

I STOP FOR ROADKILLS

If you want it done right, hire a Mammalogist
- Jim Fordley

67th ANNUAL MEETING, AMERICAN SOCIETY OF MAMMALOGISTS AT THE UNIVERSITY OF NEW MEXICO, ALBUQUERQUE, NM 87131 <http://www.msb.unm.edu/mammals/index.html>

A New Naturalist's Motto?

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Kansas Master Naturalists Course
Mammalogy – 3 April 2021

- Andrew G Hope – K-State Biology, since 2014
 - BSc. University of Glasgow, Scotland
 - MS. Eastern New Mexico University, Portales, NM
 - PhD. University of New Mexico
 - Museum of Southwestern Biology
 - Extensive work with mammals since 1997
 - Out of last 24 years, only 3 have not involved at least 1 month of fieldwork, mostly consisting of remote expeditions.
 - Discovery, **Natural History**, Museum Science, Evolution-based Conservation, Management of mammalian wildlife

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Broad overview for today

- Trapping – Fieldwork!
- History of Mammal Naturalists (mammalogists)
- Natural History of Mammals
- Methods for observing mammals
- Mammals at risk in Kansas
- Methods for identifying mammals

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Methods for observing mammals

- Binoculars? Yes, but not the main way...
- Find mammal parts/sign and identify them.
- **Traps** - Most mammals need to be caught to be observed.



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Trapping

- **Traps set**
 - Sherman live traps (~80)
 - We're going to check and collect traps
 - Must be timely
 - Morning heat can quickly stress or kill animals
 - Fold empty traps after dumping bait
 - Label and gather closed traps
 - Show-and-Tell



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Let's Go!

- Latex gloves if you would like
- Pencils for labeling
- Trap bags
- Don't handle traps if you have nut allergy



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Mammalian Natural History

- Natural History is an observational science
 - Very important!
 - Link a given species with it's surroundings
 - Habitat
 - Community
 - Life History Strategy
 - We can make predictions about what species occur where, based on knowledge of these associations
 - Pay attention to details
 - Record your observations



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History of Mammalogy in North America

- Mid- to Late-1800's – Discovery Phase
 - Physician Naturalists of the US Army Med Corps
 - Described diversity as taxonomists
- E.W. Nelson
 - 14 year field trip through Mexico!

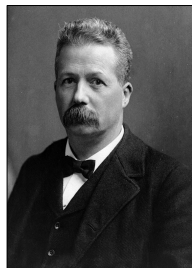


E. W. Nelson Mexico 1895

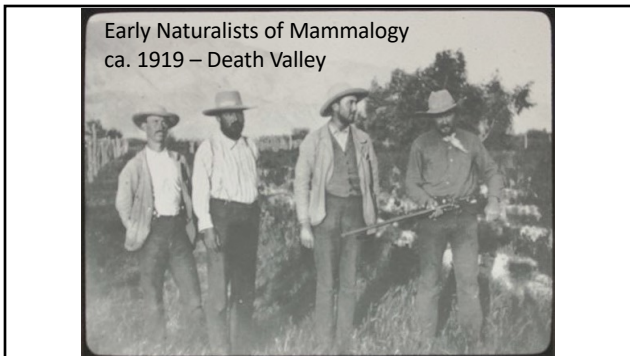
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History of Mammalogy in the U.S.

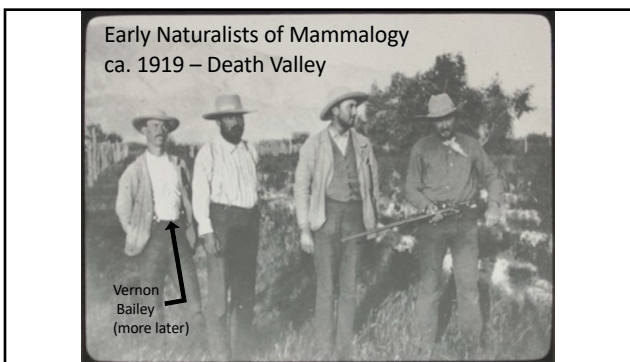
- Discovery → Natural History phase in early 1900's.
 - Relating species to each other, to their environment, and to their location (systematics, ecology, biogeography)
- C. Hart Merriam
 - 1888, Division of Economic Ornithology and Mammalogy
 - 1905, this became the Bureau of Biological Survey
 - 1919, CHM founded the American Society of Mammalogists
 - "Key to advancing systematics [knowledge] of mammals is to obtain and study large series of uniformly prepared specimens..."
 - He refined and standardized field and museum methods still used today.



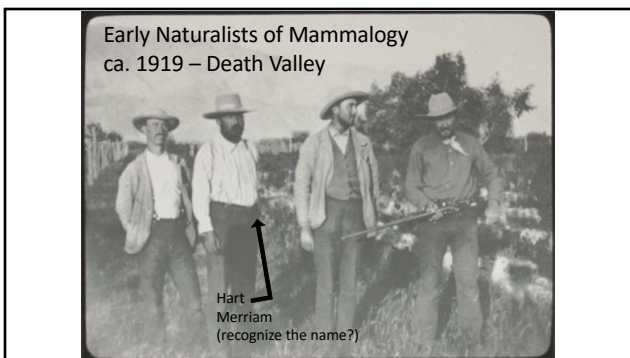
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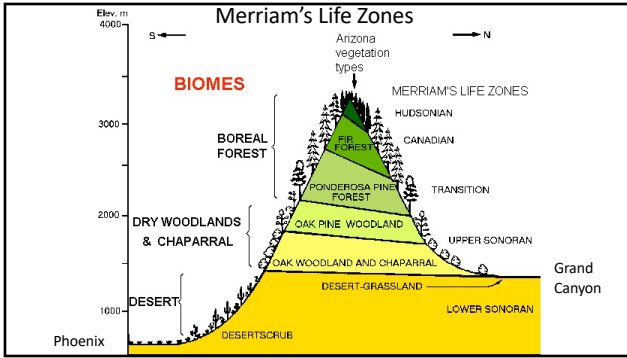
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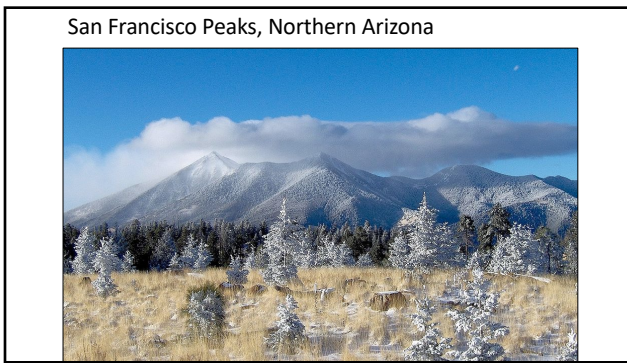
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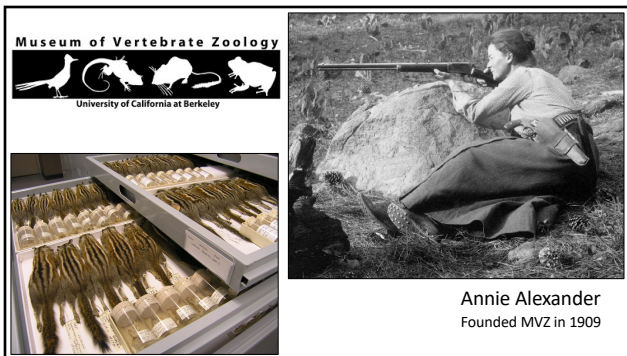
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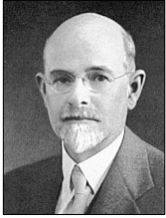


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Annie Alexander
Founded MVZ in 1909

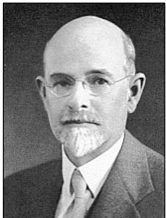
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Curator of Mammals
Museum of Vertebrate
Zoology, Berkeley,
1908-1938.

-- Joseph Grinnell
(ca. 1910)

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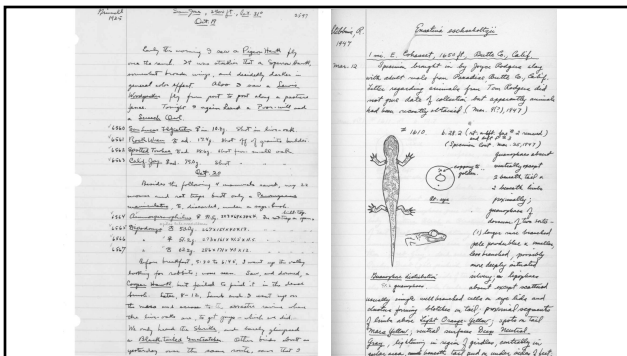


Curator of Mammals
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"At this point I wish to emphasize what I believe will ultimately prove to be the greatest value of our museum. This value will not, however, be realized until the lapse of many years, possibly a century, assuming that our material is safely preserved. And this is that the student of the future will have access to the original record of faunal conditions in California and the west, wherever we now work."

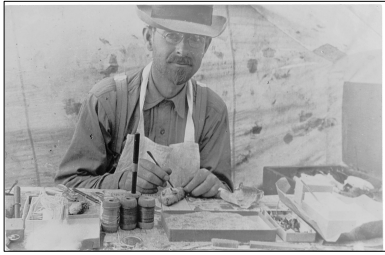
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Joseph Grinnell

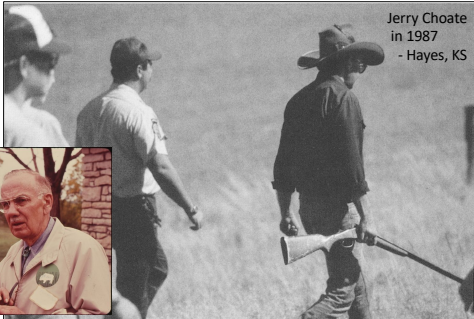
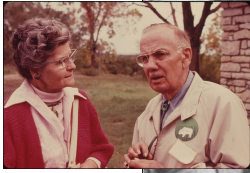


- Grinnellian Niche – “environmental conditions limit a species distribution”
- The Grinnell Method – Further standardized field note format and specimen preparation

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Mammalogy in Kansas

E. Raymond Hall
KU Museum



Jerry Choate
in 1987
- Hayes, KS

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Kailey Meacham
in 2021 (34 yrs after Choate)
- Cimarron NG, KS.



Mammalogy in Kansas



Field prepping
100 years after Grinnell

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IM
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**Building an integrated infrastructure for exploring biodiversity:
 field collections and archives of mammals and parasites**

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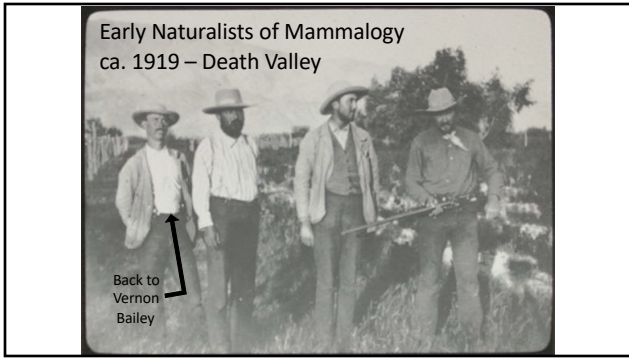
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Annie Alexander – U.C. Berkeley, Museum of Vertebrate Zoology
 → Joseph Grinnell – U.C. Berkeley, Museum of Vertebrate Zoology
 → E. Raymond Hall – KU, Biodiversity Institute
 → E. Lendell Cockrum – University of Arizona
 → Robert R. Baker – Museum of Texas Tech University
 → Terry L. Yates – University of New Mexico, Museum of Southwestern Biology
 → Joseph A. Cook – UNM, MSB
 → Andrew G. Hope – K-State Mammal Collection...

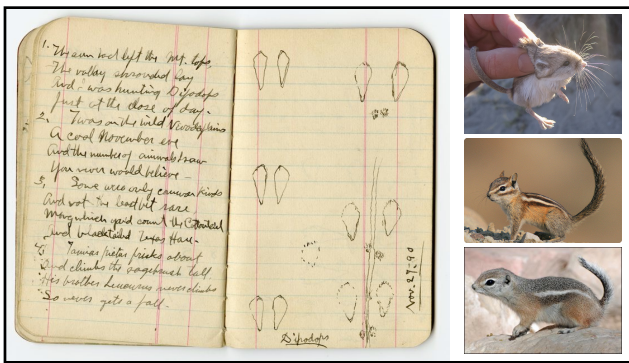
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The next generation

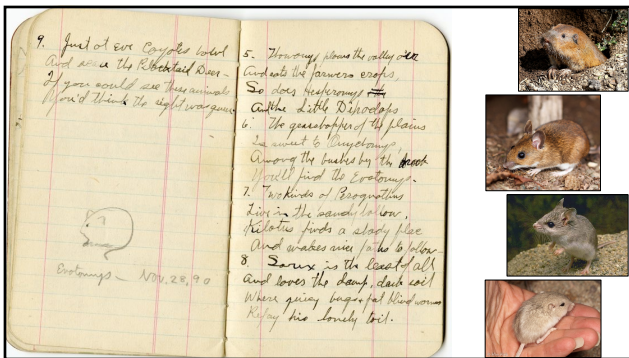
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Woodland


- In the trees
- In the bushes
- In the leaf litter, under logs
- Forest edge
- Underground
- Daytime/Nighttime
- Dawn/Dusk
- Near water



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Tallgrass Prairie


- In the bushes
- In tall grass, or open disturbed sites
- In the litter
- Underground
- Daytime/Nighttime
- Dawn/Dusk
- Near water



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Shortgrass Steppe

- In shrubs
- In the litter
- Underground
- Daytime/Nighttime
- Dawn/Dusk
- Near water



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Mammals at Risk in KS

- Black-footed ferret
- Black-tailed prairie dog
- Problems:
 - Conflict with agriculture, ranching
 - Complex relationship and fine balance
 - Disease
 - No genetic variation
- No easy solution
 - Ecotourism?
 - Subsidies?



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Meet Elizabeth Ann...

- Cloned in 2020
- DNA sample from a museum
 - 30 years old
 - Retained old genetic diversity



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Bats

- Cave dwellers → White-nose syndrome
- Tree roosters → Wind turbines
- Other diseases
- Human conflict
- No easy solution...



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Eastern Spotted Skunk

- Conflict: "clean farming"
- Modern industrial
- Much fewer edge habitats
- No easy solution...



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Other species

- Considered at risk (data deficient)
 - Southern bog-lemming
 - Southern flying squirrel
 - Spotted ground squirrel
 - Fulvous harvest mouse



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What can we do?

1. Public education → awareness/support
2. Become a naturalist!
 - Observe, record, disseminate
3. Advance science
 - population ecology, community ecology, evolutionary ecology
4. Continue field sampling and specimen collections
 - Train the next generation



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Methods for identifying mammals

Learn the major skull features.

Remainder of class: identify mammal specimens

Please handle the specimens! But, be gentle...



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