GEORGE MONTAGUE WHEELER

LAST ARMY EXPLORER OF THE AMERICAN WEST

by

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West Point, New York

18 May 1975

APPROVED:

22 May 1975
(Date)

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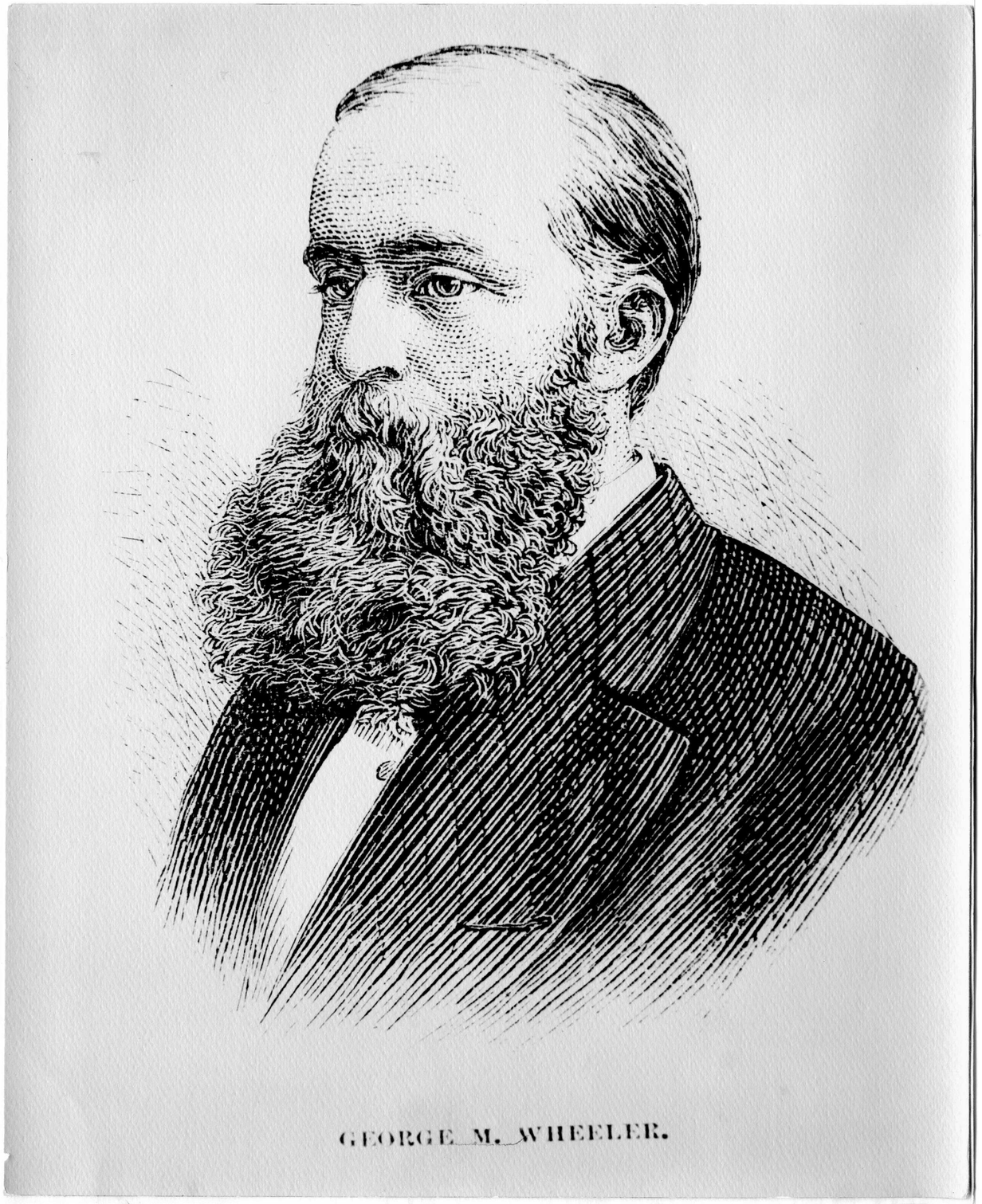
Guth, P.L., 1975, George Montague Wheeler: Last Army Explorer of the American West: unpublished EV489 independent research project, Department of Earth, Space, and Graphic Sciences, United States Military Academy, West Point, New York, 74 p. Original in the possession of the author (pguth@usna.edu; pguth@verizon.net), with copy in the Special Collections, USMA.



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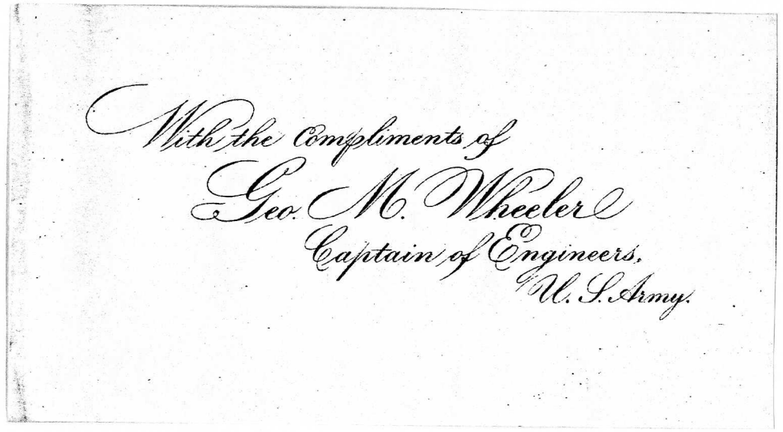

PREFACE.

The picture of Wheeler was enlarged from the article by William Rideing in the Harper's New Monthly Magazine for May 1876, where it appeared on page 807. Wheeler's card, xeroxed above, appeared on a copy of one of his maps in the Documents Room of the West Point Library.

I would like to thank the following for their assistance or encouragement: the staff of the United States Military Academy Library, particularly the Documents Room and the Rare Book Room; the illustrator for the Department of Earth, Space, and Graphic Sciences; the West Point Museum; Colonel John Garver, Captain Steven Foster, Mrs. Marie Capps, Mrs. Frederick B. Fisher, Miss Helen Wheeler, and the many people who heard me out while I explained what I was attempting to do with this project.

I would like to dedicate this paper to Olenellus gilberti, described by Meek in the pages of the Wheeler expedition reports. This little trilobite, along with his Cambrian neighbor the echinoderm Helicoplacus, firts aroused my interest in the geology

of the West. When I discovered that George Montague Wheeler had conducted a survey of the West that included geological work, I had a subject for my research.

To Olenellus gilberti, and the young West Point lieutenants who in the 1870's helped discover him.

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INTRODUCTION.

"The Corps of Topographical Engineers is the only body ever organized by law in the United States to prosecute topographical surveys." So wrote George Montague Wheeler in 1885. (Wheeler, 1885, p.468) During the Civil War the Topographical Engineers had been merged into the regular Corps of Engineers within the Army, in 1863 losing the separate identity established in 1813. Thereafter the Army would provide only one explorer who could rival or equal the pre-Civil War explorations and discoveries of the great Topographical Engineers: Major Stephen H. Long, Lieutenant John C. Fremont, Captain John W. Gunnison, Captain Howard Stansbury, Lieutenant Gouverneur K. Warren, Lieutenant Amiel W. Whipple, and Major William H. Emory. The only post-Civil War explorer to wear the Army blue was George Montague Wheeler, an 1866 graduate of West Point. Why Wheeler's work failed to permanently continue the tradition of the Topographical Engineers provides an interesting insight into the evolving relationship between science and the military.

Following the Civil War the Army did not move quickly to reenter the business of surveying and exploring the West. Into the void that before the War had been filled by the work of the Topographical Engineers stepped three civilian surveys, one under the Engineer Department of the Army but manned exclusively by civilians.

The first of the civilian surveys was headed by Ferdinand V. Hayden, who had worked as a geologist in the West before the

Civil War. Hayden's earlier work included service with two Topographical Engineers surveys, those of Warren and Raynolds. Starting in 1867 under the General Land Office, Hayden began work as a government geologist. Until the 1879 consolidation of the various surveys, Hayden's Geological and Geographical Survey of the Territories worked in Montana, Wyoming, Idaho, Utah, Colorado, Arizona, and New Mexico.

The second survey, like Hayden's under the Interior Department, came under John W. Powell. Starting as a largely private exploring effort in the Grand Canyon, Powell expanded his work until he had a survey rivalling Hayden's in size and scope, with its own title, the United States Geographical and Geological Survey of the Rocky Mountain Region. Concentrating on the area of the Southwest around the Grand Canyon, Powell studied both geology and ethnology in his survey, and contributed a volume on irrigable lands of the West.

The final survey came under the direction of the War Department, although its director, Clarence King, was not a military man. Established in 1867 and known as the United States Geological Survey of the Fortieth Parallel, King's survey worked an area about one hundred miles miles along the fortieth parallel from eastern Colorado to the Sierra Nevada mountains. Field work ended in 1872, but office work and the preparation of reports lasted until the publication of the final volume in 1880.

All three of these surveys concentrated on scientific work, especially the geology of the West. As the Army recovered from the rapid demobilization following the Civil War, it found the

traditional Army preserve of Western frontier exploration being invaded by government-financed civilians. Further, in concentrating on geology the scientists ignored the questions plaguing the Army with its wide-spread posts in the West. The Army needed accurate knowledge of the topography of the West, both for the purpose of resupply of isolated garrisons and the conduct of campaings against hostile Indians.

On graduating from the Military Academy in 1866 and being appointed to the Corps of Engineers, Lieutenant Wheeler found himself assigned to the survey of Point Lobos, near San Francisco. Two years later he became engineer on the staff of General Ord, commanding the military Department of California. In 1869 Ord sent Wheeler on a reconnaissance through Nevada, starting the career that would involve almost ten years of his life. Two years later Wheeler returned to the field, having convinced the Chief of Engineers to support a grandiose plan for mapping the West. In 1872 he set out with his scheme approved by Congress; Wheeler was going to map the entire West beyond the hundreth meridian! He planned 95 rectangelar divisions to cover the West, each about 150 miles by 120 miles in size. With a measure of permanence assured by the approval of his plan, the young officer entitled his organization "The United States Geographical Surveys West of the One Hundreth Meridian."

WHEELER'S PURPOSE.

Wheeler conceived his survey as a fundamentally different project than the other contemporary surveys. He saw his primary

purpose as geographic cartography, and after the consolidation of the surveys Wheeler remained bitter that the United States had rejected the need for such geodetic surveying and topographic mapping. Wheeler continued to maintain that the surveying and mapping that he advocated was the variety most suited to the public interest.

While attached to the staff of Brevet Major General E.O.C. Ord, commander of the Department of California, in 1869 Wheeler was sent on his first exploration. In his annual report General Ord explained the reasons for sending him on this mission.

> There was an extensive unexplored district between White Pine and the Colorado River, which was supposed to be rich in precious metals, and into which small prospecting and other parties were venturing, so that a proper regard for the general desire for correct knowledge of it required that it should be surveyed and mapped. A careful military and scientific reconnaissance of this portion of the great American desert, such as Lieutenant Wheeler will make, may result in much valuable information. (Ord, 1870, pp.123-124)

Ord added that General A.A. Humphreys provided a sum of money for Wheeler's work, and in his own report as Chief of Engineers Humphreys also mentioned the reconnaissance and the benefits it might provide.

Two years later Humphreys sent Wheeler into the field to survey. According to the letter of instruction dated 23 March 1871, Humphreys gave Wheeler's survey the following purpose.

> The main object of this exploration will be to obtain correct topographical knowledge of the country traversed by your parties and to prepare accurate maps of that section. In making this the main object, it is at the same time intended that you ascertain as far as practicable everything relating . . . (Wheeler, 1872, p.3)

Humphreys then went on to list the subjects that were to be of

secondary importance: physical features, Indians, sites of military value, rail and road sites, mineral resources, climate, geological formations, vegetation, land potential, latitude and longitude. In tasking Wheeler with the primary mission of producing maps for military purposes, he added that Wheeler should conduct a general scientific reconnaissance as far as practicable. But the primary purpose would greatly influence the way Wheeler would conduct his survey over the next eight years.

A frequent defense of the military survey would be its value to the needs of the country. Wheeler stressed that he was not engaged in pure scientific research, but that practical results would follow from his work. An article from the Army and Navy Journal in early 1873 gave a brief justification for the work in terms similar to those used by Wheeler himself.

> Constant endeavor was made to associate the scientific inquiries of the Expedition with the practical questions and needs of the territories, and not to conduct a purely scientific or specialist's investigation over the heads of the strangely conglomerate population which covers them, and looks with jealousy, or at least suspicion, on projects not calculated to advance their personal prosperity. The subjects of artesian wells, irrigation, internal improvements of various kinds, special mining surveys in the different districts for the purpose of local reference, and the possibility of utilizing barren acres, were therefore entertained with attention. (Army and Navy Journal, 8 February 1873, p.408)

Two years later, following the 1874 Congressional investigation into the surveys, Wheeler stressed their military importance. But the practical results still appeared as the fourth object listed by New York Times correspondent William Rideingwho in 1875 wrote that he was frequently asked the objectives of Wheeler's survey, and that these should be better understood.

He listed four objectives of the survey: (1) "determine exact topographical features" that were "necessary to all military operations," (2) "seek the establishment of the best routes" to the isolated Western forts and outposts, (3) select sites for new forts, and (4) conduct an "inquiry into the mineral, agricultural, and social conditions and prospects." (NY Times, 13 June 1875, p.7)

Throughout Wheeler's annual reports and the dispatches sent from the newspaper correspondents accompanying his parties, two aspects of the value of the work were particularly stressed. First came the military necessity for accurate maps. Rideing's report filed from Wheeler's camp in Carson City, Nevada, in September 1876 noted that von Moltke had given his officers maps for their use during the Franco-Prussian War. The article also claimed that the Union forces could have saved $100 million during the Civil War had they possessed accurate maps. (NY Times, 13 September 1876, p.5) In addition to the need for maps for use in the Indian campaigns as well as any other potential operations in the West, the military stressed the practical benefits for miners and settlers. In a cover letter for Wheeler's preliminary report on his 1871 field season, General Humphreys stated that

> The early mapping of this region [Nevada and Arizona] will be of great service not only for governmental purposes, but in furnishing information eagerly sought for by those interested in mining and other industrial purposes. (Wheeler, 1872, p.2)

An article in the Army and Navy Jouranal in 1873 claimed that the Wheeler survey would be cost effective. "The discovery of such routes and the value of the regions traversed for mining and

agricultural pursuits will return to the government double the cost of the expedition." (Army and Navy Journal, 23 August 1873, p.24)

Wheeler sought practical results from his exploration of the West.

METHODS.

The survey work of Wheeler's parties was adapted to the reconnaissance nature of the objectives. In his 1878 report Wheeler stated the economic tradeoffs.

> Methods commensurate with the accuracy of the topographical work being settled upon in advance, the endeavor has been to secure, in their pursuance, the best possible results at the least possible cost. (Wheeler, 1879, p.1523)

The concept of the work as reconnaissance geography led to the employment of the meander method of survey. This led to attacks from the civilian scientific community that Wheeler's topographic work was worthless.

Both in the 1874 and 1878-1879 Congressional debates over consolidation of the surveys, Wheeler's meander methods bore attacks from the civilians in the Interior Department surveys and the Eastern colleges. As a result, in his annual reports submitted to Congress Wheeler took pains to explain his methodology and demonstrate the mathematical and astronomical basis of his survey. Page after page was filled with tables of observations and calculations. In addition, his New York Times correspondent in 1876 explained the meander method and defended its scientific validity,

> "Meander" being a comprehensive scientific term worth a little explanation. To "meander," in engineer's palance, is to make a profile of the course, its windings, ascents and descents, to measure by the odometer and to gather every detail that can possibly be delineated on a map. (NY Times, 9 October 1876, p.3)

Most of this topography work was performed by civilian topographers.

The incidental scientific work in geology, ethnology, botany, and zoology was also carried out by hired civilian workers, although some of this work was done by acting assistant surgeons in the Army (at this time they were not officers). Civilian packers, cooks, and observers rounded out the parties; after the first few years the large military escorts characteristic of the first few expeditions were no longer used.

The direct involvement of the military was confined to supplying the parties, and each party was generally commanded by an Army lieutenant, although sometimes these parties would be further subdivided and a civilian scientific worker placed in charge. In 1874 Wheeler testifed before Congress on the portion of the work carried out by the officers: "The astronomical part in the field, besides the executive duties. They are called upon for more laborious duty than any other of the members of the expedition." ("Surveys West of the Mississippi," 1874, p.21) Rideing dutifully verified this, describing ascents of treacherous mountain peaks during hail storms dragging surveying instruments in order to obtain the sightings needed to determine a position by triangulation. He reported that obstacles were overcome only by "military energy and scientific care" (NY Times, 19 July 1875, p.1), and described Lieutenant Macomb and topographer Mr. Carpenter on their mountain

as "martyrs in the cause of science." (NY Times, 5 November 1876, p.4) Despite this fine rhetoric the Army provided only the direction for the field parties and the astronomical work. Everything else was done by civilian workers.

WHEELER AS DEMANDING LEADER.

Wheeler's 1871 adventures in eastern California aroused the anger of some of the local newspapers, which claimed that he murdered two of his guides and tortured some of the Indians. In the absence of further corroboration Bartlett discounts the claims of the single unidentified newspaper clipping. (Bartlett, 1962, pp.343-344) Furthermore, contrary to Bartlett's assertion that Wheeler never mentioned the loss of the two guides, Wheeler mentioned both in his 1871 report. Lieutenant Lyle "in company with a guide by the name of Hahn, had gone forward to seek a camp to the eastward, and had been left not far from this place by the guide, who apparently was confused from not knowing the country; this guide has never since been heard from." (Wheeler, 1872, p.8) Later on Wheeler reported the loss of the second guide.

> A portion of this party returned, all, in fact, except Mr. Egan, the guide, who has never yet been heard from authentically; his fate, so far, is uncertain; that of any one to have followed him in the particular direction he was taking when last seen would have been certain death. (Wheeler, 1872, p.9)

Even discounting the story of the guides lost in Death Valley, Wheeler must have been a hard leader who demanded much of his men. As he himself noted in the same 1871 report that noted the uncertain fate of the two guides,

> In order to consumate the results expected, to work with much celerity and little or no intermission, and the force at my disposal were constantly pressed with labors that gave them little if any rest, and no recreation from the commencement to the end of the season. It is with no little satisfaction that I can bear testimony to the willingness of the civilian assistants and employés, with scarce an exception, to make any and all exertions, or undergo such privations as were required of them. (Wheeler, 1872, pp.12-13)

The Grand Canyon trip of 1871 further emphasizes the demands that Wheeler placed on his men. Powell had gone down the river, but his quick journey provided Wheeler the excuse that by going up the river he could devote more time to careful study. Also the Army study could determine how far up the river steamers could carry troops and supplies. Yet Wheeler pushed his party far further than necessary for this purpose. To determine the limits of navigation they need not have pulled their boats past rapids so treacherous that,

> A dip circle, procured from the United States Coast Survey... was, however, lost in the Grand Cañon of the Colorado, along with many other valuable and useful articles . . .. Many of the valuable detailed notes collected during the last four years, and appearing as memoranda in certain books that were inadvertently taken on the Colorado, were lost in the bottom of that river. (Wheeler, 1872, pp.17,24)

Before the escapade ended the men were receiving short rations due to the same losses to the river. Wheeler had been carried away by the sense of adventure and desire to outdo Powell's survey by pressing upriver against the current. While he may have proved that specially designed steamboats could ascend the Colorado a greater distance than previously believed, Wheeler ascended the river much farther than needed to verify the limits of navigation. These quixotic exploits never made the popular press, for detailed correspondent Frederick W. Loring found his

way into the Wickenburg stage massacre before his story found its way into print. Yet the adventure on the river showed the lengths to which Wheeler would push his party.

THE 1874 HEARINGS.

During the 1873 field season parties from the surveys of Wheeler and Hayden surveyed portions of the same ground in the Colorado area. This created a public uproar that the government was paying for two separate surveys of the same region. As a result Congress conducted hearings in the spring of 1874 to consider the consolidation of the various surveys.

The question of the duplication of effort was not fully resolved. The military party involved had been under the command of Lieutenant W.L. Marshall. He thought that an agreement had been reached between himself and Hayden dividing the area, and that Hayden had then violated this agreement. Hayden's geographer and first assistant James T. Gardner did not recall any agreement. Neither did the eminent geologist J.D. Whitney, who was in camp with Hayden at the time of the overlapping work. Hayden also stated that since Wheeler's work was for military purposes different from his own, there would be no duplication of results. Faced with this conflicting evidence, the Congressional committee concluded that the duplication of effort must have been caused by a misunderstanding. ("Surveys West of the Mississippi," 1874, pp.7,17-18,32-33,71-73)

Besides considering the question of duplicated efforts, the committee investigated the possibility of consolidating the

various surveys. In a recommendation to Congress, President Grant proposed two categories of survey. The detailed survey for the opening of land for settlement should be undertaken by the Interior Department. But there was also a second category of survey work that would be required, a

> Complete map of [the] country; to determine the geographical, astronomical, geodetic, topographic, hydrographic, meteorological, geological, and mineralogical features of the country--in other words, to collect full information of the unexplored, or but partially known, portions of the country. ("Surveys West of the Mississippi," 1874, p.1)

For this task the Corps of Engineers would be best suited, since the Army would have to provide security, and because the "Engineer Corps of the Army is composed of scientific gentlemen, educated and practiced for just the kind of work to be done." ("Surveys West of the Mississippi," 1874, p.2)

General Humphreys, Chief of Engineers, agreed with the two-fold breakdown of duties proposed by the President. He did not want the Engineers involved in land surveying for sale or for settlement. On the other hand, the general survey of the West and its resources fit right in with the historic frontier mission of the Army and the old Corps of Topographical Engineers. Humphreys testified, "The War Department and the officers of the Army are not in antagonism with the science of the country, but have always maintained friendly and intimate relations with it." ("Surveys West of the Mississippi," 1874, p.42) Wheeler had testified that "The particular object of our survey is the determination of necessary facts for the construction of a topographical atlas for the entire territory west of the one

hundreth meridian." ("Surveys West of the Mississippi," 1874, p.26) The Army survey was already engaging in much of the general reconnaissance that Grant was proposing and would gladly take on the additional duties suggested.

The scientific community could not stand the idea of the Army assuming responsibility for all surveys except those marking off townships and sections. To prevent this proposal from putting them out of the business of leading surveys, the civilian community attacked both Wheeler's mapping and the more general question of the Army's suitability for the job. The scientists were interested in geologic mapping and investigating and wanted that as the primary focus of Western surveys rather than topography.

John Wesley Powell, Civil War veteran whose loss of an arm had not hampered his exploration of the Grand Canyon, provided the first espert witness against the Army. He admitted the high value of some of Wheeler's work. According to Powell, Wheeler's "astronomic work ranks among the best that has ever been done in this country, and, perhaps, with the best that has ever been done in the world." ("Surveys West of the Mississippi," 1874, p.51) That issue aside, the committee asked Powell if as a geologist he would be able to use Wheeler's meander-based maps. He replied, "I think not. I could not use them. They are practically useless to me as a geologist." ("Surveys West of the Mississippi," 1874, p.53) His earlier testimony made clear that Powell was not attacking Wheeler's prosecution of the surveying but rather the inherent inaccuracy of the meander method, which was not considered accurate enough for geological base work. (See Map 1

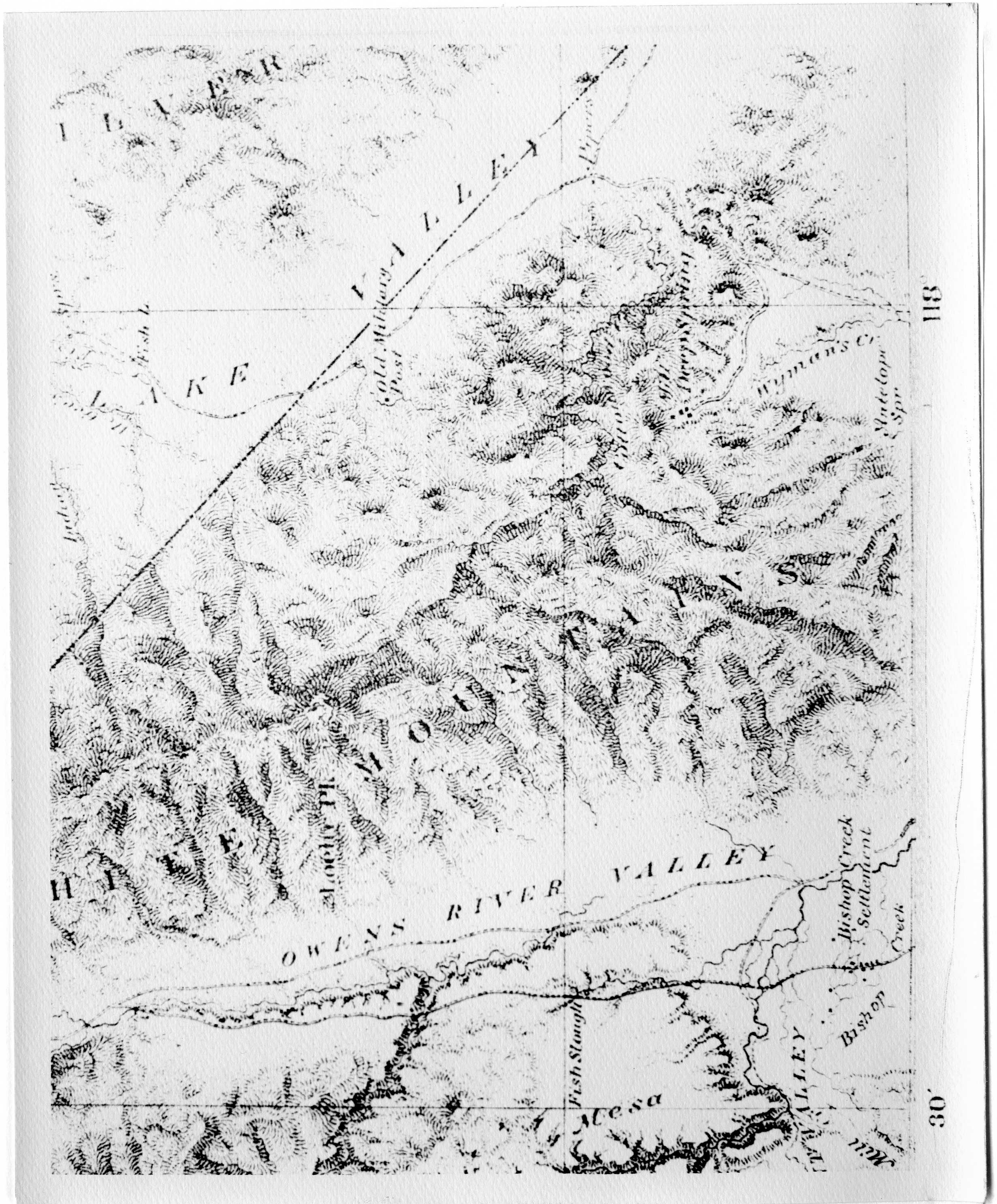
Map 1.

Two adjoining maps of the region covered in the 1871 field season. Both show enlarged segments of the sheet, done on an original scale of eight miles to the inch. The maps list only Wheeler's name.

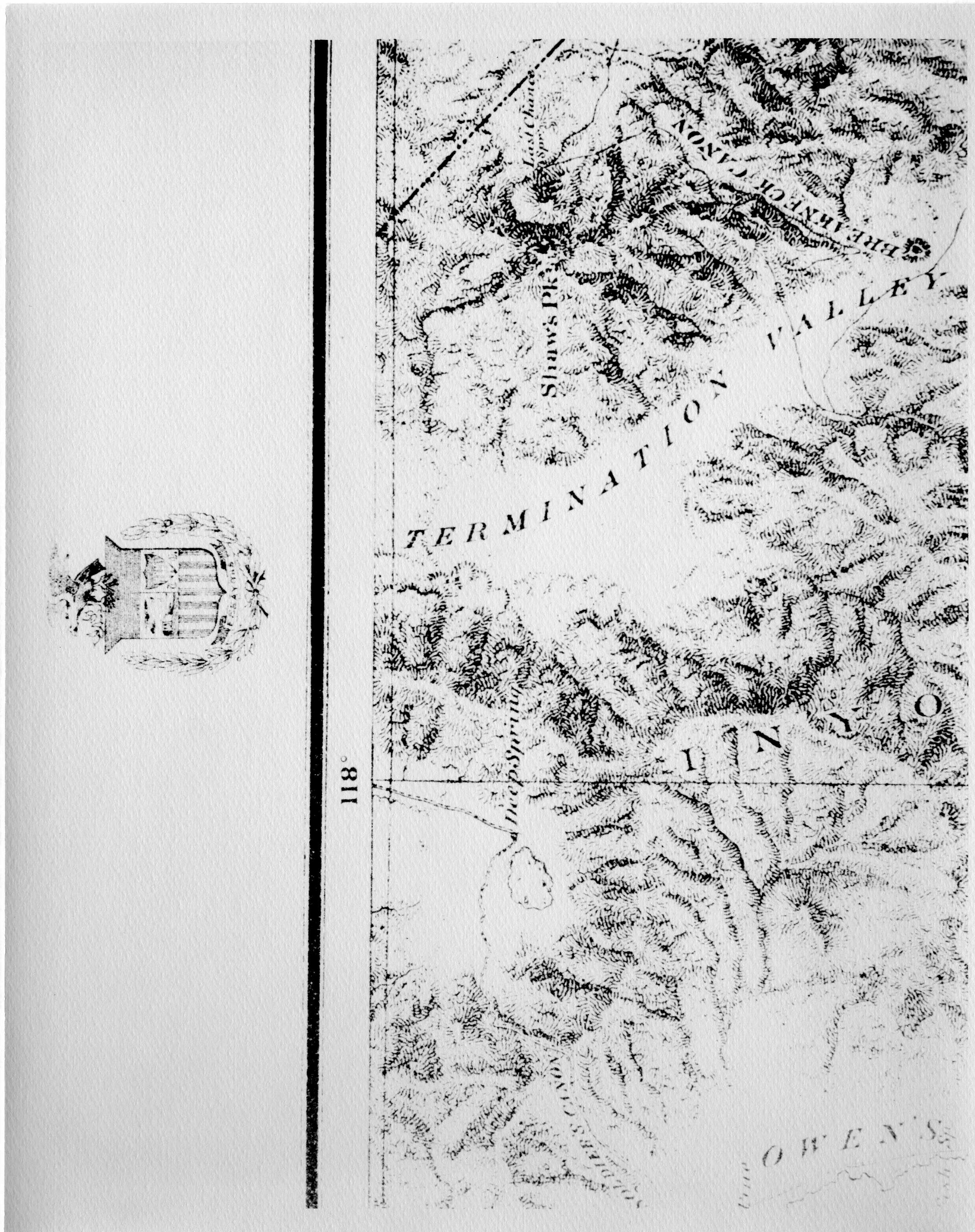
Map 1a is a section along the southern edge of Wheeler's sheet 57.

Map 1b is a portion from the top of sheet 65 that lies directly south of sheet 57.

Map 1a.


LAKE VALLEY
MOUNTAINS
OWENS RIVER VALLEY
Bishop Creek Settlement
Bishop Creek
Fish Slough
Mesa
118
30'

Map 1b.


TERMINATION VALLEY
BREAKNECK CAÑON
Shaws Pk.
INYO
OWENS
118°

for a copy of one of Wheeler's early maps.) Finally, Powell the ethnologist told of Wheeler's dealings with the Indians. During his last field season he had found the Indians excited, relaying signal fires from mountain tops 200-300 miles away. He discovered that Wheeler's soldiers had killed one Indian and blinded another, and the Indians had come several hundred miles to see Powell and inquire why the United States had sent out an Indian-killing party, meaning Wheeler. ("Surveys West of the Mississippi," 1874, p.52)

Hayden, leader of the other Interior Department survey in the West, joined Powell in attacking the military work. He felt that a surveying party would achieve a better quality of work under civilian-scientific rather than military leadership. As for the military producing scientists, for Hayden "A scientific man is, like a poet, God-made. You cannot manufacture a scientific man at a military or scientific school." ("Surveys West of the Mississippi," 1874, p.33) Furthermore, geology required long and continuous sections which were not brought out by the military or geographic purpose of Wheeler's meander method. ("Surveys West of the Mississippi," 1874, p.8)

The Eastern scientific community rallied behind Hayden and Powell. Hayden's geographer James Gardner found errors on two of Wheeler's map sheets which did not line up exactly, and he was seconded by Harvard's geology professor J.D. Whitney who declared the work in California and Nevada worthless and the maps "very bad, and entirely behind the present requirements of geographcial science in this country." ("Surveys West of the

Mississippi, 1874, pp.57,61-62) Letters of support for Hayden came in from the faculties of Yale, MIT, and Harvard, urging that his survey not be merged into those of the War Department. ("Surveys West of the Mississippi, 1874, pp.73-75) Pointing up the absence of Army officers in the Army surveys, Professor W.H. Brewer of Yale commented on the West Point education.

> Up to fifteen years ago West Point was almost the only school in the land that gave more than rather elementary instruction in engineering studies . . .. West Point has educated none of our younger naturalists nor geologists now employed by Government on its surveys . . .. West Point does not claim to educate topographers, nor geolgoists, nor naturalists, nor even to train men to take charge of geodetic work. But Harvard, Yale, and the other schools of scince do claim to train men for just such work . . .. ("Surveys West of the Mississippi," 1874, pp.59-60)

The popular press picked up the idea, and an article in The Nation agreed that scientists should direct the surveys.

> The army officers were not, after all, trained men of science; exploration for the benefit of general knowledge was not their business; they did not appreciate the needs of the scientific workers whom they carried with them, nor sympathize with their spirit; and they did not allow scientific interest a due place in competition with military and practical ones. There are schools which, in all branches required to make the successful scientific explorer, give a higher and more thorough training than West Point can afford. (The Nation, 21 May 1874, p.328)

Two weeks later the magazine printed a letter in reply, written by an author identified only as C.W.R. of the United States Naval Observatory, and defending the qualifications of Engineer officers for survey duty.

> The education which these officers receive at West Point to fit them for this duty is as follows: The instruction in mathematics is thorough and sufficently extensive; in surveying, it is limited, but furnishes all the principles required and some practice; in reconnaissance, it is quite thorough, and has been much extended of late years; in field-astronomy, it is particularly good, including

> considerable practice in the field-observatory, which is fitted with the best modern instruments. In this last respect I do not believe that the instruction is equalled at any institution in the country. The education of engineer-officers at West Point in general scienees is quite limited, except in theoretical mechanics, in which the instruction is much more thorough and advanced than is usual in our best colleges. But as far as it goes, it is acquired by the leading graduates of each class withaa thoroughness not often found in other institutions. (The Nation, 4 June 1874, pp.360-361)

A week later Brewer of Yale wrote a letter to The Nation clarifying the intention of the Yale faculty's letter to Congress. Their concern should not be taken as discrediting West Point.

> Nor did we have even a suspicion that it would be regarded as "an attack on West Point," either direct or implied. Not a single one of the signers of this petition had any personal complaint to make against any army officer connected with any scientific survey. Several of us gratefully acknowledge ourselves as under personal obligations to officers of the army for generous and zealous co-operation given us in the prosecution of scientific work whenever and wherever solicited. But we did not and do not think it is for the best interests of science that the sole direction of all geological and other scientific surveys in the interior be concentrated in their hands. (Brewer, 1874, pp.377-378)

The other signatories of the Yale letter similarly wrote an apology, covering the same ground.

> We desire most explicitly to disclaim the intention of bringing any reflection upon the Corps of Engineers or the instructors of the [Military] Academy, both of which we hold in the highest esteem. Our memorial was designed to express the conviction that it is important that gentlemen educated in the civil schools of science should have the opportunity to contribute their activity, knowledge, and enterprise in the exploration of the territory which yet remains to be examined. (Raymond, 1876, p.43; also in "Sundry Civil Appropriations Bills," 1875, p.57)

Yet despite the disclaimers, the civilian scientists clearly voiced their opinion that civilians rather than West Point educated Engineer officers should be given the major role in

the scientific exploration of the West.

With much of the criticism Wheeler had to agree. Though he had graduated sixth of forty in mineralogy and geology in his West Point class of 1866 (Diabolus, 1866, p.8), in 1874 he was careful to define what he was not. "I do not wish you to involve me in the geological work. I am not a geologist, and I have no special attainments in that line," he told the committee. ("Surveys West of the Mississippi," 1874, p. 21) But for their work in astronomy and the executive duties of handling the survey parties Wheeler felt that he and the other lieutenants were qualified and capable. And to counter the claims concerning the poor quality of the maps, he had the testimony of his boss General Humphreys, who although partial to Wheeler's cause was still respected in scientific circles. Of the War Department surveys Humphreys wrote that "Their results have received the highest commendation in this country and in Europe, where the plans of operation and methods of survey are considered as models of their kind." ("Surveys West of the Mississippi," 1874, p.4)

Further, Wheeler would have defended the education at West Point. With a touch of modesty, Wheeler told the Congressional committee,

> I have myself been one of the pioneers in the work since the war, and we have other young officers of the [Engineer] Corps who are growing up, and who will be ready to take my place very shortly. Even in the instruction at West Point remarkable innovations have been made within the last three or four years as to the practical use of instruments, both astronomic and geodetic. ("Surveys West of the Mississippi," 1874, p.17)

As a proud alumnus, Wheeler considered the West Point museum as