The October 2, 1915 Pleasant Valley Earthquake – Nevada’s Largest Historical Earthquake

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Nevada Bureau of Mines and Geology

Stanley McCoy Collection
Importance of the 1915 Earthquake

- Largest Earthquake in Nevada
- Remarkable Foreshock Sequence
- Affected a large area of Nevada
- Advanced Geological Science
- Launched Seismology in Nevada
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Professor J. Claude Jones (1915)
1:00 p.m.

“At about 1 p.m., October 2, those on the [Pearce] ranch heard a heavy rumble. We didn’t really notice any shaking, but we were up and moving around at the time.”
The Foreshock Sequence

3:40 p.m.  M5.0  “with a terrific report, similar to a large dynamite blast, the mountain side of Kennedy gave a lurch due north and then vibrated for five seconds”

5:49 p.m.  M6.1  “without the slightest warning a great roar was heard and the earth’s surface began to roll and sway up and down, evidently in all directions. ... This convulsion continued without stop for fully one and a half minutes.”

“from this disturbance on, it was an incessant, continued disturbance, the earth never appeared quiet.”

From Leon St. D. Roylance (1915)
Traditional and Proposed Epicenters

Traditional Epicenter
40.5°; -117.5°

Proposed Epicenter
40.3°; -117.8°
Pearce Ranch

3:40 p.m.  M5.0

“there was another rumble “which made us kind of nervous.” We also noticed animals were nervous; the horses were moving around.”

5:49 p.m.  M6.1

“Mabel, Lester and Mrs. Pearce were feeding the chickens out by the ranch’s huge rock barn when they felt a heavy earthquake.”

Water splashed out of both sides of the horse trough; trees swayed as if there was a heavy wind, but it was calm.

Folgate (1987)
“Mrs. Pearce told her daughter, Annie, to get the horses out of the barn. I am not sure why she said that, but the barn was kind of rattling.”

“They [the horses] didn’t want to go out of the barn, but they didn’t want to stay either.”

Folgate (1987)
The Main Shock

10:53 p.m.  M7.3, Kennedy

“things had quieted, or perhaps we were unconscious in sleep, when without the slightest warning a great roar or rumbling was heard and we were thrown violently out of bed and buffeted in all directions continuously for not less than 15 minutes.”

Leon St. D. Roylance (1915)
10:53 p.m. M7.3

“This disturbance was, to my mind, the most serious and violent that a human being can experience and live through.”

Leon St. D. Roylance (1915), Kennedy
Kennedy

10:53 p.m.  M7.3

The mill superintendent, Mr. S.L. Berry, made a flying leap through a window, clearing the sill, rather than negotiating two sets of doors to get out of his cabin.

Leon St. D. Roylance (1915)
Pearce Barn

From the Stanley McCoy Collection
“there was one man in the ranch house. The earthquake raised the ground up under the house, tipping it out of the ground. The man was so frightened he ran three miles barefoot down to the Lower Siard Ranch.”

Folgate (1987)
Small Ranch House on Schell Ranch

From the Stanley McCoy Collection
View south – men stand where walls were

Photo by Professor H.P. Boardman
Siard Ranch House

From Toddy Folgate (1987), Photo courtesy of Mabel Pearce McCoy
Modified Mercalli intensity Map

VIII-X  Collapsed buildings, fissures
VII  Damaged chimneys, cracked walls
VI  Cracked walls, people frightened
V  People awakened

1915 Pleasant Valley Earthquake
University of Nevada seismoscope record
Saturday Night Earthquake

Dances all across northern Nevada were rudely disrupted and dance halls emptied.
2008 Wells, Nevada Earthquake Damage – Front Street
Winnemucca (Folgate, 1987)

Half the brick chimneys had damage

Winneva Hall – fire walls thrown down, cracks in front

Winnemucca Hotel – lost gable ends of adobe addition

Humboldt County Court House – downed chimneys

Winnemucca Grammar School – cracked ceilings and heating plant damage – one week out of school
Winnemucca

Diehl Lodging House – part of brick wall thrown out

Overland Hotel (under construction) – lost part of fire wall

E. Reinhart Company – two plate glass windows demolished

Folgate (1987)
Western Pacific Railroad Depot

Toddy Folgate (1987)
Lovelock
Spectacular Surface Faulting

As the fault moved during the earthquake it reached the surface and created a fault scarp.

The surface rupture of the 1915 earthquake was **35-37 miles long** and had a maximum offset of **19 feet**.
Earthquake Faults

Normal Dip-Slip Faults
- fault scarp
- footwall
- hanging wall
- graben

Strike-Slip Faults
- fault
- right-lateral slip
- left-lateral slip
Pearce Ranch
Surface Rupture

Mabel and Lester Pearce

From the Stanley McCoy Collection
Folks at the 1915 Ground Offset

Golconda Canyon
Pre-1915 Earthquake Scarp Discovered

Siard Canyon

Dr. Robert E. Wallace (1984)
Liquefaction

Water-saturated ground liquefies, or temporarily behaves like a liquid, and can flow sideways or vent spouts of water and sand.
Liquefaction

Pearces at Mud Springs –

“at each great lurch of the ground the water of the spring spurted up in the air”

Leon St. D. Roylance (1915)
Liquefaction

Pleasant Valley

From the Stanley McCoy Collection
Liquefaction near Lovelock
More 1915 Information

Nevada Bureau of Mines and Geology

1915 Earthquake Centennial Web Page:

http://www.nbmg.unr.edu/Geohazards/Earthquakes/1915centennial.html

NBMG Education Series E-58 – Field Guide to Earthquake Rupture

Living with Earthquakes in Nevada
Fault Scarp

Nature

Miller Creek

Dr. Robert E. Wallace (1984)
Golconda Canyon fault scarp

Alan. R. Wallace (2015)
Pearce Ranch

10:53 p.m. M7.3

“The quake awakened Mrs. Pearce who reached out to hold onto a bedroom dresser, only to find it rolling away from her. She got up and gathered the children in the dining room. “I remember her putting pillows out there. I think she wanted to get out of the bedroom and wanted us with her.”

Folgate (1987)
Thank You!

Alan R. Wallace
Dana Toth
Jim Faulds
William and Louis Pearce
– Mud Springs

The Pearces were hauling freight to Kennedy when about at 4 p.m. they decided to stop at Mud Springs because “he found the ground in such turmoil he was afraid to proceed farther owing to the rumbling around and the convulsive motion of the ground.”

From Leon St. D. Roylance (1915)
1915 Surface Rupture
Ground Offset along the Rupture

1 meter = 3 feet (3.28 ft)

Maximum offset about 19 feet

Dr. Robert E. Wallace (1984)