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Herbert Hoover: A Geologist in Training

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Herbert Hoover, thirty-first President of the United States, was a highly successful geologist and mining engineer before entering the world of politics. He came to Stanford University in 1891, a member of its first class and one of the first graduates with a degree in geology. Recently, Branner Earth Sciences Library & Map Collections came to hold the only known manuscript copy of a map made by him during this time. This article relates the story of the acquisition of the map, Hoover's time as a geology student, and the beginnings of the Stanford Geological Survey.

KEYWORDS *Stanford Geological Survey, Herbert Hoover, topographic maps, historical cartography*

INTRODUCTION

Occasionally, when faculty retire, they offer the library a treasure or two from their personal collections with the desire to see it well taken care of into the future. Most memorably, the library received from Dr. James Ingle, Jr., a manuscript topographic map of part of the Stanford campus created around 1893 by a young Pioneer (as Stanford's first-year class called themselves) named Herbert C. Hoover. Hoover would later become the thirty-first President of the United States and a significant benefactor of Stanford University.

Dr. Ingle, professor emeritus, Geological & Environmental Sciences in the School of Earth Sciences, had another connection to Hoover besides

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preserving the Hoover map in his office. Hoover learned field mapping from John Casper Branner, the renowned geologist and second President of Stanford University. By the 1902–03 school year, Branner would form, along with John Flesher Newsom, the first official course entitled Field Geology. This course was carried out over the summer months, and it soon became known as the Stanford Geological Survey. In 1968 Dr. Ingle became an instructor of the field course and ran it many years thence. Somehow it seems fitting that Dr. Ingle stumbled across the Hoover map and held it for so many years.

As the years went by, the School of Earth Sciences collected large amounts of material from the students who participated in the Survey, much of which made its way to Branner Library. Piles of old student maps were also sequestered in the eaves of the Geology Corner section of the Stanford Quad. To this day, the Geology Corner houses the offices of the field geologists. Dr. Ingle recalled that he didn't think much about the maps until the 1989 Loma Prieta earthquake. The quake damaged the building and it needed to be repaired. The maps had to be removed. He decided to quickly look through them to see if anything should be saved. He searched and found a treasure in the stacks: an undated map whose cartographer was Herbert Hoover.

HOOVER'S STANFORD YEARS

Herbert Hoover came to Stanford University the first year it admitted students, in 1891. Hoover arrived with his friend, Fred Williams, and they lived in a boarding house while the first dorm, Encina Hall, was being finished. Being the first student given a room, he was often referred to as the first student to enter Stanford. His goal was to earn a degree in engineering, a rare offering for most schools at the time. He declared his major to be mechanical engineering, but changed his mind after the arrival of John Casper Branner to Stanford at the beginning of 1892. After taking classes and spending time with Branner, Hoover formally changed his major to Geology in the fall of 1892.

Branner, still serving as Director of the Geological Survey of Arkansas, obviously noted Hoover's talents in the field, because he offered Hoover a position in the summer of 1892 as an assistant working for that Survey. Hoover spent most of his time alone mapping "the geological outcroppings on the north side of the Ozarks."¹ He slept each night with the local people, and for his work was paid \$60 per month. During the summer of 1893, Hoover worked side by side in the Sierras and in the deserts of Nevada with Dr. Waldemar Lindgren, an excellent geologist. Hoover stated in his memoirs that "When in the high mountains we camped out with teamsters,

horses and pack mules, and, of equal importance, a good camp cook.”² Most of the work was done on horseback, which he did not like, concluding that the horse “was one of the original mistakes of creation.”³

Hoover spent his final summer as a Stanford student, again with Dr. Lindgren, in the Sierras. He learned of the Sierra assignment while vacationing in Yosemite Valley with friends. During the evenings in Yosemite, he would listen “spellbound to [Prof. Joseph Le Conte’s] talk on the geology of the Valley.”⁴ Hoover found Lindgren to be a superior scientist and teacher. He listened to talk around the campfire of current mining and engineering practice. No doubt, what he learned from the talks aided him a great deal when he later oversaw mining operations in both Australia and China.

In his senior year, the course of Hoover’s life was forever altered by a woman named Lou Henry, a freshman from Monterey, California, who matriculated at Stanford determined to pursue a degree in Geology. Hoover believed it was his duty to “aid the young lady in her studies both in the laboratory and in the field.”⁵ He was immediately smitten. Hoover graduated in May 1895 with a bachelor’s degree in Geology; Lou graduated three years after him, also with a degree in Geology, perhaps the first woman in the United States to do so—definitely the first woman from Stanford.⁶

THE HOOVER-MITCHELL-DIGGLES MAP

The geology students in the department were required to learn how to create accurate topographic and geologic maps. They could not rely on the United States Geological Survey (USGS) topographic maps for the area nor detailed geologic information to overlay on the topography. Most of the early maps in the Branner Stanford Geological Survey collection focus on the Stanford lands and surrounding region. The Hoover-Mitchell-Diggles map is no exception. Hoover, along with D. F. Mitchell (class of 1896) and J. A. Diggles (class of 1895), mapped the area to the west of the Stanford campus (see Figure 1). Hoover was the cartographer; he entitled the map *Topographic Map of a Part of the Leland Stanford Jr. University Campus* (see Figure 2). The map’s scale is 1 foot to 300 feet and the contour interval 10 feet. Contour intervals are delineated and the valleys show streams marked in blue. A reservoir is shown near the bottom left close to Mayfield Road. Calculations in pencil are shown around the edges of the map, and the triangulation lines are clearly seen (see Figure 3). The high point of the map is fixed at 467.4 feet. The back of the map, although not cartographically important, is nonetheless of great interest. Herbert C. Hoover practiced writing his name again and again using different scripts, trying each one out for size (see Figure 4).



FIGURE 1 Herbert Hoover, back row second from left, with the first class graduating class of geologists and their professors in 1895. John C. Branner is seated second from the left, first row. J.A. Diggles and Dean Mitchell, co-authors of the manuscript map, stand on either side of Professor Branner.

A picture taken in 1893 including Herbert Hoover shows the surveying squad with their gear (see Figure 5). In addition to Hoover are Arthur Diggles, R.E. McDonnell, and James White. Diggles was on the surveying squad that mapped part of the campus with Mitchell and Hoover. The men are dressed in suit coats, ties, and hats. They pose with the tools of their trade: a transit, used to measure both vertical and horizontal angles, and two surveying rods. James White holds a surveying book in which notations were made of their survey points. A handful of such notebooks exist across the life of the Survey with the earliest dated 1893 by R.E. McDonnell and George P. Baldwin.

None of the maps held during this period were created by survey teams with the exception of the Hoover map. Although the library holds only seven maps from 1893–1899, it is interesting to note that only this one reflects the work of a survey squad. It is unclear whether students typically worked as part of survey squads, doing their own geologic and cartographic work, or



FIGURE 2 The map of part of the Stanford campus created by Mitchell, Diggles and Hoover most likely done in 1893.

went through the entire process by themselves. It is clear that by the 1900s the students were regularly working in teams with each member responsible for a mapping product that closely resembled the Geologic Folio series put out by the USGS during the same period. The folios contained a topographic map, a geologic map (see Figure 6 for example), and a detailed written explanation of the area surveyed.

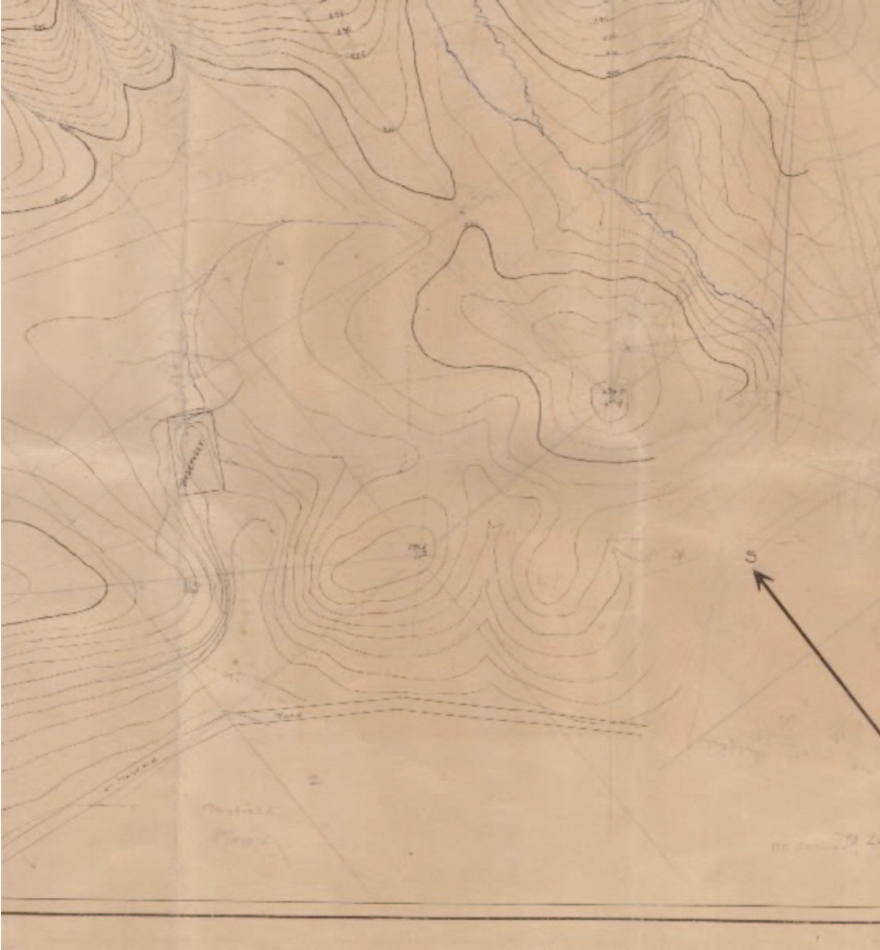


FIGURE 3 Detail from the lower right portion of the map showing the streams, the reservoir and the triangulation lines.

HOOVER'S ONGOING CONNECTION TO STANFORD

After graduating from Stanford with his degree, Hoover went on to work as a geologist and mining engineer for many years, originally in the Sierras, but then briefly overseas as well. He kept his ties to the then-named Geological Department by serving on the reunion committee for their first reunion held in 1914. Appropriately, the reunion took place in the field. The participants were told to get their blankets and field clothes ready, to gather at the Geology Building, and that a “start will be made for the hills.”⁷ The organizers provided the food and the team (pack animals) to carry the blankets and other supplies. The bond the men formed and the fondness with which they

remembered their times together is obvious when one reads the invitation, which states:

How would you like to once again hike over the hills back of the University with your hammer in your hand and J.P. [James Perrin Smith] offering a smoke to the one who finds the first fossil? And how would you like to sit around a big campfire in the evening and eat beans off a tin plate and swap stories with the other fellows who, like you, have been hammering for rocks out in the cold, cold world? You are going to have a chance to do this and also to again turn in on the hard, cold ground after the obsequies are over and gaze up at the stars through an odor of tar weed and tobacco smoke. And like old times you may be awakened occasionally by a dash of cold water, or the sound of Johnson's sleeping bag rolling down hill, or Kimball and Purdue drawing straws to see who shall sleep in the middle, or Jackson stepping into the basket of eggs.⁸

There is no record that Hoover made it to this reunion. Nash states that by 1914 Hoover, now forty years old, was at the height of his profession, earning \$100,000 a year. He was the director of eighteen mining and financial companies with a combined workforce of at least 100,000 men.⁹ There is no doubt that he felt a strong loyalty to Stanford, Dr. Branner, and Dr. Smith. J.P. Smith, his mineralogy and paleontology professor, was instrumental

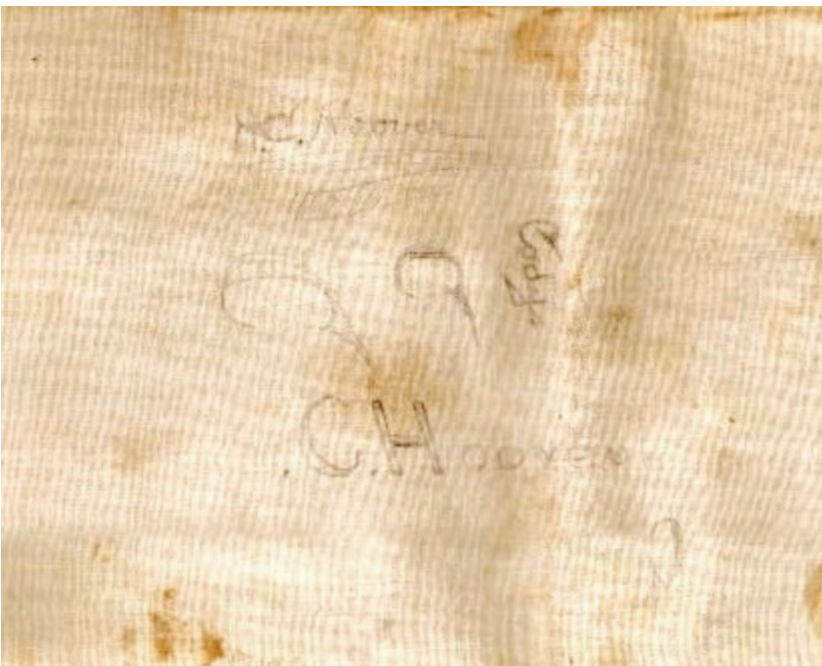


FIGURE 4 A detail of the back of the Hoover map with numerous signatures.



FIGURE 5 An 1893 picture of Hoover with his fellow surveying students and their field instruments.

in Hoover's graduation. Hoover had been admitted to Stanford on a conditional basis based on his writing skills. This "condition" had to be removed. Although he had tried numerous times to submit work that would remove this obstacle, he had been unable to do so. A few days before graduation, Smith came to his aid by taking a paper Hoover had written that was satisfactory in its content, but not in spelling, grammar, and punctuation. Together they rewrote, corrected, and refined the work. Smith presented it himself to the head of the English Department, who agreed that Hoover had passed English Composition.¹⁰ Hoover noted in his memoirs that had it not been for the help of Smith and Branner, "those implacable persons in the University office would have prevented my getting a diploma with my own class. Nevertheless, it duly arrived."¹¹



FIGURE 6 The Historical Geology map from the Big Tree folio, California, Folio 51, published 1898 by the United States Geological Survey as part of the *Geologic Atlas of the United States*. Courtesy Texas A&M University Libraries.

THE STANFORD GEOLOGICAL SURVEY

Hoover arrived at Stanford just as the university was forming and, through his participation, helped define how the Geology Department would teach the students to do their work. This was the time in which the Stanford

Geological Survey was formed. It would run for nearly 100 years. In the early years, the survey focused on the local California area including the Santa Cruz Mountains and areas to the east of San Jose, such as Mt. Hamilton. By the 1930s, it had moved to oil producing regions of southern California and the Humboldt Range in Nevada. In the 1940s, the Summit King Mine in Nevada was mapped as well as other mountain ranges in the state. Thereafter, different parts of Nevada and California were explored. There were also one ill-fated trip to Baja, Mexico, and a trek in the Kern Mountains of Utah. The final field season was in 1987 to the Northern Snake Range, Nevada, and it was run by Elizabeth Miller, the last Head of the Survey. The last map was completed in 1993, part of a cooperative research project studying the geology of the Great Basin National Park, Nevada.

CONCLUSION

With his background in mapping, Herbert Hoover joined a select group of United States presidents who spent part of their careers as surveyors. George Washington's first profession was surveying; by the age of sixteen he was making his first journey to the frontier of western Virginia. He continued to use these skills even when a General during the American Revolution. Thomas Jefferson, the son of a surveyor, was himself commissioned as a surveyor for Albemarle County in Virginia, although his skills were primarily used to manage his farm. Abraham Lincoln practiced the profession of surveying for a few years wherein he worked on government surveys, roads, and town lots.

On a more intimate level, the map that Hoover created embodies more than an early view of the Stanford campus. It highlights the methods used to create topographic maps before one could purchase a copy from the United States Geological Survey. It provides a window into the beginnings of the Stanford School of Earth Sciences, then a Department, and one of the first on the campus. It speaks to the important role John Casper Bramer, Stanford's second President, played in the life of a future geologist. Finally, it gives us a glimpse into the slice of time that Hoover spent on the Stanford campus learning his craft, with little money and a future that included many nights around a campfire swapping stories and gazing at the stars.

NOTES

1. Herbert C. Hoover, *The Memoirs of Herbert Hoover: Years of Adventure, 1874–1920* (New York: MacMillan, 1951), 17.
2. *Ibid.*, 18
3. *Ibid.*

4. Ibid., 19.
5. Ibid., 23.
6. It does not appear that Lou Henry ever participated in field mapping. Women were not allowed to attend the camps until 1964. Stanford women had to take their field geology class at another university if they chose to major in Geology. There is evidence that one woman did persevere in field work early on. Held in the library's collection are a notebook and a student report written in 1929 by Mary Balch. She was not allowed to participate in the summer field geology camp as it was decided it would be too dangerous for her to be the only woman in the camp. Alternatively, she lived at home and worked in the south San Jose area on the New Almaden Quadrangle. She reported to the Head of the Survey, Cyrus "Chief" Tolman, once a week. Ms. Balch noted that one of her early role models was Lou Henry Hoover, who she reported was famous for being the first woman geologist to graduate from Stanford and for her co-translation of *De Re Metallica* with Herbert Hoover. (Mary Balch [Mrs. Richard R.] Kennedy, interview by Judy Terry Smith and Juliet R. Crider, tape recording transcribed 25 July 1997.)
7. Friedman, Roberta, and Carol L. King, *The Stanford Geological Survey: A history dating back to 1903* (Stanford, CA: School of Earth Sciences, 1988), 2.
8. Ibid.
9. Nash, George H., *Herbert Hoover and Stanford University* (Stanford, CA: Hoover Institution Press, 1988), 23.
10. Ibid., 17–18.
11. Hoover, *The Memoirs of Herbert Hoover*, 24.

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