

Sabbatical Activities

Dr. Jeb Bevers

- Science Education, Survey and Comparative Analysis of the Milk Creek Faunas of Arizona, and the early history of Evolutionary Biology

Thanks to

- Yavapai College
- Ruth Lillie, Lab Coordinator, Yavapai College
- Beth Boyd, Geology Dept., Yavapai College, for first describing the location to me.
- Scott Farnsworth, Supervisor
- Many Bio 105 students for assisting with field and collection organizing of Milk Creek
- Lisa Beres, Spouse
- Frances Alvarado, geologist, Prescott National Forest
- Janet and David Gillette, Curators of Paleontology, Museum of Northern Arizona
- Robert McCord, Paleontology, Mesa Museum of Natural History
- Judy Galkin, Collections Manager, American Museum of Natural History
- Susan Bell, Librarian, Paleontological Archives, American Museum of Natural History
- Sandy Lynch, Sharlot Hall Museum
- Ev Lindsay, Milk Creek Collection, University of Arizona
- Eric Scott, San Bernadino County Museum
- Gary Morgan, New Mexico Museum of Natural History

Sabbatical Activities

1. Science Education Outreach
2. Paleontological Field and Comparative Museum Research and the History of Milk Creek Fossil Surveys and Collections
3. History of Paleontology and Evolutionary Biology in England

Paleontology school talks (K-12)

8 Schools, 29 classrooms and 562 students (est.)

Inquiry based interactive talks on paleontology associated with the Arizona Science Standards



Public talks on the Milk Creek fossils or the History of Paleontology

- Embry Riddle
Aeronautical University
(February 2015)
- Central Arizona Geology
Club, Prescott Public
Library (February 2015)
- Yavapai College,
Prescott campus
(September 2015)

Central Arizona Geology Club Field Trip to the Milk Creek Site



Milk Creek Fossil Research History

1938 – Ted Galusha, Assistant Curator of the American Museum of Natural History, NYC notes some private collecting and reports by local ranchers

1948 – vertebrate fossils presented to the Museum of Northern Arizona

1949 – surveys and collections from the Museum of Northern Arizona and the Arizona State Museum (U of A)

1950 – Charles Reed lists some fossil mammals in the first scientific publication of Milk Creek

1956-1962 – Ted Galusha makes several collections for the Frick Collection of the American Museum of Natural History, NYC

1963-1967 – John Lance of the U of A, Geology Department surveys and collections

1968 to early 1990's – Ev Lindsay of the U of A, Geology Department makes additional surveys and collections

Early 1990's – Surveys of three sites and collections from the Mesa Museum of Natural History

Early 1990's – Norm Tessman, curator of the Sharlot Hall Museum collections

1990's to 2013 – Beth Boyd, Geology Department, Yavapai College conducted surveys and collections with students

2006 to present – Jeb Bevers, Biology Department, Yavapai College surveys, collections and compilations and studies of prior collections. Many surveys with student assisted field trips.

This book is the property of
Ted Galusha,
% Frick Laboratory,

American Museum of Natural History,
79th Street and Central Park West
New York, N.Y.

or
Box 685,
Española, New Mexico

If lost please return to either
of the above addresses.

1955-1956

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tical and 4 horizontal lines to
the inch, Center Line Red.

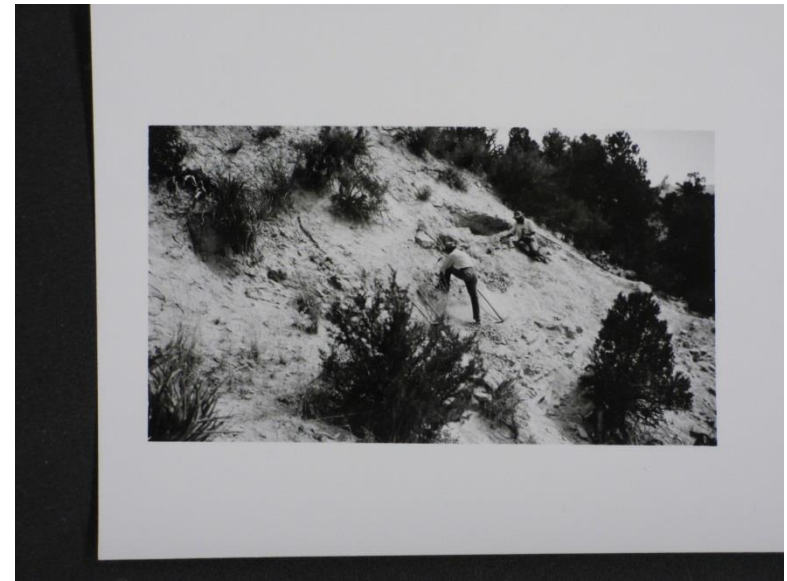
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Milk Creek, March 4, 1956 (Sun.)

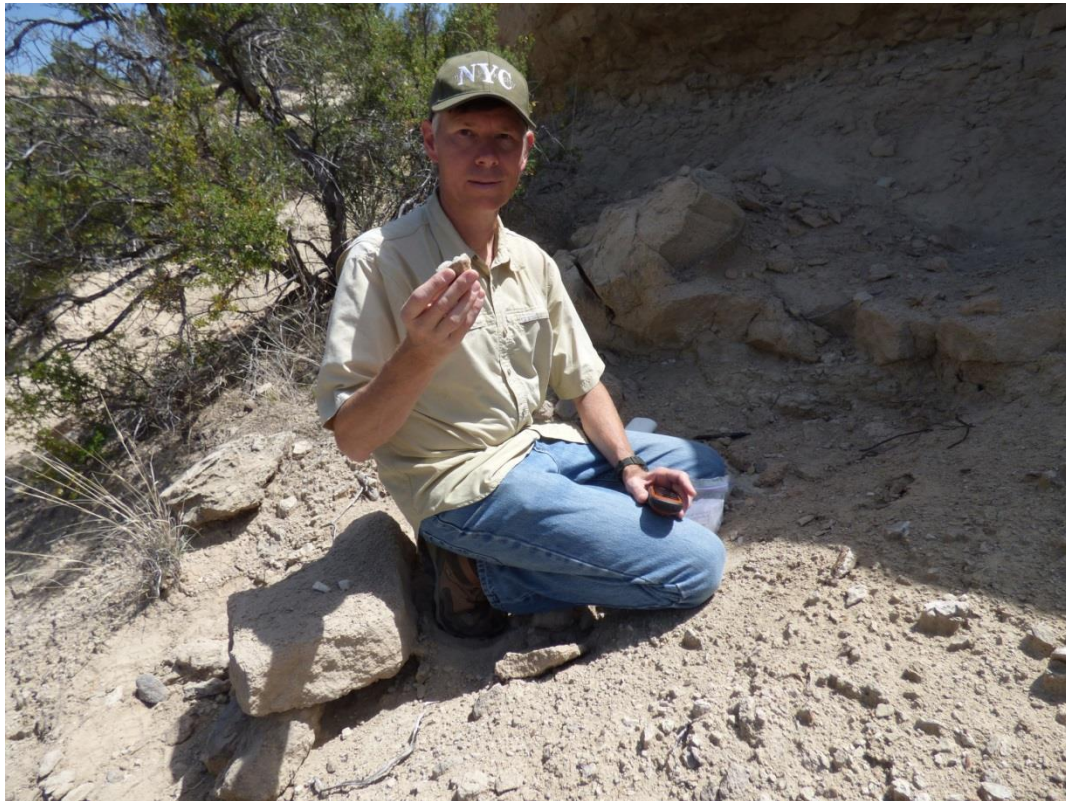
- **As things are shaping up it begins to appear that we will be able to get at least a small collection from sites already discovered.** I think we will continue prospecting in the morning in order to get as good an idea of the possibilities as we can. **I suspect that we will have to use dynamite** and it may be that it would pay to make a trip home for a few days, and bring the hills down rather than have some made up here. Anyway, I have several days coming **and as I can see we will have an extended session with the Milk Creek beds.** I think I will go home over the coming weekend; anyway I am getting short of money. **It still seems great to find a few fossils!**



Mapping Prior Historic Collection Sites



A specimen from a fossil horse (left) and camel (right)



Museum Collection holdings

- Arizona:
 - UALP (Tucson, U of A)
 - Mesa Museum of Natural History
 - Sharlot Hall Museum
 - Museum of Northern Arizona
 - Yavapai College
- New York:
 - American Museum of Natural History (the largest holdings)
 - Possible collections from at the California Institute of Technology from 1949 (not yet confirmed or visited)

Museum visits during my sabbatical for Milk Creek specimen studies and comparative anatomical and biogeographic work

- American Museum of Natural History, NYC
- Mesa Museum of Natural History
- Museum of Northern Arizona
- Sharlot Hall Museum
- Los Angeles County Museum
- San Bernadino County Museum
- Raymond Alf Museum of Paleontology, Claremont, CA
- New Mexico Museum of Natural History, Albuquerque
- University of New Mexico, Museum of Southwestern Biology Division of Mammals

Judy Galkin, Research Office, Mammalian Fossils, Building 3A, 9th floor, AMNH



Gary Morgan (left), New Mexico Museum of Natural History and Robert McCord, Mesa Museum of Natural History



A fossil storage cabinet of Milk Creek camels from the American Museum of Natural History



PALEONTOLOGY LOAN TAG

FARB FF FI FM

Catalog # 7. 136.09 F 3380 type

Taxon *Michenia*

Element Dentition

Bldg. 3A Floor 7 Door 196 Drawer 09

Loaned to S E Bevers

Institution Yavapai College

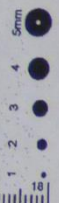
Filled in by J Bevers

Date 1-7-15

STAYS WITH SPECIMEN



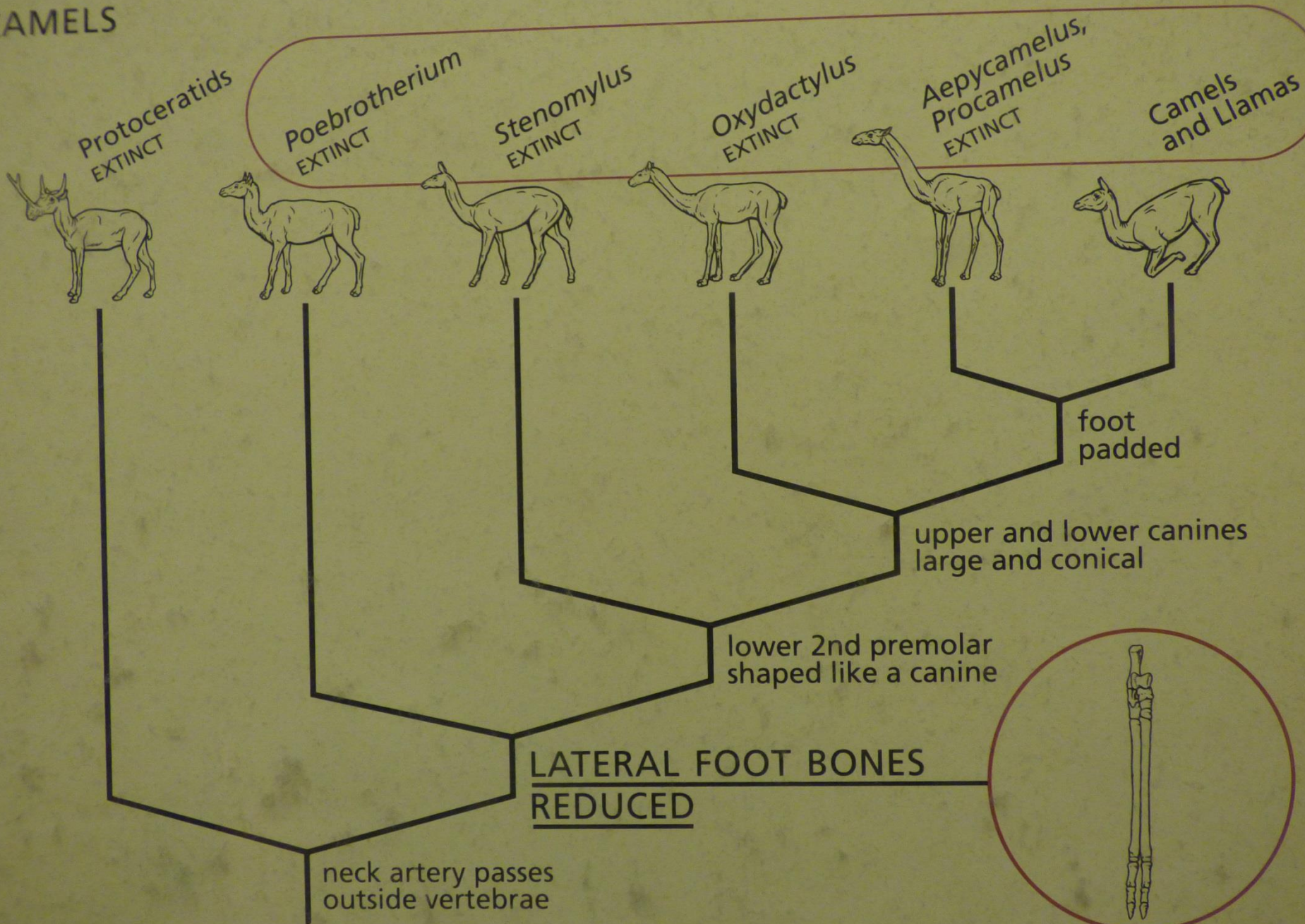
MANAGING FOSSILS ON PUBLIC LANDS



American Museum of Natural History- Division of Paleontology
AMNH 73380 HOLOTYPE
Michenia yavapaiensis
Citation: Honey & Taylor, Bull. of AmNH, pg. 411, 10/24/78



CAMELS



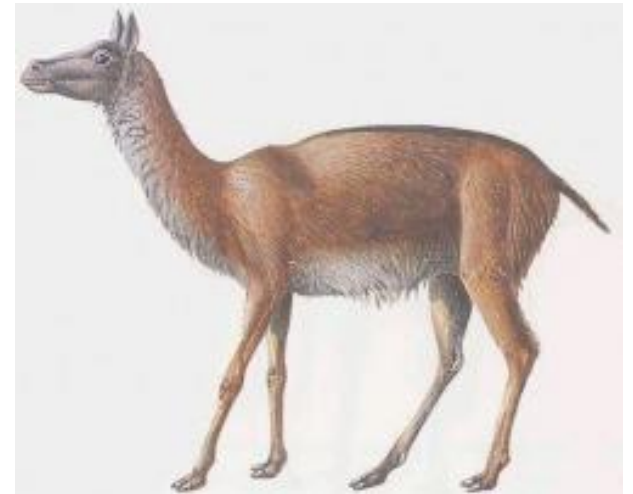
Skull of *Poebrotherium* (left) and skeleton of *Titanotylopus* (right).





- *Aepycamelus* (painting by Heinrich Harder)

- *Poebrotherium* (an early camel)



Potential new taxa (1): a giant camel?

- Astragalus and other postcranial skeletal specimens from the UALP collection supports a third, and giant camel genera.
- Likely this would be *Aepycamelus sp.* or *Hespererocamelus sp.*, both present as contemporary genera in California and New Mexico.



New taxa 2: a small canid

- The Sharlot Hall Museum collection contains a partial upper right palate with the M¹ and M² from a *Leptocyon* sp.
- This is the first documented *Leptocyon* from the Milk Creek site and perhaps from all of Arizona.



Future talks and papers on Milk Creek fossils or the History of Paleontology

- Yavapai College, spring (February?)2016
- ERAU, February 2016
- Western Association of Vertebrate Paleontology, February 2016)
- Central Arizona Geology Club, February 2016
- Sharlot Hall Museum, spring 2016
- Portland State University, May 2016
- Society of Vertebrate Paleontology, October 2016
- Western Association of Vertebrate Paleontology, February 2017, to be held at Yavapai College
- Publication on the Milk Creek fossils with new listings and a biodiversity analysis
- Publication on the history of research at the Milk Creek fossil site

Milk Creek in the Literature

- Lance, and Wood, 1958, site description
- Lindsay and Tessman 1974, overview of fauna
- Honey and Taylor, 1978, Camelidae
- Honey, Harrison, Prothero, and Stevens, 1998, Camelidae
- Wang, Tedford, and Taylor, 1999, Borophagine (Canidae)
- Baskin, 2004, *Bassariscus* (Procyonidae)
- Frick, Childs and Taylor, Beryl E., 1971, *Michenia*, a new protolabine (Mammalia, Camelidae) and a brief review of the early taxonomic history of the genus *Protolabis*
- Hook, Donald L., 1956, Late Cenozoic stratigraphy and structure of a part of the Walnut Grove Basin, Yavapai County, Arizona

Sites visited in England

- Linnaean Society library archives, London
- British Museum of Natural History, fossil mammals and library archives, London
- Sedgewick Museum, Cambridge
- University of Cambridge Library archives
- Lyme Regis Museum
- Down House, former residence of Charles Darwin and museum and English Historic Site
- Approximately 3,000 photos of historic documents and museum specimens taken, with notes.

At the Linnaean Society library archives, London



Charles Darwin fossil collection, British Museum of Natural History



- Teeth of *Toxodon platensis*, a large South American grazing mammal collected by Charles Darwin and Captain Robert FitzRoy while on the Beagle along the northern Argentine coastline.

Letter from Mary Anning, early fossilist, held at the British Museum of Natural History Library Archives

we have finely preserved the
vertebrae one in one continued chain
until the twelve last of the neck
which are dislocated sternum bones
of the pelvis very fine; I have
not yet washed it but from what
I can see there will be traces
of a skin or shell between the
vertebrae, I found it Thursday 29 Jan
and have been ever since getting and
not picking it - this is there a hope
of Lymington to Lyme again some
respectfull your oblige
humble servant
Mary Anning



Welcome to the Jurassic Coast

Mary Anning – the world's most famous fossilist



Despite poverty and little education Mary Anning found some of the most important fossils of all time here on the beach at Lyme Regis. Her dog, Tray, accompanied her as she made trips to find fossils to sell to make a living.

It was dangerous work and in 1833 Tray was killed by a landslide which nearly killed Mary too.

© The Trustees of the Natural History Museums, London

These are some types of fossils you might find on the beach...

Belemnite



© Bridport Museum

Ammonite



© Lyme Regis Museum

Ichthyosaur



...and here is what they would have looked like:

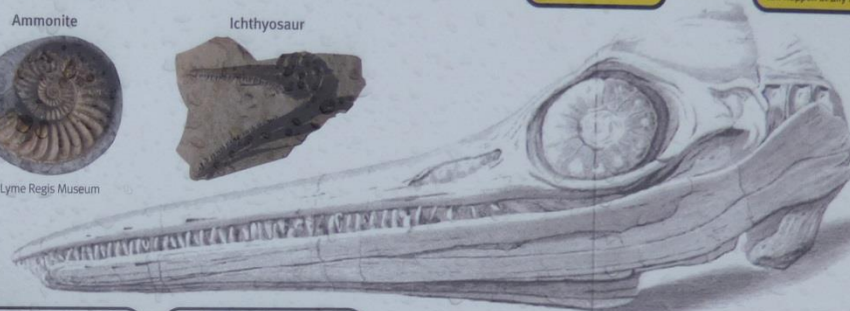


© Bob Nicholls 2014 www.paleocreations.com

If using a hammer (they are not essential), make sure it is a toughened, geological hammer and wear safety goggles.



You are most strongly advised not to stand under, or collect from, the cliffs. **ROCKFALLS** can happen at any time!



Drawing from an 1814 paper by Everard Home showing the Ichthyosaurus platyodon skull found by Joseph Anning (Mary's brother) in 1811



JURASSIC COAST
UNESCO WORLD HERITAGE SITE

www.dorsetforyou.com/lyme

What are fossils?

Fossils are the preserved remains or traces of prehistoric animals and plants found in sedimentary rocks. They provide us with a record of life, and a glimpse of lost habitats, vanished ecosystems and the slow evolution of life on earth. A fossil could be a bone, a shell or a leaf and also a footprint or burrow.

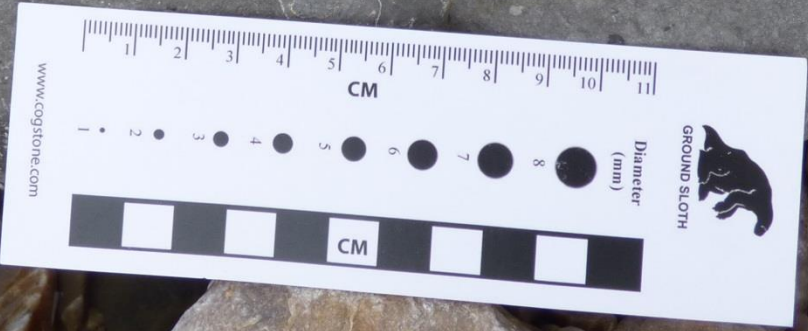


The best fossils are found on the beach and **NOT** in the cliffs

Black Ven







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CM

GROUND SLOTH



Diameter (mm)

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

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Home of Charles Darwin, Downe, England, English Historic Site and Museum



Conrad Martens, artist of the Beagle, from a sketchbook held at the University of Cambridge library archives, 1830's



Sedgewick Museum, Cambridge, England

