I. Prologue: my own geohistory

II. Laramide History

III. Huckleff and the West Side tilts

IV. Early history of the west side tilts

V. The Hominin Peak evidence

VI. The regional connection

VII. What next to my future geohistory

THANKS TO

Bob Smith
Christopher Woodroffe
Bob Special

[David Love]

Rise of The Tetons

And The Huckleff Hominid
West Side Caves (phydrology)

Bob Benedict

My Devonian GTH presentation

2012-2014

2013

Geissman GTH presentation

Devonian "field studies"

2011

2007-2010

Alamo Impact

Awakening (via "Extinction", Erwin)

2004

I. My Geohistory
Lefors continue to rise

Yellowstone caldera eruption (thickening)
(Jackson Hole sinks)
Lefors range begins to rise

Hominy Peak andesite
(Asaraka volcanic activity)
Laramide orogeny
(Shallow, intraplate seas)

Tsunami arrives here into
Alamo impact in S. Nevada

Setting the geological stage
Regional Tectonic History

20 Ma - Now: Nevada

Eocene (35 Ma - 20 Ma): Nevada

Laramide (40-80 Ma)

Solomona

Roberts Mt.

Salina

Sevier

Alamo Impact

Stretched

Sheared
More discussion at end of talk?

Possible role of caves
Evidence: Devonian springs
Tidal channels ↔ porous channels

Best possibility: hydrology

Shale need to be (some of) dated

No tsunami evidence found

Summary of my Devonian work:
The subject of this talk:

- How did the west side strata get tilted?
- When did the tilt occur?
- The ideas: volcanic deposits overlie the old strata
- Ma: Huckleberry Ridge tuff
- Grand Targhee: Hominy Peak formation
- Tilt of these recent deposits differs from the
  Tilt of the strata.
- (Teton Canyon cliffs)
- Absaroka volcanism

- Targhee Uplift

- Rise of Gros Ventre Extension

- Rise of ranges to the south of Jackson (cf. GTH talk by Adele Yonkee)

II. Laramide History
Only it smile, vanished, leaving behind the Tertiary Uplift in Alice in Wonderland, "like the Cheshire cat"

Anybody's guess

Caption: Jasher-Like Love, Read, & Pray

Teton Landscape "Creation of the"
THE REGIONAL PICTURE

- Wind River
- Big Horns
- Yellowstone
- Gravelly
- Madison
- Absaroka
- Cody

Hot Spot

Jackson

Smoke River
Carbon

2 Ma

Grizzly

25 Ma

Heat Mtn.
2. Magnetism

- What is the relation after deposition?
- Deposits in the west side foothills

III. Huckleberry Ridge Tuff
Best evidence is the N 4 S flanks of Tenon Canyon.

I conclude that field evidence by itself is quite convincing.

I disagree from Geissman.

I locate several candidate sites.

I meet Geissman's offer to find more backcountry sites.

Geissman's conclusion: 50% of fit in the last 2 million years.
-4

upon the location of the hinge.

But the topographical features do not depend on the location of the hinge of the "trap door". Elevation of the terrain in the topo map depends

Note:

Topo map of 2ma terrain can be made,

Accuracy ~ 20% (ii)

> 50% of tilt is within the last 2ma

My conclusion
BIRD ET AL.: TECTON FACULTY, TECTONOPHYSICS, NEOECONOMIC DEFORMATION


Bird, Smith, 

Geissman
o Citrus Service deep well near digging

- Common Sense

- The evidence:
  - 3% iii
  - My guess: not much

- How much rotation of the West Side-shara \\
- Tectonic did rise some in that period

--- Early Teton History (2 Ma - 10 Ma)
Thanks to Bob Spoolstra

- 4,2 -

Depth of Leigh Member

The Regional Picture
Old Hinge

New Hinge

Table
Transect
Stakes
Treasure

Sea Level

10 Ma (more or less)

2 Ma

Nowadays

Sea Level
useful in describing the Targhee uplift.

"Old Fudge" near the Big Flies may be

and its high pressure (4m gal/day of hot water)

explains the huge volume of water

...Shoeline near the well helps to

...Grand Teton remains supreme.

Advantages of this scenario:
Origin: Later originating in the Abarakas.

Loe, Leopold; Love, USGS Professional Paper 932-B.

Well studied by Pedo and Love in 1970.

- 2000' deep
- 10 square miles

Type section is near Hounini Peak 15-20 mi. N of Targhee.

- 2000' deep
- 1 square mile at 8000' on Grand Targhee

To Ma. andesite

Y. The Hounini Peak Formation
Heart Mountain, Wyoming, 29 Ma
Sulphur Creek 46-1 44.1 Ma
Washburn 29 Ma

*C. Smee & Prestegaard [USGS Professional Paper 729-C]
Absaroka Volcanic Subgroup

Me Caughn Interpretation

Hominy Peak ↔ Sulphur

The Sulphur Events

Jackson
Grand Targhee
LaHar
Yellowstone
- 5.4 -

I think this makes sense, (I will choose 3%).

Love chooses 36% extra rotation, I do not.

6% of extra rotation during 50%2ma,

Data are still consistent with.

Data are consistent with no rotation prior to 2ma.

After tilting.

Originally (E-W) horizontal. It then becomes a measure.
1. How does Leigh Member extrapolate elsewhere into Teton Valley (especially northwestern)?

2. How does Leigh Member extrapolate to the other side of Jackson Hole (Shadow Mountain, not Leidy)?

3. What is the bigger picture (especially eastward)?

- V.2M
- 2072
- 0 2 M.A.
- 0 50 M.A. - Loma - 69% dip (to west)

Summary of tilt in my study area:

- The Regional Connection
Surface Elevation 8260'  
Depth to Leech Member 4000'  
Rocky Mt. Well Data

Gross Ventress  
Anticline  
Ramshorn  
Mt. Lee  
Hale  
Jackson  
Tejon Valley  
Huck Truff  
Tensleep  
Big Holes  
Driggs  

THE REGIONAL PICTURE (AGAIN)
- Undone homework

- USGS Map I-730 (Love, Read, Christensen, & Stanley)

- Bob Smith Slides

- Shawo Mtn. (Rams horn Antilixine) well log

- Jackson Hole data:
Subsidence leaving the mountain block standing high. While the Teton faults have risen, but sedimentation has filled the valley keeping up with the ground level - Jackson Hole has dropped.

Much of the fault is displacement is below the ground level.

The Teton fault is a normal fault, typified by vertical displacement with the blocks moving in opposite directions.

(Courtesy: Bob Smith, U. of Idaho)

Valley block by an estimated ~8 km (~30,000 feet). The Teton fault separates the uplifted mountain block from the down-dropped.
USGS Map I-730
Love, Red, Christiansen, & Stach (1973)
• Scenarios are (probably) not simple.

• What does the Leigh Member structure map look like?

• Where does the Leigh Member still exist?

• What about the Tarhee uplift?
Leigh Member Structure Map (now)
- Ten Valley earthquake data
  - Three Forks
    - Bridger
    - Jefferson
    - Lewis
- Regional structure maps
  - Caves
  - Hydrology
- Back to Alamo / Devonian
  - Graspe the Hennings Peak deposit

What Next? My Future Geology