

When the Loss of a Finger is Considered a “Minor” Injury

Accidents, Occupation, Severity, and Geography on Colorado Railroads, July 1884 - June 1885

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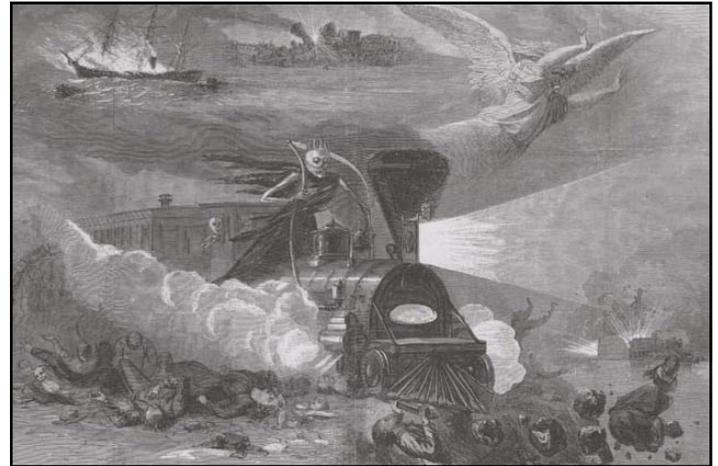
Abstract

Although there is an extensive literature on railroad accidents, virtually all of it looks at the frequency of accidents according to occupation. Attention to spatial distribution is rarer and coarse grained: by state or by region. Statistics compiled by the Colorado Railroad Commissioner, however, allow a more detailed study of accidents. We can examine not only occupational distribution, but also spatial and seasonal distribution.

The most common source of railroad injuries was track construction or repair; the highest number of severe injuries occurred while coupling; and the largest number of deaths were caused by fragile human bodies meeting moving objects. Severe accidents happened more often in the eastern part of the state, although there were more deaths in western Colorado. The changing number of workers and work required at each station, 1890 city populations, the prevalence of medical assistance, and the ongoing construction of Colorado railroad track all provide potential clues to this distribution of accidents.

Introduction

On November 12, 1884, F. C. Smith was working for the Denver and Boulder Valley Railway Company as a railroad brakeman.¹ As part of his duties, he routinely coupled and uncoupled railcars at different stopping points along the line. On this particular day, he was working at Canfield, Colorado, and things did not go according to plan. Nineteenth-century couplers came in a variety of not always compatible shapes and styles, and brakemen often had to use their hands to force the mechanisms together.² A failure to move quickly or simple bad luck could cost a man a hand or a finger. In Smith’s case, the coupler cut off the middle finger on his right hand. Two months before Smith’s accident, George W. Prince, a brakeman on the Denver and Rio Grande Railway, had lost two of his fingers on a bridge in Colorado doing the same work.³ A month after Smith lost his finger, T. Conway, also a brakeman on the Denver and Rio Grande, had his fingers mashed and rendered useless at Montrose, Colorado while coupling.⁴ These were everyday accidents exacting their quotidian toll for the brakemen working on nineteenth-century railroads. Lost fingers did not end careers. They became the mark of a brakeman; you could recognize one by their missing fingers.⁵ Considering the fact that one out of every 120 trainmen—a railroad category that mostly included brakemen—died on the job each year, it is not



Death Rode the Rails. Nineteenth-century railroads were so dangerous that this unknown political cartoonist depicted “Death” as literally riding the rails.¹⁰

surprising that the majority of trainmen considered the loss of a finger to be a “minor” injury.⁶

But brakemen were not the only workers hurt during this year—all together, 275 distinct employee accidents and fatalities were recorded in Colorado from July 1884 to June 1885.⁷ Although trainmen, and brakemen in particular, were the most prone to injury and death, working on the railroad was dangerous regardless of the job. The railroad became the “most profound technological innovation” of the nineteenth-century and the “single largest American industry” by 1900, but at a great cost.⁸ By 1907, statistics stated that almost 12,000 men had died per year since the founding of the railroad industry.⁹

While it is certainly useful (and lamentable) to know that one out of every 156 trainmen died while working on the railroad in the year ending June 30, 1894, these sorts of statistics alone cannot tell the entire history of nineteenth-century railroad accidents.¹¹ Very little literature focuses on examining railroad accidents in terms of where they occurred geographically.¹² In fact, the only geographic information consistently provided by the contemporary literature is that railroad workers were injured at higher rates both within and in close proximity to division points, which had high traffic and train maintenance facilities.¹³ The Colorado data provides an opportunity to extend the existing analyses by examining a case-study of accidents in Colorado from July 1884 to June 1885.

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Methodology

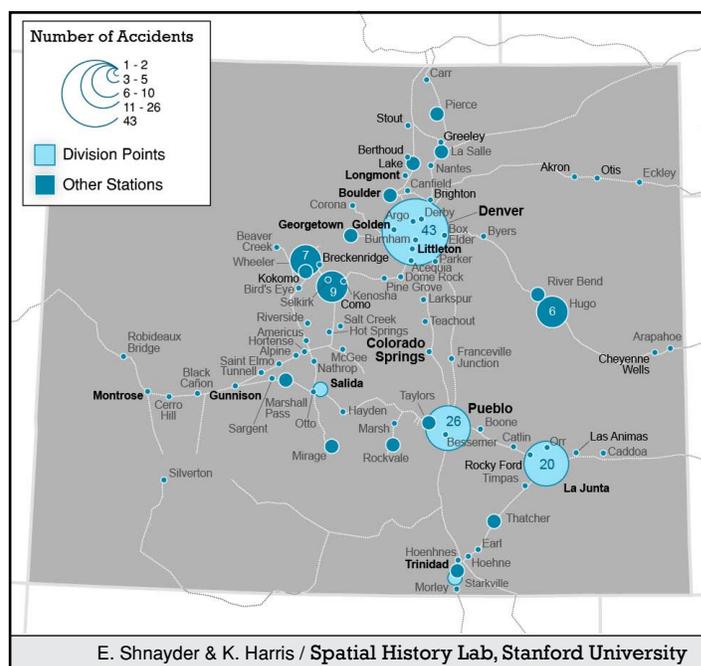
The Colorado Railroad Commissioner’s Annual Report is an excellent source for a spatial historical analysis because it was one of the few state railroad reports to list railroad accidents by location. The railroad annual reports also stated the name of each individual hurt, whether they were injured or killed, how the injury happened, which body part was hurt and the extent of the injury, and the company for which they worked.¹⁴

I connected each accident to its corresponding set of coordinates in space through a combination of the ArcGIS address locator, Geographic Names Information Systems (GNIS) database, and the historic map of Colorado in the *Atlas of the Santa Fe Route*.¹⁵ Despite all of these techniques, seven accidents that occurred at numbered bridges and mile-markers could not be located.¹⁶ In addition to accidents, the Colorado Railroad Commissioner’s guide also provided data on the number of tons of freight forwarded and revenue statistics for select Colorado stations in 1885.¹⁷

The methodology described in this publication, and in the ensuing analysis, involved some critical assumptions. First, although the station revenue and number of tons forwarded examined in this paper are from the 1885 fiscal year, they have also been applied to the six months of accidents that occurred in the second half of 1884.¹⁸ Second, division points—stations that had large railroad yards, roundhouses, and numbers of workers who rearranged railcars and that can best be described as railroad “hubs”—could not be found through primary sources and have instead been determined to be the cities in which switchmen, the men in charge of coupling and uncoupling cars at railroad hubs, had accidents.¹⁹ These five cities in Colorado were Denver, Pueblo, La Junta, Salida, and Starkville.²⁰ Finally, and most importantly, high amounts of tons forwarded and revenue imply that a station had more traffic passing through it, which in turn implies that there were more railroad workers stationed there in order to handle the larger workload.

Distribution of Colorado Accidents

David Cashier, a blacksmith for the Union Pacific Railway Company, was one of the forty-three recorded injuries in Denver, Colorado. On July 14, 1884, he caught his fingers in a tong and bruised them.²¹ This was one of the ninety-six recorded injuries at the division points, and just one of the 275 recorded injuries in Colorado during this year. Not all railroad accidents involved



Number of Railroad Accidents in CO per Station 6/1884-7/1885.

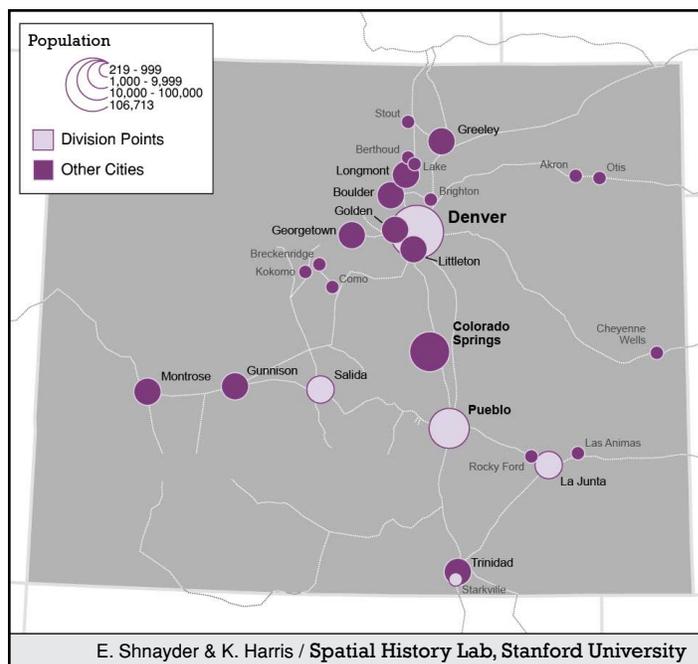
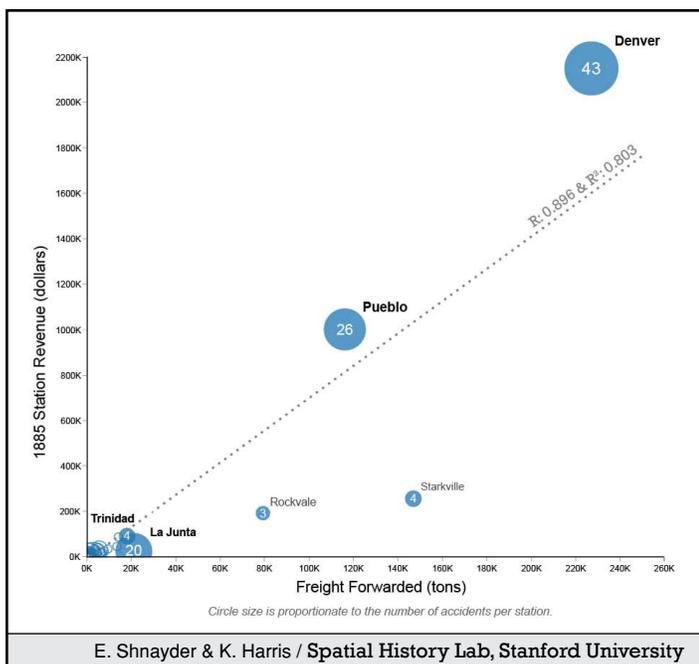
moving trains or working on railroad tracks—injury or death could strike anyone, anywhere, and at anytime.

The most accident-prone areas, at least in terms of sheer numbers, were the largest division points with railroad yards. Denver, Pueblo, and La Junta accounted for over a quarter of the total number of reported accidents.²² This is to be expected—the railroad yards had railroad roundhouses, where locomotive repair workers, such as David Cashier, could be injured in addition to the men regularly hurt working in the yards and along the tracks.

In addition, the railroad division points had more work on a day-to-day basis and required more workers. Although no data is available on how much work employees did at each station and how many worked there, the total revenue earned and the amount of freight forwarded from each station provide a surrogate with higher numbers implying that more railroad employees worked at that station in order to handle the higher workload. The data could be reflecting the fact that areas with a higher concentration of employees had more accidents. The following scatter plot shows a positive correlation ($r = .896$, $r^2 = .803$) between total station revenue and the number of tons forwarded from the corresponding station. There is also a connection between the distribution of accidents

Date	Name	Occupation	City	State	Cause of Accident	Injured or Killed	Character of Injury	Railroad Company
07/01/1884	Michael O'Keefe	laborer	Near Derby	Colorado	Getting on cars	Injured	Back bruised	Burlington and Colorado Railroad Co.
12/25/1884	Thomas Brown	laborer	Pueblo	Colorado	Struck by engine	Killed	Crushed	Atchison, Topeka and Santa Fe Railroad Co.
7/13/1884	E. Le Bert	fireman	Larkspur	Colorado	Pulling slides of ash pan	Injured	Fingers injured	Denver and Rio Grande Railway Co
6/25/1885	John Brown	laborer	Earle	Colorado	Hand car jumped the track	Injured	Testicles injured	Atchison, Topeka and Santa Fe Railroad Co.
3/30/1885	Alcaid Powell	boiler maker	Hugo	Colorado	Flue plug blew out	Injured	Scalding his neck, back and arm	Union Pacific Railway Co. - Consolidated

Table of Accidents from the *First Annual Report of the Railroad Commissioner of the State of Colorado, for Year Ending June 30, 1885*. This excerpted Excel table from the digitized version of the accidents listed in the 1885 Commissioner’s Report shows the different categories recorded.



Colorado Railroad Revenue vs. Freight Forwarded, July 1884 - June 1885. This scatter plot shows the correlation between the number of tons forwarded at a station and the station’s total revenue in dollars. Stations which had neither the number of tons forwarded nor the revenue listed have been excluded from this analysis. The number of accidents at each station is represented through the size of the circle. $R=.896$, $R^2=.803$.

Colorado Population in Select Cities, 1890. This map shows the distribution of population in Colorado per station from the 1890 census. Stations/cities which did not report population values have been grayed out. Larger circles and larger bolded text indicate higher populations. The division points are labeled in a lighter color.

and city population. The eastern half of the state, as defined by the railroad line connecting Stout and Denver to Pueblo and Starkville, had more accidents than the western half. This could be due to higher population levels in the eastern part of the state and the ensuing higher railroad traffic due to the greater demand for goods. For the year between July 1884 and June 1885, it was the amount of traffic rather than the difficulty of terrain that led to accidents.²³ The map [on the right] shows the 1890 population of Colorado cities.²⁴

Severity of Colorado Accidents

John Lynch worked as a work-train employee for the Denver and Rio Grande at Black Cañon in western Colorado.²⁵ On July 23, 1884, a powder explosion killed him and seriously injured a fellow work-train employee.²⁶ Eleven months later, another Denver and Rio Grande employee, a bridge employee, died—Charley Westland drowned after falling from the Robideaux Bridge on the western border between Colorado and Utah.²⁷ Westland’s death happened only one day after Jesse Ingersoll drowned at the same place after being knocked into the river.²⁸ These casualties tell the story of just three men who died on the western Colorado railroads. The visualization [on the following page] shows the geography of severe accidents in Colorado from July 1884 to June 1885. An explanation of the accident categories can be found in the “About” section.

The majority of the “severe” accidents happened in the eastern half of Colorado. A great portion of these occurred at the three largest

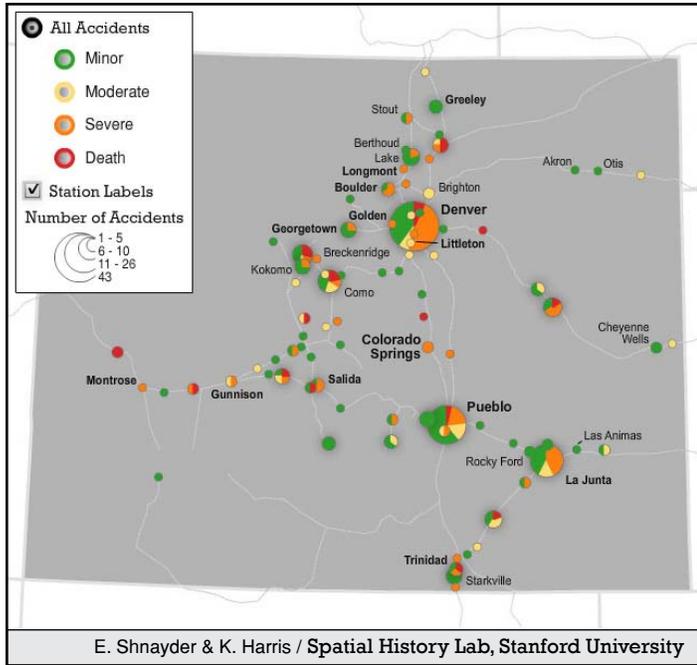
About “Severity of Colorado Railroad Accidents”

The visualization on the following page shows the distribution of Colorado accidents in terms of the number of accidents, as indicated by circle size, and the severity of each accident, as indicated by the colors within the pie charts at each station. The data can be viewed in its entirety, or categorically by selecting a particular severity level in the top corner of the online version. Stations with corresponding population data are in bold, and the size of the font indicates the city’s population relative to that of the other stations.

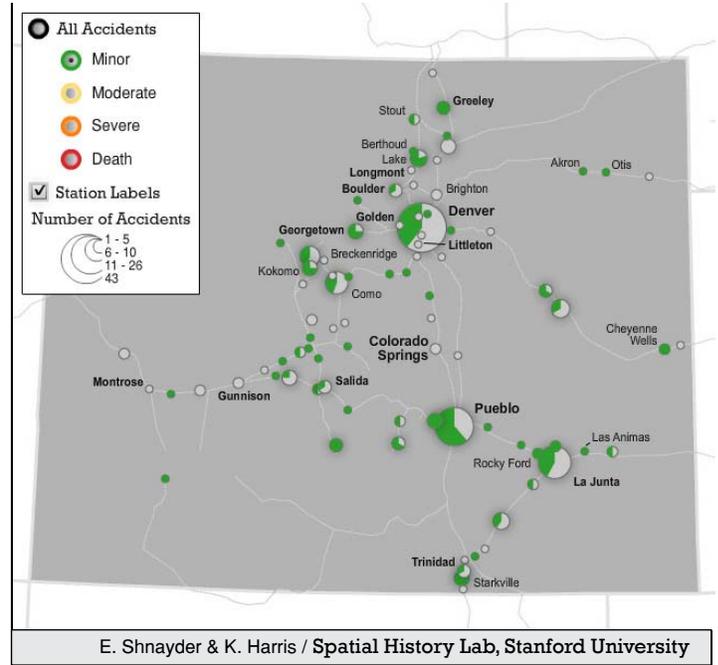
In the case of the Colorado data, it appears that an “accident” was defined as an injury that prevented a worker from continuing to work that day or for the rest of his life. I have determined and organized accident severity into the following four categories:

- Minor:** accidents that resulted in bruises or sprains
- Moderate:** accidents that resulted in broken bones
- Severe:** accidents that resulted in lost limbs or internal injuries
- Death:** accidents that resulted in death

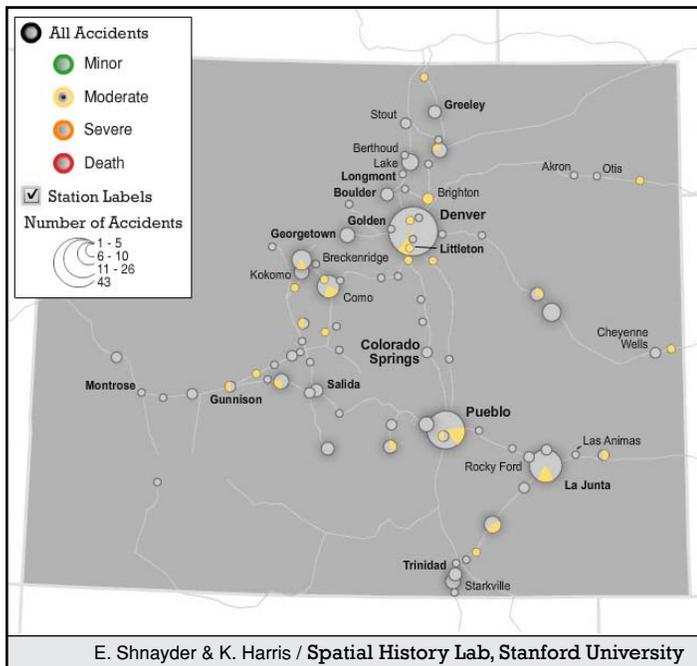
Severity of Colorado Railroad Accidents, July 1884 - June 1885.



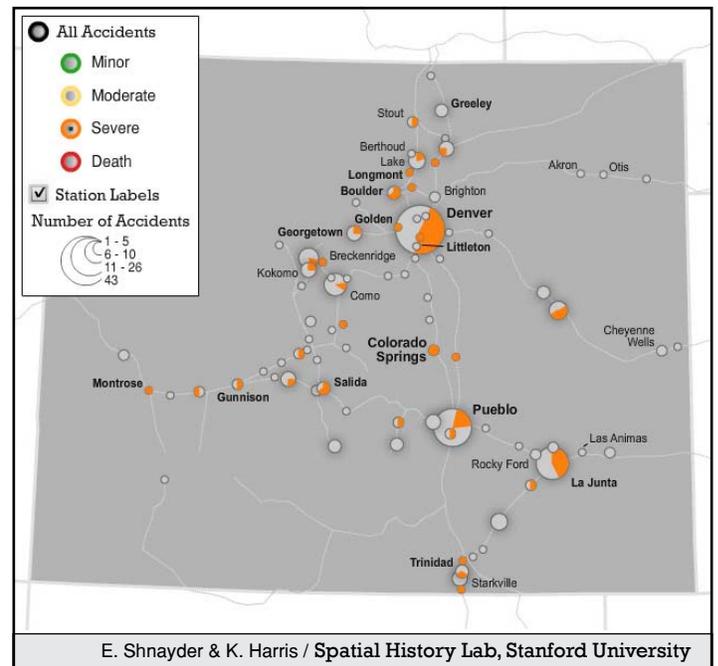
All Accidents



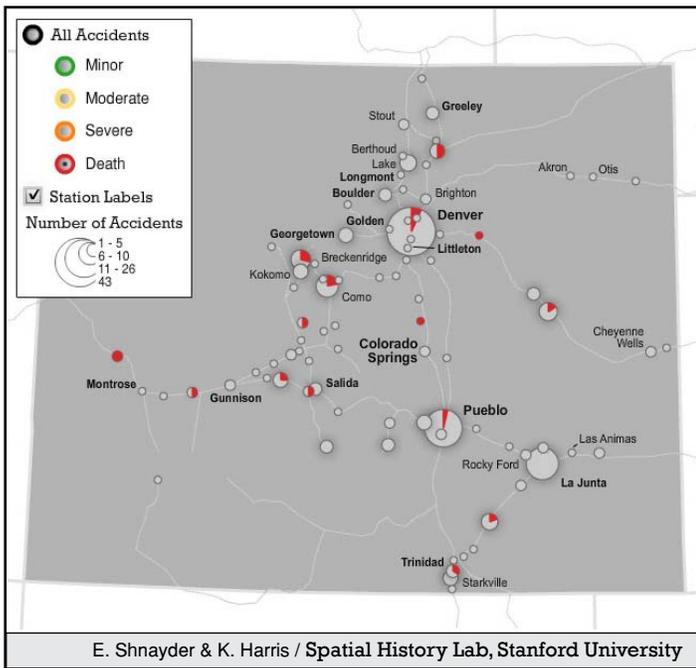
Minor



Moderate



Severe

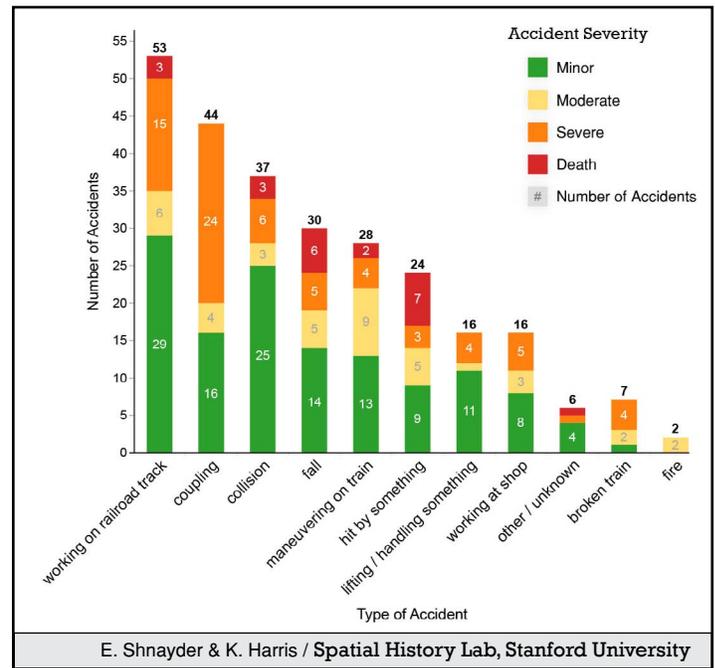


Death

division points—Denver, Pueblo, and La Junta—an indication that these were coupling accidents that cost workers hands and fingers. Unlike Denver and Pueblo, however, La Junta did not have any deadly accidents. While this could be evidence that the station’s workers were fortunate during this year, it could also be the result of having quicker medical attention for whatever injuries did occur from the Atchison, Topeka and Santa Fe Railway’s railroad hospital located at La Junta.²⁹ Deaths may have been prevented by quick treatment of severe injuries.

The opposite appears to be true in western Colorado. Railroad workers who were hurt in the western half of the state would not have been able to get medical attention as quickly as their larger city cohorts who had better access to hospitals, medical professionals, and more people in general. As a result, western Colorado injuries that would have been classified as minor or moderate at their onset could have become severe or deadly by the time that medical attention became available. This could account for the higher number of deaths in the western part of the state.

Another explanation for the higher number of deaths in western Colorado could be the growth of the railroad. From 1885 to 1893, the western half of Colorado rapidly expanded its miles of railroad track.³⁰ Out of the eleven fatal accidents that occurred in western Colorado during this year, five involved section laborers and brakemen working on areas of the track that would be expanded by 1893.³¹ The deaths in the western half of the state could be a reflection of fatal injuries incurred at railroad-building work-sites, or from trainmen traveling along brand-new miles of track to which they were not yet accustomed.



Colorado Railroad Accident Severity per Cause, July 1884 - June 1885

About “Accident Severity per Cause”

Type of Accident:

Working on railroad track: Employees creating or repairing the rail lines, employees traveling to various work sites on hand-cars.

Coupling: Employees hurt while either coupling or uncoupling railcars.

Collision: Employees involved in any kind of train accident. This varied from actual collisions to train derailments.

Fall: An employee injured due to falling from somewhere.

Maneuvering on train: Employees injured while attempting to do their job on a moving train, or employees hurt by landing between two railcars during the process of coupling.

Hit by something: An employee who was injured due to being hit by an object. The object varied from a moving train to a piece of iron.

Lifting/Handling something: Employees hurt while working with freight or baggage.

Working at shop: Employees hurt working at the train maintenance repair shops.

Other/Unknown: Unclassifiable based on the data.

Broken train: Employees hurt due to a train malfunction, such as a broken wheel.

Fire: Employees injured due to fire.

Ben McGovern's year had an ominous start in 1885. He was a switchman—an occupation responsible for coupling railcars at large railroad depots such as the division points—for the Atchison, Topeka and Santa Fe Railway. On New Year's Day, McGovern, like so many before and after him, had a coupling accident at Pueblo, Colorado. Fortunately, he only hurt his fingers instead of mashing them or cutting them off completely like brakemen Smith, Prince, and Conway.³² McGovern survived a railroad accident with only minor injuries. Others were not as lucky. The bar graph [on the previous page] shows the number of accidents divided into categories of accident “types” and the severity of each.³³

Although it appears that working on the railroad track was the most dangerous job, the numbers have to be placed in context. In Group VIII—Colorado's geographic classification in the *Seventh Annual Report on the Statistics of Railways in the United States*—trackmen and other laborers who worked on fixing and expanding railroad tracks outnumbered switchmen and brakemen by more than two to one during this time period.³⁴ The most dangerous job, forty-four (16.7%) of the total number of reported injuries, was coupling with brakemen and switchmen constituting the vast majority of these victims. Although no deaths occurred while coupling, coupling did cause the largest share of “severe” accidents.

Conclusion

In total, thirty-two men, or nine percent of the individuals with reported injuries, lost their lives working on the Colorado railroads from July 1884 to June 1885. The cause of their deaths ranged from a railcar fire to train derailment, though being “hit by something” was the most common way to die. Of the seven men who died due to moving objects, one drowned after being knocked into a river, another was shot by a hobo, and five others were run over by a moving train. The great irony is that if individual railroad workers did not suffer injury or death there would be little left in the historical record of their lives. By recording names and locating accidents in space, the Colorado sources allow a researcher to retain both the individual and the broader stories in perspective.

End Notes

- Information about F. C. Smith's accident on the Denver and Boulder Valley Railway Company, which is described in this paragraph all comes from the Railroad Commissioner of the State of Colorado, *First Annual Report of the Railroad Commissioner of the State of Colorado*, for Year Ending June 30, 1885 (Denver, Colorado: Collier & Cleveland Lith. Co., State Printers, 1886), 396.
- It is highly likely that more accidents occurred in Colorado from July 1884 to June 1885 than were reported or recorded. Walter Licht, *Working for the Railroad: The Organization of Work in the Nineteenth Century* (Princeton, New Jersey: Princeton University Press, 1983), 183.
- Railroad Commissioner of the State of Colorado, *First Annual Report*. 255
- Ibid., 256.
- Licht, *Working for the Railroad*, 183.
- Mark Aldrich, *Death Rode the Rails: American Railroad Accidents and Safety 1828-1965* (Baltimore, Maryland: The Johns Hopkins University Press, 2006), 104.
- This paper only counted and considered worker accidents. There were also passengers and people not related with the railroads involved in accidents. See the *First Annual Report of the Railroad Commissioner of the State of Colorado*.
- Steven W. Usselman, *Regulating Railroad Innovation: Business, Technology, and Politics in America, 1840-1920* (New York: Cambridge University Press, 2002), 1, Ibid., 2.
- In comparison, the total number of men killed in the Battle of Shiloh, the bloodiest day in American history, was 3,482. Ibid.
- See various sections in Licht, *Working for the Railroad* and Aldrich, *Death Rode the Rails*.
- Steven W. Usselman, “The Lure of Technology and the Appeal of Order: Railroad Safety Regulation in Nineteenth-Century America,” *Business and Economic History* 2.21 (1992): 290.
- See Aldrich, *Death Rode the Rails*, Licht, *Working for the Railroad*, and Usselman, *Regulating Railroad Innovation*.
- Usselman, “The Lure of Technology and the Appeal of Order,” 290.
- For more information on the topic of railroad depots, see any of the texts mentioned in the literature review.
- Railroad Commissioner of the State of Colorado, *First Annual Report*.
- Geographic Names Information Systems (GNIS), “GNIS Feature Search,” USGS, <http://geonames.usgs.gov/pls/gnispublic/f?p=139:1:2594013686927097> (accessed August 18, 2010), “Map of Colorado” in Traffic Department Santa Fe Route, Atlas of the Santa Fe Route: From Lake Michigan to the Gulf of Mexico, City of Mexico & Pacific Ocean (Topeka, Kansas: unknown publication information, 1889), unknown page number.
- Each railroad company numbered their bridges and mile markers differently (i.e. each company independently chose where to place mile-marker 1). Little record remains indicating where “mile 1” or “bridge 1” was for each company.
- Railroad Commissioner of the State of Colorado, *First Annual Report*.
- If a city, such as Denver, Colorado, had more than one railroad

company operating in it, the profits from every company were added together to create a total station profit. If a station listed both freight and passenger revenues, the combined revenue was used since it would not have mattered to nineteenth-century railroad workers whether they had to work on either type of car.

20. Division points are important because they are the locations in which trains with workers begin at and ended at during the day. For example, a train leaving from Denver carrying goods early in the morning would return back to Denver at the end of the workday.
21. These are the only cities in which switchmen were injured. These stations also had the highest revenues, which also appears to suggest that they were division points. Railroad Commissioner of the State of Colorado, *First Annual Report*.
22. Railroad Commissioner of the State of Colorado, *First Annual Report*, 504.
23. Denver, Pueblo, and La Junta had 89 accidents combined. Railroad Commissioner of the State of Colorado, *First Annual Report*.
24. Historic population data was found through the Colorado Division of Local Government State Demography Office. 1890 data was chosen over 1880 data because more cities reported population in the 1890 data. Because the accident data is from 1884-1885, using the 1890 census is justifiable. Colorado Division of Local Government: State Demography Office, "Historical Census Population," *Colorado Department of Local Affairs*, https://dola.colorado.gov/demog_webapps/hcp_parameters.jsf (accessed August 20, 2010).
25. Railroad Commissioner of the State of Colorado, *First Annual Report*, 254.
26. *Ibid.*, 254, 255.
27. *Ibid.*, 254.
28. *Ibid.*
29. Robert S. Gillepsie, "Partial List of Major Railroad Hospitals in the United States," *Railway Surgery*, <http://railwaysurgery.org/List.htm> (accessed August 23, 2010).
30. Toral Patel and Richard White, "The Expansion of the Western Railroad," *Spatial History Project*, <http://www.stanford.edu/group/spatialhistory/cgi-bin/site/viz.php?id=145&> (accessed August 23, 2010).
31. Information about Ben McGovern comes from Railroad Commissioner of the State of Colorado, *First Annual Report*, 194.
32. The actual ratio is probably higher than two to one because brakemen were grouped together with other professions who rode trains into a category known as "other trainmen." Switchmen were also part of a category which included other occupations, namely flagmen and watchmen. The Midwest is defined as Group

VIII and includes the majority of Colorado, parts of New Mexico, Texas, Missouri, and all of Oklahoma, Indian Territory, Kansas, and Arkansas. Interstate Commerce Commission, Statistician to the Commission, *Seventh Annual Report on the Statistics of Railways in the United States for the Year Ending June 30, 1894* (Washington D.C.: Government Printing Office, 1895), 84.

33. Railroad Commissioner of the State of Colorado, *First Annual Report*.
34. *Ibid.*

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- Railroad Commissioner of the State of Colorado. *First Annual Report of the Railroad Commissioner of the State of Colorado, for Year Ending June 30, 1885*. Denver, Colorado: Collier & Cleaveland Lith. Co., State Printers, 1886.

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