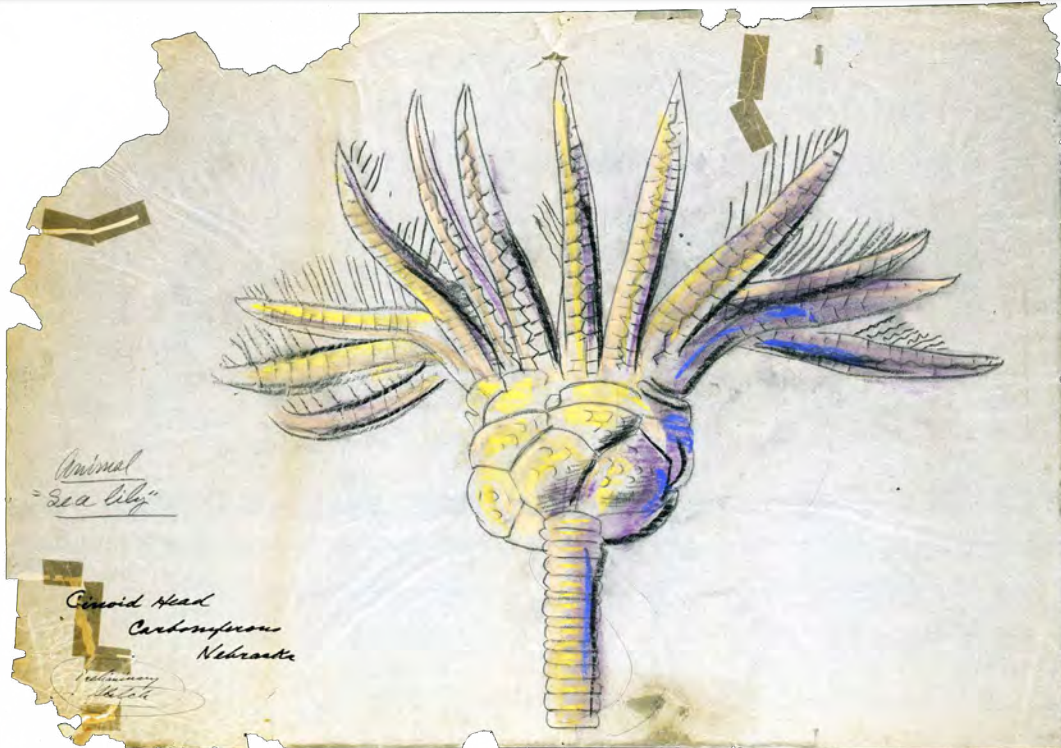
are paired with drawings of these same animals and plants by Erwin H. Barbour. In seven instances, counting the bird egg, no drawings by Barbour have been found.



The Genius of Water



Fossil 1. Crinoid [CRY noyd] *Eupachyrcinus* [you PACK ee cry nus]



Fossils 2 and 4. Sea Urchin [ER chin]



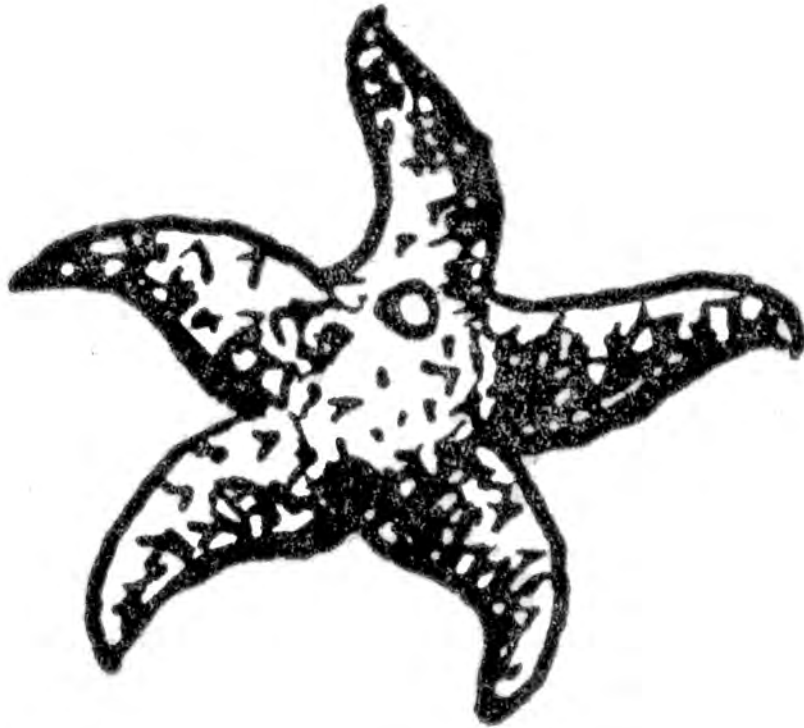
Sea Urchin - 2



Sea Urchin - 4



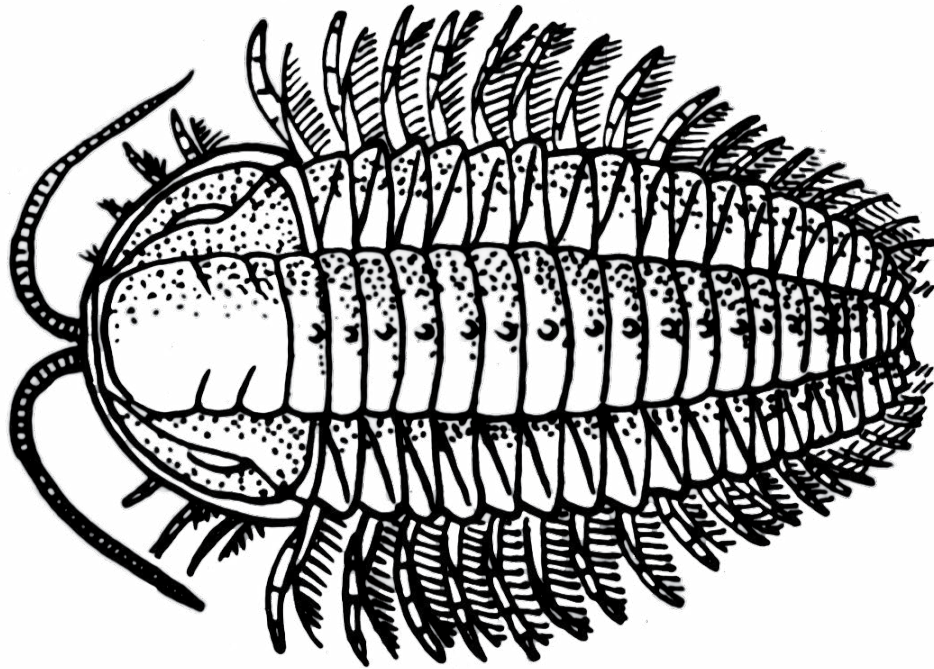
Fossil 3. Starfish



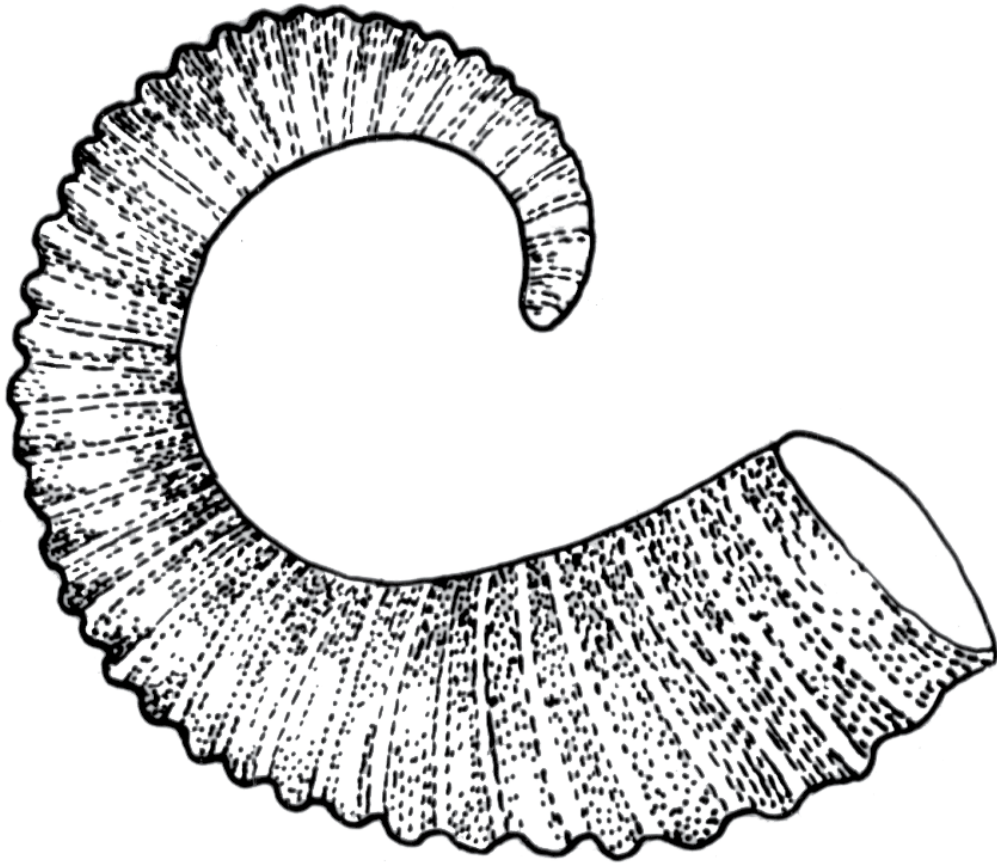
Fossil 5. Eurypterid [you RIP tuh rid] *Eurypterus* [you RIP tuh rus]



Fossil 6. Trilobite [TRY low bite]



Fossil 7. Nautiloid [NAW tuh loyd] *Goldringia* [GOLD ring ee ah]

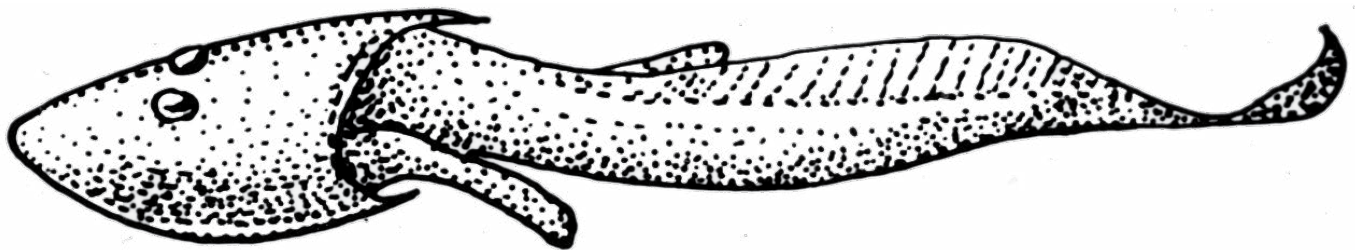
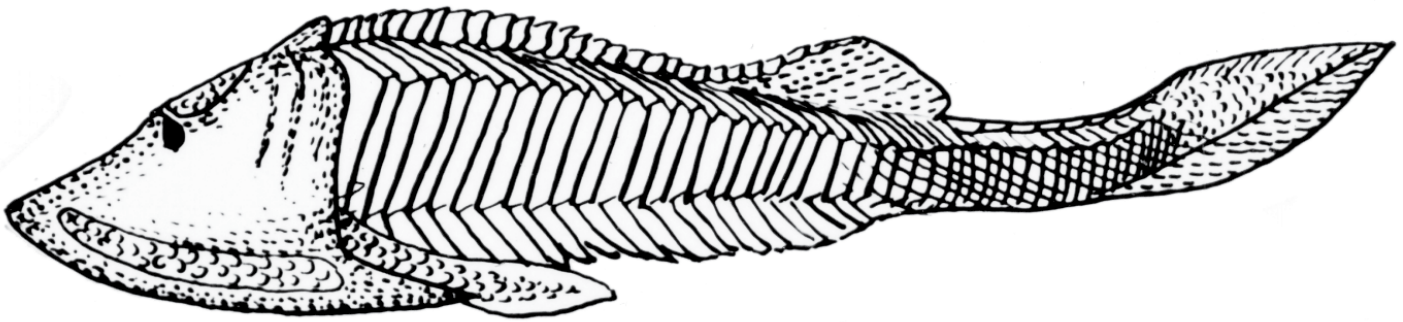


Fossil 8. Teleost Fish [TEE lee ost]

No drawing of this animal by Erwin H. Barbour has been found.



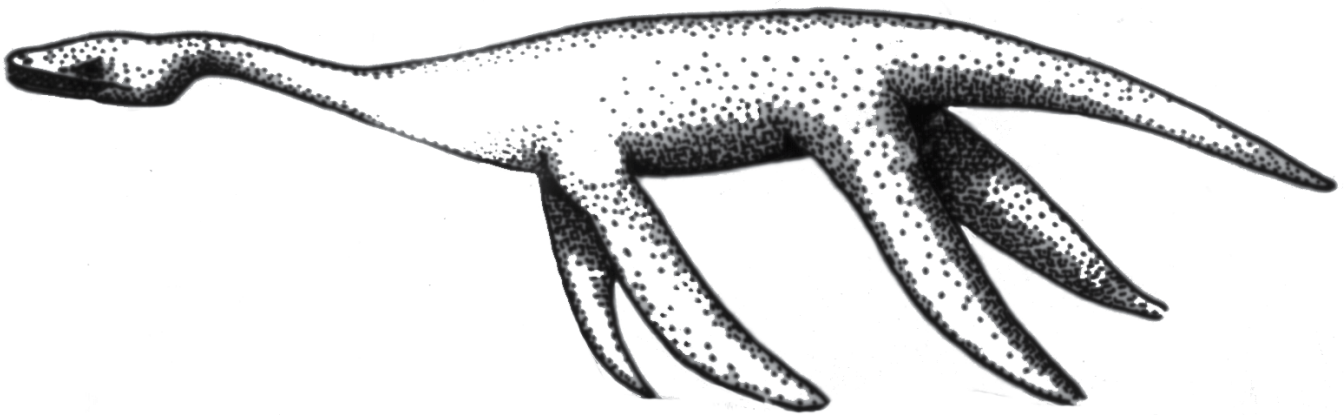
Fossil 9. Jawless Fish *Cephalaspis* [sef aah LASS pis]



Fossil 10. Ichthyosaur [ICK thee oh sore]



Fossil 11. Plesiosaur [PLEE see oh sore]



Fossil 12. Swimming Bird *Hesperornis* [HESS per or nis]



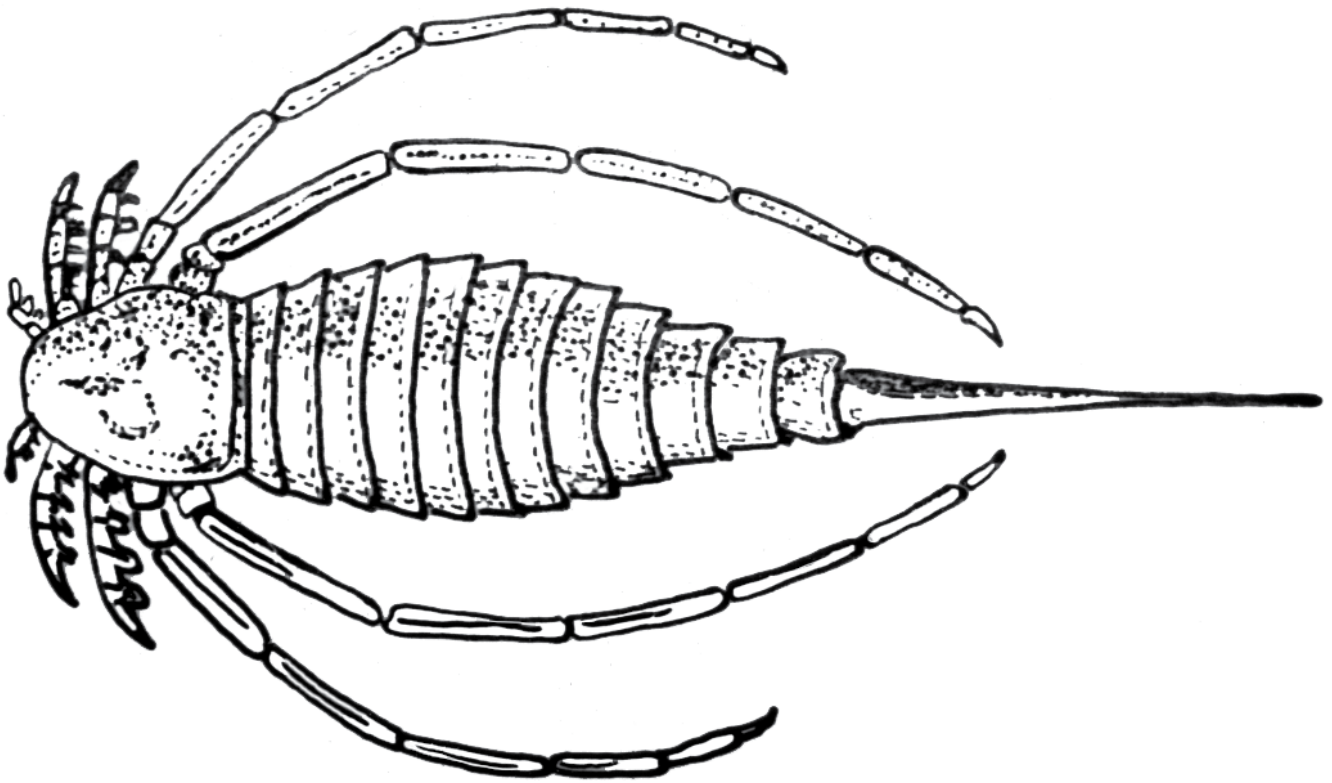
The Genius of Volcanic Fire



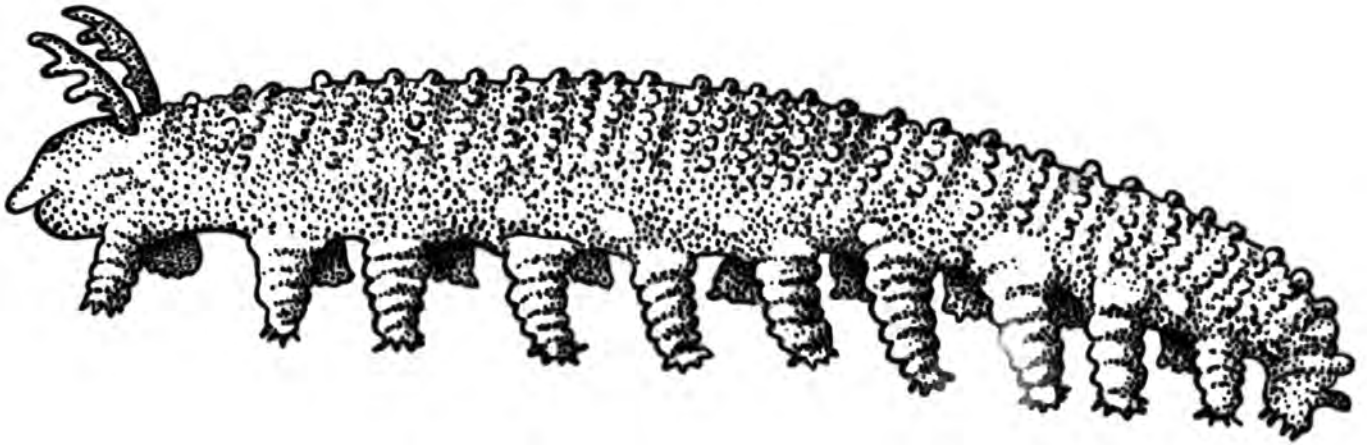
Fossil 13. Tree Fern



Fossil 14. Eurypterid [you RIP tuh rid] *Ctenopterus* [ten OP tur us]



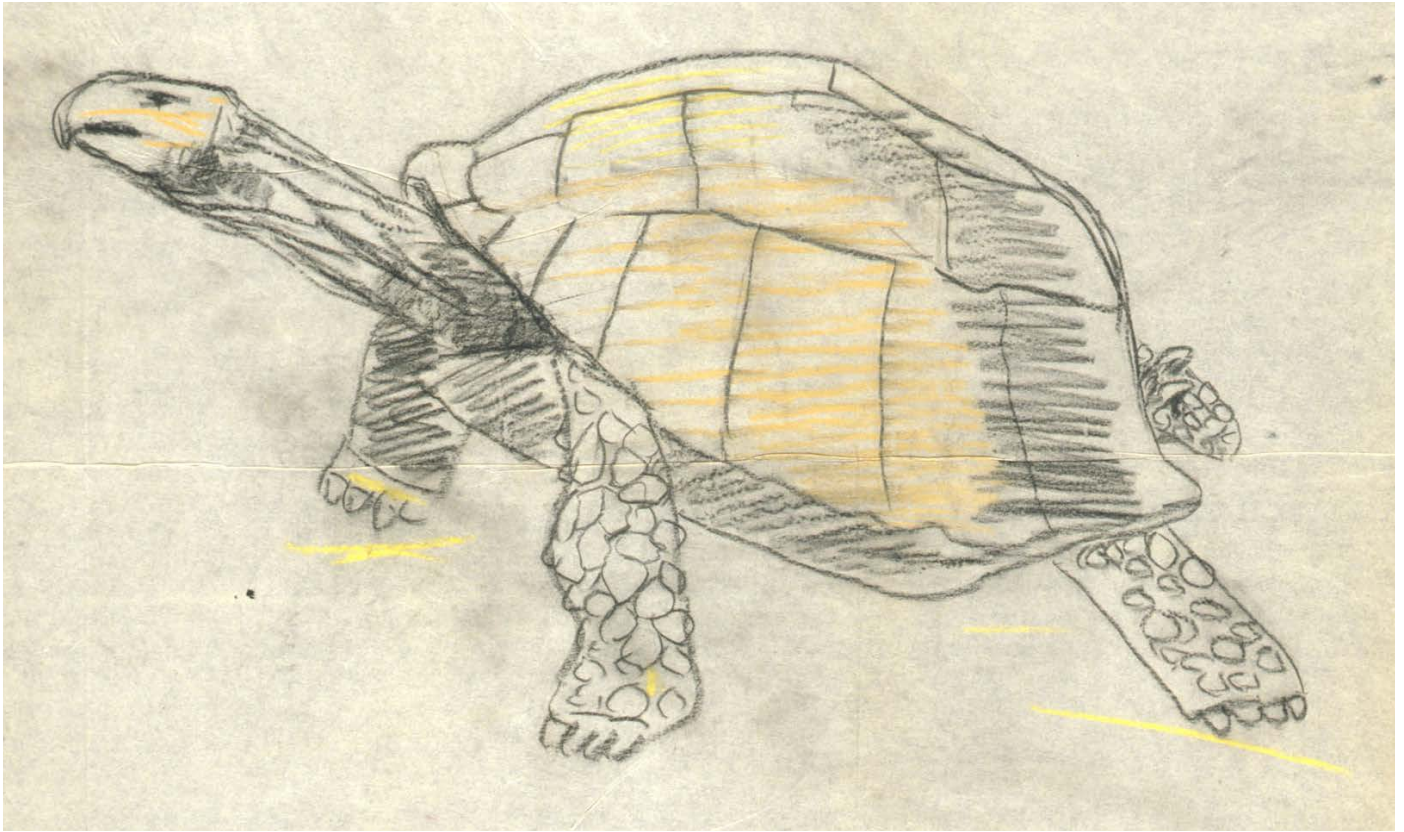
Fossil 15. Onychophoran [on ee KAA for an]



Fossil 16. Amphibian [am FIB ee an] *Eryops* [AIR ee ops]



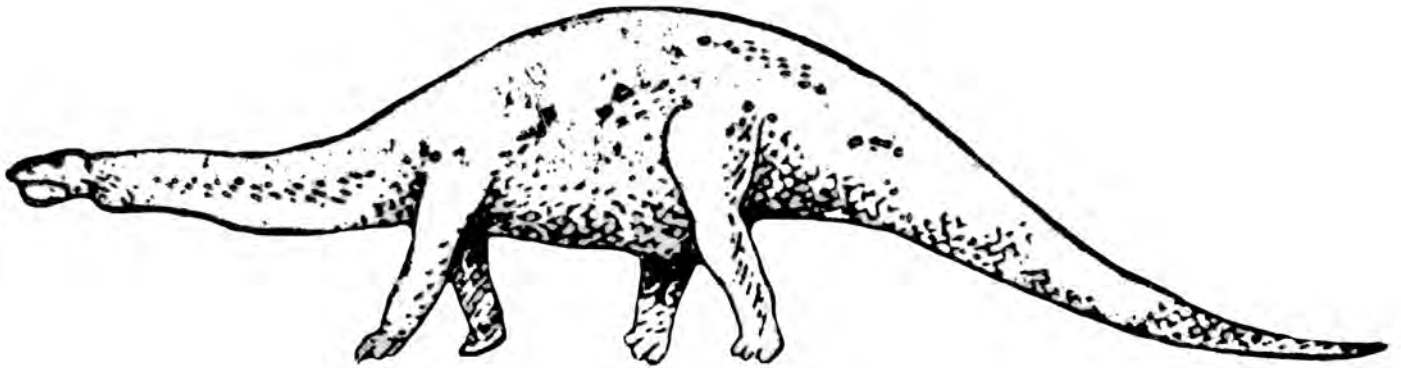
17. Tortoise [TOR tus]



Fossil 18. Mosasaur [MOW sa sore] *Tylosaurus* [tie low SORE us]



Fossil 19. Dinosaur *Diplodocus* [dip LOD oh cus]



Fossil 20. Dinosaur *Edmontosaurus* [ed mont oh SORE us]



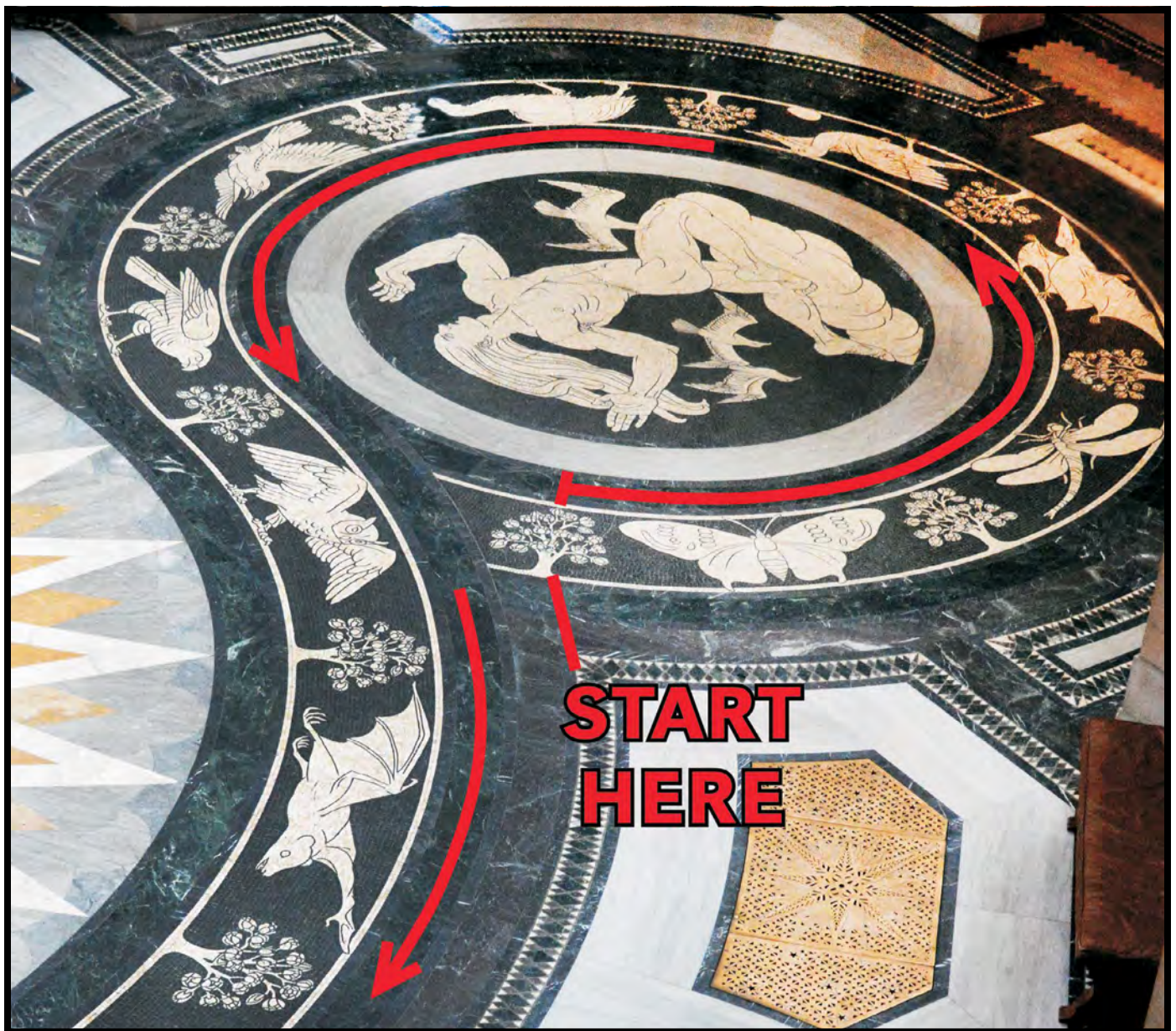
Fossil 21. Dinosaur *Stegosaurus* [steg oh SORE us]



Fossil 22. Dinosaur *Triceratops* [try SAIR ah tops]



The Genius of Air

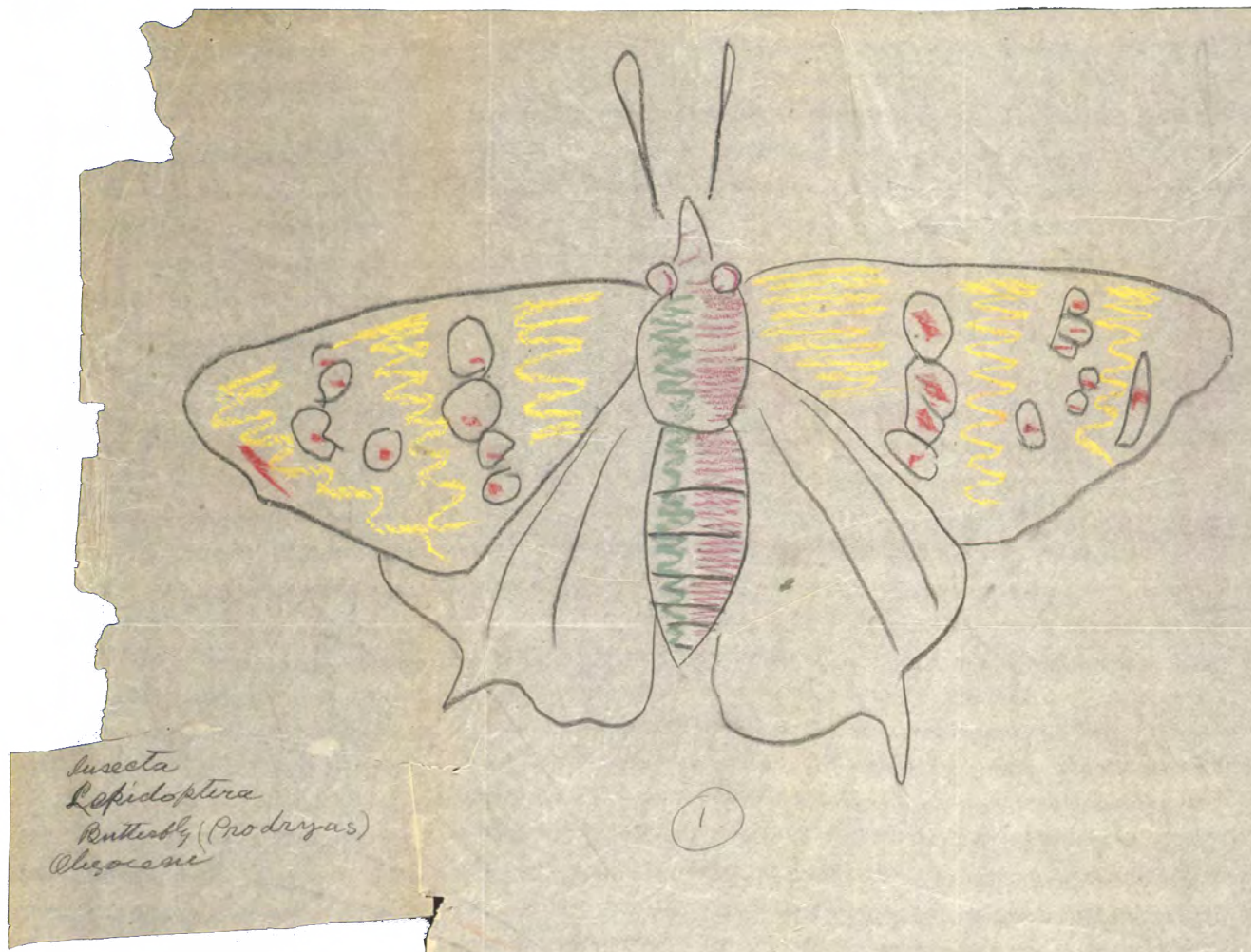


Fossil 23. Magnolia [mag NO lee a]

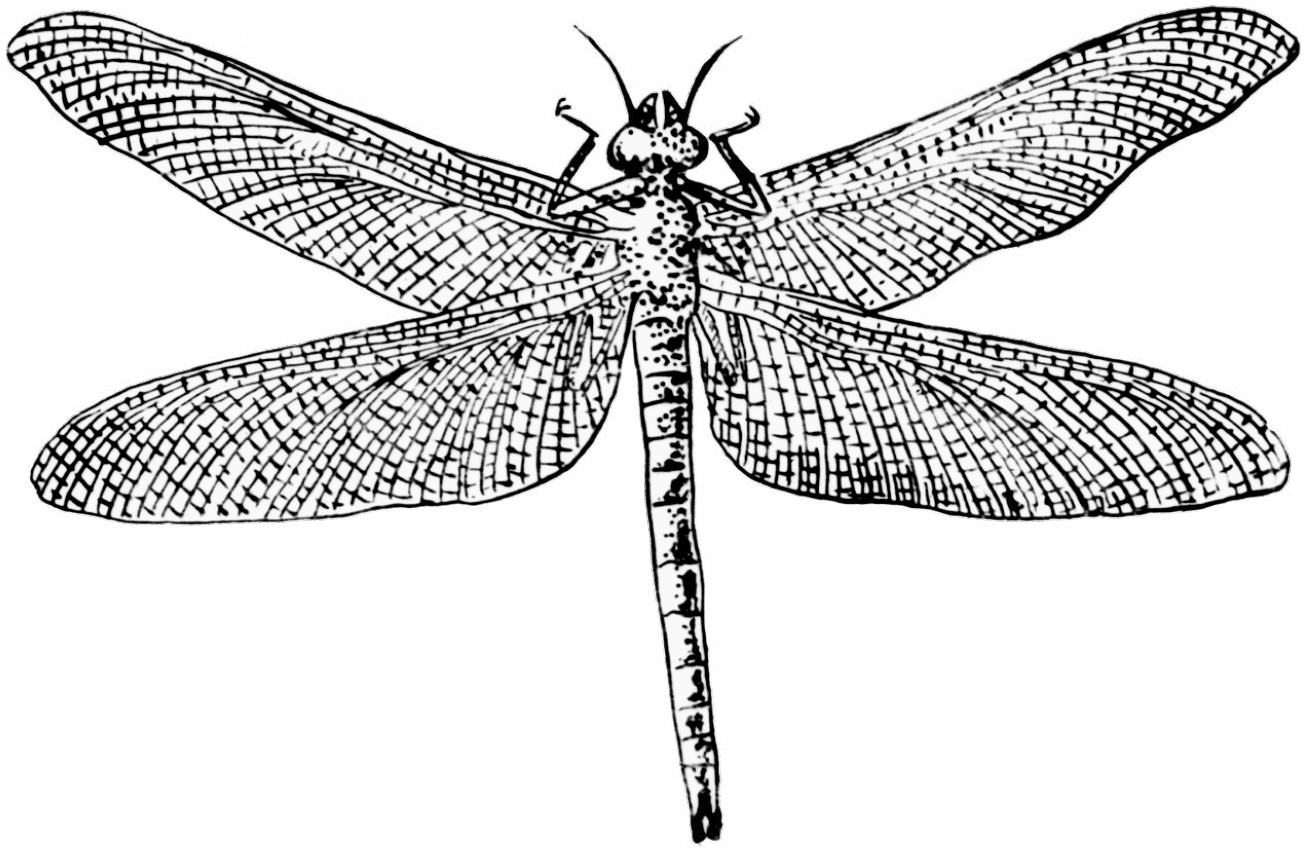
No drawing of this plant by Erwin H. Barbour has been found.



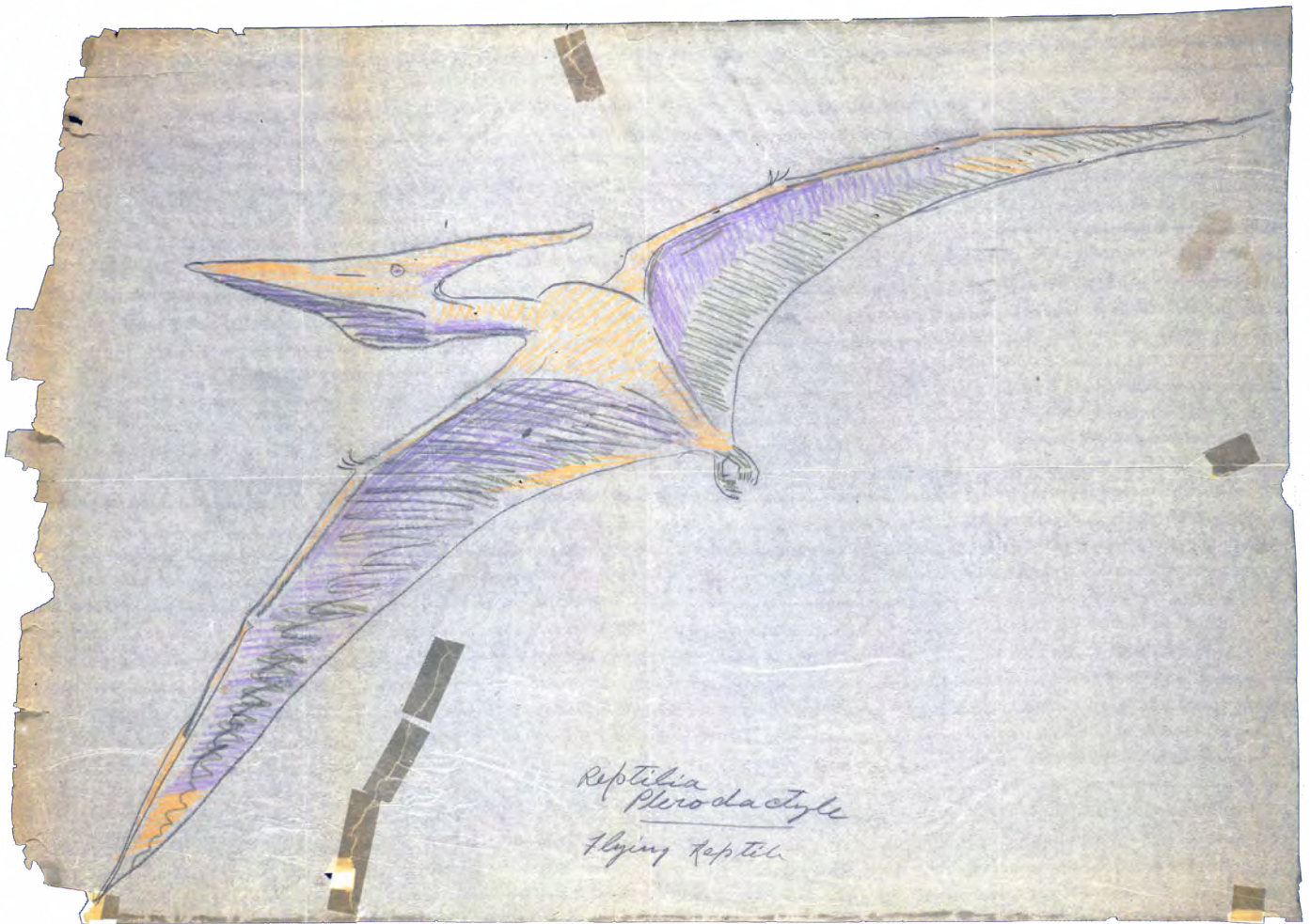
Fossil 24. Butterfly *Prodryas* [pro DRY as]



Fossil 25. Dragonfly



Fossil 26. Pterosaur [TAIR oh sore] Pteranodon [tah RAN oh don]



Fossil 27. Diving Bird and Egg *Ichthyornis* [ick thee OR nis]

No drawing of this animal and egg by Erwin H. Barbour has been found.



Fossil 28. Flightless Bird *Gastornis* [gast OR nis]



Fossil 29. Songbird – Meadowlark

No drawing of this animal by Erwin H. Barbour has been found.



Fossil 30. Falcon

No drawing of this animal by Erwin H. Barbour has been found.



Fossil 31. Owl

No drawing of this animal by Erwin H. Barbour has been found.



Fossil 32. Bat



The Genius of Earth

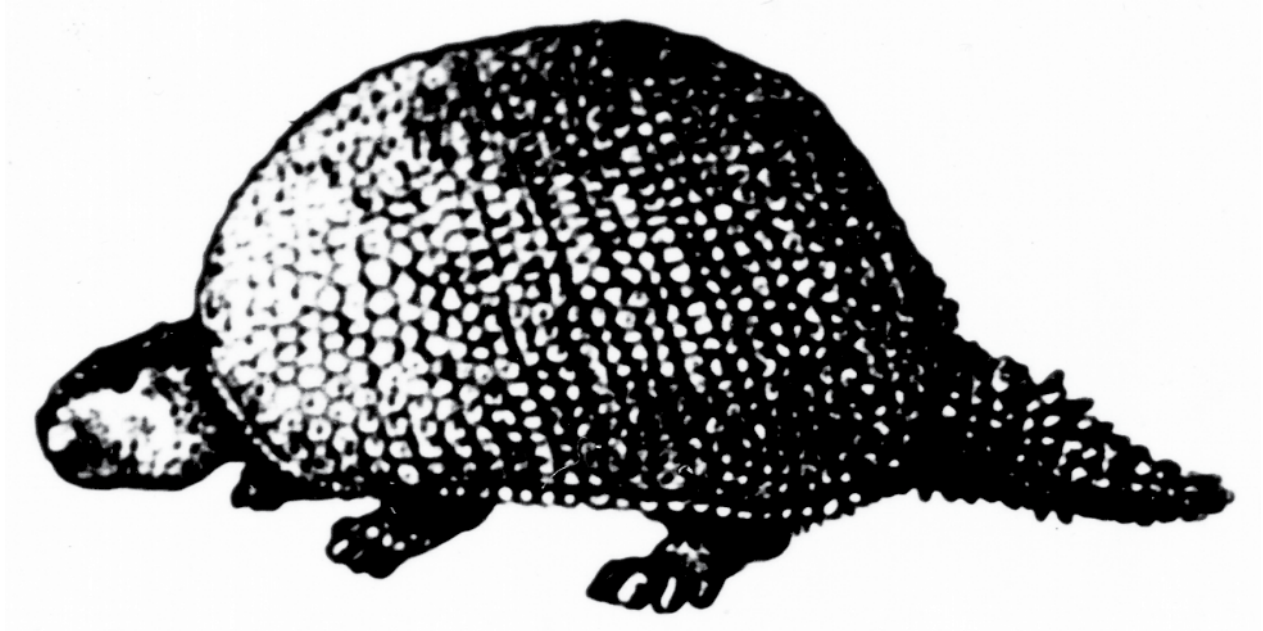


Fossil 33. Deciduous [duh CID you us] Tree

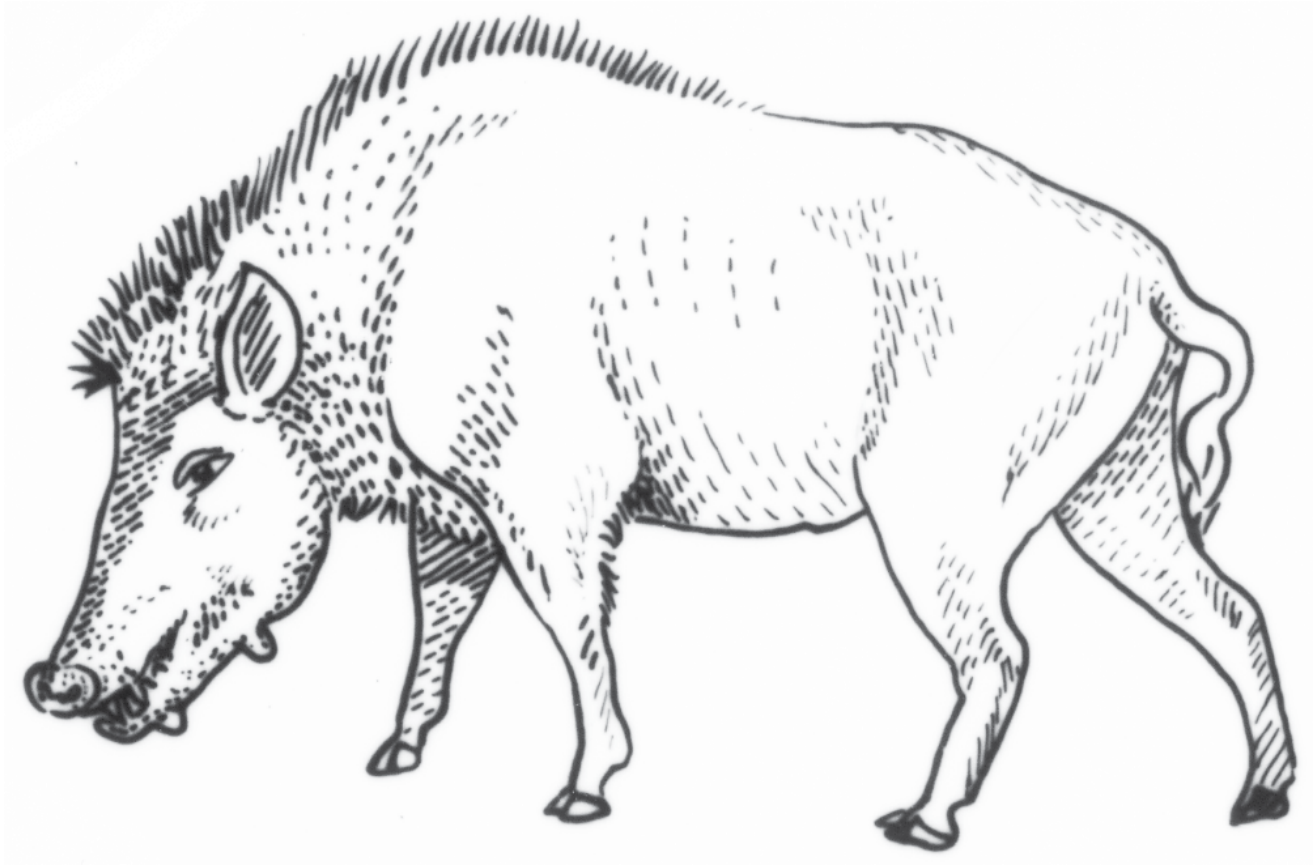
Liquidambar [LICK quid am bar]



Fossil 34. Glyptodont [GLIP toe dawnt]



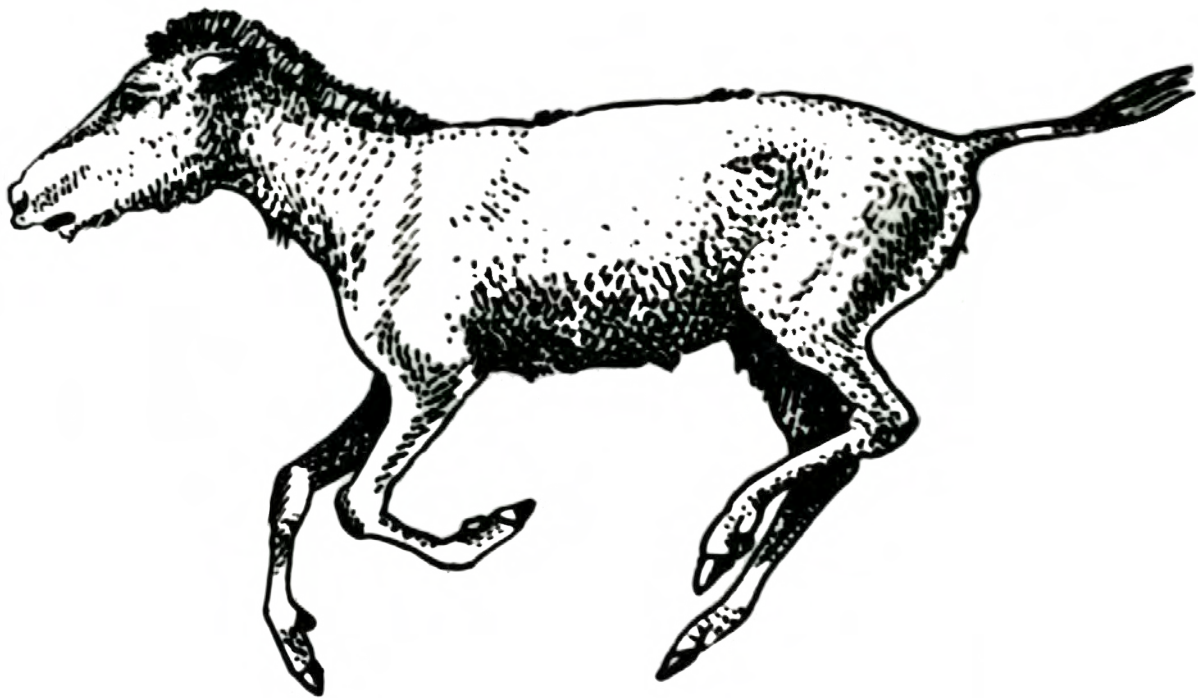
Fossil 35. Giant Hog *Daeodon* [DAY oh don]



Fossil 36. Giant Bison



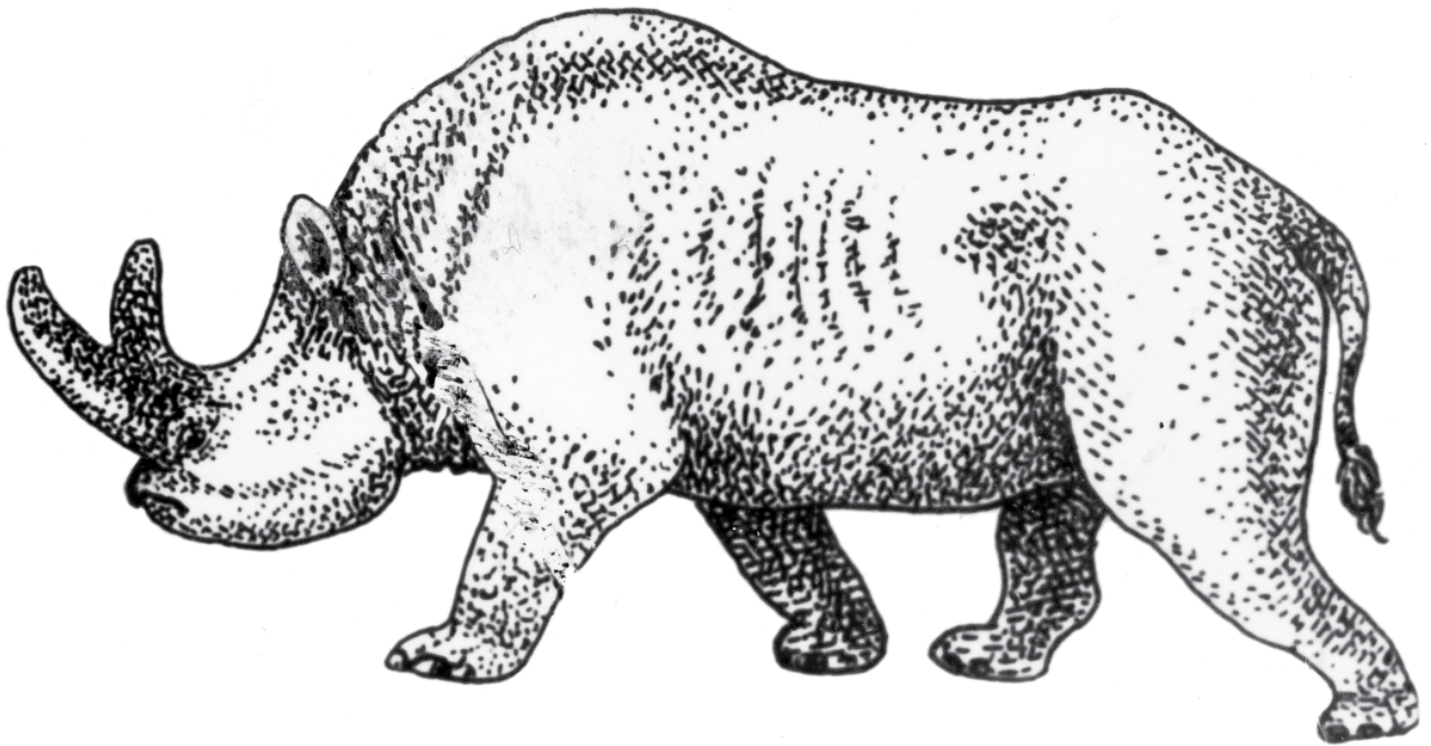
Fossil 37. Three-Toed Horse *Meshippus* [MESS oh hip us]



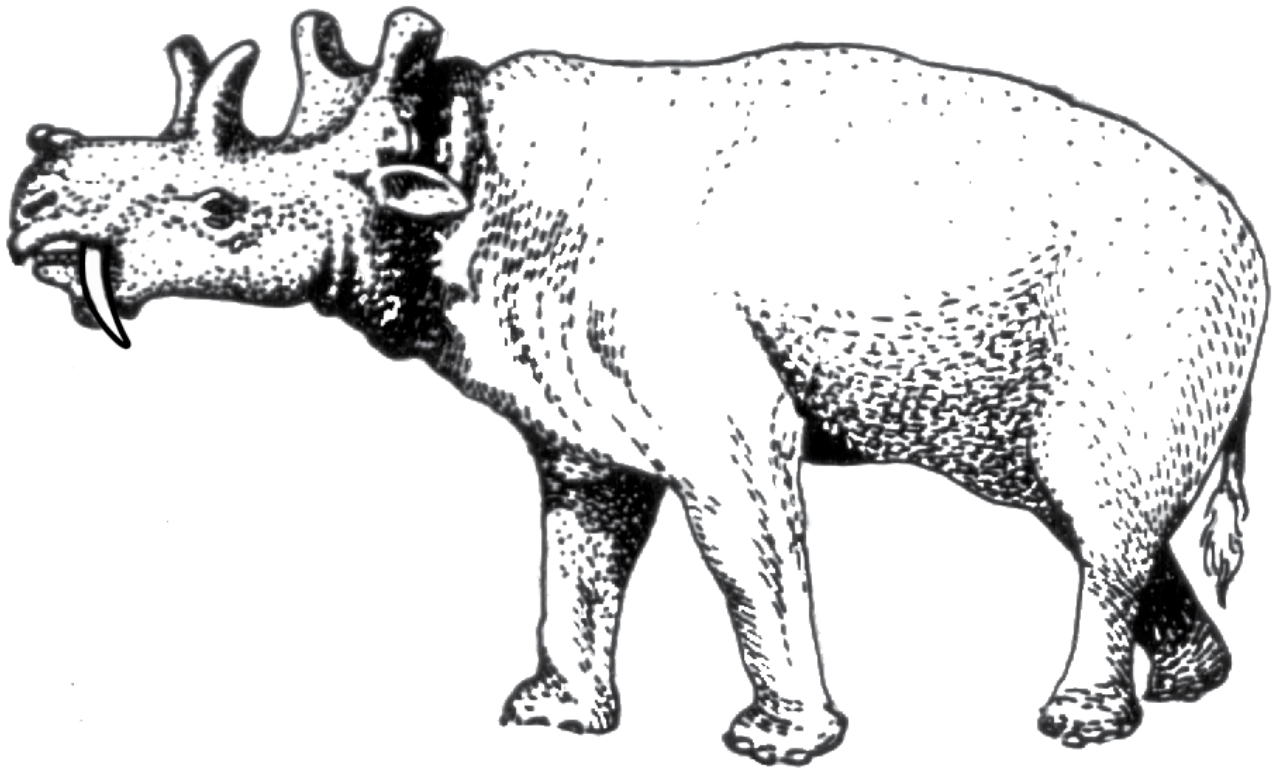
Fossil 38. Sabre-Toothed Cat *Smilodon* [SMILE oh don]



Fossil 39. Titanothera [tie TAN oh thear] *Titanotherium*



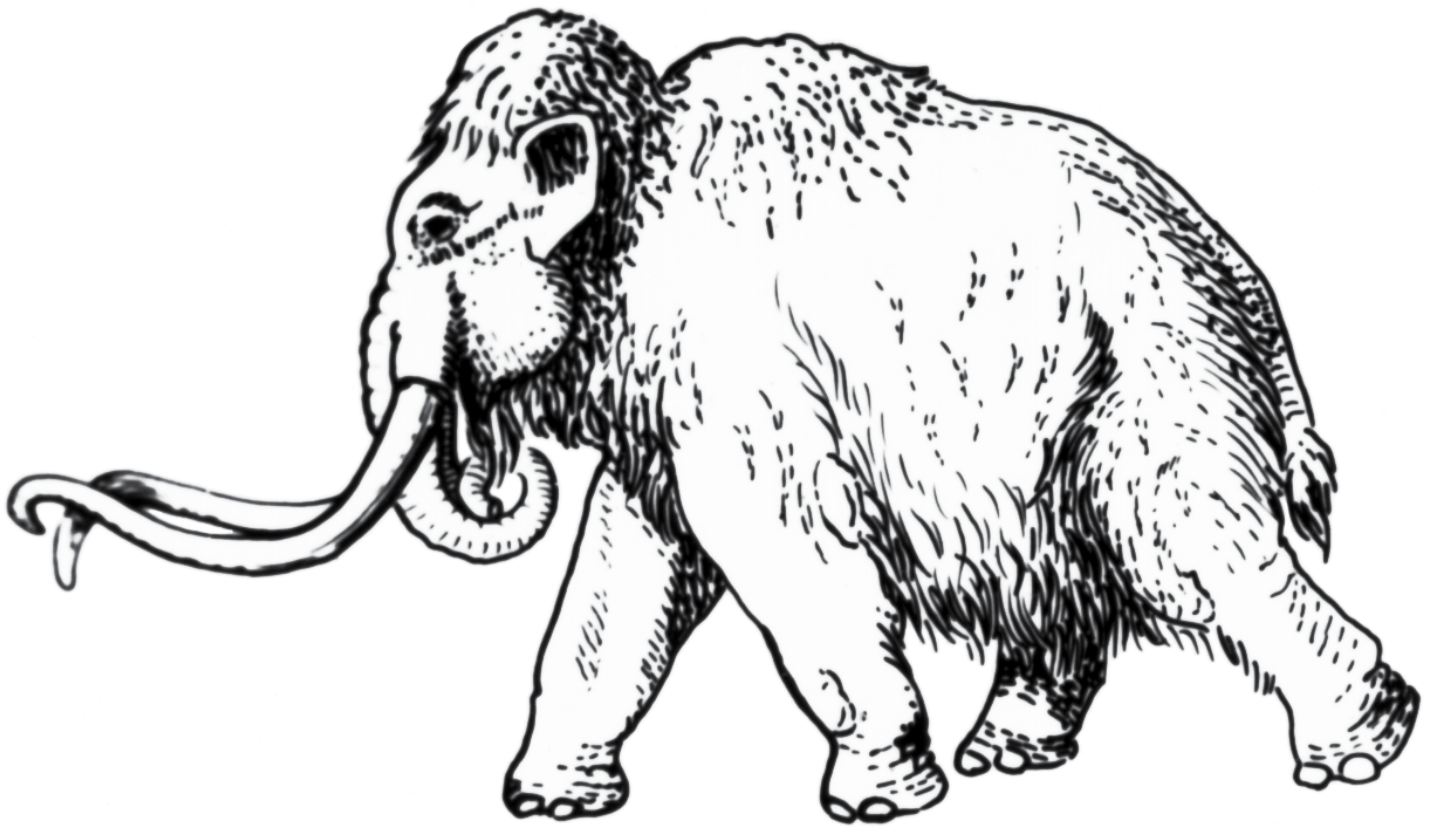
Fossil 40. Uintathere [you IN tah thear]



Fossil 41. Mastodon [MAST oh don]



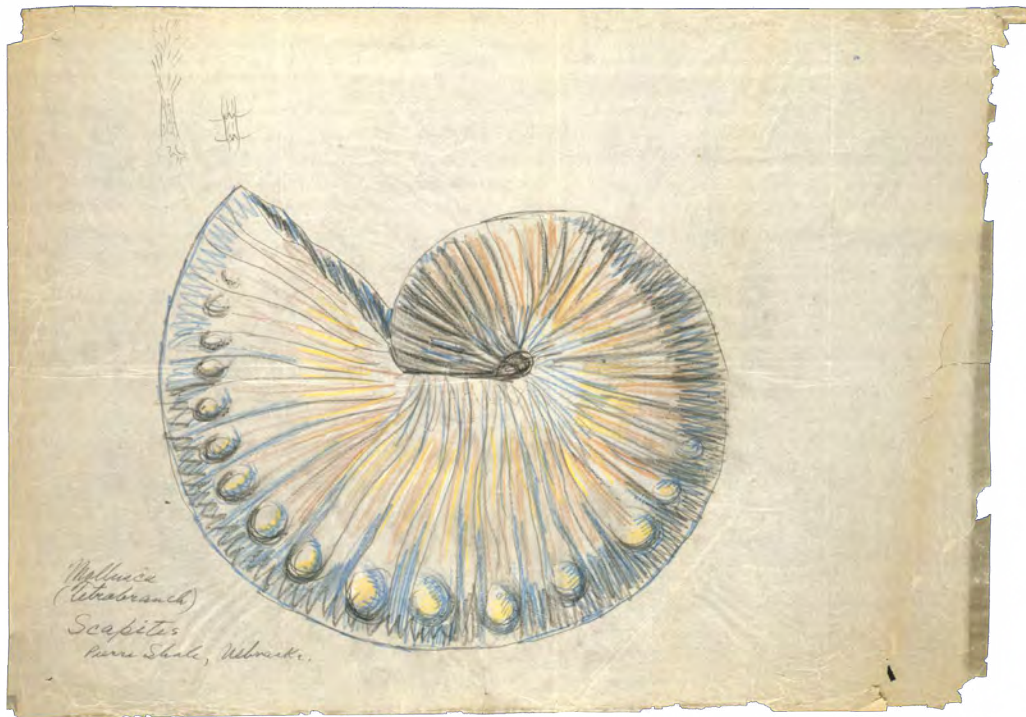
Fossil 42. Mammoth [MAM muth]



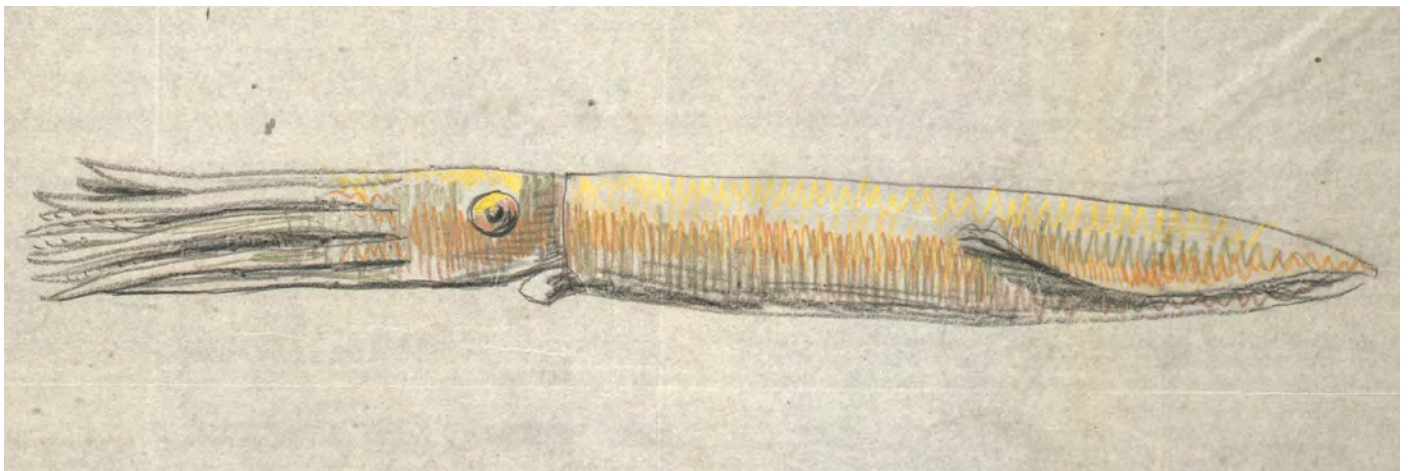
OTHER BARBOUR DRAWINGS

Hildreth Meière did not use all of the colored drawings that Erwin H. Barbour sent as models for the mosaics. Of the drawings not used, the Nebraska State Capitol Archives has those reproduced here.

Fossil 43. Ammonite [AM oh night] Scaphites [sca FIGHT ees]



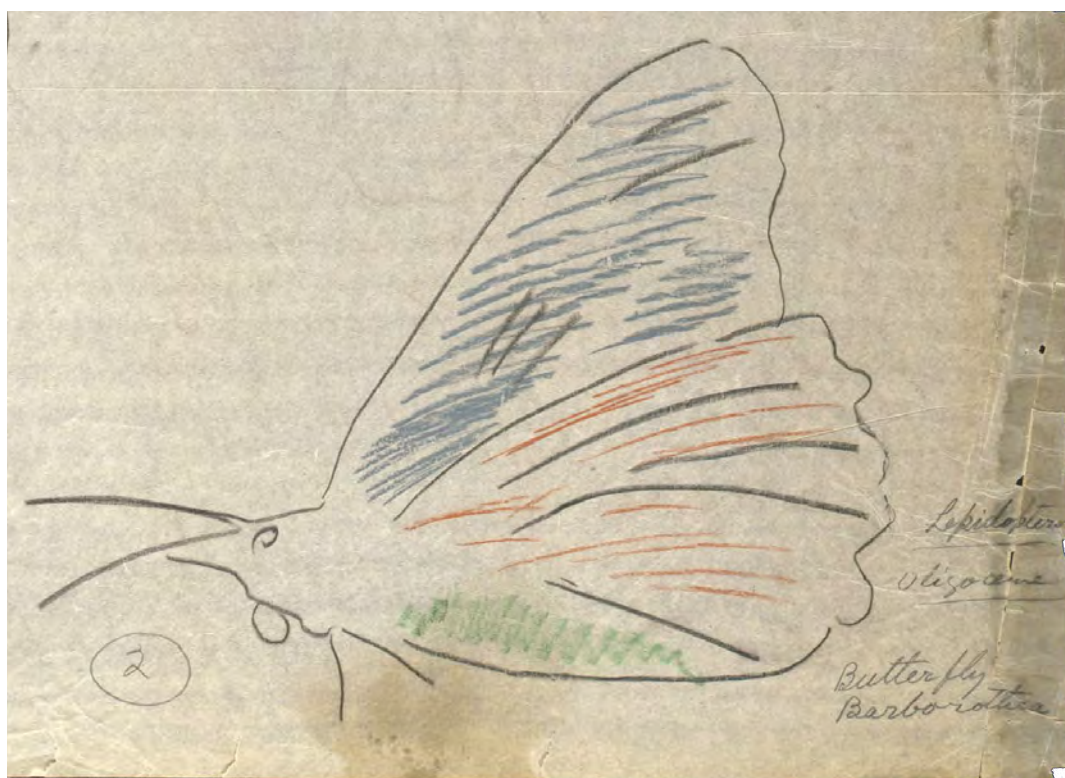
Fossil 44. Belemnite [BELL em night] (Early Squid)



Fossil 45. Beetle *Acalyphas* [a CAL uh fas]



Fossil 46. Butterfly



Fossil 47. Brachiopod [BRACK ee oh pod]
Neospirifer [nee oh SPEAR if er] *cameratus* [cam uh RAH tus]



Fossil 48. Mosasaur [MOW sa sore]



Fossil 49. Rhinoceros *Teleoceras* [tee lee AAH sir us]



Fossil 50. Rhinoceros *Subhyracodon* [sub high RACK oh don]



Fossil 51.
Pine *Cordaite*s [cor DATE ees]



Fossil 52. Poplar Tree *Populus*

Fossil 53. Willow Tree *Salix* [SAY licks]

Fossil 54. Tulip Poplar Tree *Liriodendron* [leer ee oh DEN drun]



Fossil 55. Sassafras Tree *Sassafras* [SASS ah fras]



DEFINITIONS AND ADDITIONAL INFORMATION

The following list contains definitions of names and terms and some additional information to help to explain Meière's mosaics and Barbour's drawings. If a form is represented by a mosaic or by an additional colored Barbour drawing, the number assigned to it appears below in parentheses after the

name of the plant or animal. For the chronological order and geologic age range see the geologic time scale/rock column on the inside back cover. Locations of the closest places to Nebraska where the fossils have been found are noted.

Acanthodian Fish-Extinct group of fish with two or more pairs of ventral fins supported in front by sharp spines. Age range: Late Silurian to Early Permian.

***Acalyptus* (45)**-Extinct genus of beetle found in rocks from central Colorado. Age range: Late Eocene.

Aesiocrinus*-Crinoid (1)** genus drawn and named by Barbour. Now called ***Eupachycrinus. Age range: Pennsylvanian.

Ammonite (43)-Extinct mollusks belonging to the group called **ammonoid cephalopods** that lived in the oceans world-wide. Related to squids, octopi, and **nautiloids (7)**. They had strongly ornamented shells and complex internal suture lines. Shells were straight, coiled in a spiral, or variably coiled. Some shells are up to more than nine feet in diameter. Known to have been eaten by **mosasaurs (18)** because mosasaur tooth marks have been found on some ammonite shells. Fossil ammonites are found in Cretaceous marine rocks in Nebraska. Age range: Jurassic to end of Cretaceous.

Ammonoid-Group including the **Ammonite (43)** that have complex internal suture lines. Earlier forms have sutures less complexly folded than those of later ammonites. Age range: Early Devonian to Late Cretaceous.

Amphibian (16)-Cold-blooded vertebrates, usually four-legged, that breathe by means of gills in early stages of life and later by lungs. See ***Eryops***. Age range: Devonian to Recent.

Annelid Worm-Any of the segmented worms, for example, earthworms. Age range: Cambrian to Recent.

Apatosaurus-Genus of a very large, four-legged sauropod dinosaur with a very long neck and tail. Formerly called ***Brontosaurus***. Age range: Jurassic.

Aquatic Bird-Any of the swimming or diving birds.

***Barbarothea* (46)**-Genus of fossil **butterflies** from Oligocene-age rocks in central Colorado.

Bat (32)-Only mammals capable of true flight. Their forelimbs are modified to form wings. Most species eat insects. Bats are usually active at night and hide in caves and other dark places during the day. Fossils are found in Nebraska. Age range: Eocene to Recent.

Beetle (45)-Insects that live on land in many places around the world. They are rare as fossils. See ***Acalyphas***. Age range: Pennsylvanian to Recent.

Belemnite (Early Squid) (44)-Extinct squid-shaped **cephalopod** with a hard internal skeleton of calcium carbonate. Rare belemnite fossils have been found in Late Cretaceous rocks from south-central Nebraska. Age range: Mississippian to Eocene.

Bison-Age range: Late Pleistocene to Recent in North America. See **Giant Bison (36)**.

Bos-Genus name for the North American **bison**.

Brachiopod (47)-Phylum of ocean invertebrates with two shell parts or valves that fit together along a hinge line. Soft body parts are housed inside the valves. Most adults live attached to the sea floor by a fleshy stalk called a pedicle. They feed on microscopic sea life. This phylum had world-wide distribution in the Paleozoic Era, but

is very restricted in oceans today. See *Neospirifer cameratus*. Age range: Cambrian to Recent.

Brontosaurus-See *Apatosaurus*.

Butterfly (24, 46)-Flying insects of the order Lepidoptera with broad often brightly colored wings. They live on land and feed on nectar from flowers. See *Prodryas* (24) and *Barborothea* (46). Age range: Triassic to Recent.

Caenopus (50)-Former genus name of a fossil rhinoceros found in Nebraska, now called *Subhyracodon*. Age range: Oligocene.

Carinate Bird-Flying birds. See *Ichthyornis* (27). Age range: Cretaceous to Recent.

Carnivore-Meat-eating animal.

Centipede-Segmented, land dwelling arthropods with one pair of legs per segment. Age range: Middle Silurian to Recent.

Cephalaspsis (9)-Genus of extinct freshwater fish with no jaws and a hard boney armor covering its body. This kind of **jawless fish** sucked up its food from the bottom sediment of a lake or a river in the way that a vacuum cleaner takes up dirt. Fossils have been found in Colorado. Age range: Early Devonian.

Cephalopod-Mollusks with tentacles such as octopus, squid, chambered nautilus, etc. Shelled forms have a long fossil record. Types include **nautiloids** and **ammonoids**. Age ranges: nautiloids - Late Cambrian to Recent; ammonoids - Early Devonian to Late Cretaceous.

Ceratops Dinosaur (22)-Any of the horned **ornithomimosaurs** that walked on all four feet and had very large skulls and sharp beaks. See *Triceratops*. Age range: Late Cretaceous.

Cordaites (51)-Fossil genus of ancient gymnosperm plants. Fossils are found in southeastern Nebraska. Age range: Pennsylvanian to Permian.

Crinoid (1)-Ocean dwelling animals of the phylum Echinodermata, which also includes **starfish**, brittle

stars, **sea urchins**, and sea cucumbers. Crinoids have internal skeletons composed of calcium carbonate and usually live attached to the sea floor by a stalk-like extension. Internal soft parts are housed inside a cup at the top of the stalk. Tentacles surround the animal's mouth at the top of the cup. Tentacles are covered in mucus that traps food organisms moving through the water. Crinoids living at depth are mostly brown, but those living in shallower waters have a variety of colors, either solid or multicolored. Most modern forms are unattached and move freely, mostly living in the Indo-Pacific at depths below 300 feet. Fossil forms are sometimes referred to as "sea lilies" because they are thought to resemble plants. These fossil species generally lived in shallow waters covering most of the developing continents. Age range: Ordovician to Recent. In the case of *E. verrucosus* age is Late Pennsylvanian from southeastern Nebraska, northeastern Kansas, and southwestern Iowa.

Ctenopterus (14)-Extinct genus of **eurypterids**, previously called *Stylonurus*, that lived from the Silurian through the Devonian Periods. Maximum length about four inches. The fossil on the Rotunda floor is clearly *Ctenopterus cestrosus* from the state of New York. Age range: Early Silurian.

Cycad-Like Tree-Plants similar to palms, but lacking true flowers. In this case a group that resembles cycads but that have flower-like organs. Age range: Triassic to Cretaceous.

Daeodon (35)-Genus of extinct pig-like animals, formerly called *Dynohyas*. See **Giant Hog**. Age range: Late Oligocene to Early Miocene.

Deciduous Tree-Trees that lose their leaves annually. They live in temperate climates like that of the eastern and central United States. Barbour made drawings of leaves and lower trunks of several kinds of these trees. See **Magnolia (23)**, **Liquidambar-Gum Tree (33)**, **Poplar (52)**, **Willow (53)**, **Tulip Poplar (54)**, and **Sassafras (55)**.

Diatryma-Genus of giant **flightless birds** now called *Gastornis* (28). Age range: Late Paleocene and Eocene.

Dimorphodon-Genus of extinct flying reptile or **Pterosaur** (26). Age range: Early Jurassic.

Dinosaur-Extinct reptile group divided into those with lizard-like hip structures (saurischian) and those with bird-like hip structures (ornithischian). Age ranges of both: Triassic to Cretaceous.

Diplodocus (19)-Extinct four-footed, **sauropod dinosaur** with a small head, a very long neck and a very long tail. It is an herbivorous land dweller that resembles **Apatosaurus**. Fossils are found in the Rocky Mountains states, but not in Nebraska. Age range: Late Jurassic.

Diving Bird-Any of the birds that dive into water to catch fish and other animals for food. See **Ichthyornis** (27).

Dragonfly (25)-Insect, belonging to the order Odonata, with two pairs of long, narrow wings. They live on land and eat other insects. Some fossil species were much larger than any alive today. Fossils are found in Pennsylvanian-age rocks from eastern Kansas. Age range: Pennsylvanian to Recent.

Duck-Billed Dinosaur (20)-See **Edmontosaurus**.

Echinoid (2, 4)-see **Sea Urchin**.

Edentate-Any of the mammals in the order Edentata such as armadillos, sloths, and anteaters. See **Glyptodont** (34). Age range: Paleocene to Recent.

Edmontosaurus (20)-One of the genera of extinct duck-billed **ornithopod dinosaurs** that lived on land. It had a mouth shaped like a duck's bill and teeth shaped for grinding hard plant foods. This dinosaur walked upright on two legs as well as on four legs. Fossils have been found in Wyoming and South Dakota. One part of a leg bone was found in northeastern Nebraska. Age range: Late Cretaceous.

Elephant-Any animal, living or extinct, belonging to the order Proboscidea. These include the **Mastodont** (41) and **Mammoth** (42). Age range: Late Eocene to Recent.

Elephas columbi (42)-Extinct species of **elephant** or proboscidean known as the **mammoth**. Age range: Pleistocene.

Entelodont (35)-One of the so-called **giant hogs** belonging to the swine family. Miocene forms reached great size. See **Daeodon**. Age range: Oligocene and Early Miocene.

Eupachycrinus verrucosus (1)-Species of the phylum Echinodermata or "spiny-skinned animals" (Crinoidea) drawn by Barbour for use by Meière in her mosaic of a crinoid. This form was formerly attributed to the genus **Aesiocrinus**. See **Crinoid**. Age range: Pennsylvanian.

Equus-One of the genera of horses, including the modern **horse**. The term was used by Alexander for any of the fossil horses including other extinct genera. Age range of genus: Pleistocene to Recent.

Eryops (16)-Genus of an extinct **amphibian** related to frogs and salamanders. It lived in swampy lands with warm climates and ate smaller animals including small fish. Fossils found in Texas and New Mexico reached lengths of more than six feet. Age range: Early Permian.

Eurypterid=Euryptid (5, 14)-Extinct order of Paleozoic aquatic arthropods living in brackish (somewhat salty) and fresh waters. They are related to horseshoe crabs and to scorpions. Typically they have four pairs of legs and an additional pair of appendages modified into paddles for swimming. Some grew to lengths of more than seven feet. One fossil species is found in Late Pennsylvanian rocks in southeastern Nebraska south of the city of Peru. See **Eurypterus** (5) and **Ctenopterus** (formerly **Stylonurus**) (14). Age range: Middle Ordovician to Late Permian.

Eurypterus (5)-Genus of eurypterids including **E. nebraskensis**, a species originally reported and described by Barbour from the Indian Cave Sandstone near Peru, Nebraska. This small form has a maximum length of about 3 inches. Age range: Late Pennsylvanian.

Falcon (30)-Any of the species of the **hawk** family of birds, Falconidae. Known for their excellent

eyesight, they fly high in the air and catch food by rapidly dropping down upon it from above. Falcon fossils are found in western Kansas. Age range: Late Miocene to Recent.

Fern-Plants that reproduce by spores located on the undersides of leaves. Their leaflets grow in rows along stems or branches to form a shape resembling a feather. Some extinct forms grew to heights of 80 feet or more. Age range: Middle Devonian to Recent.

Flightless Bird (28)-Any of the giant terrestrial flightless birds. See ***Gastornis***.

Flying Mammal-Any mammal with wings and capable of sustained flight. See **Bat (32)**.

Flying Reptile-Any reptile with wings and capable of sustained flight. See **Pterosaur (26)**.

Ganoid Fish (8)-Primitive-looking boney fish with thick, shiny scales. See **Teleost Fish**. Age range: Triassic to Recent.

Gastornis (28)-Genus of giant **flightless birds** previously called ***Diatryma***. These birds lived on land, had small wings and could not fly. They grew to size of an ostrich, but had larger and more massive heads with thick, heavy beaks. Fossils are found in Wyoming and New Mexico. Age range: Late Paleocene and Eocene.

Genius (plural genii)-A spirit; a mythical creature.

Giant Bison (36)-Earliest form of **bison** in North America. Migrating from Asia, it ate grasses and herbs. Extinct forms are much larger and with much longer horns than modern species. Fossils are found throughout the Great Plains including Nebraska. Age range: Late Pleistocene.

Giant Hog (35)-Extinct pig-like animal. **Omnivores**, these large **entelodonts** roamed the North American Plains. Fossils are found in northwestern Nebraska at and near Agate Fossil Beds National Monument. See ***Daeodon***. Age range: Late Oligocene to Early Miocene.

Glyptodont (34)-**Herbivorous** species of extinct **edentate** related to armadillos and tree sloths.

Some reached heights of four feet. Their body is protected by hard armor of boney plates. The nearest fossils to Nebraska are found in Texas and New Mexico. Age range: Pleistocene to Early Recent.

Goldringia cyclops (7)-Nautiloid cephalopod with open-coiled, ribbed shell. Maximum coil diameter about eight inches. Originally named *Gyroceras cyclops*, this form is found in rocks in New York State. I question the length of the tentacles in the mosaic because living **nautiloid cephalopods** have short tentacles that can be withdrawn into their shells along with the rest of their bodies to protect themselves from predators. The animal in the mosaic could not have done this. Age range: Middle Devonian.

Guilloche-Ornamental intertwining band or ribbon.

Gum Tree (33)-Common name of the flowering **deciduous tree** of the genus ***Liquidambar***. Age range: Late Cretaceous to Recent.

Hawk (30)-Any of the falconiform birds. Age range: Middle Oligocene to Recent in North America.

Herbivore-Plant-eating animal.

Hesperornis (12)-Genus of extinct flightless **swimming birds**. Using long, sharp beaks with teeth, they ate fishes and other marine animals. Age range: Late Cretaceous in the Great Plains area of North America including western Kansas.

Horse-Four-legged, solid-hoofed **herbivorous** mammal with an odd number of toes. See ***Equus***, ***Mesohippus (37)***.

Ichthyornis (27)-Genus of extinct winged, toothed **diving bird** that flew into the water to catch fish and other animals. It nested and laid eggs on land. Fossils are found in western Kansas. Age range: Late Cretaceous in the Great Plains area of North America.

Ichthyosaur (10)-One of the group of extinct swimming reptiles that have shapes and life habits similar to dolphins. They were fast swimmers that

lived in the oceans and ate fish and other marine animals. Fossils are found in rocks in parts of the western United States, but not in the Great Plains area. Age range: Early Triassic to Late Cretaceous.

Jawless Fish (9)-Fish with mouths, but lacking jaws for chewing. Some suck up food from the bottom of the water, others are parasites on other fish. Modern forms include the parasitic hagfish and lamprey. Lampreys are mostly marine, but can live in fresh water; some live in the Missouri River in Nebraska today. Fossil forms lived in both fresh and salty water. See *Cephalaspsis*. Age range: Middle Ordovician to Recent.

Limestone-Any sedimentary rock consisting of more than 50% calcium carbonate. Generally layered.

Liquidambar (33)-Genus of the deciduous **gum tree**. Of the several **deciduous trees** drawn by Barbour, Meière selected this one for a tree mosaic. Some of these trees grow in eastern Nebraska today. Age range: Late Cretaceous to Recent.

Liriodendron (54)-Genus of the **deciduous tree, tulip poplar**. Late Cretaceous fossils are found in eastern Nebraska. Age range: Late Cretaceous to Recent.

Magnolia (23)-One of the **deciduous trees** with smooth glossy leaves and large flowers. Fossil magnolias are found in Late Cretaceous rocks in Nebraska. Age range: Late Cretaceous to Recent.

Mammoth (42)-Extinct group of **elephants**. Their cheek teeth were corrugated for grinding abrasive parts from grasses and other plants. Their bodies were covered with thick hair. Some adults reached heights of more than 13 feet. Many fossils are found in Nebraska. Age range: Pleistocene.

Marble-Metamorphosed **limestone** or dolomite. That is, changed in form from the original by the application of heat and/or pressure.

Mastodon = Mastadont (41)-Extinct group of **elephants**. They had bumpy cusps on molars and premolars and ate plants less abrasive than grasses. Adults reached the size of living adult Indian elephants today. Many fossils are found

in Nebraska. Age range: Late Miocene to Late Pleistocene in North America.

Marshbird-Birds living in marshes such as redwing blackbirds, ducks, etc. Age range: Late Cretaceous to Recent.

Meadowlark (29)-**Songbird** now living on the western Plains. Fossils have been found in the western United States. The Western Meadowlark is the State Bird of Nebraska. Age range: Recent.

Meganeurid (25)-Fossil **dragonfly** found in rocks near Garnett, Kansas. Age range: Late Pennsylvanian.

Mesohippus (37)-Genus of **three-toed horses** found in rocks of the Great Plains. Age range: Middle Eocene to Early Oligocene of North America.

Mosaic-Surface decoration made by inlaying small pieces of variously colored material to form a picture or pattern.

Mosasauro (18, 48)-One of the extinct large marine fish-eating reptiles of the genera *Mosasauro* or *Tylosaurus* (18). They swam in the Cretaceous seaway covering the Great Plains area of North America including Nebraska. Age range: Cretaceous.

Myriapod-Arthropods including millipedes and **centipedes**. Age range: Late Silurian to Recent.

Nautiloid Cephalopod (7)-Form of mollusk related to the squid and octopus with an internally chambered shell with simple suture lines. Fossil shells may be either straight or coiled. Straight forms reach lengths of more than 15 feet. The living form is the pearly nautilus, which has brown stripes on a cream-colored field above and a solid cream color below. Colors obscure the shell from predators both above and below. Living forms have 94 sheathed tentacles on three lobes. At the center of the tentacles is a mouth with a parrot-like beak. The animal can withdraw into its shell and close the shell aperture with a thick, fleshy hood that covers its head. Animals can regulate nitrogen gas in internal chambers enabling them to live in waters from near the ocean surface to about 1,600

feet below. Today they live in the tropical western Pacific from Japan to Australia. The mosaic form is ***Goldringia cyclops*** (formerly *Gyroceras cyclops*, See Moore, R.C., 1958, p. 206, Fig. 8.21 G.) from the Middle Devonian of New York State. Previous reports called this fossil an **Ammonite (43)**, but that seems unlikely because Barbour made pen-and-ink drawings of a fossil he labeled *Gyroceras* with the same basic shell shape and ornamentation. Age range: Late Cambrian to Recent.

Neospirifer cameratus* (47)-Brachiopod** with two wing-shaped shells called valves. Formerly designated as ***Spirifer cameratus by Barbour. Fossils are found in southeastern Nebraska. Age range: Pennsylvanian.

Omnivore-Animal that eats plants and animals.

Onychophoran (15)-Phylum of velvet worms, intermediate between the segmented worms and the insects. The bodies of living forms are segmented with multiple pairs of stubby legs and a pair of short antennae. Today onychophorans live in tropical forests around the world. The living species nearest to Nebraska are found in forests of Central America. Fossil onychophorans probably lived in the oceans, not on land. The geologically oldest forms in North America come from British Columbia, Canada. Barbour drew a form which may have been used as a model for the mosaic. Meière omitted the antennae from the mosaic image and added more segments. Age range: Early Cambrian to Recent.

Ornithopod Dinosaur-Group of herbivorous **dinosaurs** with a bird-like pelvic structure. Age range: Triassic to Cretaceous.

Ostracoderm-Class of extinct jawless fish with an armor of bony plates covering its body. See ***Cephalaspis* (9)**. Age range of ostracoderms: Late Silurian to Early Devonian.

Ostrich-Like-Looks like an ostrich; **flightless bird**.

Owl (31)-Bird of prey with a large head and forwardly directed eyes. Owls hunt for small mammals and reptiles mostly at night. Fossils are found in western North America. Age range: Early Eocene to Recent.

Paleontologist-Scientist who studies ancient prehistoric life.

Pastel-Stick made of ground color in a binding material, used to make drawings.

Pine Tree (51)-Includes ***Cordaites***.

Placoderm-Class of extinct jawed fishes with an armor of large bony plates covering much of the body. Age range: Early Silurian to Devonian.

Plesiosaur (11)-Order of extinct marine reptiles with a turtle-shaped body, a long slender neck and tail and two pairs of flippers used to row themselves through the water. Their mouths were filled with sharply pointed teeth. They ate fishes and other animals such as **nautiloids** and **ammonites**. Fossils are common in Upper Cretaceous rocks from the midcontinent of North America. Age range: Late Triassic to Cretaceous.

Poplar Tree (52)-One of the flowering **deciduous trees**. Fossils are found in eastern Nebraska. Age range: Early Cretaceous to Recent.

***Populus* (52)**-Genus name of the **poplar tree**.

***Prodryas* (24)**-Genus of a fossil **butterfly** found in central Colorado. Age range: Eocene to Oligocene.

***Pteranodon* (26)**-Genus of extinct **flying reptiles** found in marine sedimentary rocks in the Great Plains in Wyoming. Age range: Late Cretaceous

Pterosaur=Pterodactyl (26)-Extinct Mesozoic **flying reptiles**. Pterosaurs are distantly related to lizards, **dinosaurs**, and other reptiles. They lived on land and flew over ancient oceans. Their wings resembled those of bats, but with fewer bones supporting the wings. Fossils have been found in Wyoming. Age range: Late Triassic to Cretaceous.

Rhinoceros (49, 50)-Four-legged, horned **herbivorous** mammals that live today in the wild in parts of Africa and southeastern Asia. See ***Subhyracodon*** and ***Teleoceras***. The geologic history of this group began in North America in the Early Eocene.

Sabre-Toothed Cat (38)-Large extinct carnivores that lived in North and South America. Named for their long sharp canine teeth, curved like swords, they reached the size of adult tigers. See *Smilodon*. Age range: Oligocene to Pleistocene

Sassafras (55)-Genus of flowering **deciduous tree**. Fossils are found in eastern Nebraska. Age range: Early Cretaceous to Recent.

Sauropod Dinosaur-Group of **herbivorous dinosaurs** with a lizard-like pelvic structure. Both bipeds and quadrupeds are found in this group. Age range: Triassic to Cretaceous.

Scaphites (43)-Genus of extinct **ammonite cephalopods** with a ribbed and curved shell with complex sculptured inner septal plates. Age range: Cretaceous.

Sea Bird-Any of the species of birds that live around the oceans including all types of **swimming birds** and **diving birds**, including penguins, sea gulls, etc.

Sea Urchin (2, 4)-Type of marine Echinoderm with either a globe-, disc-, or egg-shaped body. Sea urchins have a skeleton of interlocking calcium carbonate plates and an outer surface covered with movable, sharply pointed spines. They move freely and are not attached to the sea floor like most of the **Crinoids (1)**. Sea urchins move using tiny tube-shaped feet on the bottom of their bodies. The animal's mouth is located on the bottom as well. Sea urchin species have different colors. Fossil plates and spines are found in Pennsylvanian and Permian rocks in southeastern Nebraska. Age range: Late Ordovician to Recent.

Smilodon (38)-Extinct genus of large **sabre-toothed cats**. Fossils of this genus are not common in Nebraska, but have been found in great numbers at the La Brea Tar Pits in downtown Los Angeles, California. Age range of genus: Pleistocene.

Songbird (29)-Bird that utters a succession of musical tones. See **Meadowlark**. Age range: Early Eocene to Recent.

Spirifer cameratus (47)-See *Neospirifer cameratus*.

Starfish (3)-Star-shaped marine Echinoderms related to **Crinoids (1)** and **Sea Urchins (2, 4)** that use tube feet to move about on the ocean floors like sea urchins. They eat shellfish and other small sea creatures. Some fossils are found in southeastern Nebraska. Age range: Upper Ordovician to Recent.

Stegosaur Dinosaurs (21)-Group of large herbivorous four-legged, bird-hipped **dinosaurs** with bodies protected by large bony plates and spines. Age range: Jurassic to Cretaceous.

Stegosaurus (21)-One of the genera of extinct **stegosaur dinosaurs** of the **ornithomimid dinosaur** group with two rows of polygonal-shaped plates along its back and bony spines on its tail. These spines were recently proven to have been used in defense against carnivorous dinosaurs. The indentation from a spine was found in the leg bone of a carnivore. Fossils are found in the western Great Plains in Colorado and also in Utah, but not in Nebraska. Age range: Late Jurassic.

Stylonurus (14)-Extinct genus of **eurypterids** now placed in the genus *Ctenopterus*, in this case the species *C. cestrotus*. Fossils are from the state of New York. Age range: Early Silurian.

Subhyracodon (50)-Extinct **rhinoceros** found in abundance in rocks in western Nebraska, formerly called *Caenopus*. It ate soft plants and was smaller than *Teleoceras*. Age range: Oligocene.

Sus-Genus name of the swine. Age range: Oligocene to Recent.

Swimming Bird (12)-Any of the swimming birds including penguins, cormorants, ducks, geese, etc. See *Hesperornis*.

Teleost Fish (8)-Fish with scaly skins, bony internal skeletons and jaws. Today they can be found throughout the world in streams, lakes, and oceans. Some fossils are found in central and western Nebraska. Age range: Triassic to Recent.

Teleoceras (49)-Genus of fossil **rhinoceros** common in the rocks of the Great Plains area of North America. They ate grasses and herbs. Fossil grass husks have been found between their

teeth. Their bodies were shaped more like a hippopotamus than a modern rhinoceros. Adults were about the size of a small hippopotamus. Fossil teeth, bones, and complete skeletons are found in many places in western and central Nebraska. Complete skeletons are on display in place at Ashfall Fossil Beds State Historical Park in Antelope County, Nebraska. Age range: Miocene to Early Pliocene.

Tessera (plural tesserae)-Small piece of marble or other material from which a mosaic is made.

Three-Toed Horse (37)-In this case fossil **horses** with three toes. Earlier forms had more toes, while in recent ones the number of toes is reduced to one. Early horses were browsers that ate many kinds of soft plants, recent forms graze on grasses. See *Mesohippus*.

Titanotherium (39)-Large extinct plant-eating mammal that resembles a **rhinoceros** in form, also called a brontothere. Some adults reached heights at the shoulder of eight feet. They are related to **horses**, which also have an odd number of toes on each foot. Fossils are found in rocks from North America including northwestern Nebraska. Age range: Eocene.

Titanotherium (39)-Genus of **Titanotherium**.

Tondo (plural tondi)-Circular painting or mosaic.

Tortoise (17)-Any terrestrial **turtle**. They live on land in warm climates and eat a variety of plants. Fossil carapaces (shells) up to three feet wide have been found in Miocene rocks from western Nebraska. Age range in the Great Plains of North America: Late Eocene to Recent.

Trachodon (20)-Doubtful genus name of the duck-billed **dinosaur**. See *Edmontosaurus*.

Tree Fern (13)-Fossil **ferns** with treelike forms. They achieved maximum heights of about 35 feet. As they grew they lost branches and new ones formed at the top of the tree. They thrived in warm

swampy lands close to the oceans. Fossil forms are found in some Pennsylvanian and Permian rocks in southeastern Nebraska. Age range of ferns: Middle Devonian to Recent.

Triceratops (22)-Genus of quadrupedal, three-horned **ceratops dinosaurs**. They had a mouth shaped somewhat like a turtle's beak and a shelf or frill of bone at back of a very large head. Fossils are found in rocks in Montana and Wyoming. Age range: Late Cretaceous.

Trilobite (6)-Extinct group of marine arthropods with hard exoskeletons divided both longitudinally and transversely into three lobes, hence the name. Some coiled into ball shapes, probably as a defense mechanism. Many trilobites had eyes. Some fossil forms are found in southeastern Nebraska. Age range: Early Cambrian to Late Permian.

Tulip Poplar Tree (54)-See *Liriodendron*.

Turtle-Group of reptiles with a carapace of bony or cartilaginous plates covering the body. Turtles are generally aquatic. Age range: Late Triassic to Recent.

Tylosaur (18)-Subfamily of **mosasaurs**. Age range: Late Cretaceous.

Tylosaurus (18)-Genus of **tylosaur**, an extinct marine reptile. This predator lived in the Cretaceous oceans and ate fish, **ammonites** and other **cephalopods**. Some reached adult lengths of more than 40 feet. Fossils are found in the Great Plains. See **Mosasaur**. Age range: Late Cretaceous.

Uintathere (40)-Very large **herbivorous** mammal with blunt horns and sharp downwardly projecting sabre-like canine teeth in males. Fossils are found in Wyoming. Age range: Late Paleocene to Middle Eocene.

Willow Tree (53)-Any tree or shrub of the genus **Salix**. Early Cretaceous fossils are found in eastern Nebraska. Age range: Early Cretaceous to Recent.

SELECTED BOOKS AND ARTICLES

Books about the Nebraska State Capitol

Brown, E. L., 1978, Architectural Wonder of the World: Nebraska's State Capitol Building: State of Nebraska, State Building Division, 180 p.

Harm, G. P., 2008, Lee Lawrie's Prairie Deco: History in Stone at the Nebraska State Capitol: Proof Copy, Version 4.0, Privately Published, 192 p. [Copy in University of Nebraska-Lincoln Architecture Branch Library.]

Luebke, F. C., editor, 1990, A Harmony of the Arts: The Nebraska State Capitol: University of Nebraska Press, Lincoln, NE, 122 p.

Books on Fossils and Geology

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Meière’s general plan for the Rotunda floor and William Younkin’s plan for the Rotunda floor reproduced from file copies of correspondence in the Nebraska State Capitol Archives.

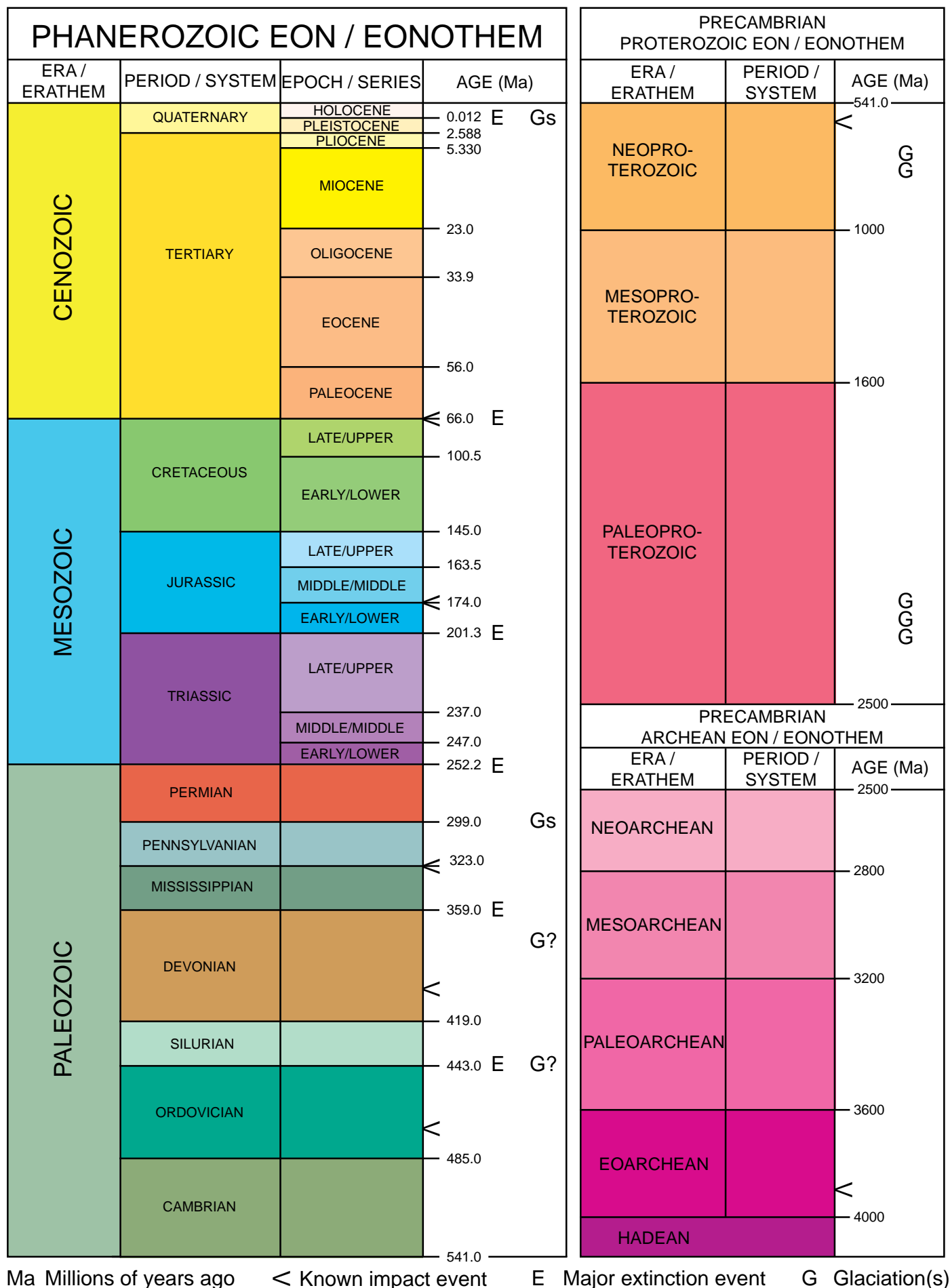
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Ma Millions of years ago < Known impact event E Major extinction event G Glaciation(s)



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